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## Plasticity of Anisotropic Aluminum Extrusions under Multi-axial Loading: Experiments and Modeling

by

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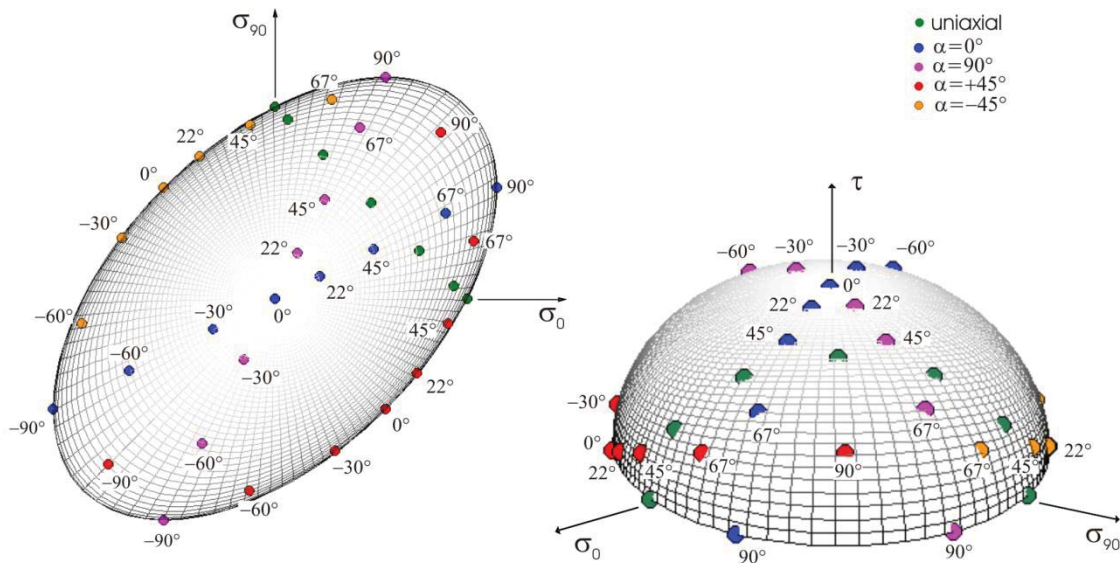
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# Plasticity of Anisotropic Aluminum Extrusions under Multi-axial Loading: Experiments and Modeling

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## Abstract

An extensive experimental program has been carried out to characterize the plastic behavior of 2mm thick extruded aluminum AA6260-T6 sheets under large deformations. Using a newly-developed dual actuator system, combinations of normal and tangential loads are applied to a flat specimen to investigate the material response under more than 30 different multi-axial stress states. The Yld2000-2d yield criterion with an associated flow rule and an isotropic hardening model has been successfully used to describe the initial yield surface and its evolution. The comparison between the experimental results and finite element simulations shows that this constitutive model provides very accurate predictions for the material response under multi-axial loading. A special extension of the Yld2000-2d yield function for general three-dimensional stress states is also presented. The yield function for three-dimensional stress states is chosen such that it reduces to the Yld2000-2d yield function under plane stress conditions and makes use of the same anisotropy coefficients.

*Keywords:* Aluminum, extrusions, anisotropy, plasticity, biaxial experiments

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