

4. PRODUCTION, IMPORT/EXPORT, USE, AND DISPOSAL

4.1 PRODUCTION

In 1991, 12 companies at 14 locations produced acetone in the United States. The U.S. manufacturers of acetone in 1991, their respective manufacturing sites, and production capacities are shown in Table 4-1 (SRI 1992).

Exxon Chemical Americas also produced acetone in the United States in 1990 (USITC 1991).

Table 4-2 lists the companies that process acetone and the intended use and maximum amounts of the chemical stored on site.

The reported total production volume of acetone in the United States was 2,330 million pounds in 1990 (USITC 1991). Historically, the reported growth of acetone demand was 2.1% per year during the 1980's and is expected to grow at a rate of 2.5% per year through 1994 (CMR 1990).

Most acetone is manufactured by one of two processes, cumene peroxidation or isopropanol dehydrogenation (SRI 1991). In the peroxidation process, cumene is oxidized to hydroperoxide, which is cleaved to yield acetone and phenol. In the dehydrogenation process, isopropanol is catalytically dehydrogenated to yield acetone and hydrogen (Nelson and Webb 1978). Relatively small quantities of acetone are recovered as a byproduct from the production of hydroquinone and oxidation of propylene oxide (SRI 1991).

4.2 IMPORT/EXPORT

The amount of acetone exported by the United States has increased in recent years. Export volume in 1987 was 5% of total production volume (CMR 1987). By 1990, export volume had increased to an estimated 138 million pounds, or 6% of the 2,330 million pounds produced (CMR 1990). The United States imported 110 million pounds of acetone in 1989, and import volume is expected to increase through 1994, due to a projected increase in domestic demand.

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TABLE 4-1. U.S. Manufacturers of Acetone in 1991^a

Manufacturer	Location	Annual capacity, (million of pounds)
Allied Signal, Inc.	Philadelphia, PA	490
Aristech Chemical Corp.	Haverhill, OH	392
ARCO Chemical Co.	Bayport, TX	62
BTL Speciality Resins Corp.	Blue Island, IL	53
Dow Chemical U.S.A.	Oyster Creek, TX	335
Eastman Chemical Co.	Kingsport, TN	25
General Electric Co.	Mount Vernon, IN	380
<i>Georgia Gulf Corp.</i>	Pasadena, TX Plaquemine, LA	100 2,656
The Goodyear Tire & Rubber Co.	Bayport, TX	12
Shell Oil Co.	Deer Park, TX Wood River, IL	459 350
Texaco, Inc.	El Dorado, KS	55
Union Carbide Corp.	Institute, WV	170
Total		3,148

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TABLE 4-2. Facilities That Manufacture or Process Acetone^a

State ^b	Number of facilities	Range of maximum amounts on site in thousands of pounds ^c	Activities and uses ^d
AK	1	0.1-0.9	1, 5
AL	46 (1) ^e	0-9,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13
AR	50 (4) ^e	0-999	1, 2, 3, 5, 6, 8, 9, 11, 12, 13
AZ	24 (2) ^e	0-999	1, 3, 5, 8, 11, 12, 13
CA	220 (13) ^e	0-499,999	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13
CO	17	0-999	8, 11, 12, 13
CT	27 (5) ^e	0.1-9,999	1, 2, 3, 5, 7, 8, 9, 11, 12, 13
DE	12 (1) ^e	0.1-99	2, 3, 7, 9, 10, 11, 12, 13
FL	107 (3) ^e	0-999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
GA	80 (10) ^e	0-999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
HI	1	1-9	13
IA	36 (2) ^e	0.1-999	1, 2, 3, 7, 8, 9, 10, 11, 12, 13
ID	9	1-99	1, 2, 3, 6, 12, 13
IL	110 (7) ^e	0.1-99,999	1, 3, 4, 7, 8, 9, 10, 11, 12, 13
IN	132 (2) ^e	0-49,999	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13
KS	34 (2) ^e	0.1-9,999	1, 3, 4, 8, 10, 11, 12, 13
KY	41 (3) ^e	0.1-9,999	1, 5, 7, 8, 10, 11, 12, 13
LA	37 (1) ^e	0-499,999	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13
MA	66 (5) ^e	0-999	2, 3, 8, 9, 10, 11, 12, 13
MD	17 (1) ^e	0.1-99	1, 2, 3, 5, 8, 9, 11, 13
ME	23 (2) ^e	0-999	1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13
MI	140 (5) ^e	0-49,999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
MN	63 (2) ^e	0.1-999	1, 2, 3, 5, 7, 8, 9, 11, 12, 13
MO	71	0.1-99,999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
MS	31 (3) ^e	0-999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13
MT	1	1-9	1, 5
NC	154 (5) ^e	0-9,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13
ND	2	0.1-99	12, 13
NE	17	0-99	8, 11, 12, 13
NH	16 (1) ^e	0.1-99	1, 2, 3, 6, 8, 9, 11, 12, 13
NJ	98 (4) ^e	0-9,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
NM	8	0.1-99	12, 13
NV	3 (1) ^e	1-99	8, 11, 13
NY	89 (6) ^e	0.1-999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
OH	157 (5) ^e	0-99,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
OK	13	0.1-99	2, 3, 8, 10, 11, 12, 13
OR	46 (2) ^e	0-999	1, 5, 6, 7, 8, 9, 10, 11, 12, 13
PA	130 (9) ^e	0-9,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
PR	25	1-9,999	2, 3, 4, 7, 8, 10, 11, 12, 13
RI	18 (1) ^e	1-99	1, 5, 9, 10, 11, 12, 13
SC	55 (1) ^e	0-9,999	1, 2, 3, 4, 5, 8, 9, 11, 12, 13
SD	3	1-9	13

