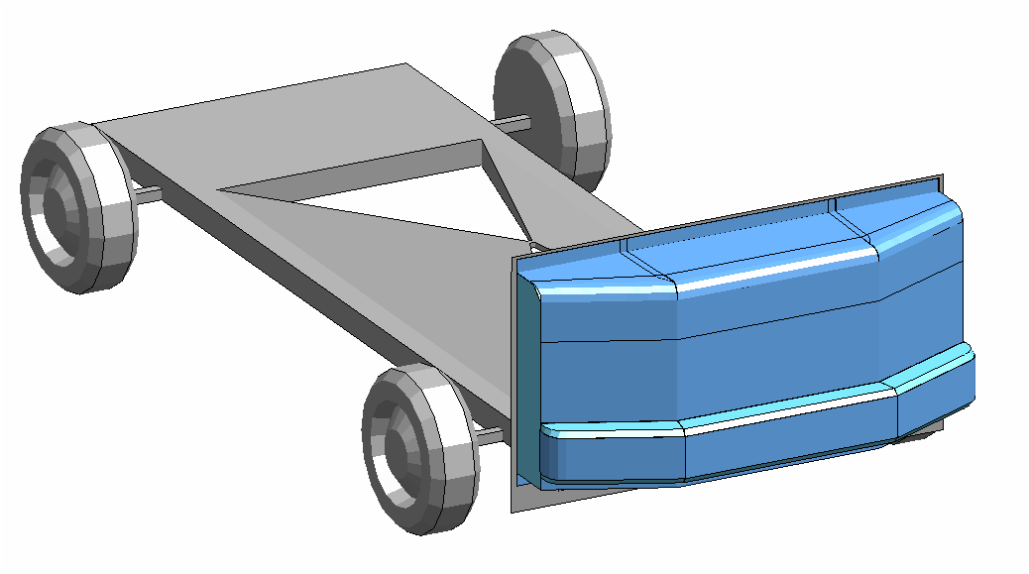
IIHS (SICE) Side Impact Barrier Model
Version 1.0



