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Title: Experimental and numerical crack paths in PUR foams

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Abstract: In this paper is presented the behaviour of PUR foams under mixed mode loading. Closed cell rigid PUR foams having three different densities 100, 145, and 300 kg/m(3) were investigated. Experiments were performed using asymmetric semi-circular bend (ASCB) and Assymmetric Four-Point Bend (AFPB) specimens. The obtained crack initiation angles established for ASCB specimens were compared with four fracture criteria MTS, SED, G(max) and ESIF, and a good agreement was observed. When testing AFPB specimens, and calculating the normalized stress intensity factors it is important to obtain a correct crack propagation, that is to impose proper geometrical dimensions as not to affect the initial crack tip. The eXtended Finite Element Method (XFEM) is a complementary powerful numerical tool used to analyze crack initiation and propagation only if the numerical model is correctly calibrated and all the influencing parameters are properly understood. (C) 2016 Elsevier Ltd. All rights reserved.

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