

4. PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

According to the most recent edition of U.S. International Trade Commission (USITC 1989), 482,028,000 pounds of 2-butanone were produced in the United States in 1988. The production volume for 1986 and 1987 was 600,440,000 and 671,859,000 pounds, respectively (USITC 1987, 1988). Total U.S. capacity for 1989 has been estimated at 622 million pounds (SRI 1989). Production of 2-butanone has been flat in the past decade, but it is expected to grow at 2%-3% through 1991 (Chemical Marketing Reporter 1987). Current manufacturers of 2-butanone are included in Table 4-1. According to the Toxic Release Inventory (TRI 1989), 2,218 facilities manufacture or process 2-butanone. These facilities had a maximum amount of 2-butanone on site of approximately 1,670,000,000 pounds in 1987. These data are presented in Table 4-2. The quality of the data must be viewed with caution since the 1987 data represent first-time, incomplete reporting by these facilities. Not all facilities that should have reported have done so.

2-Butanone is produced on a commercial scale by one of two processes. The vapor-phase dehydrogenation of set-butanol (2-butanol), itself obtained from the hydrolysis of butene, accounts for 88% 2-butanone production (Neier and Strehlke 1985; Papa and Sherman 1981). In the other commercially significant process, 2-butanone is obtained as a byproduct of acetic acid production. In this methodology, liquified butane is subjected to catalytic oxidation.

4.2 IMPORT/EXPORT

Approximately 16% of the total U.S. production of 2-butanone is exported to other countries (Chemical Marketing Reporter 1987). Imports into the United States amounted to about 52 million pounds in 1986.

4.3 USE

2-Butanone exhibits outstanding solvent properties, and combined with its low cost, it is often the choice solvent for various coating systems (Neier and Strehlke 1985; Papa and Sherman 1981). Uses of 2-butanone can be broken down into the following categories: coatings solvent, 50%; adhesives, 13%; magnetic tapes, 8%; lube oil dewaxing, 4%; printing inks, 3%; exports, 16%; and miscellaneous, 6% (Chemical Marketing Reporter 1987). Examples of specific applications include its use as a solvent for nitrocellulose, lacquers, rubber cement, printing inks, paint removers, vinyl films, resins, rosins, polystyrene, chlorinated rubber, polyurethane, acrylic coatings, and cleaning solutions (Neier and Strehlke 1985; Papa and Sherman 1981; Sax and Lewis 1987). 2-Butanone is used in the production of synthetic leathers, transparent paper, and aluminum foil. It is also used in the degreasing of metals, as an extraction solvent, in dewaxing applications, and as a solvent for the production of smokeless powders.

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TABLE 4-1. Current Manufacturers of 2-Butanone^a

Company	Location
ARCO Chemical Co.	Channelview, TX
Exxon Corporation	Baton Rouge, LA
Hoechst Celanese Corp.	Pampa, TX
Shell Oil Company	Norco, LA
Union Carbide Corp	No data

^aDerived from SRI 1989; USITC 1989

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

State ^b	No. of facilities	Range of maximum amounts on site in thousands of pounds ^c	Activities and uses ^d
AL	29 (2) ^e	0.1-999	2, 3, 8, 9, 10, 11, 12, 13
AR	41 (2) ^e	0-999	1, 2, 3, 7, 8, 9, 11, 12, 13
AZ	21 (1) ^e	0.1-99	2, 7, 8, 11, 12, 13
CA	193 (12) ^e	0-9,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
CO	14 (2) ^e	0.1-99	8, 9, 11, 12, 13
CT	37 (1) ^e	0-999	2, 8, 9, 10, 11, 12, 13
DE	10	1-999	3, 8, 11, 12, 13
FL	29 (3) ^e	0-999	2, 3, 4, 7, 8, 10, 11, 12, 13
GA	58 (2) ^e	0-999	2, 3, 4, 7, 8, 9, 10, 11, 12, 13
IA	30 (1) ^e	0-49,999	2, 8, 9, 10, 11, 12, 13
ID	1	1-9	11, 13
IL	133 (10) ^e	0.1-99,999	2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
IN	104 (7) ^e	0-999	2, 3, 5, 7, 8, 9, 10, 11, 12, 13
KS	26 (1) ^e	0-999	2, 3, 4, 5, 7, 8, 9, 11, 12, 13
KY	30 (2) ^e	0-9,999	1, 3, 8, 10, 11, 12, 13
LA	29 (1) ^e	0.1-49,999	1, 2, 3, 4, 7, 8, 9, 11, 12, 13
MA	60 (5) ^e	0-999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
MD	21	0-99	3, 8, 9, 11, 12, 13
ME	5	0.1-99	11, 12, 13
MI	119 (8) ^e	0-999	2, 3, 7, 8, 9, 10, 11, 12, 13
MN	35 (2) ^e	0-9,999	2, 3, 4, 6, 8, 9, 10, 11, 12, 13

