A NEW CONCEPT FOR BULLET PROTECTION AND DEBRIS CONTAINMENT WITH MODERN CHAIN MAIL AND HYBRIDS WITH PLASTIC/METALLIC RESINS

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In a time, when the threat of terrorist attacks or similar has an immense increase, it is often necessary to protect certain objects against projectiles like bullets, debris etc.

At the University of applied Sciences Ingolstadt, Bavaria, a new protection system for projectiles was developed using steel-chain-patches, in the following named **Flex-Metal-Mesh (FMM)** alone or combined with different resin systems together with its partner, the Institute for protection systems - Prochain e.V.

Every single ring is bended out of wire and welded at the ring opening in a specific pattern. The most classic and simplest way of connecting the single rings is the 1:4-pattern (Fig. 1), the so called kings pattern. Here every single ring is connected with four other rings.

Several tests are performed in order to characterize the impact behavior and to get analyses sources of FMM or a hybrid containing FMM at ballistic velocities with standard munitions (Fig. 2) In 2006 a number of blast tests are foreseen in order to get results on this field of application.

In order of better understanding impact behaviour of structures containing FMM and to get feasibility studies of possible applications of FMM numerical simulations were performed (Fig. 3).

The FMM shows substantial potentials for the debris containment as well as for protection devices within several speed and impactor mass regimes.

Within this potential the FMM will supply it's strength in the hinged version and in the hybrid version wherever special material properties and characteristics are demanded.

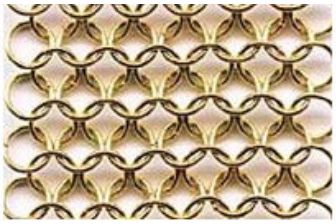

Figure 1

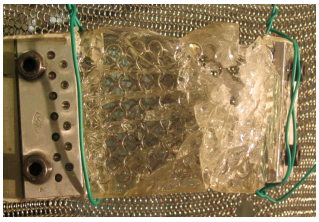

Figure 2

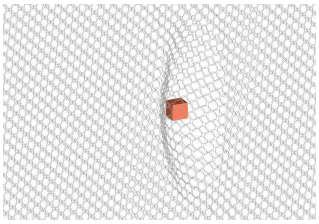

Figure 3