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Thickness Sensitivity Analysis of Nakazima Forming Limit Curves in Aluminum Alloys

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An experimental campaign was carried out on an AA5754 aluminum alloy with the aim of evaluating the influence of sheet thickness on the material's formability curve. The acquisition and processing of the strain fields were performed using stereo Digital Image Correlation, employing two synchronized cameras for the three dimensional reconstruction of the displacement field. Data post processing was conducted in accordance with the UNI EN ISO 12004 standard, applying both the position dependent method and the time dependent method for the determination of the forming limit. Based on the experimental results, the constitutive curve of the material was derived and FEM models used for process simulation were subsequently calibrated.

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