

Study of the Tribological Behavior of a Pin on Disc Type of Contact

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Abstract : The present work aims at contributing to the study of the complex phenomenon of wear of pin on disc contact in dry sliding friction between two material couples (bronze/steel and unsaturated polyester virgin and charged with graphite powder/steel). The work consists of the determination of the coefficient of friction, the study of the influence of the tribological parameters on this coefficient and the determination of the mass loss and the wear rate of the pin. This study is also widened to the highlighting of the influence of the addition of graphite powder on the tribological properties of the polymer constituting the pin. The experiments are carried out on a pin-disc type tribometer that we have designed and manufactured. Tests are conducted according to the standards DIN 50321 and DIN EN 50324. The discs are made of annealed XC48 steel and quenched and tempered XC48 steel. The main results are described here after. The increase of the normal load and the sliding speed causes the increase of the friction coefficient, whereas the increase of the percentage of graphite and the hardness of the disc surface contributes to its reduction. The mass loss also increases with the normal load. The influence of the normal load on the friction coefficient is more significant than that of the sliding speed. The effect of the sliding speed decreases for large speed values. The increase of the amount of graphite powder leads to a decrease of the coefficient of friction, the mass loss and the wear rate. The addition of graphite to the UP resin is beneficial; it plays the role of solid lubricant.

Keywords : bronze, friction coefficient, graphite, mass loss, polyester, steel, wear rate

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