

## 4. PRODUCTION, IMPORT, USE, AND DISPOSAL

### 4.1 PRODUCTION

Di-*n*-octylphthalate is produced commercially as a component of mixed phthalate esters, including straight-chain C6, C8, and C10 phthalates (EPA 1993a). Di-*n*-octylphthalate is produced at atmospheric pressure or in a vacuum by heating an excess of *n*-octanol with phthalic anhydride in the presence of an esterification catalyst such as sulfuric acid or *p*-toluenesulfonic acid. The process may be either continuous or discontinuous (EPA 1993a; HSDB 1995). Di-*n*-octylphthalate can also be produced by the reaction of *n*-octylbromide with phthalic anhydride.

The most recent report available on di-*n*-octylphthalate lists three commercial producers: Vista Chemical Company, Houston, Texas; Aristech Chemical Corporation, Neville Island, Pennsylvania; and Teknor Apex Company, Hebronville, Massachusetts and Brownsville, Texas (EPA 1993a). Additional reported producers include: Eastman Kodak Company, Rochester, New York (USITC 1994); Tenneco Chemical, Inc., Chestertown, Maryland (EPA 1987a); Alfa Products, Morton Thiokol, Inc., Danvers, Massachusetts; Primachem, Inc., Englewood Cliffs, New Jersey; and GCA Chemical Corp., Stamford, Connecticut (HSDB 1995). Table 4-1 lists the U.S. facilities that manufacture or process di-*n*-octylphthalate.

The current annual production of di-*n*-octylphthalate is difficult to estimate because of confusion in nomenclature regarding the octylphthalate isomers and reported data describing only the entire group of dioctyl orthophthalates. A total of 122,384 metric tons of total dioctylphthalates were produced in 1992 (USITC 1994). The amount of di-*n*-octylphthalate included in this group was not reported because of the possible revelation of confidential business information.

Table 4-1 lists data from the Toxics Release Inventory (TRI) regarding U.S. companies that reported the manufacture and use of di-*n*-octylphthalate in 1992 (TR192 1994). The TRI data should be used with caution since only certain types of facilities are required to report. This is not an exhaustive list.

Table 4-1. Facilities That Manufacture or Process Di-n-octylphthalate

Facility	Location <sup>a</sup>	Range of maximum amounts on site in pounds	Activities and uses
NA	AL	10,000-99,999	As a formulation component
HALSTEAD IND. INC.	AR	10,000-99,999	As a formulation component
GILLETTE CO.	CA	1,000-9,999	As a formulation component
NA	GA	10,000-99,999	Import; For sale/distribution; As a formulation component
NA	IL	1,000-9,999	As a formulation component
NA	IL	1,000-9,999	As a formulation component
NEW EXTRUSTIONS & FABRICATING	IL	10,000-99,999	As a formulation component; As a chemical processing aid; Ancillary uses
EASTERN INDUSTRIES	IL	10,000-99,999	As a product component
DOW CHEMICAL CO.	IL	10,000-99,999	As a formulation component
BRC RUBBER GROUP INC.	IN	10,000-99,999	As a formulation component
ATOCHEM N.A. INC.	KY	10,000-99,999	As a formulation component; As a chemical processing aid
VISTA CHEMICAL CO.	MA	10,000-99,999	As a formulation component
LEVITON MFG.	MA	100,000-999,999	As a product component
BRADFORD IND. INC.	MA	1,000-9,999	As a formulation component
NA	MA	1,000-9,999	As a formulation component
O'SULLIVAN CORP.	MA	10,000-99,999	As a formulation component
AMERICAN CYANAMID CO.	MI	100-999	Ancillary uses
GENERAL CABLE IND. INC.	MI	10,000-99,999	As a formulation component; As a product component
NA	MO	1,000-9,999	In repackaging only
GOODYEAR TIRE & RUBBER CO.	MO	10,000-99,999	As a reactant; As a formulation component
VISTA CHEMICAL CO.	MS	100,000-999,999	Produce; For on-site use/processing; For sale/distribution; As a formulation component
HALSTEAD IND. INC.	NC	10,000-99,999	As a formulation component
NA	NC	1,000-9,999	As a formulation component
UNIROYAL CHEMICAL CO. INC.	NC	10,000-99,999	As a formulation component

Table 4-1. Facilities That Manufacture or Process Di-n-octylphthalate (continued)

