ASSESSMENT, DEVELOPMENT AND DEMONSTRATION OF LOW-VOC MATERIALS FOR CLEANING OF LITHOGRAPHIC PRINTING INK APPLICATION EQUIPMENT

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EXECUTIVE SUMMARY

Emissions of VOC solvents used in cleanup applications in lithographic printing amount to about four tons per day in the South Coast Basin, which is located in southern California. The South Coast Air Quality Management District (SCAQMD) has established an interim VOC limit and a future final VOC limit on these solvents. For on-press blanket and roller cleaning, the VOC content of the cleaners was reduced from 800 or 600 grams per liter to 500 grams per liter in July of 2005. In July of 2006, the limit is scheduled to be reduced further, to 100 grams per liter VOC.

In two four year projects, the Institute for Research and Technical Assistance (IRTA), a nonprofit technical organization, worked with 21 lithographic printing facilities in the South Coast Basin to identify, test and demonstrate alternative low-VOC, low toxicity on-press cleaners. The projects were sponsored by SCAQMD, Cal/EPA's Department of Toxic Substances Control (DTSC) and U.S. EPA. This document reports the results of the projects.

The Printing Industries Association of Southern California assisted IRTA in identifying facilities that would be willing to participate in the project. A range of facilities was selected so the test results would be applicable to the industry as a whole. IRTA conducted preliminary testing to screen alternative cleaners that might be appropriate for field testing. IRTA initially performed tests on one or more printing presses, generally a number of times, to identify potential effective cleaners. When effective cleaners were found, IRTA provided a week's supply of the alternatives for testing. Extended testing was conducted in seven of the facilities to observe longer-term effects of the alternative cleaners. For these facilities, IRTA provided at least three months of the alternative cleaners for testing. IRTA performed cost analysis and comparison of the alternative cleaners and the current cleaners used by the facilities. In some cases, the printers decided to convert to the new cleaners.

Table E-1 summarizes the results of the project. For each of the 21 participating facilities, the table shows the type of press, the type of ink and the substrate or substrates used by the facility. The table also shows the alternatives that were found to be effective at each of the facilities for cleaning blankets and/or rollers. The VOC content of these alternatives is listed in parenthesis in the table. Finally, the table indicates the status of the facility—whether the facility converted to the alternative and whether the facility participated in the extended testing.

Seven of the facilities converted to or are converting to alternatives that meet the 100 gram per liter VOC limit. The two newspapers participating in the project, the Los Angeles Times and the San Bernardino Sun, converted to cleaners that meet the lower limit several years ago. Nelson Nameplate, another project participant, is converting to the alternatives tested during the project. The SCAQMD Print Shop and the City of Santa Monica Print Shop also converted to alternatives that were tested in the course of the project. Vertis converted a few years ago to a low-VOC cleaner. Finally, The

Table E-1
Project Testing Results

Company	Press Type	Ink Type	Substrate(s)	Blanket Wash (VOC in g/l)	Roller Wash (VOC in g/l)	Status
L.A. Times	Coldset Web	Soy	Newsprint	water-based cleaner (90)	N/A	converted
San Bernardino Sun	Coldset Web	Soy	Newsprint	water-based cleaner (37)	N/A	converted
J.S. Paluch Co., Inc.	Coldset Web	Soy	Newsprint	soy (<20)	soy (<20)	_
Nelson Nameplate	Sheet Fed	Soy	Metal, Plastic	acetone/mineral spirits (100)	acetone/water/ mineral spirits (100)	converting, E
PIP Printing	Sheet Fed	Solventborne	Coated & Uncoated Paper	N/A	soy (<20)	_
SCAQMD Print Shop	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/mineral spirits (100)	acetone/water/ mineral spirits (100)	converted, E
City of Santa Monica Print Shop	Sheet Fed	Soy	Coated & Uncoated Paper	water-based cleaner (75)	soy (<20)	converted
Presslink	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy (<20)	soy (<20)	_
Vertis, Inc.	Heat Set Web (Automated)	Solventborne	Coated & Uncoated Paper	Anchor XP (72)	Anchor XP (72)	converted, E
R.R. Donnelley & Sons Co.	Heat Set Web	Solventborne	Coated & Uncoated Paper	soy (<20)	N/A	_
Fanfare Media Works	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy (18)	soy(18)	E
Fanfare Media Works	Web	UV	Uncoated Paper	soy (18)	soy(18)	E
The Castle Press	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy/acetone (<10)	soy (50)	_
Print 2000 Graphics	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/mineral spirits (100)	soy (18)	E
Western Metal Decorating	Heat Set Sheet Fed	Solventborne	Metal	soy/acetone/current cleaner (100)	soy/acetone/current cleaner (100)	_
The Dot Printer	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/soy (<2)	soy (50)	_
Lithographix	Sheet Fed	UV	Coated & Uncoated Paper	acetone/glycol ether (100)	Water-based cleaner (90)	_
Anderson Lithograph	Heat Set Web	Solventborne	Coated & Uncoated Paper	_	_	did not complete testing
Anderson Lithograph	Sheet Fed	UV	Coated & Uncoated Paper	_	_	did not complete testing
Anderson Lithograph	Sheet Fed	Solventborne	Coated & Uncoated Paper	_	_	did not complete testing
The Printery	Sheet Fed (Automated)	Soy	Coated & Uncoated Paper	soy (<20), acetone/glycol ether (100)	soy (<20)	converting, E
The Printery	Sheet Fed	Soy	Coated & Uncoated Paper	acetone/glycol ether (100)	soy (<20)	converting, E
The Printery	Sheet Fed	Soy	Coated & Uncoated Paper	acetone/glycol ether (100)	soy (<20)	converting, E
Tedco Printing Company	Sheet Fed	UV (non-white)	Plastic, Coated & Uncoated Paper	water-based cleaner /acetone/IPA (100)	water-based cleaner /acetone/IPA (100)	E
Tedco Printing Company	Sheet Fed	UV (white)	Plastic	soy/glycol ether (200)	soy/glycol ether (200)	_
Oberthur Card Systems	Sheet Fed	Solventborne	Plastic	acetone/water/mineral spirits (100)	acetone/water/ mineral spirits (200)	_
Oberthur Card Systems	Sheet Fed	UV	Plastic	acetone/glycol ether (100)	Water-based cleaner/acetone (90)	_
Huhtamaki	Web	EB	Coated Paper	acetone/water-based cleaner (8)	Water-based cleaner (90)	_

E = Extended Testing

Printery is in the process of converting to the low-VOC alternatives tested in the project. IRTA tested the alternative blanket and roller washes that are identified in Table E-1 at the remaining facilities.

In all except two cases, IRTA identified and tested alternative blanket and roller cleaners that had a VOC content of 100 grams per liter or less. The alternatives that were tested and found to be most effective include water-based cleaners, soy based cleaners and acetone, blends of the three categories of cleaners and blends of the cleaners with small amounts of VOC solvents. Acetone is not classified as a VOC and is low in toxicity. At Oberthur Card Systems, IRTA could not find a 100 gram per liter VOC roller wash alternative for the two color sheet fed press that uses conventional ink and prints on plastic. As indicated in the table, this press required a 200 gram per liter VOC roller wash. At Tedco, IRTA could not find a roller and blanket wash with 100 grams per liter VOC or less for cleaning white UV curable ink that prints on plastic. Tedco's white ink was deliberately formulated to be especially durable. Again, in this case, a 200 gram per liter formulation is required as indicated in the table.

Cost analysis was performed for 20 of the facilities where testing was conducted. The results demonstrate that 13 of the facilities would increase their cleaning cost by converting to the alternatives. The results also show that five of the facilties would reduce their cleaning cost by converting to the alternatives. One facility would have the same cleaning cost by converting to the alternatives. The change in cost for one facility could not be determined because this facility had no record of the cost of the higher VOC cleaners.

IRTA also conducted limited testing of low-VOC alternative cleaners for other on-press components including plates, dampening rollers and metering rollers. The results of the testing indicated that cleaners for these components that meet the 100 gram per liter VOC limit are effective.

During the extended testing, IRTA tested some cleaners that were thought to be incompatible with the rubber compounds used for the rollers and the blankets. No problems with compatibility were observed for these facilities.

The California Department of Health Services Hazard Evaluation System & Information Service conducted an assessment of the toxicity of some of the high VOC products used by the participating facilities and the low-VOC alternatives tested by IRTA. This assessment was based on a review of the MSDSs. In general, the low-VOC alternatives are less toxic than the high VOC materials.

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I. INTRODUCTION AND BACKGROUND

Volatile Organic Compound (VOC) emissions from solvent cleaning operations contribute significantly to the South Coast Air Basin's emission inventory. The South Coast Air Quality Management District (SCAQMD or District) periodically adopts an Air Quality Management Plan (AQMP). This AQMP calls for significant reductions in VOC emissions from cleaning and degreasing operations by 2010 to achieve attainment status.

One of the District's rules that focuses on cleaning applications has future compliance limits for which technology has not yet been developed. This rule is SCAQMD Rule 1171 "Solvent Cleaning Operations." One of the categories of cleaning regulated in Rule 1171 is lithographic printing cleanup operations. This is an important category because VOC emissions of cleanup solvents for lithographic printers amount to about four tons per day. When this project was initiated, the VOC limits for materials used in cleaning the on-press application equipment ranged from 600 to 800 grams per liter. On July 1, 2005, the VOC limits were reduced to 500 grams per liter, an interim limit requested by the industry. The VOC limit is scheduled to be reduced even further, to 100 grams per liter, in July, 2007. Table 1-1 summarizes the VOC limits specified in the rule for this category.

Table 1-1
VOC Limits for Cleanup Solvents Used in Lithographic Printing

Cleaning Activity	Historical VOC Limit (grams/ liter)	Current VOC Limit (grams/liter)	VOC Limit on July 1, 2007 (grams/liter)
Lithographic or Letter Press Printing			
Roller Wash--step 1	600	500	100
Roller Wash--step 2, Blanket Wash & On-Press Components	800	500	100
Removable Press Components	25	25	25
Ultraviolet Ink/ElectronBeam Ink Application Equipment	800	500	100

The values of Table 1-1 show that cleaners used in off-press cleaning have a VOC limit of 25 grams per liter and that the cleaners used for cleanup of ultraviolet (UV) and electron beam (EB) ink on press have the same limits as cleaners used for other ink types.

PROJECT STRUCTURE

The Institute for Research and Technical Assistance (IRTA) is a nonprofit organization established in 1989. IRTA works with companies to test and demonstrate alternatives to ozone depleting, VOC and toxic solvents. IRTA also conducts projects that focus on finding low-VOC, low toxicity alternatives for whole industries. IRTA runs and operates

the Pollution Prevention Center, a loose affiliation of local, state and federal governmental organizations and a large electric utility company.

Cal/EPA's Department of Toxic Substances Control (DTSC), with DTSC and U.S. EPA Region IX funding, contracted with IRTA to work with lithographic printers to identify, test and demonstrate alternative low-VOC, low toxicity cleanup solvents. The SCAQMD provided DTSC with additional funding from U.S. EPA Region IX to expand the DTSC project with IRTA. In these two projects, IRTA worked with 10 lithographic printing facilities to test alternative low-VOC, low toxicity on-press cleanup materials. A report entitled "Alternative Low-VOC, Low Toxicity Cleanup solvents for the Lithographic Printing Industry" dated November 2004 summarized the results of this earlier project.

The SCAQMD also contracted with IRTA separately to conduct the technology assessment that is called for in Rule 1171 to investigate alternative low-VOC on-press cleanup materials. As part of the SCAQMD project, IRTA tested alternatives with an additional 11 lithographic printing facilities in the South Coast Basin. The purpose of this project was to find, develop, test and demonstrate suitable alternative cleaning agents that have a VOC content of 100 grams per liter or less that will meet the July 1, 2007 VOC limits in Rule 1171 and will help to satisfy the AQMP's goals for reducing VOC emissions.

The SCAQMD project included a technical working group consisting of representatives from printing facilities, a trade organization, roller manufacturers, blanket manufacturers, solvent suppliers, printers and government agencies. It also involved an effort to investigate the compatibility of the alternative cleaning agents with the materials used to make rollers and blankets. The University of Tennessee (UT) conducted the compatibility testing with assistance from the roller and blanket manufacturers. The Graphic Arts Technical Foundation (GATF), an industry supported technical organization, was charged with developing low-VOC cleaning materials by reformulating existing cleaners.

IRTA conducted the two DTSC projects and the SCAQMD project jointly with one another. Together, the three projects focused on finding viable alternative on-press cleaners for 21 lithographic printing facilities. This document reports the results of the work with the 21 lithographic printing facilities.

LITHOGRAPHIC PRINTING

The number of lithographic printers in the U.S. is about 54,000. Most of the printing companies are located in six states, one of them California. The state has about 8,300 lithographic printers and many of them are located in southern California. There are about 2,000 newspapers in California and many of them also use the lithographic printing process.

Lithographic printing is often referred to as offset printing and it is based on the fact that oil and water do not mix. The ink is offset from the plate to a rubber blanket on an

intermediate cylinder and from the blanket to the substrate--which could be paper, plastic or metal--on an impression cylinder. On the plate, the printing areas are oil or ink receptive and water repellent and the non-printing areas are water receptive and ink repellent. When the plate, mounted on a cylinder, rotates, it contacts rollers that have been wet by water or dampening solution and rollers wet by ink. The dampening solution wets the non-printing areas of the plate, which prevents the ink from wetting these areas. The ink wets the image areas and these are transferred to the blanket cylinder. As the substrate passes between the blanket cylinder and impression cylinder, the inked image is transferred to the substrate.

Some of the lithographic presses used by the industry are sheet fed where the image is printed on sheets of a substrate and some are web presses where the image is printed on a continuous web. Sheet fed presses are used for printing products like advertising, books, catalogs, greeting cards, posters, labels, packaging and coupons. Web presses, which print on rolls of paper, are used for printing business forms, newspapers, inserts, long-run catalogs, books and magazines.

PARTICIPATING FACILITIES

The Printing Industries Association of Southern California (PIASC) assisted IRTA in finding lithographic printing facilities to participate in the DTSC and SCAQMD projects. The on-press cleanup solvents used in this industry are influenced by three factors: the type of press; the substrates; and the type of ink. In facility selection, IRTA and PIASC tried to find facilities that would represent the range of different press, substrate and ink types used by the industry. Table 1-2 shows the 21 facilities that participated in the project and provides information on their presses, the substrates they print on and the type of ink they use. In some cases, the facilities had more than one press type but the table presents information on only the press types where alternative cleanup materials were tested.

The second column of Table 1-2 shows that 10 facilities participated in the DTSC projects and 11 facilities participated in the SCAQMD project. Nelson Nameplate participated in both the DTSC and the SCAQMD projects.

The third column of Table 1-2 shows the type of press used at each facility. PIP, the Santa Monica Print Shop and the SCAQMD Print Shop have very small A.B. Dick automated presses. The Printery also has one small duplicator type press. Oberthur and The Printery have two color sheet fed presses. Nelson Nameplate has two small manual sheet fed presses. Presslink, The Castle Press, Print 2000 Graphics and Fanfare Media Works have four color sheet fed presses. The Dot Printer, Anderson, Oberthur, Tedco, Lithographix and The Printery have six color sheet fed presses. Three of the facilities, the Los Angeles Times, the San Bernardino Sun and J.S. Paluch, have coldset web presses. RR Donnelley & Sons, Anderson and Vertis have heatset web presses. Western Metal Decorating has a sheet fed heatset press.

Table 1-2
Facilities Participating in DTSC and SCAQMD Projects

Company	Project	Press Type	Substrate(s)	Ink Type
Los Angeles Times	DTSC	coldset web	newsprint	soy
San Bernardino Sun	DTSC	coldset web	newsprint	soy
J.S. Paluch	DTSC	coldset web	newsprint	solventborne
Nelson Nameplate	DTSC, SCAQMD	sheet fed	metal, plastic	soy
PIP	DTSC	sheet fed	coated, un-coated paper	solventborne
SCAQMD Print Shop	SCAQMD	sheet fed	coated, un-coated paper	solventborne
City of Santa Monica Print Shop	DTSC	sheet fed	coated, un-coated paper	soy
Presslink	DTSC	sheet fed	coated, un-coated paper	solventborne
Vertis	SCAQMD	heatset web	coated, un-coated paper	solventborne
RR Donnelley & Sons	DTSC	heatset web	coated, un-coated paper	solventborne
Fanfare Media Works	SCAQMD	sheet fed	coated, un-coated paper	solventborne
The Castle Press	DTSC	sheet fed	coated, un-coated paper	solventborne
Print 2000 Graphics	SCAQMD	sheet fed	coated, un-coated paper	solventborne
Western Metal Decorating	SCAQMD	heatset sheet fed	metal	solventborne
The Dot Printer	DTSC	sheet fed	coated, un-coated paper	solventborne
Lithographix	SCAQMD	sheet fed	coated, un-coated paper	ultraviolet curable
Anderson Litho-graph	SCAQMD	sheet fed	coated, un-coated paper	solventborne
		heatset web	coated, un-coated paper	solventborne
		sheet fed	coated, un-coated paper	ultraviolet curable
The Printery	SCAQMD	sheet-fed	coated, un-coated paper	soy
Tedco	SCAQMD	sheet fed	paper, plastic	ultraviolet curable
Oberthur Card	SCAQMD	sheet fed	plastic	solventborne
		sheet fed	plastic	ultraviolet curable
Huhtamaki	SCAQMD	web	coated paper	electron beam curable

The fourth column of the table shows the type or types of substrates each of the facility prints on. Fourteen of the facilities print on coated and/or uncoated paper. Three of the facilities print on newsprint. Three of the facilities print on plastic and two print on metal.

The fifth column of Table 1-2 shows the type of ink used for printing in each of the facilities. Five of the facilities use soy based ink, thirteen use solventborne ink, five of the facilities use ultraviolet (UV) curable ink and one uses electron beam (EB) curable ink.

PROJECT APPROACH

The first step in the project was to visit each of the participating facilities. During these visits, IRTA toured the facility and focused particularly on the press or presses. IRTA also discussed the type of ink or inks used by the printer and the current cleaning process with the facility representatives. IRTA requested a sample of ink or inks from the facilities.

The second step in the project was to perform preliminary tests at the IRTA office using the ink and several alternative cleaning agents. At this stage, IRTA wanted to screen alternative cleaning materials to see if they could clean the ink. IRTA obtained a blanket from one of the printers. The ink was applied to the blanket and the different cleaning agents were rubbed on the ink with a paper towel to see if they could effectively remove the ink. This test procedure allowed IRTA to determine which alternatives might be effective in cleaning the ink on a press.

The third step in the project was to visit the facilities and test the alternatives that appeared effective in the preliminary testing for cleaning the ink on the blankets and rollers on the presses with the press operators. The on-press cleaning is much more difficult than the preliminary testing so IRTA visited the facilities often and conducted testing on some presses as many as 30 times.

Printing facilities have different practices for cleaning the blankets and rollers. A picture of a blanket at one of the facilities is shown in Figure 1-1. Press operators commonly apply the solvent to a wipe cloth and wipe across the blanket to remove the ink. In some cases, this completes the blanket cleaning process. Some operators rinse the blanket after applying the solvent with a wipe cloth wet with water. Other operators apply a dry wipe cloth to the blanket after cleaning with the solvent to dry the blanket. Some printing companies have automated blanket wash systems where the solvent is applied to the blankets with a spray bar. It is generally necessary with these automated systems to periodically also clean the blankets by hand since they are not cleaned adequately with the automated systems.


Figure 1-1. Blanket on lithographic printing press

A picture of a roller train is shown in Figure 1-2. Press operators commonly clean the ink roller train by standing above the rollers and dispensing the cleaner from a squeeze bottle across the length of the top roller. Pressure is applied to the rollers with a squeegee and an ink tray is placed at the bottom of the roller train to catch the solvent/ink combination after it passes through the train. Operators generally apply the roller cleaner three to five times. Some facilities use two cleaners on the rollers; the first cleaner, called a Step 1 cleaner, is applied a few times to the roller train; application of the Step 1 cleaner is followed by application of the second cleaner, called a Step 2 cleaner, which also may be applied a few times. In some facilities, the press operators rinse the rollers with water after cleaning.

In some cases, facilities use the same cleaner on both the blankets and the rollers. In other cases, different cleaners are used. Blankets are cleaned at the end of a job and they are often also cleaned several times during a run. Rollers are generally cleaned at the end of a job when the ink color is changed or at the end of the day if no color changes have been made. Blanket cleaning requires a cleaner that solubilizes the ink but the aggressive action of hand pressure on the wipe cloth helps substantially with the cleaning. In roller cleaning, the cleaner must pass through a long series of rollers so it must solubilize the ink effectively. Although there is some pressure during cleaning when the roller train is engaged, this does not help as much in the cleaning as the hand action on blanket cleaning. With automated blanket wash system cleaning, there is no hand pressure and this is the reason that automated blanket wash system cleaning is generally supplemented with hand blanket wash cleaning.

The fourth step in the project was to conduct scaled-up testing with each of the facilities on one or more of their presses. For scaled-up testing, IRTA provided the facilities with the blanket and roller wash that were found to be most effective by the operators during the on-site testing. IRTA generally provided enough cleaner for the facilities to clean for a week.

Figure 1-2. Rollers on Small Lithographic Press

The fifth step in the process was to conduct extended testing. Extended testing involved testing the best alternative low-VOC blanket and roller wash on one or more presses for a three-month period. Extended testing was conducted with seven of the twenty-one facilities participating in the projects.

The sixth step in the project was to analyze and compare the cost and performance of the alternative and currently used cleaners. Section II of this document presents this analysis for the 21 facilities participating in the projects.

In addition to the roller and blanket testing described above, IRTA conducted limited analysis and testing of cleaners used to clean metering rollers, dampening rollers and plates which are the other on-press components described in the regulation.

CURRENT CLEANUP SOLVENTS

Solvents of various types are used in the inks utilized by lithographic printers. These solvents are emitted during the printing process. Cleanup materials used by the industry for cleaning blankets, ink rollers, dampening rollers, metering rollers and plates also contain solvents. In fact, the emissions from the solvents used for cleanup are much higher than the emissions from the solvents used in the inks. As mentioned earlier, VOC emissions of cleanup solvents from the lithographic printing process in the South Coast Basin are estimated to be about four tons per day.

Solvents used for on-press cleanup in lithographic printing include mineral spirits, methyl ethyl ketone, toluene, xylene, glycol ethers, terpenes, heptane and hexane. All of these solvents are classified as VOCs and many of them are toxic. Mineral spirits contain trace quantities of benzene, toluene and xylene. Benzene is an established human carcinogen; toluene causes central nervous system damage and xylene causes birth defects. Benzene, toluene and xylene are listed on California's Proposition 65, The Safe Drinking Water and Toxic Enforcement Act. Hexane causes peripheral neuropathy, a nervous system disease.

The project sponsors are concerned about the VOC emissions from the solvents and the exposure of the workers and community members to the solvents. The aim of the projects was to identify, develop, test and demonstrate alternative low-VOC, low toxicity cleanup materials. The alternative cleaners were tested for blanket and ink roller cleaning and, in a more limited way, for dampening roller, metering roller and plate cleaning.

ALTERNATIVE CLEANUP MATERIALS

The alternative low-VOC, low toxicity cleanup materials IRTA tested during this project can be classified into three categories. The first category is water-based cleaners. The second category is solvents that are exempt from VOC regulations. The third category is methyl esters which have a very low VOC content. Each of these categories of cleaners is discussed in more detail below.

Water-Based Cleaners

These cleaners sometimes contain a high concentration of water. They are often diluted further with water when they are used for cleaning. Some water-based cleaners are based on surfactants; others contain solvents that are miscible with water. Water-based cleaners are most applicable for cleaning the soy based ink used by newspapers or the UV or EB curable ink used by some lithographic printers.

One of the facilities participating in the DTSC project, the Los Angeles Times, has been using a water-based cleaner called Super Clean BW for a number of years. A Material Safety Data Sheet (MSDS) for this cleaner is shown in Appendix A of this report. The cleaner contains a VOC solvent, d-limonene, and a surfactant. The VOC content of the cleaner is 495 grams per liter. The Los Angeles Times dilutes the cleaner in a five to one ratio of water to cleaner. In diluted form, the VOC content of the cleaner is about 83 grams per liter, which meets the SCAQMD Rule 1171 VOC limit specified for July 1, 2007.

Another facility participating in the DTSC project, the San Bernardino Sun, has also been using a water-based cleaner called Mirachem Pressroom Cleaner for several years. An MSDS for this cleaner is shown in Appendix A of this report. This cleaner contains small quantities of two VOC solvents, a surfactant and water. The VOC content of the cleaner concentrate is 75 grams per liter. The San Bernardino Sun uses the cleaner in a

50 percent concentration with water. The VOC content of this cleaner during use is about 38 grams per liter which meets the SCAQMD Rule 1171 VOC limit for July 1, 2007.

A water-based cleaner, called Daraclean 236, was tested by IRTA at the Los Angeles Times. This cleaner contains surfactants but does not contain solvents. The VOC content of the cleaner is 60 grams per liter. IRTA tested the cleaner at a one-third concentration in water; the VOC content of this cleaner is 20 grams per liter as used. The Daraclean 236 would comply with the SCAQMD Rule 1171 VOC limit that becomes effective in July 2007.

IRTA tested the Mirachem Pressroom Cleaner at several of the other facilities participating in the DTSC projects. It was effective in only one case, the City of Santa Monica Print Shop. As described in the Section II analysis for this facility, the shop converted to this cleaner for blanket cleaning. An MSDS for the cleaner is shown in Appendix A. One of the reasons the cleaner worked effectively for this facility might be because the City used soy based ink. In facilities where solventborne ink is used, the cleaner was not effective even at full concentration or in blends with other materials.

IRTA tested other water-based cleaners for cleaning ultraviolet and electron beam curable ink. An MSDS for one of these cleaners, called Brulin 815MX, is shown in Appendix A; it was effective for cleaning the EB curable ink at Huhtamaki, primarily for cleaning off-press components.

An MSDS for another water-based cleaner called Seibert Magic UV is also shown in Appendix A. It was designed to clean UV curable ink and it worked effectively at Oberthur, Lithographix, Huhtamaki and Tedco either alone or in combination with other materials. The cleaner has a VOC content of 90 grams per liter.

Exempt Solvents

There are a number of solvents that have been specifically deemed exempt from VOC regulations by U.S. EPA and SCAQMD. Some of these contribute to ozone depletion and their production has been banned. The use of others, perchloroethylene and methylene chloride, is severely restricted because they are classified as carcinogens. One of the volatile methyl siloxanes and parachlorobenzotrifluoride, have potential toxicity problems.

Two solvents that are exempt from VOC regulation could be used for on-press cleaning. Acetone is an aggressive solvent that is very low in toxicity. It evaporates readily and its disadvantage is its low flash point. IRTA tested acetone extensively during this project and it is a very effective ink cleaner. Methyl acetate, also an aggressive solvent, is more toxic than acetone. It has similar properties to acetone, a fast evaporation rate and a low flash point. It is more expensive than acetone. Because of its higher toxicity and cost, IRTA did not test methyl acetate during this project.

Methyl Esters

This class of chemical generally contains methyl esters that have a 16 to 18 carbon chain length. Materials like soy, canola oil, rape seed oil and coconut oil are composed of methyl esters. These materials clean most types of inks very effectively. During this project, IRTA relied heavily on soy based cleaners in the alternative roller and blanket washes. Soy was selected because it is more widely available and lower cost than some of the other methyl esters. IRTA had several different formulations tested by the SCAQMD lab to determine the VOC content of the soy materials and the VOC content ranged from five grams per liter to 25 grams per liter. MSDSs for two of the soy based cleaners tested extensively in the project, Soy Gold 2000 and Soy Gold 2500, are shown in Appendix A.

Other Formulations

During the projects, IRTA tested water-based cleaners, acetone, soy based cleaners, blends of these cleaners with one another and blends of the cleaners with VOC solvents. All the cleaners that were blended with VOC solvents had a VOC content at or below 100 grams per liter.

COMPATIBILITY

Rollers are generally replaced once every six months or once a year and are very expensive. Blankets, which are less expensive, are replaced much more often. Most lithographic printers using soy or solventborne inks use rollers and blankets made of nitrile. Printers using UV or EB curable inks generally use rollers and blankets made of EPDM. The EPDM is compatible with these inks.

All solvents damage rollers and blankets to some extent but some solvents damage them more and some damage them less. For example, acetone is compatible with EPDM but high concentrations of the solvent may damage nitrile. Solvents like toluene and xylene damage EPDM. Compatibility of the cleaners with the roller and blanket material is a very important issue and, accordingly, the SCAQMD project involved a compatibility testing task. As mentioned earlier, the University of Tennessee (UT) conducted the compatibility testing and is providing compatibility results on some of the cleaners used today and the alternatives tested by IRTA and GATF. UT worked with the roller and blanket manufacturers to develop test protocols and the manufacturers provided UT with samples of rubbers of various types for the testing. UT's final report is not available at this time so the detailed results are not reported here.

IRTA relied on guidance from the roller and blanket manufacturers and some of the preliminary results of the UT compatibility testing to determine what alternative materials to test with the printers involved in the projects. The information indicated that water-based cleaners are compatible with nitrile and EPDM, soy based cleaners are compatible with nitrile but not EPDM and acetone in high concentrations is compatible with EPDM but not nitrile.

Most of the printers involved in the projects have blankets and rollers made of nitrile. IRTA identified water-based cleaning and soy based cleaning alternatives wherever possible. In the case of blanket washes, when the facility personnel requested that the cleaner evaporate more quickly, IRTA generally provided an acetone blend. According to the UT test results, formulations containing acetone above about 25 percent will damage nitrile. As discussed later, the results of the extended testing with the seven facilities did not indicate a problem with blanket washes containing, in some cases, very high concentrations of acetone.

CLEANER PERFORMANCE

Performance of the alternative cleaning agents at each facility was evaluated on a case-by-case basis. In each instance, the plant personnel provided information on their requirements for the cleaning process. In all cases, it was important for the cleaning agent to effectively clean the ink from the rollers or the blankets in a reasonable period of time. The facility personnel were the judges of which cleaners cleaned effectively. In addition, IRTA suggested that the facility print after cleaning to make sure that the print quality was acceptable and to ensure that the press came back up to color without generating an excessive amount of paper waste. In all cases, the alternatives were required to meet or exceed the current production rates and to provide the same print quality as the high VOC cleaners. Any cleaning alternative that did not meet or exceed the current requirements was rejected.

In the case of blanket cleaning, IRTA requested information from the press personnel on how fast they needed the cleaner to evaporate. Acetone has a very high vapor pressure and evaporates too quickly to effectively clean the blankets when it is used alone. IRTA used acetone in some of the alternative blanket washes but it was always blended with one or more other cleaners to slow down the evaporation. In general, if the facility wanted a very fast evaporating blanket wash, IRTA formulated with a high percentage of acetone.

In the case of roller cleaning, acetone alone was not an effective cleaner. Its high evaporation rate prevented it from traversing the entire roller train before it evaporated. In most cases, IRTA tried to find a roller wash based on soy based cleaners for the facilities that used conventional ink. In a few cases, the soy which is very oily, could not be sufficiently rinsed from the rollers and the print quality was not adequate or there was an increase in the amount of waste paper generated before the press came back up to color. In those cases, IRTA tested various alternatives that contained some acetone. For facilities that used UV or EB curable ink, IRTA generally tested water-based cleaners or water-based cleaners in combination with acetone for roller cleaning.

COST ANALYSIS

IRTA performed cost analysis for each of the alternatives that was sucessfully tested at the facilities participating in the DTSC and SCAQMD projects. The cost of using the

alternative was compared with the cost of using the current higher VOC cleaner or cleaners on an annual basis. The cost analysis was based on the results of the testing and the feedback from the personnel. In all cases, IRTA evaluated the cost components that changed with use of the alternatives during the testing. During the testing and when the testing was completed, factors including increased cleaner usage, labor and paper waste were discussed explicitly with every participating facility. If the facility noticed a change in any of these parameters, it was taken into account in the cost analysis. None of the facilities needed to purchase capital equipment to use the alternatives. In a number of cases, use of the alternative cleaner was higher. In four cases, there was a change in labor with use of the alternative. In one case there was a change in waste paper generation.

COMPANY APPROVAL

In all cases except one, IRTA provided the performance and cost analysis writeup to the facilities for review. In some cases, the personnel requested changes and these were incorporated. All of the facilities approved the writeup for publication and the cost and performance analysis presented for each facility in Section II reflected the facility's conclusions from the testing. The one exception was Anderson Lithograph. This company dropped out of the testing before it was completed. IRTA prepared the writeup summarizing the incomplete testing results without obtaining approval from Anderson.

TIMING OF TESTS AND ANALYSIS

Alternative cleaners were tested at the 21 participating facilities over the last several years. All of the work with the facilities participating in the DTSC project was completed before November 2004. Testing with the other facilities involved in the extended testing was concluded by February of 2006. In all cases except The Printery, the cost of the alternative cleaners was compared with the cost of the 800 gram per liter VOC cleaners that were used by the facilities during the testing. The Printery converted from 800 gram per liter VOC cleaners to 500 gram per liter VOC cleaners in July 2005, well before the extended testing was started. For The Printery, IRTA compared the costs of using the alternatives with the cost of using the 800 gram per liter VOC cleaners and the cost of using the 500 gram per liter VOC cleaners.

REPORT ORGANIZATION

Section II of this report includes the analysis of the most effective alternative blanket and roller washes for each facility. It presents cost analysis and comparison of the current and alternative cleaning agents. It also discusses the more limited test results for cleaning other on-press components including dampening rollers, metering rollers and plates. Section II briefly discusses the findings during the testing and extended testing with the facilities in terms of performance and compatibility. Finally, Section II summarizes information provided by the California Department of Health Services Hazard Evaluation System & Information Service that compares the toxicity of the currently used cleaning agents and the low-VOC alternative cleaning agents. Section III summarizes the results of the testing for the participating facilities.

II. ANALYSIS AND TESTING OF THE ALTERNATIVE CLEANING AGENTS

This section presents analysis of the performance, cost and toxicity of the alternative cleaning agents. It first presents the test results for the alternative blanket and roller washes tested at the individual facilities. It then addresses the test results for the alternative cleaners for the other on-press components. It summarizes the results of the extended testing in terms of performance and compatibility. Finally, it compares the toxicity of some of the current and alternative cleaners based on the MSDSs for the materials or products.

TESTS OF ALTERNATIVE BLANKET AND ROLLER WASHES AT INDIVIDUAL FACILITIES

This subsection provides a description of each of the facilities where the testing was conducted, the cleaning agents that are used currently, the blanket and roller cleaning alternatives that were tested and the alternatives that were most effective. It also provides a cost comparison of the current and alternative cleaners. The alternative cleaners were tested for only a week in some of the facilities so it is unknown whether other problems would arise if they were tested for a longer period. In seven of the facilities, extended testing for at least three months was conducted. In these cases, the problems that were encountered are described and factored into the cost analysis.

Los Angeles Times

The Los Angeles Times San Fernando Valley Plant is located in Chatsworth, California. The company has two other plants in Southern California. The L.A. Times is a large newspaper with four presses at the Chatsworth location. A picture of one of the presses is shown in Figure 2-1. The company prints on newsprint with soy based ink and runs three shifts per day.

Figure 2-1. Press at Los Angeles Times

IRTA began working with the L.A. Times in 2001 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. At that time, the company was already using a water-based cleaner that had a very low VOC content. An MSDS for this cleaner, called Superclean BW, is shown in Appendix A. The company had converted from a VOC solvent some years before and no longer has records of the solvent use. The Pressroom Manager believes that the cost of using the water-based cleaner is lower than the cost of using the solvent cleaner. This analysis does not include a cost comparison of use of the solvent cleaner and the water-based cleaner used today.

IRTA worked with the L.A. Times to test other low-VOC water-based cleaners and a soy based cleaner. One of the alternative cleaners that was tested is Mirachem Pressroom Cleaner; an MSDS for this cleaner is shown in Appendix A. This cleaner is used by other newspapers. The second cleaner that was tested is a water-based cleaner called Daraclean 236. This cleaner is used by industrial facilities for metal cleaning; an MSDS is shown in Appendix A. The third cleaner that was tested is an emulsion of soy and water; an MSDS for this cleaner is shown in Appendix A.

The L.A. Times currently purchases 2,700 gallons of the Superclean BW. It is diluted with water in a five parts water, one part Superclean BW blend. Taking this into account, the amount of diluted cleaner used is 16,200 gallons per year. The cost of the cleaner is $10.81 per gallon. On this basis, the cost of using the cleaner is $29,187 per year. The Mirachem Pressroom cleaner worked effectively at a 50 percent concentration in water. The cost of this cleaner is $9 per gallon. Assuming that 16,200 gallons at 50 percent concentration are required, the cost of using the Mirachem cleaner would amount to $72,900 annually. The Daraclean 236 was determined to be effective at one-third concentration in water. The cost of this cleaner is $11 per gallon. On this basis and assuming that 16,200 gallons are required, the annual cost of using the Daraclean cleaner would amount to $59,400. The soy based cleaner was found to perform well and the press people thought it was the most effective cleaner. The cost of the cleaner is $3.75 per gallon. Again assuming 16,200 gallons are used, the cost of using the soy based cleaner would be $60,750.

Table 2-1 shows the cost comparison for the current cleaner and the alternative cleaners that were tested. The cost of all of the alternative cleaners is higher than the cost of the Superclean BW. The L.A. Times decided to continue using the Superclean BW because it is very low cost.

Table 2-1
Annualized Cost Comparison for the Los Angeles Times

Cleaner	Concentration Used	Annual Cost
Superclean BW	16.7 percent	$29,187
Mirachem Pressroom Cleaner	50 percent	$72,900
Darclean 236	33.3 percent	$59,400
ES-219	100 percent	$60,750

San Bernardino Sun

The San Bernardino Sun is a large lithographic newspaper printer located in San Bernardino, California. The company prints the San Bernardino Sun and USA Today. The Sun prints on newsprint and, like many other newspapers, uses soy based ink.

IRTA began work with the San Bernardino Sun in 2001 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. A picture of one of the presses in the pressroom is shown in Figure 2-2. The San Bernardino Sun previously used a cleaner purchased from Pressroom Solutions for all cleaning tasks including blanket cleaning, pipe roller cleaning and ink tray cleaning. An MSDS for this cleaner is shown in Appendix A.

Figure 2-2. Press at San Bernardino Sun

When IRTA began testing with the San Bernardino Sun, the company had already converted to an alternative cleaner for their blanket cleaning. This cleaner, called Mirachem Pressroom Cleaner, is a water-based cleaner. An MSDS for the product is shown in Appendix A. The Sun uses this cleaner in a 50 percent blend with water for blanket cleaning. The Mirachem product cannot be used for the pipe roller cleaning because the paper web is in when the pipe rollers are cleaned. Water-based cleaners can dissolve the web. The Mirachem was not used for cleaning the ink trays because it cleaned too slowly.

IRTA tested alternatives with the Sun for blanket cleaning and for pipe roller and ink tray cleaning. IRTA tested a soy based cleaner called Soy Gold 2000 and in various dilutions with water as a blanket wash. This cleaner, even when diluted in a 50 percent blend with water, cleaned the blankets well. The Sun was not interested in switching to an alternative cleaner for the blanket cleaning, however. IRTA tested several alternatives including a variety of different water-based cleaners for cleaning the pipe rollers and ink trays. The most effective cleaner was a cleaner called Soy Gold 1000. This cleaner is similar to Soy Gold 2000 but it does not contain a surfactant for rinsing. An MSDS for Soy Gold 1000 is shown in Appendix A.

The Sun used five drums per month of the original solvent based cleaner for all of their cleaning. About 80 percent of the solvent was used for blanket cleaning, five gallons per month was used for ink tray cleaning and the remaining solvent was used for pipe roller cleaning. On this basis, of the 3,300 gallons of solvent used annually, 2,640 gallons were used for blanket cleaning, 600 gallons were used for pipe roller cleaning and 60 gallons were used for ink tray cleaning. Eliminating the ink tray cleaning, which is off-press cleaning, the Sun used 3,240 gallons of solvent per year. The cost of the solvent is $5 per gallon. On this basis, the annual cost of on-press cleaning was $16,200. The annual cost of ink tray off-press cleaning was $300.

The Sun substituted the Mirachem water-based cleaner for the solvent in blanket cleaning. The price of the Mirachem cleaner is $9.09 per gallon. Assuming the Mirachem is diluted 50 percent with water and that the same amount of cleaner is required, the cost of the cleaner for blanket cleaning now is $11,999 per year. After IRTA conducted the testing, the Sun switched from the solvent cleaner to the soy based cleaner for pipe roller cleaning. The cost of the soy cleaner is $8.90 per gallon. The annual cost of the pipe roller cleaner is now $5,340. The company also adopted the soy based cleaner for cleaning the ink trays. The annual cost of ink tray cleaning is now $534.

Table 2-2 shows the cost comparison for the on-press cleaning. The cost of using the alternative cleaners is seven percent higher than the cost of using the original cleaner. The blanket cleaner has a lower cost but this is more than offset by the higher cost of the pipe roller cleaner.

Table 2-2
Annualized Cost Comparison for On-Press Cleaning for the San Bernardino Sun

	Original Cleaner	Alternative Cleaners
Blanket Cleaner Cost	$13,200	$11,999
Pipe Roller Cleaner Cost	$3,000	$5,340
Total Cost	$16,200	$17,339

Table 2-3 shows the cost comparison for the off-press ink tray cleaning. The company increased their cost by 78 percent in converting to the alternative soy based cleaner.

Table 2-3
Annualized Cost Comparison for Off-Press Cleaning for the San Bernardino Sun

	Original Cleaner	Alternative Cleaner
Ink Tray Cleaner Cost	$300	$534
Total Cost	$300	$534

J.S. Paluch Co., Inc.

J.S. Paluch is located in Santa Fe Springs, California. The company exclusively prints church newsletters and prints on an uncoated book paper with soy based inks. J.S. Paluch has four narrow web presses that can print four colors. A picture of one of the presses is shown in Figure 2-3.

Figure 2-3. Press at J.S. Paluch Co.

IRTA started working with J.S. Paluch in 2003 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. The company presently uses a cleaner that serves as both a blanket and roller wash called Allied Hydrowash. An MSDS for this cleaner is shown in Appendix A.

IRTA conducted testing at J.S. Paluch to try to identify a suitable alternative cleaning agent. IRTA tested Mirachem Pressroom Cleaner, a cleaner used by some newspapers. This water-based cleaner did clean the ink and cleaned about as effectively as the current

cleaner. IRTA also tested blends of acetone and the Mirachem cleaner and these cleaners performed reasonably well. IRTA tested a soy based cleaner called Soy Gold 2000 and this cleaner was the most effective cleaner. An MSDS for this cleaner is shown in Appendix A. IRTA provided several week's supply of this cleaner to J.S. Paluch and the operator who used the cleaner indicated that it performed very well and that it cut through the ink more quickly than the current cleaner.

J.S. Paluch uses 80 gallons per year of the current cleaner. The cost of the cleaner is $16 per gallon. On this basis, the annual cost of the current cleaner amounts to $1,280.

The cost of the alternative soy based cleaner is $8 per gallon. Assuming the same amount of the soy cleaner would be required, the annual cost of the alternative cleaner would be $640.

Table 2-4 shows the annual cost comparison for J.S. Paluch. The figures show that the company could cut their cost in half by converting to the alternative soy based cleaner.

Table 2-4
Annualized Cost Comparison for J.S. Paluch

	Current Cleaner	Alternative Cleaner
Cleaner Cost	$1,280	$640
Total Cost	$1,280	$640

Nelson Nameplate

Nelson Nameplate is located in Los Angeles, California. The company manufactures membrane switches and nameplates made of aluminum, stainless steel and brass. As part of the manufacturing process, Nelson has a lithographic printing operation.

IRTA started working with Nelson several years ago as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. Nelson has two manual presses that print on metal and plastic, one sheet at a time. A picture of one of the presses is shown in Figure 2-4.

Nelson historically used a roller wash called Hydro Clean which is an emulsion of water and mineral spirits. An MSDS for the product is shown in Appendix A. The Hydro Clean was used in a 50 percent blend with water. Nelson purchased 65 gallons of the Hydro Clean annually. The cost of the product is $10 per gallon. On this basis, the annual cost of using the Hydro Clean roller wash was $650.

Nelson also used 125 gallons of a blanket wash cleaner each year. An MSDS for the blanket wash is shown is Appendix A. The price of the blanket wash, a blend of mineral spirits and acetone, is $8.25 per gallon. The annual cost of purchasing the blanket wash is $1,031. The total cost of on-press cleanup amounts to $1,681 per year.


Figure 2-4. Press at Nelson Nameplate

IRTA tested a variety of roller wash alternatives at Nelson. IRTA tested Mirachem, a water based cleaner used by a few newspapers but this cleaner was not effective. Nelson uses a soy based ink so IRTA tested a variety of different soy based cleaners. Although the soy based cleaners cleaned the ink effectively, a residue that could not be removed with even several water rinses remained. IRTA also tested blends of the soy based products with other components that might aid in the rinsing but, in all cases, there was a residue that did not allow the quality printing Nelson requires. IRTA then began testing a series of blends of acetone with Hydro Clean, the cleaner used by Nelson for many years. The roller wash that was most effective is a blend of 25 percent acetone, 12.5 percent Hydro Clean and 62.5 percent water.

Nelson participated in the extended testing and longer term testing of the alternative low-VOC cleaners was conducted for 13 weeks. The roller wash provided to Nelson also had to be modified during the extended testing. The blend that was tested was composed of 37.5 percent acetone, 12.5 percent Hydro Clean and 50 percent water. During that period, Nelson used 60 percent more of the alternative than the original roller wash. This indicates the company would use 200 gallons of the alternative roller wash per year. The price of the Hydro Clean is $8.25 per gallon and the price of the acetone is $6.43 per gallon. On this basis, the annual cost of the alternative roller wash is $689.

IRTA also tested a variety of different formulations that might serve as an alternative blanket wash. Because Nelson used a blend of mineral spirits and acetone, IRTA focused on similar blends that had a lower VOC content. The blanket wash that appeared to be effective is a blend of 89 percent acetone and 11 percent mineral spirits. The price of this blend is $5.84 per gallon. On this basis, assuming the same usage as the original blanket wash, the cost of using the alternative blanket wash is $730 per year.

Table 2-5 shows the annualized cost comparison of using the original blanket and roller wash and the new blanket and roller wash. The figures show that the cost of using the alternative cleaners is 16 percent lower than the cost of using the original higher VOC cleaners.

Table 2-5
Annualized Cost Comparison for Nelson Nameplate

	Original Cleaners	Alternative Cleaners
Blanket Wash Cost	$1,031	$730
Roller Wash Cost	$650	$689
Total Cost	$1,681	$1,419

PIP Printing

PIP Printing is located in Santa Monica, California. The shop provides a service as a commercial lithographic printer. Among the products printed by PIP are flyers and newsletters.

IRTA began working with PIP in 2004 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. The company has a small A.B. Dick printing press. A picture of the press is shown in Figure 2-5. PIP generally cleans the rollers four or five times a day. An MSDS for PIP's current cleaning agent is shown in Appendix A.

Figure 2-5. Press at PIP Printing

During the cleaning process, the operator replaces the plate with paper cleanup mats. The cleaning agent is applied to the rollers with a squeeze bottle while the press is running. The cleaner is circulated down through the roller train and the excess ink is taken up by

the cleanup mat. As the rollers are cleaned, the cleanup mats contain less and less ink. With the current cleaner, the operator uses about five cleanup mats per cleaning cycle.

IRTA conducted testing of a variety of alternatives with PIP. IRTA tested Mirachem Pressroom Cleaner, a water-based cleaner that is used by some newspapers to clean their presses. This cleaner did not clean fast enough. IRTA tested a blend of 50 percent acetone and a water/mineral spirits emulsion and this cleaner was not effective. IRTA then tried the same cleaner with 75 percent acetone. Although this formulation did clean, it was not effective enough. IRTA tried cleaning with a white oil but this cleaner did not clean effectively.

The cleaning alternative that did work on PIP's press was a soy based cleaner. An MSDS for the cleaner is shown in Appendix A. The soy cleaner contains a surfactant so it can be rinsed with water. This cleaner effectively cleaned the ink with five cleanup mats. Two additional mats were required to rinse the rollers with tap water.

PIP uses five gallons per month of their current cleaner which is priced at $12 per gallon. The annual cost of the cleanup solvent is $720. The price of the cleanup mats is 16 cents per sheet. Assuming PIP cleans up 4.5 times per day and uses five cleanup mats, the daily cost of cleanup sheets is $3.60. The annual cost of the cleanup mats amounts to $936. The total cost of cleanup currently is $1,656 annually.

The cost of the alternative soy cleaner in five gallon quantities is about $8 per gallon. Assuming the same amount of usage of the soy as the current cleaner, the annual cleaner cost would amount to $480. With the soy cleaner, more cleanup mats were required because of the rinsing step. Assuming 4.5 cleanups per day and use of seven cleanup mats each time, the annual cost of cleanup mats would amount to $1,310. The total cost of cleaning the press with the alternative would be $1,790.

Table 2-6 shows the cost comparison of using the current cleaner and the alternative cleaner. The figures show that the cost of using the alternative cleaner would increase the cleaning cost by about eight percent.

Table 2-6
Annualized Cost Comparison for PIP Printing

	Current Cleaner	Alternative Soy Cleaner
Cleaner Cost	$720	$480
Cleanup Mat Cost	$936	$1,310
Total Cost	$1,656	$1,790

South Coast Air Quality Management District Print Shop

The South Coast Air Quality Management District (SCAQMD) print shop has a small press which is shown in Figure 2-6. The print shop provides printing services to the SCAQMD in its rule development, enforcement and outreach activities. The shop prints flyers and reports in support of SCAQMD activities.

Figure 2-6. Press at SCAQMD Print Shop

For several years, the print shop used a high VOC cleaner for cleaning the rollers and the blanket on the press. The head of the print shop estimates that the shop used seven gallons per year. Three-fourths of the cleaner or 5 gallons were used for cleaning the rollers and one-fourth was used for cleaning the blankets. The cost of the cleaner is $11.15 per gallon. On this basis, the annual cost of the cleaner amounted to $78.

The rollers on the small press shown in Figure 2-6 are cleaned using cleanup mats. The mats are placed on the machine and the cleanup solvent is applied several times. The cleanup mats absorb the ink that is put into solution by the cleanup solvent. When the mats no longer absorb ink, the rollers are clean. The print shop historically used about five cleanup mats per cleanup and cleanup is performed on average four days each week. Each cleanup mat costs 39.5 cents. The annual cost of the cleanup mats was $411.

The pressman spent about 15 minutes four days a week in the cleanup activities. Assuming the SCAQMD labor rate of $21 per hour, the annual labor cost was $1,092.

IRTA tested alternatives with the SCAQMD print shop for more than a year and the print shop has adopted the lower VOC cleaners. Alternatives that were tested included soy, water-based and acetone based cleaners. The cleaner that worked best as an alternative for roller wash cleaning was a blend of 62.5 percent acetone, 25 percent water and 12.5 percent of a mineral spirits cleaner called Hydro Clean. An MSDS for this cleaner, called Rho-Wash 100, is shown in Appendix A. The blanket wash that worked most effectively was 90 percent acetone and 10 percent mineral spirits. An MSDS for the product adopted by the print shop for blanket wash, called Rhosolv 7248, is shown in Appendix A. SCAQMD performed extended testing on their press for about six months during the project.

During the extended testing, the print shop used about the same amount of the alternative roller and blanket wash as the high VOC wash. The cost of both of the alternative cleaners amounts to $19 per gallon including a delivery fee. Assuming the same usage, the annual cost of the new cleaners is $133.

