

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

5.1 PRODUCTION

Tables 5-1 and 5-2 list the facilities in each state that manufacture or process 2,4- and 2,6-DNT, respectively, and the intended use and range of maximum amounts of 2,4- and 2,6-DNT that are stored on site. The data listed in Tables 5-1 and 5-2 are derived from the Toxics Release Inventory (TRI13 2015). Only certain types of facilities were required to report; therefore, this is not an exhaustive list. In 2013, there were facilities located in nine states that produced, processed or used 2,4-DNT and facilities located in four states that produced, processed, or used 2,6-DNT. The number of individual facilities and the amount produced on site varied in each state. The other isomers of DNT are not contained in the TRI database.

According to the 2011 Directory of Chemical Producers, 2,4- and 2,6-DNT were domestically manufactured by three corporations including Air Products and Chemicals, Inc. (production site: Pasadena, Texas), the BASF Corporation (production site: Geismar, Louisiana) and Bayer Material Science, LLC (production site: Baytown, Texas) (SRI 2011). No information regarding the other isomers of DNT was included in the directory. While no production volumes were reported, data collected by the EPA Inventory Update Reporting (IUR) system indicated that <500,000 pounds of 2,4-DNT were produced domestically in 2006 (EPA 2012a). The United Nations Screening Information Data Set (SIDS) Initial Assessment Report for Dinitrotoluene (mixed isomers) reported that the global production capacity of DNT is about 1.6 Mio t (1.6 million tons) annually (UNEP 2004).

2,4- and 2,6-DNT are generally produced as a mixture called Tg-DNT, which contains approximately 76.5% 2,4-DNT and 18.8% 2,6-DNT (with the remainder consisting of other isomers and minor contaminants such as TNT and mononitrotoluenes) (HSDB 2012). This mixture is commercially prepared in a two-step process. Toluene is nitrated with concentrated sulfuric and nitric acid resulting in the production of mononitrotoluene (U.S. Army 1987). Mononitrotoluene can be nitrated with mixed acids to yield dinitrotoluene (EPA 2008a).

5.2 IMPORT/EXPORT

No information was found concerning U.S. imports and exports of DNTs.

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Table 5-1. Facilities that Produce, Process, or Use 2,4-Dinitrotoluene

State ^a	Number of facilities	Minimum amount on site in pounds ^b	Maximum amount on site in pounds ^b	Activities and uses ^c
IA	1	100,000	999,999	8
IL	1	1,000	9,999	8
IN	3	0	999	12
KY	1	100,000	999,999	12
LA	1	0	99	14
OH	1	1,000	9,999	12
TX	3	1,000	9,999	8, 12
UT	1	10,000	99,999	12
VA	2	100,000	999,999	7

^aPost office state abbreviations used.

^bAmounts on site reported by facilities in each state.

^cActivities/Uses:

- | | | |
|--------------------------|--------------------------|-----------------------------|
| 1. Produce | 6. Impurity | 11. Chemical Processing Aid |
| 2. Import | 7. Reactant | 12. Manufacturing Aid |
| 3. Onsite use/processing | 8. Formulation Component | 13. Ancillary/Other Uses |
| 4. Sale/Distribution | 9. Article Component | 14. Process Impurity |
| 5. Byproduct | 10. Repackaging | |

Source: TRI13 2015 (Data are from 2013)

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Table 5-2. Facilities that Produce, Process, or Use 2,6-Dinitrotoluene

State ^a	Number of facilities	Minimum amount on site in pounds ^b	Maximum amount on site in pounds ^b	Activities and uses ^c
IN	1	100	999	12
KY	1	10,000	99,999	12
OH	1	1,000	9,999	12
TX	1	0	99	8

^aPost office state abbreviations used.

^bAmounts on site reported by facilities in each state.

^cActivities/Uses:

- | | | |
|--------------------------|--------------------------|-----------------------------|
| 1. Produce | 6. Impurity | 11. Chemical Processing Aid |
| 2. Import | 7. Reactant | 12. Manufacturing Aid |
| 3. Onsite use/processing | 8. Formulation Component | 13. Ancillary/Other Uses |
| 4. Sale/Distribution | 9. Article Component | 14. Process Impurity |
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Source: TRI13 2015 (Data are from 2013)

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5.3 USE

The most commercially important use of DNTs is as a chemical intermediate in the production of TDI. TDI is a precursor to polyurethane polymers (HSDB 2012). Additionally, DNTs are used in the production of TNT, as a plasticizer in propellants, and as a waterproofing, plasticizing, and gelatinizing agent in explosives (HSDB 2012). DNTs are also used as intermediates in the production of dyes and as modifiers for smokeless powders in the munitions industry (HSDB 2012).

5.4 DISPOSAL

2,4-DNT and 2,6-DNT are listed as toxic substances 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 1995). Disposal of wastes containing DNTs is controlled by a number of federal regulations (see Chapter 8).

Limited information is available regarding the appropriate disposal of DNTs. NIOSH recommends that small quantities be swept onto paper or other flammable material and incinerated in a suitable combustion chamber. Larger quantities should be reclaimed; if this is not practical, then they should be dissolved in fuel oil and atomized in a suitable combustion chamber (HSDB 2012). The ultimate disposal of DNTs can be achieved by controlled incineration in an incinerator unit equipped with an alkaline scrubber (HSDB 2012). DNTs have also been proposed as a potential candidate for rotary kiln incineration at 820–1,600 °C or fluidized bed incineration at 450–980 °C, with residence times of seconds for gases and liquids and longer for solids (HSDB 2012).