

INSENSITIVE AMMUNITION

Features



Modified plastic explosive

Modified plastic explosive (MPE) is explosive mixture based on the penthrite and polyurethane. The sensitivity of MPE was reduced using some specific additives. Main features of MPE are as follows:

- Density: 1830 kg/m³
- Detonation velocity: 6100 m/s
- Detonation pressure: 17 MPa
- Filling technology: kneading
- Bullet impact resistance according MIL-STD-2105B: non-sensitive
- Fast cook-off resistance according MIL-STD-2105B: non-sensitive

Bullet impact resistance

The bullet impact test was conducted in accordance with the MIL-STD-2105B standard requirements by exposing the explosive payload filled by MPE to the effect of 12.7 mm rounds fired in bursts from a machine gun.

Figure 1 depicts recorded frames of explosive payload reaction on the bullet impacts test.



Figure 1 - Rerecorded photographs of the bullet impact test (2 hits): MPE filled samples during hits (left) and after hits (right)

Analysis of testing results shows that the tested sample has fully met the requirements from MIL-STD-2105B standard regarding the immunity to bullet impact, since there was no detonation of the explosive charge.

Fast cook-off resistance

The Fast cook-off test has been conducted in accordance with the requirements from MIL-STD-2105B standard, by exposing the explosive payload filled by MPE to the effect of liquid fuel fire during 20 min. Figure 2 illustrates testing set-up for fast cook-off test before testing and effects of the open flame after the test, respectively.



Testing setup before burning



Testing setup during burning



Figure 2 - Details of the fast cook-off resistance testing of the MPE filled payload

Analysis of testing results shows that the tested sample has fully met the requirements from MIL-STD-2105B standard regarding the immunity to liquid fuel fire, since there was no detonation but only the burning of the explosive charge.

Polymer bonded explosive

Polymer bonded explosive (PBX) is explosive mixture based on the hexogen with polymer binder. The sensitivity of PBX was reduced using some specific additives. Main features of PBX are as follows:

- Density: 1650 kg/m³
- Detonation velocity: 6050 m/s
- Detonation pressure: 15.1 MPa
- Filling technology: casting
- Bullet impact resistance according MIL-STD-2105B: non-sensitive
- Fast cook-off resistance according MIL-STD-2105B: non-sensitive

Bullet impact resistance

The bullet impact test was conducted in accordance with the MIL-STD-2105B standard requirements by exposing the explosive payload filled by PBX to the effect of 12.7 mm rounds fired in bursts from a machine gun.

Figure 3 depicts photographs of explosive payload reaction on the bullet impacts test.



Frame 1



Frame 2

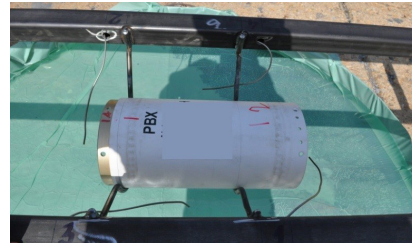
Figure 3 - Rerecorded photographs of the bullet impact test: Frame 1 - PBX filled sample before hits; Frame 2 - Sample after hits

Analysis of testing results shows that the tested sample has fully met the requirements from MIL-STD-2105B standard regarding the immunity to bullet impact, since there was no detonation of the explosive charge.

Fast cook-off resistance

The Fast cook-off test has been conducted in accordance with the requirements from MIL-STD-2105B standard, by exposing the explosive payload filled by PBX to the effect of liquid fuel fire during 20 min.

Figure 4 illustrates testing set-up for fast cook-off test before testing and effects of the open flame after the test, respectively.



Testing setup before burning



Testing setup during burning



Testing setup after burning

Figure 4 - Details of the fast cook-off resistance test of the PBX filled payload

Analysis of testing results shows that the tested sample has fully met the requirements from MIL-STD-2105B standard regarding the immunity to liquid fuel fire, since there was no detonation but only the burning of the explosive charge.