



SLOVENSKI STANDARD

SIST EN 13421:2006

01-april-2006

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Plastics - Thermoset moulding compounds - Composites and reinforcement fibres -
Preparation of specimens for determining the anisotropy of the properties of compression
moulding composites

STANDARD PREVIEW

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Kunststoffe - Duroplast-Formmassen - Verbundwerkstoffe und Verstärkungsfasern -
Herstellung von Probekörpern zur Bestimmung der Anisotropie der Eigenschaften von
verpressten Formmassen

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Plastiques - Compositions de moulage thermodurs - Composites et fibres de renfort -
Préparation des éprouvettes pour déterminer l'anisotropie des propriétés des composites
de moulage par compression

Ta slovenski standard je istoveten z: EN 13421:2006

ICS:

83.080.10	Duromeri	Thermosetting materials
83.120	Učvrščenj [l]a`^lã	Reinforced plastics

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13421

February 2006

ICS 83.120

English Version

Plastics - Thermoset moulding compounds - Composites and reinforcement fibres - Preparation of specimens for determining the anisotropy of the properties of compression moulding composites

Plastiques - Compositions de moulage thermodurs - Composites et fibres de renfort - Préparation des éprouvettes pour déterminer l'anisotropie des propriétés des composites de moulage par compression

Kunststoffe - Duroplast-Formmassen - Verbundwerkstoffe und Verstärkungsfasern - Herstellung von Probekörpern zur Bestimmung der Anisotropie der Eigenschaften von verpressten Formmassen

This European Standard was approved by CEN on 30 December 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

[SIST EN 13421:2006](https://standards.iteh.ai/catalog/standards/sist/bb30967-d793-4855-8532-15571a7661a4/en-13421:2006)

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Foreword

This European Standard (EN 13421:2006) has been prepared by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN/BIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EN 13421:2006 (E)**Introduction**

The main advantage of fibre reinforced moulding composite like SMC/BMC and GMT/LFT is their ability to carry even longer reinforcing fibres to all parts of the mould during compression moulding. This material flow causes fibre orientation in the moulding and as a consequence an anisotropy of the properties.

To provide engineers with suitable data for designing new mouldings the knowledge of the anisotropy received under defined moulding conditions is essential. In practice the mould coverage of those composites is in the range of 25 % to 30 % therefore the necessary test plates for preparing test specimens by machining needs to be manufactured under comparable conditions.

For both composites this supposition is fulfilled in their European Standards for the preparation of test plates to determine flowability. Therefore these test plates can also be used for the preparation of specimens for determining the anisotropy of the composites to be tested. No special procedure to manufacture test plates has to be given in this European Standard.

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1 Scope

This European Standard specifies a method for the preparation of specimens of compression moulding composites for determining the anisotropy induced by material flow.

It is applicable to all SMC/BMC and GMT/LFT composites, which are being moulded under defined moulding conditions as described in EN ISO 12115 and ISO 1268-9.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 472:2001, *Plastics - Vocabulary (ISO 472:1999)*

EN ISO 527-4, *Plastics — Determination of tensile properties — Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites (ISO 527-4:1997)*

EN ISO 2818, *Plastics — Preparation of test specimens by machining (ISO 2818:1994)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 472:2001 and the following apply.

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3.1

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Sheet Moulding Compound - SMC

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product composed of thoroughly mixed resins and chopped or un-chopped reinforcing fibres, with or without particulate fillers, produced in sheet form

3.2

Bulk Moulding Compound - BMC

product composed of thoroughly mixed resins and chopped reinforcing fibres, with or without particulate fillers, supplied in mass form

3.3

GMT/STC

compounds of glass mat reinforced thermoplastics

3.4

LFT

compounds of glass reinforced thermoplastics by direct moulding

3.5

flow induced anisotropy

isotropy caused by material flow of fibre reinforced compounds during moulding

4 Health and safety

This European Standard limits itself to describing the preparation of compression moulded test plates. The handling conditions of the products and materials used shall comply with the national regulations in force in each country and the staff shall be informed of the risks involved and appropriate precautions taken.

EN 13421:2006 (E)

5 Principle

To receive comparable data the specimens are being machined out of the flow areas of test plates which been manufactured under defined moulding conditions (see EN ISO 12115, ISO 1268-9 and Figure 1).

NOTE Details of preparing the composites, loading the mould and applying the moulding conditions are given in the respective standards. They are different for both composites except the mould coverage.

6 Plate dimensions

It is recommended to compression mould a plate of about 200 mm × 590 mm (see also method II in EN ISO 12115).

7 Procedure

7.1 Follow the recommendations given in EN ISO 2818.

7.2 Cut the test specimens parallel to the flow direction out of the flow area A of the test plate (see Figure 2).

7.3 Before machining the specimens perpendicular to the flow direction (flow area B) 50 mm of the end of the test plate shall be cut off because of misalignment of fibres at the end of the test plate.

