SLOVENSKI STANDARD
SIST EN 16245-3:2013

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Z vlakni ojačeni kompozitni polimerni materiali - Navajanje karakteristik surovin - 3. del: Posebne zahteve za vlakna

Fibre-reinforced plastic composites - Declaration of raw material characteristics - Part 3: Specific requirements for fibre

Faserverstärkte Verbundwerkstoffe - Angabe von Werkstoffeigenschaften - Teil 3: Spezifische Anforderungen an Fasern

Composites plastiques renforcés de fibres - Déclaration des caractéristiques des matières premières - Partie 3: Exigences particulières pour les fibres

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English Version

Fibre-reinforced plastic composites - Declaration of raw material characteristics - Part 3: Specific requirements for fibre

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Foreword

This document (EN 16245-3:2013) 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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.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* (the present document)

— *Part 4: Specific requirements for fabrics*

— *Part 5: Specific requirements for core materials*

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 fibre material to be used for the manufacturing of composites products.

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

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

This part of the standard is applicable to carbon and glass fibre 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 plastics composites — Declaration of raw material characteristics — Part 1: General requirements*

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

EN ISO 1889, *Reinforcement yarns — Determination of linear density (ISO 1889)*

EN ISO 1890, *Reinforcement yarns — Determination of twist (ISO 1890)*

EN ISO 3344, *Reinforcement products — Determination of moisture content (ISO 3344)*

EN ISO 9163, *Textile glass — Rovings — Manufacture of test specimens and determination of tensile strength of impregnated rovings (ISO 9163)*

EN ISO 10548:2003, *Carbon fibre — Determination of size content (ISO 10548:2002)*

EN ISO 10618, *Carbon fibre — Determination of tensile properties of resin-impregnated yarn (ISO 10618)*

ISO 1887, *Textile glass — Determination of combustible-matter content*

ISO 1888, *Textile glass — Staple fibres or filaments — Determination of average diameter*

ISO 10119:2002, *Carbon fibre — Determination of density*

ISO 15100, *Plastics — Reinforcement fibres — Chopped strands — Determination of bulk density*

ASTM D150-11, *Standard Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation*

ASTM D578-05, *Standard Specification for Glass Fiber Strands*

ASTM D2970-04, *Standard Test Method for Testing Tire Cords, Tire Cord Fabrics, and Industrial Yarns Made From Glass Filaments*

3 Terms and definitions

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

3.1
carbon fibre
fibre produced by the pyrolysis of organic precursor fibres such as rayon, polyacrylonitrile (PAN), and pitch in an inert atmosphere

Note 1 to entry: The term is often used interchangeably with graphite, however carbon fibres and graphite fibres differ in the temperature at which the fibres are made and heat-treated, and the amount of carbon produced. Carbon fibres typically are carbonised at about 1 300 °C and assay at 93 % to 95 % carbon, while graphite fibres are graphitised at 1 900 °C to 3 000 °C and assay at more than 99 % elemental carbon.

3.2
glass fibre
fibre made under highly controlled conditions from molten minerals and other inorganic materials where the resulting silica content normally is above 50 %

3.3
fibre
unit of matter characterised by a high ratio of length to thickness or diameter

3.4
filament
variety of fibres characterised by extreme length, such that there are normally no filament ends within a part except at geometric discontinuities

Note 1 to entry: Fibre and filament are often interchanged.

Note 2 to entry: Filaments can be formed into roving or yarn with low twist.

3.5
twist
number of turns per unit length about the axis, in a yarn or other textile strand

3.6
sizing agent/coupling agent
chemical substance applied to filaments/fibres for protection, processability and influence on mechanical and chemical properties

3.7
fibre strand
bundle of filaments

3.8
yarn
twisted strands

Note 1 to entry: For carbon fibre, yarn can be used on filament bundle with 0 twist.

3.9
roving
number of strands, tows or ends collected into a parallel bundle with little or no twist

4 Content of a declaration

A declaration for the fibre 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 fibre 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 16245-3), 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 standard or test method, this test standard or test method shall be used;

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

— if the test environment is not clearly stated in the specific test 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.

5.2 Properties of carbon fibre

The specific declaration requirements for carbon fibre are listed below. The declaration including tolerances shall be given in accordance with the test standards stated in Table 1.

Deviations from the referred standards shall be clearly stated and explained.

The following specific declaration requirements a) to n) apply for all carbon fibre independent of application:

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

b) fibre density [g/cm^3];

NOTE 1 Defines the density of the roving/yarn without sizing agent.

c) linear density [g/km (= tex)];

NOTE 2 Defines the linear density of the roving/yarn without sizing agent. Given as supply batch value and bobbin/roll value.

d) filament count (f);

e) filament diameter [µm];

f) size identification code, surface preparation and chemical basis of the sizing:

1) Defines the size applied to the fibre with respect to type and product identification.

2) The size identification shall refer to a revision number or date of modification if number/code is the same for different versions of the size formulation.

3) Identification of other type of preparation.

g) size content [wt%];

NOTE 3 Defines the average amount of size applied to fibre.

h) fibre twist [t/m]:

1) Defines the amount of twist. The twist refers to the twist after the roving/yarn has been taken off the bobbin/roll according to advised method. The associated take off method shall be mentioned, e.g. roll off or pull out from centre.

i) strand length (not applicable if continuous) [mm];

j) tensile strength [MPa]:

1) The standard and method applied shall be declared.

k) tensile modulus [GPa]:

1) The standard and method applied shall be declared.

l) tensile strain at break [%]:

1) The standard and method applied shall be declared.

m) packing/storing condition;

NOTE 4 Specifies the temperature and humidity at packaging premises and when stored.

n) bobbin/spool characteristic (i.e. spool dimensions, mass).

The Certificate of Analysis (CoA) verifies that the selected properties for the CoA for the delivered carbon fibre material comply with the declared values, in accordance with the methods specified in Table 1. The CoA shall be given in accordance with EN 16245-1:2013, Clause 6.