

**Mar Tester
Model 435**



Model 435



Model 435 S

**Adhesion and
Scratch
Resistance Tester
Model 435 S**



testing equipment for quality management

ERICHSEN

Technical Description and Operating Instructions

DIN 55 656

3 Test Ranges:

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

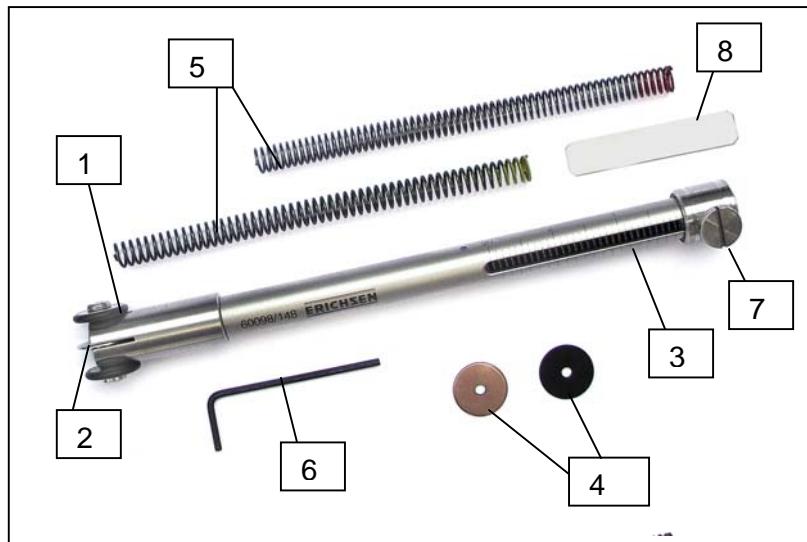
Mar Tester, Model 435

Purpose and Application

Scars on surfaces are unsightly, especially on smooth, glossy surfaces. Surfaces can be ruined so easily - for example marks on the matt polished surface of a table, by a fingernail, or on the shiny bodywork of a Cadillac, by a twig. Great annoyance can result from such small causes.

Marks can also be caused by metallic objects. The culprits may be metal particles from coins, cutlery or rings on fingers. Any of these can mar surface finishes.

The traditional test for the resistance of surfaces to such damage was to try to mark the surface with a fingernail. With the **Mar Tester, Model 435**, the quality of the surface can be measured accurately.



Design and Function

The scaring tool in the form of a disc, with locking facility, made of special plastic or metal, is mounted on a screw and is under pressure from a helical spring. This applies to a force which is adjustable from 0 to 20 N. The instrument is placed onto the surface so that it rests on the two guide wheels and the marking wheel which is locked in position then presses onto the surface with the pre-set force from the spring. The range of spring forces available is divided into three sections, each covered by one of three exchangeable springs:

Test range 1: 0 - 3 N - Sensitivity 0,1 N

Test range 2: 0 - 10 N - Sensitivity 0,5 N

Test range 3: 0 - 20 N - Sensitivity 1,0 N.

Note:

The test discs will wear at the point at which they are used. After 100 tests the discs should therefore be moved round so as to bring a point about 2 mm further along on the periphery into operation. The point at which the marking disc is first used should be marked by a scratch.

Method of Operation

First set up the selected test wheel depending on the test required, i. e.

- the plastic disc for scar-resistance tests;
- the copper disc or other special disc for metal marking.

After tightening the screw it must not be possible to turn the marking disc. The spring is then set to provide what is anticipated to be a suitable force and the instrument is placed perpendicularly onto the test surface and pressed down so that the guide wheels touch the surface.

In this way the preset pressure of the test disc is fully effective on the test surface.

The instrument is then moved a distance of a few cm so that the wheels roll over the surface, in a rapid motion appropriate for the scaring effect. The test result is the spring force in Newton which is just sufficient to produce a clear surface scar visible with the naked eye but not a crack or scratch.

If the interest is in the so-called metal marking effect, the result is expressed in terms of the spring force at which the surface just shows a black or grey mark.