During the extended testing for the alternative roller wash, the pressman indicated that he used two extra cleanup mats during the cleaning. Assuming the cleaning frequency of four days per week, use of seven cleanup mats per job and a cost of 39.5 cents per cleanup mat, the cost of cleanup mats with the alternative cleaner is $575 per year.

The pressman reported that, during the extended testing, the cleanup time was increased from 15 minutes to 20 minutes per day with the alternative cleaners. Assuming the labor rate of $21 per hour, the annual cleanup labor cost with the alternatives amounts to $1,456.

Table 2-7 shows the annualized cost comparison for the SCAQMD print shop. The cost of cleanup using the alternative low-VOC cleaners increased by about 37 percent.

Table 2-7
Annualized Cost Comparison for SCAQMD Print Shop

	High VOC Cleaner	Alternative Cleaners
Cleaner Cost	$78	$133
Cleanup Mat Cost	$411	$575
Labor Cost	$1,092	$1,456
Total Cost	$1,581	$2,164

City of Santa Monica Print Shop

The City of Santa Monica Print Shop provides support to the city for various printing activities. One of their operations involves printing on envelopes and stationary with a small lithographic printing press. The press is used twice a month and it is cleaned after each print session.

In the past, the city used two high VOC cleaners, one for cleaning the rollers and the other for cleaning the cylinder plate. The city used one gallon of the roller cleaner each year. At a cost of $40 per gallon, the total cost of purchasing the roller cleaner was $40 per year. The city used one quart of the cylinder cleaner each year. At a cost of $15 per gallon, the total cost of purchasing the cylinder cleaner was about $4 annually. Cleanup mats are used to collect the ink when the solvent is applied to the rollers. The city used 120 cleanup mats per year. At a cost of 28 cents per cleanup mat, the total annual cost was $34. The cost of purchasing cleaning materials was about $78 annually.

IRTA worked with the city to test alternatives. After testing several formulations, the city decided to convert to a soy based cleaner called Soy Gold 2000 for roller cleaning and a water-based cleaner called Mirachem Pressroom Cleaner for the cylinder cleaning. Both the soy cleaner and the water-based cleaner are lower in toxicity than the VOC cleanup solvents used by the city previously. About one gallon per year of the soy cleaner is required. At a price of $8 per gallon, the annual cost of purchasing the roller cleaner is now $8. For cleaning the cylinder, the city uses one quart per year of the water-based cleaner. At a cost of $10 per gallon, the annual cost of the formulation is $3. The city uses more cleanup mats with the new cleaner because the soy cleaner needs to be rinsed with water so it does not leave a residue; about nine cleanup mats per job or 216 cleanup mats per year are required. The annual cost of the cleanup mats is now about $60. The yearly total cost of cleaning materials is now $71.

The labor cost for cleaning has increased. When the city used the VOC cleaners, it took about one-half hour to clean the press twice a month. At a labor rate of $17.50 per hour, the annual labor cost for cleaning amounted to $210. The cleanup now takes one hour twice a month. The labor cost is twice what it was in the past, at $420.

The annual cost comparison of the VOC solvents and the low VOC cleaners is shown in Table 2-8. The values of Table 2-8 show that the cost for cleaning at the city increased by 70 percent when the city substituted the low VOC alternatives.

Table 2-8
Annualized Cost Comparison for City of Santa Monica

	VOC solvents	Soy and Water-Based Cleaner
Cleaner and Cleanup Mat Cost	$78	$71
Labor Cost	$210	$420
Total Cost	$288	$491

Presslink

Presslink is located in Anaheim, California. The company is a commercial lithographic printer with two sheet fed presses. One of the presses is a small Ryobi and the other is a larger four color press. Pictures of the small and larger presses are shown in Figure 2-7 and Figure 2-8 respectively. Presslink prints flyers and brochures.

Figure 2-7. Small Press at Presslink

Figure 2-8. Larger Press at Presslink

IRTA began working with Presslink as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate alternative on-press cleaning agents. Presslink uses an air dry solventborne ink on their small press and a heat set ink on their larger press. On the small press, the company uses a blanket wash and a two step roller wash for cleaning. An MSDS for the blanket wash is shown in Appendix A. MSDSs for the two roller washes are also shown in Appendix A. On the larger press, which has an automated roller wash system, Presslink uses the same blanket wash and the step 2 roller wash.

IRTA tested a variety of alternatives at Presslink. IRTA tested Mirachem Pressroom Cleaner, a cleaner used by some newspapers but it did not clean effectively. IRTA tested a few different blends of the Mirachem cleaner and acetone but they did not work well. IRTA tested a soy based cleaner called Soy Gold 2000 which did clean effectively.

IRTA provided Presslink with a week's supply of the soy based cleaner and it was tested as a blanket and roller wash on both presses. During the time period, it cleaned both presses well. An MSDS for the soy based cleaner is shown in Appendix A.

Presslink uses 20 gallons per month or 240 gallons per year of blanket wash. The price of the blanket wash is $3.66 per gallon, so the annual cost of using the blanket wash is $878. The company uses 2.5 gallons per month or 30 gallons per year of the two roller washes. The price of the roller washes is $10 per gallon. The annual cost of the roller wash is $300. The total annual cost of the current cleaners is $1,178.

The cost of the alternative soy based cleaner is $8 per gallon. Assuming the cleaner is used as both a blanket and roller wash and assuming that the same amount of cleaner is required, the annual cost of the alternative cleaner is $2,160.

Table 2-9 shows the annualized cost comparison for Presslink. The values show that the cleaning cost with the soy based alternative cleaner is 83 percent higher than the cleaning cost with the current cleaners.

Table 2-9
Annualized Cost Comparison for Presslink

	Current Cleaners	Alternative Cleaners
Blanket Wash Cost	$878	$1,920
Roller Wash Cost	$300	$240
Total Cost	$1,178	$2,160

Vertis, Inc.

Vertis' headquarters are in Baltimore, Maryland. The company has nearly 7,000 professional employees in approximately 120 locations. Vertis provides lithographic printing services for advertising and other commercial printing venues. The company is one of the largest producers of newspaper advertising and editorial special sections in the U.S.

As part of projects sponsored by U.S. EPA, Cal/EPA's DTSC and the SCAQMD, IRTA worked with one of the Vertis printing facilities in Riverside, California to test alternative low-VOC cleaners on its web offset presses.

Historically, Vertis used two different cleaners. The first was used in the automated blanket wash system. This cleaner has a VOC content of 264 grams per liter. The second was used as a manual blanket wash cleaner. This cleaner has a VOC content of 192 grams per liter. Although both cleaners have a low VOC content, the VOC content exceeds the SCAQMD Rule 1171 100 gram per liter limit that becomes effective in July of 2006.

IRTA tested several alternatives with Vertis. The alternatives included water-based and soy based cleaners. The water-based cleaners could not be used on the web presses, even in more dilute concentration, because cleaning was performed when the paper web was in the press and water has a tendency to shred the paper. IRTA then supplied Vertis with 10 gallons of one of the soy cleaners, called Soy Gold 2000, and it was tested for a week or so in the automatic blanket wash system on one of Vertis' presses. An MSDS for this cleaner is shown in Appendix A.

As a result of the testing, Vertis decided to convert to a lower VOC content cleaner, and contacted their solvent supplier. The supplier provided the facility with a methyl ester cleaner similar to the soy based cleaner IRTA had provided. The company has been using the cleaner, which has a VOC content of 72 grams per liter, for both automatic and manual cleaning for more than a year and a half. Discussions with the press operators indicated that they prefer the new, low-VOC cleaner because of reduced cleaning time.

Table 2-10 shows the annualized cost comparison for Vertis at its Riverside facility. Because of the reduction in labor, the cost of cleaning with the new low-VOC cleaner is about 19 percent lower than the cost of cleaning with the higher VOC cleaners.

Table 2-10
Annualized Cost Comparison for Vertis

	High VOC Cleaners	Low VOC Cleaner
Cleaner Cost	$45,396	$48,300
Labor Cost	$175,200	$131,400
Total Cost	$220,596	$179,700

R.R. Donnelley & Sons Co.

R.R. Donnelley & Sons is a large lithographic printer. One of the company's facilities is located in Torrance, California. Donnelley prints newspaper inserts and high quality magazines. The company has several large four-color presses at the Torrance location.

IRTA began working with Donnelley in 2001 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. IRTA assisted the company in converting their off-press cleaning operations to alternative low-VOC materials. IRTA also tested alternatives with Donnelley for on-press cleaning.

Donnelley has an automated roller wash system on their presses. The company uses a roller cleaner based on mineral spirits and a methyl ester. An MSDS for this product is shown in Appendix A. The operators clean the blankets by hand "on the run." They apply the cleaning solvent in spray bottles directly onto the blankets while the press is operating during printing. The blanket wash is a mineral spirit and an MSDS for the material is shown in Appendix A.

IRTA conducted testing of alternatives with Donnelley. The company tested a soy based product containing a surfactant for both blanket and roller cleaning for more than three months. An MSDS for this product is shown in Appendix A. Donnelley had blanket failures and the testing was stopped. It is unknown whether the blanket failures were attributable to use of the new cleaner. The press operators indicated that it took slightly longer to get the press back to color but did not provide details. The press operators also indicated that the residue from the new cleaner made the floor slippery and that the excess cleaner occasionally dripped onto the web. A possible explanation for these two problems is the operator practice of applying the blanket wash to the blanket in squeeze bottles in the "on the run" cleaning. The new cleaner does not evaporate readily and an alternative application method might solve these problems.

Donnelley uses 3,675 gallons of their roller wash annually. The price of this product is $10.50 per gallon. The cost of the roller wash is $38,588 per year. Donnelley uses 13,950 gallons of the other mineral spirits product in their plant and two-thirds or 9,300 gallons per year are used to clean the blankets. The price of this product is $2.60. On this basis, the annual cost of the blanket wash is $24,180. The current cost of roller and blanket wash is $62,768 per year.

The cost of the alternative Soy Gold 2000 product is $8 per gallon. Assuming the product is used for cleaning rollers and blankets and assuming the same amount is required, Donnelley would use 12,975 gallons of the alternative cleaner per year. On this basis, the cost of the alternative product would be $103,800 annually.

Table 2-11 shows the annualized cost comparison for Donnelley. The alternative soy cleaner is less costly than the current roller wash and more costly than the current blanket wash. The figures show that the cost to Donnelley would increase by 66 percent if the company adopted the alternative.

Table 2-11
Annualized Cost Comparison for R.R. Donnelley & Sons

	Current Cleaners	Alternative Soy Cleaner
Blanket Wash Cost	$24,180	$74,400
Roller Wash Cost	$38,588	$29,400
Total Cost	$62,688	$103,800

Fanfare Media Works

Fanfare Media Works is located in Valencia, California. The company has three sheet fed presses where they print posters and other material for a variety of different customers in the advertising industry. A picture of one of the sheet fed presses is shown in Figure 2-9. Fanfare also has two web fed presses that print cash register tape and car wash and dry cleaning coupons. A picture of one of the web presses is shown in Figure 2-10.

Figure 2-9. Conventional Ink Press at Fanfare Media Works

Figure 2-10. UV Curable Ink Press at Fanfare Media Works

The sheet fed presses use coated paper whereas the web presses use uncoated paper. IRTA began work with Fanfare as part of an SCAQMD project to test alternative low-VOC, low toxicity cleaners. The ink used on both types of presses, at that stage, was a solventborne air dry ink. At a later date, Fanfare switched the ink on one of the web presses to UV curable ink.

IRTA worked with Fanfare to test alternatives on the sheet fed presses. Alternatives that were tested included Mirachem, a water-based cleaner, acetone and various types of soy based products. The product that worked best was Soy Gold 2500, a product that was

designed to rinse well. IRTA provided larger quantities to Fanfare and the company participated in the extended testing. Fanfare tested the cleaner as both a roller and blanket wash for about three months. The cleaner worked very well over the period. An MSDS for the Soy Gold 2500 is provided in Appendix A.

When Fanfare switched to UV curable ink on the web presses, IRTA tested alternatives to identify cleaners that would perform well in cleaning the new ink. The two alternatives that were tested were Mirachem and Soy Gold 2500. The Mirachem cleaned well but dissolved the paper since cleaning was conducted with the web in. Fanfare tested the Soy Gold 2500 on one of the web presses for several months and the pressman indicated it worked well.

Fanfare estimates that the company uses about one drum of their high VOC roller and blanket wash every six weeks or about 477 gallons per year. This cleaner is used on all of the presses. The cost of the solvent is $8.72 per gallon. The annual cost of using the high VOC cleaner is $4,159. During the extended testing, the pressmen used the about the same amount of Soy Gold 2500 as the high VOC solvent. The Soy Gold 2500 vendor agreed to provide the product at the same cost as the high VOC solvent. This implies that the annual cost of the Soy Gold 2500 would also be $4,159.

Table 2-12 shows the annualized cost comparison for Fanfare. The cost of using the alternative low-VOC cleaner is the same as the cost of using the higher VOC cleaner.

Table 2-12
Annualized Cost Comparison for Fanfare Media Works

	High VOC Cleaner	Soy Gold 2500
Cleaner Cost	$4,159	$4,159
Total Cost	$4,159	$4,159

The Castle Press

The Castle Press is located in Pasadena, California. The company is a commercial lithographic printer with five sheet fed presses. A picture of one of Castle's presses is shown in Figure 2-11. The company prints items like newsletters and brochures.

IRTA began working with Castle as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate alternative on-press cleaning agents. Castle cleans their sheet fed presses with two blanket washes, one for cleaning with the automated system and one for cleaning by hand. The company uses a two step roller wash. Appendix A includes MSDSs for the hand blanket wash, the automated blanket wash, the step 1 roller wash and the step 2 roller wash.

IRTA conducted testing of a variety of alternatives at Castle. During blanket wash testing, one of the alternatives that was tested was Mirachem Pressroom Cleaner, a water-


Figure 2-11. Press at The Castle Press

based cleaner used by some newspapers. This cleaner did not clean aggressively enough. IRTA also tested a soy based cleaner as a blanket wash. Although it cleaned the ink well, the operator indicated that it did not evaporate quickly enough. IRTA also tested acetone but the operator thought it was too strong. IRTA tested a blend of 25 percent acetone and 75 percent Mirachem which was not aggressive enough. Finally, IRTA tested a blend of 50 percent acetone and 50 percent of a soy based cleaner and, according to the operator, this cleaner worked well. An MSDS for the soy based cleaner, called Soy Gold 2000, and for acetone are shown in Appendix A.

For the rollers, IRTA tested Mirachem Pressroom Cleaner which did not work well. IRTA also tested a soy based cleaner, called Soy Gold 2000, followed by a water rinse. This cleaner worked effectively. With further testing, however, the soy product did not rinse adequately. IRTA tested a blend of acetone with a mineral spirits/water emulsion but it did not clean adequately. Finally, IRTA tested another soy based cleaner, called Magic Wash 522C. With rinsing, this product cleaned well. An MSDS for this product is shown in Appendix A.

IRTA provided Castle with a week's supply of the blanket and roller wash that worked best for scaled up testing. After testing for that time frame, the blend of 50 percent acetone and 50 percent Soy Gold 2000 worked effectively as a blanket wash and the Magic Wash 522C worked effectively as a roller wash.

Castle uses 80 gallons per month of their current blanket wash. The cost of the blanket wash is $7.62 per gallon. On this basis, the annual blanket wash cost is $7,315. The company uses 12 gallons per month of each of the two roller washes. The cost of the two roller washes is $10.32 per gallon and $9.22 per gallon. The annual cost of the roller washes is $2,814. The total annual cost of the current cleaning materials is $10,129.

The cost of the alternative blanket wash, consisting of 50 percent acetone and 50 percent Soy Gold 2000 is estimated at $6 per gallon. Assuming the company would use the same amount of the new blanket wash as the current blanket wash, the annual cost of the alternative blanket wash would be $5,760. The cost of the Magic Wash 522C is about $20 per gallon. Again assuming the use would be the same as for the current roller washes, the annual cost of the alternative roller wash would be $5,760. The total cost for the new blanket and roller washes would amount to $11,520.

Table 2-13 shows the cost comparison for the current and alternative blanket and roller washes. The alternative blanket wash is lower cost than the current blanket wash but the cost of the alternative roller wash is higher than the cost of the current products. Conversion to the alternatives would increase the cleaning cost by 14 percent.

Table 2-13
Annualized Cost Comparison for The Castle Press

	Current Cleaners	Alternative Cleaners
Blanket Wash Cost	$7,315	$5,760
Roller Wash Cost	$2,814	$5,760
Total Cost	$10,129	$11,520

Print 2000

Print 2000 is located in Monterey Park, California. The company has four sheet fed presses and a picture of one of these is shown in Figure 2-12. Print 2000 prints high quality posters and flyers; 90 percent of the paper for the products is coated and 10 percent is uncoated.

Figure 2-12. Press at Print 2000

IRTA began work with Print 2000 as part of a project sponsored by U.S. EPA, Cal/EPA's Department of Toxic Substances Control and SCAQMD. The purpose of the project was to identify, test and demonstrate low-VOC alternatives for cleaning blankets and rollers.

Print 2000, like other printers, uses high VOC cleaners for cleaning the blankets and rollers. An MSDS for the roller wash used by the company, called Step #2 Roller Wash, is shown in Appendix A. IRTA tested a variety of alternatives with the company including water-based cleaners, soy based cleaners and acetone. Print 2000 participated in the extended testing program where IRTA provided cleaners at no cost to the company. The extended testing required about three months.

After testing several alternatives, IRTA provided Print 2000 with larger quantities of two cleaners. The roller wash that worked best was a soy based product called Soy Gold 2500. This product was designed to rinse easily and it can be rinsed with one water rinse. During the extended testing, Print 2000 tested this cleaner as a roller wash. IRTA also provided the company with a blend of 80 percent Soy Gold 2500 and 20 percent acetone for blanket cleaning. Although this blend cleaned the ink effectively, Print 2000 had to rinse the blankets with a wet wipe cloth after cleaning. The pressroom employees did not want to take this extra step. IRTA conducted additional testing with the company to find a blanket wash that would not require rinsing. The alternative that worked best is a blend of acetone and mineral spirits called Rhosolv 7248. IRTA provided larger quantities of this cleaner and Print 2000 used it for the extended testing. MSDSs for Soy Gold 2500 and Rhosolv 7248 are shown in Appendix A.

Print 2000 uses one drum per month or 12 drums per year of the high VOC cleanup solvent. On this basis, the company uses 660 gallons per year. Print 2000 estimates that about one-third of the solvent or 220 gallons is used for roller wash and two-thirds or 440 gallons is used for blanket wash. The cost of the cleaner is between $450 and $600 per drum. Assuming the midpoint of $525 per drum or $9.55 per gallon, the annual cost of the roller wash is $2,101 and the annual cost of the blanket wash is $4,202. The total annual cost of the high VOC cleaner is $6,303.

During the extended testing, the pressroom employees indicated that they used about the same amount of the low-VOC roller and blanket wash. The cost of the Soy Gold 2500 roller wash is $8.93 per gallon based on purchases of drum quantities. Assuming 220 gallons are used annually, the cost of the new low-VOC roller wash is $1,965 per year. The cost of the Rhosolv 7248 blanket cleaner, again based on purchases of drum quantitites, is $5.96 per gallon. Assuming 440 gallons are used per year, the annual cost of the low-VOC blanket wash is $2,622.

Table 2-14 shows the annualized cost comparison for Print 2000. The figures show that Print 2000 would reduce their cost of cleaning by 27 percent by converting to the low-VOC cleaning alternatives.

Table 2-14
Annualized Cost Comparison for Print 2000

	High VOC Cleaner	Low-VOC Cleaners
Blanket Cleaner Cost	$4,202	$2,622
Roller Cleaner Cost	$2,101	$1,965
Total Cost	$6,303	$4,587

Western Metal Decorating

Western Metal Decorating is located in Rancho Cucamonga, California. The company has been in business for more than 45 years decorating sheet and coil stock with operations for coating, laminating and lithographic printing. Western Metal Decorating has two lithographic printing presses. The company prints on a range of products ranging from metal can stock to vintage posters and serving trays.

IRTA worked with Western Metal Decorating as part of a project sponsored by U.S. EPA, Cal/EPA's Department of Toxic Substances Control and SCAQMD. The company uses epoxy and alkyd based inks for printing on metal. These inks are very difficult to clean.

Western Metal Decorating uses a solvent consisting of a blend of high VOC solvents that is used as thinner for the coatings. The solvent is recycled on-site and is used as a blanket and roller wash for the lithographic presses. Western Metal Decorating uses about 35 gallons of the recycled material per month or 420 gallons per year. There is no cost for the blanket and roller cleaner because it is generated by the plant.

IRTA investigated several alternative blanket and roller cleaners. The alternatives generally contained acetone and soy based cleaners. The alternative that worked most effectively was a blend of 68 percent acetone, 23 percent of a soy product called Soy Gold 2500 and nine percent of the company's recycled solvent. IRTA provided larger quantities of this cleaner for scaled-up testing. MSDSs for acetone and Soy Gold 2500 are shown in Appendix A.

Western Metal Decorating would blend the new low-VOC cleaner at the facility. The company would use their recycled solvent and purchase acetone and Soy Gold 2500 in drum quantities. The cost of the acetone, in drum quantities, is $7.02 per gallon. Assuming the same amount of the alternative cleaners would be required, 286 gallons of acetone would be required for the blend. The cost of the acetone is $2,008 annually. About 96 gallons of Soy Gold 2500 would be required. At a cost of $8.93 per gallon for drum quantities, the cost of the soy for the blend would amount to $857 per year. Western Metal Decorating would also use 38 gallons of recycled solvent at no cost in the blend. The total cost of the alternative cleaner would be $2,865 annually.

The facility is currently using 420 gallons of recycled solvent as a cleanup material on the lithographic press. If Western Metal Decorating converted to the alternative low-VOC cleaner, the blend would only require 38 gallons of recycled solvent. The company indicates that the additional recycled solvent could be used as a thinner in the coatings. Thus, the facility would not have to dispose of it as hazardous waste.

Table 2-15 presents the annualized cost comparison for Western Metal Decorating. The company would have to begin paying about $2,900 per year to use the alternative low-VOC cleaner.

Table 2-15
Annualized Cost Comparison for Western Metal Decorating

	High VOC Cleaner	Low-VOC Alternative
Cleaner Cost	$0	$2,865
Total Cost	$0	$2,865

The Dot Printer

The Dot Printer is located in Irvine, California. The company is a commercial lithographic printer that prints high quality posters and the Thomas Guide. Dot has three six-color sheet fed presses that use an air dry ink and two web presses that use a heat set ink.

IRTA began working with Dot in 2003 as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control, the South Coast Air Quality Management District and U.S. EPA to test, demonstrate and evaluate cleaning alternatives. IRTA worked with Dot to test alternative cleaners for the sheet fed presses. A picture of one of the sheet fed presses is shown in Figure 2-13.

Figure 2-13. Press at The Dot Printer

Dot uses the same cleaner for both blanket and roller cleaning on the sheet fed presses. An MSDS for this cleaner, from Day International, is shown in Appendix A. IRTA tested a number of alternative blanket and roller washes with Dot. IRTA tested Mirachem Pressroom Cleaner, a water-based cleaner used by some newspapers but it did not effectively clean the ink. IRTA tested a number of soy based cleaners and blends of soy based cleaners with other components as a roller wash. Rinsing with water did not remove the residue sufficiently. IRTA did find a soy based cleaner, called Magic Wash 522C, that could be rinsed and it cleaned the ink well. An MSDS for this cleaner is shown in Appendix A. IRTA tested a variety of different cleaners and blends consisting of soy based cleaners, acetone and other solvents with the operator to find a blanket wash that suited his needs. The operator indicated that a blend of 92 percent acetone and eight percent of a cleaner called Soy Gold 2000 worked best. An MSDS for the Soy Gold 2000 is shown in Appendix A.

IRTA provided Dot with larger quantities of the alternative roller and blanket wash and Dot tested them for a week. The cleaners performed well but the operator did not like the smell of the blanket wash. The company also thought it was inconvenient that the roller wash could not be used to clean the plate because it leaves a residue and it removed the image from the plate.

The company cleans the blankets 10 of 15 times a day and cleans the rollers when a job is completed and a color change is necessary. Dot uses 50 gallons per week or 2,600 gallons per year of the cleaner on the three sheet fed presses. Three-fourths of the cleaner is used as a blanket wash and one-fourth is used as a roller wash. The cost of the cleaner is $4.25 per gallon. The annual cost of the cleaner amounts to $11,050.

The alternative blanket wash is composed of 92 percent acetone which has a price of $4 per gallon and eight percent Soy Gold 2000 which has a price of $8 per gallon. The cost of the blend is $4.32 per gallon. Assuming Dot uses 1,950 gallons of blanket wash per year and assuming the same amount of the alternative blanket wash would be used, the annual cost of the alternative blanket wash would amount to $8,424. The alternative roller wash is priced at $20 per gallon. Assuming 650 gallons of roller wash are used each year and assuming that the new soy based roller wash would be used in the same quantity, the annual cost of roller wash would be $13,000. The total annual cost of the alternative cleanup materials would be $21,424.

Table 2-16 shows the annual cost comparison for the current and alternative cleaners assuming they are used on Dot's three sheet fed presses. The cost of using the alternative cleaners is slightly less than double the cost of using the current cleaner.

Table 2-16
Annualized Cost Comparison for The Dot Printer

	Current Cleaner	Alternative Cleaners
Blanket Wash Cost	$8,288	$8,424
Roller Wash Cost	$2,762	$13,000
Total Cost	$11,050	$21,424

Lithographix

Lithographix is a large, high quality independently owned printer. The company has three facilities in California: a corporate office and printing plant in Hawthorne; a plant in Carlsbad; and a plant in San Mateo. At the Hawthorne plant, Lithographix operates five sheet fed eight color presses and three full web presses.

IRTA began work with Lithographix with the help of the Printing Industries Association of Southern California as part of a project sponsored by U.S. EPA, DTSC and the SCAQMD to test alternative low-VOC, low toxicity cleanup materials. The testing was conducted at Lithographix's Los Angeles facility before it was moved to Hawthorne.

At various times during the testing, IRTA worked with Lithographix on alternatives for a conventional ink sheet fed press, a UV curable ink sheet fed press and a heat set ink web press. This report focuses on the results of the testing on the sheet fed press that used UV curable ink.

Historically, Lithographix used a glycol ether based cleaner for their off-press, blanket and roller cleaning. An MSDS for this cleaner, called 396 U.V. Wash, is shown in Appendix A. The company purchased two drums of the cleaner per month and the cost of the cleaner was $500 per drum or $9.09 per gallon. One drum of the solvent per month was used for off-press cleaning, three-fourths of a drum or 41 gallons per month was used for blanket cleaning and one fourth of a drum or 14 gallons per month was used for roller cleaning. The annual cost of the blanket cleaner amounts to $4,472 and the annual cost of the roller cleaner is $1,527.

Lithographix provided UV ink samples to IRTA and IRTA performed screening tests with acetone, various water-based cleaners, certain VOC solvents and blends. IRTA and Lithographix conducted preliminary testing of the cleaners that worked the best on the UV press. Cleaners that were tested included Mirachem Pressroom Cleaner, a water-based cleaner called Magic UV, acetone and blends of various VOC solvents with these cleaners. The cleaner that worked most effectively as a roller wash was Magic UV and the cleaner that worked most effectively as a blanket wash was a blend of 92 percent acetone and eight percent of a glycol ether called DPM. MSDSs for Magic UV, acetone and DPM are shown in Appendix A.

IRTA provided larger quantities of the alternative cleaners to Lithographix and the press people tested it for a few weeks. The pressman indicated that the blanket wash was as effective as the higher VOC blanket wash and the same amount of cleaner was required. He also indicated that the low-VOC roller wash cleaned effectively but that more was required. He estimated that the low-VOC cleaner would be used up in 5.5 days whereas the high VOC cleaner would last seven days. This indicates that about 27 percent more of the Magic UV alternative was required for roller cleaning.

The cost of the low-VOC blanket wash is $6.85 per gallon if purchased in drum quantities. Assuming the company would use 41 gallons of the cleaner per month, the

annual cost of the alternative blanket wash would be $3,370. The cost of the Magic UV alternative roller wash is $20 per gallon. Assuming 18 gallons per month or 216 gallons per year of the roller wash would be required, the annual cost of roller cleaning would be $4,320.

Table 2-17 shows the annual cleaning cost comparison for Lithographix. The figures in Table 2-17 indicate that the annualized cost of cleaning with the low-VOC alternatives is 28 percent higher than the cost of cleaning with the higher VOC solvents. The cost of the alternative blanket wash is lower but the cost of the roller wash is substantially higher.

Table 2-17
Annualized Cost Comparison for Lithographix

	High VOC Cleaner	Low-VOC Cleaners
Blanket Wash Cost	$4,472	$3,370
Roller Wash Cost	$1,527	$4,320
Total Cost	$5,999	$7,690

Anderson Lithograph

Anderson Lithograph, one of the largest lithographic printers in the country, has one printing facility that is located in Commerce, California. This plant has several sheet fed and web presses that use both conventional solventborne and UV curable ink.

As part of the SCAQMD and DTSC projects, IRTA worked with Anderson to test alternatives for more than two and a half years. IRTA tested alternatives on a sheet fed conventional ink press, a sheet fed UV curable ink press and a web press. Anderson originally agreed to conduct extended testing but dropped out of the testing project before it occurred. This section presents the incomplete results of the testing at Anderson.

On the web press, IRTA and Anderson tested a variety of soy based formulations. The company was already using a methyl ester formulation with relatively low VOC content when IRTA began the work. An MSDS for this cleaner, called Envirowash 220, is shown in Appendix A.

The web presses at Anderson are cleaned with an automated blanket wash system and they are also cleaned periodically by hand with a blanket wash. Because the alternative would be used in the automated system, IRTA focused on cleaners that would have a flash point of about 140 degrees F or higher. The three alternatives that worked best included blends of about 90 percent Soy Gold 2000 with 10 percent of a glycol ether called DPM, 10 percent of 1-butanol or 10 percent of EEP. MSDSs for these three components are shown in Appendix A. All of these alternatives had a VOC content of about 100 grams per liter. As mentioned above, Anderson dropped out of the program before the alternatives could undergo extended testing.

IRTA and Anderson also worked extensively on alternatives for the sheet fed conventional and UV curable ink presses. The high VOC cleaner used by Anderson for cleaning these presses is CP-580 Hybrid Wash. An MSDS for this product is shown in Appendix A. A roller wash composed of 100 percent Soy Gold 2000 and a blanket wash composed of 50 percent Soy Gold 2000 and 50 percent acetone were tested on one press using UV curable ink for a six week period. The results of the testing were positive but qualified. A letter from Frank Barnett, Director, Environmental, Health & Safety at Anderson, summarizing the results of the testing is included in Appendix B. As indicated in the letter, compatibility and flash point issues were not resolved. The blanket wash could only be used by hand since the flash point is too low for the cleaner to be used in the automated blanket wash system.

IRTA and Anderson performed additional work on the sheet fed presses taking into account that the cleaners must have high flash points. By then, IRTA had obtained a new soy formulation, called Soy Gold 2500, which was much more easily rinsed than the Soy Gold 2000. An MSDS for Soy Gold 2500 is shown in Appendix A. Several of the same formulations that were tested on the web press were tested on the sheet fed presses. The formulation that performed best, both on the conventional and UV curable ink, was a blend of 90 percent Soy Gold 2500 and 10 percent DPM. Although Anderson may have conducted some independent testing, the company dropped out of the program before the formulation could be tested in the automated blanket wash system.

The Printery

The Printery is located in Irvine, California. The company has four sheet fed presses for printing posters and other material for a variety of different customers. Two of the presses are small duplicating Crestline presses, one is a larger two color press and one is a large six color press with an automated blanket wash system. Figures 2-14, 2-15 and 2-16 show pictures of one of the Crestline presses, the two color press and the six color press.

Figure 2-14. Six Color Press at The Printery

Figure 2-15. Two Color Press at The Printery


Figure 2-16. Small Crestline Press at The Printery

IRTA began work with The Printery as part of a project sponsored by SCAQMD to test alternative, low-VOC cleanup solvent alternatives. IRTA particularly wanted to work with a company that had an automated blanket wash system on a sheet fed press. When IRTA began work with The Printery, the company had already converted to 500 gram per liter VOC cleaners.

IRTA tested alternatives with The Printery. The alternative roller wash that was most effective was a soy based cleaner called Soy Gold 2500. An MSDS for this cleaner is shown in Appendix A. This cleaner was also effective as a blanket wash for the sheet fed

press with the automated blanket wash system. This system allows use of a water rinse and The Printery routinely used the rinse feature during the extended testing. The company also cleans all of its presses, including the sheet fed press with the automated blanket wash system, with a hand blanket wash. The hand blanket wash that performed best was a blend of a glycol ether and acetone. An MSDS for this product, called Rhosolv Blanket Wash 7150, is shown in Appendix A.

The Printery participated in extended testing of the low-VOC alternatives. The alternatives were tested on one of the Crestline presses, the two color press and the six color press for more than three months. The two problems the company experienced were that the fountain solution required more frequent changeout and that the soy cleaner used in the automated blanket wash system "dripped" onto the product periodically during the day. A picture of the drip on the paper substrate is shown in Figure 2-17. The press people learned to control the dripping to some extent, but use of the blanket wash did lead to an increase in paper waste. As discussed below, when the company used the 500 gram per liter VOC cleaners, these same two problems were evident.

Figure 2-17. Drip (Circled) at The Printery

When the VOC limit for cleaners was 800 grams per liter, The Printery used a two step automated blanket wash, a roller wash and a hand blanket wash. The company used 260 gallons per year of each of the solvents comprising the two step automated blanket wash. The price of one of the components was $10.25 per gallon and the price of the other component was $9.75 per gallon. The annual cost of the two step automated blanket wash was $5,200. The Printery used 52 gallons per year of the roller wash. At a price of $9.45 per gallon, the annual cost of the roller wash amounted to $491. The company used 156 gallons per year of the hand blanket wash. At a price of $9.95 per gallon, the

annual cost of the hand blanket wash was $1,552. The total annual cost of purchasing the high VOC solvents was $7,243.

When the 800 gram per liter VOC cleaners were used, The Printery used 12 ounces of fountain solution per week. At a cost of $22 per gallon, the annual cost of purchasing the fountain solution amounted to $107. The amount of paper waste that is generated depends on many factors. The Printery estimates that the cost of the paper waste averaged about $100 per day. Assuming a five day week, the annual cost of paper waste was $26,000.

After the interim SCAQMD Rule 1171 VOC limit of 500 grams per liter became effective, The Printery converted to alternative cleaners. At this stage, the company used two cleaners, LV 33 and LV flush. The usage of each cleaner amounted to 260 gallons per year. At a price for LV 33 of $17.88 per gallon and a price for LV Flush of $19.10 per gallon, the annual cost of purchasing the cleaners amounted to $9,615.

After conversion to the 500 gram per liter VOC cleaners, The Printery had to change out the fountain solution more often and the paper waste increased because the lower vapor pressure cleaners "dripped" on the substrate. The press people estimate that the company used an additional 12 ounces of fountain solution per week. At a price of approximately $22 per gallon, the annual cost of the fountain solution increased by $107 to $214. The press people estimate that there was an increase in waste paper generation of about $30 per week. This amounts to a cost increase of $7,800 per year. The total annual cost of the paper waste was $33,800.

The 100 gram per liter VOC alternatives that were tested included Soy Gold 2500 which was used for cleaning the rollers and as an automated blanket wash and the acetone/glycol ether blend which was used as a hand blanket wash. The soy was rinsed with water during its use as a roller wash and an automated blanket wash. The Printery estimated the use of the soy product at 2.5 gallons per week or 130 gallons per year. Assuming a per drum price of $10 per gallon, the annual cost of using the soy is $1,300. The Printery used 7.5 gallons per week of the hand blanket wash. At a price of $8.60 per gallon assuming the wash is purchased in a 30 gallon drum, the annual cost of purchasing the material is $3,354. The total cost of purchasing the low-VOC cleaners is $4,654 per year.

When The Printery tested the low-VOC alternatives, the company experienced the higher fountain solution use in the large press and also the "dripping" problem that had been observed during use of the 500 gram per liter VOC cleaners. On this basis, the annual cost of the fountain solution and the waste paper is $214 and $33,800 respectively.

Table 2-18 shows the annualized cost of the 800, 500 and 100 gram per liter cleaners for The Printery. The figures show that the cost of using the 800 gram per liter VOC cleaners is the lowest of the three scenarios. The cost of using the 500 gram per liter VOC cleaners is 31 percent higher than the baseline. The cost of using the 100 gram per

liter VOC cleaners is lower than the cost of using the 500 gram per liter VOC cleaners but it is 16 percent higher than the baseline cost.

Table 2-18
Annualized Cost Comparison for The Printery

	800 Gram/Liter Cleaners	500 Gram/Liter Cleaners	100 Gram/Liter Cleaners
Cleaner Cost	$7,243	$9,615	$4,654
Fountain Solution Cost	$107	$214	$214
Waste Paper Cost	$26,000	$33,800	$33,800
Total Cost	$33,350	$43,629	$38,668

Tedco

Tedco was located in Los Angeles for many years; the company recently relocated to Paramount, California. Tedco provides lithographic printing services for a variety of customers including other printers. About half of the company's printing is on plastic substrates and half is on paper and paperboard. Tedco exclusively uses UV curable ink. The company has two six color sheet fed presses. A picture of one of the presses is shown in Figure 2-18.

Figure 2-18. Press at Tedco

IRTA began working with Tedco as part of a project sponsored by U.S. EPA, Cal/EPA's Department of Toxic Substances Control and SCAQMD. The aim of the project was to identify, test and demonstrate alternative low-VOC, low toxicity alternative cleaning solvents.

Tedco used a high VOC cleaner that contained aromatic hydrocarbons and a glycol ether for cleanup of the ink on both presses. An MSDS for this cleaner, called LC-97, is shown

in Appendix A. The material functioned as a blanket and a roller wash. IRTA tested a variety of alternatives with Tedco and the formulation that performed most effectively was a blend of 61 percent acetone, 30 percent of a water-based cleaner called Magic UV and nine percent isopropyl alcohol (IPA). MSDSs for acetone, Magic UV and IPA are shown in Appendix A. This cleaner met the 100 gram per liter low VOC target limit. IRTA was not able to clean Tedco's white ink with this formulation. The white ink used by Tedco has been formulated to be especially durable. Another formulation, composed of 20 percent of a glycol ether called DPM and 80 percent of a soy based material called Soy Gold 2500, was effective on the white ink. MSDSs for DPM and Soy Gold 2500 are shown in Appendix A. This formulation has a VOC content of 200 grams per liter.

Tedco used three gallons per week or 156 gallons per year of the high VOC solvent. The company pays $620.95 for a 55 gallon drum of the solvent. This translates into $11.29 per gallon. The annual cost of cleaning with the high VOC solvent was $1,761.

IRTA provided two weeks worth of the 100 gram per liter acetone/Magic UV/IPA blend to Tedco for scaled-up testing. The cleaner performed acceptably and IRTA provided larger quantities of the cleaner for three months of extended testing. The pressmen indicated that the cleaner performed adequately but that they used about 20 percent more cleaner than the high VOC material. Assuming that 20 percent more of the cleaner would be required, the annual use of the low VOC cleaner would amount to 187 gallons per year. The cost of the low VOC cleaner is $11.08 per gallon. On this basis, the cost of using the alternative cleaner would be $2,072 annually.

Table 2-19 shows the annualized cost comparison for the high- and low VOC cleaners. The figures indicate that the cost of using the alternative low VOC cleaner would be 18 percent higher than the cost of using the high-VOC cleaner.

Table 2-19
Annualized Cost Comparison for Tedco

	High-VOC Cleaner	Low VOC Cleaner
Cleaner Cost	$1,761	$2,072
Total Cost	$1,761	$2,072

Oberthur Card Systems

Oberthur is located in Rancho Dominguez, California. The company uses both lithographic and screen printing to print on plastic credit cards. Oberthur has five sheet fed lithographic presses and prints with both air dry conventional ink and UV curable ink. Two of the presses print two colors and three print six colors. A picture of one of Oberthur's two-color conventional ink presses is shown in Figure 2-19.

IRTA began working with Oberthur as part of a project sponsored by U.S. EPA, Cal/EPA's Department of Toxic Substances Control and SCAQMD. The aim of the

project was to identify, test and demonstrate alternative low-VOC, low toxicity alternative cleanup solvents.

Figure 2-19. Press at Oberthur Card Systems

Oberthur used high VOC cleaners for cleaning the blanket and rollers on their presses. IRTA tested a variety of alternatives with Oberthur for both the UV and conventional presses. For the conventional press, IRTA tested a number of different soy based cleaners. The soy cleaners cleaned the ink effectively but the print quality could not be achieved. When paper substrates are used, the residual oily soy is picked up by the paper and the print quality recovers quickly. In contrast, with a plastic substrate, the plastic does not pick up the residual soy and the print quality is not acceptable.

After extensive testing, IRTA identified a blanket and roller wash that cleaned effectively on the conventional press and maintained print quality. The blanket wash is a blend of 75 percent acetone, 12.5 percent Hydro Clean, a mineral spirits cleaner, and 12.5 percent water. MSDSs for acetone and Hydro Clean are provided in Appendix A. This cleaner met the 100 gram per liter VOC target. The roller wash is a blend of 25 percent acetone, 25 percent Hydro Clean and 50 percent water. This material has a 200 gram per liter VOC content. IRTA provided larger quantities of the blanket and roller wash to Oberthur for scaled-up testing on the conventional press.

IRTA also tested extensively with Oberthur on the UV press. Soy cleaners were not considered for the UV presses because of the EPDM rubber used for the rollers and blankets. The alternative that was found to be most effective for the rollers was a blend of 75 percent of a water-based cleaner called Magic UV and 25 percent acetone. For cleaning the blanket, a blend of 90 percent acetone and 10 percent DPM, a glycol ether, was found to be effective. IRTA provided larger quantities of the blanket and roller wash for scaled-up testing. These two formulations met the 100 gram per liter VOC target limit. MSDSs for acetone, Magic UV and DPM are shown in Appendix A.

Oberthur uses 440 gallons per year of a high VOC cleaner for the conventional presses. This cleaner is used for both the blanket and roller cleaning. The company indicates that about 60 percent of the cleaner or 264 gallons is used for roller cleaning and 40 percent or 176 gallons is used for blanket cleaning. The cost of the cleaner is $9.05 per gallon. On this basis, the annual cost of the high VOC blanket wash is $1,600 and the annual cost of the roller wash is $2,400.

The cost of the low-VOC alternative blanket wash is $4.65 per gallon. Because this cleaner is 75% acetone, it was assumed that twice as much or 352 gallons would be required for cleaning the blankets. On this basis, the annual cost of the alternative blanket wash would be $1,637. The cost of the roller wash is $5.30 per gallon. Assuming that the same amount of the low-VOC roller wash would be required, the annual cost of the roller wash is $1,399.

Table 2-20 shows the annualized cost comparison for the conventional press. The figures show that a conversion to the low-VOC alternatives would result in a 24 percent decrease in costs.

Table 2-20
Annualized Cost Comparison for Conventional Presses for Oberthur

	High VOC Cleaner	Alternative Low-VOC Cleaners
Blanket Cleaner Cost	$1,600	$1,637
Roller Cleaner Cost	$2,400	$1,399
Total Cost	$4,000	$3,036

Oberthur uses 350 gallons per year of a high VOC cleaner for the UV presses. Again, this cleaner is used for both roller and blanket cleaning. The company indicates that about two-thirds of the cleaner or 233 gallons per year is used for blanket wash and one-third of the cleaner or 117 gallons per year is used for roller wash. The cost of the UV ink cleaner is $16.35 per gallon. On this basis, the cost of the blanket wash is $3,810 annually and the cost of the roller wash is $1,913 annually.

The alternative cleaner that worked best as a blanket wash was a blend of 90 percent acetone and 10 percent DPM, a glycol ether. The cost of this cleaner is $7.88 per gallon. It was assumed that the company would use twice as much of the alternative low-VOC blanket wash because it evaporates more readily. On this basis, Oberthur would use 466 gallons a year and the annual cost of the alternative blanket wash would be $3,672. The alternative cleaner that worked effectively for roller wash on the UV press was 75 percent Magic UV and 25 percent acetone. The cost of this cleaner is $21.35 per gallon. Assuming that 117 gallons would be required, the annual cost of this cleaner would be $2,498.

Table 2-21 shows the annualized cost comparison of the high VOC cleaners and the alternative low-VOC cleaners. The values show that the cost of using the alternative

low-VOC cleaners would be about eight percent higher than the cost of using the high VOC cleaners.

Table 2-21
Annualized Cost Comparison for UV Presses for Oberthur

	High VOC Cleaner	Alternative Low-VOC Cleaners
Blanket Cleaner Cost	$3,810	$3,672
Roller Cleaner Cost	$1,913	$2,498
Total Cost	$5,723	$6,170

Huhtamaki

Huhtamaki is located in Los Angeles, California. The company is international and the business entity in Los Angeles makes consumer packaging, primarily for ice cream cartons. Huhtamaki has an eight stage web press with seven color stations and a clear coating station. A picture of the press is shown in Figure 2-20. Huhtamaki is one of the few companies in the U.S. to use electron beam curable ink.

Figure 2-20. Press at Huhtamaki

IRTA began work with Huhtamaki as part of a project sponsored by U.S. EPA, Cal/EPA's Department of Toxic Substances Control and SCAQMD. The focus of the project was to identify, test and demonstrate alternative low-VOC, low toxicity alternative cleanup materials.

Historically, Huhtamaki used two 55 gallon drums per month of a VOC solvent EB. An MSDS for this cleaner is shown in Appendix A. Half of the EB was used for off-press

cleaning and half was used for on-press cleaning. The facility estimates that three-fourths of a drum or 41 gallons per month was used for blanket cleaning and one-fourth of a drum or 14 gallons per month was used for roller cleaning. The cost of the solvent is $9.09 per gallon. On this basis, the cost of blanket wash amounted to $4,472 per year and the cost of roller wash amounted to $1,527 per year.

IRTA tested a variety of alternatives with Huhtamaki for both off-press and on-press cleaning. The company converted to a soy based cleaner for off-press cleaning. Because Huhtamaki's roller supplier indicates that the soy cleaner is incompatible with the EPDM rubber used to make the rollers, soy was not tested for on-press cleaning. IRTA conducted on-press testing with the company and found alternatives to use in the scaled up testing. In the meantime, however, Huhtamaki changed their ink formulation. IRTA again tested alternatives on the new ink and found different alternatives to used in the scaled up testing.

The alternative that was most effective on the rollers was a water-based cleaner called Magic UV. An MSDS for this product is shown in Appendix A. In the testing conducted by IRTA, the cleaner was slower than the current cleaner. The company also tested blends of the Magic UV with acetone and adding the acetone did speed up the cleaning. IRTA spent about six hours in the plant during a normal set of printing jobs and observed how the cleaning was performed. The pressman applied the roller wash and immediately left to perform other tasks during the downtime between jobs. Huhtamaki does not want to use acetone because of the flammability. Because the roller wash does not have to clean quickly, the company could use the Magic UV alone.

For the scaled up testing, Huhtamaki indicated they would use the Magic UV alone and would blend in acetone as required. IRTA examined two alternative cost scenarios for the roller wash. For both scenarios, IRTA assumed the company would use 1.5 times as much cleaner or 252 gallons of the low-VOC roller wash per month. The cost of the Magic UV is $20 per gallon and the cost of acetone purchased in drum quantities is $7.02 per gallon. Assuming the roller wash is 100 percent Magic UV, the annual cost of using the alternative roller wash is $5,040. Assuming the roller wash is 50 percent Magic UV and 50 percent acetone, the annual cost of using the alternative roller wash is $3,405.

The alternative low-VOC blanket wash was tailored to clean as well as the EB. The cleaner that worked best was a blend of 67 percent acetone and 33 percent Kyzen M6521, a water-based cleaner. MSDSs for acetone and the Kyzen M6521 are shown in Appendix B. The cost of acetone is $7.02 per gallon and the cost of the Kyzen water-based cleaner is $16.20 per gallon. Assuming the same amount of blanket cleaner, the annual cost of the alternative low-VOC blanket wash is $4,944.

The labor for using the alternative low-VOC roller wash could increase because the roller wash may require a rinse. During the time IRTA spent while the pressroom operators ran jobs, IRTA provided the water-based cleaner as a roller wash and the operators did not rinse the rollers with plain water. The need for rinsing was to be investigated during the scaled up testing. Huhtamaki has not yet conducted the scaled up testing so it is not

known whether rinsing would be required. For purposes of analysis, IRTA assumed that rinsing would be required. In a four hour period, when IRTA observed the cleaning, the operator cleaned two rollers. In 24 hours, or three shifts, the operator would clean 12 rollers. Assuming it takes one minute to clean each roller (the operator applies the roller wash and leaves to perform other tasks), that the company operates three shifts 5.5 days per week and that Huhtamaki's labor rate is $23 per hour, the annual labor cost for roller cleaning is $1,316. If it is assumed that rinsing is required, the labor cost would double to $2,632 per year.

The labor for cleaning the blankets would stay the same since the low-VOC alternative cleans in a similar manner to the EB. For the blanket labor, it was assumed that the operators clean four sets of blankets thirty times per day or 120 blankets per day. Assuming it requires two minutes to clean a blanket, that the press operates 5.5 hours per day and again that the labor rate is $23 per hour, the annual labor cost for blanket cleaning amounts to $26,312.

Table 2-22 presents the annualized cost comparison for cleaning for Huhtamaki assuming the roller cleaner is 100 percent Magic UV. The figures show that Huhtamaki's cost of cleaning would increase by about 16 percent with use of the low-VOC alternatives.

Table 2-22
Annualized Cost Comparison for Huhtamaki
Magic UV Roller Cleaner

	High VOC EB	Low-VOC Cleaners
Blanket Cleaner Cost	$4,472	$4,944
Roller Cleaner Cost	$1,527	$5,040
Blanket Cleaning Labor Cost	$26,312	$26,312
Roller Cleaning Labor Cost	$1,316	$2,632
Total Cost	$33,627	$38,928

Table 2-23 presents the annualized cost comparison for cleaning for Huhtamaki assuming the roller cleaner is a blend of acetone and Magic UV. The values show that Huhtamaki's cleaning cost would increase by about 11 percent if the company adopted the low-VOC alternative cleaners.

Table 2-23
Annualized Cost Comparison for Huhtamaki
Magic UV/Acetone Roller Cleaner

	High VOC EB	Low-VOC Cleaners
Blanket Cleaner Cost	$4,472	$4,944
Roller Cleaner Cost	$1,527	$3,405
Blanket Cleaning Labor Cost	$26,312	$26,312
Roller Cleaning Labor Cost	$1,316	$2,632
Total Cost	$33,627	$37,293

CLEANING OF OTHER ON-PRESS COMPONENTS

As part of this project, IRTA investigated, in a limited way, whether or not alternative low-VOC cleaners could be used to clean plates, dampening rollers and metering rollers. This subsection summarizes the results of that investigation.

IRTA talked with several industry sources to determine the emissions inventory and current practices for cleaning the other on-press components. There was general agreement among suppliers that the VOC emissions from cleaning plates, dampening rollers and metering rollers accounts for about 10 percent of total VOC emissions from cleaning these components and cleaning rollers and blankets. The emissions may be as low as five percent of the total on-press sector emissions and they may be as high as 15 percent of these emissions.

