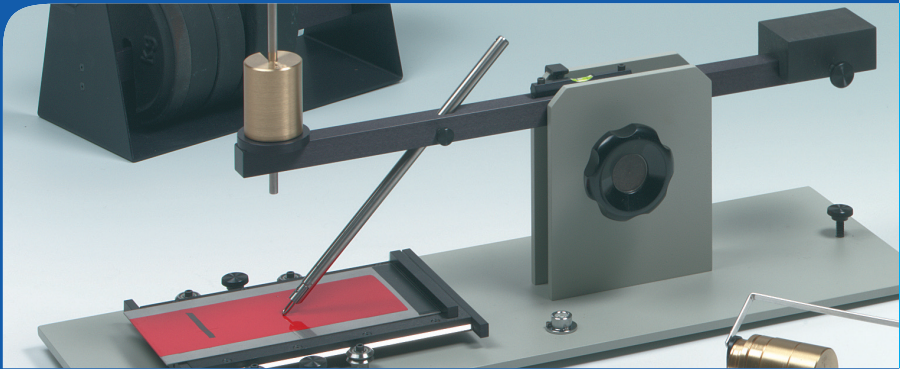


Measure what you see.

Balanced Beam Scrape Adhesion and Mar Tester



Operating Instructions

**Balanced Beam
Scarpe Adhesion &
Mar Tester**

Operating Instructions



PE-5780

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Section 1: Description 4

Section 2: General Information..... 5

Section 3: Operation 6

Section 4: Evaluation..... 8

Description

This instrument, is used for scrape-adhesion testing of coatings according to ASTM D 2197, D 5178, and for testing coatings and surfaces of other materials for their hardness or resistance to being scratched or marred by a pointed, sharp edge or blunt tipped stylus.

General Information

A pivoted beam is supported horizontally above a sturdy base plate. Near one end of the beam is an adjustable length stylus holding rod mounted through the pivoted beam at 45°. A weight platform is positioned on the beam such that weights mounted on the platform exert their force on the stylus. The weight platform is equipped with a post to help retain slotted weights. On the opposite end of the beam is a counter-weight that can be moved to balance the weight of the stylus holding rod and weight support structure. The base plate is equipped with a level and adjustable feet used to level the instrument. A separate level is mounted on the beam and is used to verify that the beam is horizontal. On the base plate under the stylus rod is a sample platform supported on bearings and freely movable. Rotation of a knob near the center of the beam will raise and lower the stylus holding rod. A movable support bar with two pegs can be inserted in holes in the sample platform at one end of the sample to assist in positioning the sample.

The instrument is supplied with slotted weights for placing a load on the stylus. The Loop Stylus for ASTM scrape adhesion and mar resistance. The Needle Stylus is for testing hardness as resistance to scratching. The Loop Stylus is a 0.0625" drill rod bent 180° to a „U“ shape with a 0.256" outside width dimension. It is hardened, buffed and nickel plated. Available as options are the Scratching Tool of the Hoffman Scratch Tester, rod stylus, ball-tipped styluses of 1/16" and 1/8" diameter and a Spit Stylus.

Operation

Level the base plate using the bubble level and the three adjustable feet. Secure the desired stylus in position in the appropriate end of the holding rod. The Loop Stylus fits into the end of the rod with the two-hole stylus clamp. The Needle Stylus can be placed in either of the two holes, as can the Rod, Spit and Ball-tipped styluses. The Hoffman Tool is mounted in the single-hole end of the rod. Styluses are held secure at either end by tightening a screw. Turn the instrument so that the stylus end is toward the operator and the counter-weight is pointing away. The sample platform may then be pulled or pushed freely using both handles.

The test specimen for this instrument must be flat and smooth. When a coating is tested, its substrate must have this form. The sample platform measures 4-3/4" x 8" (12.1 cm x 20.3 cm). The sample can be as wide as 5"; although it can be somewhat longer than the bed, the Needle Stylus onto the sample and then with a uniform motion pull the sample and inch or two using a very light initial load (about 50 gm) on the weight holder. Make successive passes across the sample, increasing the load by a convenient increment (perhaps as little as 10 gm) until the needle cuts through the film to the substrate. The coating should be penetrated with less than 1 kg. A load of 1.5 kg or more may damage the Needle Stylus. Where relatively heavy loads are needed for scratch testing, the sturdier Hoffman Tool or Rod Stylus can be used in the same manner. Low power magnification may be required for determining whether the Needle Stylus exposed the substrate, especially when the coating is transparent or the same color as the substrate.

The uncoated surface of any rigid material may be tested for hardness by finding the load required to make a visible scratch on the surface. The Needle Stylus, Hoffman Tool or Rod Stylus are used for this purpose.

The two Ball-Tipped styluses may not actually scrape or scratch, but will depress a coating or other material under sufficient load, creating a groove in the surface. As with scratch resistance, resistance to „grooving“ is a practical test because the product may be subjected to forceful contact with sharp and blunt objects.

The resistance of a surface to penetration by too sharp and too blunt objects may or may not correlate.

The Spit Stylus is used for rubbing tests. A soft object supplied by the user is impaled upon the stylus and then rubbed against the test surface under a certain load. Examples are rubbing an eraser against printed characters on paper or a piece of shoe leather against a polished floor tile.

Evaluation

Since the variety of materials that can be tested with the instrument is unlimited, we cannot offer definitive conclusions as to what constitutes acceptable hardness or scrape adhesion. The user, based on his knowledge of the material, its history and end use, must make this decision. Evaluating a coating for scrape adhesion or hardness is usually objective because the substrate is exposed or not exposed. Testing uncoated surfaces for resistance to scratching, marring or other types of deformation can be more subjective in that the operator must decide what is acceptable or the type of and extent of damage that constitutes failure.

When the approximate weight to achieve a certain end point has been found, time is saved by starting the testing of each sample just a few increments below this value. The end point load may cover a range of force with some materials due to differences between samples. Knowledge of the end point value and the end use of a material can help establish a value for a single stroke, pass-or-fail test.