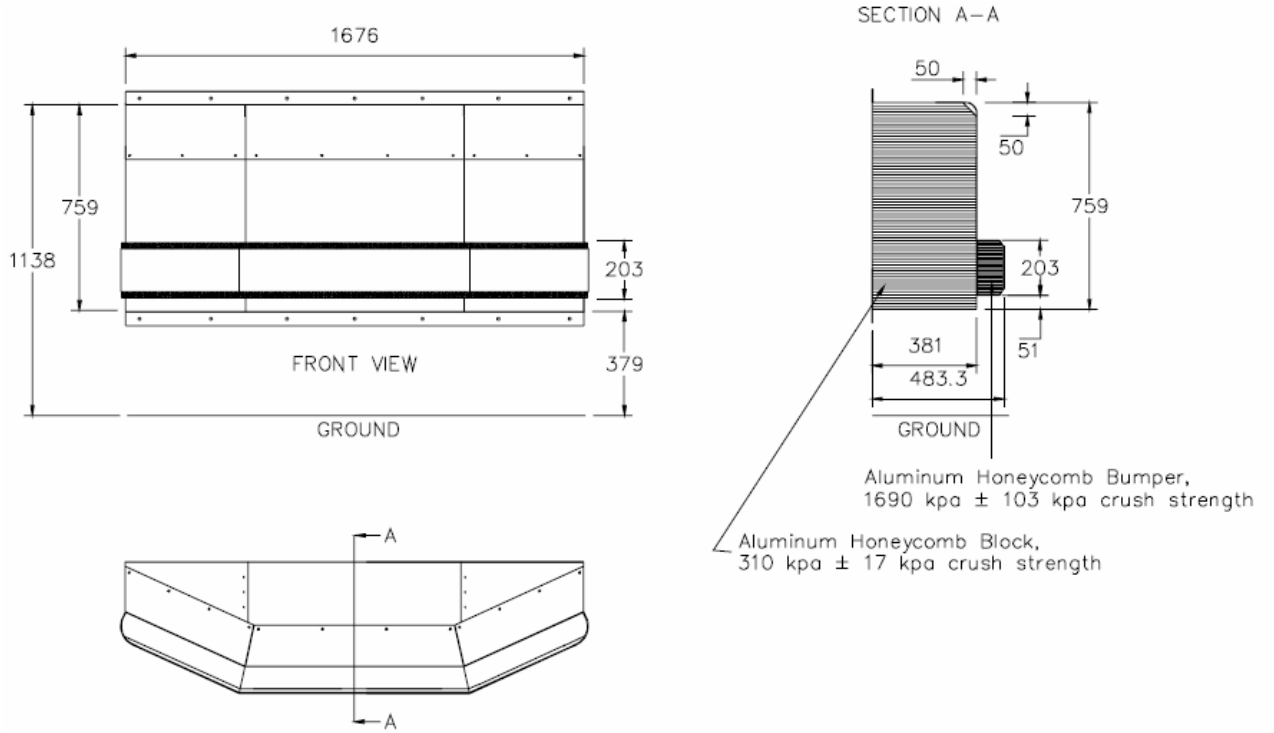
Development Report

October 2006

The specification used for the deformable impact barrier in this documentation has been taken from the IIHS Side Impact Crash Test Protocol (version IV) dated August 2005.

Barrier Characteristics

- The mass of the barrier including instrumentation should be 1500kg.
- The impactor consists of two different sized aluminium honeycomb blocks partially covered in aluminium sheets.
- The centre of gravity of the barrier lies on the barrier's lateral centerline, 990mm rearward of the front axle and 566mm above the ground.