Plates are cleaned periodically with abrasive cleaners that do not contain solvents. IRTA did not evaluate alternatives to these cleaners. The non-abrasive cleaners that have been designed specifically as plate cleaners may contain water, surfactants and solvents of various kinds like terpenes, glycol ethers, mineral spirits, heptane and IPA. Plates are regularly cleaned as part of the roller cleaning process at the end of the day or when there is a color change on the press. The plate is generally engaged during roller cleaning so the roller cleaner most often serves as the plate cleaner. The alternative low-VOC cleaners that IRTA tested for plate cleaning generally were the roller cleaners that contained 100 grams per liter or less VOC.

Metering rollers and dampening rollers most often contact one another so they are generally cleaned with the same material. Metering roller cleaners (called MRCs) are most often fast evaporating cleaners. The cleaners contain solvents of various kinds including glycol ethers, acetone, mineral spirits, heptane, methylene chloride and IPA. During this project, IRTA developed and tested two low-VOC MRCs and one of these was tested at several facilities.

Nelson Nameplate has two small automated presses. The presses have plates that are cleaned regularly and a dampening roller but no metering roller. IRTA developed and tested a low-VOC product for cleaning the plate and dampening roller. An MSDS for this product, called Rhosolv 7248, is shown in Appendix A. It contains acetone and is fast evaporating. Nelson tested this cleaner for a week and it performed acceptably.

At Print 2000, IRTA tested an alternative plate and MRC for a three month period. Print 2000, as described earlier, participated in the extended testing. The plate was engaged while the rollers were cleaned so the plate cleaner that worked effectively was the alternative roller wash, Soy Gold 2500. An MSDS for this cleaner is shown in Appendix A. The MRC that was used for cleaning the metering and dampening roller is Rhosolv 7248 which was also used for general blanket cleaning at Print 2000. This MRC worked well.

IRTA also tested the Rhosolv 7248 product at Anderson Lithograph for cleaning the metering rollers. On the sheet fed press, the press people reported that the odor was high but that the cleaner worked similarly to their current cleaner. On the web press, the Rhosolv 7248 reportedly was slower than their cleaner in cutting the ink but the press people liked it better because it eliminated the streaking that resulted from the use of their current product.

IRTA tested alternative plate and MRC cleaners at Tedco. Tedco uses UV curable ink and the company participated in the extended testing. The plate was engaged when the company cleaned the rollers so the roller wash, a blend of 61 percent acetone, 30 percent Magic UV and nine percent IPA, was used to clean the plate for several months. IRTA also tested the MRC, called Rhosolv 7248, at Tedco for metering/dampening roller cleaning. The press people indicated that it worked effectively.

IRTA tested alternative plate and metering/dampening roller cleaners at The Printery. This company participated in the extended testing. The materials were tested on three presses, a small crestline duplicating press, a two color press and a six color press. The plate was engaged during roller cleaning and the roller cleaner for the three month period on all three presses was Soy Gold 2500. An MSDS for this material is shown in Appendix A. IRTA developed an acetone based hand blanket wash for The Printery and the company used this cleaner as an MRC for the extended testing period of three months. It worked effectively for this purpose.

The limited testing IRTA conducted indicates that a range of facilities can meet the 100 gram per liter VOC limit for plate, dampening and metering roller cleaners. In most cases, if the company converts to a 100 gram per liter roller wash, this material will serve as a plate cleaner. Fast evaporating MRCs that are suitable for cleaning metering and dampening rollers can be formulated with a high concentration of acetone and these cleaners can meet the 100 gram per liter limit as well.

EXTENDED TESTING RESULTS

Extended testing of the alternatives that performed best was conducted with seven facilities. The alternatives were tested for at least three months. The facilities that participated in the extended testing included:

- Nelson Nameplate
- SCAQMD Print Shop
- Print 2000
- Fanfare Media Works
- Vertis
- Tedco
- The Printery

Performance Evaluation

More information was available for the cost analysis from the facilities involved in the extended testing. In a few cases, the company used more of the alternative and the long testing timeframe allowed that to be noted. Two companies that used acetone based alternatives, Nelson Nameplate and Tedco, used more cleaner in the extended testing. This is probably because of the high vapor pressure of acetone. Some of the other facilities that used acetone formulations, however, did not notice a difference in use.

Two of the facilities using soy based cleaners, Print 2000 and The Printery, had to change out their fountain solution more often. Tedco used a water-based cleaner and had to change out their fountain solution more often as well. The soy based cleaner and the water-based cleaner are very low vapor pressure materials and they may have contaminated the fountain solution and affected it more readily than the higher vapor pressure original cleaners.

When the 500 gram per liter VOC limit became effective in July of 2005, the industry indicated that there was a buildup over time of the vegetable based cleaners used in automated blanket wash systems on sheet fed presses. The Printery has this type of operation and no buildup was observed during the more than three months of extended testing. The pressmen at The Printery did experience a few random drips over a day that resulted in an increase in paper waste.. The increase in paper waste was taken into account in the cost analysis.

Compatibility

As discussed earlier, as part of the SCAQMD project, UT worked with the roller and blanket manufacturers to develop a protocol for compatibility testing. UT conducted extensive testing and the report summarizing the results of the testing is available from UT.

Blankets used by lithographic printers are relatively low cost when compared with the cost of rollers. Blankets are changed out frequently, generally on a periodic basis. Rollers, in contrast, are generally changed out over much longer periods ranging from six months to several years.

Two general types of rubber are used to make blankets and rollers used in lithographic printing. Nitrile is generally used for presses that run conventional solventborne or soy based ink. EPDM is commonly used for presses that run UV and EB curable ink. Roller and blanket manufacturers have many different variations of rollers and blankets based on nitrile and EPDM.

Most of the roller manufacturers cautioned about using soy based products with EPDM and about using acetone with nitrile. Bottcher, one of the largest roller manufacturers, routinely evaluates compatibility of formulations their customers are using or planning to use. The company has four classifications regarding compatibility. They include:

- acceptable for automated systems without dilution
- recommend dilution--25 percent water or heavy after rinse
- must dilute with at least 25 percent water
- not compatible--too much swelling

Other roller suppliers have the same types of classifications.

IRTA provided the Bottcher lab with a sample of Soy Gold 2000, one of the soy based cleaners tested in the project. After evaluation, Bottcher indicated that for a nitrile compound, the product fell into the category "acceptable for automated systems without dilution." Bottcher also indicated that the product fell into the category "recommend dilution--25 percent water or heavy after rinse" for an EPDM compound.

The UT results generally indicated that acetone formulations were not compatible with nitrile compounds above about 25 percent. Acetone formulations with less than 25 percent were compatible. The UT results and the roller manufacturers indicate that acetone is compatible with EPDM.

The short term testing of alternatives was not likely to reveal compatibility problems but the extended testing of at least three months should be long enough for problems to emerge. During the extended testing, the companies exclusively used the alternative blanket and roller washes on at least one press. IRTA generally followed the rules about compatibility when providing formulations to the facilities for extended testing with some exceptions.

At Fanfare Media Works, IRTA did test Soy Gold 2500 on the blankets on a small web press using UV curable ink with EPDM rubber. The press prints on grocery store tape which is very absorbent. There were no problems with the rubber during the three months of testing.

At several of the facilities participating in the extended testing, IRTA tested high acetone content formulations as roller washes or hand blanket washes. IRTA tested a high acetone content formulation at the SCAQMD Print Shop as a roller wash. The shop converted to the alternative and has been using it for over a year. There has been no observed effect on the rollers. At another facility, Nelson Nameplate, the company has been using a blanket wash containing more than about 80 percent acetone for at least six years and has observed no compatibility problems. At Print 2000, another company that participated in the three month testing, the blanket wash was more than 90 percent acetone. The company experienced no compatibility problems during the period. At The Printery, the hand blanket wash IRTA provided to the company was tested for more than three months on three presses and no compatibility problems were observed.

It is possible that some of the high acetone formulations could present problems if they were used for longer periods. At Nelson Nameplate, however, the company has been using a very high acetone content blanket wash for many years. As mentioned above, most companies replace their blankets on a periodic basis. It may be that the replacement schedule is simply shorter than the time frame for damage to be observed.

One of the soy based cleaners was used on a small press with EPDM blankets for more than three months and no compatibility problems were observed. The Bottcher evaluation for a similar soy based material indicated that it could be used with a heavy after rinse. In all cases where soy compounds are used, they must be rinsed thoroughly or the press does not come back up to color. The limited testing results described here suggest that soy based materials could be used on EPDM rubber as long as heavy rinsing is performed.

TOXICITY EVALUATION AND COMPARISON

The California Department of Health Services Hazard Evaluation System & Information Service (HESIS) conducted a toxicity assessment of the high VOC cleanup solvents and low-VOC alternatives for IRTA. The assessment was based on an evaluation of the MSDSs for some of the products used by the printers that participated in the project. A brief summary of the evaluation is presented here.

High VOC Products

Many of the high VOC products used by the facilities when the 800 gram per liter VOC content limit was in effect were composed of various fractions of mineral spirits like aromatic and aliphatic hydrocarbons. At least six products contain a component called aromatic hydrocarbon, petroleum naphtha or aromatic petro distillate (C8-C12) with the CAS # 64742-95-6. Some of the products used by the participating facilities that contain this fraction include:

- Pressroom Solutions Blanket & Roller Wash used by the San Bernardino Sun
- AQ 1301 Roller Wash No. 1 used by Presslink
- AQ 1302 Roller Wash No. 2 also used by Presslink
- PowerKlene VC Blanket and Roller Wash used by The Castle Press
- Bay International Products Div. Blanket Wash used by The Dot Printer
- Allied Hydrowash used by J.S. Paluch

Several of the MSDSs used by the participating facilities also contain CAS # 64742-88-7 referred to as aliphatic hydrocarbon or mineral spirits. Some of the products that contain this fraction include:

- Pressroom Solutions Blanket & Roller Wash used by the San Bernardino Sun
- IC ALL PRO used by PIP Printing
- Anchor Environwash 220 used by R.R. Donnelley & Sons
- Shell Mineral Spirits 146 HT used by R.R. Donnelley & Sons

Other components contained within some of the MSDSs for the high VOC products are 1,2,4-trimethyl benzene, 1,3,5-trimethylbenzene, xylene, cumene and various glycol ethers.

Most of the high VOC products exclusively contain organic solvents in concentrations ranging from 70 to 100 percent. The HESIS review indicates that overexposure to

solvent based cleaners affects the central nervous system (brain), causing nausea, dizziness, clumsiness, drowsiness and other effects like those of being drunk. Overexposure for months or years can cause long-lasting and possibly permanent damage to the nervous system. The symptoms of long-term health effects include fatigue, sleeplessness, poor coordination, difficulty in concentrating, loss of short-term memory and personality changes such as depression, anxiety and irritability. Solvent based products can also irritate the eyes, nose, throat and skin. Skin contact can cause dermatitis.

Glycol ethers in some of the products can affect the nervous system as a result of absorption through intact skin in addition to inhalation. Ethylene glycol monobutyl ether (also called 2-butoxy ethanol) and ethylene glycol monopropyl ether also can damage red blood cells and cause anemia. 1,2,4-Trimethylbenzene and 1,3,5-trimethylbenzene can pose additional risks of asthmatic bronchitis and blood dyscrasias and cancer due to benzene contamination; the Permissible Exposure Level of the isomers is 25 ppm. Xylene exhibits general solvent toxicity and has a Permissible Exposure Level of 100 ppm. Isopropylbenzene or cumene is a central nervous system toxicant and an irritant with a Permissible Exposure Level of 50 ppm.

Low-VOC Products

Alternatives that were tested by IRTA during the project generally included soy based materials, water-based materials, acetone and small amounts of VOC solvents including mineral spirits, IPA and propylene glycol ethers.

The soy based products tested in the project including Soy Gold 2000, Soy Gold 2500 and Magic Wash 522C contain fatty acid esters. HESIS reviewed the toxicity of these products. HESIS indicates that although there were no toxicity data on fatty acid esters in Toxnet, Scorecard and other chemical databases, they are not volatile, do not pose an inhalation hazard and are of low toxicity compared to organic solvents. The European Union, in conjunction with the US, is sponsoring research on vegetable oils and their fatty acid esters as substitutes for organic solvents in industrial processes.

The fatty acid ester products that are useful in this industry all contain surfactants. As discussed earlier in the document, soy based products must be rinsed so the press can come back up to color. Surfactants are generally used to allow the products to be rinsed. One of the products tested contains a surfactant called ethylphenoxypolyethoxy ethanol (a nonylphenol ethoxylate) that is an endocrine disruptor. The other two products that were tested contain unspecified surfactants so it is not clear whether they would be endocrine disruptors or not.

Water-based products were also tested during the project. Some of these include Mirachem Pressroom Cleaner and Magic UV. These products might also contain surfactants that are endorine disruptors.

IRTA relied heavily on acetone based products during the project, particularly in fast evaporating hand blanket washes that some printers prefer. Consistent with general solvent toxicity, overexposure to acetone affects the nervous system and causes skin and respiratory irritation. In the case of acetone, however, the threshold for produing these health effects are higher (the Permissible Exposure Level of acetone is 750 ppm) than for the mineral spirit Stoddard Solvent (the Permissible Exposure Level of the chemical is 100 ppm) or xylene (the Permissible Exposure Level of xylene is 100 ppm). In one case, Tedco, IRTA formulated a cleaner that contained 10 percent isopropyl alcohol. Like acetone, it has general solvent toxicity but the threshold is higher (the Permissible Exposure Level is 400 ppm) than for many other solvents.

The HESIS review indicates that 2-butoxy ethanol, an ethylene based glycol ether, can damage red blood cells and cause anemia. This glycol ether is used mainly in the high VOC products. The propylene glycol ethers used in the low-VOC products do not cause this problem and are less volatile than the ethylene glycol ethers. However, they can produce neurotoxic effects through skin absorption as well as inhalation. This points up the importance of using appropriate gloves to minimize skin contact with the solvents.

IRTA used a product called Hydro Clean in dilute concentration for some of the low-VOC formulations. This material was originally used in a 50 percent concentration with water at Nelson Nameplate. For the low-VOC products, the concentration of this product was generally no more than about 10 percent since the low-VOC materials had to meet a 100 gram per liter VOC limit. The balance of the product was water and acetone. The Hydro Clean product contains a variety of mineral spirits components, various trimethylbenzene isomers and isopropylbenzene or cumene. The effects of these materials are discussed above under the high VOC cleaners. Because they are present here in more dilute concentration, their effects would be less for the low-VOC products.

Conclusions About Toxicity

The high VOC materials are generally more toxic than the low-VOC materials tested during the project. The low-VOC products contain fatty acid esters which are not volatile and lower in toxicity than other organic solvents. Formulators should take care, however, to blend the fatty acid esters with surfactants that are not endocrine disruptors. This also holds true for water-based cleaners. IRTA relied heavily on acetone in the low-VOC alternatives. Acetone is lower in toxicity than most other organic solvents. IRTA used some of the same VOC solvent components in the low-VOC formulations that were tested but these were generally used at about a 10 percent concentration. The toxicity effects of these formulations were correspondingly lower than for the high VOC formulations. When low volatility materials like propylene glycol ethers are used in low-VOC formulations, it is important that printers wear appropriate gloves to minimize the effects of solvent toxicity through skin exposure.

OTHER CONSIDERATIONS

IRTA relied heavily on acetone as an alternative in blends for cleaning UV/EB curable ink and as a component in blanket washes used to clean conventional and UVEB curable ink. One disadvantage of acetone is its low flash point. Printing shops that elect to use the chemical must comply with local fire department regulations. The Uniform Fire Code classifies acetone as a Class I-B liquid. Class I-B liquids have flash points less than 73 degrees F and a boiling point greater than or equal to 100 degrees F. Many local fire departments directly adopt the Uniform Fire Code and some have additional requirements. The Uniform Fire Code allows facilities to have 60 gallons of acetone in use in closed containers in each control area. It also allows facilities to have 15 gallons of acetone in use in the open, for dispensing and mixing. With these limitations in mind, companies could purchase about one 55 gallon drum of an acetone based formulation for storage and could use 15 gallons in open containers during printing.

In some cases, as noted in the individual case studies, personnel in the printing shops did not like the odor of the alternatives. In other cases, and this was not noted in the case studies, personnel indicated they liked the odor of the alternative better than the odor of the higher VOC cleaner they were using currently. The perception of odor is a very personal thing. There is generally not a consensus on whether a particular cleaner has a good or bad odor and there is no way to predict whether a particular worker will like or not like the odor of a cleaner.

III. ANALYSIS OF RESULTS AND CONCLUSIONS

ANALYSIS OF ALTERNATIVES TESTING RESULTS

During this project, IRTA tested alternative on-press low-VOC, low toxicity roller and blanket cleaners with 21 participating lithographic printing facilities. Seven of the facilities converted or are converting to alternatives that meet the 100 gram per liter future VOC limit. The first facility, the Los Angeles Times, converted to an alternative a number of years ago. IRTA tested other alternatives with the Times but the facility decided to continue using the water-based cleaner they had adopted. The second facility, the San Bernardino Sun, also converted to a water-based cleaner that meets the future rule requirements for blanket cleaning several years ago. IRTA tested other alternatives with the San Bernardino Sun and the company adopted one of them for pipe roller cleaning. IRTA tested alternatives with a third facility, Nelson Nameplate; this facility is in the process of converting to alternatives with a VOC content of 100 grams per liter. A fourth facility, the SCAQMD print shop, converted to the alternatives they tested with IRTA more than a year ago A fifth facility, the City of Santa Monica Print Shop, converted to alternatives more than a two years ago after the testing with IRTA was completed. A sixth facility,Vertis, converted a few years ago to an alternative similar to the alternative they tested with IRTA. The Printery, the seventh facility, is in the process of converting to the alternatives IRTA tested. Four of these facilities, Nelson Nameplate, the SCAQMD Print Shop, Vertis and The Printery, participated in the extended testing. IRTA identified and tested alternative blanket and roller wash cleaners with the remaining 14 facilities. The scaled-up testing for these facilities was conducted for at least a week.

Table 3-1 summarizes the results of the scaled-up or extended testing for each of the facilities. The first column lists the companies that participated in the testing. The second, third and fourth columns summarize the press type, the ink type and the substrate(s) respectively for each company. The fifth column identifies the alternative low-VOC, low toxicity blanket wash that was found to be most effective at each facility. The VOC content of the cleaner in grams per liter is also shown in this column in parenthesis. The sixth column of Table 3-1 identifies the alternative roller wash that cleaned most effectively at each facility. Again, the VOC content of each of these cleaners is shown in parenthesis. Finally, the severth column indicates the status of the facility in terms of conversion and whether or not the facility participated in extended testing.

In all cases, IRTA identified and tested alternative blanket and roller washes that had a VOC content of 100 grams per liter or less with two exceptions. Many of the cleaners had a VOC content that was well below the 100 gram per liter VOC cutoff level specified in Rule 1171. For the Los Angeles Times, the San Bernardino Sun and R. R. Donnelley, IRTA did not test alternative roller washes. The two newspapers use roller wash infrequently and they use materials that comply with the 100 gram per liter VOC limit

Table 3-1
Project Testing Results

Company	Press Type	Ink Type	Substrate(s)	Blanket Wash (VOC in g/l)	Roller Wash (VOC in g/l)	Status
L.A. Times	Coldset Web	Soy	Newsprint	water-based cleaner (90)	N/A	converted
San Bernardino Sun	Coldset Web	Soy	Newsprint	water-based cleaner (37)	N/A	converted
J.S. Paluch Co., Inc.	Coldset Web	Solventborne	Newsprint	soy (<20)	soy (<20)	–
Nelson Nameplate	Sheet Fed	Soy	Metal, Plastic	acetone/mineral spirits (100)	acetone/water/ mineral spirits (100)	converting, E
PIP Printing	Sheet Fed	Solventborne	Coated & Uncoated Paper	N/A	soy (<20)	–
SCAQMD Print Shop	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/mineral spirits (100)	acetone/water/ mineral spirits (100)	converted, E
City of Santa Monica Print Shop	Sheet Fed	Soy	Coated & Uncoated Paper	water-based cleaner (75)	soy (<20)	converted
Presslink	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy (<20)	soy (<20)	–
Vertis, Inc.	Heat Set Web (Automated)	Solventborne	Coated & Uncoated Paper	Anchor XP (72)	Anchor XP (72)	converted, E
R.R. Donnelley & Sons Co.	Heat Set Web	Solventborne	Coated & Uncoated Paper	soy (<20)	N/A	–
Fanfare Media Works	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy (18)	soy(18)	E
Fanfare Media Works	Web	UV	Uncoated Paper	soy (18)	soy(18)	E
The Castle Press	Sheet Fed	Solventborne	Coated & Uncoated Paper	soy/acetone (<10)	soy (50)	–
Print 2000 Graphics	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/mineral spirits (100)	soy (18)	E
Western Metal Decorating	Heat Set Sheet Fed	Solventborne	Metal	soy/acetone/current cleaner (100)	soy/acetone/current cleaner (100)	–
The Dot Printer	Sheet Fed	Solventborne	Coated & Uncoated Paper	acetone/soy (<2)	soy (50)	–
Lithographix	Sheet Fed	UV	Coated & Uncoated Paper	acetone/glycol ether (100)	Water-based cleaner (90)	–
Anderson Lithograph	Heat Set Web	Solventborne	Coated & Uncoated Paper	–	–	did not complete testing
Anderson Lithograph	Sheet Fed	UV	Coated & Uncoated Paper	–	–	did not complete testing
Anderson Lithograph	Sheet Fed	Solventborne	Coated & Uncoated Paper	–	–	did not complete testing
The Printery	Sheet Fed (Automated)	Soy	Coated & Uncoated Paper	soy (<20), acetone/glycol ether (100)	soy (<20)	converting, E
The Printery	Sheet Fed	Soy	Coated & Uncoated Paper	acetone/glycol ether (100)	soy (<20)	converting, E
The Printery	Sheet Fed	Soy	Coated & Uncoated Paper	acetone/glycol ether (100)	soy (<20)	converting, E
Tedco Printing Company	Sheet Fed	UV (non-white)	Plastic, Coated & Uncoated Paper	water-based cleaner /acetone/IPA (100)	water-based cleaner /acetone/IPA (100)	E
Tedco Printing Company	Sheet Fed	UV (white)	Plastic	soy/glycol ether (200)	soy/glycol ether (200)	–
Oberthur Card Systems	Sheet Fed	Solventborne	Plastic	acetone/water/mineral spirits (100)	acetone/water/ mineral spirits (200)	–
Oberthur Card Systems	Sheet Fed	UV	Plastic	acetone/glycol ether (100)	Water-based cleaner/acetone (90)	–
Huhtamaki	Web	EB	Coated Paper	acetone/water-based cleaner (8)	Water-based cleaner (90)	–

E = Extended Testing

scheduled to become effective in July 2007. R. R. Donnelley & Sons did not elect to perform roller wash testing. IRTA did not test blanket wash alternatives with PIP; the company performs blanket cleaning infrequently. Anderson Lithograph ended their participation in the project before alternative products were proven.

The two newspapers involved in the project found water-based cleaners to be suitable as alternatives. IRTA also tested a dilute soy based cleaner at the Los Angeles Times and it cleaned very well. For four other facilities that use UV or EB curable ink, Lithographix, Tedco, Oberthur Card Systems and Huhtamaki, water-based cleaners or water-based cleaners combined with other materials were found to be effective. For three facilities, Nelson, the SCAQMD Print Shop and Oberthur, an emulsion of water and mineral spirits combined with acetone was effective. Soy based cleaners were found to perform well at the rest of the facilities. In some cases, facilities that used soy based cleaners as a roller wash used a faster evaporating acetone formulation as a blanket wash.

IRTA did not find effective 100 gram per liter VOC content cleaners in two cases. First, on a two color sheet fed press that used conventional ink for printing on plastic at Oburthur Card Systems, IRTA could not find a 100 gram per liter VOC roller wash. IRTA did find a 100 gram per liter VOC content blanket wash that performed acceptably. For the roller wash, IRTA identified an acceptable 200 gram per liter VOC roller wash. Second, at Tedco, IRTA could not find a 100 gram per liter VOC blanket or roller wash for cleaning Tedco's UV curable white ink that was specially formulated for the company for printing on plastic. IRTA did find an acceptable 200 gram per liter VOC cleaner that performed acceptably.

IRTA conducted more limited testing of alternative low-VOC plate, dampening roller and metering roller cleaners during the project. The results of this testing indicate that alternative cleaners for these on-press components are viable. In the course of the testing, IRTA developed a metering roller cleaner that several printers liked.

IRTA conducted extended testing with seven of the facilities that participated in the project. The results indicated that in cases where soy based cleaners are used, the fountain solution may require changeout more frequently. The results also indicated that use of the soy based cleaners in automated systems in sheet fed presses may increase the waste paper that is generated. The extended testing did not reveal any compatibility problems even though very high concentrations of acetone were used on nitrile rubber.

ANALYSIS OF COSTS

Table 3-2 summarizes the cost information for each of the facilities involved in the testing program. The first column of this table lists the participating company. The second and third columns provide the annualized cost of the original cleaning process and the alternative cleaning process respectively.

The values of Table 3-2 show that six of the facilities that participated in the project reduced or would reduce their cleaning costs through adoption of the alternatives. The

values also show that 13 of the facilities increased or would increase their cleaning cost through adoption of the alternatives. The cost increases range from seven percent to 94 percent. One of the facilities in Table 3-2 would have the same cost if the low VOC alternatives were adopted. Finally, one facility, Anderson Lithograph, ended their participation in the project so costs of the alternatives and original cleaners could not be determined.

Table 3-2
Cost Comparison for Original and Alternative Cleaners

Company	Original Cleaning Cost	Alternative Cleaning Cost	Percent Change
Los Angeles Times (a)	Unknown	$29,187	-
San Bernardino Sun	$16,200	$17,339	+7
J.S. Paluch Co., Inc.	$1,280	$640	-50
Nelson Nameplate	$1,681	$1,419	-16
PIP Printing	$1,655	$1,790	+8
SCAQMD Print Shop	$1,581	$2,164	+37
City of Santa Monica Print Shop (b)	$288	$491	+70
Presslink	$1,178	$2,160	+83
Vertis, Inc.	$220,596	$179,700	-19
R.R. Donnelley & Sons Co.	$62,688	$103,800	+66
Fanfare Media Works	$4,159	$4,159	0
The Castle Press	$10,129	$11,520	+14
Print 2000 Graphics	$6,303	$4,587	-27
Western Metal Decorating	$0	$2,865	N/A
The Dot Printer	$11,050	$21,424	+94
Lithographix	$5,999	$7,690	+28
The Printery	$33,350	$38,668	+16
Tedco Printing Co.	$1,761	$2,072	+18
Oberthur Card Systems	$9,723	$9,206	-6
Huhtamaki	$33,627	$38,928	+16

N/A is not applicable.
(a) The Los Angeles Times has no records to determine the cleaning costs of their original cleaner.
(b) Costs include one quart per year of plate cleaner.

Many of the companies that would increase their cost through adoption of the alternatives used mineral spirits of various types as their original cleaners. Mineral spirits are very low cost materials and virtually all other cleaners with either high VOC or low VOC content are more costly. Thus any printer that has relied heavily on mineral spirits cleaners which have high VOC content would likely experience a cost increase in adopting low VOC alternatives.

The costs that were evaluated did not include any savings in emissions fees through reduced VOC emissions. The SCAQMD charges a fee on VOC emissions if a facility emits more than four tons per year of VOCs. The fee amounts to $388.49 per ton of emissions when companies emit between four and 25 tons of VOC per year. The fee is higher, $630.75 per ton, if companies emit between 25 and 75 tons of VOC per year. The fee applies only to the VOC emissions above four tons per year. Some of the facilities that participated in the project have VOC emissions above four tons per year. The facilities in Table 3-2 that may have emissions above four tons per year include the Los Angeles Times, the San Bernardino Sun, The Dot Printer, R. R. Donnelley & Sons, Western Metal Decorating, Lithographix, Oberthur, Huhtamaki and Vertis. R.R. Donnelley & Sons and Lithographix may have emissions that exceed 25 tons per year. These companies could realize additional savings by converting to the low-VOC alternatives because their emission fees would be reduced.

As an example, consider the San Bernardino Sun. The company's VOC emissions related to cleaning with high VOC materials were 10.7 tons per year. When the Sun converted to the low-VOC cleaners, the emissions related to cleaning were reduced to 0.5 tons per year and the cleaning VOC emissions were reduced by 10.2 tons per year. The fee that could be avoided from this emission reduction amounts to $2,409 annually. The alternative cleaning cost in Table 3-2 would be reduced from $17,339 to $14,930. The San Bernardino Sun would reduce their annual cost for cleaning by eight percent rather than increasing the annual cost for cleaning by seven percent. Other facilities would also reduce their annual cost for using the alternatives in the same manner.

TOXICITY EVALUATION

HESIS conducted an assessment of the toxicity of some of the high VOC products used by the participating facilities and the Low-VOC alternatives tested by IRTA. This assessment was based on a review of the MSDSs. In general, the low-VOC alternatives are less toxic than the high VOC materials.

SUMMARY OF PROJECT RESULTS

During this project, IRTA tested low-VOC, low toxicity alternative cleanup materials with 21 lithographic printing facilities in the South Coast Basin. IRTA identified effective alternatives that have 100 grams per liter VOC or less for all but two narrow cleaning tasks which involve printing on plastic. In these narrow cases, 200 gram per liter VOC content cleaners were identified. IRTA conducted extended testing with seven of the facilities for three months. No compatibility problems were observed during this

testing. More than one-third of the facilities participating in the project would reduce the cost of cleaning or experience no cost increase in cleaning if they converted to the low-VOC alternatives. IRTA's limited analysis of low-VOC alternatives for cleaning plates, dampening and metering rollers indicated that 100 gram per liter VOC alternatives were suitable. Based on an MSDS evaluation, HESIS concluded that the toxicity of the alternative low-VOC alternatives is low.

Appendix A
MSDSs for Cleaners Used and Tested at Participating Facilities

High VOC Cleaners Used at Participating Facilities

High VOC Cleaner Used at the San Bernardino Sun

PRESSROOM SOLUTIONS
4701 Martin St. Fort Worth, TX 76119
(817) 535-3898 • Fax: (817) 536-8556

HAZARD RATING	
LEAST	- 0
SLIGHT	- 1
MODERATE	- 2
HIGH	- 3
EXTREME	- 4

HEALTH	= 1
FIRE	= 2
REACTIVITY	= 0

MATERIAL SAFETY DATA SHEET

EMERGENCY PHONE NUMBER FOR CHEMTREC: 1-800-424-9300
TRANSPORTATION EMERGENCY NUMBER: 1-800-424-9300

PRODUCT NAME: BLANKET & ROLLER WASH **PRODUCT ID NUMBER:** 5001-5
CHEMICAL NAME: N/A **SYNONYMS:** N/A **MSDS REVISION DATE:** 03/09/2000

Product Class: N/A **CAS Number:** N/A **DOT Proper Shipping Name:** Combustible Liquid, n.o.s., (Petroleum Distillates) **DOT Identification Number:** NA1993 **VOC Content:** 6.5 lb/gal (773 g/l) **VOC Composite Partial Pressure, PP_c:** 1.6 mm Hg @ 68°F	**WARNING STATEMENT:** Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Keep away from heat. Keep containers closed. Use with adequate ventilation. **FOR INDUSTRIAL USE ONLY** Do not cut, grind, drill, or reuse any container that contained this product.

SECTION 1 - HAZARDOUS INGREDIENTS

MATERIAL		CAS NUMBER	PEL/TLV	SOURCE
Aromatic hydrocarbons	10 - 15%	64742-95-6	NE	
contains 1,2,4-Trimethylbenzene †	3 - 5%	95-63-6	25 ppm	ACGIH
Aliphatic hydrocarbons	85 - 90%	64742-88-7	100 ppm	ACGIH
† Subject to the reporting requirements of Section 313 of SARA Title III.				

SECTION 2 - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT	Gently flush eyes with water for at least 15 minutes, while holding eyelids apart to ensure complete irrigation. Seek medical attention immediately.
SKIN CONTACT	Remove contaminated clothing and shoes. Wash affected areas with soap and water and seek medical attention if irritation persists.
INHALATION	If high vapor concentrations are encountered or breathing difficulties or light headedness occur, remove to fresh air. If breathing stops, give artificial respiration and seek medical attention immediately.
INGESTION	Do NOT induce vomiting. Seek medical attention immediately. If spontaneous vomiting occurs, keep head below hips to prevent aspiration of the liquid into the lungs.

PEL - Permissible Exposure Limit (OSHA) **TLV** - Threshold Limit Value (ACGIH) **NE** - Not Established **N/A** - Not Applicable
Federal law requires persons receiving this Material Safety Data Sheet to study it carefully and become aware of the hazards of the product involved. Notify your employees, visitors, agents, and contractors of the information on this sheet.

SECTION 3 - PHYSIOLOGICAL EFFECTS AND HEALTH INFORMATION

EYES	Eye contact with liquid and vapors may cause mild irritation. Prolonged or repeated eye contact may cause moderate to severe irritation and aggravate pre-existing conditions.
SKIN	May cause skin irritation. Prolonged or repeated exposure may defat the skin with burning, drying and cracking, and skin burns. May aggravate pre-existing skin conditions.
SYSTEMIC	Acute overexposure is possible by way of inhalation and ingestion and may lead to nasal and respiratory tract irritation, gastrointestinal disturbances including nausea and diarrhea, central nervous system (CNS) effects including headache, dizziness, fatigue, and unconsciousness, and respiratory failure. Swallowing even small amounts of this product may lead to aspiration pneumonitis, which is evidenced by cyanosis, and death. Chronic overexposure to this product may cause liver and kidney damage based on studies of laboratory animals.

SECTION 4 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	If workplace exposure limits of any component is exceeded, the use of a NIOSH/MSHA-approved respirator is advised.		
VENTILATION	Provide sufficient local exhaust or general ventilation to maintain exposure below PEL's and TLV's.		
PROTECTIVE GLOVES	Recommended	**EYE PROTECTION**	Recommended
OTHER PROTECTIVE EQUIPMENT	To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Accessibility to eye washes and safety showers in work areas is always recommended.		

SECTION 5 - REACTIVITY DATA

STABILITY	Stable	**CONDITIONS TO AVOID**	Heat, sparks, flames, and pilot lights
INCOMPATIBLE MATERIALS TO AVOID	Strong oxidizing agents		
HAZARDOUS DECOMPOSITION PRODUCTS	Thermal decomposition in the presence of air may potentially yield various hydrocarbons as well as oxides of carbon.		
HAZARDOUS POLYMERIZATION	Will not occur		

SECTION 6 - SPILL OR LEAK PROCEDURES

PRECAUTIONS IN CASE OF RELEASE OR SPILL	Keep away from any source of ignition. Wear protective equipment. Stop and/or contain discharge and ventilate area. Prevent from entering drains, sewers, or streams.
WASTE DISPOSAL METHOD	Pump or transfer spilled material to containers for recovery. Absorb unrecoverable product. Dispose of in accordance with applicable regulations.

SECTION 7 - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS	Keep from sources of heat and ignition. Ground containers when transferring material. Store with adequate ventilation and keep containers closed when not in use.
OTHER PRECAUTIONS	Emptied containers may retain product residue; therefore, all hazard precautions given in this data sheet should be observed.

SECTION 8 - FIRE AND EXPLOSION HAZARD DATA

DOT HAZARD CLASSIFICATION	Combustible Class	**FLASH POINT AND METHOD**	>100°F by Setaflash
LOWER EXPLOSIVE LIMIT	0.7% (approximate)	**UPPER EXPLOSIVE LIMIT**	7% (approximate)
EXTINGUISHING MEDIA	Use foam, CO_2, or dry chemical fire apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors are heavier than air and may travel along the ground and be ignited by sources of heat, pilot lights, and other flames distant from the material handling point. Empty containers can also still provide a source of combustible vapors and ignite explosively.		
FIRE FIGHTING PROCEDURES	Fire fighters should wear self-contained breathing apparatus and chemical-resistant, protective clothing. Spraying water directly into fire may cause material to float on surface and become reignited. Water spray should be used to cool nearby containers and structures that are exposed to fire.		

SECTION 9 - PHYSICAL DATA

APPEARANCE	Clear, colorless liquid	**pH (APPROXIMATE)**	N/A
BOILING RANGE (APPROXIMATE)	300 - 360°F	**VAPOR DENSITY**	Heavier than air
WEIGHT LB. PER GALLON	6.5	**EVAPORATION RATE**	Slower than water
PERCENT VOLATILE INCLUDING WATER	100%	**SOLUBILITY IN WATER**	Negligible

SECTION 10 - DOCUMENTARY INFORMATION

PRODUCT NAME: BLANKET & ROLLER WASH **PRODUCT ID NUMBER:** 5001-5

PREPARED BY: DAJ **APPROVED BY:** AF **MSDS REVISION DATE:** 03/09/2000

The information contained in this data sheet is, to the best of our knowledge, accurate but is not warranted. All materials may present unknown health hazards and should be used with caution. It is the user's responsibility to evaluate the information in a prudent manner and to use it in a manner consistent with its purpose. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

High VOC Cleaner Used at J.S. Paluch

ALLIED HYDROWASH

MATERIAL SAFETY DATA SHEET

ALLIED PHOTO OFFSET SUPPLY CORPORATION
2040 LEE STREET
HOLLYWOOD, FL 33020

EFFECTIVE: AUGUST 22, 1996

I - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: ALLIED PHOTO OFFSET SUPPLY CORP.
ADDRESS: 2040 LEE STREET, HOLLYWOOD, FL 33020
PHONE NUMBER: (305) 923-9884
EMERGENCY PHONE NUMBER: 1-800-424-9300 CHEMTREC
TRADE NAME: ALLIED HYDROWASH
SYNONYMS: Blanket & Roller Cleaner for Lithographic Presses

II - HAZARDOUS INGREDIENTS

Material or Component	% Mass	Hazard Data
Aromatic Petroleum Distillates CAS#64742-95-6	50%	ACGIH (TWA-TLV) 100 PPM
(This ingredient contains:		
Xylene CAS#1330-20-7 2-5% *		ACGIH (TWA-TLV) 100 PPM
Cumene CAS#98-82-8 1-4% *		ACGIH (TWA-TLV) 50 PPM-SKIN
1,2,4-Trimethylbenzene CAS#95-63-6 24-29%)*		Not Established
Aliphatic Petroleum Distillates CAS#64741-41-9	46%	ACGIH (TWA-TLV) 100 PPM

*These ingredients are subject to the reporting requirements of SARA 313 and 40 CFR 372.

None of the ingredients present in the product are identified as carcinogenic or potentially carcinogenic by NTP, IARC or ACGIH.

All ingredients are listed in the U.S. TSCA inventory.

HEALTH HAZARD: 2

4 - Deadly
3 - Extreme Danger
2 - Hazardous
1 - Slightly Hazardous
0 - Normal Material

FIRE HAZARD: 2

Flash Points:
4 - Below 73°F
3 - Below 100°F
2 - Above 100°F (Not exceeding 200°F)
1 - Above 200°F
0 - Will Not Burn

REACTIVITY: 0

4 - May Detonate
3 - Shock and Heat May Detonate
2 - Violent Chemical Change
1 - Unstable if heated
0 - Stable

PROTECTIVE EQUIPMENT: SC
(Synthetic gloves, apron and splash goggles)

III - PHYSICAL DATA

BOILING POINT @ 760 mm Hg: 307°F - 389°F
MELTING POINT: Liquid
SPECIFIC GRAVITY (H_2O=1): 0.827
VAPOR PRESSURE: < 3 mm Hg at 20° (68° F)
VAPOR DENSITY (Air = 1): >1
SOLUBILITY IN H_2O, % BY WEIGHT: Negligible
% VOLATILES BY VOLUME: 96%
EVAPORATION RATE (Butyl Acetate = 1): <1
APPEARANCE AND ODOR: Clear, colorless liquid, hydrocarbon odor
pH: N/A
VOLATILE ORGANIC COMPOUNDS (VOC's)= 96% By Mass
= 6.62 lb/Gal.

IV - FIRE AND EXPLOSION DATA

FLASH POINT: 107°F TCC
AUTOIGNITION TEMPERATURE: Unknown
FLAMMABLE LIMITS IN AIR, % BY VOLUME: LOWER: Unknown
UPPER: Unknown
EXTINGUISHING MEDIA: Dry chemical, carbon dioxide or universal type foam.
SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus.
UNUSUAL FIRE & EXPLOSION HAZARD: Avoid spreading burning liquid with water used for cooling purposes.

V - HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA
ROUTES OF EXPOSURE:

INHALATION: High concentrations of vapors or mists may cause irritation of nose and throat, and signs of central nervous system depression e.g. headaches, drowsiness, loss of coordination, possible unconsciousness.
SKIN CONTACT: May cause skin irritation, redness, burning and drying.
SKIN ABSORPTION: Possible absorption on prolonged contact.
EYE CONTACT: Severe irritation, tearing, redness and swelling.
INGESTION: Irritation of digestive tract, signs of central nervous system depression. Material is an aspiration hazard.

EFFECTS OF:

ACUTE OVEREXPOSURE: All of the above.

CHRONIC OVEREXPOSURE: Prolonged and repeated overexposure to solvents have been associated with permanent brain and central nervous system damage.

EMERGENCY FIRST AID PROCEDURES

EYES: Flush eyes for 15 minutes holding eyelids apart. Seek medical attention.
SKIN: Wash affected areas with soap and water. Remove contaminated clothing and launder before reuse.
INHALATION: Remove to fresh air. If breathing difficulties occur, oxygen should be administered by trained personnel. If breathing stops begin artificial respiration. Seek immediate medical attention.
INGESTION: Do not induce vomiting. Material is an aspiration hazard and can enter lungs during swallowing or vomiting and cause lung damage. Seek immediate medical attention.

VI - REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: Stable
INCOMPATIBILITY: Strong acids or bases, oxidizing agents, selected amines.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, various hydrocarbons.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: None

VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Ventilate area of spill. Extinguish all sources of ignition. Prevent spill from spreading. Large spill, pump material into containers. For small spill, absorb into inert absorbent and shovel into containers. Do not flush with water.

NEUTRALIZING CHEMICALS: None needed

WASTE DISPOSAL METHOD: Dispose of in accordance with all applicable local, county, state and federal regulations.

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS: Provide sufficient mechanical ventilation (general and/or local exhaust) to prevent exposure exceeding TLV and the irritating buildup of vapors.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY (Specify in Detail): Use NIOSH approved respirator where needed.

EYE: Chemical splash goggles.

GLOVES: Impermeable

OTHER CLOTHING AND EQUIPMENT: Safety apron, appropriate work clothes to prevent repeated skin contact; eyewash station, drench shower.

SPECIAL PRECAUTIONS

This is an industrial product and should be used by trained personnel only.

Containers of this material may be hazardous even when emptied, since containers retain product residue. Follow all hazard warnings given in this data sheet even after container is emptied.

Do not breathe vapors. Use with adequate ventilation.

SPECIAL PRECAUTIONS, CONT.

Avoid prolonged skin contact. Wash thoroughly after handling.

Do not get in eyes. Wear appropriate eye protection. Material will cause severe eye irritation.

Do not ingest.

Keep away from heat sparks and open flame.

STORAGE REQUIREMENTS

Keep container tightly closed when not in use.

Store in cool, dry place.

Store as COMBUSTIBLE MATERIAL.

Keep away from heat sparks and open flame.

SHIPPING REQUIREMENTS.

DOT Shipping Name: Combustible Liquid NOS
(Contains: Petroleum Distillates)

I.D. # : NA1993

The above information is believed to be correct as of the date hereof and is based on data supplied by raw material suppliers, however, no warranty of merchantability , fitness for any use, or any other warranty is expressed or is to be implied regarding the accuracy of these data, the results to be obtained from the use of the material, or the hazards connected with each use. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar, and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume responsibility for the results of its' use. This information is furnished on the condition that the person receiving it shall make his own determination as to the suitability of the material for his particular purpose and on the condition that he assume risk of his use thereof.

High VOC Roller Cleaner Used at Nelson Nameplate

A.G. LAYNE, INC.

Shell Oil & Chemical Jobbers
LEE CHEMICAL CO.
4876 Brazil Street
Los Angeles, CA 90039
(323) 245-2345 • FAX (818) 242-7604

MATERIAL SAFETY DATA SHEETS

ISSUE DATE: 8/1/98 PAGE 1

Health Emergencies: Call Los Angeles Poison Information Center (24 hrs.):
(800) 777-0476 or (714) 634-5988 in Orange County

PRODUCT IDENTIFICATION

Product Name: HYDRO CLEAN
A Water-Activated Power Cleaner for Lithographic Presses

Generic Name: Water Miscible Solvent Blend
DOT Proper Shipping Name: Paint Related Material
ID Number: UN-1263
Classification: Combustible Liquid, PG III

SCAQMD INFORMATION

The VOC for This Product Before Adding Water is:
90% by Mass or
795 Grams/Liter or 6.62 Pounds/Gallon

VOC Composite Partial Pressure
(Vapor Pressure):
2.0 mm Hg @ 20 Degs. C

SECTION I - HAZARDOUS INGREDIENTS/EXPOSURE LIMITS

HAZARDOUS INGREDIENTS	CAS NUMBERS	TLV/PEL	UNITS	AGENCY	TYPE
This is an industrial product and should only be used or handled by trained personnel.					
MINERAL SPIRITS					
Hydrotreated Distillate, Light (Comparable to Stoddard Solvent)	64742-47-8 8052-41-3	See Stoddard Solvent			
		100	PPM	OSHA	TWA
		100	PPM	ACGIH	TWA
		100	PPM	MSHA	TWA
		200	PPM	MSHA	STEL
		100	PPM	CAL OSHA	TWA

SECTION 1 - CONTINUED - HAZARDOUS INGREDIENTS/EXPOSURE LIMITS

HAZARDOUS INGREDIENTS	CAS NUMBERS	TLV/PEL	UNITS	AGENCY	TYPE
AROMATIC HYDROCARBON	64742-95-6	NONE			
Xylene	1330-20-7	100	PPM	OSHA	TWA
		100	PPM	ACGIH	TWA
		150	PPM	ACGIH	STEL
		150	PPM	OSHA	STEL
		200	PPM	CAL OSHA	EXCUR
		100 SKIN	PPM	CAL OSHA	TWA
		300 SKIN	PPM	CAL OSHA	CEIL
		100	PPM	MSHA	TWA
1,3,5-Trimethylbenzene	108-67-8	No Exposure Limits Established			
1,2,4-Trimethylbenzene	95-63-6	No Exposure Limits Established			
Isopropylbenzene	98-82-8	50 SKIN	PPM	ACGIH	TWA
		50 SKIN	PPM	OSHA	TWA

SECTION 1A- This product contains the following chemicals subject to the reporting requirements of SARA 313 AND 40CFR 372.65:

Listed ingredients	CAS Numbers	Percent Range
Xylene	1330-20-7	2.20 %
1,2,4-Trimethylbenzene	95-63-6	11.0 %
Isopropylbenzene	98-82-8	1.65 %

SECTION 1B – SARA SECTIONS 311/312 HAZARD RATINGS

This product is rated as a fire hazard under the reporting requirements of SARA 311 and 312. The health hazard category for this product under SARA Sections 311/312 reporting meets both immediate (acute) and delayed (chronic) definitions. Discharge to the environment including the sewer may be reportable (under the regulations of CERCLA/DOT) to the National Response Center, (800) 424-8802. Protection of stratospheric ozone (pursuant to Section 611 of the Clean Air Act Amendments of 1990) per 40 CFR Part 82: This product does not contain nor was it directly manufactured with any Class I or Class II ozone-depleting substances.

CALIFORNIA PROPOSITION 65 WARNING

This product contains detectable amounts of substances known to the State of California to cause cancer, birth defects, or other reproductive harm.

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

****EMERGENCY****
Have a physician call Los Angeles Poison Information Center (24hrs.): 800-777-6476
Orange County Poison Center: 714-634-5988

EYE CONTACT:

Move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes gently with clean water and seek medical attention. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes--seek medical attention.

SKIN CONTACT:

Immediately flush affected area(s) with large amounts of water while removing contaminated shoes, clothing, and constrictive jewelry. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse the affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention.

INHALATION (BREATHING):

Immediately move victim away from source of exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

INGESTION (SWALLOWING):

****SEEK EMERGENCY MEDICAL ATTENTION****If victim is drowsy or unconscious, place on left side with head down, and do not give anything by mouth. ***DO NOT INDUCE VOMITING***If vomiting occurs spontaneously, keep head below hips. Vomiting should only be induced under the direction of a physician or poison control center. Do not leave victim unattended.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

One or more components of this material is an eye irritant. Direct contact with the liquid or exposure to its vapors or mists may cause stinging, tearing, redness, and swelling

SKIN CONTACT:

One or more components of this material may cause skin irritation. Prolonged or repeated skin contact may cause redness, burning, drying and cracking of the skin, and skin damage. Please use protective gloves.

SKIN ABSORPTION:

Skin contact may be harmful. Contact may result in skin absorption. This material may be toxic when absorbed through the skin. Persons with pre-existing skin disorders or sensitive skin may be more susceptible to the effects of this material.

INHALATION (BREATHING):

Do not breathe vapors; use adequate ventilation.

This material has a low degree of toxicity by inhalation. Breathing high concentrations of vapors or mists may cause:

Irritation of the nose and throat.
Signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, fatigue, and nausea).

Prolonged or repeated exposure to vapors or mists may cause:

Liver and/or kidney damage.

Respiratory symptoms associated with pre-existing lung disorders (e.g., asthma-like conditions) may be aggravated by exposure to this material.

Refer to Section I for proper Threshold Limit Values (TLV).

SECTION III - CONTINUED - HEALTH HAZARDS/ROUTES OF ENTRY

INGESTION (SWALLOWING):

Ingestion of this material may cause irritation of the digestive tract, nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, and fatigue), nausea, vomiting, and diarrhea.

ASPIRATION HAZARD:

One or more components of this material can enter the lungs during swallowing or vomiting and cause lung inflammation, lung damage, or chemical pneumonia.

TARGET ORGAN EFFECTS/DEVELOPMENTAL INFORMATION/CANCER INFORMATION:

Pre-existing heart, blood, eye, skin, kidney, liver, lung or respiratory, spleen, or testis disorders may be aggravated by exposure to this material. This material (or a component) has been shown to lower activity of certain immune system cells in experimental animals. Exposure to this material (or a component) has been found to cause kidney damage in male rats. Overexposure to this material (or a component) has been suggested as a cause to the following in laboratory animals: liver abnormalities, blood abnormalities, cataracts, cardiac sensitization, hearing damage, kidney damage. The significance of these animal studies to human health is uncertain. Overexposure to this material (or a component) has been suggested as a cause to the following in humans: liver abnormalities. This material (or a component) has been shown to cause birth defects in laboratory animal studies. Harm to the fetus occurred only at exposure levels that harmed the pregnant animal. The significance of these animal studies to human development is uncertain. Based on available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

WARNING:

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes called Solvent or Painters' Syndrome). Intentional misuse by deliberately concentrating and inhaling the contents of this product may be harmful or fatal.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

If current ventilation practices are not adequate to maintain airborne concentrations below established exposure limits (see Section I), additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used.

RESPIRATORY PROTECTION:

The use of respiratory protection is advised when concentrations exceed the established exposure limits (see Section I). Depending on the airborne concentration, use a respirator or gas mask with approved cartridges and canisters (NIOSH approved, if available) or supplied air equipment.

PROTECTIVE GLOVES:

The use of gloves impermeable to the specific material handled is strongly advised to prevent skin contact and possible skin irritation and damage.

