

Wear Testing and Wear Measurement

Wear test is carried out to predict the wear performance and to investigate the wear mechanism.

Wear is a process of removal of material from one or both of two solid surfaces in solid state contact. As the wear is a surface removal phenomenon and occurs mostly at outer surfaces, it is more appropriate and economical to make surface modification of existing alloys than using the wear resistant alloys.

In this experiment, the test was conducted with the following parameters:

1. Load
2. Speed
3. Distance

In the present experiment the parameters such as speed, time and load are kept constant throughout for all the experiments

PIN-ON-DISC TEST

In this study, Pin-on-Disc testing method was used for tribological characterization. The test procedure is as follows:

Initially, pin surface was made flat such that it will support the load over its entire cross-section called first stage. This was achieved by the surfaces of the pin sample ground using emery paper (80 grit size) prior to testing

Run-in-wear was performed in the next stage/ second stage. This stage avoids initial turbulent period associated with friction and wear curves

Final stage/ third stage is the actual testing called constant/ steady state wear. This stage is the dynamic competition between material transfer processes (transfer of material from pin onto the disc and formation of wear debris and their subsequent removal). Before the test, both the pin and disc were cleaned with ethanol soaked cotton.

Wear Calculation

1. Area

Cross sectional Area, $A = \pi r^2$

2. Volume loss

Volume loss = Cross sectional Area x Height loss

3. Wear rate

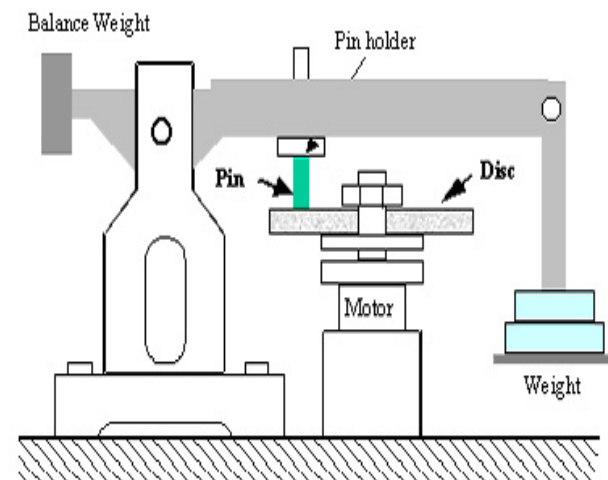
Wear rate = Volume loss / Sliding distance

4. Wear resistance

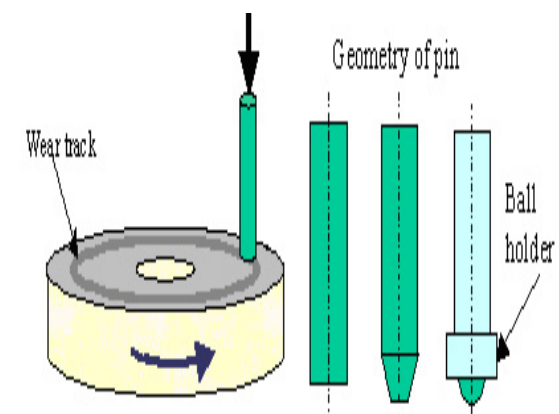
Wear resistance = $1 / \text{Wear rate}$

5. Specific wear rate

Specific wear rate = Wear rate/load



a) pin-on-disc-machine



b) arrangement on samples

b) geometry of pin