

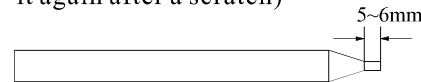
# PENCIL HARDNESS TESTER HT-6510P

## 1. FEATURES

- \* Coating hardness is the necessary measurement for the performance of coatings. This instrument applied the Pencil Scratch Method. It is a fast and economical way to determine the film hardness using the drawing lead core or the pencil core. The pencil scratch method for coating hardness testing is a common method in the world since the 1980s. In China, this test method has also been promoted to the coating research and industrial production. The instrument can be used both in laboratory and on site.
- \* Referenced standard,
  - 《GB/T 6739-96》 Coating Hardness Pencil Test Method
  - 《ASTM D3363-00》 Standard Test Method for Determination of Coating Hardness by Pencil Test Method
  - 《GB/T 1727-92》 General Method for

- 1 - Horizontal Mark
- 2 - Pencil
- 3 - Wheel
- 4 - Coating
- 5 - Base Material
- 6 - Weights
- 7 - Screw
- 8 - Moving Direction
- 9 - Pencil Core

rigid plane. Place the core vertically against the sand paper and draw circles. Grind it until the tip become flat, the edge become sharp. The edge must not be broken or with gap. (rotate a pencil 180 degrees or grind it again after a scratch)



- Fig 4-1 A sketch of sharpened pencil
- ### 4.3 Test procedure
- #### 4.3.1 Place the horizontal pad block under main body of the instrument. Pick the prepared pencil of appropriate type (start from the most hard core), insert it into the 45 degrees hole of the tester. When the core touches test surface, tighten the fastening screws. (choose whether to increase the weight according to test requirements of the product)
- #### 4.3.2 Take out the horizontal pad block,

## 2. SPECIFICATIONS AND PRINCIPLES

- Preparing The Film
- Load Weight 1000g/750g/500g
  - Measurement Angle (Between Pencil and Measured Surface), 45°
  - Three Touch Points (Two Wheels, a Pencil Core).
  - Scratch Speed, About 1mm/s
- Standard Configuration,
- Pencil Hardness Tester.....1
  - 1000g Weight.....1
  - 750g Weight.....1
  - Pencils (6B-6H).....13
  - Eraser.....1
  - Knife.....1
  - Horizontal Pad Block.....1
  - Sandpaper.....1

The instrument applies mechanical measurement. Keep three point touch the coating (two wheel, a pencil core), and a 45 degree angle between pencil and test surface. Push the instrument

sliding, pencil draws the corresponding track in the coating. In the change of different pencil marks, the hardness value of the film can be determined.

## 3. STRUCTURE DESCRIPTION

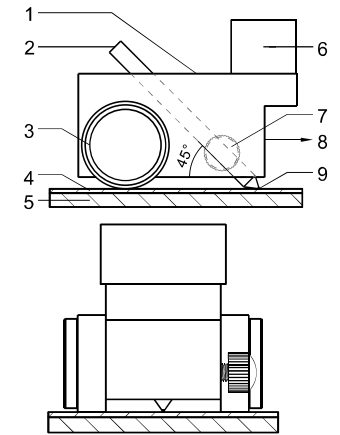


Fig 3-1 Structure Diagram of Pencil Hardness Tester  
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look at the Horizontal Mark, ensure that the bubble is between two black lines. If the bubble is not between the two lines, re-adjust it. It is applicable to take measurement only when the bubble stays between the two lines. Push forward the tester with the speed of 1mm/s, the pencil draws a line on the surface. Release the fastening screw, rotate the pencil 180 degree or re-grind it, and then draw another line. According to this procedure, draw 5 lines on different visible positions of the sample. It is suggested to draw each line with length of 6.5 mm. After drawing lines, use eraser to wipe tested surface and check the appearance and property.

#### 4.3.3 Film scratch estimate: After drawing 5 lines, if the pencil can break the coating more than 2 times, change another softer pencil. Until

the pencil can not break the coating at least 4 times, the pencil hardness is measured pencil hardness of coating.

## 5. NOTE

- \* When sharpening pencils, pay attention that the core should be cut out the shape of a cylinder.
- \* When inserting a pencil into the tester, it is necessary to use a horizontal pad block, so as to avoid the angle deviation.
- \* When pushing forward the tester, don't push too hard, ensure the force is enough to keep the tester moving forward, so as to avoid breaking the pencil.
- \* After drawing one line, it is necessary to release the fastening screws and rotate the pencil to draw another line.
- \* To choose pencil in test procedure: In accordance with the order of 6H-5H-4H-3H-2H-H-HB-B-2B-3B-4B-5B-6B, from hardest to softest.