SLOVENSKI STANDARD
SIST EN 16245-5:2013

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Z vlakni ojačeni kompozitni polimerni materiali - Navajanje karakteristik surovin - 5. del: Posebne zahteve za osrednji material

Fibre-reinforced plastic composites - Declaration of raw material characteristics - Part 5: Specific requirements for core materials

Faserverstärkte Verbundwerkstoffe - Angabe von Werkstoffeigenschaften - Teil 5: Spezifische Anforderungen an den Kernwerkstoff

Composites plastiques renforcés de fibres - Déclaration des caractéristiques des matières premières - Partie 5: Exigences particulières pour les matériaux d'âme

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Fibre-reinforced plastic composites - Declaration of raw material characteristics - Part 5: Specific requirements for core materials

Composites plastiques renforcés de fibres - Déclaration des caractéristiques des matières premières - Partie 5: Exigences particulières pour les matériaux d'âme

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Foreword

This document (EN 16245-5:2013) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

EN 16245 consists of the following parts, under the general title *Fibre-reinforced plastic composites — Declaration of raw material characteristics*:

— *Part 1: General requirements*

— *Part 2: Specific requirements for resin, curing systems, additives and modifiers*

— *Part 3: Specific requirements for fibre*

— *Part 4: Specific requirements for fabrics*

— *Part 5: Specific requirements for core materials* (the present document)

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

1 Scope

This European Standard specifies the minimum information to be declared for core materials to be used for the manufacturing of composites products.

These specific declaration requirements are in addition to the general requirements given EN 16245-1.

This document includes requirements for the Certificate of Analysis (CoA). The purpose of the CoA is to verify that material properties conform to the declared values.

This part of the standard is applicable to rigid foam and balsa core material.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16245-1:2013, *Fibre-reinforced plastic composites — Declaration of raw material characteristics — Part 1*: *General requirements*

EN ISO 291, *Plastics — Standard atmospheres for conditioning and testing (ISO 291)*

EN ISO 844, *Rigid cellular plastics — Determination of compression properties (ISO 844)*

EN ISO 845, *Cellular plastics and rubbers — Determination of apparent density (ISO 845)*

ISO 1922, *Rigid cellular plastics — Determination of shear strength*

ISO 8301, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Heat flow meter apparatus*

ASTM C273, *Standard Test Method for Shear Properties of Sandwich Core Materials*

ASTM C297, *Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions*

ASTM C365, *Standard Test Method for Flatwise Compressive Properties of Sandwich Cores*

ASTM D1623, *Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
core material
central component of a sandwich construction to which the sandwich faces or skins are attached

3.2
balsa core material
rigid balsa sheets cut in end-grain configuration to assure good compressive properties normal to the plane

3.3
foam core material
various different polymer materials that are foamed in order to reduce their specific weight

3.4
nominal value
supplier defined value, typically defined by the mean value derived from a historical database of the respective property

[SOURCE: EN 16245-1:2013, 3.6]

3.5
statistical minimum value
mean value minus two standard deviations of a historical population, i.e. there is 97,6 % probability that the test values are above this statistically defined minimum value

Note 1 to entry: This implies that all or part of the received material can have CoA values below the statistical minimum value declared by the manufacturer. In order to avoid this, the customer can instead require guaranteed minimum value to be declared.

[SOURCE: EN 16245-1:2013, 3.8]

3.6
guaranteed minimum or maximum value
value guaranteed by the supplier, such as no single sample value is below or above the declared values, respectively

[SOURCE: EN 16245-1:2013, 3.2]

4 Content of a declaration

A declaration for the core material shall consist of information according to EN 16245-1:2013, Clause 5 and Clause 5 of this standard.

5 Specific declaration requirements

5.1 General

The specific requirements for core materials are given below.

