

Block-On-Ring Tribometer in Atmosphere and Elevated Temperature (ASTM G 77)

The Block-on-Ring Tribometer is capable of simulating a variety of harsh field conditions, e.g. high temperature, high speed and high loading pressure (Fig.1). The friction coefficient is calculated in-situ by acquiring the shear force based on the lever momentum torque. The wear characteristics of materials can be determined after testing. This tribometer is used for the testing of coatings, greases, additives and sliding performance. It is very flexible in allowing different options to be used, for example, for the contact geometry, i.e. a point, line, and an area on a ring.

Temperature control

The temperature control can be managed through the operator selection of the chamber and heater configuration, regulating environment or test specimen temperature. Computer controlled systems enable programmable control of temperature set points, ramp rates, test parameter cycles, and test start sequences. Sample temperature can be achieved up to 750°C with an external cooling. Additionally, the increase in temperature due to the sliding process can be measured as a thermocouple can be inserted into the back of sample very close to the contact area.

Parameters

Load: 1 - 150 N
Rotation: up to 1'500 rpm
Ø-Ring: up to 40 mm
Temperature: up to 750°C

Typical Standard Method

ASTM G 77, Standard test method for ranking resistance of materials to sliding wear using block-on-Ring wear test

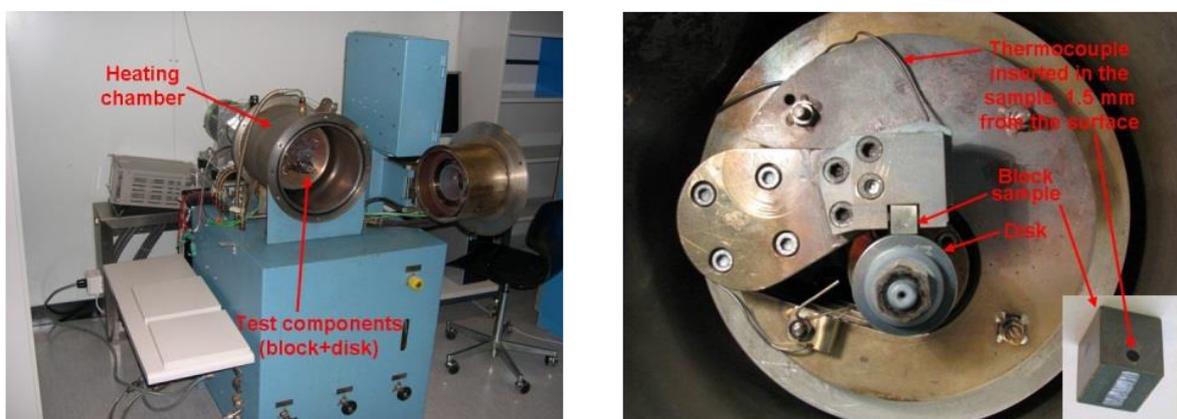


Figure 1: Block-On-Ring set-up

Example of wear test at high temperature:

An abrasion bloc-on-ring test was performed on two Cr₃C₂-NiCr thermally sprayed coatings deposited by different thermal spray processes. The tests were run at a temperature of 700°C and the results are shown in Fig 2.

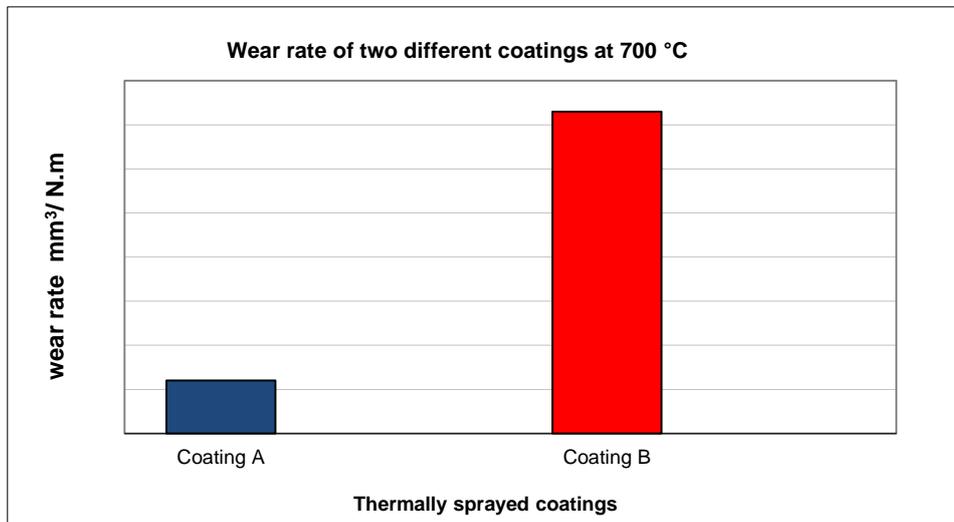
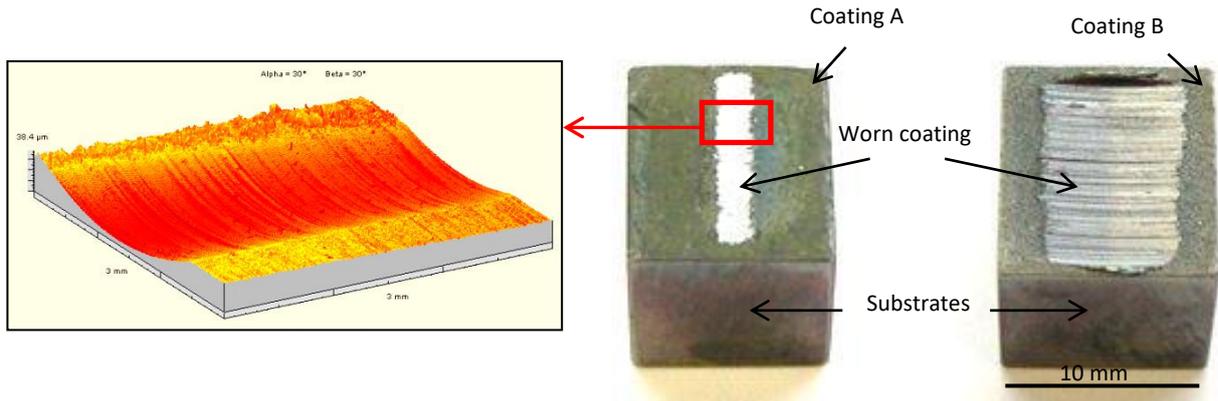


Figure 2: The morphology of the worn surface of the coating (block) subjected to high load and friction sliding with 3 D topographical measurements scanned using a White-Light profilometer (AltiSurf-Cotec) and the absolute wear rates.