



Business Area
Polyurethane Chemicals

TDI

Demand for TDI

Global polyurethane use continues to grow rapidly. As demand for polyurethane increases, so does the need for isocyanates, key raw materials used in polyurethane production. TDI (toluene diisocyanate) products are isocyanates commonly used to manufacture flexible foams for transportation and furnishings industries.

Working with Chematur Engineering

Chematur offers state-of-the-art TDI technology to meet modern manufacturers' needs. TDI competencies include dinitrotoluene, toluene diamine and TDI technologies. Chematur services are available for a wide range of related processes, such as nitric acid, nitrobenzene, aniline, polymeric and pure MDA, polymeric MDI, MDI purification and modification, and brine purification.

Clients have full freedom to commercialize plant products. Service is customized, ranging from simple licensing to full turnkey projects. Finally, Chematur brings more than 40 years of experience designing and constructing plants that handle hazardous materials.

The TDI Process

TDI manufacture involves highly complex chemistries. The process is fully continuous in three major steps from DNT (dinitrotoluene) to TDA (toluene diamine) and on to TDI.

The DNT section uses the pump nitration concept to react toluene with nitric acid in the presence of sulfuric acid. Spent sulfuric acid is recovered in a third-party reconcentration unit and recycled to the nitration section. The crude DNT stream is water-washed to produce the final DNT product.

In the TDA section, DNT is reacted with hydrogen in a special stirred-tank hydrogenator to produce crude TDA in high yield using a precious-metal catalyst. Light impurities and water are removed in the first distillation column, and then the ortho-TDA isomers are removed by vacuum distillation.

In the TDI section, phosgene is produced from carbon monoxide and chlorine. TDI is produced by the continuous phosgenation of MTD in an aromatic solvent solution. In a series of separators, strippers and distillation columns, byproduct HCl, solvent, excess phosgene and volatile impurities are removed from the reactor product. Recovered solvent and phosgene are recycled while the HCl is purified for sale. TDI product is removed from high-boiling tar impurities by vacuum distillation. The tar stream is sent to a third-party recovery system, which recovers the TDI content and produces a dry, granular tar waste stream.



Plant Benefits

- Safe – Because it is consumed as quickly as it is produced, pure phosgene is never liquefied or stored. Redundant emergency systems are provided. Ambient air monitoring is provided to verify a safe operating environment is being maintained.
- Environmentally sound – Process materials are recovered from waste streams wherever possible. Remaining vent streams are cleaned to the required standards. Steam is produced from the incineration of solid and liquid organic waste streams. A special unit pre-treats the wastewater so that it is suitable for final treatment in a typical biological waste treatment plant.
- No restrictions on production or sale of products – Chematur is a technology supplier, not a producer of TDI.
- Quality oriented – Plants are designed to meet modern product quality standards.
- Reduced staffing costs – Plants are designed and instrumented to minimize staffing requirements.

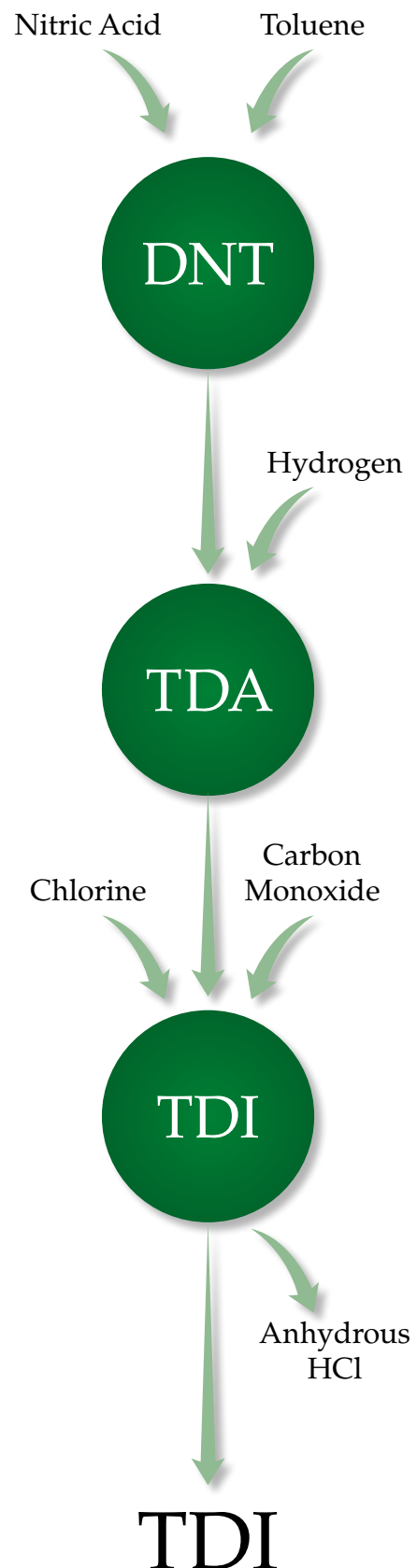
The Bottom Line

Chematur has been designing and constructing chemical plants for over 80 years. We specialize in working on global projects involving hazardous materials, and provide customized engineering services. Chematur engineers help clients with plant needs.

Chematur has always remained committed to finding ways to continuously improve its processes. No part of a process is considered insignificant. Chematur's isocyanate processes are continuously upgraded to increase safety (for operators, the community and the environment), improve product quality and reduce operating costs.

The result? In addition to reliably producing high-quality TDI product, Chematur plants are extremely cost-effective. If you are considering TDI production, research Chematur.

TDI Process



Chematur Engineering AB, a member of the Chematur Engineering Group, is an independent engineering company whose main activities are marketing of process know-how and supply of chemical plants. Chematur Engineering is equipped with full capabilities for implementing entire plant projects on a turnkey basis. Altogether the Chematur Engineering Group companies have supplied more than 1000 plants to customers worldwide.

Proprietary technologies and licence agreements secure a state of the art technology base, giving the Chematur Engineering Group the advantage of being able to offer our clients complete processes in many fields.

