



SLOVENSKI STANDARD
SIST EN 59:1999

01-maj-1999

S steklom ojačeni polimerni materiali – Merjenje trdote z napravo po Barcolu

Glass reinforced plastics - Measurement of hardness by means of a Barcol impressor

Glasfaserverstärkte Kunststoffe - Bestimmung der Härte mit dem Barcol-Härteprüfgerät

Matieres plastiques renforcées au verre textile - Mesure de la dureté au durometre Barcol

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English version

GLASS REINFORCED PLASTICS

MEASUREMENT OF HARDNESS BY MEANS OF A BARCOL IMPRESSOR

Matières plastiques renforcées
au verre textile.
Mesure de la dureté au duromètre
barcol.

Glasfaserverstärkte Kunststoffe.
Bestimmung der Härte mit dem
Barcol-Härteprüfgerät.

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Central Secretariat or to any CEN member.

This European Standard exists in three versions (English, French, German), recognized by CEN as equivalent. National versions in other languages rank as translations and in case of doubt shall be checked against one of the recognized versions.

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CEN

EUROPEAN COMMITTEE FOR STANDARDIZATION
Comité Européen de Normalisation
Europäisches Komitee für Normung

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BRIEF HISTORY

This European Standard was drawn up by CEN Technical Committee 66 "Testing of glass fibre reinforced plastics", the Secretariat of which is held by AFNOR.

The contents of this Standard were submitted for ballot to the members of CEN in November 1974 in view of its adoption as a European Standard.

This European Standard was adopted by CEN as a result of its acceptance by the following member countries :

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Austria, Belgium, Denmark, France, Germany, Ireland, Italy, Portugal, Sweden, United Kingdom.

GLASS REINFORCED PLASTICS - MEASUREMENT OF HARDNESS
BY MEANS OF A BARCOL IMPRESSOR

1. SCOPE

This European Standard describes the determination of indentation hardness of glass reinforced plastics materials using a Barcol Impressor, Model No 934-1.

NOTE 1: The Barcol impressor is portable and therefore suitable for testing the hardness of fabricated parts and individual test specimens for production control purposes.

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2. REFERENCE

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EN 62 - Glass reinforced plastics - Standard atmospheres for conditioning and testing.

3. APPARATUS

The apparatus (see Figure 1) is a Barcol Impressor, Model No 934-1 which consists of the following parts:

- 3.1 Indenter. The indenter shall consist of a hardened steel truncated cone having an angle of 26 degrees with a flat tip of diameter 0.157 mm. It shall fit into a hollow spindle and be held down by a spring-loaded plunger.
- 3.2 Indicating device. The indicating dial shall have 100 divisions, each representing a penetration depth of 0.0076 mm. The dial shall read directly in Barcol hardness units; the higher the reading the harder the material.

4. TEST SPECIMENS

- 4.1 Test surface. The testing area shall be smooth and free from mechanical damage (such as scratches or holes).
- 4.2 Dimensions. Test specimens shall be at least 1.5 mm thick and large enough to ensure a minimum distance of 3 mm in any direction from the indenter tip to the edge of the specimen or to another earlier test position.

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5. CALIBRATION

Adjust the apparatus, by means of the lower plunger guide nut in accordance with the maker's instructions, so as to obtain a dial reading of 100 when the apparatus is used on a glass surface and the hardness values stated by the maker when it is used on the aluminium calibration discs ('hard' and 'soft') supplied with the apparatus.

6. Conditioning

6.1 Conditioning of test specimens. Condition the test specimens as required by the specification for the particular glass reinforced plastics material. If no specification exists, condition the test specimens in accordance with European Standard EN 62.

NOTE 2: For tests made at 23 °C and 50 % r h it is permissible to reduce the conditioning period to a minimum of 16 hours.

6.2 Test atmosphere. Test in one of the standard atmospheres specified in European Standard EN 62.

6.3 If the size of the product to be tested does not permit conditioning and testing in the standard atmosphere, state this in the test report.

7. PROCEDURE

7.1 Support the test specimens by a hard, firm surface if they are likely to bend or deform under the pressure of the indenter (Note 3). The indenter shall be perpendicular to the surface being tested. Grasp the impressor firmly between leg and point sleeve and set both on the surface to be tested. For small test specimens it may be necessary to support the leg on a wedge. Quickly apply by hand sufficient force on the housing to ensure firm contact with the test specimen and record the highest dial reading as the hardness in Barcol hardness units (Note 4). Take care to avoid sliding or scraping while the indenter is in contact with the surface being tested.

NOTE 3: Curved surfaces may be more difficult to support. When the force is applied, bending and spring action in the specimen should be avoided.

NOTE 4: A slow fall in the reading on the indicating dial is sometimes noted for materials which are susceptible to creep. It is particularly important for such materials to record the highest instantaneous reading on the indicating dial.

