

केन्द्रीय मुहर विभाग -2

संदर्भ -: के मू वी-2/16:16481

01 02 2023

विषय: IS 16481:2022 के amendment no. 2 के अनुपालन के दिशा निर्देश

यह उपरोक्त विषय के संदर्भ में है।

सक्षम अधिकारी द्वारा अनुमोदित दिशा निर्देश अनुपालन हेतु संलग्न है।

अनुरोध है की दिशा निर्देशों का तत्काल प्रभाव से अनुपालन सुनिश्चित करें।

**आदित्य दास
वैज्ञानिक D**

प्रमुख (के मू वी 2)

प्रमुख (CHBO)

Copy to: सभी क्षेत्रीय/शाखा कार्यालय/प्रयोगशालाएँ/ TXD/LRMD

CENTRAL MARKS DEPARTMENT-2

Our Ref: CMD-2/16:16481

01 02 2023

Subject: Guidelines for implementation of amendment no. 2 to IS 16481:2022

This has reference to the subject mentioned above.

The Competent Authority has approved the enclosed Guidelines for implementation.

It is requested to ensure the implementation of the above Guidelines with immediate effect.

(Aditya Das)
Scientist D

Head (CMD-2)

Head (CHBO)

Copy to:

All ROs/BOs/Labs/TXD/LRMD

CENTRAL MARKS DEPARTMENT-2

Our Ref:CMD-2/16:16481

Date: 01 02 2023

Subject: Guidelines for implementation of Amendment no. 2 to IS 16481:2022 (Textiles — Synthetic Micro Fibres for Use in Cement Based Matrix — Specification)

1. Amendment no. 2 to IS 16481:2022 has been published. The amendment shall be implemented with effect from **15 Feb 2023**.
2. The significant changes in the standard through this amendment as listed in the Table are given for the purpose of general guidance.
- 3.

Clause	Change
1.2	The scope has been elaborated by adding the following: “ Three classes of fibres based on tensile strength have been specified for polyester and polypropylene fibres which can be selected depending upon end use”
4.3	Currently, only virgin synthetic fibers (monofilament/multifilament in case of polyester and nylon and monofilament/fibrillated in case of polypropylene) of cut length 6 mm to 25 mm, are permitted. Now, it has been specified that if required by the customer, fibres of cut length more than 25 mm are permitted.
4.3.1 and 4.3.2	The clause 4.3.1 which specifies the manner of checking for polyester virgin fibres, as well as requirements for polymer content of all virgin polymers and other additives have been separated into two different clauses, 4.3.1 and 4.3.2 for more clarity
4.3.3	The table for secant modulus values has been modified to specify the requirements more clearly
4.4	The requirement for Resistance to Alkalis has been relaxed from 90 percent to 85 percent (of their original breaking strength retained).
4.7	The requirement for Resistance to Ultraviolet Light has been relaxed from 90 percent to 85 percent (of original tensile strength value).
4.2, Table 2, SI No. ii),	Value of length of synthetic fibre has been changed to 6 to 25 to align it with value given at Cl. 4.3
Annex G and J	Test methods for determination of specific gravity and equivalent fibre diameter have been modified

4. Revised product manual incorporating the amendment is being circulated separately.

5. Most of the changes to the standard through this amendment are editorial, apart from relaxations in requirements for Cut length of fibres, Resistance to Alkalis and Ultraviolet Light.
6. However, since the test methods for determination of specific gravity and equivalent fibre diameter have been modified, CHBO shall advise the licensee to declare that they will implement the amendment including the modified test methods and also submit an in house/independent test report of the product where sample has been tested as per the modified methods as well as any additional test equipment required by **15 Feb 2023**. The implementation of the amendment including the modified test method shall be verified during the next factory visit.
7. Similarly, other BOs which receive any application till 15 Feb 2023 for this product, shall also advise the applicant to declare that they will implement the amendment and also submit an in house/independent test report of the product where samples has been tested as per the modified methods as well as any additional test equipment required by **15 Feb 2023**. The implementation of the amendment including the modified test methods shall be verified during the next factory visit.
8. No application for grant of licence and/or change in scope of licence shall be accepted or grant of licence/change in scope permitted without consideration of the amendment after **15 Feb 2023**.
9. The above guidelines come into force with immediate effect.

Aditya Das
Sc. D

Head (CMD-2)
DDG (Certification)

AMENDMENT NO. 2 JANUARY 2023

TO

**IS 16481 : 2022 TEXTILES — SYNTHETIC MICRO-FIBRES FOR USE IN CEMENT
BASED MATRIX — SPECIFICATION**

(First Revision)

(Page 1, Clause 1) — Renumber the clause as **1.1** and insert the following clause after Clause **1.1**:

‘**1.2** Three classes of fibres based on tensile strength have been specified for polyester and polypropylene fibres which can be selected depending upon end use.’

(Page 3, Clause 4.3) — Insert the following note under the clause:

‘NOTE — If required by the customer, fibres of cut length more than 25 mm are permitted.’

(Page 3, Clause 4.3.1) — Substitute the following for existing:

‘**4.3.1** The user shall obtain a test certificate for every lot of fibre purchased from the fibre manufacturer along with a test report, if any indicating that the fibre supplied is virgin fibre. For checking polyester virgin fibres, a routine test may be conducted by examining them under ultraviolet light where recycled fibers appear blue while virgin fibers appear white. However, in cases of dispute, the maximum Isophthalic Acid (IPA) content shall be ‘Not Detectable’ when tested by the method prescribed in Annex C.