EYE PROTECTION:

Approved eye protection to safeguard against potential eye contact, irritation, or injury is strongly recommended.

OTHER PROTECTIVE EQUIPMENT:

It is suggested that a source of clean water be available in the work area for flushing eyes and skin. Special safety stations and equipment are available for this purpose. Impervious clothing should be worn as needed.

SECTION V - REACTIVITY DATA

STABILITY:

This product is stable.

INCOMPATIBILITY (MATERIALS TO AVOID):

This product forms combustible and/or explosive mixtures with air and/or oxygen. This product is incompatible with oxidizing agents, strong acids or bases, or selected amines.

HAZARDOUS POLYMERIZATION:

Hazardous polymerization will not occur.

SECTION VI - SPILL OR LEAK PROCEDURES

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

Keep all sources of ignition and hot metal surfaces away from spill/release. Stay upwind and away from spill/release. Isolate hazard area and limit entry to emergency crew. Stop spill/release if it can be done without risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section IV). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Dike far ahead of spill/release for later recovery or disposal. Spilled material may be absorbed into suitable absorbent material. Immediate cleanup of any spill/release is recommended. Notify appropriate federal, state, and local agencies. Discharge to the environment including the sewer may be reportable (under the regulations of CERCLA/DOT) to the National Response Center; (800) 424-8802.

WASTE DISPOSAL METHOD:

Product waste is considered hazardous and must be disposed of in accordance with local, county, state, and federal regulations.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

Keep containers tightly closed. Keep containers cool, dry, and away from sources of ignition. Use and store this product with adequate ventilation. Avoid inhalation of vapors and personal contact with this product. Containers of this material may be hazardous when emptied. Since emptied containers retain product residue (vapor, liquid, or solid), all hazard precautions given in this MSDS must be observed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose product containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. Other containers should be disposed of in an environmentally safe manner and in accordance with government regulations. All five-gallon pails and larger containers must be grounded and/or bonded when transferring material. Hydrocarbon solvents are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, or pumping at high flow rates. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable and combustible liquids. To prevent "autoignition," any use of this product in an elevated temperature or pressure process should be thoroughly evaluated to establish and maintain safe operating conditions. **All of the information contained in these pages applies to rags, sponges, or other materials that are used to hold this material.**

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS		HAZARD RANKING	HMIS HAZARD CLASS	
HEALTH HAZARD:	1	0 = LEAST	HEALTH HAZARD:	2
FLAMMABILITY:	2	1 = SLIGHT	FLAMMABILITY:	2
REACTIVITY:	0	2 = MODERATE	REACTIVITY:	0
OTHER:	---	3 = HIGH	PERSONAL PROTECTION:	B
		4 = EXTREME		
		B = GLASSES & GLOVES		

Lower - Upper Explosive Limit (% Vol.): Unknown

Est. Flash Point (Deg. Fahr.): 107

EXTINGUISHING MEDIA:

Extinguish with dry chemical, CO_2, or a universal type foam.

FIRE AND EXPLOSION HAZARDS:

This material is <u>combustible.</u> This material readily gives off vapors that may travel long distances from their source by air currents or by ventilation equipment. These vapors may be ignited by heat, flame, spark, smoking, electric motors, or other sources of ignition far from their source. If container is not properly cooled, it may explode in the heat of a fire.

FIRE FIGHTING PROCEDURES:

Wear a SCBA with a full facepiece operated in the positive pressure demand mode with appropriate turnout gear and chemical resistant personal protective equipment. Water spray may be useful in minimizing vapors and cooling containers exposed to heat and flame. Avoid spreading burning liquid with water used for cooling purposes. Vapors are heavier than air and will collect in low areas. Vapors may travel by air currents and ignite at a distance from container or spill.

SECTION IX - PHYSICAL DATA

<u>APPROXIMATE BOILING POINT (Initial):</u>
307 - 389 Degrees F.

<u>RELATIVE EVAPORATION RATE (N-Butyl Acetate=1):</u>
.30 (Approximate)

<u>VAPOR PRESSURE:</u>
2.6 mm Hg @ 20 Degrees C

<u>VAPOR DENSITY (Air = 1):</u>
4.8 (Heavier Than Air)

<u>SPECIFIC GRAVITY:</u>
.827

<u>SOLUBILITY IN WATER:</u>
Slight

<u>ODOR:</u>
Characteristic Solvent Odor

<u>APPEARANCE:</u>
Clear, light-colored, mobile liquid

High VOC Blanket Cleaner Used at Nelson Nameplate

LOW VOC 1.68 BLANKET WASH

A. G. Layne, Inc.

MATERIAL SAFETY DATA SHEET

Date Prepared: August 10, 1996

NFPA Ratings:

H	F	R	S
1	3	0	--

Material Safety Data Sheet

SECTION I - COMPANY IDENTIFICATION

Manufacturer:
A. G. Layne, Inc.
4578 Brazil Street
Los Angeles, California 90039

Telephone Numbers:
Office (213) 245-2345
24 Hour Emergency Contact:
Chemtrec (800) 424-9300

SECTION II - HAZARDOUS INGREDIENTS

OSHA Hazardous Components (29 CFR 1910.1200)		EXPOSURE LIMITS: 8 HR. TWA OSHA PEL	ACGIH TLV
Acetone	(CAS# 67-64-1)	750 ppm	750 ppm
Vent Naphtha, light aliphatic	(CAS# 64742-89-8)	300 ppm*	300 ppm*
Xylene	(CAS# 1330-20-7)	100 ppm	100 ppm
Solvent Naphtha, light aromatic	(CAS# 64742-95-6)		
1,2,4-Trimethylbenzene	(CAS# 95-63-6)	25 ppm	25 ppm

*recommend exposure limits of VM&P Naphtha as guideline

SECTION III - HAZARDS IDENTIFICATIONS

EMERGENCY OVERVIEW: DANGER! High exposures can cause nausea, vomiting, narcosis, and central nervous system (CNS) depression. Liquid may irritate skin and eyes. Mist may irritate mucous membranes and respiratory system.

POTENTIAL HEALTH EFFECTS:

INHALATION: Inhalation of high vapor concentrations may cause central nervous system (CNS) depression. Symptoms of CNS depression include: giddiness, headache, dizziness, and nausea; in extreme cases unconsciousness and death may occur. Aspiration of the liquid must be avoided as even small quantities may result in aspiration pneumonitis.

EYE CONTACT: Liquid severely irritates the eyes. High vapor concentrations irritate the eyes. Preexisting eye disorders may be aggravated by exposure.

SKIN CONTACT: Liquid irritates the skin. Prolonged contact can cause defatting and drying of the skin. Preexisting skin disorders may be aggravated by exposure.

INGESTION: Ingestion may cause vomiting and central nervous system (CNS) depression. Symptoms of CNS depression include: giddiness, headache, dizziness, and nausea; in extreme cases unconsciousness and death may occur.

CHRONIC: None known.

CARCINOGENICITY: LISTED IN NTP? No IARC? No OSHA Regulated? No

SECTION IV - FIRST AID MEASURES

INHALATION: Remove to fresh air. Supply oxygen if breathing is difficult. If not breathing, apply artificial respiration. Get medical attention.

EYE CONTACT: Flush with large amounts of running water for 15 minutes, while holding eyelids open. Get medical attention.

SKIN CONTACT: Remove contaminated clothing or shoes. Flush skin with water. Follow by washing with soap and water. Seek medical advice if irritation develops.

INGESTION: Do NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. Get medical attention immediately.

SECTION V - FIRE FIGHTING MEASURES

Flashpoint (Method): 0° F (Flashpoint of lowest flashing component)
Flammable Limits: Lower: NE Upper: NE
Autoignition Temperature: NE

GENERAL HAZARD: DANGER! Extremely flammable. Clear area of unprotected personnel and isolate. Vapors are denser than air, flashback along vapor trail may occur. Vapor may explode if ignited in enclosed space. Product components will float and can be reignited on surface of water.

FIRE FIGHTING INSTRUCTIONS: Approach fire from upwind side. Avoid breathing smoke, fumes, mist, or vapors. Firefighters wear protective clothing, and self contained breathing apparatus.

EXTINGUISHING MEDIA: Use extinguishing media such as foam, dry chemical, carbon dioxide, or water fog. Water in straight hose stream may scatter product and spread the fire. Cool containers exposed to heat with water to prevent vapor pressure buildup leading to container rupture.

HAZARDOUS COMBUSTION PRODUCTS: Acrid smoke, irritating fumes, carbon monoxide, carbon dioxide and unidentified organic compounds

SECTION VI - ACCIDENTAL RELEASE MEASURES

DANGER! Extremely flammable. Keep unnecessary and unprotected people away. Isolate hazard area. Eliminate all ignition sources. Handling equipment should be grounded to prevent sparks. Stay upwind.

LARGE SPILL: Wear appropriate respirator and protective clothing. Shut off source of leak if safe to do so. Dike and contain. Water fog may be useful in suppressing vapor cloud. Keep spills and cleaning runoff out of municipal sewers and open waterways. Collect free product with vacuum truck or pump to storage container. Absorb residue with inert material, then place waste in a chemical waste container for disposal. Flush area with water to remove trace residue; dispose of flush solution as above.

SMALL SPILL: Absorb product with inert material, then place waste in a chemical waste container for disposal. Seal waste container for proper disposal.

SECTION VII - HANDLING AND STORAGE

Keep liquid away from heat, sparks, and flame. Static electricity may accumulate and create a fire hazard. Ground fixed equipment. Bond and ground transfer containers and equipment.

Use with adequate ventilation. Prevent vapor accumulation. Keep containers closed when not in use. Containers, even emptied, will retain product residue and can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers. Do not pressurize containers to empty them.

Avoid prolonged or repeated breathing of mist or vapors. Do not get into eyes or on skin. Do not swallow. Wash hands thoroughly after handling material and before eating, drinking, smoking, or using restroom facilities.

Store in a cool, dry place away from oxidizers and oxidizing agents.

SECTION VIII - EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Explosion - proof ventilation is recommended.

PERSONAL PROTECTION: Not normally needed under proper conditions of use and storage. If exposure may or does exceed occupational exposure limits use a NIOSH approved respirator.

PROTECTIVE CLOTHING: Avoid contact with eyes; use chemical goggles to protect eyes if contact is likely. Wear chemical resistant gloves and other clothing as required to minimize contact. Air dry contaminated clothing in well-ventilated space, then launder before reusing.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	160 mm Hg @ 100°F (est.)	**Vapor Density (Air=1):**	>2
Specific Gravity:	0.8	**Evaporation Rate**	
Solubility in Water:	NE	**(n-Butyl Acetate=1):**	NE
pH:	NE	**Freezing Point:**	NE
Boiling Point:	NE	**VOC:**	1.6 lb./gal. (calc.)

Appearance & Odor: Clear, colorless liquid with hydrocarbon odor.

SECTION X - STABILITY AND REACTIVITY

GENERAL: Stable

INCOMPATIBLE MATERIALS: Strong oxidizing agents.

CONDITIONS TO AVOID: Avoid heat, sparks and flame. Avoid vapor accumulation.

HAZARDOUS POLYMERIZATION: Will not occur.

LOW VOC 1.68 BLANKET WASH

SECTION XI - TOXICOLOGICAL INFORMATION

Acetone	CAS#	67-64-1.	TD_{LO} : 2857 mg/kg (oral - man) TD_{LO} : 10 mg/m^3/6h (inhalation - man)
Solvent Naphtha, light aliphatic	CAS#	64742-89-8	LD_{50}: >8 ml/kg (oral - rat)
Xylene	CAS#	1330-20-7	LD_{50}: 4.3 g/kg (oral - rat)
Solvent naphtha, light aromatic	CAS#	64742-95-6	LD_{50}: 4.7 g/kg (oral - rat)

SECTION XII - ECOLOGICAL INFORMATION

Acetone	CAS#	67-64-1	14,250 ppm/24 h/sunfish/lethal/tap water 13,000 ppm/48 h/mosquito fish/TL_m/turbid water
Xylene	CAS#	1330-20-7	22 ppm/96 hr/bluegill/TL_m/fresh water Solvent

SECTION XIII - DISPOSAL CONSIDERATIONS

Classification and documentation is required before disposing of this product. If the product becomes a waste material, it may be an ignitable hazardous waste.

Follow all local, state, and federal regulations regarding proper disposal.

SECTION XIV - TRANSPORTATION INFORMATION

PROPER SHIPPING NAME: Flammable Liquids, n.o.s., (Acetone, Petroleum Distillates), 3, UN1993, PG II

HAZARD CLASS: 3

IDENTIFICATION NUMBER: UN1993

DOT Emergency Guide #: 128

Reportable Quantity (RQ): 5000 lb. acetone

SECTION XV - REGULATORY INFORMATION

TSCA (Toxic Substance Control Act):
The components of this product are listed on the TSCA Inventory.

CERCLA (Comprehensive Environmental Response, Compensation and Liability Act):
Reportable quantity from release or spill: 5000 lb. acetone

CWA (Clean Water Act, Section 311):
Components of this product are considered oils. Spills into or leading into surface waters that cause a sheen must be reported to the National Response Center, (800) 424-8802

SARA TITLE III (Superfund Amendments and Reauthorization Act):

311/312 Hazard Categories: acute, chronic, ignitable

313 Reportable Ingredients: Xylene (CAS# 1330-20-7) - 1-2%
1,2,4-Trimethylbenzene (CAS# 95-63-6) - 2%

STATE REQUIREMENTS:

Benzene (CAS# 71-43-2), Cumene (CAS# 98-82-8), Toluene (CAS 108-88-3), Acetone (CAS# 67-44-1), and Xylene (CAS# 1330-20-7) are regulated by CA, CT, FL, IL, LA, MA, ME, MN, NJ, PA, and RI. Other states may also have special requirements. This product contains less than 10 ppm benzene and less than 0.3% cumene.

1,2,4-trimethylbenzene (CAS# 95-63-6) is regulated by CA, MA, MN, PA, and NJ. Other states may also have special requirements.

Other components of this product may be also be subject to state regulations. For details on specific state requirements, contact the appropriate agency in your state.

CALIF. PROP. 65: This product contains the following chemicals known to the State of California to cause cancer, birth defects, and/or reproductive harm: Benzene.

SECTION XVI - OTHER INFORMATION

PREPARED BY: TALEM, Inc. - Engineering & Consulting Services (817) 335 - 1186
INFORMATION SUPPLIED BY: A. G. Layne, Inc.
PREPARATION DATE: 08/96
REVISED 9/96: Section XIV - Proper Shipping Name

FOOTNOTES:
NA - Not Applicable NE - Data Not Established CS - Cancer Suspect Agent OX - Oxidizer ND - No Data Cor - Corrosive
CALC - Calculated EST - Estimated STEL - Short Term Exposure Limit TLV - Threshold Limit Value
PEL - Permissible Exposure Limit TWA - Time Weighted Average, 8 hours

THE INFORMATION RELATES TO THIS SPECIFIC MATERIAL. IT MAY NOT BE VALID FOR THIS MATERIAL IF USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY ONESELF AS TO THE SUITABILITY AND COMPLETENESS OF THIS INFORMATION FOR HIS OWN PARTICULAR USE. NEITHER THE SELLER NOR PREPARER MAKES ANY WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE INFORMATION PRESENTED.

High VOC Cleaner Used at PIP Printing

MATERIAL SAFETY DATA SHEET

I C Compound Co.
120 E 163rd St P.O. Box 66 Gardena, CA 90248
(310) 323-6210

HAZARD RATING

Acute Health	Fire	Reactivity
2	2	0

Least = 0 Slight = 1 Moderate = 2 High = 3 Extreme = 4

Date Printed: November 18, 2001
PRODUCT NAME: **I.C. ALL PRO**
CHEMICAL NAME: A proprietary blend containing aliphatic/aromatic petroleum distillates, glycol ethers, esters and other diluents
CHEMICAL FAMILY: Hydrocarbon and Glycol Ether Solvent

I. PHYSICAL DATA

BOILING POINT (760 mm Hg): 300° F
FREEZING POINT: N/A
SPECIFIC GRAVITY (H2O=1): .847
VAPOR PRESSURE @20° C: 3.1 mm Hg
VAPOR DENSITY (AIR=1): 3.9
SOLUB. IN H20: Part. Soluble
% VOLATILES (BY VOLUME): 99
EVAP. RATE (BUT. ACET.=1): .1
APPEARANCE AND ODOR: Clear liquid with mild odor
V O C (lbs/gal) 6.6

II. HAZARDOUS INGREDIENT / COMPOSITION

MATERIAL	CAS NO.	TLV UNITS
A. Mineral Spirits	64742-88-7*	100
B. Aromatic Hydrocarbon Distillates	64742-95-6	25
C. 2-Propoxyethanol	2807-30-9	N/A

* A combination of complex hydrocarbons; exact combination will vary

III. ACUTE TOXICITY DATA

MAT. NO	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION DATA
II.A	>25 ml/kg (rat)	>4 ml/kg (rabbit)	>700 ppm/4hr (rat)
II.B	>4.7 g/kg (rat)	>4 ml/kg (rat)	>3670 ppm/8hr (rat)
II.C	>3.1 g/kg (rat)	>1.3 g/kg (rabbit)	>2132 ppm/6hr (rat)

IV. HEALTH INFORMATION

The health effects listed below are consistent with requirements under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

A. Eye Contact: Liquid is irritating to the eyes under normal vapor concentration. This material may cause eye irritation (burning, tearing and redness).

B. Skin Contact: Liquid is slightly irritating to the skin. Prolonged or repeated liquid contact can result in defatting and/or drying of the skin which may result in skin irritation and/or dermatitis other symptoms of toxicity as described in effects of ingestion.

C. Inhalation: Vapors may be irritating to the eyes, nose, throat and respiratory tract. High vapor concentrations may cause CNS depression, headache, nausea, vomiting, weakness.

D. Ingestion: Ingestion of product may induce vomiting. Aspiration (breathing) of vomitus into the lungs must be avoided as even small quantities may result in aspiration pneumonitus. Ingestion may also cause CNS depression, headache, nausea and drowsiness, and dizziness.

E. Signs and Symptoms: Irritation as noted above. Slight to moderate CNS (Central Nervous System) depression may be evidenced by giddiness, headache, dizziness and nausea. Aspiration pneumonitus may be evidenced by coughing, labored breathing and cyanosis (bluish skin); in severe cases, death may occur.

F. Aggravated Medical Conditions: Pre-existing eye, skin, and respiratory disorders may be aggravated by exposure to this product.

V. OCCUPATIONAL EXPOSURE LIMITS

NO	PEL/TWA	PEL CEILING	TLV/TWA	TLV/STEL
A.	100 ppm	N/A	100 ppm	N/A
B.*	25 ppm	N/A	25 ppm	N/A
C.	N/A	N/A	N/A	N/A

*TLV information provided for the Trimethylbenzene component only- no data available for the mixture as a whole.

VI. EMERGENCY AND FIRST AID PROCEDURES

A. Eye Contact: Immediately flush eyes with plenty of water for 15 minutes while holding eyelids open. Do not let victims rub their eyes. Get medical attention.

B. Skin Contact: Remove contaminated clothing and shoes. Flush skin with water. Follow by washing with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.

C. Inhalation: Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention immediately.

D. Ingestion: *DO NOT INDUCE VOMITING.* If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Get medical attention.

VII. FIRE AND EXPLOSION HAZARDS

A. Flash Point and Method: 103° F (TCC)

B. Flammable Limits / % by Volume in Air: LEL (Lower Expl. Limit) =1: UEL (Upper Expl. Limit)=7

C. Extinguishing Media: Use water fog, foam, dry chemical or CO2. Do not use a direct stream of water. Product will float and can be reignited on surface of water.

D. Special Firefighting Procedures and Precautions: CAUTION. COMBUSTIBLE. Do not enter confined firespace without full bunker gear, including a positive pressure NIOSH approved self contained breathing apparatus. Cool fire exposed containers with water.

VIII. REACTIVITY

A. Stability: Stable

B. Hazardous Polymerization: Will not occur.

C. Conditions and Materials to Avoid: Avoid heat, flame and contact with strong oxidizing agents.

D. Hazardous Decomposition Products: Carbon dioxide, carbon monoxide and un(identified) organic compounds may be formed during combustion.

I.C. ALL PRO

IX. EMPLOYEE PROTECTION

A. Respiratory Protection: Avoid prolonged or repeated breathing of vapors. In accord with 29 CFR 1910.134, use either an atmosphere-supplying respirator or an air-purifying respirator for organic vapors.

B. Protective Clothing: Avoid contact with eyes. Wear safety glasses or goggles as appropriate. Avoid prolonged or repeated contact with skin. Wear chemical resistant gloves (butyl rubber) and other clothing to minimize contact.

C. Additional Protective Measures / Equipment: Use explosion proof ventilation as required to control vapor concentrations. Clean contaminated clothing before reusing.

X. ENVIRONMENTAL PROTECTION

A. Spill or Leak procedures: CAUTION - COMBUSTIBLE - LARGE SPILLS - Eliminate potential sources of ignition. Wear appropriate respirator and other protective clothing. Shut off source of leak only if safe to do so. Dike and contain, remove with vacuum trucks or pump to storage / salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers and seal tightly for proper disposal. Flush areas with water to remove trace residue; dispose of flush solution as above. SMALL SPILLS- Take up with an absorbent material and place in non-leaking containers for proper disposal.

B. Waste Disposal: Under EPA-RCA (40 CFR 261.21), if this product becomes a waste material, it would be ignitable hazardous waste, hazardous waste number D001. Refer to the latest EPA or State regulations regarding proper disposal.

C. Environmental Hazards: Under EPA-CWA, this product is classified as an oil under section 311. Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

EPA-Comprehensive Environmental Response, Compensation at Liability Act. Under EPA-CERCLA (Superfund), releases to air, land or water may be reportable to the National Response Center, 1-800-424-8802 (circumstances surrounding the release and cleanup determine reportability)

XI. SPECIAL PRECAUTIONS

A. Keep liquid and vapor away from heat, sparks and flame. Keep containers closed when not in use. Use with adequate ventilation.

B. Containers, even empty, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

C. Static electricity may accumulate and create a fire hazard. Ground fixed equipment. Bond and ground transfer equipment and containers.

XII. OTHER REGULATORY INFORMATION

A. The components of this product are listed on the EPA / TSCA Inventory of Chemical Substances.

B. SARA Hazard Category. This product has been reviewed according to the EPA "Hazard categories" per Section 311 / 312 of SARA Title III, and is considered to meet the following categories:

1. An immediate health hazard
2. A delayed health hazard
3. A fire hazard

C. SARA 313 Information: This product contains the following substances subject to the reporting requirements of SARA Title III, Section 313, and 40 CFR Part 372:

Name	CAS NO	Concentration
Trimethylbenzene	95-63-6	1 - 7 %
Cumene	98-82-8	0 - 2 %
Xylene	1330-20-7	0 - 1.5 %
Glycol Ethers	2807-30-9	7 - 12 %

The information contained herein is based on the data available to us and is believed to be correct. However, we make no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. We assume no responsibility for injury from the use of the product described herein.

High VOC Blanket Wash Used at Presslink

LITHO-CHEM, INC.

9441 SANTA FE SPRINGS ROAD, SANTA FE SPRINGS, CA 90670
TEL: 562.946.5537 FAX: 562.946.2333

LC-1700

MATERIAL SAFETY DATA SHEET

DATE PREPARED: August 2003 | FOR EMERGENCY: 800-424-9300

SECTION I - IDENTIFICATION

PRODUCT	PRESS WASH
CODE	LC-1700
CHEMICAL FAMILY	Proprietary blend of aliphatic hydrocarbon solvents with ketone
DOT CLASSIFICATION	Paint related material,3,UN1263,II

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV	CAS NO.
2-propanone	1-10	750	67-64-1
Aliphatic hydrocarbon	>50	300	64742-89-8

HEALTH	FIRE	REACTIVITY	PERSONAL
 1	 3	 0	B PROTECTION

HAZARD RATING
LEAST = 0 SLIGHT = 1
MODERATE = 2 HIGH = 3
EXTREME = 4

SECTION III - PHYSICAL PROPERTIES

BOILING POINT	131 °F (minimum boiling component)
PARTIAL PRESSURE (mmHg@20°C)	69.1 (32.3 calculated as per AQMD Rule 1171)
DENSITY (Lbs/Gal)	6.0
SPECIFIC GRAVITY	0.72
SOLUBILITY IN WATER	Appreciable
APPEARANCE AND ODOR	Clear, lavender liquid with a mild solvent odor
VOLATILE ORGANIC COMPOUNDS (VOC)	5.5 lb/gal (663 gm/l) EPA Method 24

SECTION IV - FIRE AND EXPLOSION HAZARDS

FLASH POINT (TCC)	0°F
EXPLOSIVE LIMITS IN AIR (% BY VOLUME)	LL=1.2% UL=12.8%
EXTINGUISHING MEDIA	Alcohol resistant foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing
UNUSUAL FIRE AND EXPLOSION HAZARD	Material is highly volatile. Vapors may travel at ground level and be ignited by pilot lights, sparks, heaters, electrical motors, etc

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL: Not established
THRESHOLD VALUE: Not established
EFFECTS OF OVEREXPOSURE

EYES: Exposure to liquid or vapor causes eye irritation. Symptoms may include stinging, tearing, redness and swelling.

SKIN: Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying, cracking and skin burns. Pre-existing skin disorders may be

EYES: Exposure to liquid or vapor causes eye irritation. Symptoms may include stinging, tearing, redness and swelling.

SKIN: Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying, cracking and skin burns. Pre-existing skin disorders may be aggravated by exposure to this material. Absorption is possible but harmful effects are not expected from this route of exposure under normal conditions of handling and use.

BREATHING: Exposure to vapors or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits. Symptoms of exposure may include:

- Irritation of nose, throat, respiratory tract
- Pre-existing lung disorders, e.g. asthma-like conditions, may be aggravated by exposure to this material resulting in cough, central nervous system (CSN) depression (dizziness, weakness, drowsiness, fatigue, nausea, headache, unconsciousness) and other CNS effects (coma).

SWALLOWING: Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Symptoms may include: throat irritation, gastrointestinal irritation (nausea, vomiting, diarrhea), central nervous system depression (dizziness, weakness, fatigue, nausea, headache, unconsciousness), high blood sugar, coma. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

FIRST AIDE:
- If on skin: Remove contaminated clothing, wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before re-use.
- If in eyes: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes with water for at least 15 minutes while holding eyelids apart. If symptoms persist, seek medical attention.
- If swallowed: DO NOT INDUCE VOMITING. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with head down. Seek medical attention. If possible, do not leave individual unattended.
- If breathed: If symptoms develop, immediately move individual away from exposure and into fresh air. Seek medical attention. Keep individual warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

NOTE TO PHYSICIAN This material (or a component) has produced hyperglycemia and ketosis following substantial ingestion.

PRIMARY ROUTES OF ENTRY: Inhalation, skin absorption, skin contact, eye contact.

EFFECTS OF CHRONIC EXPOSURE: This material (or a component) shortens the time of onset or worsens the liver and kidney damaged induced by other chemicals. This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies; harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals and may aggravate pre-existing disorders of these organs in humans: mild, reversible liver effects and mild, reversible kidney effects.

SECTION VI - REACTIVITY DATA

STABILITY	Stable under normal conditions of storage and handling
INCOMPATIBLE MATERIALS	Avoid contact with strong oxidizing agents and strong acids
HAZARDOUS POLYMERIZATION	Cannot occur

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL

Small spill: Absorb liquid on vermiculite, floor absorbent, or other absorbent material and transfer to hood

Large spill: Eliminate all ignition sources (flares, flames, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent spill from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to approved containers for disposal.

WASTE DISPOSAL METHOD

Small spill: Dispose of in accordance with all local, state and federal regulations

Large spill: Dispose of in accordance with all local, state and federal regulations

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: If workplace exposure limit(s) of product (or a component) is exceeded (see Section II), a NIOSH/MSHA air supplied respirator is advised. In absence of proper environmental control, OSHA regulation also permits other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure levels below TLV's (see Section II) or to below level of overexposure (from known, suspected or apparent adverse effects).

PROTECTIVE GLOVES: Wear resistant gloves (consult safety equipment supplier).

EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised. However, OSHA regulations also permit other types of safety glasses (consult safety equipment supplier).

OTHER PROTECTIVE EQUIPMENT: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Containers of this material may be hazardous when emptied since emptied containers retain product residues (vapor, liquid and/or solids). All hazard precautions given in this sheet must be observed.

WARNING!!! Sudden release of hot organic vapors or mists from processor equipment operating at elevated temperatures and pressures, or sudden ingress of air into vacuum equipment may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product at elevated process temperatures should be thoroughly evaluated to establish and maintain safe operating conditions.

High VOC Roller Wash Step 1 Cleaner Used at Presslink

LITHO-CHEM, INC.

9441 SANTA FE SPRINGS ROAD, SANTA FE SPRINGS, CA 90670
TEL: 562.946.5537 FAX: 562.946.2333

AQ 1301

MATERIAL SAFETY DATA SHEET

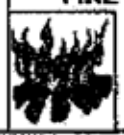
DATE PREPARED: OCTOBER 2002	FOR EMERGENCY: 562 946 5537

SECTION I - IDENTIFICATION

PRODUCT	ROLLER WASH NO.1
CODE	AQ 1301
CHEMICAL FAMILY	Aqueous emulsion of aliphatic and aromatic solvents with glycol ether and non-hazardous proprietary ingredients
DOT CLASSIFICATION	Combustible liquid,n.o.s.,(naphtha),NA1993,III

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV	CAS NO.
Aliphatic Hydrocarbon	30-60	275	8008-20-6
Aromatic Hydrocarbon	10-30	100	64742-95-6
Glycol ether	1-10	20	111-76-2

HEALTH	FIRE	REACTIVITY	PERSONAL	HAZARD RATING
 2	 2	 0	B PROTECTION	LEAST = 0 SLIGHT = 1 MODERATE = 2 HIGH = 3 EXTREME = 4

SECTION III - PHYSICAL PROPERTIES

BOILING POINT	259°F
PARTIAL PRESSURE (mmHg@20°C)	9.5 (1.7 Calculated as per SCAQMD rule 1171)
DENSITY (Lbs/Gal)	7.3
SPECIFIC GRAVITY	0.84
SOLUBILITY IN WATER	Appreciable
APPEARANCE AND ODOR	Translucent amber liquid with a mild solvent odor
VOLATILE ORGANIC COMPOUNDS (VOC)	4.7 lb/gal (564 gm/l)

SECTION IV - FIRE AND EXPLOSION HAZARDS

FLASH POINT (TCC)	120 °F
EXPLOSIVE LIMITS IN AIR (% BY VOLUME)	LL=0.7% UL=10.6%
EXTINGUISHING MEDIA	Alcohol foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing
UNUSUAL FIRE AND EXPLOSION HAZARD	Containers exposed to intensive heat should be cooled with water spray

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL: Not Established
THRESHOLD VALUE: Not Established
EFFECTS OF OVEREXPOSURE:

EYES: Exposure to liquid or vapor causes eye irritation. Symptoms may include stinging, tearing, redness and swelling.

SKIN: Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying, cracking and skin burns. Pre-existing skin disorders may be aggravated by exposure to this material. Absorption is possible but harmful effects are not expected from this route of exposure under normal conditions of handling and use.

BREATHING: Exposure to vapors or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits. Symptoms of exposure may include:

- Irritation of nose, throat, respiratory tract
- Pre-existing lung disorders, e.g. asthma-like conditions, may be aggravated by exposure to this material resulting in cough, central nervous system (CSN) depression (dizziness, weakness, drowsiness, fatigue, nausea, headache, unconsciousness) and other CNS effects (coma).

SWALLOWING: Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Symptoms may include: throat irritation, gastrointestinal irritation (nausea, vomiting, diarrhea), central nervous system depression (dizziness, weakness, fatigue, nausea, headache, unconsciousness), high blood sugar, coma. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

FIRST AIDE:
- If on skin: Remove contaminated clothing, wash exposed area with soap and water if symptoms persist, seek medical attention. Launder clothing before re-use.
- If in eyes: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes with water for at least 15 minutes while holding eyelids apart. If symptoms persist, seek medical attention.
- If swallowed: DO NOT INDUCE VOMITING. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with head down. Seek medical attention. If possible, do not leave individual unattended.
- If breathed: If symptoms develop, immediately move individual away from exposure and into fresh air. Seek medical attention. Keep individual warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

NOTE TO PHYSICIAN: This material (or a component) has produced hyperglycemia and ketosis following substantial ingestion.

PRIMARY ROUTES OF ENTRY: Inhalation, skin absorption, skin contact, eye contact.

EFFECTS OF CHRONIC EXPOSURE: This material (or a component) shortens the time of onset or worsens the liver and kidney damaged induced by other chemicals. This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies; harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain. Overexposure to this material (or it's components) has been suggested as a cause of the following effects in laboratory animals and may aggravate pre-existing disorders if these organs in humans: mild, reversible liver effects and mild, reversible kidney effects.

SECTION VI - REACTIVITY DATA

STABILITY	Stable under normal conditions of storage and handling
INCOMPATIBLE MATERIALS	Avoid contact with strong oxidizing agents and strong acids
HAZARDOUS POLYMERIZATION	Cannot occur

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL

Small spill: Absorb liquid on vermiculite, floor absorbent, or other absorbent material and transfer to hood

Large spill: Eliminate all ignition sources (flares, flames, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent spill from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to approved containers for disposal.

WASTE DISPOSAL METHOD

Small spill: Dispose of in accordance with all local, state and federal regulations

Large spill: Dispose of in accordance with all local, state and federal regulations

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: If workplace exposure limit(s) of product (or a component) is exceeded (see Section II), a NIOSH/MSHA air supplied respirator is advised. In absence of proper environmental control, OSHA regulation also permits other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure levels below TLV's (see Section II) or to below level of overexposure (from known, suspected or apparent adverse effects).

PROTECTIVE GLOVES: Wear resistant gloves (consult safety equipment supplier).

EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised. However, OSHA regulations also permit other types of safety glasses (consult safety equipment supplier).

OTHER PROTECTIVE EQUIPMENT: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Containers of this material may be hazardous when emptied since emptied containers retain product residues (vapor, liquid and/or solids). All hazard precautions given in this sheet must be observed.

WARNING!! Sudden release of hot organic vapors or mists from processor equipment operating at elevated temperatures and pressures, or sudden ingress of air into vacuum equipment may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product at elevated process temperatures should be thoroughly evaluated to establish and maintain safe operating conditions.

High VOC Roller Wash Step 2 Cleaner Used at Presslink

LITHO-CHEM, INC.

9441 SANTA FE SPRINGS ROAD, SANTA FE SPRINGS, CA 90670
TEL: 562 946 5537 FAX: 562.946 2333

AQ 1302

MATERIAL SAFETY DATA SHEET

DATE PREPARED OCTOBER 1998	FOR EMERGENCY, 562 946 5537

SECTION I - IDENTIFICATION

PRODUCT	ROLLER WASH No. 2
CODE	AQ 1302
CHEMICAL FAMILY	Blend of aromatic and aliphatic hydrocarbon solvents
DOT CLASSIFICATION	Combustible liquid n.o.s.(naphtha), NA1993,III

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV	CAS NO.
Aliphatic hydrocarbon	70 - 80	400	8052-41-3
Aromatic hydrocarbon	15 - 25	100	64742-95-6
Glycol ether	7 - 12	50	111-76-2

HEALTH	FIRE	REACTIVITY	PERSONAL PROTECTION	HAZARD RATING
 2	 2	 0	B	LEAST = 0 SLIGHT = 1 MODERATE = 2 HIGH = 3 EXTREME = 4

SECTION III - PHYSICAL PROPERTIES

BOILING POINT	310°F
PARTIAL PRESSURE (mmHg@20°C)	2.9
DENSITY (Lbs/Gal)	6.6
SPECIFIC GRAVITY	0.792
SOLUBILITY IN WATER	Dispersible
APPEARANCE AND ODOR	Clear, yellow, liquid, mild odor
VOLATILE ORGANIC COMPOUNDS (VOC)	6.6 lb/gal (792 gm/l)

SECTION IV - FIRE AND EXPLOSION HAZARDS

FLASH POINT (TCC)	113°F
EXPLOSIVE LIMITS IN AIR (% BY VOLUME)	LL=1.0% UL=6.2%
EXTINGUISHING MEDIA	Water, foam, carbon dioxide , dry chemical
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing
UNUSUAL FIRE AND EXPLOSION HAZARD	Material is highly volatile. Vapors may travel at ground level and be ignited by pilot lights, sparks, heaters, electrical motors, etc

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL 750 ppm
THRESHOLD VALUE 750 ppm

EFFECTS OF OVEREXPOSURE

EYES: Exposure to liquid or vapor causes eye irritation. Symptoms may include stinging, tearing, redness and swelling

SKIN: Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying, cracking and skin burns. Pre-existing skin disorders may be aggravated by exposure to this material. Absorption is possible but harmful effects are not expected from this route of exposure under normal conditions of handling and use

BREATHING: Exposure to vapors or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits. Symptoms of exposure may include

- -Irritation of nose, throat, respiratory tract
- -Pre-existing lung disorders, e.g. asthma-like conditions, may be aggravated by exposure to this material resulting in cough, central nervous system (CSN) depression (dizziness, weakness, drowsiness, fatigue, nausea, headache, unconsciousness) and other CNS effects (coma).

SWALLOWING: Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Symptoms may include: throat irritation, gastrointestinal irritation (nausea, vomiting, diarrhea), central nervous system depression (dizziness, weakness, fatigue, nausea, headache, unconsciousness), high blood sugar, coma. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

FIRST AIDE: If on skin: Remove contaminated clothing, wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before re-use.

If in eyes: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes with water for at least 15 minutes while holding eyelids apart. If symptoms persist, seek medical attention.

If swallowed: DO NOT INDUCE VOMITING. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with head down. Seek medical attention. If possible, do not leave individual unattended

If breathed: If symptoms develop, immediately move individual away from exposure and into fresh air. Seek medical attention. Keep individual warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

NOTE TO PHYSICIAN This material (or a component) has produced hyperglycemia and ketosis following substantial ingestion.

PRIMARY ROUTES OF ENTRY: Inhalation, skin absorption, skin contact, eye contact.

EFFECTS OF CHRONIC EXPOSURE: This material (or a component) shortens the time of onset or worsens the liver and kidney damaged induced by other chemicals. This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies; harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain. Overexposure to this material (or it's components) has been suggested as a cause of the following effects in laboratory animals and may aggravate pre-existing disorders if these organs in humans: mild, reversible liver effects and mild, reversible kidney effects.

SECTION VI - REACTIVITY DATA

STABILITY	Stable under normal conditions of storage and handling
INCOMPATIBLE MATERIALS	Avoid contact with strong oxidizing agents and strong acids
HAZARDOUS POLYMERIZATION	Cannot occur

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL

Small spill: Absorb liquid on vermiculite, floor absorbent, or other absorbent material and transfer to hood

Large spill: Eliminate all ignition sources (flares, flames, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent spill from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to approved containers for disposal.

WASTE DISPOSAL METHOD

Small spill: Dispose of in accordance with all local, state and federal regulations

Large spill: Dispose of in accordance with all local, state and federal regulations

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: If workplace exposure limit(s) of product (or a component) is exceeded (see Section II), a NIOSH/MSHA air supplied respirator is advised. In absence of proper environmental control, OSHA regulation also permits other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure levels below TLV's (see Section II) or to below level of overexposure (from known, suspected or apparent adverse effects).

PROTECTIVE GLOVES: Wear resistant gloves (consult safety equipment supplier)

EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised. However, OSHA regulations also permit other types of safety glasses (consult safety equipment supplier)

OTHER PROTECTIVE EQUIPMENT: To prevent repeated or prolonged skin contact, wear impervious clothing and boots

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Containers of this material may be hazardous when emptied since emptied containers retain product residues (vapor, liquid and/or solids). All hazard precautions given in this sheet must be observed.

WARNING!!! Sudden release of hot organic vapors or mists from processor equipment operating at elevated temperatures and pressures, or sudden ingress of air into vacuum equipment may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product at elevated process temperatures should be thoroughly evaluated to establish and maintain safe operating conditions.

High VOC Roller Cleaner Used at R.R. Donnelley & Sons

ANCHOR

MATERIAL SAFETY DATA SHEET

The Anchor MSDS information provided on this site is updated on a monthly basis and com
OSHA's Hazard Communication Standard (CFR 1910.1200) and the American National Standard
(ANSI) Standard for Material Safety Data Sheets (ANSI Z400.1).

Finished Goods Catalog

7955 - ENVIROWASH 220 ACID LEAN

Manufacturer Name

ANCHOR LITHKEMKO, A SUBSIDIARY OF FUJI HUNT

SECTION 1 - COMPANY IDENTIFICATION

Catalog / Sub-assembly Number: 7955
ANCHOR LITHKEMKO, A SUBSIDIARY OF FUJI HUNT
50 Industrial Loop North
Orange Park, FL 32073

TRANSPORTATION EMERGENCIES (24HR)
Inside US/Canada 800-424-9300
Outside US/Canada 703-527-3887
(accepts collect calls)
MEDICAL EMERGENCIES (24HR)
Prosar 877-975-7787
NON-EMERGENCY
EHS Info 904-264-3500
General Info 800-354-2300

FOR INDUSTRIAL USE ONLY.....USE ONLY AS DIRECTED.....DO NOT TAKE INTERNALLY!

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Wt.%	OSHA PEL (mg/m3)	ACGIH (mg/m3)
Aliphatic Hydrocarbon	64742-88-7	10-20%	100ppm	100ppm
Aromatic Hydrocarbons	70892-06-0	5-10%	NE	NE
Fatty Acid Ester	TSRN 06-0836 -332-5035	15-30%	NE	NE
Aliphatic Hydrocarbon	8042-47-5	50-70%	5 TWA	10 STEL

NE-Not Established STEL-Short Term Exposure Limit C-Ceiling Limits

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

****

Appearance: Light, yellow liquid
Odor: Mild Odor

Avoid contact with eyes, skin or clothing. Avoid breathing mist or vapor. Do not swallow. Wear chemical safety goggles & chemical resistant gloves. Wash thoroughly after handling. Keep container closed when not in use. Use only

with adequate ventilation. May produce hazardous gases under fire conditions. During emergencies, wear equipment to protect eyes, skin and respiratory tract. Dike or absorb spills to keep material and run-off from entering sewer or waterways. Use water spray to cool containers and disperse vapors. Consult MSDS for additional information.

HMIS: Health: 2 Flammability: 2 Reactivity: 0 Protection: E
NFPA: Health: 2 Flammability: 2 Reactivity: 0 Spec. Haz.: COMB

Hazard Rating: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
A = Gloves B = Gloves & Goggles C = Gloves, Goggles & Apron
D = Face Shield, Gloves, Goggles & Apron

UN NO: NA1993
DOT GUIDE: ERG Guide 128

Potential Health Effects:
Skin: Contact causes irritation.
Eyes: Causes irritation.
Inhalation: Irritant to respiratory tract and mucous membranes.
Ingestion: Ingestion of product may cause nausea and vomiting.
Conditions aggravated by exposure:
None expected except those associated with acute effects.

SECTION 4 - FIRST AID MEASURES

Eye Contact: Immediately flush with CLEAN water for 15 minutes. Call a physician.
Skin Contact: In case of skin contact, wash with soap and water for 15 minutes. Call a physician.
Ingestion: In case of ingestion, do not drink water. Do not induce vomiting. Call a physician.
Inhalation: Immediately remove victim to fresh air. Call a physician for further recommendations.

SECTION 5 - FIRE FIGHTING MEASURES

Flammable Properties
Flash Point: 165 Deg F (TCC)
Autoignition Temperature: N/A deg F (CC)
Explosion Limits: Lower: N/A vol.%: Not Tested
Upper: N/A vol.%:
OSHA Class IIIA Combustible Liquid

Extinguishing Media:
Choose extinguishing media suitable for the surrounding materials, such as water spray, dry chemical, alcohol foam or carbon dioxide.
Unsuitable Extinguishing Media:
No restrictions on media based on knowledge of this material.
Fire Fighting Instructions:
Water spray should be used to cool fire exposed containers and to disperse un-ignited vapors. Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus when material has ignited or becomes involved in a fire. Try to remove material containers from fire area if can be accomplished without risk to personnel.

Evacuate area and fight fire from a safe distance. Call your local fire department. Wear positive pressure, breathing apparatus and protect eyes and skin. Use water to cool fire-exposed containers, to protect personnel and to disperse vapors and spills. Fire media run-off can damage the environment. Dike and collect media used to fight fire.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Small Spills:

For small incidental spills and leaks wear chemical safety goggles, and neoprene gloves and apron or coveralls. Isolate area of spill by diking. Stop source of leak. Add dry absorbent. Clean up and place in an approved D.O.T. container and seal. Wash all contaminated clothing before reuse, and discard contaminated leather shoes.

Large Spills:

For larger spills requiring emergency response, neoprene boots and respiratory protection may also be required. Follow OSHA regulations and NIOSH recommendations for respirator use (29 CFR 1910.134 and NIOSH Pub. 87-108) and emergency response (see 29 CFR 1910.120). Isolate area of spill by diking. Stop source of leak. Add dry absorbent. Clean up and place in an approved D.O.T. container and seal. Wash all contaminated clothing before reuse, and discard contaminated leather shoes. Call the emergency telephone number shown on the front of this sheet.

SECTION 7 - HANDLING / STORAGE

Handling:

Avoid contact with eyes, skin or clothing. Avoid breathing mist or vapor. Do not swallow. Wear chemical safety goggles and neoprene gloves and apron. Wash thoroughly after handling. Keep container closed when not in use. Use only with adequate ventilation.

Storage:

Store in a cool, dry, well-ventilated area away from all sources of ignition. Keep containers closed when not in use.

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

Ventilation:

Good general ventilation should be sufficient for most processing operations. Vent work area to ensure airborne concentrations are below the current occupational exposure limits. Ten (10) or more room air changes per hour containing a minimum of 15% fresh air will meet these requirements. Consult ASHRAE 62-1989 for further requirements.

Personal Protective Equipment

Respiratory Protection: If used under normal operating conditions and with adequate ventilation, respiratory protection is not required. However, refer to OSHA 29 CFR 1910.134.

Skin Protection:	Chemical resistant gloves
Eye Protection:	Chemical safety goggles

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light, yellow liquid
Odor: Mild Odor
Change in Physical State:

Boiling Point:	350-350	Deg F	
Melting Point:	N/D	deg F	
Specific Gravity:	8.85		Water=1
Vapors Pressure:	8.2		mmHg @ 20C
Viscosity:	N/A		
Solubility in Water:	Emulsifies		
pH Value:	N/A		
VOC (lbs/gal):	2.26	(USEPA Method 24)	

SECTION 10 - STABILITY AND REACTIVITY

Hazardous Polymerization:

Hazardous polymerization WILL NOT occur if product is used and stored as directed. Product is stable if used and stored as directed.
Hazardous Decomposition Products:
Oxides of Nitrogen; Oxides of Carbon
Materials and Conditions to Avoid:
Keep containers and liquids away from all potential sources of ignition. Keep away from excess heat. Avoid contact with strong oxidizers, strong acids and strong bases.

SECTION 11 - TOXICOLOGICAL INFORMATION

Product Information
LD50 (oral, rat): No Data Available
Acute Overexposure:
Skin, eye, mucous membrane and respiratory tract irritant.
Chronic Overexposure:
Prolonged or repeated skin contact may cause allergic reaction and dermatitis.
Ingredient Information:
Swallowing of Hydrocarbons can cause lung damage. Repeated exposure to Hydrocarbons can cause dermatitis.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity Data: No Data Available
Chemical Fate Data: No Data Available

SECTION 13 - DISPOSAL CONSIDERATIONS

Hazardous Waste Characteristic:
None
Recommendation:
Dispose of contaminated product, empty containers and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, state and local regulatory agencies to ascertain proper disposal procedures. Discharge of processing effluent to the sewer may require a permit. DO NOT discharge effluent solutions to septic systems.

SECTION 14 - TRANSPORTATION INFORMATION

Ground Shipping Information
Proper Shipping Name: Combustible Liquid, N.O.S. (contains Petroleum Naphtha)
Hazard Class: 3
UN/NA Number: NA1593
Packing Group: PGIII
Air (ICAO/IATA) Shipping Information
Proper Shipping Name: Chemicals, N.O.I., Not D.G.T. regulated.
Hazard Class: None
UN No: None
Packing Group: None
Subsidiary Risk: None
UN/DOT Labels Needed: Combustible
International Maritime Organization (IMO) Additional Shipping Class:
IMDG Code: Not Applicable
Amdt. Code: Amdt. N/A
HTS Code: HTS#3814.00.5030.0
Product is labeled in accordance with US D.O.T. 49 CFR.

Further information:
Please call (904) 264-1580 for further D.O.T. information.

SECTION 15 - REGULATORY INFORMATION

**Note: The ingredient information listed in this section is provided for reporting requirements as dictated by OSHA, state and local regulation. If ingredient is listed in this section but not in Section 2, then the concentration of this ingredient is below de minimis (less than 0.1%).

U.S. FEDERAL REGULATIONS:
313 = SARA Title III Section 313 (40 CFR 372 -- Toxic Release Inventory)
355 = SARA Title III Section 302 (40 CFR 355 -- Extremely Hazardous Substance)
302 = SARA Title III Section 304 (40 CFR 302 -- Hazardous Substance List)
CWA = Clean Water Act Priority Pollutants List
CAA = Clean Air Act 1990 Hazardous Air Contaminants
HAP = Clean Air Act - NON Rule - HAPs

Ingredients	CAS Number	313	355	302	CWA	CAA	HAP
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N	N
Aromatic Hydrocarbons	70693-06-0	N	N	N	N	N	N
Fatty Acid Ester	TSRN 06-0826 -331-5085	N	N	N	N	N	N
Aliphatic Hydrocarbon	8042-47-5	N	N	N	N	N	N

TSCA 12(b) Export Notification
CAS NUMBER CHEMICAL NAME
131-11-3 DIMETHYL PHTHALATE (DMP)

TOXICITY INFORMATION:
IRC1 = IARC Group 1 Human Carcinogens List
IRC2 = IARC Group 2 Human Carcinogens List (limited human data)
IRC3 = IARC Group 2B Human Carcinogens List (sufficient animal data)
NTP = NTP Known Carcinogens List
CSHA = OSHA Known Carcinogens List

Ingredients	CAS Number	IRC1	IRC2	IRC3	NTP	CSHA
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N
Aromatic Hydrocarbons	70693-06-0	N	N	N	N	N
Fatty Acid Ester	TSRN 06-0826 -331-5085	N	N	N	N	N
Aliphatic Hydrocarbon	8042-47-5	N	N	N	N	N

STATE REGULATIONS:
FL = Florida Hazardous Substance List
MI = Michigan Critical Materials List
NJ = New Jersey Right-To-Know List
MA = Massachusetts Right-To-Know List
MN = Minnesota Hazardous Substance List
PA = Pennsylvania Right-To-Know List

Ingredients	CAS Number	PA	NJ	MN	MI	MA	FL
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N	N
Aromatic Hydrocarbons	70693-06-0	N	N	N	N	N	N
Fatty Acid Ester	TSRN 06-0826 -331-5085	N	N	N	N	N	N
Aliphatic Hydrocarbon	8042-47-5	N	N	N	N	N	N

The following information is required by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 or Proposition 65. This regulation does not address di minimus levels; therefore, even trace amounts of chemicals included on these lists must be noted with the 'Safe Harbor' wording.

