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.



FWDB Full Width Deformable Barrier LS-DYNA Solid model for frontal impact

This barrier, also known as Full Width Compatibility Barrier, was developed by Cellbond on behalf of the Transport Research Laboratory, UK as part of the VC-Compat project.

- Used for frontal full width impact testing.
- Developed to work alongside the EEVC Frontal Offset Barrier to fulfil needs for research on the compatibility of vehicle fronts.
- 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.





The Full Width Deformable Barrier (also known as Full Width Compatibility Barrier) was proposed by the Vehicle Crash Compatibility Project (VC-Compat) and is developed by Cellbond on behalf of the Transport Research Laboratory (TRL), UK.

This barrier was been developed to work alongside the EEVC Frontal Offset Barrier to fulfil needs for research on the compatibility of vehicle fronts, their aggressivity and partner protection.

Element Type	LS-DYNA Release Version	Total Number of Elements	Timestep	Regulation Test	Regulation Speed
Solid	R7.1.2 SMP/MPP	117233	1.2E-6sec	-	-

Specifications

Validation

Two tests have been selected for correlating the LS-DYNA FWDB model: a flat wall impact at 17kph and the TRL Sled Test at 40kph. The tests involve the impactors on a trolley impacting the fixed FWDB barrier. For the Flat Wall case, the correlation has been carried out using test results provided by Cellbond. The test results used in the Sled Test correlation have been taken from a number of reports published by TRL Limited.

The force - deflection curves generated from model's analyses and tests have been compared.

This validation work has been carried out in both SMP and MPP versions of LS-DYNA R7.1.2 to ensure the correct performance and accuracy.