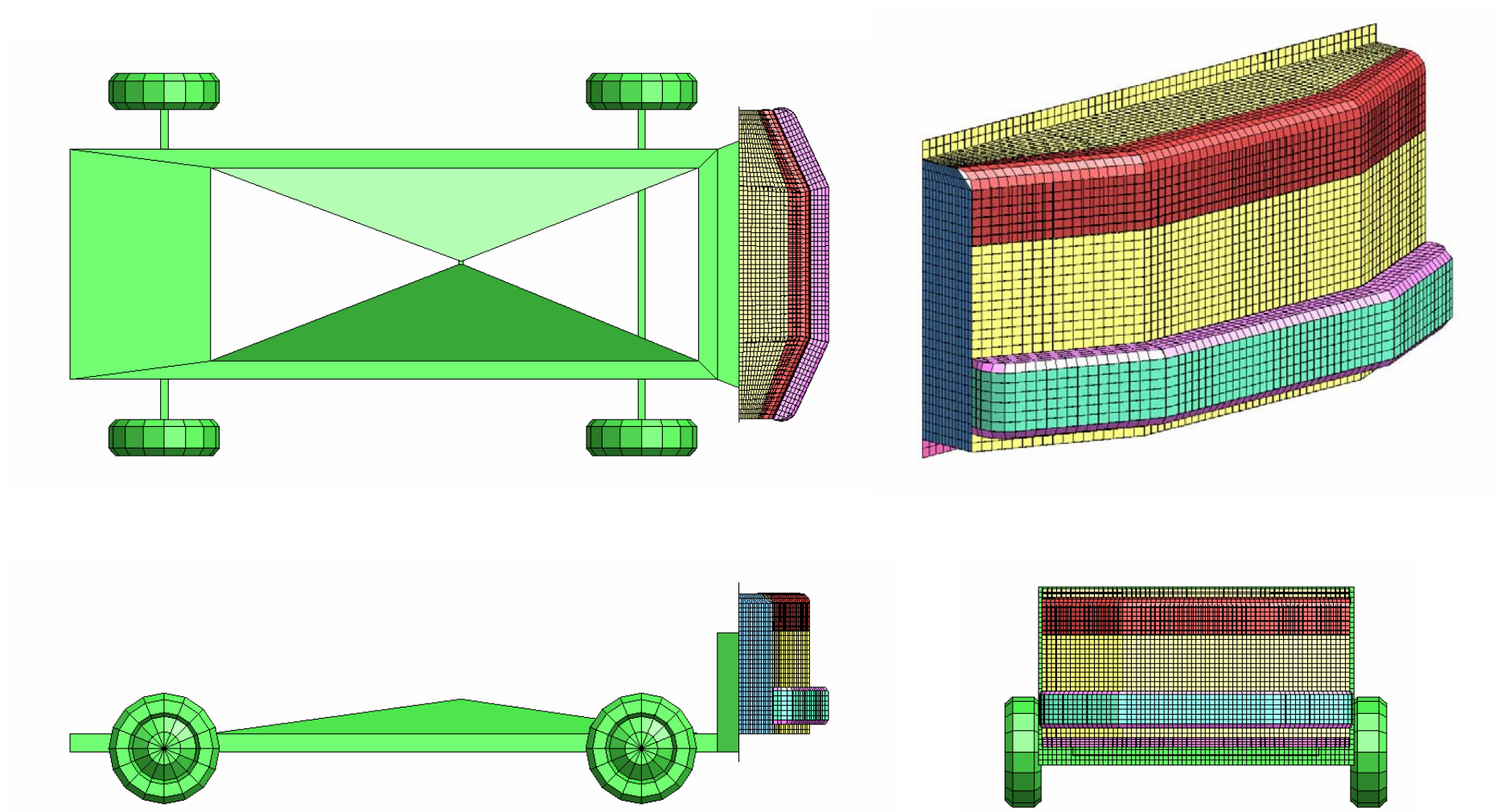
Material Characteristics

- The main honeycomb block should have a crush strength of 0.31 N/mm2 ±0.017 N/mm2. The front and top faces of the main block should be covered with 0.7 mm aluminium sheet. The top aluminium sheet should not be bonded to the main block.
- The bumper honeycomb block should have a crush strength of 1.69 N/mm2 ±0.103 N/mm2 . The front face of the bumper block should be covered with 3 mm aluminium sheet.

Calibration Procedure

No calibration test is specified for the deformable impact barrier as its crush performance is characterised by its material properties.

Figure 1.1 – IIHS barrier model



Calibration Tests

The two test that have been selected for correlating the barrier are described below:

Condition A – Rigid Pole Impact

This test involves the barrier on a trolley impacting a pole. The velocity is 7.0m/s (25km/h). Figure 1.2 shows the test configuration. Figure 1.4 shows the deceleration characteristic of the barrier obtained from the analysis compared with test. The curves have been normalized to unity.

Condition B – Rigid Wall Impact

This test involves the barrier on a trolley impacting a rigid wall. The velocity is 7.0m/s (25km/h). Figure 1.5 shows the test configuration. Figure 1.7 shows the deceleration characteristic of the barrier obtained from the analysis compared with test. The curves have been normalized to unity.

