

10<sup>th</sup> International Conference on

## EMERGING MATERIALS AND NANOTECHNOLOGY

July 27-29, 2017 Vancouver, Canada

**High temperature tribological behavior of AISI D2 against AISI 52100 and alumina****Mohd Farooq Wani**

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In cold forming, die materials are subjected to severe wear because of high contact temperature and pressure. D2 steel is used as die material for cold forming applications. However, its friction and wear properties have not been studied fully under high stress and high temperature conditions. Friction and wear behavior of D2 steel against AISI 52100 and Alumina have been studied under dry sliding conditions in temperature range of RT – 150°C, using ball-on-disc universal tribometer. For sliding distance test the wear rate of D2 with AISI 52100 is less than the Alumina for entire range at 150°C. The wear volume of D2 steel increases with the increase in sliding distance from 200 m to 1000 m against AISI 52100 and Alumina. For D2 steel, highest coefficient of friction ( $\mu$ ) 0.751 and 0.754 against AISI 52100 and Alumina was obtained at 5 N, whereas minimum  $\mu$  of 0.32 and 0.43 against AISI 52100 and Alumina was obtained at 25 N, these tests were carried out at 150°C. For temperature test, highest coefficient of friction ( $\mu$ ) of 0.92 and 0.7671 against AISI 52100 and Alumina was obtained at 50°C, whereas minimum  $\mu$  of 0.77 and 0.52 against AISI 52100 and Alumina was obtained at RT. Optical microscopy, SEM, EDXA and 3D profilometry have been used to understand the friction and wear mechanism of tribopair. From these observations it is concluded that wear of D2 steel is minimum for particular range of load and temperature. The results obtained are useful for designers and engineers working in the field of cold forming.

**Biography**

Mohd Farooq Wani has expertise in the Field of Life Cycle Engineering Design and Tribology. He possesses 35 years of teaching and research experience at UG, PG and PhD level. His concept of sustainability design of mechanical systems through innovative tribological applications is unique contribution in the development of sustainability design of mechanical systems. He has guided more than 50 theses at PG level in the Field of Tribology and Life Cycle and has successfully guided 6 PhD theses in the Field of Tribology and LCD. He has published 50 research papers in international journals and more than 40 publications in international conference proceedings.

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