

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

4.1 PRODUCTION

Table 4-1 lists the facilities in each state that manufacture or process toluene, the intended use, and the range of maximum amounts of toluene that are stored on site. There are currently 3,062 facilities that produce or process toluene in the United States. The data listed in Table 4-1 are derived from the Toxics Release Inventory (TRI97 1999). Only certain types of facilities were required to report. Therefore, this is not an exhaustive list.

About 11% of the total toluene produced in the United States is isolated by distillation of reformed or pyrolyzed petroleum and coal-tar oil. The remainder is added as a mixture, known as benzene-toluene-xylene (BTX), to gasoline (EPA 1990a). One estimate of domestic 1978 production of both isolated and nonisolated toluene was 3 million metric tons (EPA 1981). Most data available, however, are for isolated toluene. According to the latest available data, the domestic capacity has been estimated at 6 million metric tons (1,774 million gallons) (SRI 1988). There are 41 major U.S. producers of toluene (SRI 1999). Production of isolated toluene in the United States from all sources except for distillers and coke oven operators was estimated at 6.7 billion pounds (927 million gallons) in 1995 (C&EN 1996). As of October 1, 1996, the International Trade Commission ceased to collect or publish annual synthetic organic chemicals data. The National Petroleum Refiners Association, which currently collects such data, does not include toluene on its list of organic chemicals.

Toluene is widely used and is produced by a large number of domestic chemical and petroleum companies. In 1979, there were 201 locations in the United States that produced toluene by catalytic reformation, 9 locations where it was produced by petroleum pyrolysis, and six where toluene was produced from coal tar (IARC 1988). The 10 companies which currently produce or supply toluene in the United States are: BP Amoco Corporation; Chevron Chemical Company; CITGO Petroleum Corporation; Coastal Eagle Point Oil Co., Coastal Refining and Marketing, Inc.; Dow Chemical U.S.A.; Equilon Enterprises LLC; Equistar Chemicals LP; Exxon Chemical Company; Fina Oil and Chemical Company, Hovensa, LLC.; Koch Petroleum Group LP; Lyondell-Citgo Refining Company Ltd.; Marathon Ashland Chemical, Inc.; Mobil Chemical Company; Phillips Petroleum Company; Shell Chemical Company; Sunoco, Inc.; Ultramar Diamond Shamrock Corporation; and Valero Energy Corporation(SRI 1999).

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Table 4-1. Facilities that Manufacture or Process Toluene

State ^a	Number of facilities	Range of maximum amounts on site in pounds ^b	Activities and uses ^c
AK	2	1,000,000–49,999,999	1, 3, 4, 8
AL	75	0–999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
AR	59	0–9,999,999	1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13
AZ	9	0–999,999	8, 9, 10, 11, 12, 13
CA	125	100–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
CO	22	100–49,999,999	1, 4, 5, 6, 8, 10, 11, 12, 13
CT	33	1000–9,999,999	8, 9, 11, 12, 13
DE	10	1,000–49,999,999	1, 3, 8, 9, 11, 12, 13
FL	47	100–9,999,999	2,3, 8, 9, 10, 11, 12, 13
GA	79	100–49,999,999	1, 2, 3, 6, 8, 9, 10, 11, 12, 13
HI	2	1,000,000–9,999,999	1, 2, 6, 8
IA	51	0–9,999,999	1, 2, 3, 4,7, 8, 9, 10, 11, 12, 13
ID	3	1000–99,999	2, 3, 8, 10,11, 12
IL	198	0–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
IN	171	100–999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
KS	51	0–999,999,999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
KY	57	100–49,999,999	1, 2, 3, 4, 5, 6,7, 8, 9, 10, 11, 12, 13
LA	75	0–999,999,999	1, 2, 3, 4, 5, 6, 7 ,8, 9, 10, 11, 12, 13
MA	74	0–999,999	1, 3, 8, 9, 10, 11, 12, 13
MD	20	1,000–999,999	2, 3, 4, 7, 8, 9, 10, 11, 12, 13
ME	7	100–999,999	1, 2, 3, 6, 8, 11, 12, 13
MI	150	0–49,999,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
MN	65	0–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
MO	81	100–9,999,999	2, 3, 4, 7, 8, 9, 10, 11, 12, 13
MS	61	0–49,999,999	1, 2, 3, 6, 7, 8, 9, 11, 12, 13
MT	6	1,000–49,999,999	1, 3, 4, 6, 7, 8, 9, 13
NC	156	0–999,999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
ND	3	100–9,999,999	1, 2, 3, 4, 7, 9, 11, 13
NE	19	100–99,999	2, 3, 8,10, 11, 12, 13