Adhesion and Scratch Resistance Tester, Model 435 S

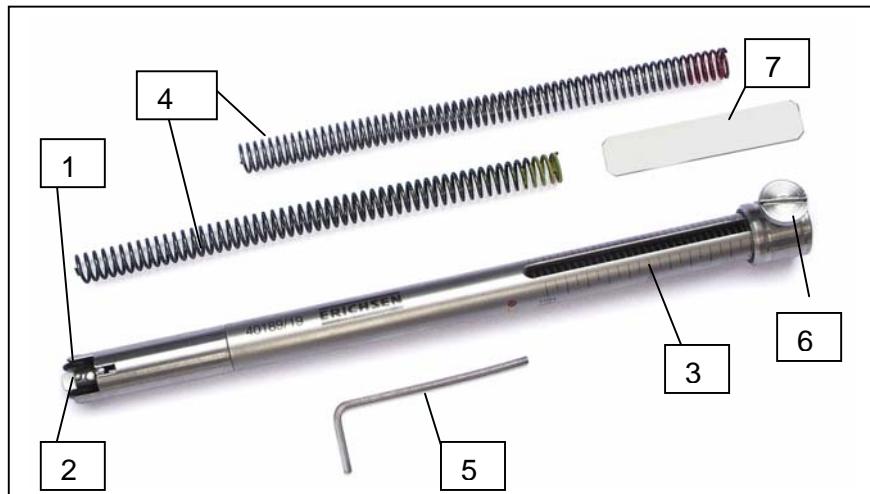
Purpose and Application

At first developed from the Mar Tester 435, **Model 435 S** has been adjusted, in cooperation with a well-known manufacturer of – among others – scaled indication fittings for vehicle cockpits, especially to tests of this product group.

When used as an adhesion tester e.g. the coloured coating applied to the dial of a speedometer in the shape of raised numbers, points or scale lines, is tested concerning its adhesion to the substrate, by lateral slipping with a defined “blunt” test body geometry, with a preselected test force.

In principle the **Model 435 S** is feasible for testing the adhesion of almost all printed scales, numbers, letters and marks “lying” on the scale plates’ surface!

When used as a scratch resistance tester for testing surfaces against “blunt” effects, it is recommended for testing surfaces on which the Hardness Test Rod 318 is still too “aggressive” – even using the largest tip diameter of 1 mm available for this purpose.



1. Rotating guide rolls
2. Test disc made of steel
3. Test force scale
4. Force springs
5. Allen key
6. Locking screw slider
7. Help aid for fixing the locking screw slider

Design and Function

The main difference between the Mar Tester 435 and the new **Model 435 S** is the direction in which the test body is moved. While the test body of Model 435 (a disc with locking facility) is moved relatively fast in longitudinal direction in order to produce a “scar”, the test direction in which the test body of **Model 435 S** is guided is rotated by 90°.

The part of the test body relevant for the test, corresponds in its shape exactly to that of Model 435 and is basically, for the time being, only available in the version made of steel which is most useful within the scope of products tested up to now.

As the diameter of the test head of **Model 435 S** is considerably smaller compared with the steel disc of Model 435, a central sector of the disc of Model 435 has been chosen as test body for reasons of space saving. The test body is mounted on a bolt and is preloaded by an internal helical spring to a force adjustable from 0 to 20 N. When placing **Model 435 S** with the two guide wheel perpendicularly onto the surface, the rigidly arrested test tool acts (with the preset force) upon the surface. The test force can be varied – as for Model 435 – by means of 3 exchangeable springs covering three different test ranges.

Method of Operation

After checking the tight fixing of the test tool at the end of the load transmission bolt, the required force is adjusted on the scale using the locking screw slider. Then the **Model 435 S** is placed perpendicularly onto the surface to be tested resp. beside the applied raised coating to be tested, and is pressed down so that the guide wheels touch the surface. In this way the preset force acting upon the test tool is fully effective on the test surface. The instrument is now moved into the rolling direction the wheels over the specimen to be tested e.g. against, for example, scale lines.

The user selects the speed that is adequate for the product to be tested. When testing e.g. raised inscriptions, the test result is expressed by the test force in Newton (N) at which the adhesion of the coating failed.

For scratch resistance tests of surfaces against “blunt” effects the test result is the maximum force in Newton (N) at which the test tool does not leave any trace on the test surface.

Order Information	
Ord.-No.	Product Description
0096.01.31	Mar Tester according to Oesterle, Model 435
Including ◆ 3 test discs (duroplast, copper, steel) ◆ 3 force springs ◆ 1 case	

Order Information	
Ord.-No.	Product Description
0268.01.31	Adhesion and Scratch Resistance Tester, Model 435 S
Including: ◆ 1 test disc made of steel ◆ 3 force springs ◆ 1 case	

Spare Parts	
Ord.-No.	Product Description
0430.01.32	Duroplast test disc
0430.02.32	Test disc made of copper
0430.03.32	Test disc made of steel

Spare Part	
Ord.-No.	Product Description
0796.01.32	Test disc made of steel

The right of technical modifications is reserved.
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