EXPERIMENTS WITH AN ANTHROPOMORPHIC DUMMY FOR BLAST RESEARCH

JöNSSON,A.;CLEMEDSON,C.J.;ARVEBO,E.

An anthropomorphic dummy has been constructed and used in various blast experiments. Originally, the dummy was designed for the study of primary blast effects in humans exposed to shock waves in air or water, but it may be used in certain types of experiments concerning secondary effects in air as well. The dummy is useful e.g. for assessing hazards, for tests of protective devices, and in the study of biodynamics of impact.

The construction of the dummy is based on the fact that the soft tissues in the body, and particularly the gas-filled parts, e.g. the lungs, parts of the intestinal tract, and the auditory organs, are most susceptible to primary blast load. To indicate the risk of lung injury, a model lung, furnished with a pressure transducer, is inserted in a water-filled model of the thorax, and to indicate the risk of blast injury to the ears pressure transducers are placed at the site of the tympanic membranes in a model head. Recorded pressure-time events are then used as severity indices.

The dummy has been used in experiments performed in the open air as well as in shock tubes and in shelters. In some experiments the response of the dummy could be compared to the response of mammals simulating man subjected to identical blast load. The results of the experiments performed so far have indicated that the properties of the dummy are adequate for studies in the range of pressure loads relevant to man.