WARNING: Known to the State of California to cause cancer:
CAS NUMBER CHEMICAL NAME
91-20-3 NAPHTHALENE
WARNING: Known to the State of California to cause developmental toxicity:
****None Listed****
WARNING: Known to the State of California to cause female reproductive effects
****None Listed****

WARNING: Known to the State of California to cause male reproductive effects.
****None listed****

The following designation is used only for those facilities that have air permits in nonattainment areas for ozone:
Non-Photochemically Reactive

SECTION 16 - OTHER INFORMATION

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

High VOC Blanket Cleaner Used at R.R. Donnelley & Sons

MATERIAL SAFETY DATA SHEET

Shell

MSDS NUMBER ▶ 7.591-3 PAGE 1

24 HOUR EMERGENCY ASSISTANCE	ORIGINAL MSDS ASSISTANCE
SHELL: 713-672-9461 CHEMTREC: 800-424-9300	SHELL: 713-241-4519

BE SAFE

HEALTH	FIRE	REACTIVITY	HAZARD RATING ▶
2	2	0	MINOR - 0 SLIGHT - 1 MODERATE - 2 SEVERE - 3 EXTREME - 4

*For acute and chronic health effects refer to the discussion in Section III

SECTION I PRODUCT NAME

PRODUCT ▶	SHELL MINERAL SPIRITS 145 HT
CHEMICAL NAME ▶	SOLVENT NAPHTHA (PETROLEUM), MEDIUM ALIPHATIC
CHEMICAL FAMILY ▶	HYDROCARBON SOLVENT
SHELL CODE ▶	83003

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P:	SHELL MINERAL SPIRITS 145 HT*	64742-88-7	100

*A COMPLEX COMBINATION OF PREDOMINANTLY C8-C12 HYDROCARBONS; EXACT COMPOSITION WILL VARY.

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P:	NOT AVAILABLE		
I:	>25 ML/KG (RAT)	>4 ML/KG (RAT)	>2670 PPM/8H (RAT)

A. G. LAYNE, INC.
4578 BRAZIL STREET
LOS ANGELES, CA 90039
213/245-2345 * FAX # 818/242-7804

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY DIZZINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

ID.	OSHA PEL/TWA	OSHA PEL/CEILING	ACGIH TLV/TWA	OTHER TLV/STEL
*	100 PPM		100 PPM	

*RECOMMEND THAT LIMITS FOR STODDARD SOLVENT BE USED AS A GUIDE.

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING/SHOES. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING.

INGESTION
DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.*

NOTE TO PHYSICIAN
*IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

MALE RATS EXPOSED FOR 90 DAYS BY INHALATION TO VAPORS OF SIMILAR SOLVENTS SHOWED EVIDENCE OF KIDNEY DAMAGE. THE RELEVANCE OF THIS EFFECT TO MANIS UNKNOWN. IN ONE OF THE STUDIES A LOW GRADE ANEMIA WAS ALSO OBSERVED.

SECTION VII — PHYSICAL DATA

BOILING POINT: 320-370 | SPECIFIC GRAVITY: 0.78 | VAPOR PRESSURE: <5 @ 100 DEG F (MM HG)

MELTING POINT: NOT AVAILABLE (DEG F)

SOLUBILITY: (IN WATER) NEGLIGIBLE

VAPOR DENSITY: 5.5 (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): 0.07

APPEARANCE AND ODOR:
LIGHT COLORED LIQUID. HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
104 DEG F (TCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: 1 UPPER: 7

EXTINGUISHING MEDIA
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
CAUTION. COMBUSTIBLE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

OSHA HAS ESTABLISHED TRANSITIONAL OCCUPATIONAL EXPOSURE LIMITS FOR THIS PRODUCT AND/OR COMPONENTS OF THIS PRODUCT. REFER TO 29 CFR 1910.1000 FOR THESE TRANSITIONAL LIMITS AND REQUIREMENTS FOR MEETING THESE LIMITS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR SAFETY GLASSES OR GOGGLES AS APPROPRIATE. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL-RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THAT

ADDITIONAL PROTECTIVE MEASURES
BEST PROTECTION IS PROVIDED BY NITRILE MATERIAL. USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. AIR-DRY CONTAMINATED CLOTHING IN A WELL VENTILATED AREA THEN LAUNDER BEFORE REUSING.

ION XI — ENVIRONMENTAL PROTECTION

OR LEAK PROCEDURES
ION. COMBUSTIBLE. *** LARGE SPILLS *** ELIMINATE POTENTIAL SOURCES OF IGNITION. WEAR
OPRIATE RESPIRATOR AND OTHER PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO
DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP
DUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING
AINERS AND SEAL TIGHTLY FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE;
OSE OF FLUSH SOLUTION AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABOSRBENT MATERIAL AND
E IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL.

ION XII — SPECIAL PRECAUTIONS

LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY
TE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES
TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY
MULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM THE HANDLING SITE; FLASH-FIRE CAN RESULT.
CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILATION.

AINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL,
D, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS.

TIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND
ND TRANSFER CONTAINERS AND EQUIPMENT.

TION XIII — TRANSPORTATION REQUIREMENTS

MENT OF TRANSPORTATION CLASSIFICATION:
AMABLE LIQUID

.T. PROPER SHIPPING NAME:
ROLEUM NAPHTHA

ER REQUIREMENTS:
1255. GUIDE SHEET 27.

TION XIV — OTHER REGULATORY CONTROLS

S PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

ACCORDANCE WITH SARA TITLE III, SECTION 313, THE EDS SHOULD ALWAYS BE COPIED AND SENT WITH THE
IS.

TION XV — STATE REGULATORY INFORMATION

THIS INFORMATION IS BEING SYSTEMATICALLY ADDED TO OUR MSDS. IT WAS PREVIOUSLY BEEN PROVIDED TO YOU IN VARIOUS WAYS, INCLUDING THE MSDS. THE NEW MSDS FORMAT IS INTENDED TO PROVIDE THE USER WITH THE INFORMATION IN A MORE CONVENIENT MANNER.

SECTION XVI SPECIAL NOTES

THIS REVISION REFLECTS A PRODUCT NAME CHANGE.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: JANUARY 31, 1995

BE SAFE
READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

G. A. VAN GELDER

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

High VOC Hand Blanket Wash Used at The Castle Press

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: POWERKLENE VC
PRODUCT CODE: A748
CHEMICAL NAME: BLANKET AND ROLLER WASH

HMIS CODES: H P R P
1*2 0 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS : 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE : 1-800-424-9300 DATE REVISED : 06/10/97
INFORMATION PHONE : 1-973-589-7800 NAME OF PREPARER : ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
AROMATIC PETRO DISTILLATE (C8-C11)	64742-95-6	2.7mmHg	25 C	40 - 50%
PEL 100 ppm // LD50 4.7g/kg; LC50 3670 ppm/8hr				
ALIPHATIC PETRO DISTILLATE (C9 - C11)	64742-48-9	2.7	25 C	40 - 50%
PEL 100ppm; TLV 100ppm // LD50> 25ml/kg; LC50 >709ppm/4hr				
DIPROPYLENE GLYCOL METHYL ETHER	34590-94-8	0.1mmHg	20 C	1 - 10%
PEL 100ppm; TLV 100ppm // LD50 7.5g/Kg				
1-METHYL-4-(1-METHYLETHENYL)CYCLOHEXENE	5989-27-5	1mmHg	20 C	1 - 10%
LD50 > 5g/kg				
SORBITAN MONOLEATE	1338-43-8	NO DATA	NO DATA	1 - 10%
LD50 > 15g/kg				

CAS# 64742-95-6 contains approximately 5% XYLENE (CAS# 1330-20-7) which has a PEL and TLV of 100 ppm; approximately 4% CUMENE (CAS# 98-82-8), which has a PEL and TLV of 50 ppm-skin; and approximately 27% 1.2.4 TRIMETHYLBENZENE (CAS# 95-63-7), which has a PEL and TLV of 25 ppm. XYLENE, CUMENE AND 1.2.4 TRIMETHYLBENZENE are subject to the reporting requirements of section 313 OF SARA TITLE III.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : 316 F
VAPOR DENSITY : 4.4 (air =1)
DRYING RATE : 0.25(nButyl Acet.=1)
PHOTOREACTIVE : YES
VOLATILES : 96%
PHYSICAL STATE : LIQUID
SPECIFIC GRAVITY (H2O=1): 0.82
VAPOR PRESSURE : 2.92 mmHg
VOC : 6.69 lb/gal METHOD: EPA #24
H2O SOLUBILITY : SLIGHT
APPEARANCE : YELLOW
ODOR : MODERATE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 114 F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.5 UPPER: 6.1
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED, THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED, GENERATE A FIREBALL.

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS:
INCOMPATIBILITY (MATERIALS TO AVOID): YES IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONSCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
EYE CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS, ITCHING, IRRITATION ON OVEREXPOSURE.

High VOC Automated Blanket Wash Used at The Castle Press

MATERIAL SAFETY DATA SHEET

AUTOWASH 6000

PRODUCT NAME: AUTOWASH 6000
PRODUCT CODE: A299
CHEMICAL NAME: BLANKET AND ROLLER WASH

HMIS CODES: H F R P
1 2 C E

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS : 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE : 1-800-424-9300
INFORMATION PHONE : 1-973-589-7800

LAST REVISION : 8/02/2000
DATE REVISED : 09/22/00
PREPARER : ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
ALIPHATIC PETRO DISTILLATE (C9 - C11) PEL 100ppm TLV 100ppm // LD50> 25ml/kg: LC50 700ppmV4hr	64742-48-9	2.7 mmHg	25 C	70 - 80%
* AROMATIC PETRO DISTILLATE (C8-C11) PEL 100 ppm // LD50 4.7g/kg: LC50 3670 ppm/8hr	64742-95-6	2.7mmHg	25 C	20 - 30%
NONYLPHENOXYPOLY(ETHYLENEOXY)ETHANOL LD50 2.4g/kg	9016-45-9	NO DATA	NO DATA	1 - 10%

* Indicates chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372. CAS# 64742-95-6 contains: approximately 5% XYLENE (CAS# 1330-20-7) an HAP reportable which has a PEL and TLV of 100 ppm: approximately 4% CUMENE (CAS# 98-82-8). an HAP reportable which has a PEL and TLV of 50 ppm-skin: and approximately 27% 1,2,4 TRIMETHYLBENZENE (CAS# 95-63-6). which has a PEL and TLV of 25 ppm. XYLENE. CUMENE AND 1,2,4 TRIMETHYLBENZENE are subject to the reporting requirements of section 313 OF SARA TITLE III.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : 313 F
VAPOR DENSITY : 4.56 (air = 1)
DRYING RATE : .12(n-Butyl Acet.=1)
PHOTOREACTIVE : YES
VOLATILES : 98%
PHYSICAL STATE : LIQUID

SPECIFIC GRAVITY (H20=1): 0.78
VAPOR PRESSURE : 2.7 mmHg at 20 C
VOC : 6.48 lb/gl METHOD: EPA #24
H2O SOLUBILITY : SLIGHT
APPEARANCE : CLEAR
ODOR : SOLVENT ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 105 F
METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.5 UPPER: 6.0
EXTINGUISHING MEDIA: CARBON DIOXIDE. FOAM. OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED. THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED. GENERATE A FIREBALL.

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS: .
INCOMPATIBILITY (MATERIALS TO AVOID): YES
IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE. CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE. DIZZINESS. NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
E CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS. ITCHING. IRRITATION ON OVEREXPOSURE.

High VOC Roller Wash Step 1 Cleaner Used at The Castle Press

MATERIAL SAFETY DATA SHEET

SUPERKLENE 1 IC-EXEMPT

Page:

PRODUCT NAME: SUPERKLENE 1 IC-EXEMPT

HMIS CODES: H F R
1 2 1

PRODUCT CODE: A222

CHEMICAL NAME: BLANKET AND ROLLER WASH (EBLB 1171-STEP1)

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS : 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE : 1-800-424-9300
INFORMATION PHONE : 1-973-589-7800

LAST REVISION : 12/03/01
DATE REVISED : 01/24/02
PREPARER : ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
ALIPHATIC PETROLEUM DISTILLATE	64742-88-7	0.5mmHg 20 C	60 - 70%
PEL 100ppm; TLV 100ppm // LD50> 25ml/kg; LC50> 700ppm/4hr			
DIETHANOLAMINE OLEATE	93-83-4	<0.1mmHg 20 C	10-20%
NO DATA			
AROMATIC PETROLEUM DISTILLATE (C9-C12)	64742-94-5	<1mmHg 20 C	1 - 10%
PEL 100ppm; TLV 100ppm // LD50 4.7g/kg; LC50 > 3670ppm/4hr			
TRIETHANOLAMINE BENZENE SULFONATE	1864-21-3	17.6mmHg 20 C	1 - 10%
NO DATA			

CAS# 64742-94-5 contains approximately 4% 1,2,4 TRIMETHYLBENZENE (CAS# 95-63-6), which has a PEL and TLV of 25 ppm and approximately 1% NAPHTHALENE (CAS# 91-20-3), an HAP reportable which has a PEL and TLV of 10 ppm. NAPHTHALENE and 1,2,4 TRIMETHYLBENZENE are subject to the reporting requirements of section 313 of SARA TITLE III.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : 212 - 360 F
VAPOR DENSITY : 2.4 [air = 1]
DRYING RATE : <0.1(nButyl Acet.=1)
PHOTOREACTIVE : NO
VOLATILES : > 70 % by weight
PHYSICAL STATE : LIQUID

SPECIFIC GRAVITY (H2O=1): 0.84
VAPOR PRESSURE : 11.2 mmHg(-H2O 0.53) at 20 C
VOC : 5.00 lb/gal METHOD: EPA #24
H2O SOLUBILITY : MISCIBLE
APPEARANCE : BROWN AND CLOUDY
ODOR : MILD SOLVENT

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 142 F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.5 UPPER: 7.0
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINERS COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED, THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED, GENERATE A FIREBALL.

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS: .
INCOMPATIBILITY (MATERIALS TO AVOID): YES
IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE, NITROGEN OXIDES, OXIDES OF SULFUR AND HYDROGEN SULFIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONSCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
EYE CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.

High VOC Roller Wash Step 2 Cleaner Used at The Castle Press

MATERIAL SAFETY DATA SHEET

SUPERKLENE 2P

PRODUCT NAME: SUPERKLENE 2P
PRODUCT CODE: A315
CHEMICAL NAME: TWO STEP ROLLER WASH - SECOND STEP

HMIS CODES: H F R P
1 2 0 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS: 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE: 1-800-424-9300
INFORMATION PHONE: 1-973-589-7800
DATE REVISED: 07/23/97
NAME OF PREPARER: ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
AROMATIC PETRO DISTILLATE (C8-C11)	64742-95-6	2.7mmHg 25 C	50 - 60%
PEL 100 ppm // [illegible]			
ALIPHATIC PETRO DISTILLATE (C9 - C11)	64742-48-9	2.7 mmHg 25 C	40 - 50%
PEL 100ppm; TLV 100ppm // LD50> 25ml/kg; LC50 700ppm/4hr			

CAS# 64742-95-6 contains approximately 5% XYLENE (CAS# 1330-20-7) which has a PEL and TLV of 100 ppm; approximately 4% CUMENE (CAS# 98-82-8), which has a PEL and TLV of 50 ppm-skin; and approximately 27% 1,2,4 TRIMETHYLBENZENE (CAS# 95-63-7), which has a PEL and TLV of 25 ppm. XYLENE, CUMENE AND 1,2,4 TRIMETHYLBENZENE are subject to the reporting requirements of section 313 OF SARA TITLE III.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : 315 F
VAPOR DENSITY : 4.4 (air = 1)
DRYING RATE : 0.29(nBuAc) Acet =1)
PHOTOREACTIVE : YES
VOLATILES : 100%
PHYSICAL STATE : LIQUID
SPECIFIC GRAVITY (H2O=1): 0.83
VAPOR PRESSURE : 2.7 mmHg
VOC : 6.85 lb/gal METHOD: EPA #24
H2O SOLUBILITY : NONE
APPEARANCE : GREEN
ODOR : SOLVENT ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 105 F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.6 UPPER: 6
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED, THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED, GENERATE A FIREBALL.

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS:
INCOMPATIBILITY (MATERIALS TO AVOID): YES IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONSCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
EYE CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS, ITCHING. IRRITATION ON OVEREXPOSURE
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SEVERE GASTROINTESTINAL IRRITATION. NAUSEA, VOMITING AND DIARRHEA.

EMERGENCY AND FIRST AID PROCEDURES
IF IN EYES: FLUSH WITH WATER FOR 15 MIN. LIFT UPPER AND LOWER EYE LIDS. SEE A DOCTOR
IF ON SKIN: WASH WITH SOAP AND WATER.
IF INHALED: REMOVE TO FRESH AIR. IF UNCONSCIOUS, USE ARTIFICIAL RESPIRATION
IF INGESTED: DO NOT INDUCE VOMITING. SEE DOCTOR IMMEDIATELY TO PUMP STOMACH.

High VOC Cleaner Used at Print 2000

Step #2 roller wash

Material Safety Data Sheet

SECTION I - PRODUCT IDENTIFICATION

PRODUCT: STEP #2 ROLLER WASH

SUPPLIER: A. G. Layne, Inc.
4578 Brazil Street
Los Angeles, California 90039
(323) 245-2345
(818) 242-8643

NFPA Ratings:
Health: 1
Fire: 2
React: 0
Special: ---
0=LEAST to 4=EXTREME

HMIS PERSONAL PROT: J

24 HOUR EMERGENCY CONTACT: Chemtrec (800) 424-9300

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	(CAS Number)	EXPOSURE LIMITS
Mineral Spirits	(64742-88-7)	100 ppm recommended
Light Aromatic Solvent Naphtha	(64742-95-6)	ND Contains:
Xylene (1330-20-7)		OSHA TWA 100 ppm, STEL 150 ppm, ACGIH TWA 100 ppm, STEL 150 ppm
1,2,4-trimethylbenzenes (95-63-6)		OSHA TWA 25 ppm

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 315°-400° F
SPECIFIC GRAVITY (H2O=1): 0.8
VAPOR DENSITY (Air=1): >1
SOLUBILITY IN WATER: Insoluble
APPEARANCE AND ODOR: light colored liquid, aromatic solvent odor

MELTING POINT: NA
VAPOR PRESSURE: 1.5 mmHG @ 20 deg. C (68 deg. F)
EVAPORATION RATE (BuAc=1): <1
pH: NA
VOC: 6.6 lbs/gal, 791.87 g/lt.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method): 108° F
FLAMMABLE LIMITS: Lower [ND] Upper [ND]
EXTINGUISHING MEDIA: Dry powder, carbon dioxide (CO2), water fog or spray.
SPECIAL FIRE FIGHTING PROCEDURES: Approach fire from upwind side. Avoid breathing smoke, fumes, mist, or vapors on the downwind side. Firefighters wear protective clothing, and self contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Firefighters wear protective clothing, and self contained breathing apparatus.

SECTION V - REACTIVITY INFORMATION

STABILITY: Product is Stable
INCOMPATIBILITY:
MATERIALS TO AVOID: Oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: From combustion: smoke, carbon monoxide, carbon dioxide.
HAZARDOUS POLYMERIZATION: Will not occur.

STEP #2 ROLLER WASH

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY

INHALATION? possible - irritant/narcotic
SKIN ABSORPTION? yes - unlikely
SKIN/EYES? yes - irritant
INGESTION? possible - irritant

HEALTH HAZARDS

ACUTE: Inhalation of vapors may be narcotic or anesthetic. Ingestion of liquid will cause gastrointestinal distress, irritation, and possibly nausea. Liquid or vapors may be irritating to skin and eyes.

CHRONIC: None Established

CARCINOGENICITY: LISTED IN NTP? No IARC MONOGRAPHS? No OSHA REGULATED? No

SIGNS AND SYMPTOMS OF EXPOSURE: Signs of inhalation overexposure, in order: irritation of respiratory tract, nervous system depression, headaches, dizziness, staggering gait, confusion, unconsciousness, coma.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Pre-existing skin disorders.

FIRST AID PROCEDURES

EYE CONTACT: Flush eyes with water 15 minutes. Get medical attention if symptoms develop and persist.
SKIN CONTACT: Flush with water or soap and water for 15 minutes or until all traces have been removed. Seek medical attention if symptoms develop and persist.
INGESTION: Do not induce vomiting. Rinse mouth out with water. Get immediate medical attention.
INHALATION: Remove victim to fresh air and, if needed, immediately begin artificial respiration. Give oxygen if breathing is labored. Get emergency medical help. Contact a physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

SPILL OR LEAK PROCEDURES: Emergency response coordinator must have mandated training. Eliminate all ignition sources. SMALL SPILLS: Pick up with absorbent materials and place in non-leaking containers; seal tightly for proper disposal or reuse. LARGE SPILLS: Evacuate the hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak if safe to do so. Dike and contain. Remove with vacuum trucks or pumps to storage/salvage vessels.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool place away from ignition sources. Store away from oxidizers or materials bearing a yellow "D.O.T." label.

OTHER PRECAUTIONS: Clean up leaks/spills immediately to prevent soil or water contamination.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: If TLV is met or exceeded NIOSH Approved respirator.

VENTILATION: LOCAL EXHAUST - Recommended, SPECIAL - Not necessary,
MECHANICAL - Recommended, OTHER - Not necessary.

PROTECTIVE GLOVES: Chemical resistant gloves.

EYE PROTECTION: Chemical goggles or full face shield.

OTHER PROTECTIVE EQUIPMENT: Boots, aprons, drench showers, eye wash as needed for protection against spills and/or splashes.

WORK HYGIENIC PRACTICES: Avoid contact with skin, eyes, and clothing. After handling this product, wash hands before eating, drinking, or smoking. If contact occurs, remove contaminated clothing. If needed, take first aid action shown in section VI. Launder contaminated clothing before reuse.

STEP #2 ROLLER WASH

SECTION IX - TRANSPORTATION INFORMATION

Shipping Name: Combustible Liquid,N.O.S.,(Petroleum Distillates),NA1993,PGIII
Containers under 119 gallons: Non-Regulated Combustible Liquid,Packaged at or above 100 deg. F., Guide 128

SECTION X - REGULATORY/ENVIRONMENTAL

EPA HAZARDS: ACUTE - Yes CHRONIC - No FLAMMABILITY - Yes
SUDDEN RELEASE OF PRESSURE - No REACTIVE - No

CERCLA RQ: 33,100 based on Xylene NOTICE: V.O.C. DECLINE WITH ADDITIONS OF WATER

SARA Title III
Section 313, Toxic Materials:

Chemical Name	CAS #	Percentage
Xylene	(1330-20-7)	0 - 2%
1,2,4-trimethylbenzene	C95-63-6)	10%

CLEAN AIR ACT: Section 111 CLEAN WATER ACT: Section 311

STATE REQUIREMENTS:

Xylene (CAS# 1330-20-7) and Cumene (CAS# 98-82-8) are regulated by CA, CT, FL, IL, LA, MA, ME, MN, NJ, PA, and RI in various state regulations. Other states may also have special requirements. This product contains less than 1% Cumene.

1,2,4-trimethylbenzene (CAS# 95-63-6) is regulated by CA, MA, MN, NJ, and PA.

Other components of this product may be included in various state regulations.

For details on specific state requirements, contact the appropriate agency in your state.

CALIF. PROP. 65: To the best of our present knowledge, based on information available at the time of this entry, we are not aware of any chemicals present in this product known to the State of California to cause cancer, birth defects, and/or reproductive harm.

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710 Sources of the raw materials used in this mixture assure that all chemical ingredients present are in compliance with Sect. 8(b) Chemical Substance Inventory, or are otherwise in compliance with TSCA.

Footnotes:
NA - Not Applicable ND - Data Not Available CS - Cancer Suspect Agent OX - Oxidizer Cor - Corrosive
CALC - Calculated EST - Estimated STEL - Short Term Exposure Limit
TLV - Threshold Limit Value PEL - Permissible Exposure Limit TWA - Time Weighted Average, 8 hours
HMIS, PPI - Hazardous Material Identification System, Personal Protection Index
The data presented is true and correct to the best of our knowledge and belief, however, neither seller nor preparer makes any warranties, express or implied, concerning the information presented. The user is cautioned to perform his own hazard evaluation and to rely upon his own determinations.

SCIENTIFIC INFORMATION SERVICES
Form essentially the same as OSHA Form 174 dated September 1985
Preparation date: July 15, 1991

Revised By:
TALEM, Inc.
(817) 335-1186

August 1996: Section II: deleted minor component of Naphtha
Section III: revised vapor pressure and VOC
Section X: updated 313 chemicals, added state requirements and the California Proposition 65 Warning
September 1996: Section IX

397 - Section IX - Shipping Name, Guide # - A.G. Layne, Inc.
398 - Section III - Physical/Chemical Characteristics - Vapor Pressure,VOCs data - A.G. Layne, Inc.

High VOC Blanket and Roller Cleaner Used at The Dot Printer

MATERIAL SAFETY DATA SHEET

RESPONSE #000 Page: 1
Revised: February 20, 2003

PRODUCT CODE: 8030008 HMIS CODES: H F R P
1 2 0 X

Blanket Wash

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Day International Chemical Products Div.
ADDRESS : 905 South Westwood Avenue
Addison, Illinois 60101

EMERGENCY PHONE: 800-424-9300 INFORMATION PHONE: 800-336-8276
NAME OF PREPARER: DAY Chemical Prod. Div. DATE PRINTED: 2/20/03
REASON REVISED: Update; Supersedes All Previous Revisions.

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE MM HG @ TEMP		WEIGHT PERCENT
Petroleum Naphtha	64742-47-8	2.8	68°F	53
OSHA PEL: 500ppm TWA, ACGIH TLV: N/E				
Petroleum Naphtha	64742-95-6	2.7	68°F	28
OSHA PEL: N/E, ACGIH TLV: N/E, Mfg: 50ppm				
* 1,2,4-Trimethyl Benzene	95-63-6			11
Dipropylene Glycol Methyl Ether	34590-94-8	0.17	68°F	3
OSHA PEL: 100ppm, ACGIH TLV: 100ppm, STEL: 150ppm				
* Xylenes	1330-20-7			1
Hazardous Air Pollutant				

* indicates toxic chemical(s) subject to the reporting requirements of Section 313 of SARA Title III and of 40 CFR 372. All ingredients are listed on the EPA TSCA inventory.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE/POINT: 315°F - 358°F SPECIFIC GRAVITY (H20=1): .82
VAPOR DENSITY: Heavier than air.
EVAPORATION RATE: Slower than n-Butyl Acetate.
V.O.C. (EPA METHOD 24): 6.6 lb/gl
VAPOR PRESSURE (MM HG @ 20°C): 2.6
SOLUBILITY IN WATER: Emulsible
APPEARANCE AND ODOR: Yellow Liquid - Petroleum Odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 107°F METHOD USED: TAG CC
FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER: 1.0% UPPER: 6.5%

EXTINGUISHING MEDIA:
Foam, Alcohol Foam, CO2, Dry Chemical, Water Fog.

SPECIAL FIREFIGHTING PROCEDURES:
As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved) and full protective gear. Water may not be effective to extinguish fire. Use water spray to cool fire-exposed containers and to protect personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Treat as Petroleum Fire.

SECTION 5 - REACTIVITY DATA

STABILITY:
Stable

CONDITIONS TO AVOID:
Avoid heat, sparks, flame and other sources of ignition.

INCOMPATIBILITY (MATERIALS TO AVOID):
Avoid mixing with strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Burning will produce oxides of carbon and dense smoke.

HAZARDOUS POLYMERIZATION:
Will Not Occur.

SECTION 6 - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Breathing high concentrations of vapors will cause irritation of the nose and throat. Signs of central nervous system depression such as headache, drowsiness, dizziness and nausea may be experienced with overexposure.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Skin and eye contact may cause moderate to severe irritation.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Single prolonged exposure is not likely to result in the product being absorbed through the skin in harmful amounts.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Ingestion of this product will cause nausea, gastro-intestinal irritation, diarrhea and possible damage to vital organs. Follow first aid procedures.

HEALTH HAZARDS (ACUTE AND CHRONIC):
Repeated or abusive breathing of concentrated vapors may affect pulmonary, cardiovascular, and central nervous systems. Repeated skin contact will dry out and crack skin. Aspiration hazard if swallowed; aspiration of product into the lungs can cause chemical pneumonitis.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

This product contains no known carcinogens.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Skin contact may aggravate pre-existing dermatitis. Inhalation of vapors may aggravate pre-existing asthmatic like conditions.

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove victim to fresh air. Give oxygen if breathing is labored. Apply artificial respiration if not breathing. Seek medical help. SKIN: Remove all contaminated clothing and shoes. Wash with soap and water. Do not reuse clothing and shoes until cleaned. EYES: Flush eyes with plenty of water while removing any contact lenses. Hold eyelids open and continue flushing for at least 15 minutes. INGESTION: DO NOT INDUCE vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Seek medical attention immediately.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Eliminate all ignition sources. Spills should be diked and must be kept from entering the sewer. Soak up with absorbent or transfer liquid into a closed container for later disposal. Use spark-proof tools and explosion proof equipment.

WASTE DISPOSAL METHOD:
If this product as supplied, becomes a waste it is regulated by RCRA as Ignitable Waste, EPA I.D. #D001. Suitable methods of disposal include reclamation and fuel blending. Contact a licensed Hazardous Waste Hauler for more information.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Containers should be grounded and bonded before transferring product. Store in the original closed container away from sunlight, excess heat, sparks, flames and other sources of ignition. Avoid skin or eye contact. Avoid breathing vapors. When transferring or using this product, wear proper personal protective equipment. Store and handle as a Combustible Liquid.

OTHER PRECAUTIONS/DOT INFORMATION:
DOT Proper Shipping Name: Combustible Liquid n.o.s. (Naphthol, Hazard Class: Combustible Liquid, ID No.: NA1993, Packing Group: III. Non-bulk packagings not regulated as per 49CFR 173.150 (f)(2). Product is classified as an OSHA Class II Combustible Liquid.

SECTION 8 - CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION:
The use of respiratory protection is advised when concentrations exceed the established exposure limits in SECTION 2. Depending on the airborne concentration, use a respirator with appropriate organic vapor cartridge (NIOSH approved).

VENTILATION:
If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits in SECTION 2, additional general ventilation or local exhaust systems may be required.

PROTECTIVE GLOVES:
Wear solvent resistant gloves made of nitrile or butyl rubber.

EYE PROTECTION:
Wear safety glasses with side shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A personal protective rating of X means you must see your supervisor for guidance. OSHA regulations (29CFR Part 1910, Subpart I) require employers to evaluate Personal Protective Equipment requirements in the workplace.

WORK/HYGIENIC PRACTICES:
Wash with soap and water after product contact with skin.

SECTION 9 - DISCLAIMER

The information on this MSDS is believed to be accurate as of the date shown in SECTION 1. Since the use of this product is not under the control of DAY Chemical Products Division, it is the user's responsibility to determine what constitutes safe usage for particular product. This form may be reproduced in quantities necessary to meet your requirements.

High VOC Cleaner Used at Lithographix

MATERIAL SAFETY DATA SHEET

09/18/96

Tower Products, Inc., 2703 Freemansburg Ave., Easton, PA 18045
Information Telephone Number: 1-800-527-8626 or 610-253-6206
For Chemical Spill Emergency - Call 1-800-424-9300

SECTION 1: PRODUCT INFORMATION

Product Name: 396 U.V. WASH (Premium One-Step Ultraviolet Ink Cleaner)
D.O.T. Designation: Combustible Liquid, N.O.S. (Contains Naphtha, Solvent, Dipropylene Glycol Monomethyl Ether), NA1993, PGIII

SECTION 2: HAZARDOUS COMPONENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENT	CAS No.	%WT.	OSHA* PEL	ACGIH TLV-TWA	OTHER RATINGS	OSHA* STEL
Aromatic Hydrocarbon	64742-95-6	55-65	100ppm	-	-	-
Dipropylene Glycol Monomethyl Ether	34590-94-8	45-55	100ppm	100ppm	-	150ppm

*OSHA data is based on 1993 levels.

SECTION 3: PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 305-340 degrees F.
Specific Gravity: (Water =1) 0.91
Vapor Pressure: (mmHG, calculated) 3.0 at 68 degrees F., 20 degrees C.
Melting Point: N/A
Vapor Density: (Air =1, calculated) <5
Solubility in Water: Negligible
Appearance & Odor: Light colored liquid, petroleum odor
Maximum VOC Content: 7.5 lbs. per gallon (900 grams per liter)
Maximum VOC% : 100% (EPA Method 24)

SECTION 4: FIRE AND EXPLOSION DATA

Flash Point (Tag Closed Cup Method): 115 degrees F.
Flammable Limits (Calculated): LEL: 0.6% UEL: 14%
Extinguishing Media: Use dry chemical or carbon dioxide.
Special Fire-fighting Procedures: Use self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: Combustible liquid. Upon combustion, the product may form carbon monoxide and other organic compounds. Product containers may rupture from vapor pressure when exposed to heat from fire.

SECTION 5: REACTIVITY DATA

WARNING: Spontaneous combustion may occur when solvent soaked combustible materials (paper, cotton, etc.) are allowed to stand in confined areas.
Stability: Stable
Incompatibility: Avoid strong oxidizing agents.
Hazardous Decomposition or Byproducts: Carbon monoxide and other compounds during combustion.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Avoid exposure to high heat sources, electrical and welding arcs and open flame. Also avoid strong oxidizing agents.

SECTION 6: HEALTH HAZARD DATA

Route of Entry: Inhalation, Ingestion, Skin
Health Hazards (Acute): Overexposure may lead to central nervous system depression, leading to headaches, nausea and unconsciousness.
Health Hazards (Chronic): Overexposure in high concentrations may produce central nervous system depression.
Eye Contact: May lead to irritation.
Skin Contact: May lead to dermatitis.
Ingestion: May lead to vomiting.

Signs and Symptoms of Exposure: Overexposure may lead to dizziness, headaches, dermatitis and eye irritation.

Medical Conditions Aggravated by Exposure: Health studies have shown that many petroleum hydrocarbons pose potential health risks that vary from person to person, exposure to liquids, vapors, mists or fumes should be minimized.

Emergency and First Aid Procedures:
For Skin Contact: Flush with large volume of water for at least 15 minutes. Get immediate medical attention if necessary.
For Inhalation: Remove to fresh air. Get immediate medical attention.
For Eye Contact: Flush with large volume of water for at least 15 minutes. Get immediate medical attention.
For Ingestion: Get immediate medical attention. Do not induce vomiting.

SECTION 7: PRECAUTIONS FOR SAFE HANDLING AND USE/REGULATORY INFORMATION
Steps to be taken in case material is released or spilled:
Minor Spills: Absorb material with ground clay, vermiculite, or similar absorbent material, then place into containers for removal.
Major Spills: Dike and contain spill. Eliminate potential sources of ignition, and shut off source of spill if possible. Remove liquid by chemical vacuum, absorbent, or other safe and approved method and place into containers for legal disposal. Flush area with water to remove residue, and remove flushed solutions as above.
Waste Disposal Method: Dispose of all waste in accordance with federal, state and local regulations.

Regulatory Information:
This information may be useful in complying with EPA Regulation 40CFR302 'CERCLA' Section 102 and EPA Regulation 40CFR 372 'SARA 313': This product contains approximately 2.0% cumene, 0.8% ethylbenzene, 2.0% xylene and 12% of 1,2,4 trimethylbenzene.

Precautions to be Taken in Handling and Storing: Ventilation in work area should be sufficient to maintain atmosphere with vapor level below lowest listed TLV in Section 2. If TLV's are exceeded, use a respirator with appropriate NIOSH approved cartridges or supplied air equipment. Keep containers closed when not in use. Combustible liquid--empty containers can be hazardous and contain explosive vapors.

HMIS: Health Hazard: 2 Flammability: 2 Reactivity: 0 Personal Protection: B

SECTION 8: CONTROL MEASURES
Respiratory Protection: Needed if TLV's in Section 2 are exceeded. Use a respirator with appropriate NIOSH approved cartridges or air supplied equipment.
Ventilation: Local and mechanical exhaust recommended. Avoid open electrical sources near product vapor areas.
Protective Gloves: Impervious or chemical resistant gloves (consult safety equipment supplier).
Eye Protection: Splash goggles or faceshield are recommended to protect against potential eye contact.
Other Protective Clothing/Equipment: Safety shoes and aprons recommended.
Work/Hygienic Practices: Do not take internally. Avoid skin contact, and wash skin after using products. Do not eat, drink or smoke in work area. Keep away from children.

High VOC Cleaner Used on Web Press at Anderson

ANCHOR

Anderson Litho - LA
ID# 037601
MSDS
Ref. No.
R-0141

MATERIAL SAFETY DATA SHEET

The Anchor MSDS information provided on this site is updated on a monthly basis and complies with OSHA's Hazard Communication Standard (CFR 1910.1200) and the American National Standards Institute (ANSI) Standard for Material Safety Data Sheets (ANSI Z400.1).

Finished Goods Catalog

7422 - ENVIROWASH(R) 220-AUTO BLANKET/ROLLER WASH

Manufacturer Name

ANCHOR LITHKEMKO, A SUBSIDIARY OF FUJI HUNT

SECTION 1 - COMPANY IDENTIFICATION

Catalog / Sub-assembly Number: 7422
ANCHOR LITHKEMKO, A SUBSIDIARY OF FUJI HUNT
50 Industrial Loop North
Orange Park, FL 32073

TRANSPORTATION EMERGENCIES (24HR)
Inside US/Canada 800-424-9300
Outside US/Canada 703-527-3887
(accepts collect calls)
MEDICAL EMERGENCIES (24HR)
Prosar 877-935-7387
NON-EMERGENCY
EHS Info 904-264-3500
General Info 800-354-2300

FOR INDUSTRIAL USE ONLY.....USE ONLY AS DIRECTED.....DO NOT TAKE INTERNALLY!

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Wt.%	OSHA PEL (mg/m3)	ACGIH (mg/m3)
Aliphatic Hydrocarbon	64742-88-7	10-20%	100ppm	100ppm
Aromatic Hydrocarbon	64742-94-5	5-10%	100ppm	NE
Dipropylene Glycol Monomethyl Ether	34590-94-8	1-5%	100ppm; 150ppm STEL	100ppm; 150ppm STEL
Fatty Acid Ester	TSRN 06-0836 -331-5005	60-80%	NE	NE
Naphthalene	91-20-3	0.1-1%	50; 75 STEL	52; 79 STEL
1,2,4-Trimethylbenzene	95-63-6	0.1-1%	NE	NE

NE=Not Established STEL=Short Term Exposure Limit C=Ceiling Limits

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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Appearance: Clear, amber liquid

Odor: Mild solvent odor

Avoid contact with eyes, skin or clothing. Avoid breathing mist or vapor. Do not swallow. Wear chemical safety goggles & chemical resistant gloves. Wash thoroughly after handling. Keep container closed when not in use. Use only with adequate ventilation. May produce hazardous gases under fire conditions. During emergencies, wear equipment to protect eyes, skin and respiratory tract. Dike or absorb spills to keep material and run-off from entering sewer or waterways. Use water spray to cool containers and disperse vapors. Consult MSDS for additonal information.

HMIS: Health: 2 Flammability: 2 Reactivity: 0 Protection: B
NFPA: Health: 2 Flammability: 2 Reactivity: 0 Spec. Haz.: None

Hazard Rating: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
A = Gloves B = Gloves & Goggles C = Gloves, Goggles & Apron
D = Face Shield, Gloves, Goggles & Apron

UN NO: NA1993
DOT GUIDE: ERG Guide 128
****
Potential Health Effects:
Skin: Contact causes irritation.
Eyes: Causes irritation.
Inhalation: Irritant to respiratory tract and mucous membranes.
Ingestion: Ingestion of product may cause nausea and vomiting.
Conditions aggravated by exposure:
None expected except those associated with acute effects.

SECTION 4 - FIRST AID MEASURES

Eye Contact: Immediately flush with COOL water for 15 minutes. Call a physician.
Skin Contact: In case of skin contact; wash with soap and water for 15 minutes. Call a physician.
Ingestion: In case of ingestion; do not drink water. Do not induce vomiting. Call a physician.
Inhalation: Immediately remove victim to fresh air. Call a physician.

SECTION 5 - FIRE FIGHTING MEASURES

Flammable Properties
Flash Point: 165 deg F TCC
Autoignition Temperature: N/A deg F (CC)
Explosion Limits: Lower: N/A vol.%: Not Tested
Upper: N/A vol.%:
OSHA Class IIIA Combustible Liquid

Extinguishing Media:
Choose extinguishing media suitable for the surrounding materials, such as water spray, dry chemical, alcohol foam or carbon dioxide.
Unsuitable Extinguishing Media:
No restrictions on media based on knowledge of this material.
Fire Fighting Instructions:
Water spray should be used to cool fire exposed containers and to disperse un-ignited vapors. Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus when material has ignited or becomes involved in a fire. Try to remove material containers from fire area if can be accomplished without risk to personnel.

Evacuate area and fight fire from a safe distance. Call your local fire department. Wear positive pressure, breathing apparatus and protect eyes and skin. Use water to cool fire-exposed containers, to protect personnel and to disperse vapors and spills. Fire media run-off can damage the environment. Dike and collect media used to fight fire.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Small Spills:
For small incidental spills and leaks wear chemical safety goggles, and neoprene gloves and apron or coveralls. Isolate area of spill by diking. Stop source of leak. Add dry absorbent. Clean up and place in an approved D.O.T. container and seal. Wash all contaminated clothing before reuse, and discard contaminated leather shoes.

Large Spills:
For larger spills requiring emergency response, neoprene boots and respiratory protection may also be required. Follow OSHA regulations and NIOSH recommendations for respirator use (29 CFR 1910.134 and NIOSH Pub. 87-108) and emergency response (see 29 CFR 1910.120). Isolate area of spill by diking. Stop source of leak. Add dry absorbent. Clean up and place in an approved D.O.T. container and seal. Wash all contaminated clothing before reuse, and discard contaminated leather shoes. Call the emergency telephone number shown on the front of this sheet.

SECTION 7 - HANDLING / STORAGE

Handling:
Avoid contact with eyes, skin or clothing. Avoid breathing mist or vapor. Do not swallow. Wear chemical safety goggles and neoprene gloves and apron. Wash thoroughly after handling. Keep container closed when not in use. Use only with adequate ventilation.

Storge:
Store in a cool, dry, well-ventilated area away from all sources of ignition. Keep containers closed when not in use.

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

Ventilation:
Good general ventilation should be sufficient for most processing operations. Vent work area to ensure airborne concentrations are below the current occupational exposure limits. Ten (10) or more room air changes per hour containing a minimum of 15% fresh air will meet these requirements. Consult ASHRAE 62-1989 for further requirements.

Personal Protective Equipment
Respiratory Protection: If used under normal operating conditions and with adequate ventilation, respiratory protection is not required. However, refer to OSHA 29 CFR 1910.134.

Skin Protection:	Chemical resistant gloves
Eye Protection:	Chemical safety goggles

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, amber liquid
Odor: Mild solvent odor
Change in Physical State:

Boiling Point:	400	deg F	
Melting Point:	N/D	deg F	
Specific Gravity:	0.88		Water=1
Vapour Pressure:	0.20		mmHg @ 20C
Viscosity:	N/A		
Solubility in Water:	Insoluble		
pH Value:	ND		
VOC (lbs/gal):	2.20	(USEPA Method 24)	
	Non-Photochemically Reactive		

SECTION 10 - STABILITY AND REACTIVITY

Hazardous Polymerization:

Hazardous polymerization WILL NOT occur if product is used and stored as directed. Product is stable if used and stored as directed.
Hazardous Decomposition Products:
Oxides of Nitrogen; Oxides of Carbon
Materials and Conditions to Avoid:
Keep containers and liquids away from all potential sources of ignition. Keep away from excess heat. Avoid contact with strong oxidizers, strong acids and strong bases.

SECTION 11 - TOXICOLOGICAL INFORMATION

Product Information
LD50 (oral, rat): >5000 mg/kg
Acute Overexposure:
Skin, eye, mucous membrane and respiratory tract irritant.
Chronic Overexposure:
Prolonged or repeated exposure can cause allergic skin reaction, anemia and weakness.
Ingredient information:
Swallowing of Hydrocarbons can cause lung damage. Repeated exposure to Hydrocarbons can cause dermatitis. Chronic overexposure to Dipropylene Glycol Monomethyl Ether in high concentrations has caused minor kidney and liver damage in laboratory animals. "In vitro" mutagenicity studies of Dipropylene Glycol Monomethyl Ether were negative.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity Data: No Data Available
Chemical Fate Data: No Data Available

SECTION 13 - DISPOSAL CONSIDERATIONS

Hazardous Waste Characteristic:
None
Recommendation:
Dispose of contaminated product, empty containers and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, state and local regulatory agencies to ascertain proper disposal procedures. Discharge of processing effluent to the sewer may require a permit. DO NOT discharge effluent solutions to septic systems.

SECTION 14 - TRANSPORTATION INFORMATION

Ground Shipping Information
Proper Shipping Name: Combustible Liquid, N.O.S. (contains Petroluem Naphtha)
Hazard Class: 3
UN/NA Number: NA1993
Packing Group: PGIII
Air (ICAO/IATA) Shipping Information
Proper Shipping Name: Chemicals, N.O.I., Not D.O.T. regulated.
Hazard Class: None
UN No: None
Packing Group: None
Subsidiary Risk: None
UN/DOT Labels Needed: Combustible
International Maritime Organization (IMO) Additional Shipping Class:
IMDG Code: Not Applicable
Amdt. Code: Amdt. N/A
HTS Code: Not Applicable
Product is labeled in accordance with US D.O.T. 49 CFR.

Further information:

Please call (904) 264-3500 for further D.O.T. information.

SECTION 15 - REGULATORY INFORMATION

**Note: The ingredient information listed in this section is provided for reporting requirements as dictated by USEPA, state and local regulation. If ingredient is listed in this section but not in Section 2, then the concentration of this ingredient is below de minumis (less than 0.1%).

U.S. FEDERAL REGULATIONS:
313 = SARA Title III Section 313 (40 CFR 372 -- Toxic Release Inventory)
355 = SARA Title III Section 302 (40 CFR 355 -- Extremely Hazardous Substance)
302 = SARA Title III Section 304 (40 CFR 302 -- Hazardous Substance List)
CWA = Clean Water Act Priority Pollutants List
CAA = Clean Air Act 1990 Hazardous Air Contaminants
HAP = Clean Air Act - MON Rule - HAPs

Ingredients	CAS Number	313	355	302	CWA	CAA	HAP
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N	N
Aromatic Hydrocarbon	64742-94-5	N	N	N	N	N	N
Dipropylene Glycol Monomethyl Ether	34590-94-8	N	N	N	N	N	N
Fatty Acid Ester	TSRN 06-0836 -331-5005	N	N	N	N	N	N
Naphthalene	91-20-3	Y	N	Y	Y	Y	Y
1,2,4-Trimethylbenzene	95-63-6	Y	N	N	N	N	N

TSCA 12(b) Export Notification

CAS NUMBER	CHEMICAL NAME
628-63-7	N-AMYL ACETATE
131-11-3	DIMETHYL PHTHALATE (DMP)

TOXICITY INFORMATION:
IRC1 = IARC Group 1 Human Carcinogens List
IRC2 = IARC Group 2 Human Carcinogens List (limited human data)
IRC3 = IARC Group 2B Human Carcinogens List (sufficient animal data)
NTP = NTP Known Carcinogens List
OSHA = OSHA Known Carcinogens List

Ingredients	CAS Number	IRC1	IRC2	IRC3	NTP	OSHA
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N
Aromatic Hydrocarbon	64742-94-5	N	N	N	N	N
Dipropylene Glycol Monomethyl Ether	34590-94-8	N	N	N	N	N
Fatty Acid Ester	TSRN 06-0836 -331-5005	N	N	N	N	N
Naphthalene	91-20-3	N	N	N	N	N
1,2,4-Trimethylbenzene	95-63-6	N	N	N	N	N

STATE REGULATIONS:
FL = Florida Hazardous Substance List
MI = Michigan Critical Materials List
NJ = New Jersey Right-To-Know List
MA = Massachusetts Right-To-Know List
MN = Minnesota Hazardous Substance List
PA = Pennsylvania Right-To-Know List

Ingredients	CAS Number	PA	NJ	MN	MI	MA	FL
Aliphatic Hydrocarbon	64742-88-7	N	N	N	N	N	N
Aromatic Hydrocarbon	64742-94-5	N	N	N	N	N	N
Dipropylene Glycol Monomethyl Ether	34590-94-8	Y	Y	Y	N	Y	Y
Fatty Acid Ester	TSRN 06-0836 -331-5005	N	N	N	N	N	N
Naphthalene	91-20-3	Y	Y	Y	Y	Y	Y
1,2,4-Trimethylbenzene	95-63-6	Y	Y	N	N	Y	N

High VOC Cleaner Used on Sheet Fed Presses at Anderson

Lithograph
ID# 037601
MSDS
Ref. No.:
R-0915

MATERIAL SAFETY DATA SHEET

CP-580 HYBRID WASH

Revised: August 29, 2001

PRODUCT CODE: B010057

HMIS CODES: H F R P
2 1 0 X

SECTION 1 - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: VARN PRODUCTS
ADDRESS : 905 S. WESTWOOD AVENUE
ADDISON, ILLINOIS 60101

EMERGENCY PHONE: 800-424-9300
INFORMATION PHONE: 800-336-8276
DATE PRINTED: 08/29/2001
NAME OF PREPARER: Varn Products Co.
REASON REVISED: Custom Product - Supersedes All Previous Revisions.

SECTION 2 - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
* 2-Butoxy Ethanol OSHA PEL: 50ppm SKIN. ACGIH TLV: 20ppm SKIN Hazardous Air Pollutant	111-76-2	0.8 68°F	85
Normal Propyl Alcohol OSHA PEL: 200ppm. ACGIH TLV: 200ppm. STEL: 250ppm	71-23-8	14.5 68°F	15

* Indicates toxic chemical(s) subject to the reporting requirements of Section 313 of SARA Title III and of 40 CFR 372.
All ingredients are listed on the EPA TSCA Inventory.

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE/POINT: 207°F - 340°F
SPECIFIC GRAVITY (H2O=1): 0.89
VAPOR DENSITY: Heavier than air.
EVAPORATION RATE: Slower than n-Butyl Acetate.
V.O.C. (EPA METHOD 24): 7.39 lb/gl
VAPOR PRESSURE (mm Hg @ 20°C): 4.3
SOLUBILITY IN WATER: 100%
APPEARANCE AND ODOR: Clear Liquid - Mild Odor

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 110°F
METHOD USED: TAG CC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.0%
UPPER: 13.5%
EXTINGUISHING MEDIA: Alcohol Foam, CO2, Dry Chemical.

SPECIAL FIREFIGHTING PROCEDURES:
As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved) and full protective gear. Water may not be effective to extinguish fire. Use water spray to cool fire-exposed containers and to protect personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Treat as Petroleum Fire.

SECTION 5 - REACTIVITY DATA

STABILITY:
Stable

CONDITIONS TO AVOID:
Avoid heat, sparks, flame and other sources of ignition.

INCOMPATIBILITY (MATERIALS TO AVOID):
Avoid mixing with strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Burning will produce oxides of carbon and dense smoke.

HAZARDOUS POLYMERIZATION:
Will Not Occur.

SECTION 6 - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Breathing high concentrations of vapors will cause irritation of the nose and throat. Signs of central nervous system depression such as headache, drowsiness, dizziness and nausea may be experienced with overexposure.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Skin and eye contact may cause moderate to severe irritation.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Skin contact will result in absorption and potentially contribute to the overall exposure to the chemical 2-Butoxy ethanol.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Ingredients in this product are toxic. Ingestion may cause nausea, moderate gastro-intestinal irritation, diarrhea and possible damage to vital organs. Follow first aid procedures.

