

Experimental Investigation of Friction Coefficient and Wear Rate of Different Sliding Pairs

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Abstract:

A series of experimental tests were carried out using turned and ground mild steel surfaces rubbing against smooth and rough mild steel conterfaces under different operating conditions on a pin-on-disc test rig. The test parameters include the sliding speed of 1–2 m/s, normal force of 10–20N and relative humidity of 70%. During testing, the friction coefficient and wear rate were recorded. The topography of worn surfaces was also observed with optical microscope. The average surface roughness of turned and ground mild steel were measured after friction test. The result displays that normal load, sliding speed and surface conditions of pin and disc have a distinct effect on the friction and wear behaviour of turned and ground mild steel rubbing against smooth and rough mild steel conterfaces. During this study, the effects of duration of rubbing on friction coefficient are also observed. Friction coefficient and wear rate of four types of disc-pin combinations such as ground-smooth, turned-smooth, ground-rough and turned-rough are observed under different normal loads and sliding velocities. Experimental results reveal that friction coefficient of mild steel for all types of disc-pin combinations decreases with the increase in normal load and sliding velocity. The magnitudes of friction coefficient are different for different disc-pin combinations. With increasing sliding velocity and normal load, wear rate of mild steel for different disc-pin combinations increases within the observed range.

Keywords : Friction coefficient, Wear rate, Turned surface, Ground surface
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