INSENSITIVE MUNITIONS

Explosive Processing Services

General Dynamics Ordnance and Tactical Systems-Canada's (GDOTS Canada) involvement with Insensitive Munitions (IM) including ignition systems, propulsion systems and high explosives, dates to the 1980's. Processing expertise was developed in the area of cast-cure Plastic Bonded Explosives (PBX) based on nitramines (RDX and HMX) in a polymeric binder with Canadian, American, British and French formulations. Vacuum casting of PBX can be performed using a batch process and either a two or ten U.S. gallon planetary mixer. A continuous process pilot line using a bi-component equipment and static mixer is also available.

GDOTS Canada's experience with insensitive explosive formulations include melt-pour Dinitroanisole (DNAN based) formulations (PAX-21, IMX-104, PAX-48, OSX-12). In addition, pressing of boosters of different sizes has been performed with less sensitive PBX formulations such as PBX-5, PBXN-9 and PBXN-12.

Expertise in the area of LOVA propellant covers charge design was based on XM-39 and similar formulations of propellant and Pyrodex based primer. GDOTS Canada is equipped with computer simulation tools and a transparent gun simulator to optimize propellant charge design. Packaging, propelling case, and shell design, also play an important role in the overall insensitive munitions performance, for which we also have system design and integration expertise.

While IM testing is generally subcontracted to other facilities, GDOTS Canada is able to conduct bullet impact, sympathetic detonation, slow cook-off, and shaped charge attack tests.

GDOTS Canada's past expertise in this area was acquired with 57mm Pre-Fragmented High Explosive (PFHE) and 105mm tank Multi-Purpose High Explosive (MPHE) rounds. The 120mm mortar development of enhanced insensitive munitions with a cast cure explosive formulation has been achieved successfully with the U.S. Army and other companies leading to the qualification of the M934A2 ammunition. GDOTS Canada showed its capabilities to load, assemble and produce 60 and 81mm mortars using IMX-104 explosive, as well as the 120mm IM HE-T with PAX-48.

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