Figure 1.2 – IIHS condition A

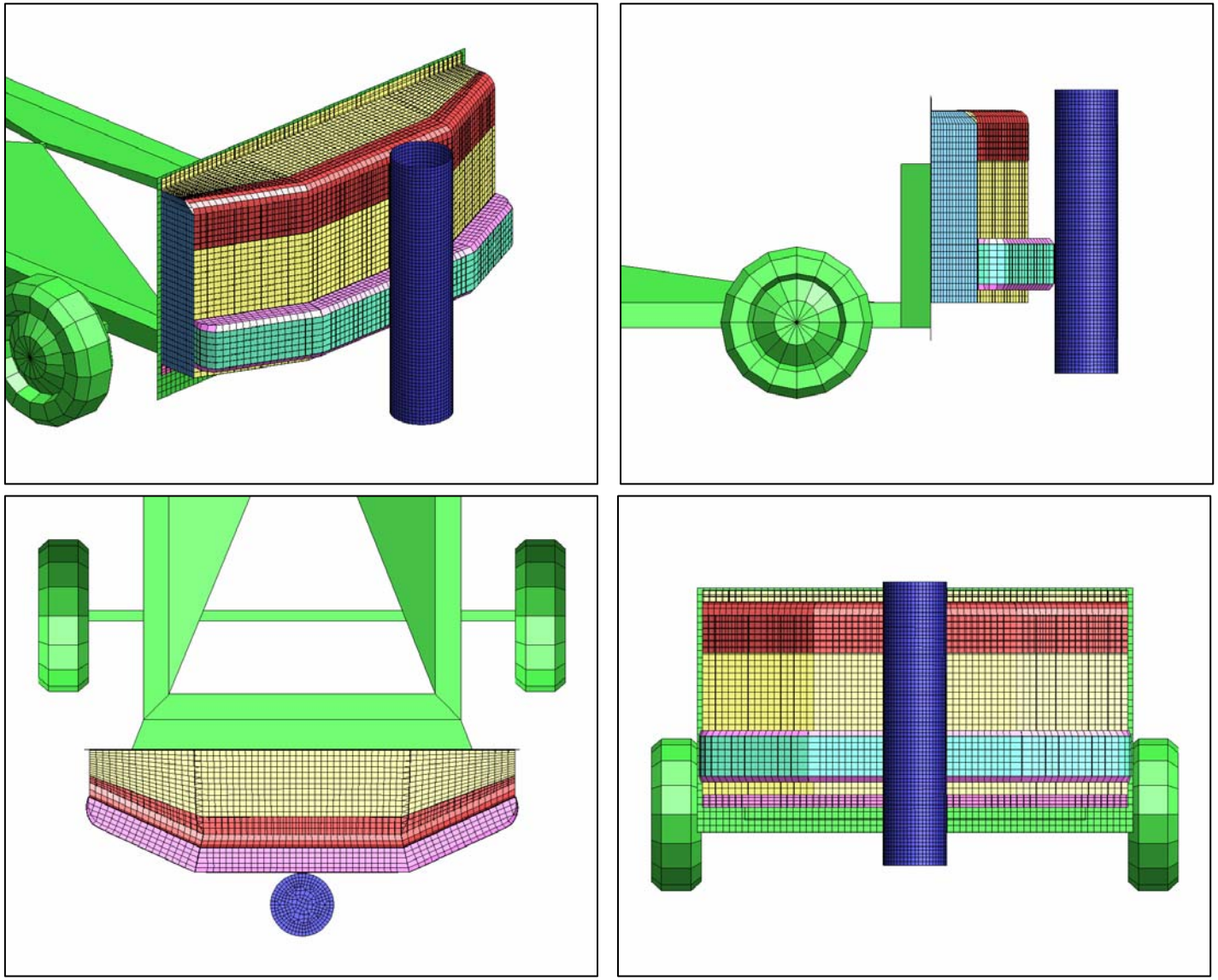
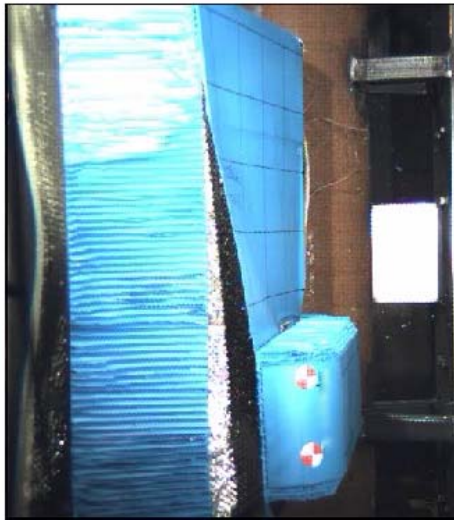
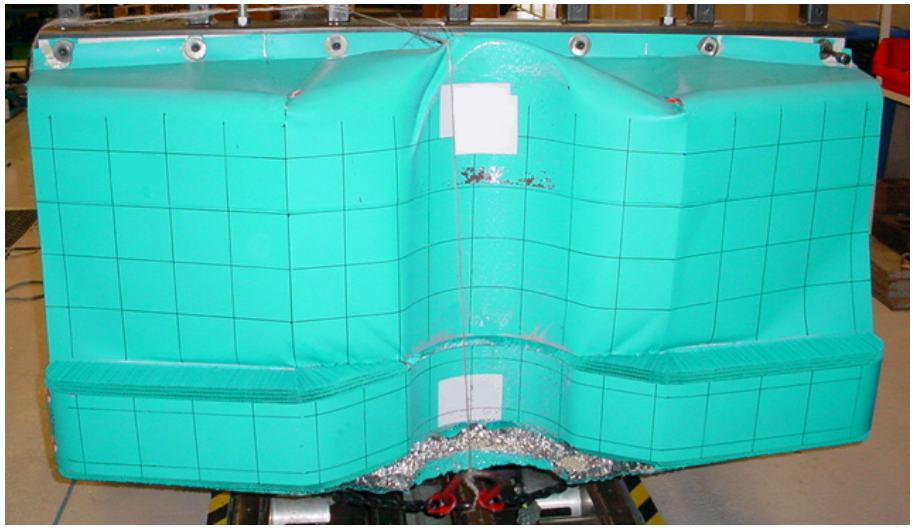
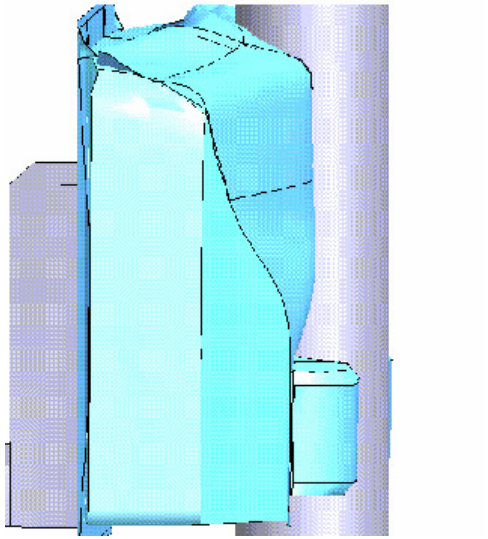


