



उत्पाद मैनुअल
फ्लोरोपॉलीमर डिस्पर्स तथा संकचन और बहिर्वेधन के लिए सामग्री भाग 1 अभिमान प्रणाली
IS 14635 (PART 1) : 2025 के अनुसार

**PRODUCT MANUAL
FOR FLOUROPOLYMER DISPERSION AND EXTRUSION MATERIALS PART 1
DESIGNATION SYSTEM ACCORDING TO IS 14635 (PART 1) : 2025**

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	मानक संख्या IS No.	:	IS 14635 (Part 1) : 2025
	शीर्षक Title	:	फ्लोरोपॉलीमर डिस्पर्स तथा संकचन और बहिर्वेधन के लिए सामग्री भाग 1 अभिमान प्रणाली Flouropolymer Dispersion and Extrusion Materials Part 1 Designation System
	संशोधनों की संख्या No. of amendments	:	Nil
2.	नमूना दिशानिर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	No specific requirement for raw material.
b)	समूहीकरण दिशानिर्देश Grouping guidelines	:	1. Samples from both a) PTFE granular moulding and ram extrusion materials, and b) PTFE resin produced from coagulation of dispersion shall be tested to cover both the varieties PTFE (cl 1.2.1) in the scope of licence.

			2. A sample from each type of fluoropolymer (cl. 1.2.2 to 1.2.7) shall be tested for covering the variety in the scope of licence. Note : i. It shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the manufacture and testing of the varieties to be included in the scope of licence. ii. During the operation of licence, BO shall ensure that all the varieties covered in the scope of license are drawn for independent testing on rotation over a period of time.
c)	नमूने का परिमाण Sample Quantity	:	1 kg powder + Prepared pieces for mechanical requirements.
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request		Name of the product: Type:
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-A देखें Please refer ANNEX – A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	कृपया Annex-B देखें Please refer ANNEX – B
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	a. Bulk Density b. Particle Size c. Melt Peak Temperature d. Extrusion Pressure e. Stretch Void Index f. PTFE percentage in dispersion g. Surfactant percentage in dispersion h. Surfactant tolerance level		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 14635 (Part 1) with the following scope:		
	उत्पाद का नाम Name of the product		Fluoropolymer Dispersion and Extrusion Materials Part 1 Designation System
	Types		PTFE (including or excluding PTFE granular moulding and ram extrusion materials, and PTFE resin produced from coagulation of dispersion) and / Aqueous Dispersion of PTFE/ Melt processable resin / PCTFE / TFE PDD/ Aqueous Dispersion Melt processable resin/ Melt processable PTFE (PTFE Micro powder) Resin Produced from Coagulation of Dispersion or by Thermomechanical Degradation

ANNEX- A

List of Test Equipment

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Standard Specific Gravity, Clause 1.2.1 and 4.5.1.1.1 and Thermal Instability Index Clause 1.2.1 and 4.5.1.1.2	Cylindrical preforming mould Flat Aluminium foil discs Air conditioner and Thermometer Weighing scale (LC 0.1 gm) Sieve (2.0 mm) Hydraulic Press Sintering Oven
2.	Bulk density Clause 1.2.1, Clause 1.2.7 and 4.5.1.1.3	Funnel, as shown in Fig. 4. of IS 14635 Part 2 Feeder, with a wire screen having 2.38 mm openings Controller Volumetric Cup and cup stand as per fig 5 of IS 14635 Part 2 Levelling Device as per fig 6 of IS 14635 Part 2 Work Surface Weighing scale (LC 0.1 gm)
3.	Particle Size Clause 1.2.1, Clause 1.2.7 and 4.5.1.1.4	<u>Wet – Sieve Analysis</u> Weighing scale (LC 0.1 gm) Standard Sieves- 1.4 mm (No. 14), 1 mm (No. 18), 710 µm (No. 25), 500 µm (No. 35), 355 µm (No. 45), 250 µm (No.60) and 180 µm (No. 80) Ventilated Hood, Six beakers, capacity 150 ml Sieving and solvent-spraying apparatus, a suggested arrangement for an apparatus with recirculating spray liquid is shown in Fig. 7 of IS 14635 Part 2 Spray Liquid <u>Dry Sieve Analysis</u> Weighing scale (LC 0.1 gm) Standard Sieves- 1.4 mm (No. 14), 1 mm (No. 18), 710 µm (No. 25), 500 µm (No. 35), 355 µm (No. 45), 250 µm (No.60) and 180 µm (No. 80) Mechanical Sieve shaker Freezer <u>Coulter Principle Using a Resistance-Variation Tester</u> Electric sensing-zone particle counter Analytical balance Magnetic stirrer Ultrasonic tank <u>Light Scattering of a Laser Beam</u>