HEALTH HAZARDS (ACUTE AND CHRONIC):
Repeated or abusive breathing of concentrated vapors may effect pulmonary, cardiovascular, and central nervous system. Repeated skin contact will dry out and crack skin.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

This product contains no known carcinogens.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Skin contact may aggravate pre-existing dermatitis. Inhalation of vapors may aggravate pre-existing asthma like conditions.

EMERGENCY AND FIRST AID PROCEDURES:
EYES: Hold eyelids open and flush with water for 15 minutes. Contact physician if irritation persists. SKIN: Wash with soap and water. INGESTION: If victim is fully conscious, induce vomiting as directed by medical personnel. Seek medical attention immediately. INHALATION: Move victim to fresh air. Give oxygen if breathing is labored.

Anderson Lithograph
ID# 037601
MSDS
Ref. NO.:
R-0915

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Eliminate all ignition sources. Spills should be diked and must be kept from entering the sewer. Soak up with absorbent or transfer liquid into a closed container for later disposal. Use spark-proof tools and explosion proof equipment.

WASTE DISPOSAL METHOD:
If this product as supplied, becomes a waste it is regulated by RCRA as Ignitable Waste, EPA I.D. #D001. Suitable methods of disposal include reclamation and fuel blending. Contact a Licensed Hazardous Waste Hauler for more information.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Containers should be grounded and bonded before transferring product. Store in the original closed container away from sunlight, excess heat, sparks, flames and other sources of ignition. Avoid skin or eye contact. Avoid breathing vapors. When transferring or using this product, wear proper personal protective equipment. Store and handle as a Combustible Liquid.

OTHER PRECAUTIONS/DOT INFORMATION:
DOT Proper Shipping Name: Combustible Liquid, n.o.s. (n-propyl alcohol). Hazard Class: Combustible Liquid, UN Number: NA1993, Packing Group: II, Non-Bulk Limited Quantity. Not regulated as per H9CFR 173.150(f)(2). Product is classified as an OSHA Class II Combustible Liquid.

SECTION 8 - CONTROL MEASURES

RESPIRATORY PROTECTION:
The use of respiratory protection is advised when concentrations exceed the established exposure limits in SECTION 2. Depending on the airborne concentration, use a respirator with appropriate organic vapor cartridge (NIOSH approved).

VENTILATION:
If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits in SECTION 2, additional general ventilation or local exhaust systems may be required.

PROTECTIVE GLOVES:
Wear solvent resistant gloves made of butyl or nitrile rubber.

EYE PROTECTION:
Wear safety glasses with side shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A personal protective rating of X means you must see your supervisor for guidance. OSHA regulations (29CFR Part 1910. Subpart I) require employers to evaluate Personal Protective Equipment requirements in the workplace.

WORK/HYGIENIC PRACTICES:
Wash with soap and water after product contact with skin.

SECTION 9 - DISCLAIMER

The information on this MSDS is believed to be accurate as of the date shown in SECTION 1. Since the use of this product is not under the control of Varn, it is the user's responsibility to determine what constitutes safe usage for a particular product. This form may be reproduced in quantities necessary to meet your requirements.

TOTAL P.04

High VOC Cleaner Used at Tedco

LITHO-CHEM, INC.

9441 SANTA FE SPRINGS ROAD, SANTA FE SPRINGS, CA 90670
TEL: 562.946.5537 FAX: 562.946.2333

LC-97

MATERIAL SAFETY DATA SHEET

DATE PREPARED: November 2001 | FOR EMERGENCY:800-424-9300

SECTION I - IDENTIFICATION

PRODUCT	U. V. ROLLER WASH
CODE	LC-97
CHEMICAL FAMILY	Blend of aromatic hydrocarbon and glycol ether solvents with non-hazardous proprietary ingredients.
DOT CLASSIFICATION	Paint related material,3,UN1263,III

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV	CAS NO.
Aromatic hydrocarbons	30-60	100	64742-95-6
Glycol ether	30-60	100	3459-94-8

HEALTH	FIRE	REACTIVITY	PERSONAL
2	2	0	B

PROTECTION

HAZARD RATING
LEAST = 0 SLIGHT = 1
MODERATE = 2 HIGH = 3
EXTREME = 4

SECTION III - PHYSICAL PROPERTIES

BOILING POINT	351 °F
PARTIAL PRESSURE (mmHg@20°C)	2.3
DENSITY (Lbs/Gal)	7.5
SPECIFIC GRAVITY	0.91
SOLUBILITY IN WATER	Appreciable
APPEARANCE AND ODOR	Clear, lavender liquid with a mild odor
VOLATILE ORGANIC COMPOUNDS (VOC)	6.7 lb/gal (799 gm/l) EPA Method 24

SECTION IV - FIRE AND EXPLOSION HAZARDS

FLASH POINT (TCC)	110°F
EXPLOSIVE LIMITS IN AIR (% BY VOLUME)	LL=1.0% UL=14.0%
EXTINGUISHING MEDIA	Alcohol resistant foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing
UNUSUAL FIRE AND EXPLOSION HAZARD	Material is highly volatile. Vapors may travel at ground level and be ignited by pilot lights, sparks, heaters, electrical motors, etc.

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL Not established
THRESHOLD VALUE Not established
EFFECTS OF OVEREXPOSURE:

EYES: Exposure to liquid or vapor causes eye irritation. Symptoms may include stinging, tearing, redness and swelling.

SKIN: Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying, cracking and skin burns. Pre-existing skin disorders may be aggravated by exposure to this material. Absorption is possible but harmful effects are not expected from this route of exposure under normal conditions of handling and use.

BREATHING: Exposure to vapors or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits. Symptoms of exposure may include:

-Irritation of nose, throat, respiratory tract

-Pre-existing lung disorders, e.g. asthma-like conditions, may be aggravated by exposure to this material resulting in cough, central nervous system (CSN) depression (dizziness, weakness, drowsiness, fatigue, nausea, headache, unconsciousness) and other CNS effects (coma).

SWALLOWING: Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Symptoms may include: throat irritation, gastrointestinal irritation (nausea, vomiting, diarrhea), central nervous system depression (dizziness, weakness, fatigue, nausea, headache, unconsciousness), high blood sugar, coma. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

FIRST AIDE:
If on skin: Remove contaminated clothing, wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before re-use.
If in eyes: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes with water for at least 15 minutes while holding eyelids apart. If symptoms persist, seek medical attention.
If swallowed: DO NOT INDUCE VOMITING. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with head down. Seek medical attention. If possible, do not leave individual unattended.
If breathed: If symptoms develop, immediately move individual away from exposure and into fresh air. Seek medical attention. Keep individual warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

NOTE TO PHYSICIAN This material (or a component) has produced hyperglycemia and ketosis following substantial ingestion.

PRIMARY ROUTES OF ENTRY: Inhalation, skin absorption, skin contact, eye contact.
EFFECTS OF CHRONIC EXPOSURE: This material (or a component) shortens the time of onset or worsens the liver and kidney damaged induced by other chemicals. This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies; harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain. Overexposure to this material (or it's components) has been suggested as a cause of the following effects in laboratory animals and may aggravate pre-existing disorders if these organs in humans: mild, reversible liver effects and mild, reversible kidney effects.

SECTION VI - REACTIVITY DATA

STABILITY Stable under normal conditions of storage and handling
INCOMPATIBLE MATERIALS Avoid contact with strong oxidizing agents and strong acids
HAZARDOUS POLYMERIZATION Cannot occur

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL

Small spill: Absorb liquid on vermiculite, floor absorbent, or other absorbent material and transfer to hood

Large spill: Eliminate all ignition sources (flares, flames, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent spill from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to approved containers for disposal.

WASTE DISPOSAL METHOD

Small spill: Dispose of in accordance with all local, state and federal regulations

Large spill: Dispose of in accordance with all local, state and federal regulations

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION If workplace exposure limit(s) of product (or a component) is exceeded (see Section II), a NIOSH/MSHA air supplied respirator is advised. In absence of proper environmental control, OSHA regulation also permits other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

VENTILATION Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure levels below TLV's (see Section II) or to below level of overexposure (from known, suspected or apparent adverse effects).

PROTECTIVE GLOVES Wear resistant gloves (consult safety equipment supplier).

EYE PROTECTION Chemical splash goggles in compliance with OSHA regulations are advised. However, OSHA regulations also permit other types of safety glasses (consult safety equipment supplier).

OTHER PROTECTIVE EQUIPMENT To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Containers of this material may be hazardous when emptied since emptied containers retain product residues (vapor, liquid and/or solids). All hazard precautions given in this sheet must be observed.

WARNING!!! Sudden release of hot organic vapors or mists from processor equipment operating at elevated temperatures and pressures, or sudden ingress of air into vacuum equipment may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product at elevated process temperatures should be thoroughly evaluated to establish and maintain safe operating conditions.

High VOC Cleaner Used at Huhtamaki

MATERIAL SAFETY DATA SHEET

WASH EB Page: 1

PRODUCT NAME: WASH EB
PRODUCT CODE: B111
CHEMICAL NAME: BLANKET AND ROLLER WASH

HMIS CODES: H F R P
2 2 0 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS : 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE : 1-800-424-9300
INFORMATION PHONE : 1-973-589-7800

LAST REVISION : 06/25/97
DATE REVISED : 03/17/99
PREPARER : ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
* 2-BUTOXYETHANOL	111-76-2	0.6 mmHg 20 C	80 - 90%
PEL 25ppm: TLV 25ppm // LD50 1.746g/kg: LC50 400ppm/4hr // HAP reportable			
n-PROPYL ALCOHOL	71-23-8	15mmHg 20 C	10 - 20%
PEL 200PPM: TLV 200PPM // LD50 1.87g/kg: LC50> 20000ppm/hr			

* Indicates chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : 204 F
VAPOR DENSITY : 3.7 (air = 1)
DRYING RATE : 0.3(nButyl Acet.=1)
PHOTOREACTIVE : NO
VOLATILES : 100%
PHYSICAL STATE : LIQUID

SPECIFIC GRAVITY (H2O=1): 0.88
VAPOR PRESSURE : 4.1 mmHg at 20 C
VOC : 7.36 lb/gal METHOD: EPA @24
H2O SOLUBILITY : 100%
APPEARANCE : CLEAR
ODOR : ALCOHOL ODOR

1 lb/Gal = 120 gm/L

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 105 F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.1 **UPPER:** 13.5
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED, THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED, GENERATE A FIREBALL.

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS: .
INCOMPATIBILITY (MATERIALS TO AVOID): YES
IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA, VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
EYE CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS, ITCHING. IRRITATION ON OVEREXPOSURE.
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SEVERE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA.

EMERGENCY AND FIRST AID PROCEDURES
IF IN EYES: FLUSH WITH WATER FOR 15 MIN. LIFT UPPER AND LOWER EYE LIDS. SEE A DOCTOR.
IF ON SKIN: WASH WITH SOAP AND WATER.
IF INHALED: REMOVE TO FRESH AIR. IF UNCONSCIOUS, USE ARTIFICIAL RESPIRATON.
IF INGESTED: DO NOT INDUCE VOMITING. SEE DOCTOR IMMEDIATELY TO PUMP STOMACH.
HEALTH HAZARDS (ACUTE AND CHRONIC):

MATERIAL SAFETY DATA SHEET

WASH EB

EFFECT OF CHRONIC EXPOSURE: NONE
EFFECT OF ACCUTE EXPOSURE: NONE
IN ALL CASES OF EMERGENCY AND FIRST AID, WE STRONGLY RECOMMEND A DOCTOR BE SEEN

CARCINOGENICITY: NTP CARCINOGEN: No **IARC MONOGRAPHS:** No **OSHA REGULATED:** No
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: DERMATITIS MAY AGGRAVATE EXISTING LIVER AND KIDNEY AILMENTS.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: VENTILATE AREA. KEEP AWAY FROM STRONG OXIDIZERS. HEAT, SPARKS OR OPEN FLAMES. PREVENT SPILL FROM SPREADING BY USING AN INERT MATERIAL, SUCH AS SAND, AS A DAM. KEEP OUT OF ALL WATERWAYS OR WATER DRAINS. DO NOT FLUSH AREA WITH WATER. FOR SMALL SPILLS USE ABSORBENT PADS. FOR LARGE SPILLS, CALL A SPILL RESPONSE TEAM. IF REQUIRED, CONTACT STATE/LOCAL AGENCIES.
WASTE DISPOSAL METHOD: PRODUCT SOAKED ABSORBENT SHOULD BE PLACED IN SEALED METAL DRUMS FOR DISPOSAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP AWAY FROM STRONG OXIDIZERS, HEAT, SPARKS AND OPEN FLAMES. DO NOT CUT OR DRILL INTO AN EMPTY CONTAINER IN ANY WAY THAT MIGHT GENERATE A SPARK. SOLVENT RESIDUE IN THE CONTAINER COULD IGNITE AND CAUSE AN EXPLOSION. KEEP CONTAINER TIGHTLY CLOSED AND OUT OF THE WEATHER.
OTHER PRECAUTIONS: WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT. DISPOSAL OF CONTAINERS SHOULD BE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS. "EMPTY" DRUMS SHOULD NOT BE GIVEN TO INDIVIDUALS.

SECTION VIII - CONTROL MEASURES

EXPOSURE CONTROL AND PERSONAL PROTECTION:
RESPIRATORY PROTECTION: IF TLV IS EXCEEDED USE A GAS MASK WITH APPROPRIATE CARTRIDGES, CANISTER OR SUPPLIED AIR EQUIPMENT.
VENTILATION: IF NORMAL VENTILATION IS INADEQUATE USE ADDITIONAL SYSTEMS,ESPECIALLY LOCAL VENTILATION. IF THE VAPOR LEVEL CAN APPROACH THE LEL - LOWER EXPLOSION LIMIT, USE EXPLOSION PROOF SYSTEMS.
PROTECTIVE GLOVES: USE SOLVENT RESISTANT GLOVES.
EYE PROTECTION: USE SAFETY GLASSES OR GOGGLES.
OTHER PROTECTIVE EQUIPMENT OR CLOTHING: NONE.
WORK/HYGIENIC PRACTICES: WASH SKIN/CLOTHES IF THEY COME IN CONTACT WITH THE PRODUCT. DO NOT WEAR CLOTHING WET WITH THE PRODUCT.

SECTION IX - SHIPPING INFORMATION

GROUND SHIPMENT. UN No : NA 1993
D.O.T HAZARD CLASSIFICATION: COMBUSTIBLE LIQUID- N.O.S.

SECTION X - DISCLAIMER

THE INFORMATION AND RECOMMENDATIONS HEREIN HAVE BEEN COMPILED FROM OUR RECORDS AND OTHER SOURCES BELIEVED TO BE RELIABLE. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE BY PRINTERS' SERVICE AS TO THE SUFFICIENCY OF ANY REPRESENTATION. THE ABSENCE OF DATA INDICATES ONLY THAT THE DATA IS NOT READILY AVAILABLE TO US. ADDITIONAL SAFETY MEASURES MAY BE REQUIRED UNDER PARTICULAR OR EXCEPTIONAL CONDITIONS OF USE. WITH REGARD TO THE MATERIALS THEMSELVES, PRINTERS' SERVICE MAKES NO WARRANTY OF ANY KIND WHATEVER, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

PRINTERS SERVICE

MATERIAL SAFETY DATA SHEET

E-CURE CLASSIC CA

PRODUCT NAME: E-CURE CLASSIC CA
PRODUCT CODE: R149
CHEMICAL NAME: BLANKET AND ROLLER WASH

Page: 1

RMCS CODES: H F R P
2 2 0 8

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS: 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE: 1 800 424 9300
INFORMATION PHONE: 1 973 589-7800

LAST REVISION:
DATE REVISED: 04/10/02
PREPARER: ENVIRONMENTAL DEPT.

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
* 2-BUTOXYETHANOL	111-76 2	0.8 mmHg 20 C	70 - 80%
PFT: 25ppm TLV 25ppm // LC50 450ppm/4hr LD50 1.746g/kg // IMP reportable			
ACETONE, ALCOHOL	172-42 2	1 mmHg 20 C	10 - 20%
PFT: 50ppm TLV 500ppm // LD50 0.5 kg/kg			

* Indicates chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 212 - 336 F
VAPOR DENSITY: 2.22 (air = 1)
DRYING RATE: 0 (Butyl Acet. 1)
FLAMMABLE: No
VOLATILES: 100%
PHYSICAL STATE: Liquid
SPECIFIC GRAVITY (H2O=1): 0.93
VAPOR PRESSURE: 9.47 mmHg@0.66 (MM) at 20 C
VOC: 0.06 lb/gal METHOD: EPA 24
H2O SOLUBILITY: Miscible
APPEARANCE: Clear
ODOR: Mild

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 126 F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.1 UPPER: 10.6
EXTINGUISHING MEDIA: CARBON DIOXIDE FOAM OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES: APPLY CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED, THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED, GENERATE A FIREBALL

SECTION V - REACTIVITY DATA

STABILITY: YES IF NO CONDITIONS:
INCOMPATIBILITY (MATERIALS TO AVOID): YES
IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

SECTION VI - HEALTH HAZARD DATA

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONSCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE
SKIN CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS, ITCHING, IRRITATION ON OVEREXPOSURE
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SEVERE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA
EMERGENCY AND FIRST AID PROCEDURES
IN EYES: FLUSH WITH WATER FOR 15 MIN. LIFT UPPER AND LOWER EYELIDS. SEE A DOCTOR
ON SKIN: WASH WITH SOAP AND WATER
INHALED: REMOVE TO FRESH AIR. IF UNCONSCIOUS, USE ARTIFICIAL RESPIRATION
IF INGESTED: DO NOT INDUCE VOMITING. SEE DOCTOR IMMEDIATELY. IF PUKE STOMACH

MATERIAL SAFETY DATA SHEET

S-CURE CLASSIC CR

HEALTH HAZARDS (ACUTE AND CHRONIC):
EFFECT OF CHRONIC EXPOSURE: PROLONGED HIGH VAPOR EXPOSURE MAY CAUSE LIVER AND KIDNEY PROBLEMS.
EFFECT OF ACCUTE EXPOSURE: NONE
IN ALL CASES OF EMERGENCY AND FIRST AID, WE STRONGLY RECOMMEND A DOCTOR BE SEEN

CARCINOGENICITY: NTP CARCINOGEN: No **IARC MONOGRAPHS:** No **OSHA REGULATED:** No
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: DERMATITIS, EXISTING LIVER AND KIDNEY AILMENTS

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: VENTILATE AREA. KEEP AWAY FROM STRONG OXIDIZERS, HEAT, SPARKS OR OPEN FLAMES. PREVENT SPILL FROM SPREADING BY USING AN INERT MATERIAL, SUCH AS SAND, AS A DAM. KEEP OUT OF ALL WATERWAYS OR WATER DRAINS. DO NOT FLUSH AREA WITH WATER. FOR SMALL SPILLS USE ABSORBENT PADS. FOR LARGE SPILLS CALL A SPILL RESPONSE TEAM. IF REQUIRED CONTACT STATE/LOCAL AGENCIES.
WASTE DISPOSAL METHOD: PRODUCT SOAKED ADSORBENT SHOULD BE PLACED IN SEALED METAL DRUMS FOR DISPOSAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP AWAY FROM STRONG OXIDIZERS, HEAT, SPARKS AND OPEN FLAMES. DO NOT CUT OR DRILL INTO AN EMPTY CONTAINER IN ANY WAY THAT MIGHT GENERATE A SPARK. SOLVENT RESIDUE IN THE CONTAINER COULD IGNITE AND CAUSE AN EXPLOSION. KEEP CONTAINER TIGHTLY CLOSED AND OUT OF THE WEATHER.
OTHER PRECAUTIONS: WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT. DISPOSAL OF CONTAINERS SHOULD BE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS. "EMPTY" DRUMS SHOULD NOT BE GIVEN TO INDIVIDUALS.

SECTION VIII - CONTROL MEASURES

EXPOSURE CONTROL AND PERSONAL PROTECTION:
RESPIRATORY PROTECTION: IF TLV IS EXCEEDED USE A GAS MASK WITH APPROPRIATE CAPABILITIES. CANNISTER OR SUPPLIED AIR EQUIPMENT.
VENTILATION: IF NORMAL VENTILATION IS INADEQUATE USE ADDITIONAL SYSTEMS ESPECIALLY LOCAL VENTILATION. IF THE VAPOR LEVEL CAN APPROACH THE LEL - LOWER EXPLOSION LIMIT, USE EXPLOSION PROOF SYSTEMS.
PROTECTIVE CLOTHS: USE SOLVENT RESISTANT GLOVES
EYE PROTECTION: USE SAFETY GLASSES OR GOGGLES.
OTHER PROTECTIVE EQUIPMENT OR CLOTHING: NONE.
WORK/HYGIENIC PRACTICES: WASH SKIN/CLOTHES IF THEY COME IN CONTACT WITH THE PRODUCT. DO NOT WEAR CLOTHING WET WITH THE PRODUCT.

SECTION IX - SHIPPING INFORMATION

GROUND SHIPMENT.
D.O.T HAZARD CLASSIFICATION: COMBUSTIBLE LIQUID- N.O.S. UN No : NA 1993

SECTION X - DISCLAIMER

THE INFORMATION AND RECOMMENDATIONS HEREIN HAVE BEEN COMPILED FROM OUR RECORDS AND OTHER SOURCES BELIEVED TO BE RELIABLE. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE BY PRINTERS' SERVICE AS TO THE SUFFICIENCY OF ANY REPRESENTATION, THE ABSENCE OF DATA INDICATES ONLY THAT THE DATA IS NOT READILY AVAILABLE TO US. ADDITIONAL SAFETY MEASURES MAY BE REQUIRED UNDER PARTICULAR OR EXCEPTIONAL CONDITIONS OF USE. WITH REGARD TO THE MATERIALS THEMSELVES, PRINTERS' SERVICE MAKES NO WARRANTY OF ANY KIND WHATEVER, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

Low-VOC Cleaners Used and Tested at Participating Facilities

Low-VOC Cleaner Used at Los Angeles Times

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA'S Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety & H Adm.
(Non Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list) SUPER CLEAN BW

SECTION I

Manufacture's Name:
SUPER CHEM CORP.

Emergency Telephone Number:
(714) 995-5988

Address:
2635 W. Woodland Drive
Anaheim, CA 92801

Telephone Number For Information:
(714) 995-5988

Date Prepared: Revised: March 11, 2001

Signature Of Prepared: (Optional)

SECTION II - HAZARDOUS INGREDIENTS / IDENTIFY INFORMATION

Hazardous Components Specific Chemical Identity; Common Names	OSHA	ACGIH TLV	Other Limits Recommended	% Optional
Etylphenoxypolyethoxy - Ethanol				
CAS # 9036-19-5	None	None		
D-Limonene				
CAS # 5989-27/5	None	None		

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point:	>200F	Specific Gravity (H20 = 1):	0.96
Vapor Pressure (mm Hg):	20C	Melting Points:	NA
Vapor Density (AIR = 1):	N.E.	Evaporation Rate (Butyl Acetate = 1):	<1
Solubility in water :	Emulsifiable	VOC: 3.65 lb per gal	495 gm per liter
Appearance and Odor:	Blue Green Clear Liquid with Citrus Odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used):	180F	Flammable Limits.	LEL: 0.7 UEL: 6.1
Extinguishing Media:	Class B fires: Foam Co2 or Dry Compound		
Special Fire Fighting Procedures:	If confined in a container, cool exterior with water spray		
Unusual Fire and Explosion Hazards:	Dense black smoke produced		

SECTION V - REACTIVITY DATA

Stability:	Unstable:		Conditions to avoid:
	Stable:	XX	High heat & direct sunlight
Incompatibility (Materials to avoid):		Oxidizing agents, acids, peroxides, halogens	
Hazardous Decomposition or Byproducts:			
Hazardous Polymerization:	May Occur:		Conditions to avoid:
	Will Not Occur:	XX	High temp. contact w/reactive monomer

SECTION VI - HEALTH AND HAZARD DATA

Route of Entry:	Inhalation	Skin	Ingestion
Health Hazards (Acute & Chronic):	Over exposure my irritate eyes and mucus membranes, may cause localized itching on skin		
Carcinogenicity:	NTP?: No	IARC Monographs?:	No
	OSHA Regulated?: NO		
Signs & Symptoms of Exposure:	Slight irritation or itching		
Medical Conditions Generally Aggravated by Exposure:	None Known		

Emergency & First Aid Procedures:
Flush eyes with water for at least 15 minutes and wash from skin with soap and water. If irritation persists see a physician. See Physician if ingested.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled:
Keep open flames and sparks away. Contain and absorb with sand or earth

Waste Disposal Method:	Dispose spent absorbent in sealed containers in accordance to Federal, State and Local regulations.
Precautions to be Taken in Handling & Storage:	Store in cool well ventilated place away from reactive chemicals, spark sources & open flames, Keep containers closed.

SECTION VIII - CONTROL MEASURES

Respiratory Protection (specify type): None

Ventilation:

Local Exhaust:	Adequate	Special:	None
Mechanical (general):	Recommended	Other:	

Protective Gloves.	Rubber Gloves	Eye Protection:	Safety Glasses
Protective Clothing or Equipment:	Synthetic apron and boots		
Work/Hygienic Practices:	Safety shower & Eye wash should be nearby		

Low-VOC Daraclean 236 Cleaner Tested at Los Angeles Times

MAGNAFLUX®

A Division of Illinois Tool Works Inc.

MATERIAL SAFETY DATA SHEET

DARACLEAN® 236

1. **IDENTIFICATION**

Company:	MAGNAFLUX
Address:	3624 West Lake Avenue, Glenview, Illinois 60025
Telephone No.:	(847) 657-5300 (Off-Hour Emergency Number - CHEMTREC - 1-800-424-9300)
Product Use:	Aqueous alkaline cleaner
Packages:	5 gallon pail, 55 gallon drum
NFPA Rating:	Health 2, Flammability 0, Reactivity 0
PIN:	None
Revision Date:	October 23, 2001

2. **INGREDIENTS**

Hazardous Ingredients	CAS Number	% by Weight	OSHA PEL*	ACGIH TLV**
Triethanolamine	102-71-6	1 – 5	Not available	Not available

This product contains no hazardous chemical substances at 1.0% or more listed in 29 CFR 1910 Subpart Z, or ACGIH Threshold limit Values. Also this product contains no carcinogens at 0.1% or more listed in NTP Annual Report on Carcinogens, IARC Monographs, or 29 CFR 1910 Subpart Z

3. **HAZARDS IDENTIFICATION**

EMERGENCY OVERVIEW
Bland, nonflammable, thin liquid which may irritate the skin and eyes.

Signs & Symptoms of Acute Exposure

Inhalation: Irritation may occur if material becomes airborne.

Eyes: Irritation upon direct contact.

Skin: Irritation upon direct contact.

Ingestion: None known.

4. **FIRST AID**

Skin Contact: Wash off with soap and water. Use soothing lotion.
Eyes: Rinse carefully under upper and lower eyelids using plenty of water.
Inhalation: Remove to fresh air.
Ingestion: If conscious, dilute by giving 2 glasses of water. Call physician or local poison control center immediately.
NOTE: In all severe cases, contact physician immediately. Local telephone operators can furnish number of regional poison control center.

5. **FIRE HAZARD**

Conditions of flammability: None
Flash point: None to boiling
Flammable limits in air: None
Extinguishing media: Carbon Dioxide, dry chemical, foam. Avoid water if possible. *Special fire fighting procedures:* None
Hazardous combustion products: Combustion will result in the release of the usual decomposition products including oxides of carbon and nitrogen
Unusual fire hazards: None

6. **ACCIDENTAL RELEASE MEASURES**

For Small Spills: Wipe up, or absorb with sand or other absorbent material. Collect waste in sealed containers.
For Large Spills: Dike area to prevent spreading. Shovel or pump to drum or salvage tank. Absorb residual material with sand, or other absorbent material. Wash area with soapy water and rinse. Area will be slippery until cleaned.

Dispose of all product wastes and water rinses in accordance with current local, state, and Federal regulations.

7. **HANDLING AND STORAGE**

-Does not normally become airborne; in operations where it does, if general ventilation or local exhaust is inadequate, persons exposed to mists should wear approved breathing devices.
-Wear neoprene gloves if direct contact likely; wear eye protection.
-Store product at 40-100°F in a well-ventilated area.
-Do not mix with nitrites or nitrite containing compounds (49 FR 24858, 6/14/84).

8 **EXPOSURE CONTROLS/PERSONAL PROTECTION**

Respiratory protection:	None
Ventilation:	Mechanical (general) sufficient
Protective gloves:	Recommended (rubber)
Eye protection:	Recommended
Work/hygienic practices:	Avoid breathing spray mist

9 **PHYSICAL PROPERTIES**

Initial boiling point (b.p.):	212°F approx.	*Vapor pressure:*	18 mm Hg @ 20°C
Percent volatile:	Not Established	*Vapor density:*	None established
Density/sp. gravity:	1.0 approx.	*Evaporation rate:*	1.0 (water = 1.0)
Water solubility:	100%	*Appearance:*	Colorless to pale yellow slightly hazy liquid
pH of concentrate:	7.5		

10 **STABILITY AND REACTIVITY**

Stability:	Stable
Incompatibility:	None
Hazardous decomposition products:	None
Reactivity:	None

11 **TOXICOLOGICAL INFORMATION**

Carcinogenicity:	Contains no known or suspected carcinogens listed with OSHA, IARC, NTP, or ACGIH.
Threshold limit value:	Not established.
WHMIS information (Canada):	According to available information, the ingredients have not been found to show reproductive toxicity, teratogenicity, mutagenicity, skin sensitization, or synergistic toxic effects with other materials.

12 **ECOLOGICAL INFORMATION**

No data is available. It dissolves in to water and is biodegradable. Its low vapor pressure may exempt it from VOC restrictions.

13 **DISPOSAL**

Dispose according to Federal, State and Local laws and 40 CFR.

RCRA:	Not a hazardous waste
U.S. EPA Waste Number:	None

14 **TRANSPORTATION**

U.S. DOT: 49 CFR 172.101 Hazardous Materials Table

	Bulk
Proper shipping name:	Not regulated
Hazard class or division:	None
Identification No.:	None
Packing Group:	None

15 **REGULATORY INFORMATION**

TSCA:	All ingredients are listed in TSCA inventory.
CERCLA:	Not reportable
SARA TITLE III, Section 313:	Contains nothing on this list.
California Proposition 65:	Contains nothing on this list.
WHMIS Class (Canada):	Not a controlled product.

Note: This MSDS has been prepared to meet WHMIS (Canada) requirements with the exception of using 16 headings.

16 **OTHER INFORMATION**

Revision Statement:	New format
Supersedes:	April 6, 2001
Prepared by:	Tamie Simmons, R&D Manager

Low-VOC ES-219 Cleaner Tested at Los Angeles Times

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Trade Name: 219-ES Ester Emulsion
Generic Name: Water Based Emulsion Cleaner

CAS #: Proprietary Blend

Manufacturer: Sieberi, Inc.
Address: 8134 West 47th Street
City: Lyons State: IL Zip: 60534

Emergency phone#: (800) 535-5053
Technical phone#: (708) 442-2010

DOT Hazard Classification: Not Regulated
NFPA Codes: Health - 0 Flammability - 0 Reactivity - 0
HMIS Codes: Health - 1 Flammability - 0 Reactivity - 0 Personal Protection - B

II. HAZARDOUS INGREDIENTS

If present, IARC, NTP, and OSHA carcinogens and chemicals subject to the reporting requirements of SARA Title III Section 313 are identified in this section.

Ingredient Name	CAS Number	%wt	TLV	STEL	SARA TITLE III
Fatty esters	Various	20 to 25	None established	None established	No
Surfactants	Various	15 to 30	None established	None established	No
Coco amide	68603-42-9	5 to 15	None established	None established	No

References: 29CFR 1910.1000, ACGIH "Threshold Limit Values for Chemicals in the Workplace", National Toxicology Program Annual Report, International Agency for Research on Cancer Monographs, and 40CFR Part 372. All components of this product are in compliance with TSCA.

III. PHYSICAL DATA

Boiling Point @ 760 mm Hg:	308 - 335°F
Vapor Pressure @ 80°F:	<0.1 mm Hg
Specific Gravity @ 68°F:	0.92
Water Solubility (%):	Soluble
Specific Vapor Density (air=1):	<1.0
% Volatile by Volume:	53.0
% Volatile Organic Compound(s):	<1.0
Appearance:	Clear golden liquid
Odor:	Typical organic odor

IV. FIRE AND EXPLOSION DATA

Flash Point (Method): >300°F (TCC)
Explosive Limit: LEL - N/E UEL - N/E
Extinguishing Media: Water fog, carbon dioxide, or dry chemical.
Special Fire Fighting Procedures: Wear self-contained breathing apparatus when fighting chemical fires.
Unusual Fire and Explosion Hazards: Fine sprays/mists may be combustible at temperatures below normal flash point. Rags soaked with material, stored for a long period while mixed with strong alkali or acidic materials, may smolder, then smoke, and may even ignite.

V. HEALTH HAZARD DATA

Eyes - May cause temporary irritation, redness, tearing, blurred vision. Contact lenses must not be worn when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin - Prolonged or repeated contact may cause irritation.
Breathing - Excessive inhalation of vapors may cause nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.
Swallowing - Can cause gastrointestinal irritation, nausea, vomiting, and diarrhea.

First Aid/Emergency Procedures

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet and get medical attention.
Skin Contact: Wash thoroughly with soap and water. Remove contaminated clothing. Launder contaminated clothing before re-use.
Eyes: Flush with copious amounts of water. Get medical attention.
Ingestion: Do not induce vomiting. If large quantity is swallowed, give lukewarm water (pint). NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get medical attention immediately. Risk of damage to lungs exceeds poisoning risk.
Primary Entry Route(s): Inhalation, skin contact.
Chronic Health Effects: Chronic overexposure may aggravate existing skin, eye and lung conditions.

VI. REACTIVITY DATA

Stability: Stable. Hazardous Polymerization: Cannot occur.
Incompatibilities: Avoid contact with strong oxidizing materials, strong alkalies, strong mineral acids.
Hazardous Decomposition Products: Carbon mono/di oxides.
Conditions to Avoid: None

VII. SPILL OR LEAK PROCEDURES

Procedures for Spill/Leak:
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks, etc.).
Small Spill - Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to a recovery drum.
Large Spill - Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into recovery drums. Prevent run-off to sewers, streams or others bodies of water. Notify proper authorities, as required, that a spill has occurred.
Waste Management:
Landfill solids at permitted sites. Use registrated transporters. Burn concentrated liquids at permitted sites. Avoid flameouts. Assure emissions comply with applicable regulations. Dilute aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection:
If workplace exposure limit(s) of product is exceeded, a NIOSH/MSHA approved air supplied respirator is advised in the absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.
Ventilation: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain minimum exposure.
Eye Protection: Chemical Splash Proof Goggles and full face shield are advised for operations where eye or face contact can occur.
Gloves: Wear impervious gloves.
Other Protective Equipment: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

IX. SPECIAL PRECAUTIONS

Special Handling/Storage:

To avoid skin contact and ingestion, wash hands and face well before eating or smoking. Do not permit food in work area. Avoid breathing mists if generated. Store at room temperature. Reseal container when not in use. Do not store near acids, bases or flammable liquids. Containers of this material should be rinsed when emptied, since emptied containers retain product residues (vapor, liquid, and/or solid). All hazard precautions given in this data sheet must be observed.

As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

Date revised: 03/22/2002
jpm

Low-VOC Mirachem Pressroom Cleaner Tested At Los Angeles Times and Used at the San Bernardino Sun

HIGH PERFORMANCE MIRACHEM®

A division of

Material Safety Data Sheet

MIRACHEM. Pressroom Cleaner (Formulation No. 2501)

Section I - General

Manufacturer Name:	The Mirachem Corporation P.O. Box 27608 Tempe, Arizona 85285-7608	Date Prepared: Revision Date:	7/3/96
Emergency Phone:	1-(800) 847-3527		

Section II - Hazardous Ingredients/Identity Information

Hazardous Component (CAS #)	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
None				

N.E. = None Established

Section III - Physical/Chemical Characteristics

Boiling Point:	>210°F	Specific Gravity (H_2O = 1):	0.9957
Vapor Pressure (mm Hg.): @ 20°C	Composite 0.006	pH:	8.7-9.5
Vapor Density (AIR =1):	> 1	Evaporation Rate (Butyl Acetate=1):	> 1
Solubility in Water:	Complete	Melting Point:	N/A

Appearance and Odor: Clear liquid with a mild citrus odor

N/A = Not Applicable N.E. = Not Established

Section IV - Fire and Explosion Hazard

Flash Point (Method Used):	>212°F (PMCC ASTM D93)	Explosive Limits:	N/A
Extinguishing Media:	N/A		
Special Fire Fighting Procedures:	N/A	Unusual Fire Fighting and Explosion Hazards:	N/A

Section V - Reactivity

Stability:	Unstable		Incompatibility (Materials to Avoid):	Strong Acids and Alkalies. demulsify product.
	Stable	X		
Hazardous Decomposition or By-products:		Thermal decomposition may produce CO_2		
Hazardous Polymerization:		May Occur		Will Not Occur X

Section VI - Health Hazard Data

Eye Contact:	May cause mild temporary irritation.
Skin Contact:	Prolonged or repeated exposure may cause mild irritation.
Inhalation:	No adverse effects expected.
Ingestion:	No adverse health effects are anticipated to occur as a result of acute ingestion. Chronic effects are not known.
Carcinogenicity:	None of the components in this material are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.
Signs/Symptoms of Overexposure:	Prolonged contact may cause mild irritation or dryness to sensitive skin.
Medical Conditions Generally Aggravated by Exposure:	None known.

Section VII - Emergency and First Aid Procedures

Eyes:	Immediately flush with clean water. Consult physician if necessary.
Skin:	Rinse with water.
Ingestion:	If swallowed, treat symptomatically and supportively. Do not induce vomiting. If victim conscious and alert, give two glasses of water or milk to drink. If vomiting occurs, keep head below hips to prevent aspiration. Contact Physician.
Inhalation:	No adverse effects anticipated.

Section VIII - Precautions for Safe Handling and Use

In Case of Spill:	Flush with water into containing area.
Waste Disposal:	Flush to sewer where applicable within Federal, State or Local disposal requirements.
Handling & Storage Precautions:	Wear protective goggles or face shield if splashing or spraying liquid. Protect from freezing.
Other Precautions:	Keep container tightly closed. Keep out of reach of children.

Section IX - Control Measures

Respiratory Protection:	No respiratory protection is necessary.
Ventilation:	Good general ventilation is sufficient.
Protective Clothing:	When prolonged skin contact is expected, wear protective gloves.
Eye Protection:	Wear safety glasses.
Work/Hygienic Practices:	Use good personal hygiene practices, wash hands before eating, drinking, smoking, or using toilet facilities.

Low-VOC Soy Gold 1000 Cleaner Used for Pipe Roller Cleaning at the San Bernardino Sun

SOYGOLD® 1000 SOLVENT

MATERIAL SAFETY DATA SHE

EMERGENCY PHONE: 913-599-6911 CHEMTREC: 800-424

SECTION I-IDENTIFICATION

PRODUCT: SOYGOLD® 1000
CAS No.: 67784-80-9
CHEMICAL: Fatty acid methyl esters
SYNONYMS: Methyl esters of soybean oil

SECTION II-INGREDIENTS AND HAZARD CLASSIFICATION

TYPICAL COMPOSITION

Alkyl C_{16}-C_{18}-Methyl Esters

This product contains no hazardous material.

SARA HAZARD: TITLE III SECTION 313-Not listed FIRE-(Section 311/312) None noted

SECTION III-HEALTH INFORMATION

EFFECTS OF OVEREXPOSURE

INHALATION: No known problems
INGESTION: LD50:>50ml/kg (albino rats)(similar products)
EYE CONTACT: Not classified as eye irritants
SKIN CONTACT: Not classified as a skin irritant or corrosive material

SECTION IV-OCCUPATIONAL EXPOSURE LIMITS

PEL: NO OSHA PEL TLV: NO ACGIH TLV

SECTION V-EMERGENCY FIRST AID PROCEDURE

FOLLOW STANDARD FIRST AID PROCEDURES:

SWALLOWING: Call physician or poison control center.
SKIN CONTACT: Wash affected area.
EYE CONTACT: Flush eyes with cool water for at least 15 minutes. Do not let victim rub eyes.
INHALATION: Immediately remove victim to fresh air. Get medical attention immediately.

SECTION VI-PHYSICAL DATA

BOILING POINT:	Over 600° F (315° C) at 760 mm Hg pressure
MELTING POINT:	-1° C
VAPOR PRESSURE:	Less than 5 mm Hg at 72° F
SPECIFIC GRAVITY:	0.87 at 25° C
SOLUBILITY IN WATER:	Negligible at room temperature
APPEARANCE AND COLOR:	Light yellow and liquid at room temperature
ODOR:	Light vegetable oil odor

SECTION VII-FIRE AND EXPLOSION HAZARDS

FLASH POINT & METHOD USED:	425° F (218° C)(PMCC)
FLAMMABLE LIMITS:	Not applicable
NFPA RATING:	No NFPA rating

HMIS RATING: **HEALTH: 0** **FIRE: 1** **REACTIVITY: 0**

SPECIAL FIRE FIGHTING PROCEDURES & PRECAUTIONS: Treat as oil fire.
Use water spray, dry chemical, foam or carbon dioxide.

UNUSUAL FIRE & EXPLOSION HAZARDS:
Rags soaked with any solvent present a fire hazard and should always be stored in UL listed or Factory Mutual approved, covered containers. Improperly stored rags can create conditions that lead to oxidation. Oxidation, under certain conditions can lead to spontaneous combustion. This product contains antioxidants to retard oxidation.

SECTION VIII-REACTIVITY

STABILITY:	Stable
HAZARDOUS POLYMERIZATION:	None likely
MATERIALS TO AVOID:	Strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS:	CO_2, CO
CONDITIONS TO AVOID:	None known

SECTION IX-EMPLOYEE PROTECTION

CONTROL MEASURES:	Adequate ventilation
RESPIRATORY PROTECTION:	None required
PROTECTIVE CLOTHING:	No need anticipated
EYE PROTECTION:	None required

SECTION X-ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PRECAUTIONS: Avoid uncontrolled releases of this material to environment.

SPILL OR LEAK PRECAUTIONS: Contain spilled material. Transfer to secure containers. Where necessary, collect using absorbent media.

WASTE DISPOSAL: Dispose of according to federal, state and/or local requirements.

SECTION XI-REGULATORY CONTROLS

DOT CLASSIFICATION:	Class 55
DOT PROPER SHIPPING NAME:	Cleaning Compound, N.O.S.
OTHER REGULATORY REQUIREMENTS:	Listed in TSCA inventory

SECTION XII-PRECAUTIONS: HANDLING, STORAGE AND USAGE

No special precautions necessary.

SECTION XIII-DATE AND SIGNATURE

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. The stated MSDS is reliable to the best of the company's knowledge and believed accurate as of the date indicated. However, no representation, warranty or guarantee of any kind, expressed or implied, is made as to its accuracy, reliability or completeness and we assume no responsibility for any loss, damage or expense, direct or consequential, arising out of use. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

AC ENVIRONMENTAL PRODUCTS, L.L.C.
9804 PFLUMM
LENEXA, KS 66215

SIGNATURE: William A. Ayres

PREPARED BY: WILLIAM A. AYRES REVISION DATE: 7-1-98

Low-VOC Soy Gold 2000 Cleaner Tested at J. S. Paluch, PIP Printing, City of Santa Monica print Shop, Presslink, Vertis and R.R. Donnelley & Sons

SOYGOLD 2000 SOLVENT

MATERIAL SAFETY DATA SHEET

EMERGENCY PHONE: 913-599-6911 CHEMTREC: 800-424-9300

SECTION I-IDENTIFICATION

PRODUCT: SOYGOLD® 2000
CAS No.: 67784-80-9
CHEMICAL: Fatty acid methyl esters
SYNONYMS: Methyl esters of soybean oil

SECTION II-INGREDIENTS AND HAZARD CLASSIFICATION

TYPICAL COMPOSITION	CAS	%
Alkyl C_{16}-C_{18}-Methyl Esters	67784-80-9	97-99
Surfactant	9016-45-9	1-3

SARA HAZARD: TITLE III SECTION 313: Not listed FIRE (Section 311/312): None noted

SECTION III-HEALTH INFORMATION

EFFECTS OF OVEREXPOSURE
INHALATION: No known problems
INGESTION: LD_{50}>50ml/kg (albino rats)(similar products)
EYE CONTACT: Not classified as eye irritants
SKIN CONTACT: Not classified as a skin irritant or corrosive material

SECTION IV-OCCUPATIONAL EXPOSURE LIMITS

PEL: NO OSHA PEL TLV: NO ACGIH TLV

SECTION V-EMERGENCY FIRST AID PROCEDURE

FOLLOW STANDARD FIRST AID PROCEDURES
SWALLOWING: Call physician or poison control center.
SKIN CONTACT: Wash affected area.
EYE CONTACT: Flush eyes with cool water for at least 15 minutes. Do not let victim rub eyes.
INHALATION: Immediately remove victim to fresh air. Get medical attention immediately.

SECTION VI-PHYSICAL DATA

BOILING POINT: Over 600° F (315° C) at 760 mm Hg pressure
MELTING POINT: -1° C
VAPOR PRESSURE: 0.882 mm Hg at 25° C
SPECIFIC GRAVITY: 0.882 g/mL at 25° C
DIELECTRIC STRENGTH: >36.9
SOLUBILITY IN WATER: Negligible at room temperature
APPEARANCE AND COLOR: Light yellow to clear and liquid at room temperature
ODOR: Light vegetable oil odor

SECTION VII-FIRE AND EXPLOSION HAZARDS

FLASH POINT & METHOD USED: 425° F (218° C)(PMCC)
FLAMMABLE LIMITS: Not applicable
NFPA RATING: No NFPA rating

HMIS RATING: HEALTH: 0 FIRE: 1 REACTIVITY: 0

AEP 6/2003

SPECIAL FIRE FIGHTING PROCEDURES & PRECAUTIONS
Treat as oil fire. Use water spray, dry chemical, foam or carbon dioxide.

UNUSUAL FIRE & EXPLOSION HAZARDS
Rags soaked with any solvent present a fire hazard and should always be stored in UL listed or Factory Mutual approved, covered containers. Improperly stored rags can create conditions that lead to oxidation. Oxidation, under certain conditions can lead to spontaneous combustion. This product contains antioxidants to retard oxidation.

SECTION VIII-REACTIVITY

STABILITY:	Stable
HAZARDOUS POLYMERIZATION:	None likely
MATERIALS TO AVOID:	Strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS:	CO_2, CO
CONDITIONS TO AVOID:	None known

SECTION IX-EMPLOYEE PROTECTION

CONTROL MEASURES:	Adequate ventilation
RESPIRATORY PROTECTION:	None required
PROTECTIVE CLOTHING:	No need anticipated
EYE PROTECTION:	None required

SECTION X-ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PRECAUTIONS:	Avoid uncontrolled releases of this material into environment.
SPILL OR LEAK PRECAUTIONS:	Contain spilled material. Transfer to secure containers. Where necessary, collect using absorbent media.
WASTE DISPOSAL:	Dispose of according to federal, state and/or local requirements.

SECTION XI-REGULATORY CONTROLS

DOT CLASSIFICATION:	Class 55
DOT PROPER SHIPPING NAME:	Cleaning Compound, N.O.S.
OTHER REGULATORY REQUIREMENTS:	Listed in TSCA inventory

SECTION XII-PRECAUTIONS: HANDLING, STORAGE AND USAGE

No special precautions necessary.

SECTION XIII-DATE AND SIGNATURE

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. The stated MSDS is reliable to the best of the company's knowledge and believed accurate as of the date indicated. However, no representation, warranty or guarantee of any kind, expressed or implied, is made as to its accuracy, reliability or completeness and we assume no responsibility for any loss, damage or expense, direct or consequential, arising out of use. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

AG ENVIRONMENTAL PRODUCTS, L.L.C.
9804 PFLUMM
LENEXA, KS 66215

SIGNATURE: William A. Ayres

PREPARED BY: WILLIAM A. AYRES REVISION DATE: 5-01-01

Low-VOC Acetone Ingredient Tested at Nelson Nameplate, SCAQMD Print Shop, The Castle Press, Print 2000 Graphics, Western Metal Decorating, The Dot Printer, Lithographix, The Printery, Tedco, Oberthur Card Systems and Huhtamaki

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-327-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ACETONE

MSDS Number: A0446 — *Effective Date: 04/10/01*

1. Product Identification

Synonyms: Dimethylketone; 2-propanone; dimethylketal
CAS No.: 67-64-1
Molecular Weight: 58.08
Chemical Formula: (CH3)2CO
Product Codes:
J.T. Baker: 5356, 5580, 5805, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008, 9009, 9010, 9015, 9036, 9125, 9254, 9271, A134, V655
Mallinckrodt: 0018, 2432, 2435, 2437, 2438, 2440, 2443, 2445, 2850, H451, H580, H981

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Acetone	67-64-1	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight

Flammability Rating: 4 - Extreme (Flammable)
Reactivity Rating: 2 - Moderate
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Inhalation of vapors irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.
Ingestion:
Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms are expected to parallel inhalation.
Skin Contact:
Irritating due to defatting action on skin. Causes redness, pain, drying and cracking of the skin.
Eye Contact:
Vapors are irritating to the eyes. Splashes may cause severe irritation, with stinging, tearing, redness and pain.
Chronic Exposure:
Prolonged or repeated skin contact may produce severe irritation or dermatitis.
Aggravation of Pre-existing Conditions:
Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

5. Fire Fighting Measures

Fire:
Flash point: -20C (-4F) CC
Autoignition temperature: 465C (869F)
Flammable limits in air % by volume:
lel: 2.5; uel: 12.8
Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. This material may produce a floating fire hazard. Sensitive to static discharge.

Fire Extinguishing Media:
Dry chemical, alcohol foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB(R) solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Acetone:
-OSHA Permissible Exposure Limit (PEL):
1000 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):
500 ppm (TWA), 750 ppm (STEL) A4 - not classifiable as a human carcinogen
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin

contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless, volatile liquid.
Odor:
Fragrant, mint-like
Solubility:
Miscible in all proportions in water.
Specific Gravity:
0.79 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
56.5C (133F) @ 760 mm Hg
Melting Point:
-95C (-139F)
Vapor Density (Air=1):
2.0
Vapor Pressure (mm Hg):
400 @ 39.5C (104F)
Evaporation Rate (BuAc=1):
ca. 7.7

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Concentrated nitric and sulfuric acid mixtures, oxidizing materials, chloroform, alkalis, chlorine compounds, acids, potassium t-butoxide.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m3; Irritation eye rabbit, Standard Draize, 20 mg severe; investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Acetone (67-64-1)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.
Environmental Toxicity:
This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ACETONE
Hazard Class: 3
UN/NA: UN1090
Packing Group: II
Information reported for product/size: 350LB

International (Water, I.M.O.)