Figure 1.3 – IIHS condition A final deformation







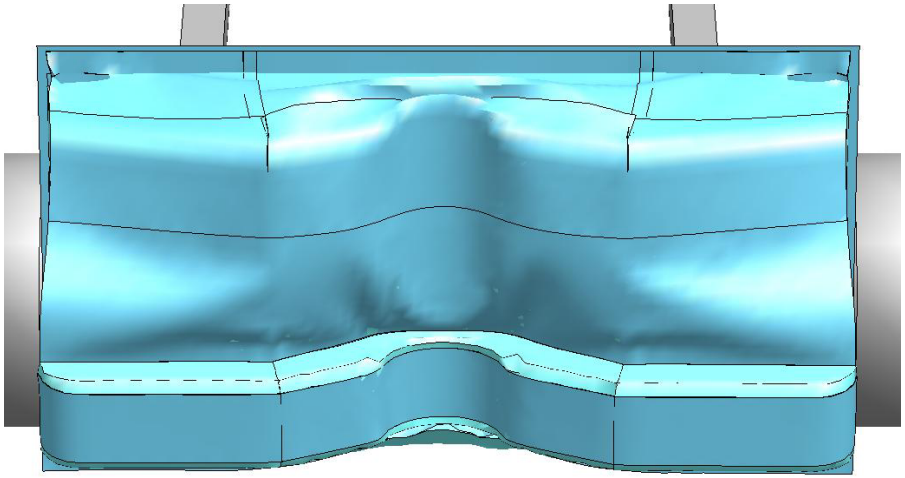


Figure 1.4 – IIHS condition A Acceleration Curve (C60)

