

COMPARATIVE STUDY OF PRESSURE-TEMPERATURE EFFECTS FROM TNT AND RDX-IPN-AL EXPLOSIONS

B.E. Gelfand¹, S.P. Medvedev¹, S.V. Khomik¹, M.V. Silnikov²

¹*Semenov Institute of Chemical Physics, Russian Academy of Sciences*

4 Kosigina Street, Moscow, 119991, Russia

²*Special Materials Research Institute*

28-a B.Sampsonievski, St.Petersburg, 194044, Russia

ABSTRACT

A series of field trials were performed for the purpose to reveal distinctions between explosions of conventional TNT charges and hybrid explosives. The mixture under investigation belongs to 'thermobaric explosives' and it represents a blend of isopropyl nitrate (liquid) and powdered RDX and Al (RISAL).

The experiments were performed with 1 kg charges of TNT and RISAL both in open and confined space (building of 200 m³). Along with dynamic pressure registration a specially designed double-wavelength photodiode detector was applied to temperature measurements in the course of afterburning of expanded detonation products. Particular attention was paid to the investigation of the influence of confinement on the temperature history at a late stage of explosion.