Air-blast response of sacrificial cladding using low density foams: experimental and analytical approach

H. Ousji, B. Belkassem, M.A. Louar, B. Reymen, J. Martino, D. Lecompte, L. Pyl, J. Vantomme

PII: S0020-7403(16)30754-8
DOI: 10.1016/j.ijmecsci.2017.05.024
Reference: MS 3699

To appear in: *International Journal of Mechanical Sciences*

Received date: 10 November 2016
Revised date: 13 March 2017
Accepted date: 5 May 2017

Please cite this article as: H. Ousji, B. Belkassem, M.A. Louar, B. Reymen, J. Martino, D. Lecompte, L. Pyl, J. Vantomme, Air-blast response of sacrificial cladding using low density foams: experimental and analytical approach, *International Journal of Mechanical Sciences* (2017), doi: 10.1016/j.ijmecsci.2017.05.024

Highlights

- The study of the effectiveness of the sacrificial cladding and the fluid-structure interaction (FSI) effect to mitigate a given blast load.
- The minimum polyurethane thickness needed to mitigate a given blast load, depends on the blast load, the front plate mass, the plateau stress and the densification strain.
- The analytical model of Hanssen et al. over-estimates the front plate displacement and hence, the minimum polyurethane thickness. While Hanssen et al. use quasi-static plateau stress, it should be noted that the transmitted pressure to the main structure using PU as crushable core, is higher than the plateau stress obtained from quasi-static tests.
- The FSI effect cannot be neglected in the case of low density foam.
- The Kambouchev-Noels-Radovitzky (KNR) theory is suitable to simulate the FSI effect in the case of low density foam.