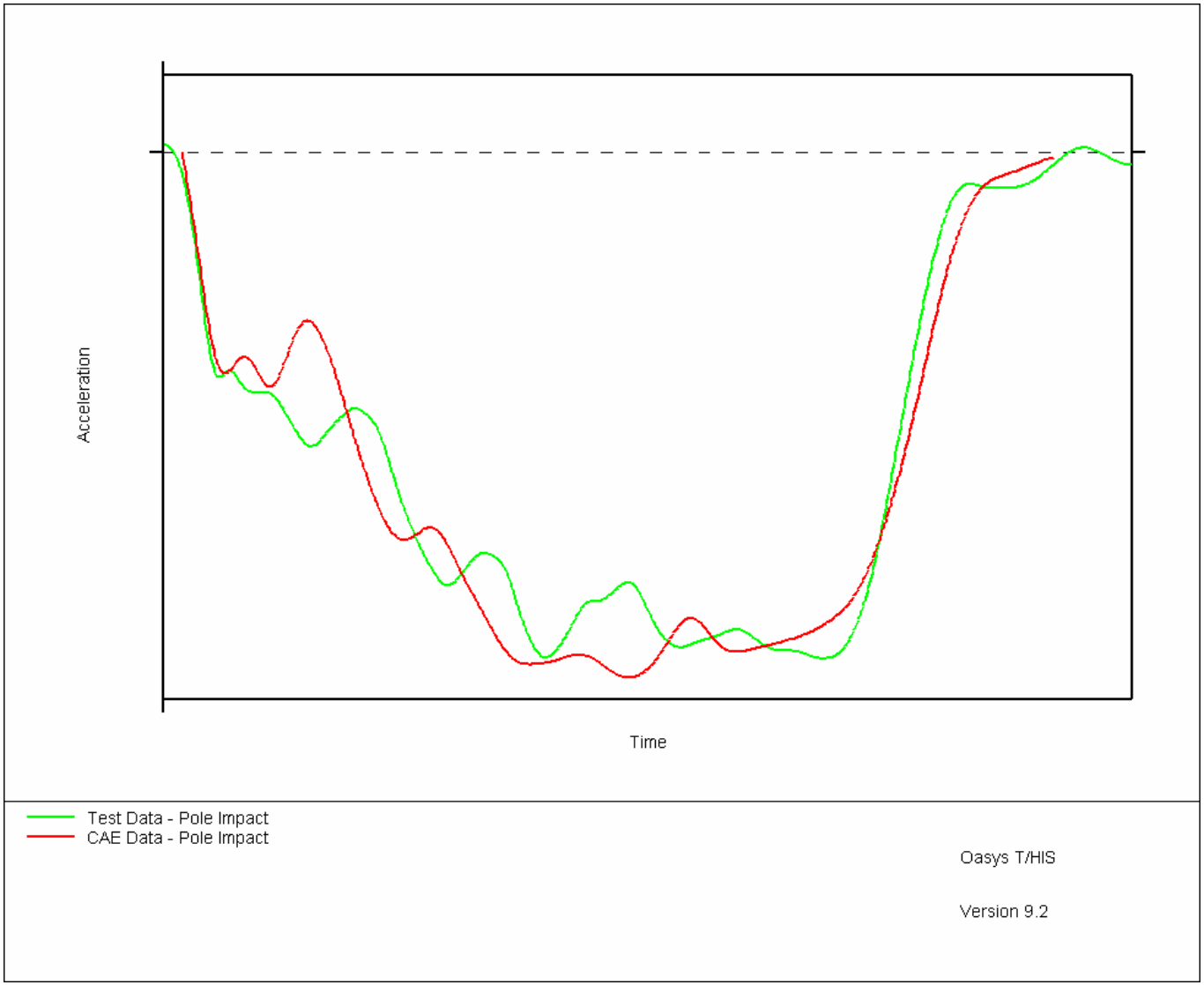


Figure 1.5 – IIHS condition B

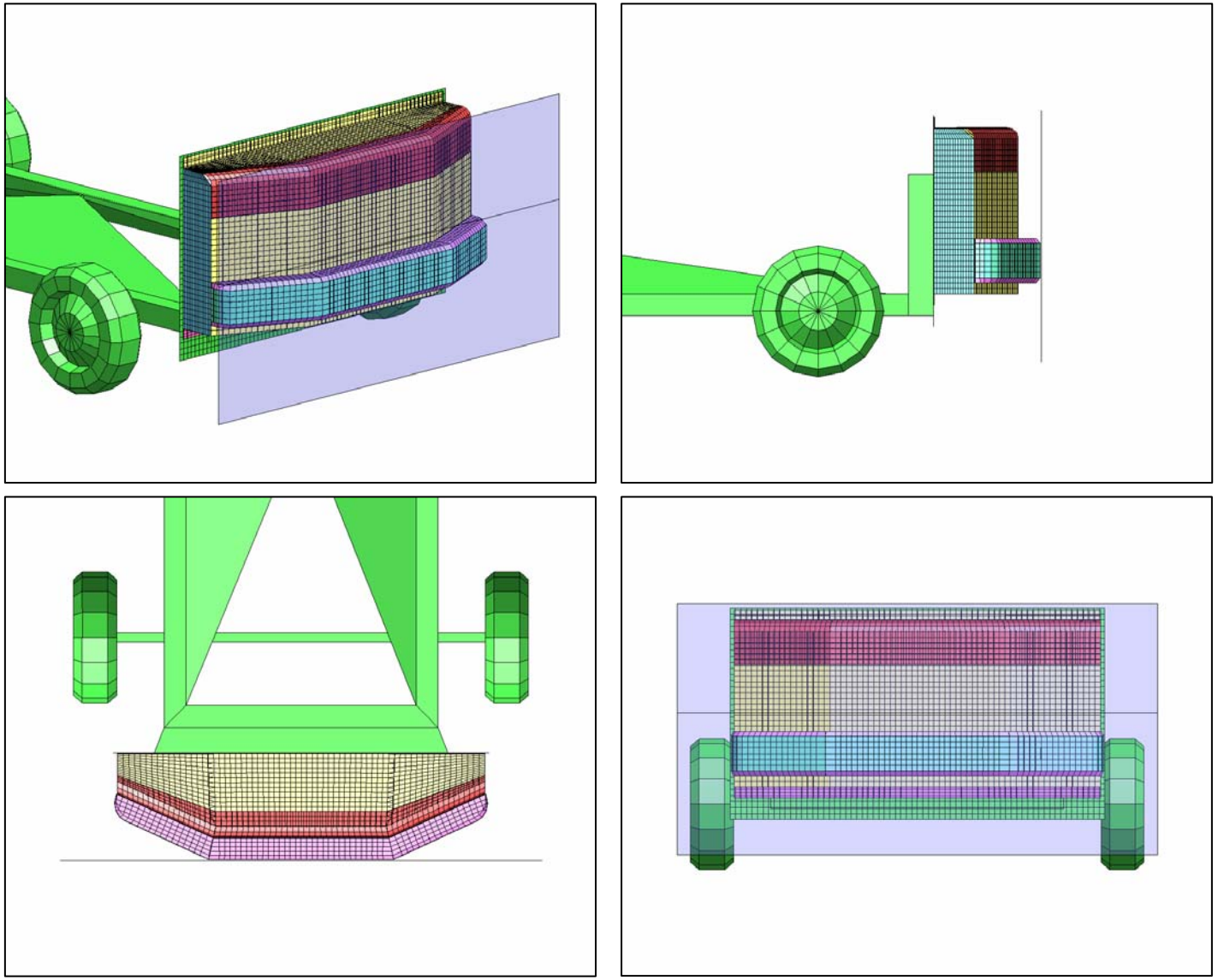
