

PEDESTRIAN SAFETY

FROM CONCEPT TO CERTIFICATION



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Test Facility

Our pedestrian test capability has been continuously developed over 10 years to give a high-quality service and rapid turn-around. With experienced staff, a temperature controlled laboratory, dedicated instrumentation and high-speed video equipment, it provides a complete service. We can help test and develop products from individual components to complete vehicle prototypes.

A complete suite of impactors, gives capability to perform any type of testing:

- ◆ European headforms Adult (4.8kg) Small Adult (3.5kg) and Child (2.5kg)
- ◆ Japanese / GTR 4.5kg Adult headform
- ◆ Upper Leg WG17 / EC
- ◆ Lower Leg WG17 / EC

Our pedestrian rigs have been developed and built in-house to provide a fast, accurate and reliable service.

Unique features of MIRA's pedestrian facility include:

- ◆ Equipment and software developed in-house for targeting and aligning the headform which ensures every impact is exactly where it is supposed to be, well within the permitted tolerance.
- ◆ An accurate independent measurement of the headform velocity before impact, for every test, using a laser-based system.
- ◆ Lower-leg tests conducted using a long acceleration distance to ensure the foam at the rear of the leg is not compressed before the impact on the vehicle
- ◆ In-house calibration of all the pedestrian impactors means no interruptions to major test programme while fast test turn-around reduces project timescales and costs.

MIRA can help develop your vehicle to exceed pedestrian safety requirements from the very start of your project, and continue to provide support all the way through to final certification.

- ◆ EuroNCAP
- ◆ TRIAS 63
- ◆ 2003/102/EC 2004/90/EC – Vehicles
- ◆ J-NCAP
- ◆ GTR
- ◆ 2005/66/EC 2006/368/EC – Frontal Protection Systems

Concept Development & Simulation

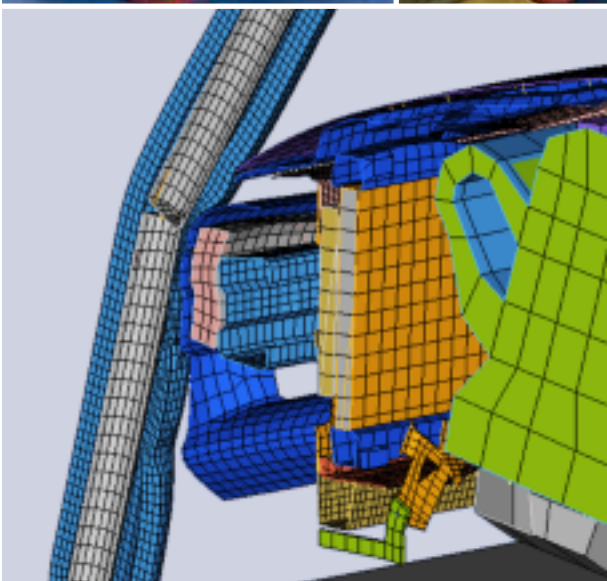
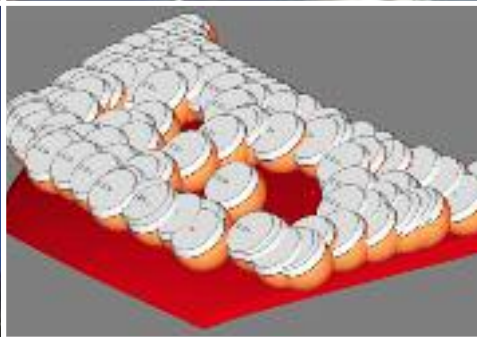
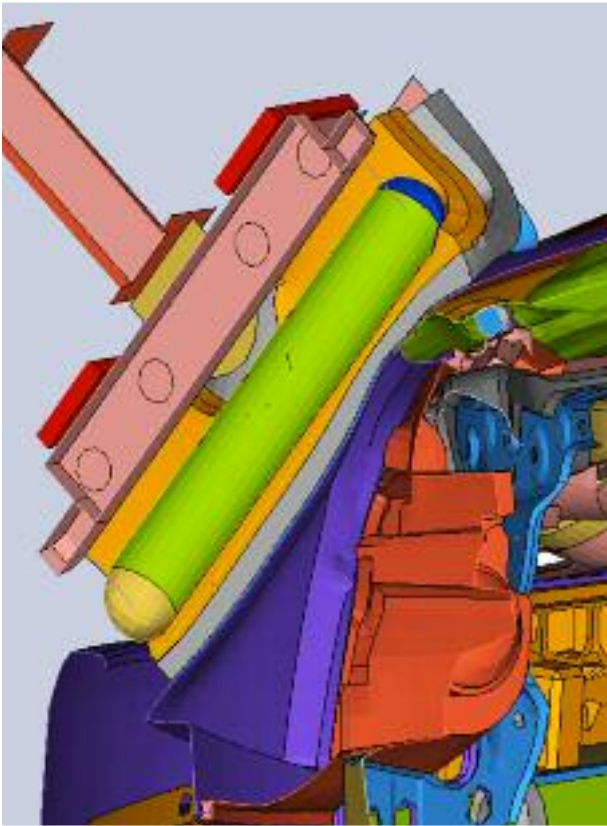
Our CAE department is highly experienced in modelling vehicles for pedestrian safety. We have developed our own in-house models of the pedestrian impactors which give accurate and robust predictions of test results – verified over many projects against physical testing.

