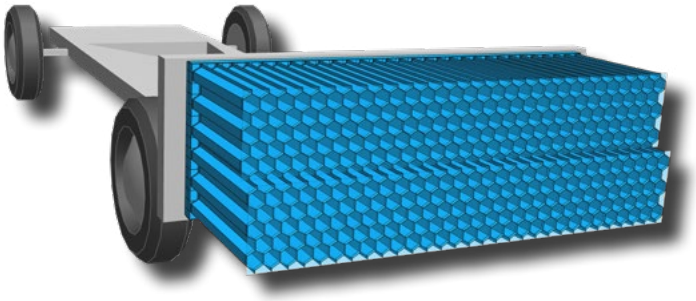
Arup Cellbond Barrier Models

Working in collaboration, Arup and Cellbond have developed a range of LS-DYNA finite element models based on the aluminium honeycomb barriers produced by Cellbond.



EEVC Advanced 2000

European Enhanced Vehicle-safety Committee
LS-DYNA Shell model for side impact

This model is a requirement for the side barrier impact safety regulations. It was used by EuroNCAP for side testing until 2015 when it was superseded by the AE-MDB barrier.

- Used for side mobile impact testing.
- Model calibration and validation processes go beyond the barrier specification tests: the model is correlated to additional dynamic tests at component and full barrier levels.
- Arup has a track record with over 20 years of experience in barrier development using proven modelling techniques that demonstrate robustness and fidelity.

ARUP

CELLBOND

EEVC Advanced 2000

European Enhanced Vehicle-safety Committee Advanced 2000 LS-DYNA Shell model for side impact

This barrier is used in the EU front impact regulation and by several consumer test organisations in their front offset impact test. The specification used for the deformable impact barrier has been taken from the ECE R95 Amendment 3 dated September 2003.

Validation

The LS-DYNA model calibration has been done using the test results provided by Cellbond:

- Offset Pole Impact at 5.6 m/s
- Rigid wall impact at 9.7 m/s

The force-deflection curves (generated from model analysis and test) for the individual block of the barrier have been compared. The results have also been checked against the force-deflection corridors from the specification document.

This validation work has been carried out in both SMP and MPP versions of LS-DYNA R9.2 and R7.12 to ensure the performance and accuracy.

Specifications

Element Type	LS-DYNA Release Version	Total Number of Elements	Timestep	Regulation Test	Regulation Speed
Shell	LS-DYNA 971 R7.1.2 SMP/MPP	322876	-	-	-