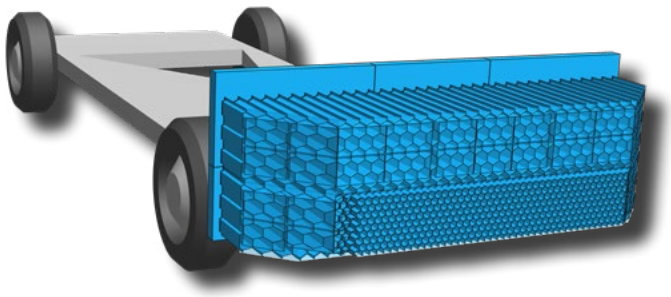
Arup Cellbond Barrier Models

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.



AE-MDB

Advanced European Mobile Deformable Barrier
LS-DYNA Shell model for side impact

The AE-MDB was adopted by EuroNCAP and replaced the Advanced-2000 barrier in 2015. It is intended to be used alongside the WorldSID dummy model.

- Used for side mobile impact testing.
- Adopted by ANCAP, EuroNCAP, JNCAP and KNCAP.
- 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.

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AE-MDB

Advanced European Mobile Deformable Barrier LS-DYNA Shell model for side Impact

The specification used for the development of the AE-MDB deformable impact barrier has been taken from the Euro-NCAP document 'AE-MDB Specification,Version 1.0', dated 26th February 2013.

The AE-MDB was adopted by EuroNCAP and replaced the Advanced2000 barrier in 2015. It is intended to be used alongside the new WorldSID dummy.

This barrier uses the same manufacturing principles as the side impact barrier Advanced-2000.

Specifications

Element Type	LS-DYNA Release Version	Total Number of Elements	Mass	Regulation Test	Regulation Speed
Shell	LS-DYNA 971, R7.1.2 SMP/MPP	382080	1300kg	UN R95 Lateral Collision Protection	50kph

Validation

The LS-DYNA model calibration has been done using the test results provided by Cellbond for a 35kph dynamic impact against a rigid wall. The test involves the barrier on a trolley impacting a rigid wall. This Shell version of the AE-MDB model is an upgrade of the AE-MDB Solid version.

The force-deflection curves (generated from model's analyses and tests) 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 R9.2.0 and R7.1.2 to ensure the performance and accuracy.

The AE-MDB model is also available in the Solid element version.