

## V. RESEARCH NEEDS

There is little published information on the health experience of workers engaged in the manufacture of paint and allied coating products. Additional epidemiological studies are needed to determine the morbidity and mortality experience of workers in this industry.

Frequent use of volatile solvents throughout the coatings industry increases the possibility that subtle behavioral and neurological effects will occur in workers. A potential problem of chronic deterioration of the central nervous system has recently been identified in Scandinavia among workers with long-term solvent exposures [69-71]. More information is needed to evaluate these effects. Fortunately, the need for this type of information becomes less urgent as solvent-based coatings are being progressively replaced by water-based coatings. However, it has been estimated that considerable quantities of solvents will still be used by the coatings industry in 1990 [6].

Documentation of the exposures that occur in operations where powder coatings and reactive coatings (e.g., radiation-curable coatings) are produced is needed since little is known of the hazards present during their manufacture.

Research is needed to develop more comfortable and effective personal protective equipment, particularly respirators. It is also important to determine the effect on respirator filter cartridge or canister life when there is a mixture of solvents in the surrounding air.

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## VII. APPENDIX A

### GLOSSARY

<b>Acrylic Resins</b>	A family of synthetic resins made by polymerizing esters of acrylic acids.
<b>Alkyd Resins</b>	Synthetic resins that are the condensation products of polybasic acids (e.g., phthalic acid), polyhydric alcohols (e.g., glycerin), and fatty acids or fatty oils.
<b>Anti-livering Agents</b>	Substances added to decrease the consistency of paint (see livering).
<b>Ball Mill</b>	A revolving cylindrical metal mill that uses steel balls, stones, or other media to grind or disperse the pigment in the film-former.
<b>Coating</b>	Film-forming material applied for protection or decoration of surfaces.
<b>Cold Cutting</b>	The mixing of materials, usually liquids, without the addition of heat.
<b>Cooking</b>	The heating of the combined ingredients of a varnish.
<b>Depalletizer</b>	A machine that unloads a pallet of materials.
<b>Diluent</b>	A liquid that is blended with an active solvent to reduce cost.
<b>Dispersion</b>	Any heterogeneous system of solids, gases, or liquids.
<b>Drying Oils</b>	Oils capable of absorbing oxygen from the air and becoming solid films.
<b>Extender</b>	A pigment that contributes little hiding to the system but does reinforce the film and alter its gloss.
<b>Film-Former</b>	The nonvolatile binder portion of a coating. These may be classified as either thermoplastic or convertible (see vehicle).
<b>Flash Point</b>	The lowest temperature at which a substance in an open vessel gives off enough vapors to produce a flash of fire when a flame is passed near the surface as described by American Society of Testing and Materials (ASTM) test procedures.

<b>Flush Colors</b>	Water dispersions of organic and inorganic pigments that are supplied as organophilic pastes.
<b>Hiding Power</b>	The ability of a paint to obscure the background over which it is applied.
<b>High-Solids Coatings</b>	Coatings that contain more than 70% nonvolatile material.
<b>Kettle</b>	Vessel used in the production of varnish.
<b>Lacquer</b>	Usually indicates a material that dries by evaporation and forms a film from the nonvolatile constituents.
<b>Latex</b>	A generic term describing stable dispersions of resin particles in a water system.
<b>Livering</b>	An increase in the consistency of paint resulting in a rubbery or coagulated mass.
<b>Oil</b>	A general term for a water-insoluble viscous liquid usually consisting of triglycerides.
<b>Oleoresinous</b>	A material that has been made by a combination of oil and resin.
<b>Organosol</b>	A dispersion formed by the suspension of resin particles (usually a vinyl resin) in a liquid consisting of volatile solvents.
<b>Pebble Mills</b>	Mills usually lined with porcelain or buhrstone in which flint pebbles or porcelain balls are used as the grinding media.
<b>Plastisol</b>	A dispersion formed by the suspension of resin particles (usually vinyl) in a liquid consisting only of plasticizers.
<b>Powder Coatings</b>	Pigmented polymer coatings applied in powder form by various techniques such as electrostatic spray, fluidized bed, flocking gun, flame spray, or cloud chamber.
<b>Prebatch</b>	The phase of coatings production in which raw materials are weighed and assembled for mixing.
<b>Radiation-Curable Coatings</b>	Coatings that dry or cure as the result of initiation of polymerization by radiation such as infrared, ultraviolet, or electron beam.

<b>Resin</b>	An organic polymer in the form of a crystalline or amorphous solid or viscous liquid of either natural or synthetic origin.
<b>Thermoplastic Resins</b>	Resins that soften and flow when heated and, on cooling, regain their original physical and chemical properties.
<b>Thermosetting Resins</b>	Resins that undergo a chemical change and become hard after heating and cannot be resoftened. When used as a film-former, they are often referred to as convertible film-formers.
<b>Two-Part Catalyzed Coatings</b>	Coatings, usually urethane, formed by catalytic conversion that occurs so rapidly at ambient temperature that the components must be shipped in two separate containers.
<b>Varnishes</b>	Solutions of film-formers in organic solvents, with no pigments.
<b>Vehicle</b>	The liquid portion of a coating material that forms the finished film and binds the pigments in the coating (see film-former).