



Poster 11

Assessing the bendability of UHSS (Ultra-high Strength Steel) in plane strain conditions



Phillip Krawec

AUTHOR OF POSTER:
Phillip Krawec

INSTITUTION:
University of Warwick

OTHER AUTHORS:
Dr Sumit Hazra, University of Warwick
Dr Ed Brambley, University of Warwick

ABSTRACT:

Inconsistent behaviour and premature failure are common when bending UHSS (Ultra-high Strength Steel). Practicality limits laboratory testing to smaller samples, which may not replicate the conditions of production, and larger volumes of material used in manufacturing may increase the likelihood that material inhomogeneities will cause failure.

A rig was developed, capable of replicating the size and scale of production. Tests have been undertaken on a grade of UHSS at 5 forming radius/thickness ratios, with strains measured using digital image techniques. Results show that punch separation occurs on specimens that ultimately fail, causing the bend severity to increase unexpectedly. This phenomenon occurs at consistent bend displacements, with bending strains matching those not displaying the phenomenon until a deviation point. Separation occurs more frequently when the bend line is parallel to the rolling direction. Upcoming investigations will focus on behaviour at this deviation point to try and better understand this separation behaviour.



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