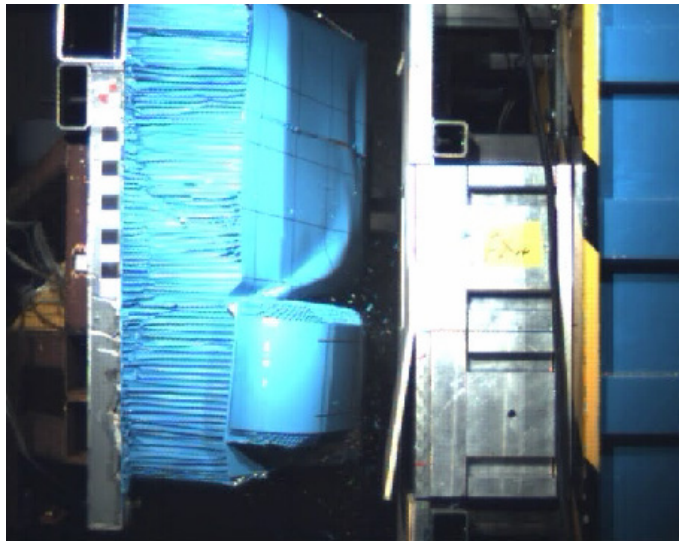
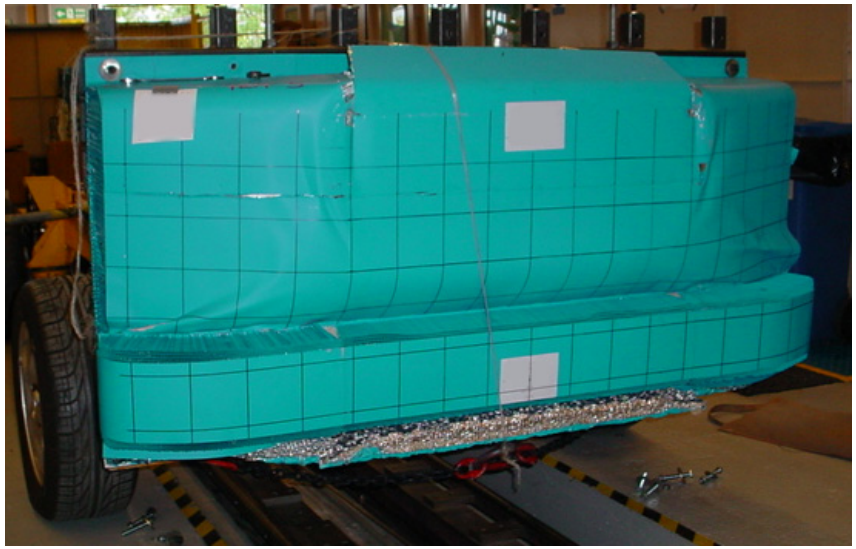
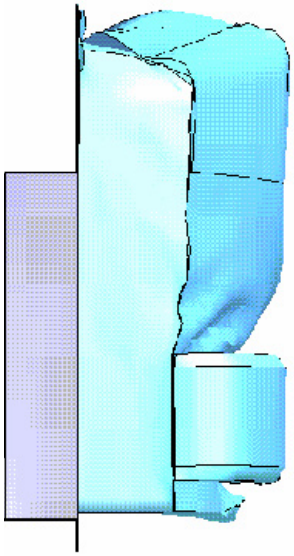


