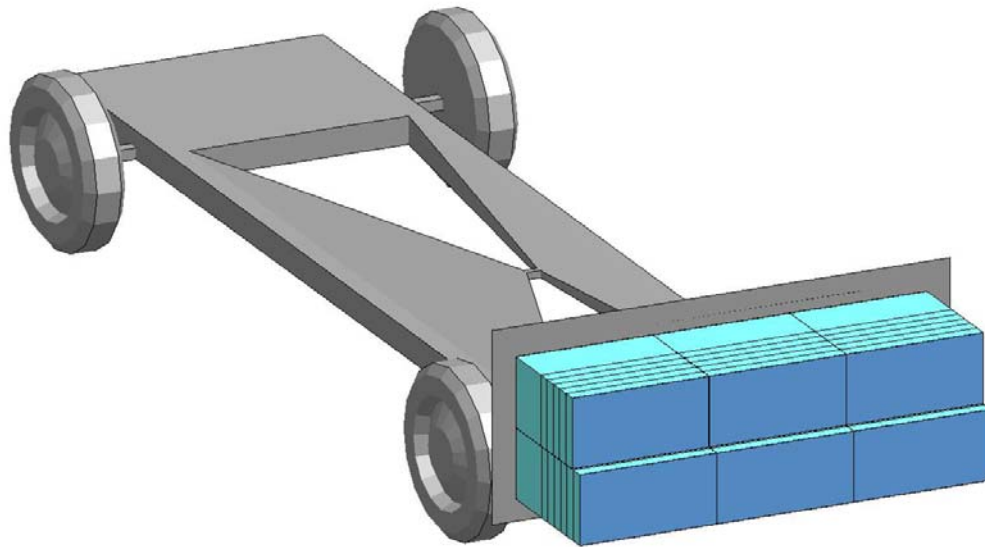


Advanced 2000
European (EEVC) Side Impact Barrier Model
Version 1.0



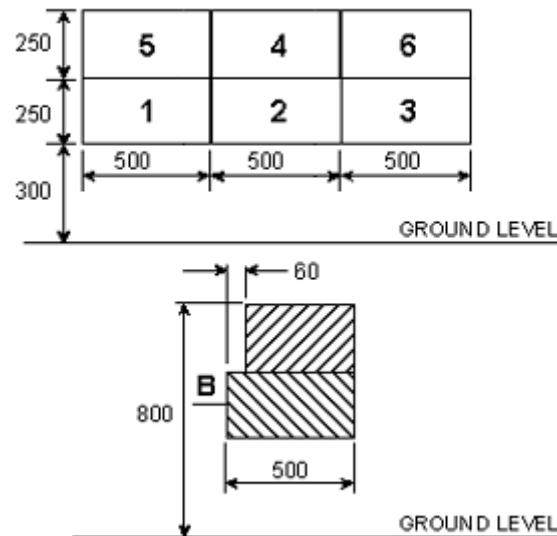
Development
Report

May 2007

The specification used for the deformable impact barrier in this documentation has been taken from the ECE R95 Amendment 3 dated September 2003.

Barrier Characteristics

- The mass of the barrier including instrumentation should be 950kg.
- The impactor consists of six single blocks of aluminium honeycomb, which have been processed in order to give a progressively increasing level of force with increasing deflection. Front and rear aluminium plates are attached to the aluminium honeycomb blocks.
- The centre of gravity of the barrier lies on the barrier's lateral centerline, 1000mm rearward of the front axle, 2000mm rearward of the front face, and 500mm above the ground.



Material Characteristics

- Each of the aluminium blocks that make up the barrier have a progressive crush strength as specified in the graphs below.

Calibration Procedure

- A static crush test is carried out on a sample of each block.
- A dynamic rigid wall impact is carried out on every hundredth barrier