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TABLE 4-2 (Continued)

State ^b	No. of facilities	Range of maximum amounts on site in thousands of pounds ^c	Activities and uses ^d
MO	72 (4) ^e	0-499,999	2, 3, 7, 8, 9, 10, 11, 12, 13
MS	21 (1) ^e	0-999	2, 8, 9, 11, 12, 13
MT	1	1-9	8, 11
NC	133 (13) ^e	0-999	3, 5, 7, 8, 9, 10, 11, 12, 13
ND	3	0.1-9	11, 12, 13
NE	14 (1) ^e	0.1-99	5, 7, 8, 9, 11, 12, 13
NH	23 (1) ^e	0-999	2, 3, 7, 8, 9, 10, 11, 12, 13
NJ	103 (7) ^e	0-49,999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
NM	1	1-9	12, 13
NV	4 (1) ^e	0.1-99	9, 12
NY	85 (15) ^e	0.1-49,999	1, 2, 3, 7, 8, 9, 10, 11, 12, 13
OH	174 (10) ^e	0-49,999	2, 3, 7, 8, 9, 10, 11, 12, 13
OK	17	0.1-999	2, 4, 8, 9, 11, 12, 13
OR	13 (1) ^e	0.1-99	8, 9, 10, 11, 12, 13
PA	109 (5) ^e	0-499,999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
PR	9 (2) ^e	0-999	8, 9, 12
RI	13 (1) ^e	1-99,999	3, 4, 8, 11, 12, 13
SC	36 (4) ^e	0.1-49,999	2, 3, 4, 7, 8, 9, 11, 12, 13
SD	5	1-99	8, 11, 13
TN	60 (6) ^e	0-9,999	2, 3, 5, 7, 8, 9, 11, 12, 13
TX	107 (2) ^e	0-49,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

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TABLE 4-2 (Continued)

State ^b	No. of facilities	Range of maximum amounts on site in thousands of pounds ^c	Activities and uses ^d
UT	10	0-99	8, 9, 11, 12, 13
VA	64 (1) ^e	0-49,999	3, 7, 8, 9, 10, 11, 12, 13
VT	4	1-9	8, 11, 12, 13
WA	32 (5) ^e	1-999	8, 10, 11, 12, 13
WI	71 (3) ^e	0-999	1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13
WV	8 (3) ^e	1-9,999	1, 3, 5, 6, 10, 11, 12, 13
WY	1	10-99	7

^aTRI 1989

^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.

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4.4 DISPOSAL

Dilute solutions of 2-butanone can be discharged directly into sewage treatment facilities, sprayed into incinerators, or burned in paper packaging (OHM/TADS 1989). It can be destroyed in fluidized-bed incinerators, rotary kiln incinerators, or liquid injection incinerators using short residence times of a few seconds for either liquids or gases, and longer residence times for contaminated solids, if applicable (HSDB 1989). 2-Butanone has been reported to be amenable to biological degradation in sewage treatment plants (Babeu and Vaishnav 1987; Bridie et al. 1979; Gaudy et al. 1963.; Price et al. 1974; Urano and Kato 1986; Vaishnav et al. 1987; Young et al. 1968). No data are available regarding the amount disposed by each of these methods, nor is any information available regarding the trends in the disposal of 2-butanone.