ABSTRACT

The present study is focused on elucidating the wear mechanisms taking place during sliding friction of five (5) steel grades subjected to Trufftriding. For this purpose, three sliding friction experimental configurations were used and the friction coefficients, real-time-recorded during testing, were correlated to the post-testing microscopic observations of the worn surfaces. Finally, the experimental findings were evaluated with respect to the initial microstructure of the tool steels in their as-received and/or heat-treated state. In the case of non-conformal point contact against ceramic counterbodies, the friction coefficient was found to depend only on the steel grade and the particular counterbody, tending to a constant value, regardless of the applied load and/or its heat- or surface treatment. In the case of conformal plane contact against hardened steel, each steel grade exhibited an applied pressure range within which the wear coefficient remains practically constant, whereas for higher pressure values, seizure occurred. Nitrocarburising “displaced” the constant wear coefficient range towards higher pressure values, resulting in seizure retardation.