



DESCRIPTION:

Martec was contracted by a large Canadian manufacturer of automobile accessories to assist with the structural design of one of their new product lines. This manufacturer produces accessories that are supplied as original equipment with new automobiles. One accessory that they manufacture is a bullbar for sport utility vehicles (SUVs). Bullbars are tubular structures that protect the front grills of SUVs in minor impacts.

Recently, legislation has been introduced in Europe to protect pedestrians during frontal impact with vehicles. This has resulted in the European Experimental Vehicle Committee (EEVC) designing impact test requirements to be passed for all bullbars to be marketed and sold in Europe. The test requirements are very demanding and are based upon reducing the level of deceleration of critical pedestrian body components to a level where an impact with a vehicle at 40 km/h can be survived.

In order to reduce prototyping costs and time-to-market to a competitive level, virtual prototyping was utilized by Martec to assess current designs and to redesign bullbar components. Martec used the special purpose impact analysis program PamCrash to simulate the impact tests and to ensure that the proposed designs would pass the test requirements of the EEVC. Tubular sections were designed with various types of energy absorbing foams encased in plastic shells. A design was derived that was capable of passing the EEVC requirements.