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TABLE 4-2 Facilities That Manufacture or Process Acetone^a (Continued)

State ^b	Number of facilities	Range of maximum amounts on site in thousands of pounds ^c	Activities and uses ^d
TN	83 (2) ^e	0-49,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
TX	166 (4) ^e	0-99,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
UT	16	0-99	3, 8, 10, 11, 12, 13
VA	81 (2) ^e	0-9,999	1, 2, 3, 5, 8, 9, 10, 11, 12, 13
VT	4 (1) ^e	1-99	8, 12, 13
WA	65 (5) ^e	0-999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
WI	75 (5) ^e	0-99,999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
WV	16	0-49,999	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13

^aDerived from TRI90 (1992)

^bPost office state abbreviations

^cData in TRI are maximum amounts on site at each facility.

^dActivities/Uses:

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|-------------------------------|----------------------------------|
| 1. produce | 8. as a formulation component |
| 2. import | 9. as an article component |
| 3. for on-site use/processing | 10. for repackaging only |
| 4. for sale/distribution | 11. as a chemical processing aid |
| 5. as a byproduct | 12. as a manufacturing aid |
| 6. as an impurity | 13. ancillary or other use |
| 7. as a reactant | |

^eNumber of facilities reporting "no data" regarding maximum amount of the substance on site

4.3 USE

Acetone is used primarily as an intermediate in chemical production and as a solvent (Nelson and Webb 1978). In 1989, 40% of the available acetone was used in the production of methyl methacrylate, methacrylic acid, and higher methacrylates; 20% was used as a solvent; 13% was used in the production of bisphenol A; 10% was used in the production of methyl isobutyl ketone and methyl isobutyl carbinol; 6% was used in drug and pharmaceutical applications; 5% accounted for miscellaneous uses; and 6% was exported (CMR 1990).

4.4 DISPOSAL

A small amount of acetone is regenerated from solvent wastes produced during its use by reclaiming processes (Kupferschmid and Perkins 1986). Acetone can be removed from waste water by air stripping (HSDB 1992), but the vapor phase acetone generated during stripping requires a suitable disposal method. The three methods commonly used for the disposal of waste containing acetone are underground injection, burial in sanitary landfill, and incineration. The underground injection of acetone-containing waste is allowed under the amended Section 148.10 of Code of Federal Regulations (EPA 1991b). The land disposal of waste waters containing spent acetone is allowed under Section 268.41 of the Code of Federal Register as long as the concentrations of acetone and other permissible spent cosolvents in the waste do not exceed 0.05 and 0.59 mg/L, respectively (EPA 1988a). Incineration under controlled conditions (to attain complete combustion) is one of the better methods of disposal for acetone, and incineration is easier when acetone is mixed with a more flammable solvent. The suitable methods for the destruction of acetone are fluidized bed incineration at a temperature of 450-980°C and residence times of seconds or rotary kiln incineration at 820-1,600°C and residence times of seconds (HSDB 1992).

