MITIGATION OF NEAR-FIELD BLAST INDUCED DEFORMATION USING NOVEL SHAPED WATER-FILLED CONTAINERS

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Previous work has identified the potential benefits of using water-filled containers for near-field blast protection. These investigations identified that mass, shadowing and spreading were the key mitigation mechanisms by which the water was able to reduce the deformation of steel target plate. Whilst these investigations identified that taller and narrower containers provided the best mitigation, all containers investigated were quadrangular in shape.

This experimental investigation focuses on comparing near-field blast mitigation provided by the best performing quadrangular water-filled containers to a range of novel container geometries. Experiments were conducted with a range of novel container shapes including a cone, inverted cone, diamond and mushroom. In addition to these container shapes, an array of water bottles known as a kinetic energy defeat device (KEDD) was also evaluated. The best performing novel shapes were the mushroom and inverted cone shaped containers, which enhance the spreading mitigation mechanism. However, the mushroom-shaped container was the only container which was able to provide better efficiency than the most efficient quadrangular container.