Off-line testing of multifunctional surfaces for metal forming applications

Off-line testing of multifunctional surfaces for metal forming applications
In this paper, Bending-Under-Tension, an off-line test method simulating deep-drawing, is chosen for investigating the effectiveness of multifunctional (MUFU) surfaces in metal forming operations. Four different MUFU surfaces, characterized by a plateau bearing area and grooves for lubricant retention, are manufactured, together with two polished references. During the tests, surface texture is the only variable. The results show how MUFU surfaces perform better than the polished references, which produce severe galling, while MUFU surfaces with low bearing area display no clear evidence of galling. Metal-to-metal contact occurs anyway, but the strip material is pulverized and deposited onto the tool instead of cold-welding to it. The pockets create a discontinuity on the texture hindering pick-up propagation.

General information
State: Published
Organisations: Department of Mechanical Engineering, Strecon A/S
Contributors: Godi, A., Grønbæk, J., De Chiffre, L.
Pages: 28-35
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: CIRP Journal of Manufacturing Science and Technology
Volume: 11
ISSN (Print): 1755-5817
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.78 SJR 1.377 SNIP 2.049
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.76 SJR 1.107 SNIP 2.093
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 2.55 SJR 1.197 SNIP 1.847
Web of Science (2015): Indexed yes
Scopus rating (2014): CiteScore 2.46 SJR 1.349 SNIP 1.863
Scopus rating (2013): CiteScore 2.01 SJR 0.992 SNIP 1.771
ISI indexed (2013): ISI indexed no
Scopus rating (2012): CiteScore 1.69 SJR 0.776 SNIP 1.799
ISI indexed (2012): ISI indexed no
Scopus rating (2011): CiteScore 1.72 SJR 0.941 SNIP 1.988
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 1.124 SNIP 2.324
Scopus rating (2009): SJR 0.917 SNIP 1.183
Original language: English
Keywords: Bending under tension, Functional surfaces, Galling, Metal forming
DOIs:
10.1016/j.cirpj.2015.06.001
Source: FindIt
Source-ID: 2279838373
Research output: Research - peer-review › Journal article – Annual report year: 2015