		The particle-size analyser shall be based on Fraunhofer diffraction, Mie scattering or a combination of both light-scattering analysis techniques
4.	Tensile Properties Clause 1.2.1, Clause 1.2.3 and 4.5.1.1.e	Micrometer Specimen cutter Steel rule die as per Fig 9 of IS 14635 Part 2 UTM Machine
5.	Dielectric Strength Clause 1.2.1 and 4.5.1.1.6	Conditioning chamber Surrounding medium (transformer oil according to IEC 60296, silicone fluid according to IEC 60836 or ester fluid according to IEC 61099) Voltage source
6.	Powder flow time Clause 1.2.1 and 4.5.1.1.7	Feeder, with a wire screen having 2.38 mm openings Funnel, complying with Fig. 10 of IS 14635 Part 2, constructed of aluminium and electroplated with a regular chromium coating as described in A-2.1 of BS 4641, to a thickness of 12 µm. Controller Vibrator, capable of vibrating the funnel at 50 cycles per second with an amplitude of 0.75 ± 0.25 mm. Volumetric Cup and Cup Stand, as Detailed in Fig 11 of IS 14635 Part 2 Work Surface Timing device Levelling Device as per fig 6 of IS 14635 Part 2 Conditioning chamber
7.	Deformation temperature under load Clause 1.2.1 and 4.5.1.1.8	Flexural stress machine as per figure 1 of ISO 75-1. Heating equipment- heating bath containing a suitable liquid, a fluidized bed or an air oven Weights Temperature measuring equipment (LC 1 deg C) Deflection measuring instrument- calibrated dial gauge or any other indicating or recording device, including electric displacement sensing apparatus (LC- 0.01mm) Micrometer and gauges
8.	Melting peak temperature Clause 1.2.1, Clause 1.2.3, Clause 1.2.7 and 4.5.1.1.9	Weighing balance Differential Scanning Calorimetry Heating and cooling device

9.	Extrusion Pressure Clause 1.2.1 and 4.5.1.1.10	Paste extruder as per fig 12 of IS 14635 Part 2- with pressure gauge, temperature controller Interchangeable Extrusion Dies (as per fig 12 of IS 14635 Part 2), each having a 30° included angle Miscellaneous Apparatus, for weighing, blending, conditioning (at 30 °C) and preforming, as well as for cleaning the extruder. Sieve- 4.75mm Weighing Balance Water Bath Kerosene type hydrocarbon liquid Tumbler (V Blender)
10	Stretching Void Index Clause 1.2.1 and 4.5.1.1.11	Weighing Balance Sieve- 2.00 mm Mould for sample preparation Hydraulic Press Micrometer Specimen cutter UTM machine
11	PTFE percentage in dispersion Clause 1.2.2 and 4.5.1.2.1 Surfactant percentage in dispersion Clause 1.2.2 and 4.5.1.2.2 Surfactant tolerance level Clause 1.2.2 and 4.5.1.2.3	Weighing balance (LC- 0.1mg) Hot air oven High temperature oven (till 400 deg C) Aluminium weighing disc Dessicator
12.	Melt Mass flow rate Clause 1.2.3, Clause 1.2.7 and 4.5.2.1.2	Extrusion Plastomer as per fig 1 of ISO 1133-1 having following essential parts: • Cylinder- length between 115 mm and 180 mm and an internal diameter of (9.550 ± 0.007) mm and shall be fixed in a vertical position • Piston • Temperature control system • Die- Tungsten carbide or hardened steel • Load- set of removable weights • Packing road • Cleaning equipment • Go/ no go gauges • Temperature calibration device • Die plug • Device for preforming samples • Sample cutting device • Timer • Weighing balance

13.	Density Clause 1.2.3 and 4.5.2.1.3	Method A- Immersion Test - Analytical Balance- 0.1 mg - Immersion Vessel - Stationary support - Thermometer- LC 0.1 deg C - Wire- corrosion resistant - Sinker - Pyknometer- equipped with thermometer - Liquid Bath- thermostatically controlled - Immersion liquid- distilled of deionized water Method B- Liquid Pyknometer Method - Balance- accurate of 0.1mg - Stationary support - Pyknometer - Liquid Bath - Dessicator- connected to vacuum system - Immersion Liquid Method C - Titration Method - Liquid Bath- thermostatically controlled - Glass Cylinder- capacity 250 ml - Thermometer - Volumetric Flask- 100ml - Flat tipped glass rod stirrer - Burette
14	Zero Strength Time Clause 1.2.4 and 4.5.2.2	- Device of preforming sample with mold and application of hydrostatic pressure. - Sintering oven - Conditioning chamber - Cylindrical Brass Thermostat as per Annex A of ASTM D 1430. Provision shall be made to heat the apparatus so that temperature can be maintained at $250^{\circ}\text{C} \pm 1^{\circ}\text{C}$ - Timing mechanism, Thermometer - Specimen Holder, Clip on weight, Cutting tools - Notching tools
15.	Glass transition temperature Clause 1.2.5 and 4.5.2.3	Weighing balance Differential Scanning calorimetry
16.	Polymer percentage in dispersion Clause 1.2.6 and 4.5.2.4.1 Surfactant percentage in dispersion Clause 1.2.6 and 4.5.2.4.2 Surfactant tolerance level clause 1.2.6 and 4.5. 2.4.3	Weighing balance (LC- 0.1mg) Hot air oven High temperature oven (till 400 deg C) Aluminium weighing disc Dessicator