From early concept stage, simulations of the impact tests can be carried out, without any prototype parts, to refine the design of the vehicle front structure. Models can include both vehicle structure and panels, and also complex headlamp, engine component and bumper assemblies. MIRA's FE engineers are experienced in relating predictive simulations to real-world test scenarios. This provides our customers with the utmost confidence in their pedestrian test results as early in their programme as possible.

Simulation can be used to run very high numbers of impacts on vehicle models to determine the border between the HIC1000 / HIC 2000 zones, evaluate design changes, and identify any problem areas, in a short space of time and without any physical prototype parts.

MIRA has developed detailed material models of all components involved in a pedestrian impact. These models include full prediction of rate-sensitive behaviour and where appropriate initiation and propagation of fracture.

MIRA

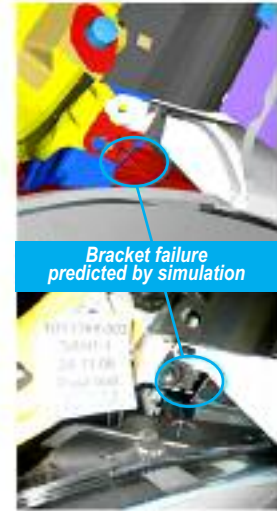
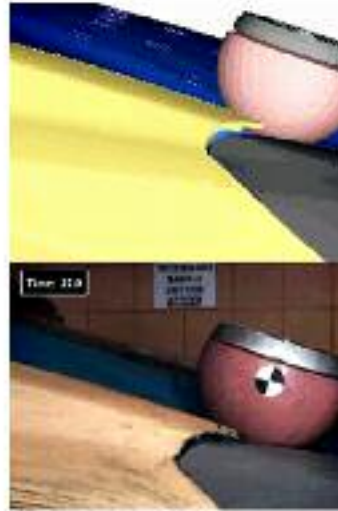
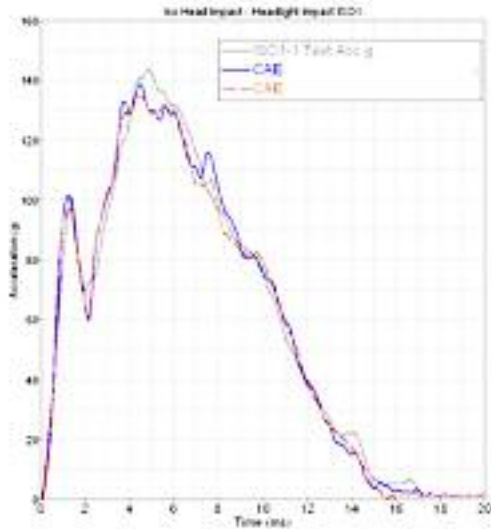


Testing

Throughout concept development and simulation runs, correlation tests on single panels or full vehicles can be undertaken to verify the simulation results and provide additional information for the model.

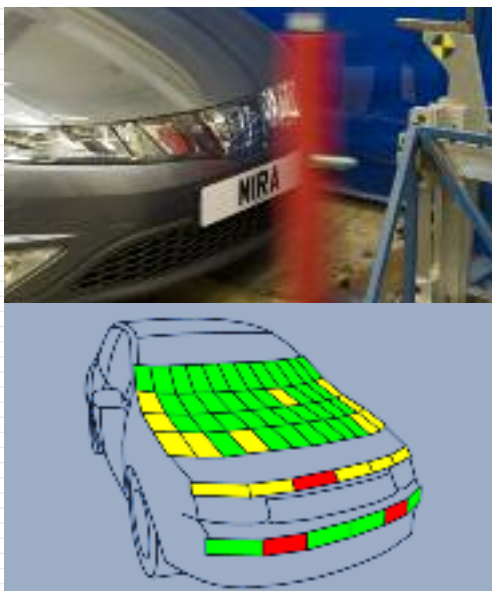
CAE Correlation

- ◆ Simulation uses MIRA developed pedestrian impactor and MIRA material models.
- ◆ Test HIC 1057, simulation HIC 1074.



Certification

MIRA is approved as a Technical Service to carry out testing and issue Type-Approval Certificates through RDW and our in-house Certification department. This means that no outside witness organisations or staff are required, reducing project complexity and cost. The laboratory equipment and procedures for conducting tests and calibrating the impactors have also been independently approved by VCA.



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