Proper Shipping Name: ACETONE
Hazard Class: 3
UN/NA: UN1090
Packing Group: II
Information reported for product/size: 350LB

15. Regulatory Information

Ingredient	\Chemical Inventory Status - Part 1\ TSCA	EC	Japan	Australia

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Acetone (67-64-1)	Yes	Yes	Yes	Yes

Ingredient	-SARA 302- RQ	TPQ	-SARA 313- List	Chemical Catg.
Acetone (67-64-1)	No	No	Yes	No

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Acetone (67-64-1)	5000	U002	No

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: Yes
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2[Y]E
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: 1 Flammability: 3 Reactivity: 0
Label Hazard Warning:
DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.
Label Precautions:
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid breathing vapor.
Avoid contact with eyes, skin and clothing.
Label First Aid:
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Revision Information:
No changes.
Disclaimer:
****

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Low-VOC Acetone/Mineral Spirits Blanket Cleaner Used at Nelson Nameplate and Metering Roller Cleaner Tested at Several Facilities

MATERIAL SAFETY DATA SHEET
RHO-CHEM CORPORATION

(A Fully Owned Subsidiary of Philip Services Corporation)
425 Isis Avenue, Inglewood, California – 90301
Tel.: (323)776-6233, Fax: (310)645-6379

Product : Rhosolv-7248, Revision- Initial Release/10-21-2004

1. **COMPANY AND MATERIAL IDENTIFICATION :**

Product Name/Number	:	Rho-Solv 7248
Synonyms	:	N. A.
Chemical Family	:	Flammable Solvent Blend
Stock Number	:	Technical Grade –7248 Electronic/Semiconductor Grade – N. A. Reconstituted Grade – N.A. ACS Reagent Grade – N.A.

2. **COMPOSITION OF THE MATERIAL: MIXTURE**

Chemical Name	CAS No.	% Concentration
Acetone	67-64-1	70 – 90%
Naphtha (light aliphatic)	64742-89-8	< 10%
Naphtha (light aromatic)	64742-95-6	< 10%

3. **HAZARDS IDENTIFICATION :**

EXTREMELY FLAMMABLE LIQUID & VAPOR. MAY CAUSE FLASH FIRE.

Inhalation:
High concentration of vapors will be irritating to the respiratory tract and may cause dizziness, headache, and dizziness Central Nervous System effects & possibly death.

Ingestion:
Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can cause lung damage.

Skin Contact:
May cause some irritation, drying, redness or cracking to skin

Eye Contact:
Vapors may be irritating to eyes. Splashing may cause redness and pain to eyes.

Symptoms & Signs to Exposure:
Basically, same symptoms and signs will occur, as given above.

Medical Conditions Aggravated:
Pre-existing medical conditions of the Respiratory System, Skin dermatitis and Eyes may be aggravated by further exposure to this material.

4. FIRST AID :

Inhalation:
Remove the person to fresh air. If no improvement noticed, then transport to the nearest medical care facility for further treatment.

Ingestion:
If swallowed, do not induce vomiting. transport to the nearest medical care facility for further treatment.

Skin Contact:
Remove contaminated clothing. Flush exposed area with water followed by washing with soap.

Eye Contact:
Flush eyes with water with eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision , or swelling persist, transport to the nearest medical care facility for further treatment.

Advice to Physician:
Causes CNS depression. Prolonged or repeated exposure may result in dermatitis.

5. FIRE FIGHTING MEASURES :
Clear the area of all non-emergency, un-protected personnel.

Ingredient	Flash Point	U.F.L.	L.F.L.	Auto Ignition Temp.
Acetone	-20° C – CC	12.8	2.5	465° C (869° F)
Naphtha (aliphatic)	14-18° C-CC	0.7	0.9	Not available
Naphtha (aromatic)	40-47° C –CC	0.1	0.6	Not available

Specific Hazards:
Carbon Monoxide may be evolved in case of incomplete combustion. Will float on the surface water and can be re-ignited. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup, which could result in container rupture. Containers exposed to direct flame should be cooled with large quantities of water as needed to prevent weakening of container structure or rupture.
Extinguishing Media:
Use water, foam dry chemical or Carbon dioxide, sand or earth may be used in case of small fires. The extinguishing water must be collected separately and disposed of as a waste. At no instance, this contaminated water will be discharged to the environment or into sewage, city or

municipal waters. Material can accumulate static discharge. Empty containers still retain residue, a liquid & or vapor mixture.

Protective Equipment:
Wear full protective clothing and Self contained breathing apparatus for large spill/fire.

6. **ACCIDENTAL RELEASE MEASURES**
Observe all relevant local, State, Federal and International regulations as applicable.

Protective measures:
Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment, please refer to section 8 and for disposal of spilled material refer to section 13 of this MSDS. Shut off leaks, if no risk is involved. Eliminate all possible ignition sources in surrounding area. Use appropriate containment methods to avoid further contamination to environment and to neighboring areas. Avoid spreading or entering the spilled material into the drains, ditches or rivers by using sand, earth or other appropriate barriers. Attempt to Disperse the vapors to divert its flow to a safe location, by using fog sprays, for example. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding all equipment. Monitor area with combustible gas indicator. A leaking drum or container can be rolled or made up side down in the direction opposite to the leaking spot

Clean Up Methods:
For small liquid spills (< 1 drum of 55 gal), transfer to a labeled, sealable container by mechanical means for safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.
For large liquid spills (> 1 drum of 55 gal), transfer by mechanical means such as vacuum truck to a salvage tank for safe disposal. Retain as a contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Additional Information:
Notify appropriate authorities if there is a risk involved to the general public or to the environment or to the neighborhood due to the spill or release of this material. Vapor may form ~~an explosive mixture with air. Please report to the National Response Center @ (800)424-8802~~ if the spilled quantity exceeds the reportable quantity. (Refer to chapter 15 of this MSDS. Required under CERCLA (Comprehensive Environment Response, Compensation & Liability Act).

7. HANDLING AND STORAGE

General Precautions :
Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. Use appropriate P.P.E. per section 8 of this MSDS.

Handling:
Handle and open the container with CARE in well ventilated area. Remove ignition sources. Avoid sparks. **Do not create friction.** Keep container closed, to avoid emissions and inhalation. Avoid any force opening, creating friction. Avoid contact with skin, eyes and clothing. **Ensure electrical continuity by bonding and grounding all equipment**. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m./sec until fill pipe is submerged to twice its diameter, then <= 7 m/sec.) Avoid splash filling. Do not use compressed air for filling, discharging or handling operations. The vapor is heavier than air spreads along the ground and distant ignition is possible. Extinguish any naked flames. Do not smoke. Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Do not empty into drains. **Avoid handling above its flash point**, otherwise the product will form flammable/explosive vapor-air mixtures.

Storage:
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Store at ambient temperature. Keep away from aerosols, oxidizers, corrosives.

Product Transfer:
Keep containers closed when not in use. Do not use compressed air for filling. Discharging or handling.

Recommended Materials:
For containers or container linings, use mild steel or Stainless steel. For container paints, use epoxy paint, zinc silicate paint.

Unsuitable Materials:
Avoid prolonged contact with natural, butyl or nitrile rubbers.

Container Recommendation :
Emptied containers may still contain explosive vapors. Do Not cut, drill grind or perform similar operations on or near containers Do not re-use empty containers without commercial cleaning or reconditioning.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Following table may be referred in absence of occupational standards for this material.

Material	Source	Type	PPM	mg/m^3
Acetone	OSHA	TWA	1000	----
	Cal/OSHA	TWA	750	1780
	Cal/OSHA	STEL	1000	2400
	ACGIH	TWA	500	N.A
	ACGIH	STEL	750	N.A
Naphtha-aliphatic	OSHA	TWA	300	1,350
	Cal/OSHA	TWA	400	1,800
	ACGIH	TWA	300	N.A.
Naphtha-aromatic	OSHA	TWA	100	400
	Cal/OSHA	TWA	100	400
	ACGIH	TWA	400	N.A.

General Information:

Wash hands before eating, drinking, smoking and using toilet.

Exposure Control:

The levels of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local environment. Ensure adequate ventilation to control airborne concentration, below the exposure guidelines/limits. Eye washes and showers must be used in case of an emergency.

Personal Protective Equipment:

Use Personal Protective Equipment (P.P.E.) that are NIOSH approved and/or recommended per National Standards.

Respiratory Protection:

If an engineering control fail to maintain airborne concentrations to a level which is safe to protect workers' health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Also check with the Respiratory Protective Equipment suppliers and refer to the OSHA Respiratory Standard 1910.134 for detailed information. When air purifying respirator is required, select appropriate respirator and filters suitable for organic gases and vapors. Where air purifying respirators are un-suitable, for example airborne concentration is high, or oxygen is deficient, confined space etc., use appropriate positive pressure, breathing apparatus. For regular handling, full face respirator With organic vapor cartridges is recommended in order to protect the face from splashes.

Hand Protection:
Nitrile rubber gloves give good chemical resistance and can be used for regular use.
In case of direct incidental contact, splash, clean up etc., PVC or Neoprene rubber gloves should be used.

Eye Protection:
Chemical Splash goggles (Chemical mono-goggles) should be used

Protective Clothing:
Use chemical resistant clothing, chemical resistant shoes or boots.

Environmental Exposure Controls:
Follow and comply with the local, state and federal guidelines for V.O.C. emission control limits, and for the discharge of exhaust air containing vapors of this material.

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9. **PHYSICAL AND CHEMICAL PROPERTIES of Acetone, being a major component in this mixture.**

Appearance	:	Colorless volatile liquid
Odor	:	Distinct fragrant odor
Boiling point	:	56.5° C (133° F) @ 760 mm Hg
Vapor Pressure	:	400 @ 39.5°C (104°F)
Specific Gravity	:	0.79 @ 20°C
Water Solubility	:	Miscible in water
Vapor density (air =1)	:	2.0 (Air =1)
Volatile Organic Compound	:	100 %

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10. **STABILITY AND REACTIVITY**

Stability:
Stable under normal conditions of use.
Conditions to Avoid:
Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid:
Strong Oxidizing agents, Conc. Nitric or Sulfuric acid, halogenated compounds
Hazardous Decomposition Products:
Will not occur.

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11. TOXICOLOGICAL INFORMATION

Basis of Assessment:
The information given herein is based on similar products, and or compounds.

Acetone:
Oral Toxicity: LD50: 5800 mg/kg , rat

Inhalation Toxicity: LC50 : 5, 100 mg/m^3

Carcinogenicity: Not classified as a human carcinogen by ACGIH or IARC.

Naphtha solvents:
Oral Toxicity: LD50: >2000 mg/kg , rat

Inhalation Toxicity: LC50 : > 5, 000 p.p.m. / 1hour

Carcinogenicity: Not classified as a human carcinogen by ACGIH or IARC.

12. ECOLOGICAL INFORMATION

Acetone: CAS # 67-64-1
Acetone Is not expected to be toxic to aquatic life.

Environmental Toxicity:	Less toxic: LC50/96 – hour - > 100 mg/l
Mobility:	Will quickly evaporate from water, will evaporate if released to soil.
Bioaccumulation:	Does not bio-accumulate significantly.
Persistence/degradability:	Moderately bio-degradable, by reaction with photo-chemically produced hydroxyl radicals.

~~**Naphtha (Aromatic) CAS # 64742-95-6**~~

Fish, Algae & Aquatic Invertebrates:	1 < LC/EC/IC50 < = 10 mg/l
Mobility:	Low mobility. Absorbs to soil, floats on water
Persistence/degradability:	Expected to be readily biodegradable.
Bio-accumulation:	Has the potential to bioaccumulate

13. DISPOSAL METHODS

Material Disposal:
Recover or recycle if possible. It is the responsibility of a waste generator to determine the exten of hazard, and physical properties of the material generated. Additionally, the generator of the waste of this material must determine its waste classification and disposal methods in compliance with local, state and federal or other regulations.

Container Disposal:
Drain the container thoroughly, and then vent it in a safe place away from sparks, and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld un-cleaned containers. Send the waste drum to the drum re-coverer or reclaimer.

Local Regulatory Compliance:
The disposal should be in compliance with applicable local, regional, state and national laws an regulations.

14. TRANSPORT INFORMATION

U. S. Department of Transportation Classification (49 CFR)

Identification number:	UN 1993
Proper shipping name:	Flammable liquid, n. o. s. (Acetone/Naphtha mixture)
Class/Division:	3
Packing Group:	II
Contains OIL	
Emergency Response Guide No.:	128

15. REGULATORY INFORMATION

Federal Regulatory Status:
Notification:

- TSCA Listed

SARA TITLE III, Sections 311, 312
Classified as Fire hazard.
SARA Toxic Release Inventory (TRI) 313
Naphtha (aromatic) in contains following chemicals:
1, 2, 4 Trimethyl benzene : < 5%
Cumene: < 0.5% and Xylene: <0.2%

State Regulatory Information:
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
Not listed.

16. **OTHER INFORMATION**

HMIS Rating: (Health, Flammability & Reactivity)	H=1, F=3, R = 0
NFPA Rating : (Health, Flammability & Reactivity	H=1, F=3, R = 0
MSDS Revision level:	New – Initial Release
Uses and Restrictions:	Industrial solvent
MSDS Distribution:	The copy of this MSDS should be available to every one who may handle this material.

Disclaimer:
The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 and the information contained herein is to the best of our knowledge for its original form in which it is supplied and is intended as guidelines for the purpose of handler's and environmental safety. No warranty or guarantee is expressed or implied regarding the accuracy of this data or of the resulting product, using this material.

Low-VOC Cleaner Used by SCAQMD Print Shop

MATERIAL SAFETY DATA SHEET
RHO-CHEM CORPORATION

(A Fully Owned Subsidiary of Philip Services Corporation)
425 Isis Avenue, Inglewood, California – 90301
Tel.: (323)776-6233, Fax: (310)645-6379

Product : Rho-Wash 100, Revision- Initial Release/7-19-2005

1. COMPANY AND MATERIAL IDENTIFICATION :

Product Name/Number	:	Rho-Wash 100
Synonyms	:	N. A.
Chemical Family	:	Flammable Solvent Blend
Stock Number	:	T011

2. COMPOSITION OF THE MATERIAL: MIXTURE

Chemical Name	CAS No.	Wt.% Concentration
Acetone	67-64-1	50 - 75
Mineral Spirits (comparable to Stoddard solvent)	64742-47-8	10 - 15
1,2,4-Trimethylbenzene	95-63-6	1 – 5
Non-hazardous substances		25 - 30

3. HAZARDS IDENTIFICATION :

FLAMMABLE LIQUID & VAPOR. MAY CAUSE FLASH FIRE.

Inhalation:
High concentration of vapors will be irritating to the respiratory tract and may cause drowsiness, headache, dizziness and Central Nervous System effects.

Ingestion:
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. If large amounts may be harmful if accidentally swallowed. May result into lung inflammation.

Skin Contact:
May cause some irritation to skin. Exposure to large amounts may result into redness, burning, drying and cracking. Not harmful if handled safely.

Eye Contact:
Vapors may be irritating to eyes. May cause stinging, tearing, redness and swelling of eyes.

Symptoms & Signs to Exposure:
Basically, same symptoms and signs will occur, as given above.

Medical Conditions Aggravated:
Pre-existing medical conditions of the Respiratory System, Skin dermatitis and Eyes may be aggravated by further exposure to this material.

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4. FIRST AID :

Inhalation:
Remove the person to fresh air. If no improvement noticed, then transport to the nearest medical care facility for further treatment.

Ingestion:
If swallowed, do not induce vomiting, take the affected person to the nearest medical care facility for further treatment.

Skin Contact:
Remove contaminated clothing. Flush exposed area with water followed by washing with soap.

Eye Contact:
Flush eyes with water with eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision , or swelling persist, transport to the nearest medical care facility for further treatment.

Advice to Physician:
Causes CNS depression. Prolonged or repeated exposure may result in dermatitis.

5. FIRE FIGHTING MEASURES :

Clear the area of all non-emergency, un-protected personnel.

Flash Point of the mixture: < 100° F - TCC

Following properties are of the main ingredient (Acetone) in the mixture:
Upper Flammable Limit: 2.6 % (V)

Lower Flammable Limit: 12.8 % (V)

Auto Ignition Temperature: 465°C

Specific Hazards:
Carbon Monoxide may be evolved in case of incomplete combustion. Will float on the surface water and can be re-ignited. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup, which could result in container rupture. Containers exposed to direct flame should be cooled with large quantities of water as needed to prevent weakening of container structure or rupture. Keep away from all the ignition and electrical sources.

Extinguishing Media:
Use water, foam, dry chemical or Carbon dioxide, sand or earth in case of small fires. The extinguishing water must be collected separately and disposed of as a waste. At no instance, this contaminated water will be discharged to the environment or into sewage, city or municipal waters. Material can accumulate static discharge. **Empty** containers still retain residue, a liquid & or vapor mixture.

Protective Equipment:
Wear full protective clothing and Self contained breathing apparatus for large spill/fire.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local, State, Federal and International regulations as applicable.

Protective measures:
Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment, please refer to section 8 and for disposal of spilled material refer to section 13 of this MSDS. Shut off leaks, if no risk is involved. Eliminate all possible ignition sources in surrounding area. Use appropriate containment methods to avoid further contamination to environment and to neighboring areas. Avoid spreading or entering the spilled material into the drains, ditches or rivers by using sand, earth or other appropriate barriers. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding all equipment. Monitor area with combustible gas indicator. A leaking drum or container can be rolled or made up side down in the direction opposite to the leaking spot

Clean Up Methods:
Use appropriate P.P.E. while handling the spill. Better if a HAZWOPER trained personnel handles the spill.

For small liquid spills (< 1 drum of 55 gal), transfer to a labeled, seallable container by mechanical means for safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.
For large liquid spills (> 1 drum of 55 gal), transfer by mechanical means such as vacuum truck to a salvage tank for safe disposal. Retain as a contaminated waste. Allow residues to evaporate

Unsuitable Materials:
Avoid prolonged contact with natural, butyl or nitrile rubbers.
Container Recommendation :
Emptied containers may still contain explosive vapors. Do Not cut, drill, grind or perform similar operations on or near containers Do not re-use empty containers without commercial cleaning or reconditioning.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits
Following table may be referred in absence of occupational standards for this material.

Material	Source	Type	PPM	mg/m^3
Acetone	ACGIH	TWA	500	------
	ACGIH	STEL	750	------
	OSHA	TWA	1000	------
	Cal/OSHA	TWA	750	1780
	Cal/OSHA	STEL	1000	2400
Mineral Spirit	ACGIH	TWA	100	
	OSHA Z1	PEL	500	2,900 mg/m^3
	OSHA Z1 A	TWA	100	525 mg/m^3
1,2,4-Trimethylbenzene	NIOSH REL	TWA	25	125 mg/m^3

General Information:
Wash hands before eating, drinking, smoking and using toilet.

Exposure Control:
The levels of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local environment. Ensure adequate ventilation to control airborne concentration, below the exposure guidelines/limits. Eye washes and showers must be used in case of an emergency.

Personal Protective Equipment:
Use Personal Protective Equipment (P.P.E.) that are NIOSH approved and/or recommended per National Standards.

Respiratory Protection:
If an engineering control fail to maintain airborne concentrations to a level which is safe to protect workers' health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Also check with the Respiratory Protective

Equipment suppliers and refer to the OSHA Respiratory Standard 1910.134 for detailed information. When air purifying respirator is required, select appropriate respirator and filters suitable for organic gases and vapors. Where air purifying respirators are un-suitable, for example airborne concentration is high, or oxygen is deficient, confined space etc., use appropriate positive pressure, breathing apparatus. For regular handling, full face respirator With organic vapor cartridges is recommended in order to protect the face from splashes.

Hand Protection:
Nitrile rubber gloves give good chemical resistance and can be used for regular use.
In case of direct incidental contact, splash, clean up etc., PVC or Neoprene rubber gloves should be used.

Eye Protection:
Chemical Splash goggles (Chemical mono-goggles) should be used

Protective Clothing:
Use chemical resistant clothing, chemical resistant shoes or boots.

Environmental Exposure Controls:
Follow and comply with the local, state and federal guidelines for V.O.C. emission control limits, and for the discharge of exhaust air containing vapors of this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Colorless liquid
Odor	:	Distinct aromatic odor
Boiling point	:	62 ° C
Flash point	:	<100° F
Specific Gravity	:	0.85
Water Solubility	:	negligible.
Vapor Pressure	:	Not available
Vapor density (air =1)	:	Not available
Volatile Organic Compound	:	98gms/litre per AQMD method 304.91

10. STABILITY AND REACTIVITY

Stability:
Stable under normal conditions of use.
Conditions to Avoid:
Avoid heat, sparks, open flames and other ignition sources.

Materials to Avoid:
Strong Oxidizing agents, Conc. Nitric or Sulfuric acid, halogens or molten sulfur.
Hazardous Decomposition Products:
Complex mixtures of airborne solids, liquids and gases including Carbon Monoxide, Carbon dioxide and other organic compounds will be evolved during combustion or thermal or oxidative degradation of this material.

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11. TOXICOLOGICAL INFORMATION

Basis of Assessment:
The information given herein is based on similar products, and or compounds.
Mineral Spirits:
Acute Oral Toxicity: LD50: > 2000 mg/Kg
Rat: Aspiration into lungs when swallowed or vomited. May cause chemical pneumonitis.

Acute Dermal Toxicity: Low dermal toxicity.

Acute Inhalation Toxicity: Low toxicity.
LC50 greater than near-saturated vapor concentration/ 1 hour, rat.

Carcinogenicity: Not classified as a human carcinogen by ACGIH or IARC.

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12. ECOLOGICAL INFORMATION

Mineral spirits:
Acute Toxicity:

Fish and marine animals:	Low toxicity: LC/EC/C50: > 1000 mg/l
Micro-organisms:	Fairly toxic: LC/EC/IC50: < or = 10 mg/l

Acetone:
Acetone Is not expected to be toxic to aquatic life.

Persistence/degradability: Moderately bio-degradable, by reaction with photo-chemically produced hydroxyl radicals.

---

13. DISPOSAL METHODS

Material Disposal:
Recover or recycle if possible. It is the responsibility of the waste generator to determine the

the waste of this material must determine its waste classification and disposal methods in compliance with local, state and federal or other regulations.

Container Disposal:
Drain the container thoroughly, and then vent it in a safe place away from sparks, and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld un-cleaned containers. Send the waste drum to the drum re-coverer or re-claimer.

Local Regulatory Compliance:
The disposal should be in compliance with applicable local, regional, state and national laws and regulations.

14. TRANSPORT INFORMATION

U. S. Department of Transportation Classification (49 CFR)

Identification number:	UN 1993
Proper shipping name:	Flammable liquid, n. o. s. (Acetone, petroleum distillate)
Class/Division:	3
Packing Group:	II
Emergency Response Guide No.:	128

15. REGULATORY INFORMATION

Federal Regulatory Status:
Notification:

- **TSCA:** All ingredients in this compound are listed on TSCA list.
- **SARA TITLE III, Sections 311, 312 :** Classified as Fire hazard.
- **SARA 313 (TRI):** None.

State Regulatory Information:
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
This material **does not** contains a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.
There may be some impurities from the original manufacturers/distributors, of which we are not aware of. Such impurities may or may not cause cancer or reproductive harm or birth effects.

16. OTHER INFORMATION

HMIS Rating: H=1, F=3, R = 0
(Health, Flammability & Reactivity)

NFPA Rating : H=1, F=3, R = 0
(Health, Flammability & Reactivity

MSDS Revision level: New – Initial Release/07-19-05

Uses and Restrictions:
Industrial solvent for cleaning purposes.

MSDS Distribution:
The copy of this MSDS should be available to every one who may handle this material.

Disclaimer:
The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 and the information contained herein is to the best of our knowledge for its original form in which it is supplied and is intended as guidelines for the purpose of handler's and environmental safety. No warranty or guarantee is expressed or implied regarding the accuracy of this data or of the resulting product, using this material.

Low-VOC Cleaner Tested at Fanfare Media Works, Print 200, Western Metal Decorating, The Printery and Tedco

SOYGOLD 2500 RINSEABLE SOLVENT

Material Safety Data Sheet

SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identity (As Used on Label and List) **SOYGOLD 2500 RINSEABLE SOLVENT - EXPERIMENTAL**	*Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.*
Chemical Name: C_{16}-C_{18}, C_{18} Unsaturated Ethoxylated Methyl Ester/Surfactant Blend	**Synonym Name:** Rinseable Solvent, Soy Methyl Ester/Surfactant Cleaner Concentrate
Another Exclusive Product of: AG Environmental Products, L.L.C.	**Emergency Telephone Number** 402-496-6688 Chemtrec 800-424-9300
Address (Number, Street, City, State, and ZIP Code 12700 West Dodge Road	**Telephone Number for Information** 1-800-599-9209
Omaha, NE 68154	**Date Prepared** February 4, 2005

SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components (Specific Chemical Identity, Common Name(s))	CAS No.	OSHA PEL	ACGIH-TLV	Other Limits Recommended	%(Opt.)
In accordance with 29 CFR 1910.1200, this product does not contain sufficient concentrations of any substances defined as hazardous by this standard					

There are no exposure limits established for this product.

SECTION III – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW – Caution! May Cause Eye Irritation. A light yellow liquid that may cause eye and skin irritation. No hazard if spilled and no unusual hazard if involved in a fire. Slippery, can cause fall if spilled and walked on.

POTENTIAL HEALTH EFFECTS –
EYES – May cause eye irritation.
SKIN – May cause skin irritation.
INHALATION – Exposure via inhalation not likely. No hazard in normal industrial use.
INGESTION – No significant adverse effects are expected upon ingestion of the products.

SECTION IV – FIRST AID MEASURES

EYES – In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. If irritation persist get medical attention.
SKIN – In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. If irritation persists get medial attention. Wash clothing before reuse.
INHALATION – No need for first aid is anticipated not likely exposure route.
INGESTION – No need for first aid is anticipated if material is swallowed.

SECTION V – FIRE FIGHTING MEASURES

Flash Point (Method Used)	Flammable Limits	LEL	UEL
>160 C° (D93 Flash Point – Pensky Martens Closed Cup	No Data	No Data	No Data

Extinguishing Media -
Not usually necessary as this product does not readily support combustion. Use media appropriate for fire's fuel source. CO_2, dry chemical, foam.

Special Fire Fighting Procedures – Cool exposed equipment with water spray until well after fire is out. Do not scatter spilled material with high pressure water streams. Dike fire control water for later disposal. Self contained breathing apparatus and structural firefighter's clothing will provide limited protection.

Unusual Fire and Explosion Hazards – None Expected.

SECTION VI – ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Caution, slip hazard. Wipe up small spills promptly. Use a cloth or other absorbant material.

LARGE SPILL: Isolate area. Dike area to prevent spreading. Stay upwind. Wear protective gear as required. Pick up on absorbent material. Put in suitable container for proper disposal.

SECTION VII – HANDLING AND STORAGE

HANDLING: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

STORAGE: Store indoors in a dry area. Follow label directions carefully. Keep out of reach of children. Keep container tightly sealed when not in use. Do not contaminate water or feed by use or storage. Use from original container only. Do not store with fertilizers, seeds, insecticides or fungicides.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection (Specify Type) – Use with adequate ventilation. Use NIOSH/MSHA approved respirator if PELs or TLVs are exceeded.

Engineering Controls	**Local Exhaust**	Not usually needed	**Special**	None
	Mechanical (General)	Yes	**Other**	None

Protective Gloves - Impervious
Eye Protection - Safety glasses or goggles

Other Protective Clothing or Equipment -
Not usually necessary. If direct contact is possible, wear apron, boots, face shield, etc. as needed.

Work/Hygienic Practices -
Follow label instructions. Wash hands after use and before eating, drinking, smoking, using restrooms, etc.

SECTION IX -- PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point	No Data	**Specific Gravity (H_2O = 1)** @77°F / 25°C	0.93
Vapor Pressure (mm-Hg @ 68° F)	No Data	**Melting Point**	No Data
Vapor Density (AIR = 1)	Greater than one (1)	**Evaporation Rate (Butyl Acetate = 1)**	No Data
Solubility in Water	Partially Soluble	**pH**	NA
Appearance and Odor - A yellow liquid with a faint sweet odor.		**VOC's**—No Data	10 gm/l

SECTION X -- STABILITY AND REACTIVITY

Chemical Stability	Stable	**Conditions to Avoid** -- None known

Incompatibility (Materials to Avoid) -
Strong oxidizing and reducing agents, strong alkalis and strong acids

Hazardous Decomposition or Byproducts -
Carbon dioxide, carbon monoxide, smoke, soot and various organic oxidation by-products.

Hazardous Polymerization	Will Not Occur	**Conditions to Avoid -** NA

SECTION XI -- TOXICOLOGICAL INFORMATION

Ingestion LD_{50}	No Data	**Acute Dermal LD_{50}**	No Data
Acute Oral LD_{50}	No Data	**Acute Inhalation LC_{50}**	No Data

SECTION XII -- ECOLOGICAL INFORMATION

No Data

SECTION XIII -- DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

SECTION XIV -- TRANSPORT INFORMATION (Not meant to be all inclusive)

Domestic Highway		**Domestic Air Shipments**	
Proper Shipping Name:	Environmentally hazardous substance, liquid, n.o.s. (Fatty Methyl Ester C_{16}-C_{18} Ethoxylate)	Proper Shipping Name:	Unknown
Hazard Class/Subsidiary Hazard:	Class 9	Hazard Class/Subsidiary Hazard:	Unknown
UN/NA No.:	3082	UN/NA No.:	Unknown
Label Required:	None	Label Required:	Unknown

SECTION XV -- REGULATORY INFORMATION (Not meant to be all inclusive - selected regulations represented)

NFPA Rating	**Health**	**2**	**Fire**	**0**	**Reactivity**	**0**
HMIS Rating	**Health**	**2**	**Flammability**	**0**	**Reactivity**	**0**

U.S. FEDERAL REGULATIONS:

OSHA: There are no exposure limits established for this product. Not hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

CERCLA: SARA TITLE III SECTION 311/312 HAZARD CLASSES:

Fire	None Noted
Acute Health	None Noted
Reactive	None Noted
Chronic Health	None Noted
Release of Pressure	None Noted

SARA TITLE III SECTION 313:
This product is not known to contain any compound listed and in quantities requiring reporting under SARA Title III Section 313.

TSCA: NA

SNAP: NA.

HAPS: Not listed.

INTERNATIONAL REGULATIONS:

CANADIAN WHMIS:

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All components of this product are on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.

EINECS: All components of this product are on the European Inventory of Existing Commercial Chemical Substances.

STATE REGULATIONS:

STATE RIGHT-TO-KNOW REGULATIONS: Any substance listed as hazardous under labor statutes by the States of California, Florida, Illinois, Michigan, New Jersey, Ohio, Pennsylvania or Texas is described in Section II above if known present in regulated concentrations.

CALIFORNIA PROPOSITION 65: This product is not known to contain any material listed under California's Proposition 65.

SECTION XVI -- OTHER INFORMATION

MSDS Status: Revised Section(s):

Low-VOC Magic Wash 522C Cleaner Tested at The Castle Press and The Dot Printer

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Trade Name: MAGIC WASH 522C
Generic Name: Lithographic Press Wash

CAS #: Proprietary Blend

Manufacturer: Siebert, Inc.
Address: 8134 West 47th Street
City: Lyons State: IL Zip: 60534

Emergency phone#: (800) 535-5053
Technical phone#: (708) 442-2010

DOT Hazard Classification: Not Regulated
NFPA Codes: Health - 0 Flammability - 0 Reactivity - 0
HMIS Codes: Health - 1 Flammability - 0 Reactivity - 0 Personal Protection - B

II. HAZARDOUS INGREDIENTS

If present, IARC, NTP, and OSHA carcinogens and chemicals subject to the reporting requirements of SARA Title III Section 313 are identified in this section.

Ingredient Name	CAS Number	%wt	TLV	STEL	SARA TITLE III
Fatty esters	Various	70 to 90	None established	None established	No
Surfactants	Various	15 to 30	None established	None established	No

References: 29CFR 1910.1000, ACGIH "Threshold Limit Values for Chemicals in the Workplace", National Toxicology Program Annual Report, International Agency for Research on Cancer Monographs, and 40CFR Part 372. All components of this product are in compliance with TSCA

III. PHYSICAL DATA

Boiling Point @ 760 mm Hg:	308 - 335°F
Vapor Pressure @ 80°F:	<0.1 mm Hg
Specific Gravity @ 68°F:	0.92
Water Solubility (%):	Insoluble
Specific Vapor Density (air=1):	<1.0
% Volatile by Volume:	<2.0
% Volatile Organic Compound(s):	<2.0
Appearance:	Clear golden liquid
Odor:	Typical organic odor

IV. FIRE AND EXPLOSION DATA

Flash Point (Method): >300°F (TCC)
Explosive Limit: LEL - N/E UEL - N/E
Extinguishing Media: Water fog, carbon dioxide, or dry chemical.
Special Fire Fighting Procedures: Wear self-contained breathing apparatus when fighting chemical fires.
Unusual Fire and Explosion Hazards: Fine sprays/mists may be combustible at temperatures below normal flash point. Rags soaked with material, stored for a long period while mixed with strong alkali or acidic materials, may smolder, then smoke, and may even ignite.

V. HEALTH HAZARD DATA

Eyes - May cause temporary irritation, redness, tearing, blurred vision. Contact lenses must not be worn when possibility exists for eye contact due to spraying liquid or airborne particles.
Skin - Prolonged or repeated contact may cause irritation.

Breathing - Excessive inhalation of vapors may cause nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.
Swallowing - Can cause gastrointestinal irritation, nausea, vomiting, and diarrhea.

First Aid/Emergency Procedures

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet and get medical attention.
Skin Contact: Wash thoroughly with soap and water. Remove contaminated clothing. Launder contaminated clothing before re-use.
Eyes: Flush with copious amounts of water. Get medical attention.
Ingestion: Do not induce vomiting. If large quantity is swallowed, give lukewarm water (pint). NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get medical attention immediately. Risk of damage to lungs exceeds poisoning risk.
Primary Entry Route(s): Inhalation, skin contact.
Chronic Health Effects: Chronic overexposure may aggravate existing skin, eye and lung conditions.

VI. REACTIVITY DATA

Stability: Stable. Hazardous Polymerization: Cannot occur.
Incompatibilities: Avoid contact with strong oxidizing materials, strong alkalies, strong mineral acids.
Hazardous Decomposition Products: Carbon mono/di oxides.
Conditions to Avoid: None

VII. SPILL OR LEAK PROCEDURES

Procedures for Spill/Leak:

Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks, etc.).

Small Spill - Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to a recovery drum.
Large Spill - Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into recovery drums. Prevent run-off to sewers, streams or others bodies of water. Notify proper authorities, as required, that a spill has occurred.
Waste Management:

Landfill solids at permitted sites. Use registrated transporters. Burn concentrated liquids at permitted sites. Avoid flameouts. Assure emissions comply with applicable regulations. Dilute aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection:

If workplace exposure limit(s) of product is exceeded, a NIOSH/MSHA approved air supplied respirator is advised in the absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

Ventilation: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain minimum exposure.
Eye Protection: Chemical Splash Proof Goggles and full face shield are advised for operations where eye or face contact can occur.
Gloves: Wear impervious gloves.
Other Protective Equipment: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

IX. SPECIAL PRECAUTIONS

MAGIC WASH 522C

Special Handling/Storage:

To avoid skin contact and ingestion, wash hands and face well before eating or smoking. Do not permit food in work area. Avoid breathing mists if generated. Store at room temperature. Reseal container when not in use. Do not store near acids, bases or flammable liquids. Containers of this material should be rinsed when emptied, since emptied containers retain product residues (vapor, liquid, and/or solid). All hazard precautions given in this data sheet must be observed.

As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

Date revised: 04/01/2001
jpm

Low-VOC Cleaner Tested at Lithographix, Tedco, Oberthur Card Systems and Huhtamaki

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Trade Name: MAGIC UV WASH
Generic Name: Lithographic UV / EB Ink Roller Wash

CAS #: Proprietary Blend

Manufacturer: SIEBERT, INC.
Address: 8134 West 47th Street
City: Lyons State: IL Zip: 60534 USA

Emergency Phone #: (800) 535-5053
Technical Phone #: (708) 442-2010

DOT Hazard Classification: Not Regulated
NFPA Codes: Health - 1 Flammability - 0 Reactivity - 0
HMIS Codes: Health - 1 Flammability - 0 Reactivity - 0 Personal Protection - B

II. HAZARDOUS INGREDIENTS

If present, IARC, NTP, and OSHA carcinogens and chemicals subject to the reporting requirements of SARA Title III Section 313 are identified in this section.

Ingredient Name	CAS #	%wt	TLV	STEL	SARA TITLE III
Surfactants	Various	70 to 90	None established	None established	No

References: 29CFR 1910.1000, ACGIH "Threshold Limit Values for Chemicals in the Workplace", National Toxicology Program Annual Report, International Agency for Research on Cancer Monographs, and 40CFR Part 372. All components of this product are in compliance with TSCA.

III. PHYSICAL DATA

Boiling Point @ 760 mm Hg, (initial):	212°F
Vapor Pressure @ 80°F:	<1 mm Hg
Specific Gravity @ 68°F:	0.99
Water Solubility (%):	Soluble
Specific Vapor Density (air=1):	<1
% Volatile by Volume:	~30
% Volatile Organic Compound(s),(EPA Method 24):	<2.0
Appearance:	Clear liquid
Odor:	Mild organic odor

IV. FIRE AND EXPLOSION DATA

Flash Point (Method): Not Applicable
Explosive Limit: LEL - N/E UEL - N/E
Extinguishing Media: Water fog, carbon dioxide, or dry chemical.
Special Fire Fighting Procedures: Wear self-contained breathing apparatus when fighting chemical fires.
Unusual Fire and Explosion Hazards: None Known.

V. HEALTH HAZARD DATA

Eyes - May cause severe irritation, tearing, blurred vision. Contact lenses must not be worn when possibility exists for eye contact due to spraying liquid or airborne particles.
Skin - Prolonged or repeated contact may cause irritation.
Breathing - Excessive inhalation of vapors can cause nasal and respiratory irritation, central nervous system effects including dizziness, fatigue, nausea, and headache.
Swallowing - Can cause gastrointestinal irritation, nausea, vomiting, and diarrhea.

First Aid/Emergency Procedures

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet and get medical attention.

Skin Contact: Wash thoroughly with soap and water. Remove contaminated clothing. Launder contaminated clothing before re-use.
Eyes: Flush with copious amounts of water. Get medical attention.
Ingestion: Do not induce vomiting. If large quantity is swallowed, give lukewarm water (pint). NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get medical attention immediately. Risk of damage to lungs exceeds poisoning risk.
Primary Entry Route(s): Inhalation, eye contact, skin contact.
Chronic Health Effects: Chronic overexposure may aggravate existing skin, eye and lung conditions.

VI. REACTIVITY DATA

Stability: Stable. Hazardous Polymerization: Cannot occur.
Incompatibilities: Avoid contact with strong oxidizing materials, strong mineral acids and chlorine bleach.
Hazardous Decomposition Products: Carbon mono/di oxides.
Conditions to Avoid: None known.

VII. SPILL OR LEAK PROCEDURES

Procedures for Spill/Leak:
Small Spill - Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to a recovery drum.
Large Spill - Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into recovery drums. Prevent run-off to sewers, streams or others bodies of water. Notify proper authorities, as required, that a spill has occurred.
Waste Management:
Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids at permitted sites. Avoid flameouts. Assure emissions comply with applicable regulations. Dilute aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: If workplace exposure limit(s) of product is exceeded, a NIOSH/MSHA approved air supplied respirator is advised in the absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.
Ventilation: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain minimum exposure.
Eye Protection: Chemical Splash Proof Goggles and full face shield are advised for operations where eye or face contact can occur.
Gloves: Wear impervious gloves.
Other Protective Equipment: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

IX. SPECIAL PRECAUTIONS

Special Handling/Storage:
To avoid skin contact and ingestion, wash hands and face well before eating or smoking. Do not permit food in work area. Avoid breathing mists if generated. Store at temperatures between 45°F and 110°F. Do not freeze. Reseal container when not in use. Do not store near acids, bases or flammables. Containers of this material should be rinsed when emptied, since emptied containers retain product residues (vapor, liquid, and/or solid). All hazard precautions given in this data sheet must be observed.

As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

Date revised: 11/01/2001
jpm

Low-VOC Cleaner Ingredient Tested at Anderson and Oberthur Card Systems

72-62-7820-01

008669

GLYCOL ETHER DPM

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

****

Product Name: GLYCOL ETHER DPM
CAS NUMBER: 34590-94-8

Data Sheet No: 0003866-005
Prepared: 10/05/89
Supersedes: 03/04/86

BENCO SALES INC
P O BOX 1415
CROSSVILLE TN 38557

05 50 088 0936060-

PRODUCT: 3989160
INVOICE: 650542
INVOICE DATE: 10/23/89
TO: BENCO SALES INC
STOUT DRIVE
CROSSVILLE TN 38555

ATTN: PLANT MGR./SAFETY DIR.

SECTION I-PRODUCT IDENTIFICATION

General or Generic ID: GLYCOL ETHER

DOT Hazard Classification: COMBUSTIBLE (173.115)

SECTION II-COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION. SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by WT)	PEL	TLV	Note
DIPROPYLENE GLYCOL MONOMETHYL ETHER CAS #: 34590-94-8	>95	100 PPM - SKIN	100 PPM - SKIN	(1)

Notes:

(1) SKIN ABSORPTION MAY POTENTIALLY CONTRIBUTE TO THE OVERALL EXPOSURE TO THIS MATERIAL. APPROPRIATE MEASURES SHOULD BE TAKEN TO PREVENT ABSORPTION SO THAT THE TLV IS NOT INVALIDATED.

OSHA/ACGIH SHORT TERM EXPOSURE LIMIT (STEL) FOR DIPROPYLENE GLYCOL MONOMETHYL ETHER IS 150 PPM.

SECTION III-PHYSICAL DATA

Boiling Point	for PRODUCT	356.00 - 378.00 Deg F (180.00 - 192.22 Deg C) @ 760.00 mm Hg
Vapor Pressure	for PRODUCT	< 0.10 mm Hg @ 68.00 Deg F (20.00 Deg C)
Specific Vapor Density	AIR = 1	5.1
Specific Gravity		.953 - .959 @ 68.00 Deg F (20.00 Deg C)
Percent Volatiles		100.00%
Evaporation Rate	(BU AC = 1)	.80

SECTION IV-FIRE AND EXPLOSION INFORMATION

FLASH POINT(TCC) 167.0 Deg F (75.0 Deg C)

EXPLOSIVE LIMIT (PRODUCT) LOWER - 1.1%

EXTINGUISHING MEDIA: ALCOHOL FOAM OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.

SPECIAL FIRE & EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND IGNITED BY HEAT, PILOT LIGHTS, OTHER FLAMES AND IGNITION SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT.

NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

ALL FIVE GALLON PAILS AND LARGER METAL CONTAINERS INCLUDING TANK CARS AND TANK TRUCKS SHOULD BE GROUNDED AND/OR BONDED WHEN MATERIAL IS TRANSFERRED.

NFPA CODES: HEALTH- 0 FLAMMABILITY- 2 REACTIVITY- 0

SECTION V-HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL 100 PPM - SKIN

THRESHOLD LIMIT VALUE 100 PPM - SKIN

(SKIN)

CONTINUED ON PAGE: 2

SECTION V-HEALTH HAZARD DATA (Continued)

EFFECTS OF ACUTE OVEREXPOSURE: FOR PRODUCT

EYES - CAN CAUSE IRRITATION.
SKIN - CAN CAUSE SLIGHT IRRITATION.
BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION AND CENTRAL NERVOUS SYSTEM EFFECTS INCLUDING DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE AND POSSIBLE UNCONSCIOUSNESS.
SWALLOWING - SLIGHTLY TOXIC. MAY PRODUCE SIGNS OF INTOXICATION CHARACTERIZED BY INCOORDINATION, DIZZINESS, DROWSINESS, HEADACHE, NAUSEA, MENTAL CONFUSION, POSSIBLY SLURRED SPEECH, AND STUPOR, DEPENDING ON THE QUANTITY OF MATERIAL INGESTED.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY.

IF SWALLOWED: IMMEDIATELY DRINK TWO GLASSES OF WATER AND INDUCE VOMITING BY EITHER GIVING IPECAC SYRUP OR BY PLACING FINGER AT BACK OF THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.

IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

PRIMARY ROUTE(S) OF ENTRY:

INHALATION, SKIN ABSORPTION, SKIN CONTACT

EFFECTS OF CHRONIC OVEREXPOSURE: FOR PRODUCT

OVEREXPOSURE TO THIS MATERIAL (OR ITS COMPONENTS) HAS APPARENTLY BEEN FOUND TO CAUSE THE FOLLOWING EFFECTS IN LABORATORY ANIMALS:, LIVER ABNORMALITIES, KIDNEY DAMAGE

SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH:, STRONG OXIDIZING AGENTS.

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

VENTILATE AREA.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH:, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED, THAT A SPILL HAS OCCURED.

WASTE DISPOSAL METHOD:

SMALL SPILL: DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

LARGE SPILL: DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION II), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS:, NITRILE RUBBER, NATURAL RUBBER

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER)

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED.SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THE DATA SHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

 LAST PAGE--SEE ATTACHMENT PAGE ENCLOSED--LAST PAGE

72-62-7820-01

DEFINITIONS

This definition page is intended for use with Material Safety Data Sheets supplied by the Ashland Chemical Company. Recipients of these data sheets should consult the OSHA Safety and Health Standards (29 CFR 1910), particularly subpart G - Occupational Health and Environmental Control, and subpart I - Personal Protective Equipment, for general guidance on control of potential Occupational Health and Safety Hazards.

SECTION I
PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: Chemical family or product description.

DOT HAZARD CLASSIFICATION: Product meets DOT criteria for hazards listed.

SECTION II
COMPONENTS

Components are listed in this section if they present a physical or health hazard and are present at or above 1% in the mixture. If a component is identified as a CARCINOGEN by NTP, IARC or OSHA as of the date on the MSDS, it will be listed and footnoted in this section when present at or above 0.1% in the product. Negative conclusions concerning carcinogenicity are not reported. Additional health information may be found in Section V. Components subject to the reporting requirements of Section 313 of SARA Title III are identified in the footnotes in this section, along with typical percentages. Other components may be listed if deemed appropriate.

Exposure recommendations are for components. OSHA Permissible Exposure Limits (PELs) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) appear on the line with the component identification. Other recommendations appear as footnotes.

SECTION III
PHYSICAL DATA

BOILING POINT: Of product if known. The lowest value of the components is listed for mixtures.

VAPOR PRESSURE: Of product if known. The highest value of the components is listed for mixtures.

SPECIFIC VAPOR DENSITY: Compared to AIR = 1. If Specific Vapor Density of product is not known, the value is expressed as lighter or heavier than air.

SPECIFIC GRAVITY: Compared to WATER = 1. If Specific Gravity of product is not known, the value is expressed as less than or greater than water.

pH: If applicable.

PERCENT VOLATILES: Percentage of material with initial boiling point below 425 degrees Fahrenheit.

EVAPORATION RATE: Indicated as faster or slower than ETHYL ETHER, unless otherwise stated.

SECTION IV
FIRE AND EXPLOSION DATA

FLASH POINT: Method identified.

EXPLOSION LIMITS: For product if known. The lowest value of the components is listed for mixtures.

HAZARDOUS DECOMPOSITION PRODUCTS: Known or expected hazardous products resulting from heating, burning or other reactions.

SECTION IV (cont.)

EXTINGUISHING MEDIA: Following National Fire Protection Association criteria.

FIREFIGHTING PROCEDURES: Minimum equipment to protect firefighters from toxic products of vaporization, combustion or decomposition in fire situations. Other firefighting hazards may also be indicated.

SPECIAL FIRE AND EXPLOSION HAZARDS: States hazards not covered by other sections.

NFPA CODES: Hazard ratings assigned by the National Fire Protection Association.

SECTION V
HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMIT: For product.

THRESHOLD LIMIT VALUE: For product.

EFFECTS OF ACUTE OVEREXPOSURE: Potential local and systemic effects due to single or short term overexposure to the eyes and skin or through inhalation or ingestion.

EFFECTS OF CHRONIC OVEREXPOSURE: Potential local and systemic effects due to repeated or long term overexposure to the eyes and skin or through inhalation or ingestion.

FIRST AID: Procedures to be followed when dealing with accidental overexposure.

PRIMARY ROUTE OF ENTRY: Based on properties and expected use.

SECTION VI
REACTIVITY DATA

HAZARDOUS POLYMERIZATION: Conditions to avoid to prevent hazardous polymerization resulting in a large release of energy.

STABILITY: Conditions to avoid to prevent hazardous or violent decomposition.

INCOMPATIBILITY: Materials and conditions to avoid to prevent hazardous reactions.

SECTION VII
SPILL OR LEAK PROCEDURES

Reasonable precautions to be taken and methods of containment, clean-up and disposal. Consult federal, state and local regulations for accepted procedures and any reporting or notification requirements.

SECTION VIII
PROTECTIVE EQUIPMENT TO BE USED

Protective equipment which may be needed when handling the product.

SECTION IX
SPECIAL PRECAUTIONS OR OTHER COMMENTS

Covers any relevant points not previously mentioned.

ADDITIONAL COMMENTS

Containers should be either reconditioned by CERTIFIED firms or properly disposed of by APPROVED firms. Disposal of containers should be in accordance with applicable laws and regulations. "EMPTY" drums should not be given to individuals. Serious accidents have resulted from the misuse of "EMPTIED" containers (drums, pails, etc.). Refer to Sections IV and IX.

Low-VOC Cleaner Ingredient Tested at Anderson

EASTMAN

MATERIAL SAFETY DATA SHEET

Revision Date: 07/15/2004
MSDSANSI/ANSI/EN/150000001149/Version 12.0

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	Eastman(TM) EEP Solvent
Product Identification Number(s)	12470-00, P1247000, P1247001, P1247002, P1247003, P1247004, P1247005, P1247006, P1247007, P1247008, P1247010, P1247009, P12470M2, P12470M4, P1247011
Manufacturer/Supplier	Eastman Chemical Company Eastman Road Kingsport, TN 37662 US
MSDS Prepared by	Eastman Product Safety and Health
Chemical Name	3-ethoxypropanoic acid, ethyl ester
Synonym(s)	12470-00 970309
Molecular Formula	C7H14O3
Molecular Weight	146.19
Product Use	solvent
OSHA Status	hazardous

For emergency health, safety & environmental information, call 800-EASTMAN.

For emergency transportation information, call CHEMTREC at 800-424-9300 or call 800-EASTMAN.

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

Weight %	Component	CAS Registry No.
>99.5%	ethyl 3-ethoxypropionate	763-69-9
<0.02%	formaldehyde	50-00-0
<0.02%	butylated hydroxytoluene (as inhibitor)	128-37-0

3. HAZARDS IDENTIFICATION

CAUTION!
COMBUSTIBLE LIQUID AND VAPOR
FORMS PEROXIDES IF MATERIAL BECOMES UNINHIBITED
HIGH VAPOR CONCENTRATIONS MAY CAUSE DROWSINESS

HMIS® Hazard Ratings: Health - 1, Flammability -2, Chemical Reactivity - 1

HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. FIRST-AID MEASURES

Inhalation: Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.
Eyes: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if symptoms persist.
Skin: Wash with soap and water. Get medical attention if symptoms occur.
Ingestion: Seek medical advice.

5. FIRE FIGHTING MEASURES

Extinguishing Media: water spray, carbon dioxide, dry chemical, foam
Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool. USE WATER WITH CAUTION. Material will float and may ignite on surface of water. Water may be ineffective in fighting the fire. The fire could easily be spread by the use of water in an area where the water could not be contained.
Hazardous Combustion Products: carbon dioxide, carbon monoxide
Unusual Fire and Explosion Hazards: Forms peroxides of unknown stability if material becomes uninhibited. Combustible.

6. ACCIDENTAL RELEASE MEASURES

Use personal protective equipment. Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.
For Large Spills: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.