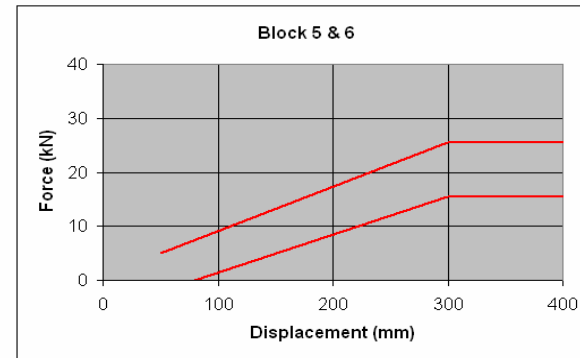
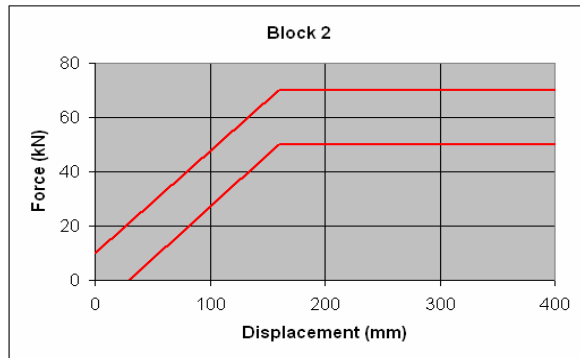
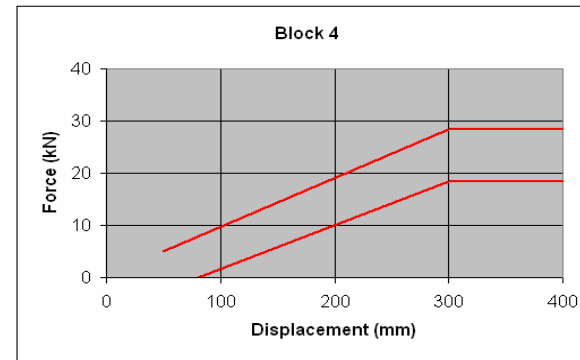
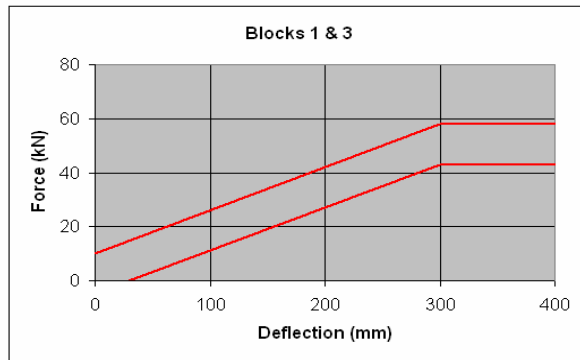
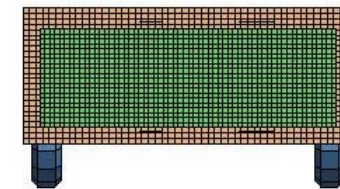
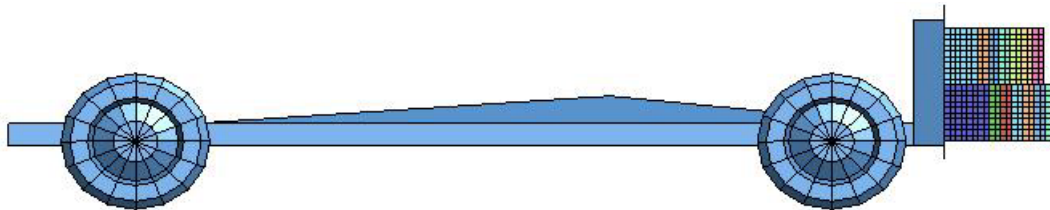
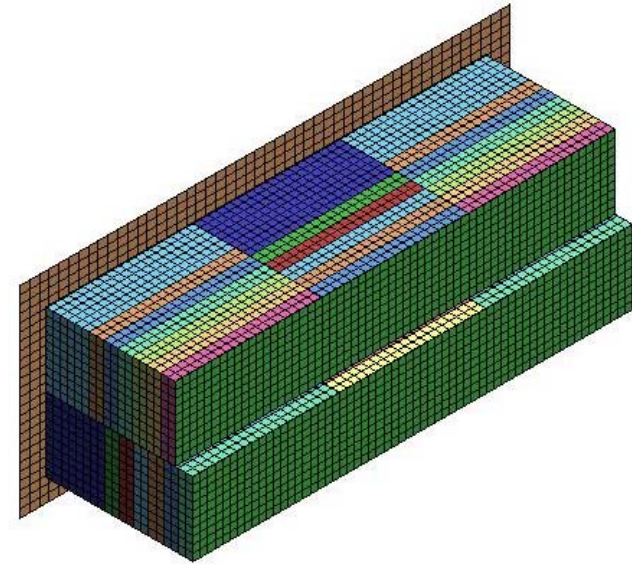
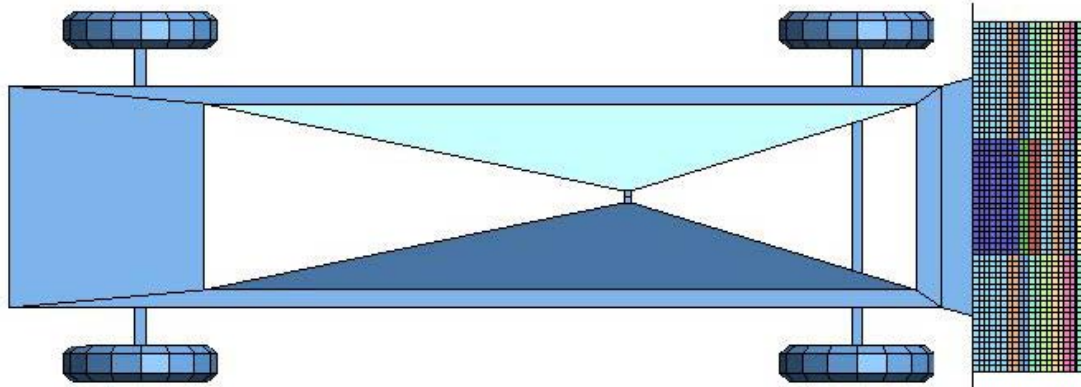