Figure 1.6 – IIHS condition B final deformation







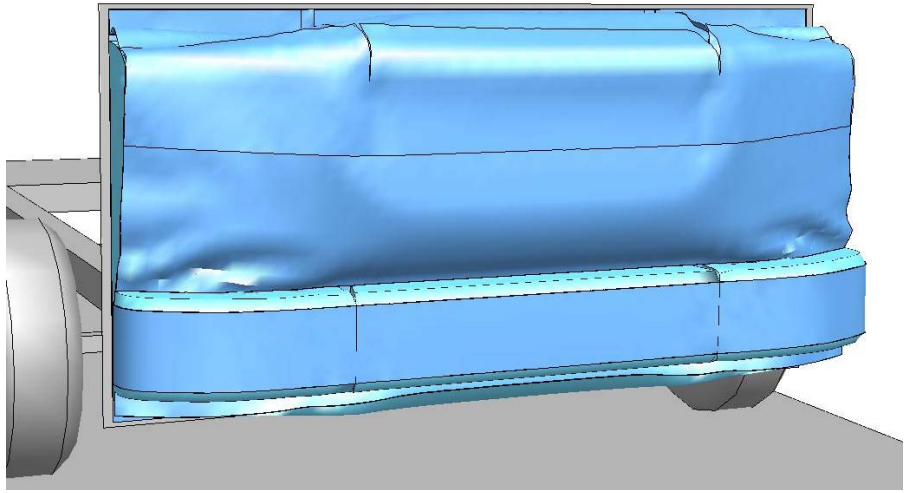
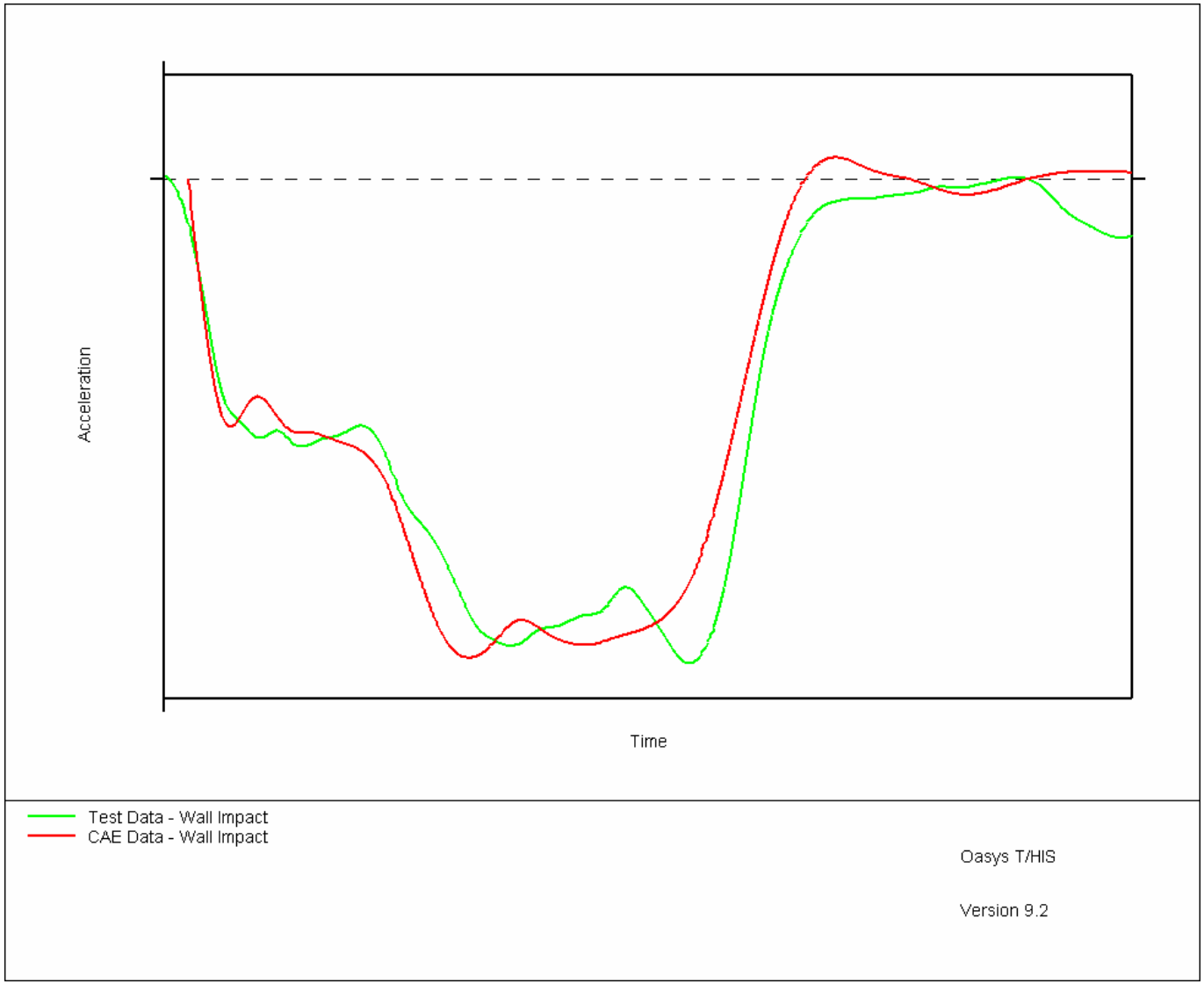


Figure 1.7 – IIHS condition B Acceleration Curve (C60)



Company and Contact Information

The IIHS model is developed by Cellbond Composites in association with Arup.

www.cellbond.com

www.arup.com

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