7.2 Impressions should not be made within 3 mm of the edge of the specimen or of other impressions.

8. NUMBER OF READINGS

Reinforced plastics materials are inherently heterogeneous and a large scatter of readings is observed. This is mainly caused by the differences in hardness between the resin and the reinforcement material in contact with the small diameter indenter. The number of measurements shall be such that the average result has a confidence limit of $\pm 4\%$ (at a 95 % probability level).

9. TEST REPORT

The test report shall include a reference to this standard and include the following particulars :

- a) complete identification of the material tested;
- b) method of preparing the test specimens;
- c) atmospheres used for conditioning and testing
- d) number of readings taken;
- e) average of the hardness values rounded to the nearest whole scale division;
- f) date of test.

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Legend to figure

- | | |
|-----------------------------|-----------------------------------|
| (1) Casing | (9) Lock nut |
| (2) Indicating dial | (10) Lever |
| (3) Body of apparatus | (11) Fixed (spring) sleeve |
| (4) Leg | (12) Moveable point sleeve |
| (5) Plunger | (13) Moveable point sleeve spring |
| (6) Upper plunger guide nut | (14) Guide ring |
| (7) Spring | (15) Indentor tip |
| (8) Lower plunger guide nut | (16) Height adjustment ring. |

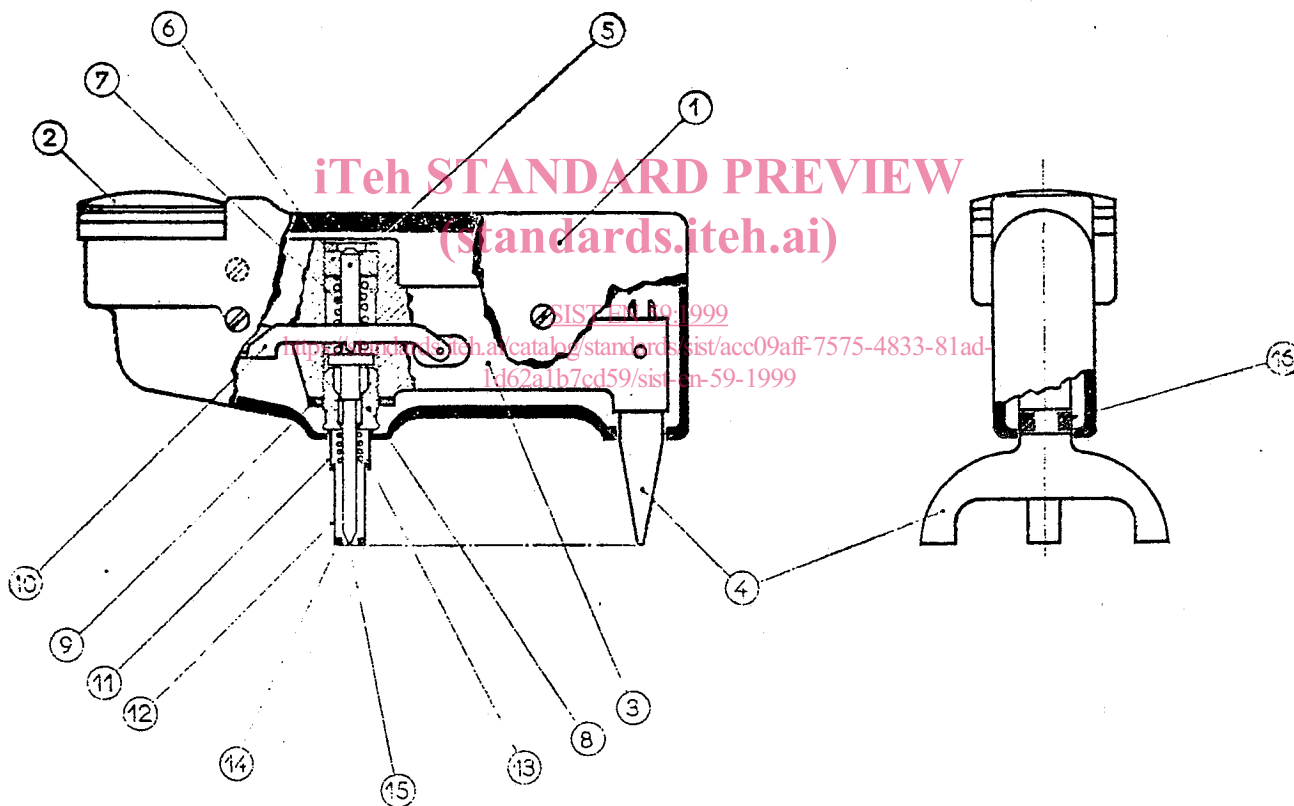


FIGURE 1

GENERAL CONSTRUCTION OF
BARCOL IMPRESSOR