Figure 1.1 – ADV 2000 barrier model

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

Condition A – Offset Pole Impact

This test involves the barrier on a trolley impacting an offset pole. The velocity is 5.6m/s (20km/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 9.7m/s (35km/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. Figures 1.8 – 1.9 show the crush characteristic of each honeycomb block. The curves have been normalized to unity.

Figure 1.2 – ADV 2000 condition A

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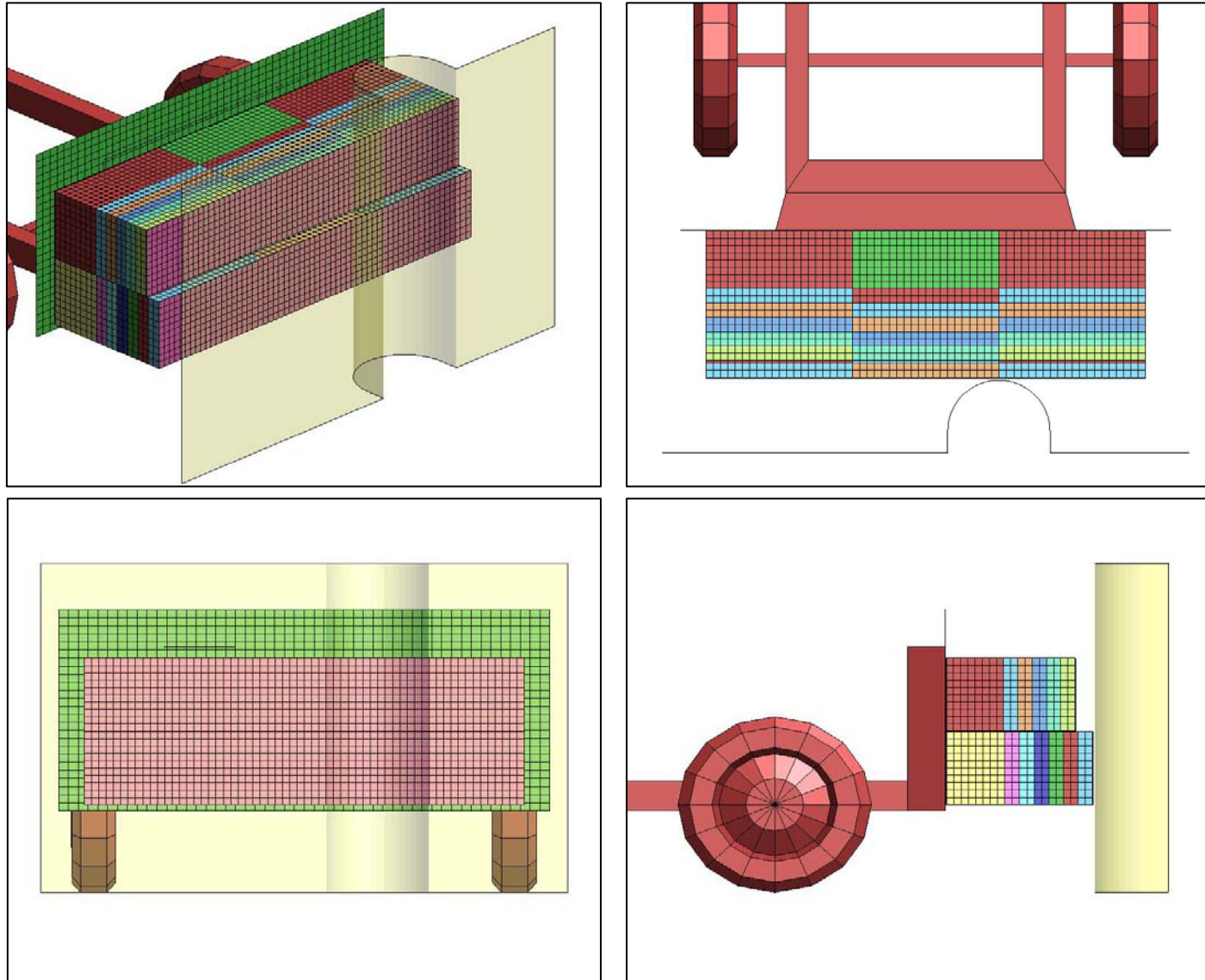


