Dry Sand Rubber/Wheel Abrasion Test (ASTM G 65)

Dry sand rubber/wheel abrasion test is one of the most widely used abrasion testing method. The abrasive, for example dry sand, is fed between the specimen and the rotating rubber wheel (Fig 1). Other abrasives can be used depending on the application such as, industrial equipment for grinding grain, paints, plastics, coatings, slurry abrasion, construction and farm equipment. A wide range of materials can be tested for example; metals, ceramics, plastics, composite materials and coatings. Parametric flexibility (e.g. load, sliding speed and distance, sand size and quality) of this set-up can provide many advantages in simulating various tribological systems.

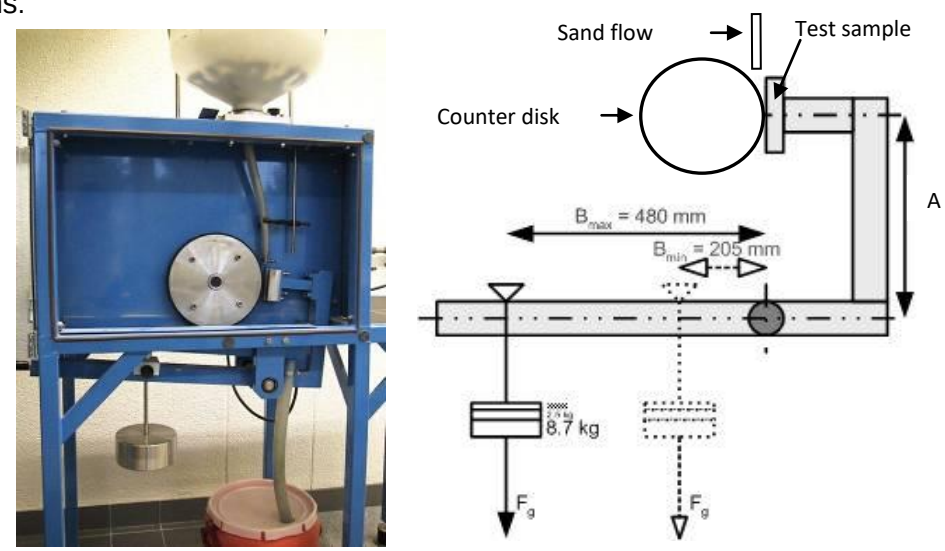

Figure 1: Rubber/Wheel set-up with loading flexibility system

The testing parameters are:

Test sample dimension:	1″ x 3″ x 0.12 - 0.5″ (25.4 x 76.2 x 3.2-12.7 mm)
Abrasive and feeding rate:	Alumina, 30-600 gr/min.
Load:	20, 130, 250 N
Sliding distance:	718 to 4309 m
Disks (also available):	(St37, CK45, GG25, X155)

Typical Standard Method

ASTM G65: Standard Test Method for Measuring Abrasion Using the Dry Sand/Rubber Wheel Apparatus

ASTM B611: Standard Test Method for Abrasive Wear Resistance of Cemented Carbide

Nova Werke AG · Vogelsangstrasse 24 · 8307 Effretikon · Switzerland · +41 52 354 16 16 · novaswiss.com

Example of an abrasive tribological test:

Self-fluxing WC-NiCrSiB flame sprayed coating is usually applied for abrasion and erosion wear resistance materials. The high wear resistance of this type of coating is caused by the combination of both mechanical properties of the hardness of tungsten carbide particles and the toughness of the metallic matrix NiCrSiB. Therefore, to reveal the effect of WC particles shape on the tribological behavior of such coatings, different kinds of powders with various WC shapes were HVOF sprayed (Fig 2). The standard abrasive Rubber/Wheel tests were carried out. To understand the wear mechanism, few of SEM observations have been performed on the worn surface (Fig 3).

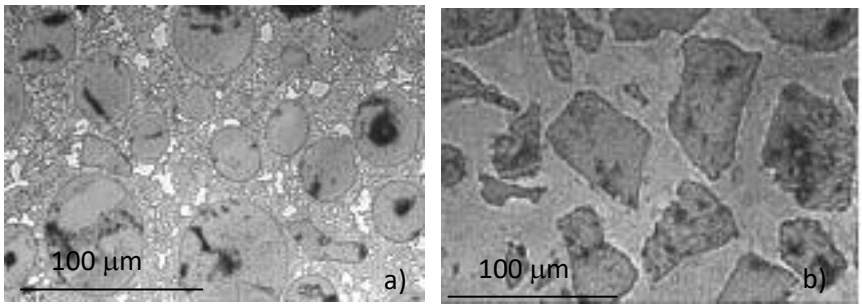

Figure 2: SEM micrographs of the coated samples, a) spherical WC shape, b) blocky WC shape.

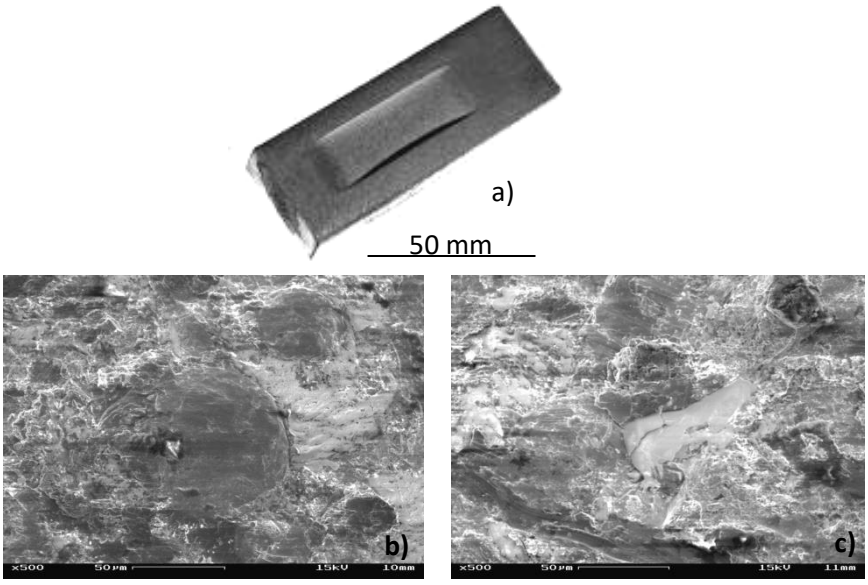

Figure 3: a) the morphology of worn surface of test sample, b) SEM micrographs of the worn surface of the spherical WC shape, and c) blocky WC shape.

Nova Werke AG · Vogelsangstrasse 24 · 8307 Effretikon · Switzerland · +41 52 354 16 16 · novaswiss.com