1

Title:
Out-of-Plane Surface Deformation Measurement of Advanced High Strength Steel Using 3D DIC

Journal:
Advanced Structures Materials, Volume 148, 2021

Document Type:
Book Chapter

Authors:
Rohaizat N.I.,
Pinna C.,
Ghadbeigi H.,
Hanlon D.N.,
Azid I.A.,
Sharif S.M.

Full text link:
https://www.springerprofessional.de/out-of-plane-surface-deformation-measurement-of-advanced-high-st/19151342

Scopus preview
https://www.scopus.com/inward/record.uri?eid=2-s2.0-85105624676&doi=10.1007%2f978-3-030-67750-3_24&partnerID=40&md5=85fdba0de156d501f3aa436ae4eb1cb6

Citation:
Rohaizat N.I., Pinna C., Ghadbeigi H., Hanlon D.N., Azid I.A., Sharif S.M.
Out-of-Plane Surface Deformation Measurement of Advanced High Strength Steel Using 3D DIC
(2021) Advanced Structured Materials, 148, pp. 285 - 295,
DOI: 10.1007/978-3-030-67750-3_24

Abstract:

This paper presents the out-of-plane deformation analysis on a dual-phase steel with a UTS of 1000 MPa (DP1000) by using three-dimensional (3D) optical digital image correlation (DIC) technique on a laboratory scale punch test. The laboratory scale punch test being used in this study has been built to deform sheet steel specimens in a manner that resembles the forming process in automotive industry. The results obtained from conducting the punch test using three-dimensional (3D) optical digital image correlation on the investigated DP1000 materials showed that a uniform deformation takes place until a strain values of 10%. The deformation begins to localise around the sides of the punch as the maximum strain value at the area of necking reaches 19.7% just before fracture. DIC results also showed that the laboratory scale punch tests are equi-biaxial, where the strain distribution throughout the test are uniform. The mechanical response from the punch test shows that the punch test has good repeatability.