



POURING & CASTING

Explosive
Processing
Services

SERVICES

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General Dynamics Ordnance and Tactical Systems-Canada's (GDOTS Canada) expertise with casting of TNT based explosives dates back to World War II, and covers the filling of different calibers of fragmentation projectiles and shaped charges. GDOTS Canada also developed expertise in Dinitroanisole (DNAN) based melt-pour high explosive formulations since 2002.

Two melt-pour explosives processing facilities are available. GDOTS Canada's facilities are used for 60mm and above caliber projectiles. The first facility is equipped with three 200 U.S. gallons kettles. Ten cooling stations, each able to handle twenty-three 120mm caliber and below projectiles or nine 155mm M107 shells, are equipped with probe and coils systems. The cooling stations include a water bath to perform controlled cooling and solidification of the cast explosive, providing high quality levels. The second facility is used for high-rate production of munitions with calibers up to 81mm. Two 200 U.S. gallon kettles can be used in parallel for munitions filling.

A tunnel fitted with one section for warm air heat pre-conditioning of projectiles, and one section for cooling using circulating water and air is used in this facility.

Both process lines are monitored using data acquisition and statistical process control (SPC).

The cooling step in both facilities is automated to provide a better control of this critical operation. In addition, GDOTS Canada also has a pilot plant laboratory equipped with a 20 U.S. gallon kettle, and a cooling station very similar to the production equipment. The use of instrumented shells enables the study of the cooling behavior of the cast explosive in different shell designs. This equipment is used to optimize the pre-heating and cooling processes to make them more robust for new products and types of explosives through design of experiments. Numerical simulations of the process can also be run to improve the knowledge, and orient the work at the beginning of the filling method development.