



# TNT/DNT Plant

Technology | Production | Know-How



The technology is adapted for continuous production of TNT with possible using of final product for military purpose as well as for mining purpose (industrial explosive). Special emphasis has been placed on achieving a closed cycle process; this being accomplished through recovery of acids. The production process comprises a number of inter-linked manufacturing phases: synthesis (nitration), purification, drying, granulation process, packing, recovery of acids.

## TECHNOLOGY

Toluene nitration to TNT is conducted in eight reactors units which are mutually connected into a single whole - nitration line. Each nitration reactor unit consists of: nitrator with a dynamic separator, agitator with power plant and a distributor. Nitration reaction is carried out as follows: pure raw materials are introduced directly into nitrators (while the mass is being vigorously mixed by use of impeller-type agitator) and excessive reaction heat is being discharged from the process. Reaction temperature in each of nitrators is maintained at pre-set value by means of thermostatic control over cooling water flow through cooling nitrators.



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Separation of reacting mixture (with separation of organic and inorganic phases) is ensured by use of dynamic separator (inside the nitrator) which forms a single assembly with the mixer's driving engine. Crude TNT is purified in five reactor units which are mutually connected in series and form an integral whole - the line for TNT purification. Each of the purification units includes a reactor with a dynamic separator, agitator with power plant and a distributor.

TNT emulsion with water resulting from TNT purification is now first introduced into the unit with dynamic separator, in which TNT separation is carried out.

Separated TNT is fed into the drying unit where it is being dried in counter-current flow of hot air. Separated water is, through wet scrubber, returned into the process of TNT purification.

From the bottom of the drying unit dried TNT is withdrawn to granulation (through hydraulic overflow cup).

Drum-type crystallizers, which are cooled with cooling water, are partially wetted from outer side with liquid TNT, and due to drum rotation around its axis, a thin crust of solidified TNT is formed at its outer surface. Solidified TNT crust is scraped off the drum with a bras knife. TNT flakes obtained in this manner are conveyed to packing (via an adjustable conveyor). The drum is now again immersed in liquid TNT and the operation is carried on continuously.

## SAFETY

All units are designed such to provide completely safe control of the process. The plant is equipped with necessary measuring-control equipment, by which the process is managed, as well as with blockade and alarm system for process controlling and managing into safe conditions. Where is necessary for process safety reasons, all motors are foreseen in Ex-proof execution. In case of accidental situations, the emergency discharging of reactors is foreseen, and the process is brought into safe condition. The quantity of the hazardous materials in the buildings, as well as the work in them is strictly controlled, and is completely defined by operating regulations.



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