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : For the purpose of this scheme, the total quantity of fluoropolymer of the same type produced from the same type of raw material in one day shall constitute one control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred :

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the license shall be marked on each package of the material, provided always that the product thus marked conforms to all the requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 Additional Marking requirements: Additionally, the following shall also be marked on product or package :

- a) "For BIS certification details please visit www.bis.gov.in"
- b) Any other requirement not specified in the Indian Standard

4. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(Recommended Levels of Control by BIS- For Guidance Only)

(1)				(2)		
Test Details				Levels of Control		
Cl.	Requirement	Test Method Cl. Ref.	Test Method IS	No. of Sample	Frequency	Remarks
1.2.1	Polytetrafluoroethylene (PTFE)- For PTFE granular moulding and ram extrusion materials, and for PTFE resin produced from coagulation of dispersion					
a)	Standard Specific Gravity	4.5.1.1.1 6.1	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	-
b)	Thermal Instability Index	4.5.1.1.2 6.1	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
c)	Bulk density	4.5.1.1.3 6.2	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
d)	Particle Size	4.5.1.1.4 6.3	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
e)	Tensile properties	4.5.1.1.5 6.4	IS 14635 Pt 1 IS 14635 Pt 2	Five	Each Control Unit	
f)	Dielectric Strength	4.5.1.1.6 ---	IS 14635 Pt 1 IEC 60243-1 or ASTM D 149	One	Each Control Unit	
g)	Powder flow time	4.5.1.1.7 6.5	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
h)	Deformation temperature under load	4.5.1.1.8 ---	IS 14635 Pt 1 IS 13360 (Part 6/sec 17)	As per agreement between manufacturer and purchaser.		

j)	Melting peak temperature	4.5.1.1.9 6.6	IS 14635 Pt 1 IS 14635 Pt 2	Two	Each Control Unit	
k)	Extrusion pressure	4.5.1.1.10 6.7	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
m)	Stretching Void Index	4.5.1.1.11 6.8	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
1.2.2	Aqueous Dispersion of PTFE					
a)	PTFE percentage in dispersion	4.5.1.2.1 6.9.2	IS 14635 Pt 1 IS 14635 Pt 2	Two	Each Control Unit	
b)	Surfactant percentage in dispersion	4.5.1.2.1 6.9.2	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
c)	Surfactant Tolerance level	4.5.1.2.1 6.9.2	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
1.2.3	For Melt-processable Resins (CPT, ECTFE, EFEP, ETFE, FEP, PFA, PVDF, PVF, VDF/CTFE, VDF/HFP, VDF/TFE, VDF/TFE/HFP)					
a)	Melting Peak Temperature	4.5.2.1.1 6.6	IS 14635 Pt 1 IS 14635 Pt 2	Two	Each Control Unit	
b)	Melt mass flow rate	4.5.2.1.2 6.10	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
c)	Density	4.5.2.1.3 6.11	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
d)	Tensile Strength	4.5.1.1.e 6.4	IS 14635 Pt 1 IS 14635 Pt 2	Five	Each Control Unit	
e)	Elongation at break	4.5.1.1.e 6.4	IS 14635 Pt 1 IS 14635 Pt 2	Five	Each Control Unit	
1.2.4	For PCTFE					
a)	Zero Strength Time	4.5.2.2 -----	IS 14635 Pt 1 ASTM D 1430	One	Each Control Unit	

1.2.5	For TFE/PDD					
a)	Glass Transition Temperature	4.5.2.3 -----	IS 14635 Pt 1 ASTM D 4591 or ISO 11357-2	One	Each Control Unit	
1.2.6	For Aqueous Dispersion of Melt-processable Resins (ETFE, FEP, PFA, PVDF, PVF, VDF/CTFE, VDF/HFP, VDF/TFE, VDF/TFE/HFP)					
a)	Polymer percentage in dispersion	4.5.2.4.1	IS 14635 Pt 1	Two	Each Control Unit	
b)	Surfactant percentage in dispersion	4.5.2.4.2	IS 14635 Pt 1	One	Each Control Unit	
c)	Surfactant Tolerance level	4.5.2.4.3	IS 14635 Pt 1	One	Each Control Unit	
1.2.7	For Melt Processable PTFE (PTFE Micro powder) Resin Produced from Coagulation of Dispersion or by thermomechanical Degradation					
a)	Particle Size	4.5.1.1.4 6.3	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
b)	Melting Peak Temperature	4.5.2.1.1 6.6	IS 14635 Pt 1 IS 14635 Pt 2	Two	Each Control Unit	
c)	Melt mass flow rate	4.5.2.1.2 6.10	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	
d)	Density	4.5.2.1.3 6.11	IS 14635 Pt 1 IS 14635 Pt 2	One	Each Control Unit	