7. HANDLING AND STORAGE

Personal Precautionary Measures: Avoid breathing high vapor concentrations. Use only with adequate ventilation. Wash thoroughly after handling.
Prevention of Fire and Explosion: Keep away from heat and flame. Keep from contact with oxidizing materials. Keep inhibited. Minimize exposure to air. After opening, purge container with nitrogen before reclosing. Periodically test for peroxide formation on long-term storage. If peroxide formation is suspected, do not open or move container. Do not allow to evaporate to near dryness. Do not distill to near dryness.
Storage: Keep container closed.
Additional Information: Store away from heat and light.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Country specific exposure limits have not been established or are not applicable unless listed below.

ETHYL 3-ETHOXYPROPIONATE

Eastman Chemical Company occupational exposure limit:
Time Weighted Average (TWA): 50 ppm,
Eastman Chemical Company occupational exposure limit:
Short Term Exposure Limit (STEL): 100 ppm,

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Eye Protection: It is a good industrial hygiene practice to minimize eye contact.

Recommended Decontamination Facilities: eye bath, washing facilities

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: liquid
Color: colorless
Odor: ester, pungent
Odor Threshold: 0.02 ppm
Specific Gravity: 0.95 (20 °C)
Vapor Pressure: 25 °C; 2.0 mbar
Vapor Density: 5.0
Freezing Point: <-50 °C
Boiling Point: 165 °C
Evaporation Rate: 0.12 (n-butyl acetate = 1)
Viscosity: 1.20 mPa.s (25 °C) ,
Solubility in Water: 29 g/l
Octanol/Water Partition Coefficient: P: 22.4; log P: 1.35
Flash Point: 59 °C (Setaflash closed cup)
Autoignition Temperature: 377 °C (ASTM E659)
Thermal Decomposition Temperature: (HPDTA) No exotherm to 400°C

10. STABILITY AND REACTIVITY

Stability: Stable. Forms peroxides if material becomes uninhibited.
Incompatibility: Material reacts with strong oxidizing agents.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oral LD-50:(male rat)	>5,000 mg/kg(highest dose tested)
Oral LD-50:(female rat)	4,300 mg/kg
Inhalation LC-50: (rat)	6 hours: > 1000 ppm (highest concentration tested)
Dermal LD-50: (guinea pig)	> 20 ml/kg (highest dose tested)
Skin Irritation (guinea pig)	slight
Eye Irritation (rabbit)	slight
Skin Sensitization: (guinea pig)	none

12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

This material is readily biodegraded and is not likely to bioconcentrate.

Oxygen Demand Data:

BOD-5: 370 mg/g
BOD-20: 560 mg/g

COD: 1,920 mg/g
ThBOD: 1,970 mg/g

Acute Aquatic Effects Data:

96 h LC-50 (fathead minnow): 50 mg/l NOEC: 25 mg/l
48 h EC-50 (Daphnia magna): > 480 mg/l NOEC: 470 mg/l
72 h EC-50 (Selenastrum capricornutum): > 115 mg/l

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

DOT (USA)

Class combustible liquid, Packing group III for quantities of 450 liters (119 gallons) or more; not regulated for smaller quantities
()

Marine pollutant:

Possible Shipping Description(s):

not regulated

Esters, n.o.s. (ethyl 3-ethoxypropionate)
combustible liquid UN III

Esters, n.o.s. (ethyl 3-ethoxypropionate)
combustible liquid UN 3272 III

Sea - IMDG (International Maritime Dangerous Goods)

Possible Shipping Description(s):

ESTERS, N.O.S. (ethyl 3-ethoxypropionate)
3 UN 3272 III

Air - ICAO (International Civil Aviation Organization)

Possible Shipping Description(s):

Esters, n.o.s. (ethyl 3-ethoxypropionate)
3 UN 3272 III

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
WHMIS (Canada) Status: controlled

WHMIS (Canada) Hazard Classification: B/3

SARA 311-312 Hazard Classification(s):
fire hazard
reactive hazard

SARA 313: none, unless listed below

Carcinogenicity Classification (components present at 0.1% or more): none, unless listed below

TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.
DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL. Any impurities present in this product are exempt from listing.
EINECS (European Inventory of Existing Commercial Chemical Substances): This product is listed on EINECS or otherwise complies with EINECS requirements.
AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.
MITI (Japanese Handbook of Existing and New Chemical Substances): This product is listed in the Handbook or has been approved in Japan by new substance notification.
ECL (Korean Toxic Substances Control Act): This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.

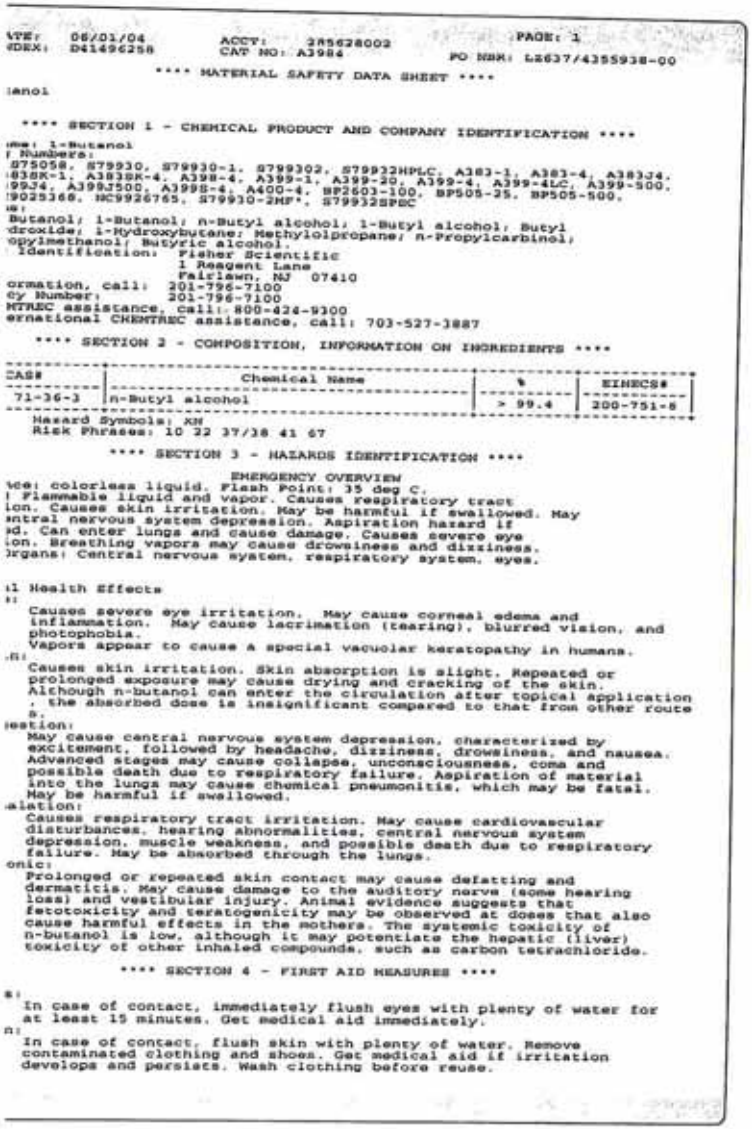
16. OTHER INFORMATION

Visit our website at www.EASTMAN.com or call 001-423-229-2000.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information. Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment.

Highlighted areas indicate new or changed information.

Low-VOC Cleaner Ingredient Tested at Anderson



DATE: 06/01/04 ACCT: 285628002 PAGE: 1
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**** MATERIAL SAFETY DATA SHEET ****

anol

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

me: 1-Butanol
Numbers:
S75058, S79930, S79930-1, S799302, S79932HPLC, A383-1, A383-4, A383J4,
838K-1, A3838K-4, A398-4, A399-1, A399-20, A399-4, A399-4LC, A399-500,
99J4, A399J500, A399E-4, A400-4, BP2603-100, BP505-25, BP505-500,
9025360, MC9926745, S79930-2MF*, S79932ESPEC
e:
Butanol; 1-Butanol; n-Butyl alcohol; 1-Butyl alcohol; Butyl
droxide; 1-Hydroxybutane; Methylolpropane; n-Propylcarbinol;
opylmethanol; Butyric alcohol;
Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410
ormation, call: 201-796-7100
cy Number: 201-796-7100
MTREC assistance, call: 800-424-9300
ernational CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
71-36-3	n-Butyl alcohol	> 99.4	200-751-6

Hazard Symbols: XN
Risk Phrases: 10 22 37/38 41 67

**** SECTION 3 - HAZARDS IDENTIFICATION ****

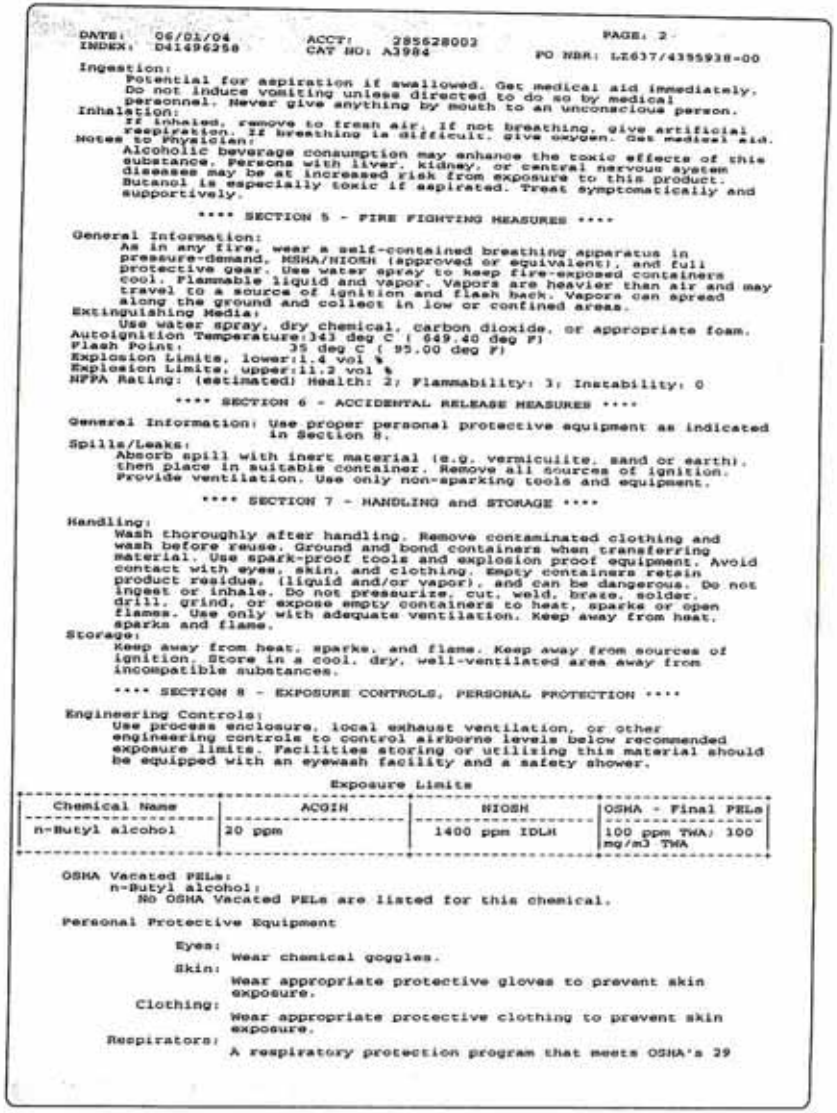
EMERGENCY OVERVIEW

ce: colorless liquid. Flash Point: 35 deg C.
Flammable liquid and vapor. Causes respiratory tract
ion. Causes skin irritation. May be harmful if swallowed. May
ntral nervous system depression. Aspiration hazard if
d. Can enter lungs and cause damage. Causes severe eye
ion. Breathing vapors may cause drowsiness and dizziness.
rgans: Central nervous system, respiratory system, eyes.

l Health Effects
:
Causes severe eye irritation. May cause corneal edema and inflammation. May cause lacrimation (tearing), blurred vision, and photophobia.
Vapors appear to cause a special vacuolar keratopathy in humans.
n:
Causes skin irritation. Skin absorption is slight. Repeated or prolonged exposure may cause drying and cracking of the skin. Although n-butanol can enter the circulation after topical application , the absorbed dose is insignificant compared to that from other route s.
estion:
May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May be harmful if swallowed.
alation:
Causes respiratory tract irritation. May cause cardiovascular disturbances, hearing abnormalities, central nervous system depression, muscle weakness, and possible death due to respiratory failure. May be absorbed through the lungs.
onic:
Prolonged or repeated skin contact may cause defatting and dermatitis. May cause damage to the auditory nerve (some hearing loss) and vestibular injury. Animal evidence suggests that fetotoxicity and teratogenicity may be observed at doses that also cause harmful effects in the mothers. The systemic toxicity of n-butanol is low, although it may potentiate the hepatic (liver) toxicity of other inhaled compounds, such as carbon tetrachloride.

**** SECTION 4 - FIRST AID MEASURES ****

s:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.
n:
In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.



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Ingestion:
Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.
Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Alcoholic beverage consumption may enhance the toxic effects of this substance. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Butanol is especially toxic if aspirated. Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media:
Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Autoignition Temperature:343 deg C (649.40 deg F)
Flash Point: 35 deg C (95.00 deg F)
Explosion Limits, lower:1.4 vol %
Explosion Limits, upper:11.2 vol %
NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:
Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. Use only non-sparking tools and equipment.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.
Storage:
Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Butyl alcohol	20 ppm	1400 ppm IDLH	100 ppm TWA; 300 mg/m3 TWA

OSHA Vacated PELs:
n-Butyl alcohol:
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29

CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

ysical State:	Liquid
lor:	Colorless
or:	Vinous or wine-like
:	Not available.
por Pressure:	6.7 mm Hg @ 25 deg C
por Density:	2.6 (Air=1)
aporation Rate:	0.46 (Butyl acetate=1)
scosity:	2.94 cP at 20 deg C
iling Point:	116 deg C
ezing/Melting Point:	-89.5 deg C
composition Temperature:	Not available.
lubility in water:	Slightly soluble.
ecific Gravity/Density:	0.8100 (Water=1)
lecular Formula:	C4H10O
lecular Weight:	74.12

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Ignition sources, excess heat, confined spaces.
Incompatibilities with Other Materials:
Strong oxidizing agents, strong acids, alkali metals, halogens.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 71-36-3: EO1400000
LD50/LC50:
CAS# 71-36-3: Draize test, rabbit, eye: 2 mg Severe; Draize test, rabbit, eye: 2 mg/24H Severe; Draize test, rabbit, skin: 405 mg/24H Moderate; Draize test, rabbit, skin: 20 mg/24H Moderate; Inhalation, rat: LC50 = 24000 mg/m3/4H; Inhalation, rat: LC50 = 8000 ppm/4H; Oral, mouse: LD50 = 100 mg/kg; Oral, rabbit: LD50 = 3400 mg/kg; Oral, rabbit: LD50 = 3484 mg/kg; Oral, rat: LD50 = 800 mg/kg; Oral, rat: LD50 = 790 mg/kg; Skin, rabbit: LD50 = 3400 mg/kg.
Carcinogenicity:
n-Butyl alcohol -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No data available.
Teratogenicity:
See actual entry in RTECS for complete information.
Reproductive Effects:
See actual entry in RTECS for complete information.
Neurotoxicity:
No information available.
Mutagenicity:
See actual entry in RTECS for complete information.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Fish: Fathead Minnow: LC50 = 1910-1730 mg/L; 96 Hr; Static bioassay at 24.76C (pH 7.64)Water flea Daphnia: EC50 = 1980-1983 mg/L; 48 Hr; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 2817-3710 mg/L; 5.30 min; Microtox testRelease of n-butanol to soil may result in volatilization from the soil surface and biodegradation is expected to be significant. n-Butanol should not bind strongly to soil and so is expected to leach into groundwater. Release of n-butanol to water is expected to result in biodegradation and in volatilization from the water surface. Photooxidation by hydroxyl radicals is expected to be slow.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

mical waste generators must determine whether a discarded chemical classified as a hazardous waste.
EPA guidelines for the classification determination are listed in CFR Parts 261.3. Additionally, waste generators must consult state local hazardous waste regulations to ensure complete and accurate ssification.
A F-Series: None listed.
A U-Series: CAS# 71-36-3: waste number U031
nitable waste).

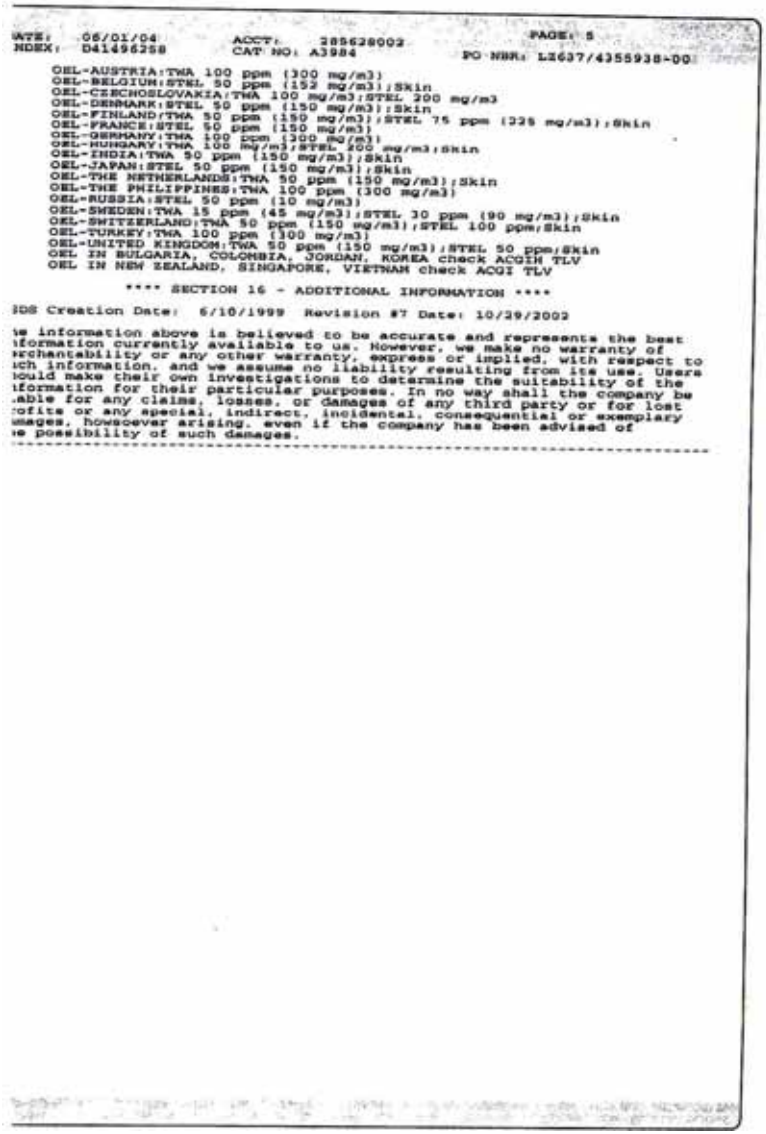
**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: BUTANOLS
Hazard Class: 3
UN Number: UN1120
Packing Group: III
Canadian TDG
Shipping Name: BUTANOLS
Hazard Class: 3
UN Number: UN1120
Other Information: FLASHPOINT 29 C

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA
CAS# 71-36-3 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
CERCLA Hazardous Substances and corresponding RQs
CAS# 71-36-3: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 71-36-3: acute, flammable.
Section 313
This material contains n-Butyl alcohol (CAS# 71-36-3, 99 4%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
n-Butyl alcohol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
California No Significant Risk Level:
None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XN
Risk Phrases:
R 10 Flammable.
R 22 Harmful if swallowed.
R 37/38 Irritating to respiratory system and skin.
R 41 Risk of serious damage to eyes.
R 67 Vapors may cause drowsiness and dizziness.
Safety Phrases:
S 7/9 Keep container tightly closed and in a well-ventilated place.
S 13 Keep away from food, drink and animal feeding stuffs.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.
S 46 If swallowed, seek medical advice immediately and show this container or label.
WGK (Water Danger/Protection)
CAS# 71-36-3: 1
United Kingdom Occupational Exposure Limits
CAS# 71-36-3: OES-United Kingdom, STEL 50 ppm STEL; 154 mg/m3 STEL
United Kingdom Maximum Exposure Limits

Canada
CAS# 71-36-3 is listed on Canada's DSL List.
This product has a WHMIS classification of B2, D2B.
CAS# 71-36-3 is listed on Canada's Ingredient Disclosure List.
Exposure Limits
CAS# 71-36-3: OEL-AUSTRALIA:TWA 50 ppm (150 mg/m3);Skin



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NDEX: D41496258 CAT NO: A3984 PO NBR: LZ637/4355938-00

OEL-AUSTRIA:TWA 100 ppm (300 mg/m3)
OEL-BELGIUM:STEL 50 ppm (152 mg/m3);Skin
OEL-CZECHOSLOVAKIA:TWA 100 mg/m3;STEL 200 mg/m3
OEL-DENMARK:STEL 50 ppm (150 mg/m3);Skin
OEL-FINLAND:TWA 50 ppm (150 mg/m3);STEL 75 ppm (225 mg/m3);Skin
OEL-FRANCE:STEL 50 ppm (150 mg/m3)
OEL-GERMANY:TWA 100 ppm (300 mg/m3)
OEL-HUNGARY:TWA 100 mg/m3;STEL 200 mg/m3;Skin
OEL-INDIA:TWA 50 ppm (150 mg/m3);Skin
OEL-JAPAN:STEL 50 ppm (150 mg/m3);Skin
OEL-THE NETHERLANDS:TWA 50 ppm (150 mg/m3);Skin
OEL-THE PHILIPPINES:TWA 100 ppm (300 mg/m3)
OEL-RUSSIA:STEL 50 ppm (10 mg/m3)
OEL-SWEDEN:TWA 15 ppm (45 mg/m3);STEL 30 ppm (90 mg/m3);Skin
OEL-SWITZERLAND:TWA 50 ppm (150 mg/m3);STEL 100 ppm;Skin
OEL-TURKEY:TWA 100 ppm (300 mg/m3)
OEL-UNITED KINGDOM:TWA 50 ppm (150 mg/m3);STEL 50 ppm;Skin
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

SDS Creation Date: 6/10/1999 Revision #7 Date: 10/29/2002

he information above is believed to be accurate and represents the best
nformation currently available to us. However, we make no warranty of
erchantability or any other warranty, express or implied, with respect to
uch information, and we assume no liability resulting from its use. Users
hould make their own investigations to determine the suitability of the
nformation for their particular purposes. In no way shall the company be
.able for any claims, losses, or damages of any third party or for lost
rofits or any special, indirect, incidental, consequential or exemplary
amages, however arising, even if the company has been advised of
he possibility of such damages.

Low-VOC Hand Blanket Wash Tested at The Printery

MATERIAL SAFETY DATA SHEET
RHO-CHEM CORPORATION

(A Fully Owned Subsidiary of Philip Services Corporation)
425 Isis Avenue, Inglewood, California – 90301
Tel.: (323)776-6233, Fax: (310)645-6379

Product : Rhosolv-7150 Blanket Wash, Revision- Initial Release/3-03-06

1. COMPANY AND MATERIAL IDENTIFICATION :

Product Name/Number	:	Rho-Solv 7150 Blanket Wash
Synonyms	:	N. A.
Chemical Family	:	Flammable Solvent Blend
Stock Number	:	Technical Grade –7150

2. COMPOSITION OF THE MATERIAL: MIXTURE

Chemical Name	CAS No.	% Concentration
Acetone	67-64-1	80– 90%
Diethylene Glycol Monobutyl Ether	112-34-5	10 – 15%

3. HAZARDS IDENTIFICATION :

EXTREMELY FLAMMABLE LIQUID & VAPOR. MAY CAUSE FLASH FIRE.

Inhalation:
High concentration of vapors will be irritating to the respiratory tract and may cause dizziness, headache, and dizziness Central Nervous System effects & possibly death.

Ingestion:
Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can cause lung damage.

Skin Contact:
May cause some irritation, drying, redness or cracking to skin

Eye Contact:
Vapors may be irritating to eyes. Splashing may cause redness and pain to eyes.

Symptoms & Signs to Exposure:
Basically, same symptoms and signs will occur, as given above.

Medical Conditions Aggravated:
Pre-existing medical conditions of the Respiratory System, Skin dermatitis and Eyes may be aggravated by further exposure to this material.

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4. FIRST AID :

Inhalation:
Remove the person to fresh air. If no improvement noticed, then transport to the nearest medical care facility for further treatment.

Ingestion:
If swallowed, do not induce vomiting. transport to the nearest medical care facility for further treatment.

Skin Contact:
Remove contaminated clothing. Flush exposed area with water followed by washing with soap.

Eye Contact:
Flush eyes with water with eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision , or swelling persist, transport to the nearest medical care facility for further treatment.

Advice to Physician:
Causes CNS depression. Prolonged or repeated exposure may result in dermatitis.

5. FIRE FIGHTING MEASURES :

Clear the area of all non-emergency, un-protected personnel.

Ingredient	Flash Point	U.F. L.	L.F.L.	Auto Ignition Temp.
Acetone	-20° C – CC	12.8	2.5	465° C (869° F)
Diethylene Glycol Monobutyl Ether	115° C – CC	-----	0.9	204° C (399° F)

Specific Hazards:
Carbon Monoxide may be evolved in case of incomplete combustion. Will float on the surface water and can be re-ignited. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup, which could result in container rupture. Containers exposed to direct flame should be cooled with large quantities of water as needed to prevent weakening of container structure or rupture.

Extinguishing Media:
Use water, foam dry chemical or Carbon dioxide, sand or earth may be used in case of small fires. The extinguishing water must be collected separately and disposed of as a waste. At no instance, this contaminated water will be discharged to the environment or into sewage, city or municipal waters. Material can accumulate static discharge. **Empty** containers still retain residue, a liquid & or vapor mixture.

Protective Equipment:
Wear full protective clothing and Self contained breathing apparatus for large spill/fire.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local, State, Federal and International regulations as applicable.

Protective measures:
Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment, please refer to section 8 and for disposal of spilled material refer to section 13 of this MSDS. Shut off leaks, if no risk is involved. Eliminate all possible ignition sources in surrounding area. Use appropriate containment methods to avoid further contamination to environment and to neighboring areas. Avoid spreading or entering the spilled material into the drains, ditches or rivers by using sand, earth or other appropriate barriers. Attempt to Disperse the vapors to divert its flow to a safe location, by using fog sprays, for example. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding all equipment. Monitor area with combustible gas indicator. A leaking drum or container can be rolled or made up side down in the direction opposite to the leaking spot

Clean Up Methods:
For small liquid spills (< 1 drum of 55 gal), transfer to a labeled, seallable container by mechanical means for safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.
For large liquid spills (> 1 drum of 55 gal), transfer by mechanical means such as vacuum truck to a salvage tank for safe disposal. Retain as a contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Additional Information:
Notify appropriate authorities if there is a risk involved to the general public or to the environment or to the neighborhood due to the spill or release of this material. Vapor may form an explosive mixture with air. Please report to the National Response Center @ (800)424-8802 if the spilled quantity exceeds the reportable quantity. (Refer to chapter 15 of this MSDS. Required under CERCLA (Comprehensive Environment Response, Compensation & Liability Act).

7. HANDLING AND STORAGE

General Precautions :
Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. Use appropriate P.P.E. per section 8 of this MSDS.

Handling:
Handle and open the container with **CARE** in well ventilated area. Remove ignition sources. Avoid sparks. **Do not create friction.** Keep container closed, to avoid emissions and inhalation. Avoid any force opening, creating friction. Avoid contact with skin, eyes and clothing**. Ensure electrical continuity by bonding and grounding all equipment**. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m./sec until fill pipe is submerged to twice its diameter, then <= 7 m/sec.) Avoid splash filling. Do not use compressed air for filling, discharging or handling operations. The vapor is heavier than air spreads along the ground and distant ignition is possible. Extinguish any naked flames. Do not smoke. Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Do not empty into drains. **Avoid handling above its flash point**, otherwise the product will form flammable/explosive vapor-air mixtures.

Storage:
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Store at ambient temperature. Keep away from aerosols, oxidizers, corrosives.

Product Transfer:
Keep containers closed when not in use. Do not use compressed air for filling. Discharging or handling. Use grounding bonding wires during transfer.

Recommended Materials:
For containers or container linings, use mild steel or Stainless steel. For container paints, use epoxy paint, zinc silicate paint.

Unsuitable Materials:
Avoid prolonged contact with natural, butyl or nitrile rubbers.

Container Recommendation :
Emptied containers may still contain explosive vapors. Do Not cut, drill grind or perform similar operations on or near containers Do not re-use empty containers without commercial cleaning or reconditioning.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Following table may be referred in absence of occupational standards for this material.

Material	Source	Type	PPM	mg/m^3
Acetone	OSHA	TWA	1000	------
	Cal/OSHA	TWA	750	1780
	Cal/OSHA	STEL	1000	2400
	ACGIH	TWA	500	N.A
	ACGIH	STEL	750	N.A
Diethylene Glycol Monobutyl Ether	OSHA	TWA	135	N/A

General Information:
Wash hands before eating, drinking, smoking and using toilet.

Exposure Control:
The levels of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local environment. Ensure adequate ventilation to control airborne concentration, below the exposure guidelines/limits. Eye washes and showers must be used in case of an emergency.

Personal Protective Equipment:
Use Personal Protective Equipment (P.P.E.) that are NIOSH approved and/or recommended per National Standards.

Respiratory Protection:
If an engineering control fail to maintain airborne concentrations to a level which is safe to protect workers' health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Also check with the Respiratory Protective Equipment suppliers and refer to the OSHA Respiratory Standard 1910.134 for detailed information. When air purifying respirator is required, select appropriate respirator and filters suitable for organic gases and vapors. Where air purifying respirators are un-suitable, for example airborne concentration is high, or oxygen is deficient, confined space etc., use appropriate positive pressure, breathing apparatus. For regular handling, full face respirator With organic vapor cartridges is recommended in order to protect the face from splashes.

Hand Protection:
Nitrile rubber gloves give good chemical resistance and can be used for regular use.
In case of direct incidental contact, splash, clean up etc., PVC or Neoprene rubber gloves should be used.

Eye Protection:
Chemical Splash goggles (Chemical mono-goggles) should be used

Protective Clothing:
Use chemical resistant clothing, chemical resistant shoes or boots.

Environmental Exposure Controls:
Follow and comply with the local, state and federal guidelines for V.O.C. emission control limits, and for the discharge of exhaust air containing vapors of this material.

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9. PHYSICAL AND CHEMICAL PROPERTIES of Acetone, being a major component in this mixture.

Appearance	:	Colorless volatile liquid
Odor	:	Distinct fragrant odor
Boiling point	:	56.5° C (133° F) @ 760 mm Hg
Vapor Pressure	:	400 @ 39.5°C (104°F)
Specific Gravity	:	0.79 @ 20°C
Water Solubility	:	Miscible in water
Vapor density (air =1)	:	2.0 (Air =1)
Volatile Organic Compound	:	114.4 gms/L as Diethyleneglycol Monobutyl Ether

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10. STABILITY AND REACTIVITY

Stability:
Stable under normal conditions of use.
Conditions to Avoid:
Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid:
Strong Oxidizing agents, Conc. Nitric or Sulfuric acid, halogenated compounds
Hazardous Decomposition Products:
Will not occur.

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11. TOXICOLOGICAL INFORMATION

Basis of Assessment:
The information given herein is based on similar products, and or compounds.

Acetone:
Oral Toxicity: LD50: 5800 mg/kg , rat

Inhalation Toxicity: LC50 : 5, 100 mg/m^3

Carcinogenicity: Not classified as a human carcinogen by ACGIH or IARC.

Diethyleneglycol Monobutyl Ether :
Acute Oral Toxicity:
Ingestion (rat) LD50: 7,292 mg/Kg
Oral (Mouse) LD50: 2,406 mg/Kg

Acute Dermal Toxicity:
Dermal (rabbit) LD50: 2,764 mg/Kg
Skin (rabbit): Slight irritant
Eye (rabbit): Moderate.

Carcinogenicity: Not a IARC or NTP carcinogen.

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12. ECOLOGICAL INFORMATION

Acetone:
Acetone is not expected to be toxic to aquatic life.

Environmental Toxicity:	Less toxic: LC50/96 – hour - > 100 mg/l
Mobility:	Will quickly evaporate from water, will evaporate if released to soil.
Bioaccumulation:	Does not bio-accumulate significantly.
Persistence/degradability:	Moderately bio-degradable, by reaction with photo-chemically produced hydroxyl radicals.

Diethyleneglycol Monobutyl Ether:
BOD – 5: 250 mg/g
COD: 2,080 mg/g

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13. DISPOSAL METHODS

Material Disposal:
Recover or recycle if possible. It is the responsibility of a waste generator to determine the extent of hazard, and physical properties of the material generated. Additionally, the generator of the waste of this material must determine its waste classification and disposal methods in compliance with local, state and federal or other regulations.

Container Disposal:
Drain the container thoroughly, and then vent it in a safe place away from sparks, and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld un-cleaned containers. Send the waste drum to the drum re-coverer or reclaimer.

Local Regulatory Compliance:
The disposal should be in compliance with applicable local, regional, state and national laws and regulations.

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14. TRANSPORT INFORMATION

U. S. Department of Transportation Classification (49 CFR)

Identification number:	UN 1993
Proper shipping name:	Flammable liquid, n. o. s. (Acetone/ Diethyleneglycol Monobutyl ether mixture)
Class/Division:	3
Packing Group:	II
Contains OIL	
Emergency Response Guide No.:	128

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5. REGULATORY INFORMATION

Federal Regulatory Status:
Notification:

- TSCA — Both the components of this mixture are listed on TSCA inventory.

SARA TITLE III, Sections 311, 312
Acetone is classified as fire hazard., and D.E.G.M.B.E. as acute hazard.

SARA Toxic Release Inventory (TRI) 313

State Regulatory Information:
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
Not listed.

South Coast Air Quality Management District:
VOC content: 114.4 g/l

6. OTHER INFORMATION

HMIS Rating: **(Health, Flammability & Reactivity)**	H=1, F=3, R = 0
NFPA Rating : **(Health, Flammability & Reactivity**	H=1, F=3, R = 0
MSDS Revision level:	Initial Release /03-03-06
Uses and Restrictions:	Industrial Cleaning Solvent
MSDS Distribution:	The copy of this MSDS should be available to every one who may handle this material.

Disclaimer:
The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 and the information contained herein is to the best of our knowledge for its original form in which it is supplied and is intended as guidelines for the purpose of handler's and environmental safety. No warranty or guarantee is expressed or implied regarding the accuracy of this data or of the resulting product, using this material.

Low-VOC Cleaner Ingredient Tested at Tedco

VAN WATER & ROGER -- ISOPROPYL ALCOHOL -- 6505-00-261-7256

========== Product Identification ==========

Product ID:ISOPROPYL ALCOHOL
MSDS Date:05/01/1993
FSC:6505
NIIN:00-261-7256
MSDS Number: BVGJL
=== Responsible Party ===
Company Name:VAN WATER & ROGER
Address:2600 CAMPUS DR
Box:5932
City:SAN MATEO
State:CA
ZIP:94403-2522
Country:US
Info Phone Num:714-864-2310
Emergency Phone Num:800-424-9300
Preparer's Name:C.A.EISENHARD
CAGE:09N91
=== Contractor Identification ===
Company Name:CHEMICAL COMMODITIES AGENCY, INC.
Address:27447 PACIFIC STREET
Box:City:HIGHLAND
State:CA
ZIP:92346-2640
Country:US
Phone:909-864-2310
CAGE:60777
Company Name:VAN WATER & ROGERS INC.,SUB OF UNIVAR
Address:6100 CARILLON POINT
Box:5932
City:KIRKLAND
State:WA
ZIP:98033
Country:US
Phone:206-889-3400
CAGE:09N91
Company Name:VAN WATERS AND ROGERS
Address:2256 JUNCTION AVE
City:SAN JOSE
State:CA
ZIP:95131
Country:US
Phone:408-435-8700/800-424-9300(CHEMTREC)
CAGE:0AN91

========== Composition/Information on Ingredients ==========

Ingred Name:ISOPROPYL ALCOHOL (SARA III) (PER SPEC, MATERIAL IS
"ISOPROPYL ALCOHOL, N.F." FORMULATION COULD NOT BE FOUND."
CAS:67-63-0
RTECS #:NT8050000
Fraction by Wt: PER N F
Other REC Limits:NONE DETERMINED
OSHA PEL:400 PPM/500 STEL
ACGIH TLV:400 PPM/500STEL;9192

========== Hazards Identification ==========

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHALATION-IRRITATION OF NOSE & THROAT. EYES-IRRITATION, CORNEAL BURNS. PROLONGED EXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE SEVERE OR FATAL CNS DEPRESSION.
Explanation of Carcinogenicity:NOT CARCINOGENIC.
Effects of Overexposure:INHALATION-HIGHER CONCENTRATIONS MAY CAUSE HEADACHE, VOMITING, COMA. EVEN HIGHER CONCENTRATIONS MAY CAUSE COMA OR DEATH. SKIN-DRYNESS, POSSIBLE DERMATITIS. INGESTION-LARGE AMOUNTS CAUSES HEADACHE, NAU SEA, VOMITING, STOMACH CRAMPS, UNCONSCIOUSNESS OR DEATH.
Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN DISORDERS, EYE PROBLEMS, OR IMPAIRED RESPIRATORY FUNCTION MAY BE SUSCEPTIBLE.

========== First Aid Measures ==========

First Aid:INHALATION: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION. EYES: FLUSH WITH WATER FOR 15 MINUTES, GET MEDICAL ATTENTION. SKIN: WASH AREA WITH SOAP & WATER. IF IRRI TATION PERSISTS, SEEK MEDICAL ATTENTION.INGESTION: INDUCE VOMITING BY GIVING WATER, PREVENT ASPIRATION, GET IMMEDIATE MEDICAL ATTENTION.

========== Fire Fighting Measures ==========

Flash Point Method:TCC
Flash Point:53.0F,11.7C
Lower Limits:2.0
Upper Limits:12.7
Extinguishing Media:WATER SPRAY, DRY CHEMICAL, CARBON DIOXIDE, ALCOHOL FOAM; DO NOT USE DIRECT WATER SPRAY.
Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS & FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS & STRUCTURES THAT ARE EXPOSED.
Unusual Fire/Explosion Hazard:EXTINGUISH ALL NEARBY SOURCES OF IGNITION BECAUSE VAPORS MAY BE MOVED BY AIR CURRENTS TO IGNITION SOURCES DISTANT FROM THE HANDLING POINT.

========== Accidental Release Measures ==========

Spill Release Procedures:EXTINGUISH ALL IGNITION SOURCES. MAKE SURE ALL HANDLING EQUIPMENT IS ELECTRICALLY GROUNDED. FOR SMALL SPILLS MOP UP & PLACE IN D.O.T. APPROVED CONTAINERS.

========== Handling and Storage ==========

Handling and Storage Precautions:KEEP AWAY FROM HEAT, SPARKS & OPEN FLAMES. STORE IN COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERAILS. VENT CONTAINERS FREQUENTLY.
Other Precautions:MORE OFTEN IN WARM WEATHER, USE ONLY ON NON-SPARKING TOOLS AND ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT. DO NOT USE PRESSURE TO EMPTY CONTAINERS. EMPTY CONTAINERS CAN HAVE RESIDUES , GASES & MISTS.

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:BASED UPON CONTAMINATION LEVELS IN THE WORK PLACE. FOR EXAMPLE: HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATORS

OR SUPPLIED AIR RESPIRATORS.
Ventilation:LOCAL-MECHNAICAL EXHAUST.
Protective Gloves:RUBBER GLOVES.
Eye Protection:SAFETY GOGGLES.
Other Protective Equipment:RUBBER APRON, RUBBER BOOTS, IMPERVIOUS CLOTHING.
Work Hygienic Practices:EYE WASH FOUNTAIN, QUICK DRENCH SHOWER.
Supplemental Safety and Health
AN MSDS WAS REQUESTED. CHEM COMMODITIES INFORMED US 12OCT94 THAT THEY HAD SUPPLIED VAN WATERS & ROGERS MATERIAL TO DPSC. MSDS COPIED FOR ANOTHER VWR WHICH HAD BEEN SUPPLIED BY CHEM COMMODITIES. -- MATERIAL PER SPEC IS "ISOPROPYL ALCOHOL, N.F.". FORMULATION COULD NOT BE FOUND. FORMULA IS THOUGHT TO BE 70%/30% WATER.

========== Physical/Chemical Properties ==========

HCC:F2
NRC/State Lic Num:NONE
Boiling Pt:B.P. Text:181F,83C
Melt/Freeze Pt:M.P/F.P Text:-127F,-88C
Vapor Pres:33
Vapor Density:2.07
Spec Gravity:0.79
Evaporation Rate & Reference:3.0 (BUTYL ACETATE=1)
Solubility in Water:100%
Appearance and Odor:MEDICINAL ALCOHOLIC ODOR.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, ALUMINUM, ACETALDEHYDE, CHLORINE, ETHYLENE OXIDE, HYPOCHLOROUS ACID, ALDEHYDES.
Stability Condition to Avoid:HEAT, SPARKS AND OPEN FLAMES.
Hazardous Decomposition Products:MAY LIBERATE CARBON MONOXIDE AND CARBON DIOXIDE.

========== Disposal Considerations ==========

Waste Disposal Methods:CONSULT APPROPIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

Appendix B
Letter from Frank Barnett at Anderson Lithograph to IRTA

Anderson Lithograph
3217 S. Garfield Avenue, Commerce, CA 90040-3219

A Mail-Well Company

January 13, 2004

Ms. Katy Wolf, Ph.D.
Institute for Research & Technical Assistance
2800 Olympic Blvd.
Suite 101
Santa Monica, CA 90404

Subject: SCAQMD Alternative Solvent Technology Assessment
Soya Base Roller & Blanket Wash Solvent Formulation
Extended Filed Test: Sheetfed Press, Ultra Violet Ink

Dear Ms. Wolf:

As a member of the Technical Advisory Group for the South Coast AQMD Technology Assessment of Alternative Clean-Up Solvents under Graphic Arts Rule 1171; Anderson Lithograph committed its management, financial and manufacturing resources to SCAQMD and the other participating members of the Technical Advisory Group for the conduct of field performance evaluations of alternative roller and blanket wash formulations developed as part of this technology assessment. Since last September, in a joint effort with your organization, IRTA, and PIA, we have performed a multitude of preliminary, or "bench", evaluation tests and a number of short-term on-press performance tests of alternative formulations developed by your organization. The short-term on-press performance testing was conducted on both web heatset and sheetfed offset lithographic press lines, and on both ultra This testing was performed The results of those tests violet and conventional sheetfed ink formulations.

Based on the results of this initial battery of testing, the roller and blanket wash formulations that exhibited the best on-press performance were further reviewed and one roller and blanket wash formulation was selected to be utilized as a basis for an "extended" on-press performance evaluation test. Since the web press lines at Anderson are equipped with integrated automatic blanket wash systems of a design that precludes making temporary piping modifications to facilitate a single unit alternative wash test, and the physical configuration of the press unit guards are such the manual, or "hand-wipe", washing of blankets with rag applied solvent presents a safety hazard; it was agreed that the extended on-press testing would be conducted on sheetfed offset lithographic press lines running both conventional and ultra violet ink formulations.

IRTA supplied to Anderson Lithograph two sets of five gallon pails of the selected roller and blanket wash alternative formulations for testing, one set each for conventional and ultra violet based ink formulations.. To-date, Anderson has been able to facilitate the on-press of the formulations on a press running ultra violet ink formulations. Production schedules have constrained Anderson's ability to run the test on conventional inks formulations. It is projected that the conventional ink formulation testing will be conducted in February, 2004 during the Annual Report production season. The sections that follow provide a summary of the test criteria and results obtained.

A. Roller Wash Extended On-Press - Test No. 1:

Solvent Formulation:	100% Soy Gold 2000
Formulator:	IRTA (Katy Wolf, Ph. D.)
Test Time Frame:	11/10/2003 to 12/19/2003, six weeks
Press Equipment:	Press HCD-6: Heidelberg, Model CD-108, 8 Unit, Coating Tower UV and IR Curing Stations
Test Unit:	Printing Unit No. 3 - "RED" Unit
Impression Count:	Start: 8,550,000 End: 10,250,000
Ink Rollers:	Rotodyne, "HE" Series ultra violet/conventional combination
Roller Durometer:	Start: 24, End: 29
Printing Inks:	Ink Systems Inc. "H" Series Ultra Violet

Description of Test:

Test was performed on only one (1) printing unit, Unit No. 3, in normal rotation the "RED" printing unit. All othewr printing units on the press were cleaned utilizing standard solvents and cleaning procedures. The test solvent was applied via a solvent "squirt bottle", applying approximately three to four ounces per application, directly to the top roller of ink roller train, with the roller train operating in normal wash-up mode and speed. Waited approximately one minute for solvent to be distributed through to bottom of roller train, then applied blade and another application of solvent. Waited one minute and applied a third application of solvent, and then a fourth waiting the same time period between applications.

The solvent application was followed by four (4) applications of R/O water (demineralized), each consisting of approximately three to five ounces applied via a solvent squirt bottle. Rollers were let run until their surface was nearly dry before another application of rinse water was applied. With the final application of rinse water the rollers were run until their surface was basically dry. This completed the roller cleaning procedure utilized during the testing. Other than the solvent utilized, this procedure is consistent with the standard procedure utilized to clean rollers with conventional petroleum (aliphatic or aromatic) based roller wash formulations. The test was continued until the supplied quantity (5 gallons) of roller wash was expended. This took approximately six calendar weeks to expend the supply of solvent.

Other Factors:

During the test period four (4) color change washes were accomplished on the test print unit. The ink color was changed from the standard rotation "RED" to a PMS White, PMS Grey and PMS Metallic Silver. After completion of the form requiring the PMS, the unit was colored washed again and the standard process "RED" ink placed into the print unit again.

A. Roller Wash Extended On-Press - Test No. 1: (cont'd)

Results of Test:

Test solvent was found to clean the complete roller train to an acceptable level without any significant change in procedures and/or time required. It found that the solvent left "no" appreciable amount of residual deposits and/or contaminants in the pores/structure of the material comprising the "rubber" component of the rollers. This was supported by the fact that no contaminants were experienced when performing roller color change wash-ups, going from the standard process "RED" to the PMS's white, silver and grey, all of which would have be shown "tinting" impacts of contaminants of a red hue if contaminants did exist in the roller train.

In general, press crew personnel said that they did not experience any noticeable negative effects of the solvent on printability of the print unit in which the test solvent was utilized. Specifically, no staining, ink take-up and/or roller train ink distribution problems were encountered during the course of the test. Roller durometer on the selected roller was measured at 29 at the end of the test, increasing five (5) units from the value of 24 measured at the start of the test. This is the same gain experienced on the ink train rollers of other print units on the same press over the same time frame where conventional solvent formulations were utilized to clean the rollers. After each roller wash-up, normal ink take-up and distribution through the train to the plate and ultimately the blanket, was normally achieved in twenty to thirty sheets. This is within parameters experienced with petroleum based roller wash formulations.

Conclusions:

Based on the results of this limited on-press testing, this solvent formulation is believed to be a viable alternative to existing petroleum based solvent formulations. However, longer term material compatibility testing must be performed to determine if there is any negative impact on the roller compound material and therefore acceptable printing operation tolerances over a more sustained term before this formulation can be termed a viable formulation and released into a normal production environment, and certainty before any changes in "BACT" can be based on this formulation chemistry. Material compatibility must also be verified to manufacturer specifications for automatic solvent dispensing systems that are supplied both as OEM and after market retro-fit equipment.

B. Blanket Wash Extended On-Press - Test No. 1:

Solvent Formulation:	50% Soy Gold 2000, 50% acetone
Formulator:	IRTA (Katy Wolf, Ph. D.)
Test Time Frame:	11/10/2003 to 12/19/2003, six weeks
Press Equipment:	Press HCD-6: Heidelberg, Model CD-108, 8 Unit, Coating Tower UV and IR Curing Stations
Test Unit:	Printing Unit No. 3 - "RED" Unit
Impression Count:	Start: 9,XXX,XXX, End: 10,971,800
Press Blankets:	Day International, Series 3000, compressible (0.075")
Printing Inks:	Ink Systems Inc. "H" Series Ultra Violet

Description of Test:

Print Unit No. 3, normal "RED" process color unit, was utilized for the test. The Heidelberg automatic blanket wash system was turned "OFF" on this print unit. The automatic brush scrubber system could not be utilized for the test for several reasons. The first being potential material compatibility problems. Additionally, there were questions concerning the effective flash point of the test formulation and potential fire hazards within the automatic blanket system solvent storage and piping delivery sub-systems. All blanket cleaning was performed manually, utilizing pre-folded cotton rags with the test solvent mixture applied to the rag. The unit blanket was then cleaned with the solvent mixture by manually "wiping" the solvent mixture laden rag across the surface of the blanket.

It was found that some amount of R/O water needed to be applied to the blanket cleaning rag along with the solvent mixture to facilitate in the removal of paper fiber and coating deposits present on the blanket. In summary, the blankets were washed utilizing the same standard procedure as would have been utilized with standard petroleum based blanket wash solvent formulations in a manual cleaning mode.

Results of Test:

The test solvent formulation was very comparable to standard petroleum based formulations in terms of cleaning capability. Only on occasion did the press crews express any concern over apparent early "flash-off" of the acetone portion of the formulation resulting a longer time frame top remove the residual soy portion of the formulation from the blanket surface. It was found that the test mixture had a tendency to somewhat separate if it set for any extended period of time, resulting in the acetone rising to the top. Hence, crews would some times get a higher concentration of the acetone portion of the mixture on their cleaning rag causing inconsistent cleaning characteristics of the solvent.

Results of Test (cont'd): Aside from this minor issue, the test solvent performed within acceptable parameters in its ability to clean the ink from the surface of the blanket in a time frame and expended amount of effort that is comparable to that experienced with manual blanket washing operations utilizing standard petroleum based blanket wash formulations. The crews experienced no significant negative impact on press printability when utilizing this alternative solvent formulation. Ink lay-down consistency was "nominal" as was the amount of dot gain experienced after a blanket wash-up when compared to the other print units of the press after they had been cleaned utilizing the automatic blanket wash system and standard petroleum based solvent formulation.

Conclusions: Based on the results of this limited on-press testing, this solvent formulation is believed to be a viable alternative to existing formulations. However, there are concerns relative to long-term material compatibility in regard to both consumables and equipment, and the flammable characteristics of the formulation. Utilizing this formulation in the present Heidelberg automatic blanket wash system may present problems in both areas noted. These concerns will have to addressed before this formulation and/or derivations of it can be considered as presenting viable options for daily production operations. Utilizing this formulation on a web offset heatset press could pose even more concerns with regard to the flammable nature of the formulation and the "lower explosive limits" of the hot air dryer.

In summary, both the roller and blanket wash formulations tested performed within acceptable operating parameters for wash-up solvents. Neither formulation exhibited any appreciable negative impact on the productivity, efficiency, consistency or level of quality of the printing operations in which their were utilized. Given that the material compatibility and flammability issues can be effectively resolved, and the unit price and availability do not pose any major issue, these alternative formulations are viable substitutes for existing conventional petroleum based solvents. If you have any questions regarding the information presented in this report, please call me.

Sincerely,

Frank C. Barnett
Director, Environmental, Health & Safety

Cc: Anderson Lithograph: E. Binder, J. Worthing, C. Lucas, D. Ibarra
PIA/GATF: G. Bonetto, Director Governmental Affairs