Facility	Location <sup>a</sup>	Range of maximum amounts on site in pounds	Activities and uses
KONICA CORP.	NC	1,000-9,999	Ancillary uses
HBD INDUSTRIES INC.	NC	10,000-99,999	Import; For on-site use/processing; As a formulation component; As a chemical processing aid
PLASTICS SPECIALTIES & TECHNOL	NJ	100,000-999,999	As a formulation component
OCCIDENTAL PETROLEUM CORP.	NJ	10,000-99,999	As a formulation component
PLASTIC SPECIALTIES & TECHNOLO	NJ	10,000-99,999	As a formulation component
NA	NJ	10,000-99,999	As a formulation component
NA	NJ	1,000-9,999	As a formulation component
PLASTICS SPECIALTIES & TECHNOL	NV	10,000-99,999	As a formulation component
HM HOLDINGS INC.	NY	1,000-9,999	As a formulation component
NA	NY	10,000-99,999	As a product component
GOODYEAR TIRE & RUBBER CO.	OH	1,000-9,999	As a formulation component; As a product component; Ancillary uses
COOKSON AMERICA	OH	10,000-99,999	As a formulation component
BORDEN INC.	OH	10,000-99,999	As a product component
NA	OH	100-999	Import; For on-site use/processing; As a formulation component
A. SCHULMAN INC.	OH	10,000-99,999	As a formulation component
NA	OH	1,000-9,999	As a product component
ACC MIDDLE CORP.	PA	100,000-999,999	Produce; For sale/distribution
NA	PA	10,000-99,999	As a formulation component
NA	TN	100-999	As a formulation component
NA	TN	10,000-99,999	As a product component
GMC	TN	100,000-999,999	As a product component
NA	TN	10,000-99,999	As a formulation component
TEXAS IND. INC.	TX	1,000-9,999	Ancillary uses

**Table 4-1. Facilities That Manufacture or Process Di-n-octylphthalate (continued)**

Facility	Location <sup>a</sup>	Range of maximum amounts on site in pounds	Activities and uses
TANDY CORP.	TX	1,000-9,999	As a formulation component
AMERON INC.	TX	10,000-99,999	As a reactant; As a formulation component
NA	UT	10,000-99,999	As a formulation component
NA	VA	1,000-9,999	As a formulation component
NA	VA	100,000-999,999	As a formulation component
UNIROYAL TECH. CORP.	WI	10,000-99,999	As a formulation component
NA	WI	10,000-99,999	As a formulation component
NA	WV	10,000-99,999	As a formulation component

Source: TRI92 1994

<sup>a</sup> Post office state abbreviations used

NA = not available

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**4.2 IMPORT/EXPORT**

In 1988, 6 million pounds of di-octylphthalates (i.e., di-*n*-octylphthalate and di[2-ethylhexyl]phthalate) were imported and 37 million pounds were exported. No data were located on specific quantities for di-*n*-octylphthalate (Mannsville Chemical Products Corporation 1989).

**4.3 USE**

Di-*n*-octylphthalate is principally used as a plasticizer in the production of plastics (Sittig 1991) and PVC resins. When used as a plasticizer, di-*n*-octylphthalate can represent 5-60% of the total weight of the plastics and resins. It increases flexibility and enhances or alters the properties of the material. It is also used for cellulose ester and polystyrene resins, as a dye carrier in plastic production (primarily PVC), and as a chemical intermediate in the manufacture of adhesives, plastisols, and nitrocellulose lacquer coatings (EPA 1993a; HSDB 1995; Mannsville Chemical Products Corporation 1989). It is a registered active ingredient in pesticides (EPA 1987b) and is found in cosmetics and colorants (EPA 1992a). Di-*n*-octylphthalate also serves as a carrier for catalysts or initiators and as a substitute for electrical capacitor fluid (EPA 1992a).

Flexible PVC resins and other dioctylphthalate-containing plastics and resins are used in a variety of industrial and domestic products: plastisols for carpetback coating (EPA 1987b), film, wire, cables, and adhesives (HSDB 1995). Additional end-use products are automobile and furniture upholstery, wall coverings, window shades, garden hoses, shower curtains, tablecloths, rainwear, shoes, dolls, and toys (Mannsville Chemical Products Corporation 1989).

**4.4 DISPOSAL**

Di-*n*-octylphthalate, including waste containing di-*n*-octylphthalate, is classified as a hazardous waste product by EPA. Generators of waste containing this contaminant must conform to EPA regulations for treatment, storage, and disposal (see Chapter 7). Rotary kiln or fluidized bed incineration methods are acceptable disposal methods for these wastes. Liquid injection incineration may also be used (HSDB 1995).

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According to the TRI, 240,609 pounds of di-*n*-octylphthalate were transferred to landfills and/or treatment/disposal facilities in 1992 (see Section 5.2) (TR192 1994). Of this quantity, about 1,475 pounds were discharged to publicly owned treatment works. A total of 15,302 pounds was released to air, land, and water by manufacturing and processing facilities. No di-*n*-octylphthalate was released for underground injection.