Figure 1.3 – ADV 2000 condition A final deformation

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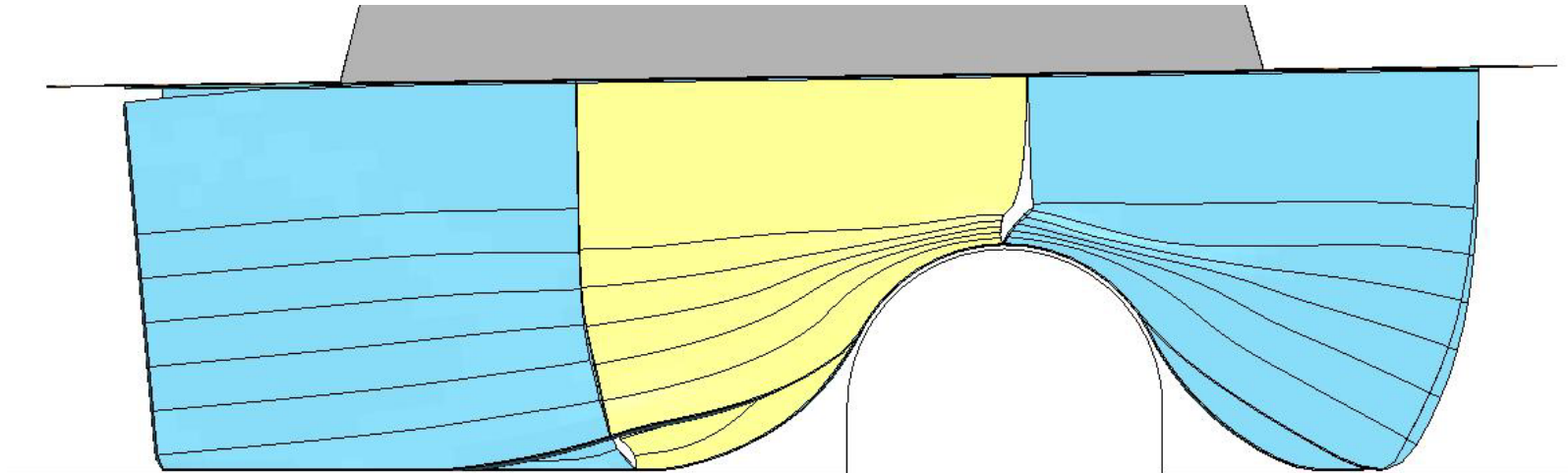


Figure 1.4 – ADV 2000 condition A Force Curve (C60)

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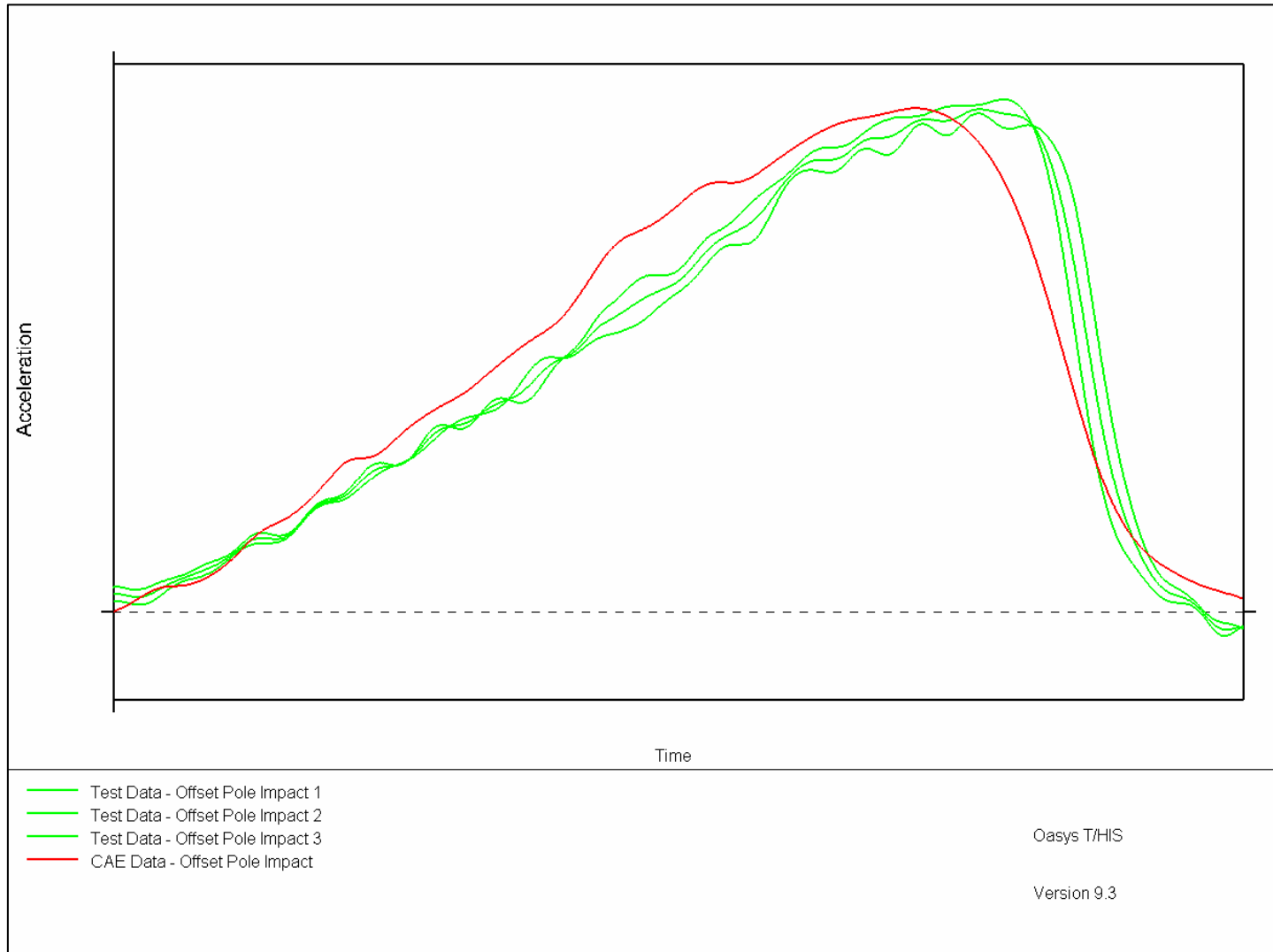