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Table 4-1. Facilities that Manufacture or Process Toluene (continued)

State ^a	Number of Facilities	Range of maximum amounts on site in pounds ^b	Activities and uses ^c
NH	12	100–999,999	8, 11, 12, 13
NJ	107	100–99,999,999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
NM	10	100–9,999,999	1, 3, 4, 6, 7, 8, 9, 12, 13
NV	2	1,000,000–9,999,999	9
NY	87	0–9,999,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13
OH	203	0–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
OK	36	1000–49,999,999	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13
OR	32	0–9,999,999	2, 3, 8, 9, 10, 11, 12, 13
PA	148	0–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
PR	28	1,000–10,000,000,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
RI	16	100–999,999	8, 10, 11, 12, 13
SC	63	0–9,999,999	1, 2, 3, 5, 7, 8, 9, 11, 12, 13
SD	10	100–99,999	2, 3, 8, 9, 11, 12, 13
TN	115	100–49,999,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13
TX	208	100–999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
UT	22	100–49,999,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
VA	83	100–9,999,999	1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13
VI	1	100,000,000–999,999,999	1, 2, 3, 4, 7, 8
VT	6	1,000–99,999	8, 11, 12, 13
WA	39	100–99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
WI	94	0–49,999,999	1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13
WV	21	100–49,999,999	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13
WY	8	0–9,999,999	1, 3, 4, 5, 6, 7, 8, 10, 13

Source: TRI97 1999

^aPost office state abbreviations used^bRange represents maximum amounts on site reported by facilities in each state^cActivities/Uses:

- | | | |
|--------------------------|--------------------------|-----------------------------|
| 1. Produce | 6. Impurity | 10. Repackaging |
| 2. Import | 7. Reactant | 11. Chemical Processing Aid |
| 3. Onsite use/processing | 8. Formulation Component | 12. Manufacturing Aid |
| 4. Sale/Distribution | 9. Article Component | 13. Ancillary/Other Uses |
| 5. Byproduct | | |

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4.2 IMPORT/EXPORT

United States imports of toluene in 1984 were estimated at 602 million pounds (273,000 metric tons) (U.S. Department of Commerce 1985a). Exports during the same year were estimated at 289 million pounds (131,000 metric tons) (U.S. Department of Commerce 1985b). No data on recent import/export volume for toluene are available.

4.3 USE

All nonisolated toluene is used in a BTX mixture added to gasoline to improve octane ratings (EPA 1990a). Nearly half of the isolated toluene is used to produce benzene (IARC 1988). About one-third of the isolated toluene is used as a solvent in paints, coatings, adhesives, inks, and cleaning agents. A portion of the isolated toluene goes into the production of polymers used to make nylon, plastic soda bottles, and polyurethanes. Toluene is also used as a starting material in the synthesis of trinitrotoluene (TNT). The remainder is used for pharmaceuticals, dyes, nail polish, and the synthesis of organic chemicals (Cosmetic Ingredient Review Panel 1987). Toluene was once used as an anthelmintic agent against roundworms and hookworms (Krinsky 1980).

4.4 DISPOSAL

Toluene is regulated by the Resource Conservation and Recovery Act (RCRA) as a hazardous waste (F005-spent solvents including toluene) and is therefore subject to RCRA regulations (see Chapter 7). These regulations include standards for storage, transport, and disposal of toluene.

Industrial wastes containing spent solvents may not be disposed of on land if extracts of the waste contain more than 0.33 ppm of toluene. Waste waters containing spent solvents may not be land-disposed if they contain greater than 1.12 ppm of toluene (EPA 1994d).

Consumer products containing toluene are typically disposed of in landfills as municipal waste. No information was available on total disposal of toluene to solid waste landfills. There are no data concerning disposal of toluene by municipal incineration. However, high-temperature incineration (>1,600 °F) probably is very efficient for toluene destruction.

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In 1996, it was estimated that about 0.6 million pounds (272 metric tons) of waste toluene was disposed of in publicly owned treatment works (POTW) and about 125 million pounds (5,679 metric tons) of waste toluene was transported from production facilities or points of usage for disposal (TRI97 1999).

Toluene is listed as a toxic substance under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA) under Title III of the Superfund Amendments and Reauthorization Act (SARA) (EPA 1995j). Disposal of wastes containing toluene is controlled by a number of federal regulations (see Chapter 7).