NOTE — The PP and Nylon polymers are not recycled for the type of use specified in this standard.

4.3.2 The polymer content of all virgin polymers of polyester, polyamide and polypropylene shall be minimum 97 percent and other additives such as oxidation and UV stabilizers shall not be more than 3 percent and the same shall be validated by a certificate from the polymer supplier for each lot for batch wise process.

NOTE — For continuous process of production from master batch of Poly Terephthalic Acid (PTA) and mono ethylene glycol, the polymer content shall be calculated by subtracting percentage of additives added to the polymer from 100 which shall be more than 97 percent. The manufacturer shall calculate the polymer content and maintain records for inspection by the inspecting agency.

4.3.3 The secant modulus of the fibers shall not be less than the values as per the table given below:

Sl No.	Type of fibre	Secant Modulus (10³MPa) at 3 % extension, <i>Min</i>
(1)	(2)	(3)
i)	Polyester	2
ii)	Polypropylene	2
iii)	Nylon 6	2

The user shall obtain a test certificate from the fibre manufacturer for every lot of fibre purchased along with a test report, if any, indicating conformance to the requirements of secant modulus as per the table given above.’

Price Group 2

Amendment No. 2 to IS No. 16481

(Page 3, Clause 4.4, line 2) — Substitute ‘85 percent’ for ‘90 percent’.

(Page 4, Clause 4.7, line 5) — Substitute ‘85 percent’ for ‘90 percent’.

[Page 6, Table 2, Sl No. ii), col (3)] — Substitute ‘6 to 25’ for ‘5 to 25’.

(Page 17, Annex G, see Amendment 1) — Substitute the following for the existing:

‘G-1 PREPARATION OF TEST SAMPLE

The gross samples, approximately 1 kg, shall be spread out evenly on a level ground in the form of either a square with each side slightly greater than 1 m or in the case of a larger sample, a rectangle with the shorter side slightly greater than 1 m and the larger side slightly greater than 2 m. Over this, a metallic framework of size 1 m × 1 m with 25 sub-squares or 1 m × 2 m with 50 sub-squares, as the case may be, shall be placed. From each of these sub-squares one bunch (or more) of fibres shall be pulled out at random, taking care (a) not to exercise any bias in favour of or against any particular place within a sub-square, and (b) that the fibres drawn from each sub-square weigh about the same amount. The total quantity of about 6 g to 10 g of fibres drawn shall constitute the reduced sample.

G-1.1 The reduced sample shall be divided into 25 or 50 approximately equal groups. From a different portion of each of these groups one small tuft (or more) of fibres shall be extracted at random, taking care that the fibres drawn are nearly equal in weight, and the total weight of fibres thus drawn is not less than 200 mg. This shall constitute the ‘test sample’.

G-2 Select five tufts from a well spread-out sample. Parallelize them thoroughly by gently combing both sides alternately. Clamp one end of a tuft and again parallelize them. Apply a suitable tension sufficient to remove the crimp in the fibres and grip the free end of the tuft. Ensure that all the fibres are caught at both the grips. Using a cutter, cut the fibres of a specified length (l) to ensure that all fibres are of equal length. Collect the fibres and place on the velvet pad. Cover it with a glass slide. Collect 100 fibres and weigh in the microbalance to an accuracy of 0.005 mg. Repeat the procedure with the remaining four tufts.

G-3 Let d be the mean fibre diameter in cm, correct to two decimal places as determined in IS 6919.

G-4 For circular cross-section fibres, calculate the specific gravity of the fibre by the formula:

$$\text{Specific gravity of the fibre} = \frac{4m}{\pi d^2 l n}$$

where

m = mass of specimen in mg;

l = length of fibres in cm;

d = mean fibre diameter in cm; and

n = total number of fibres.

G-5 For triangular cross-section fibres, calculate the specific gravity of the fibre by the formula:

$$\text{Specific gravity of the fibre} = \frac{m}{a \times \sin 60 \times a/2 \times l \times n} = \frac{m}{0.433 a^2 \times l \times n}$$

Where

a = side of the equilateral triangle of cross-section of the fibre.

G-6 For rectangular cross-section fibres, calculate the specific gravity of the fibre by the formula:

$$\text{Specific gravity of the fibre} = \frac{m}{a \times b \times l \times n}$$

Where

a = longer side of the rectangle of cross-section of the fibre; and

b = shorter side of rectangle of cross-section of the fibre.'

(Page 21, Annex **J-2.1**) — Substitute the following for the existing:

J-2.1 Select a tuft from a well spread-out sample. Parallelize them thoroughly by gently combing both sides alternately. Clamp one end of a tuft and again parallelize them. Collect 50 fibres and weigh it accurately to nearest mg. Find out the average mass of individual fibre by dividing the total mass by total number of fibres. Measure the length accurately and then calculate the average fibre length. The average mass, m_f in g, and the average (developed) length, l_d in mm, of the fibre shall be determined to an accuracy of 0.001 g and 0.01 mm, respectively. The equivalent fiber diameter shall be computed from the mass and the developed length using the following formula with the nominal density of the fibre, ρ , in g/cm^3 :

$$d_e = \sqrt{\frac{4.m_f.10^6}{\pi.\rho.l_d}}$$