Figure 1.5 – ADV 2000 condition B

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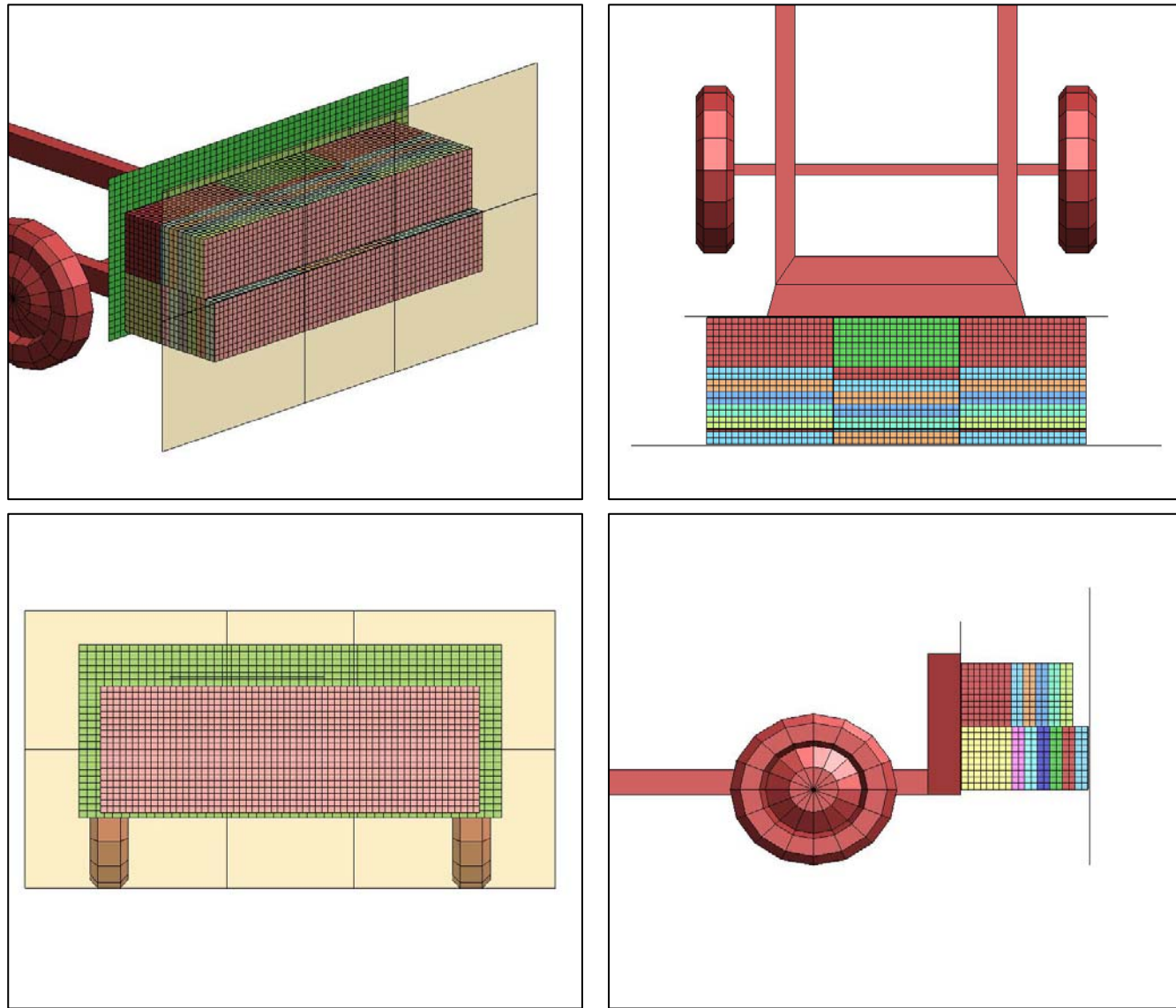


