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Split Hopkinson Pressure Bar and Direct Impact Testing of Rohacell Foam ELISAVET PALAMIDI, University of Manchester, JOHN HARRIGAN, University of Aberdeen, QINGMING LI, University of Manchester — Rohacell foam is a low density close-cell polymethacrylimide rigid foam used as a core material in sandwich panels which are utilised in aircraft and marine constructions and in radiation applications. As such its dynamic properties are important. Two foam densities, Rohacell 51WF and 110 WF, have been tested at quasi-static and intermediate strain rates along their three principal directions. Typically, the foams have plateau strengths of 1 and 3 MPa in their strongest direction and corresponding densification strains of 0.66 and 0.6. Due to the low strength of the foams, the split Hopkinson pressure bar (SHPB) tests were carried out on low impedance PMMA bars. The propagation coefficient was determined experimentally to account for wave dispersion and attenuation in the bars. Wave separation was used to measure large strains. The foam properties appear broadly independent of strain rate. Direct impact tests were carried out to measure proximal and distal end forces at impact velocities of between 40 and 120 m.s^{-1}. With increasing impact velocity, the deformations are localized at a compaction front. The proximal stresses increase as predicted by the Rankine-Hugoniot conditions.

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