

## Effect of the dynamic response of experimental equipments on the tribological results

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Wear and friction measurements reveal in general a lack of repeatability in inter-laboratory comparison. The control of the test variables, the atmosphere and also the test procedure can play an important role on the results reliability. However, the vibration on the contact specimens and transient responses on the electric signal generated by displacement and force sensors (so the dynamic response of the equipment and of the measurement system) can influence significantly the results.

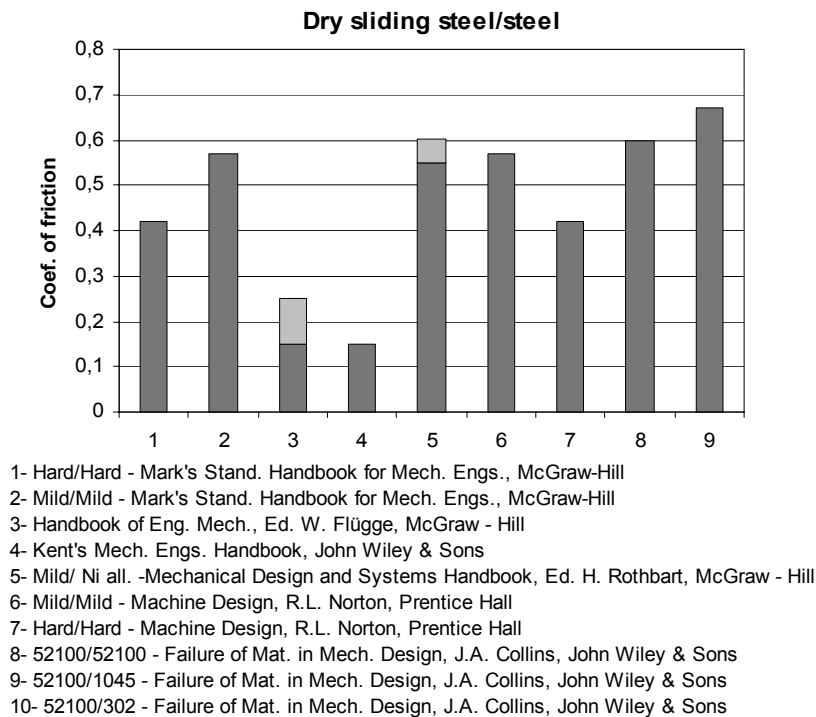


Figure 1

In engineering applications this fact leads to an important lack of precision. In fact if an engineer in a project activity need a value of friction coefficient for a steel / steel contact and use as reference some engineering handbooks, a wide range of values can be achieved, figure 1.

The main problem in the experiments to measure friction is related to the nature of the friction force. In fact friction is a reaction force acting on the vicinity of the sliding interface, thus, we can't measure the friction force itself. In most tribology rigs it is measured a force that equilibrate the system.

To study the dynamic response of friction measurement systems, simplified lumped mass-spring-damping models can be used. By means of the general dynamic approach the relationships between the measured force  $F_t$  and the real friction force  $F$  can be analysed.

Starting with a rigid body sliding on a plane surface, different kind of equipment's and practical aspects will be analysed in order to understand the important role of dynamic effects on the tribological test results.