Figure 1.7 – ADV 2000 condition B Force Curve (C60)

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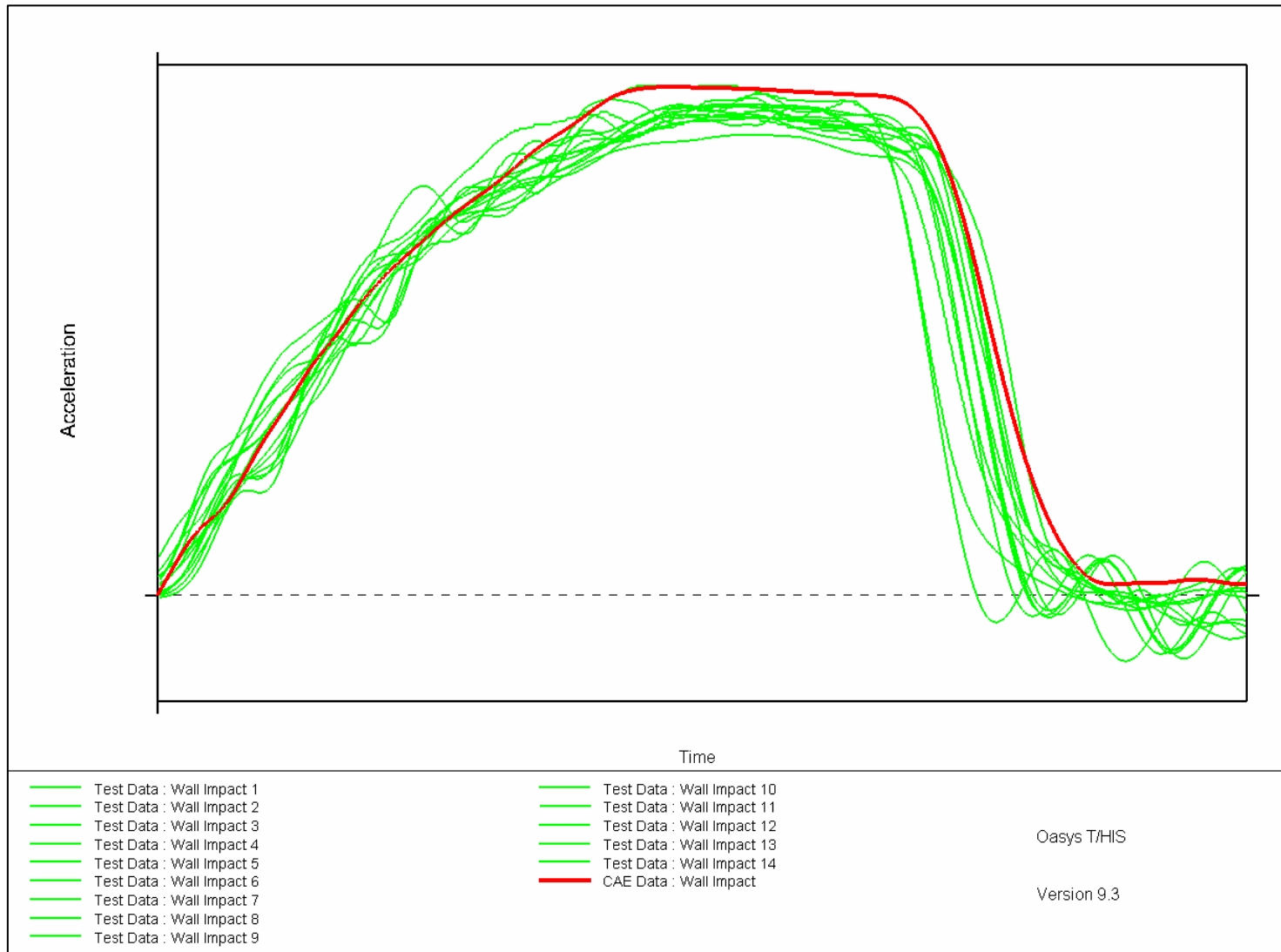


Figure 1.8 – ADV 2000 condition B Force Curve (C60)