All declaration requirements, i.e. the general information according to EN 16245-1 and the specific declaration requirements according to this part (i.e. EN 16245-5), and application dependant requirements as agreed between manufacturer/supplier and customer, shall be declared by the supplier as information to the customer. The following also apply:

— if the property given has reference to a test method standard or test method, this test method standard or test method shall be used;

— the values given shall be in accordance with the test method standard given;

— if the test environment is not clearly stated in the specific test method standard, the standard atmosphere conditioning and testing shall be carried out in accordance with EN ISO 291;

— the manufacturer shall be responsible for the performance and results of all tests required for the declaration;

— the material property declaration shall account for any density variation. Tolerances and nominal values shall be given considering the range of density specified in 5.2;

— the material and fixture shall be acclimated at the test temperature for a period sufficient to ensure even temperature throughout the specimen and fixture. If the test method standard does not specifically mention how the test at elevated/decreased temperature shall be performed, the test shall be performed in a temperature-controlled chamber. The temperature in the specimen shall not deviate by more than ± 2 °C from the given test temperature.

5.2 Properties of foam core material

The specific declaration requirements for core material are listed below. The declaration including tolerances shall be given in accordance with the test method standards stated in Table 1 and Table 2.

If the core sheets consist of different core blocks bonded together in order to obtain required thickness/size, the given declaration shall be valid for the assembled core sheet.

The following specific declaration requirements a) to q) apply for all foam core material independent of application:

a) identification (name/number/code used by the manufacturer for identification purposes);

b) density [kg/m^3] – nominal, guaranteed minimum and guaranteed maximum value;

c) shear strength [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

d) shear modulus [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

e) shear elongation (ultimate) [%] – nominal and statistical minimum value:

   1) Obtained based on stress-strain curves.

   2) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

f) compression strength (out of plane) [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

g) compression modulus (out of plane) [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

h) tensile strength (out of plane) [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

i) tensile modulus (out of plane) [MPa] – nominal and statistical minimum value:

   1) Nominal values shall also be given for test temperatures -20 °C and +80 °C.

j) thickness [mm]:

   1) The thickness is defined as the nominal thickness of the sheet.

2) The thickness shall be measured 50 mm from the corner with equal distance to the edges.

3) Guaranteed minimum and maximum shall be given as maximum difference of highest and lowest measured value (regardless of the location) to the nominal value (may be given as % of the nominal value).

k) in-plane length and width dimensions [mm x mm]:

1) The nominal length and width of the sheet/panel shall be given.

2) The guaranteed minimum and maximum shall be given as:

i) Maximum deviation from the nominal length: ± [mm];

ii) Maximum deviation from the nominal width: ± [mm];

iii) Maximum deviation from 90° at corners: ± [degrees].

l) thermal conductivity, λ [W/(m·K)] – nominal, minimum and maximum value;

m) maximum continuous operating temperature [°C] – nominal value:

1) Maximum temperature at which the unloaded material can be exposed in a period of three months with less than 10 % permanent degradation of the strength and module properties, both in shear and compression. The degradation shall be measured at room temperature and according to the test method standard used for static testing at ambient temperature (see Table 2).

n) heat resistance [°C] – nominal value:

1) Heat resistance is defined as the material temperature at which the average strengths and module both in shear and compression have decreased by 20 % relative to the mean values obtained at the standard test temperature according to the relevant test method standard.

2) All four temperatures (strength related and modulus related for shear and compression) shall be given.

3) The test method is to be the same as for static testing at ambient temperature (see Table 1).

o) maximum process temperature [°C] – nominal value:

1) The supplier shall give guidelines with respect to the maximum processing temperature. The maximum temperature during processing is the highest allowable temperature during a curing cycle for the sandwich.

2) Give at least one set of values for temperature, pressure and time for such a process.

p) core treatment/modification/assembly:

1) If a material is added to the surface of the core (coating/impregnation), the type and mass per square metre shall be given, including tolerances [kg/m^2] – nominal, guaranteed minimum and maximum value.

2) If a core sheet is delivered with a carrier textile/scrim, the type of the carrier textile/scrim shall be given.

3) If core blocks are bonded together to form a rigid plate/sheet, the bonding system and type shall be specified.