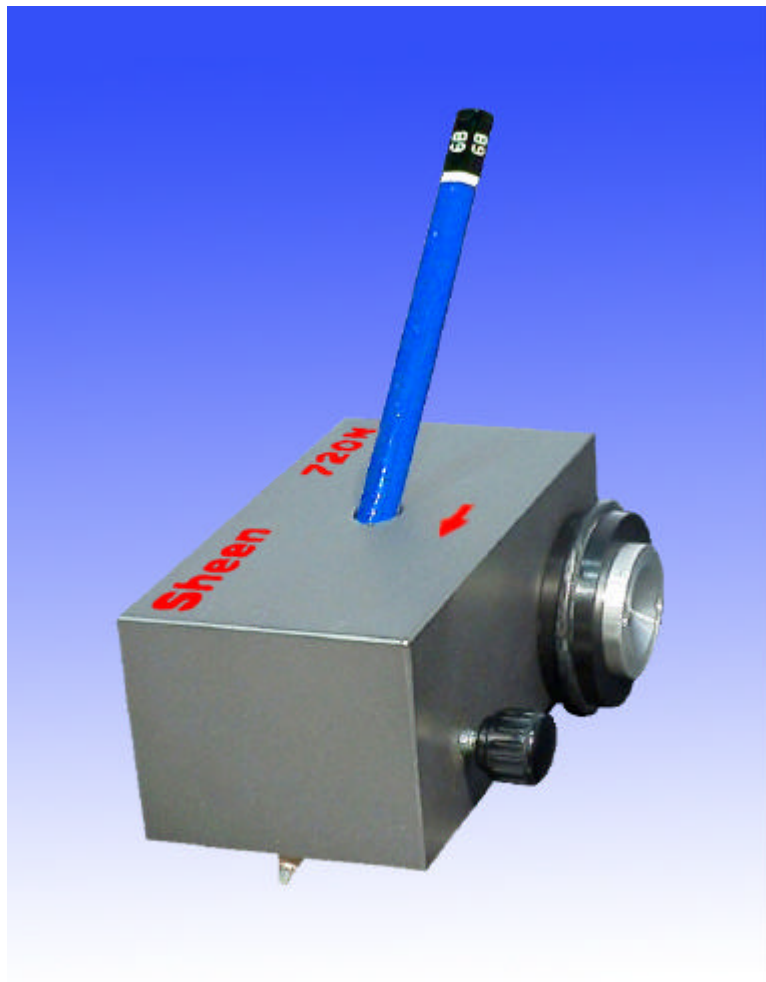


HARDNESS

Sheen



REF. 720N PENCIL SCRATCH HARDNESS TESTER



INTRODUCTION

The purpose of scratch hardness test is to determine the resistance of coating materials or lacquers to scratch effects on the surface. This test is of particular value for furniture or vehicle lacquers, but is also a useful aid in the development of synthetic resins or other film forming substances.

Generally scratch hardness is measured by moving a more or less sharp object under a known pressure over the surface of the material. The test result may either be the value of the pressure required to scratch through the material if a scratching tool of constant hardness is used, or alternatively the hardness of the scratching tool if this is varied whilst constant pressure is applied.

TEST PRINCIPLE

The pencil test uses constant pressure and variable hardness of the test tool as its fundamental principle. Pencils of varying hardness, starting with the hardest lead, are moved over the surface under a fixed pressure of 7.5 Newtons (765 gms) and at a fixed angle of 45 degrees to the surface. The degree of hardness of the pencil which damages the surface is taken as a measurement for scratch hardness.

Twenty pencils in the range of grades from 9B to 9H (ISO 15184 / BS 3900 - E19) are used. The pencils can be exchanged quickly and easily. The instrument is supplied complete with pencils, pencil sharpener, abrasive paper and carrying case.

The test method is fully described in the standards specified.

Note: ASTM D3363 / ECCA T4 specifies only 14 pencils.

INSTRUCTIONS FOR USE

The test methods describe how the relative hardness of a coating is to be determined. This is achieved using a set of pencils of known hardness.

The test surface needs to be correctly prepared and smooth. (Please refer to the relevant test standard.) The test should be performed at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ with a relative humidity of $50 \pm 5\%$ (ECCA T4) or $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (ASTM D3363).

1. Select a mid range pencil eg. 2H.
2. For wood pencils, remove approximately 3/16 to 1/4 in. (5 to 6 mm) of wood from the point of each pencil using a draftsman-type mechanical sharpener, being careful to leave an undisturbed, unmarked, smooth cylinder of lead. Holding the pencil holder (when using drawing leads) at an angle of 90° to the abrasive paper, rub the lead against the paper maintaining an exact angle of 90° to the abrasive paper until a flat, smooth and circular cross section is obtained, free of chips or nicks in the edge of the cross section.
3. Stand the 720N onto its end face and insert the pencil until its point touches the flat surface. Tighten the pencil clamping screw.
4. Place the 720N on the test surface and push it forward by approximately 1/4 -1/2" (6-12mm). Be sure to hold the gauge by the indentations on the wheels.
5. Rotate the pencil through 90° and move the gauge 1/2" (12mm) to one side of the first test. Repeat step 4.
6. Repeat step 5.
7. Examine the coating for indentation and scratching. If there is none, repeat the test using a harder pencil eg. 3H. If the surface is scratched or indented repeat with softer pencil eg. H.
8. Repeat step 7 until a pair of pencils is found, one of which scratches / indents the coating, the other does not.

PLEASE NOTE: This method is only applicable to smooth surfaces and coatings.

ORDERING

Ref. 720N Pencil scratch hardness tester (supplied with pencils, sharpener, 400 grit paper, case).
Ref, 721N Replacement pencil set (20).

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

Sheen Instruments Ltd

Unit 4, St. Georges Ind. Est., Richmond Road, Kingston, KT2 5BQ England.

Tel: 020 8541 4333 Fax: 020 8549 3374 Intl.Tel: 44 20 8541 4333 Intl.Fax: 44 20 8549 3374

Internet : www.sheeninstruments.com Email: info@sheeninstruments.com