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High temperature sliding wear of Ti-6Al-4V against silicon nitride and alumina

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In aircraft, compressor blades are subjected to severe wear because of high contact temperature and pressure. Ti-6Al-4V is used as compressor blade for aircraft applications; however, its friction and wear properties have not been studied fully under high stress and high temperature conditions. Friction and wear behaviour of Ti-6Al-4V against silicon nitride and alumina have been studied under dry sliding conditions in temperature range of RT-400°C, using ball-on-disc universal tribometer. For sliding distance test the wear rate of Ti-6Al-4V with alumina is less than the silicon nitride for entire range at 400°C. The wear volume of Ti-6Al-4V increases with increase in sliding distance from 200 m to 1000 m against silicon nitride and alumina. For Ti-6Al-4V, highest coefficient of friction (μ) 0.76 and 0.71 against silicon nitride and alumina was obtained at 10 N, whereas minimum μ of 0.36 and 0.47 against silicon nitride and alumina was obtained at 20 N, these tests were carried out at 400°C. For temperature test highest coefficient of friction (μ) 0.56 and 0.74 against silicon nitride and alumina was obtained at 400°C, whereas minimum μ of 0.44 and 0.38 against silicon nitride and alumina was obtained at RT. Optical microscopy, SEM, EDAX, and 3 D profilometery have been used to understand the friction and wear mechanism of tribopair. From these observations it is concluded that wear of Ti-6Al-4V is minimum.

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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