NOTE Normally 5 tests are carried out to determine the tensile properties. For better statistical safety it is recommended and should agree upon between user and supplier to manufacture 3 test plates of each composites to be tested.

7.4 Check if all test specimens are free of failures which may effect the further test procedure (e.g. surface fissures, high void content, local delaminations etc.)

8 Manufacturing report

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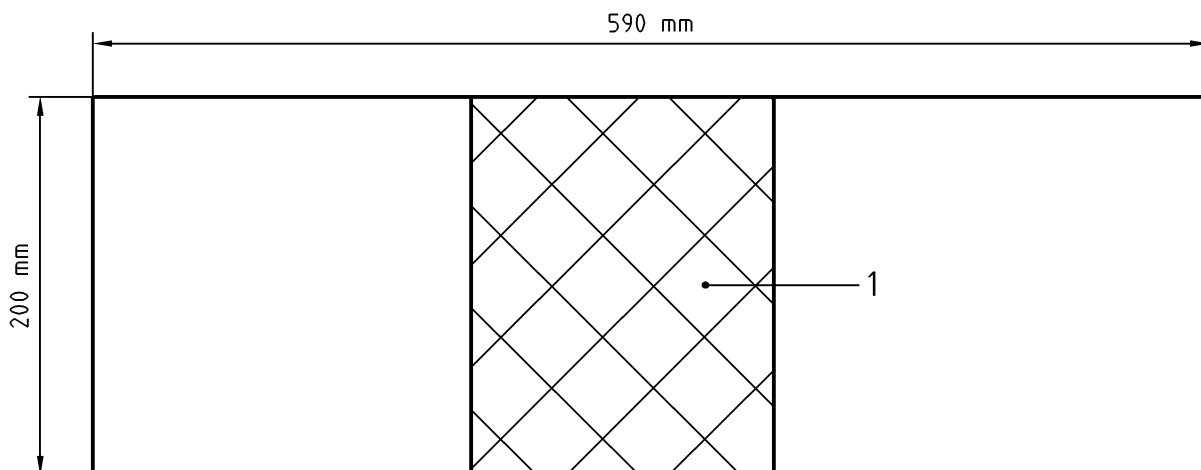
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The report shall include the following information:

- a) reference to this European Standard, i.e. EN 13421;
- b) complete identification of the test plate used as given in their respective EN standard test report;
- c) date of preparing the specimens;
- d) dimensions of the specimens;
- e) number of test specimens for both flow directions;
- f) statement as to whether any test specimens have been rejected and, if so, the reasons;
- g) any details not specified in this European Standard which may have an influence on the further test results.

9 Precision

The precision of the machining of the test specimens depends on the accuracy of the respective cutting procedure. It has to fulfil the requirements for specimens used to determine the tensile properties according to EN ISO 527-4. Therefore no special advice is given here.



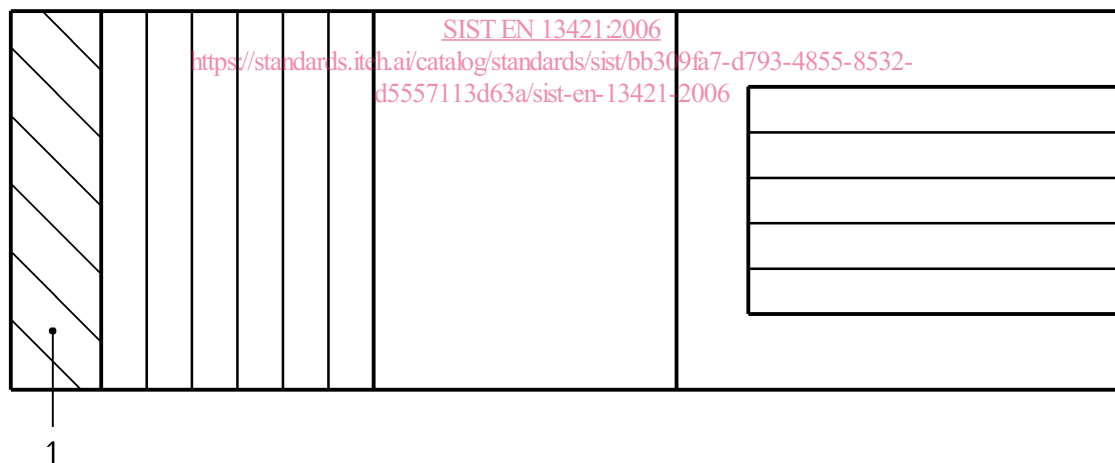
Key

- 1 mould coverage

Figure 1 — Mould coverage (25 % to 30 % of the total area)

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Key

- 1 cut off
- 2 flow area B
- 3 flow area A

Figure 2 — Flow areas of the test plate