Model 318 S with accessories

Hardness Test Pencil Models 318/318 S/318 C

Rolling Head of Model 318 S

Chucking adapter for Model 318 C

Model 318 with accessories

testing equipment for quality management

ERICHSEN
since 1910

Technical Description and Operating Instructions

3 Pressure Ranges:

0 - 3 N
0 - 10 N
0 - 20 N

4 Test Geometries:

0.75	**mm**	**(Bosch)**
1.0	**mm**	**(ISO)**
0.5	**mm**	**(van Laar)**
0.5	**mm**	**(Opel)**

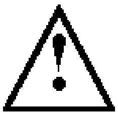
For the Measurement of the Hardness of Protective Coatings

DIN 55 656

SAFETY INSTRUCTIONS

Proper Use

This instrument has been designed for the measurement of the hardness of protective coatings.



Danger

Risk of Injuries!

In contrast to the other test tip types, the test tip acc. to OPEL projects distinctly out of the Hardness Pencil's head.
This can cause, in case of handling malpractice of the Hardness Pencil, dangerous situations with stab or scratch injuries!

Purpose and Application

Modern manufacturing processes require efficient testing methods. Speedy, straight forward, accurate. Every time, everywhere.

This instrument has been designed for the measurement of the hardness of protective coatings. The degree of hardness of paint films, plastic coatings, etc. can be accurately measured and recorded with the **Hardness Test Pencil, Models 318**, **318 S and 318 C**, no matter whether on a level or curved surface, small or large. The instrument is always ready for use and, because of it's small size easy transportable, an asset which will be appreciated by all concerned with hardness tests.

Uniform hardness and quality of the coating facilitate smooth-running manufacture. Deviation from a specified hardness causes rejects, delay in production and complaints. Developed by Robert Bosch GmbH of Stuttgart and manufactured by ERICHSEN, the instrument permits regular quality control of protective coatings, even during processing.

The **Hardness Test Pencil**, **Models 318, 318 S and 318 C,** provides the users with a test instrument that satisfies the requirements of smooth production runs.

Years ago, the well-proven ERICHSEN hardness test pencil 318 has been significantly improved in the form of the parallel available version **318 S**, with a rolling test head for scratch testing on sensitive surfaces.

The head is equipped with two little rubber hooped guide wheels. This ensures that even if the user exerts unindentedly too much pressure onto the test pencil, only the test tip used will still leave a trace on the test surface.

Fig. Rolling test head, Model 318 S

Due to increasing requests to a simple test with sharp tools, another version of the hardness test pencil has been developed - **Model 318 C.**

By the use of sharp edged tools, the influence of their positioning angle can cause a distinctly wide spread of results.
Therefore, for enabling comparability and repeatability, only the vertical positioning and guidance makes sense.

The hardness test rod, **model 318 C** can be equipped with two types of sharp-edged tool:

With the test tip in accordance to Clemen

as well as with the test tip for cross hatch cutting.

The vertical positioning is achieved by the use of the rolling chucking adapter with handle (lockable).

The pointer finger of the guiding hand presses directly onto the rolling chucking adapter and ensures by that the preset test force, whereas the rest of the hand just guides the testing performance by pulling the handle.

The three nylon wheels provide the corresponding stability for the vertical placement and guidance.

Fig. Model 318 C with chucking adapter and handle

An existing hardness test pencil 318 can easily retrofitted by separately ordered test head, test tips, chucking adapter and handle.

Test Procedure using Test tips Nos. 1, 2 and 3

The handling of the **Hardness Test Pencil** is extremely simple. The estimated or known spring tension is set with the help of the slider. Holding the instrument upright and placing its point on the test surface one draws a 5 to 10 mm long line at a rate of approximately 10 mm/sec. The stylus should produce a scratch which is just visible with the naked eye. If the spring pressure is too high, the scratch is clearly visible; if too low, no scratch appears. The applied pressure, fixed by locking the slider, is marked in Newtons.

Three scales are engraved into the test pencil for the three pressure ranges:

0 - 3 N (blue marked)
0 - 10 N (red marked)
0 - 20 N (yellow marked).

The springs for each of the pressure ranges are colour coded and the corresponding scale is marked in the same colour.

A basic requirement to gain useful results is a sensitive guidance of the test pencil.
If the pressure exerted onto the surface is too high, it is possible that the outer edge of the test head produces a trace falsifying the results or rendering their interpretation difficult.
Especially when using imitations with an edge of the test head that is not sufficiently smooth, this effect sometimes led to inappropriate scepticism with regard to the test method in general.

Test Procedure using Test tip No. 4

The test tip in accordance with "Opel" (0.5 mm dia.) has got a special tip geometry and a length that exceeds that of the other marking pins by approx. 15 mm. To ensure the desired test force, preset by the fixed slider's position, working on the test tip, the latter must be pressed into the test pencil by approx. 5 mm during the test.
If the "Opel" test tip is used in **Model 318 S**, it's pressing of approx. 5 mm into the head has to begin from the wheel's bottom level where the wheels normally get in contact with the surface to be tested.

Technical Data

Compression Springs:	spring steel
Test tips	
nos. 1, 2 and 3:	tungsten carbide spheres
no. 4	spring steel, with special tip geometry
Total length:	160 mm
Diameter:	16 mm
Weight, net:	approx. 250 g

Order Informations	
Ord.-No.	**Product-Description**
0020.01.31	**Hardness Test Pencil**, **Model 318** including test tip no. 1 (0.75 mm dia. - Bosch) and 3 springs (0 - 3 N; 0 - 10 N; 0 - 20 N), plastic carrying case
0273.01.31	**Hardness Test Pencil, Model 318 S** with rolling head, including test tip no. 1 (0.75 mm dia. - Bosch) and 3 springs (0 - 3 N; 0 - 10 N; 0 - 20 N), plastic carrying case
0314.01.31	**Hardness Test Pencil, Model 318 C** incl. test tip acc. to Clemen (R Ø 1 mm), chucking adapter (rolling – for fixing and vertical guidance of the Hardness Test Pencil), handle (anti-slip grip) and 3 springs

Accessories and/or Spare Parts	
Ord.-No.	**Description**
0428.02.32	Test tip no. 1 (acc. to Bosch; 0.75 mm Ø)
0428.03.32	Test tip no. 2 (technically equivalent to ISO 1518; 1.0 mm Ø)
0428.04.32	Test tip no. 3 (acc. to von Laar; 0.5 mm Ø)
0428.01.32	Test tip no. 4 (acc. to Opel; 0.5 mm Ø)
0429.01.32	Spring 0 - 3 N
0429.02.32	Spring 0 - 10 N
0429.03.32	Spring 0 - 20 N
0428.05.32	Test tip (Ø 3 mm) for scratch inclination test acc. to BMW GS 97034-8
0769.01.32	Special head (for use of Model 318 in connection with film applicator COATMASTER 510)
2109.01.32	Test head „C“ (movable/retrofit) for models 318/318 S, for using the Clemen test tip *Attention:* Requires a Clemen test tip as well as a chucking adapter (rolling – for fixing and vertical guidance of the Hardness Test Pencil) and handle (anti-slip grip)
0218.02.32	Test tip acc. to Clemen (R 1.0 mm)
1972.01.32	Chucking adapter (rolling) for fixing and vertical guidance of the Hardness Test Pencil
1969.02.32	Handle for the chucking adapter adaptable anti-slip grip made of aluminium with engraved grid pattern, with freely rotating axis for constant force application. When using Model 318 C, the rotation function has to be locked.

Subject to of technical modifications.
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