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Title: Analysis of Deformation Bands in Polyurethane Foams**Author(s):** Apostol, DA (Apostol, Dragos Alexandru); Constantinescu, DM (Constantinescu, Dan Mihai); Marsavina, L (Marsavina, Liviu); Linul, E (Linul, Emanoil)**Edited by:** Marsavina L**Source:** PROCEEDINGS OF THE 14TH SYMPOSIUM ON EXPERIMENTAL STRESS ANALYSIS AND MATERIALS TESTING **Book Series:** Key Engineering Materials **Volume:** 601 **Pages:** 250-+ **DOI:** 10.4028/www.scientific.net/KEM.601.250 **Published:** 2014**Times Cited in Web of Science Core Collection:** 0**Total Times Cited:** 0**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 3**Cited Reference Count:** 5

Abstract: Closed cell polyurethane foams with densities of 100, 160 and 301 kg/m(3) were tested in compression at speeds of 1 and 5 mm/min. Digital image correlation (DIC) is used to determine the engineering characteristic curve, modulus of elasticity, Poisson's ratio and the deformation bands that appear during deformation and prior to the final failure of the specimens. By using this procedure both global and local phenomena are observed and analyzed. While each specimen is compressed the damage behaviour of the foams is directly observed in different stages, as being in the linear elastic domain, in the plateau region, and in the densification region. Several observations, characteristic for each foam density are discussed. As damage mechanisms are different, DIC allows the direct monitoring of the formation of the deformation bands and their propagation till the final failure of the foams, as long as calculations of the local strains are possible. Maps of the vertical displacements and local Mises strains are presented and comments on the characteristics of the deformation bands are done.

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