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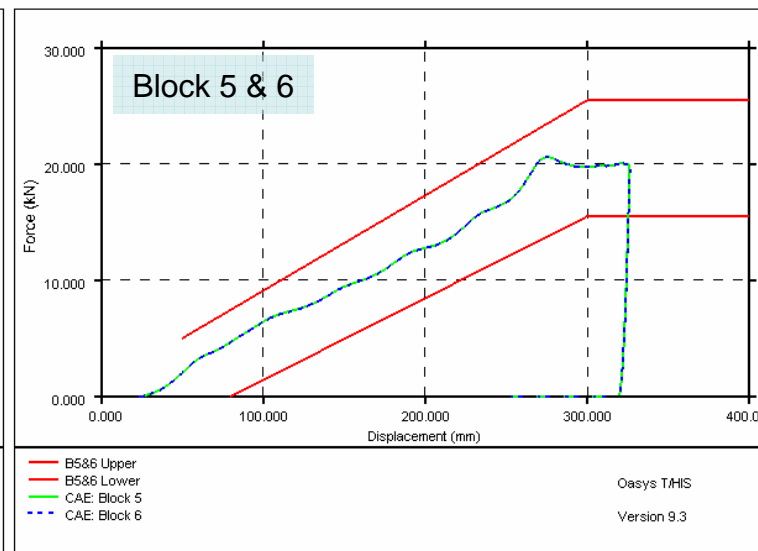
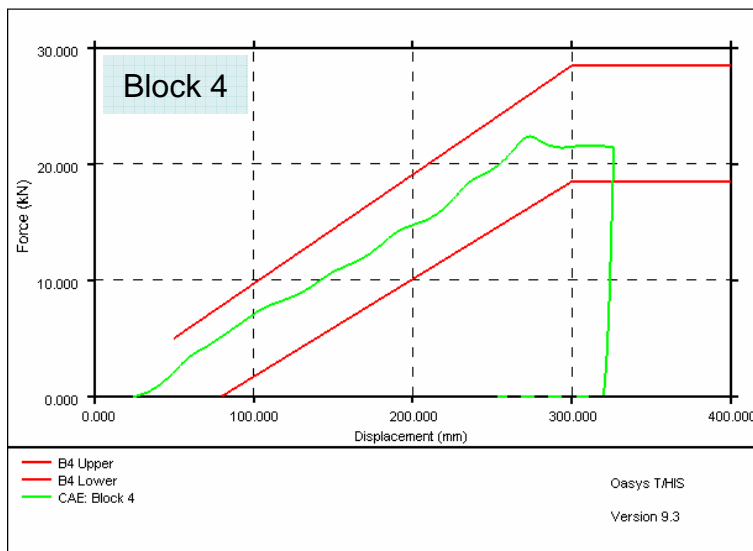
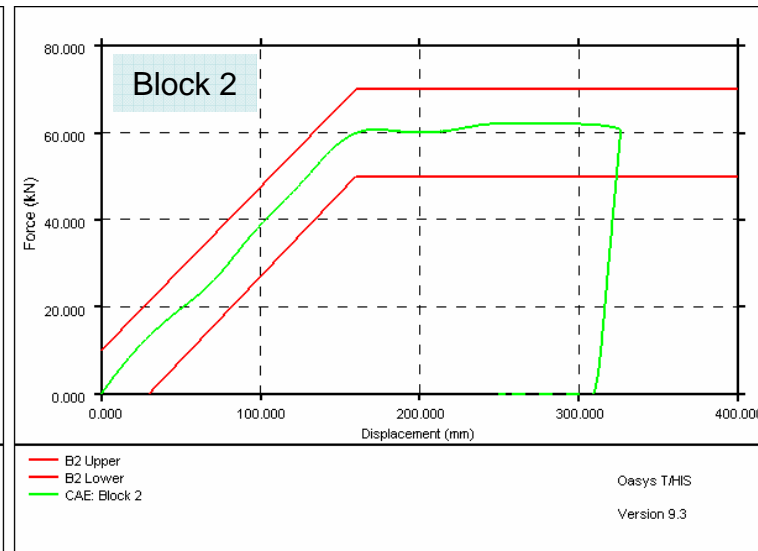
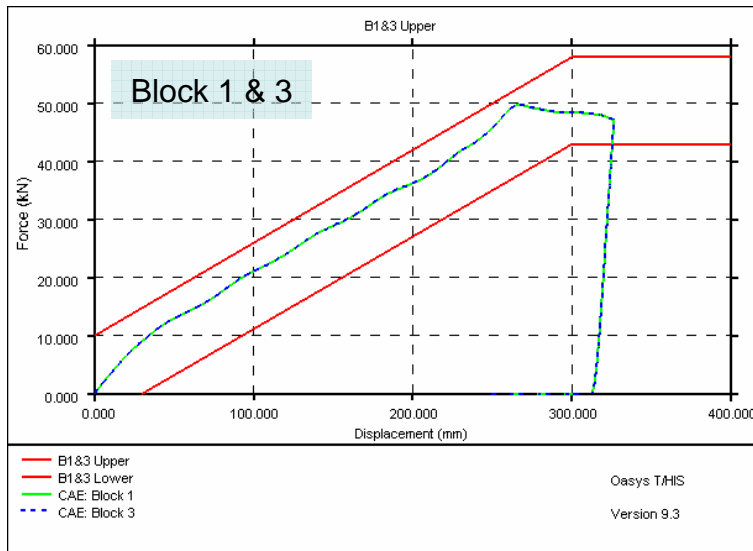
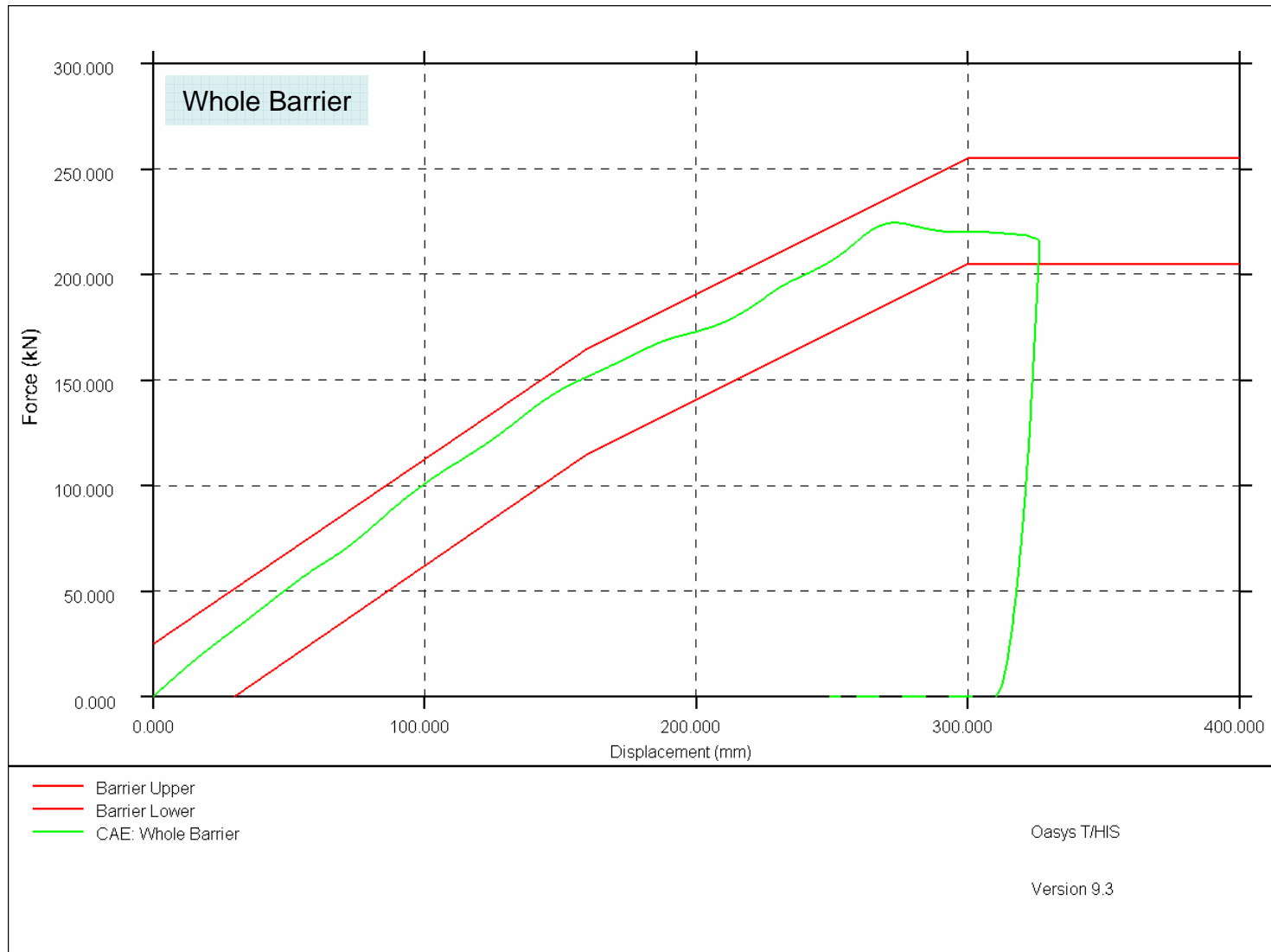


Figure 1.9 – ADV 2000 condition B Force Curve (C60)

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The Advanced 2000 model is developed by Cellbond Composites in association with Arup.



www.cellbond.com



www.arup.com

For more information on the model please contact the following:

Arup UK

The Arup Campus

Blythe Gate

Blythe Valley Park

Solihull, West Midlands

B90 8AE UK

T. +44 (0)121 213-3399

F. +44 (0)121 213-3302

dyna.support@arup.com