

Coating performance is related to many factors that include the hardness of the coating with other physical properties such as adhesion, lubricity, resilience, as well as the influence of coating thickness and curing conditions.

It is a quantifiable indication of the extent to which serious damage is resisted when a loaded needle is raked across a relatively smooth, flat surface. The motor driven machine is recommended as it provides better repeatability of test performance than the hand-operated version, which can be affected by operator variables.

## Mechanised Scratch Tester (SH705)

This machine is encased with a cover enclosing the gears and other parts for operating the slide at a constant speed (3-4 cm per second) and the arm lifting mechanism. The needle arm is counterpoised and rigid to prevent whip or chatter at the ball-point.

A 1mm tungsten carbide ball ended needle (normally supplied with each instrument) is held in a chuck at 90° to the test panel and can be easily removed for inspection and replacement. The tungsten carbide needle will provide with care, a long useful life without the need to replace the tip after each test.

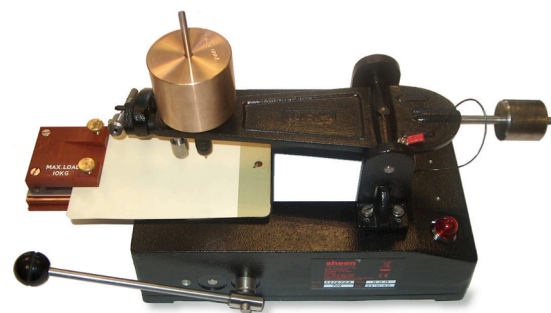
Weights providing increments of 100gm to Kg (0-20N) mass are loaded above the ball ended needle (or stylus), additional weights up to maximum 10kg loading are available as optional accessories for harder coatings.

Standard test panels (usually metallic) of 150 x 100 mm with thickness up to 1.65 mm can be used, however upon request provision can be made to accommodate thicker panels if required.

A plastic protective screen is available to avoid injury or intrusion into the mechanism or whilst instrument is activated.



*Mechanised Scratch Tester (SH705)*



*Hand Operated Scratch Tester (SH706)*

# Physical Testing: Hardness: **Scratch Testers**

## Method of test

Reference should be made to the relative test procedure, in general as follows:

1. Check suitable needle / stylus is fitted. Clamp test panel to slide.
2. Load needle arm with weights to determine threshold of failure,  
a) as specified for go/no go tests. Or  
b) progressively increasing load until failure occurs.
3. Actuate slide - either automatically or manually, depending on model. If failure occurs, needle on voltmeter will flick over (Ref. SH705) or red light will illuminate (Ref. SH706)
4. Only conductive metallic panels will be suitable for this test result.
5. Remove panel for visual assessment of scratch.

ECCA Metal Marking Resistance test is a procedure designed to evaluate the resistance to a smooth organic coating when rubbed by a metallic object.

The standard model Scratch Testers can be used by simply substituting the ball-ended needle for a special tool onto which 15um thick annealed aluminium foil is attached.

ASTM D2197 Scrape Adhesion Test and D5178 Mar Resistant Test call for a test procedure which requires a radius stylus, this is presented to the test panel at a 45° angle.

## Ordering information – Mechanised Scratch Testers

Mechanised Scratch Testers	Description
SH705	<b>Mechanised Scratch Tester. BS EN ISO 1518-1 2011.</b> 3-4 cm displacement. Tungston carbide hemispherical stylus, 2kg set of weights (1x100g, 2x200g, 1x500g, 1x1Kg and 1 spindle)
SH705/1	<b>Mechanised Mar Resistance Tester. ASTM D5178.</b> 6 mm displacement ø1.6 mm toroidal tool, set of weights as above + 4x2Kg=10kg
SH705/2	<b>Mechanised Scratch Tester. ASTM D2197.</b> Featuring a 1-2"/sec speed motor, stylus assembly and set of weights (2Kg set + 4x2Kg = 10Kg).
<b>Accessories and spares</b>	
SH705/050/D	2Kg Set of Weights (1x100g, 2x200g, 1x500g, 1x1000g), for use with SH705
SH 705/050/D2	2Kg Set of Weights (2x500g, 1x1000g), for use with SH705/1 & SH705/2
SH 705/050/D3	3Kg Set of Weights (1x100g, 2x200g, 1x500g, 2x1000g), for use with SH 705/3
SH 705/060/D	ASTM replacement stylus. (ASTM D5178 and D2197)
SH 705/061/D	ASTM stylus holder. (ASTM D5178 and D2197)
SH 705/078/S	Rub Stylus Marking Tool. ECCA-T11 1985 specification, supplied with 15 micron thick aluminium foil sheets and a rubber O-ring.
SH706/032/S3	Tungsten Carbide 1 mm ball ended needle

PLEASE SPECIFY 220 VOLT 50HZ OR 110 VOLT 60HZ WHEN ORDERING

## Physical Testing: Hardness: **Scratch Testers**

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### **Ordering information – Hand Operated Scratch Testers**

Hand Operated Scratch Tester	Description
SH706	<b>Hand Operated Scratch Tester. BS 3900 Part E2 1992/ISO 151 8 1992.</b> Complete with 2 Tungsten Carbide Needles and 2Kg set of weights.
<b>Accessories and spares</b>	
SH706/032/S3	Tungsten Carbide 1 mm ball ended needle
SH706/032/S4	Ruby Tip 1mm diameter Hemispherical tip needle
SH706/024/D	2Kg Weight
SH706/064/D	50g Weight
SH706/037/A	Conversion kit to ASTM D2197 1986. Consisting of ASTM alignment tool, ASTM stylus module, ASTM weight kit and pillar.

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Owing to continuous development, we reserve the right to introduce improvements and modify specifications without prior notice.

**Our sales team can be contacted on:  
[info@sheeninstruments.com](mailto:info@sheeninstruments.com) or +44 (0)208 783 4321**