

BLAST WAVE GENERATOR BASED ON PBX ENCLOSED IN WATER CONTAINER

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Abstract: The blasting effect of underwater detonations of Plastic Bonded Explosive (PBX) is characterized in small-scale experiments as a function of the explosive mass, explosive packing density, aluminum additives and general design of explosive charge. The basic objective is to enhance the blasting performance of the PBX driven water buffer in the particular case when the PBX 50g-charge detonates inside the water-filled 50-liter container of 25 cm x 40 cm x 50 cm size. In such configuration, Blast Wave Generator (BWG) avoids the environmentally dangerous high-velocity fragments as well as reduces a noise generation. After theoretical evaluation, the BWG has been tested in various experiments, revealing the shock sensitivity and the detonation wave (DW) performance of PBX charges, the shock wave attenuation in water and finally the interaction of the PBX driven water buffer with the obstacle mimic. Modifications of the PBX charge design allowed increasing the BWG efficiency up to 15% in mechanical momentum transmitted to the obstacle.