



उत्पाद मानुयल
पॉलीकार्बोनेट संचकन और बहिर्वेधन सामग्री – विशिष्टि
IS 14434:2023 के अनुसार

PRODUCT MANUAL FOR
POLYCARBONATE MOULDING AND EXTRUSION MATERIALS- SPECIFICATION
ACCORDING TO IS 14434: 2023

भारतीय मानक ब्यूरो -की स्कीम 2018 विनियम (अनुरूपता मूल्यांकन)। के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीयशाखा / कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस प्रमाण पत्र प्राप्त करने के इच्छुक भावी/लाइसेन्स आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices& licensees to ensure coherence 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 license/certificate.

1	उत्पाद Product	:	IS 14434: 2023
	शीर्षक Title	:	POLYCARBONATE MOULDING AND EXTRUSION MATERIALS- SPECIFICATION
	संशोधन संख्या No. of Amendments	:	Nil
2	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
A	कच्चा माल Raw material	:	No specific requirement
B	समूहिकरण दिशा निर्देश Grouping guidelines	:	कृपया Annex-A देखें Please refer ANNEX-A
C	नमूनेका परिमाण Sample Size	:	3 Kg granules
3	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-B देखें Please refer ANNEX-B

4	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer ANNEX-C
5	एक दिन में संभावित परीक्षण Possible tests in a day :	:	Except test for Determination of Ash, all tests require pre-conditioned samples (48 hrs at $27 \pm 2^\circ$ C under $65 \pm 5\%$ RH) as per Cl. 7 of IS 14434: 2023
6	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence:		
	IS 14434: 2023 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है Licence is granted to use standard Mark as per IS 14434: 2023 with the following scope:		
	उत्पाद का नाम Name of the product	Polycarbonate Moulding and Extrusion Materials	
	Designation(s)	Designation of Polycarbonate Moulding and Extrusion Materials as per Cl. 4 of IS 14434: 2023 For eg. – IS 14434-PCGF10-ILRC-22265-F34	

BUREAU OF INDIAN STANDARDS
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New Delhi – 110002

ANNEX-A
GROUPING GUIDELINES

1. The manufacturer shall declare, in their application for considering grant of licence and/or change in scope of licence, each designation code which they intend to cover in the scope of the licence. The Scope of Licence may be restricted based on the Manufacturing and testing capabilities of the Manufacturer.
2. For considering grant of licence and/or change in scope of licence, the following grouping shall be considered:

Data Block	Details of Data Block	Sample to be drawn/tested pertaining to each data block
Data Block 1	For Indian Standard	For information purpose only and has no bearing on the testing
Data Block 2	Identification of the type of thermoplastic material, its form of reinforcement or filler present and the level of addition of reinforcement or filler by its symbol and codification system as per Table 1 and 2	a) Manufacturer shall declare the thermoplastic material, its type and form of reinforcement or filler present and the level of addition of reinforcement or filler intended to be covered in the scope of licence as per Cl. 4.2.2 b) One sample from each combination of filler/reinforcement shall be tested as per IS 13360(Part8/Sec 8) to determine the percentage of filler/reinforcement represented by coding system as per Table 2
Data Block 3	Method of processing and information regarding presence of specific additives, colours and any specific feature of the material.	Position 1: Manufacturer shall declare the method of processing represented by a code letter as per Table 3 Position 2 to 4: Manufacturer shall declare presence of specific additives, colours and any specific feature of the material represented by code letters as per Table 3 (This is to be provided only as information to BIS and has no bearing on the testing)
Data Block 4	Designation properties	
	Melt Flow Index (MFI)	a) Manufacturer shall declare the range of Melt Flow Index (MFI) (<3 g/10 min to > 24 g/10 min) represented by a code number as per Table 4, being manufactured and intended to be covered in the scope of licence as per Cl. 4.2.4.1, Sl. No. (a) for each combination. b) One sample each of the highest, lowest and intermediate MFI range, may be tested to cover the ranges. E.g. to cover designation codes for 1,2,3,4,5 for MFI Range, only three samples i.e. one each of code 1, code 5 and any one of the codes among 2,3 or 4

		may be tested as per test conditions in table 4 of IS 14434.
	Specific Gravity	a) Manufacturer shall declare the range of Specific Gravity of the material (1.19 to >1.50) represented by a code number as per Table 4, intended to be covered in the scope of licence as per Cl. 4.2.4.1, Sl. No. (b) for each combination. b) One sample each of the designation code pertaining to the highest and lowest Specific Gravity range (1.19 to >1.50) intended to be covered in the scope of licence shall be tested
	Flexural Modulus	a) Manufacturer shall declare the Flexural Modulus represented by a code number as per Table 4, intended to be covered in the scope of licence as per Cl. 4.2.4.1, Sl. No. (c) for each combination. b) One sample against each code number as per Table 4, to be tested
	Charpy Impact Strength, Notched	a) Manufacturer shall declare the Charpy Impact Strength, Notched represented by a code number as per Table 4, intended to be covered in the scope of licence as per Cl. 4.2.4.1, Sl. No. (d) for each combination b) One sample against each code number as per Table 4, to be tested
	Deflection Temperature	a) Manufacturer shall declare the Deflection Temperature under load of 1.82 MPa represented by a code number as per Table 4, intended to be covered in the scope of licence as per Cl. 4.2.4.1, Sl. No. (e) for each combination. b) One sample against each code number as per Table 4, to be tested
Data Block 5 (optional)	Additional requirements	a) Manufacturer may declare additional performance requirement, if required like electrical, flammability and optical requirements intended to be covered in the scope of licence as per clause 4.2.5 for each combination. b) One sample from each specimen thickness and flammability class (as given in cl. 4.2.5) shall be tested

3. Scope of licence shall be restricted based on the manufacturing and testing facilities available.
4. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX – B
List of test equipment

Sl. No	Tests used in with Clause Reference	Test Equipment
1	For sample preparation and Conditioning of Test Specimens, Cl. 6 of IS 14434:2023 Reference IS 13360(Part 2/ Sec 3)	Injection Molding Machine or compression moulding machine, Hot air oven, Desiccator, Anhydrous Calcium Chloride, Humidity Chamber with relative humidity and temperature indicator, Hygrometer, Thermometer, Stop Watch, Air Conditioner
2	Determination of Ash, Cl. 4.2.2.2 of IS 14434:2023, Reference IS13360(Part 8/ Sec 8) (Method A — Direct calcination OR Method B — Calcination following sulfuric acid treatment after burning OR Method C — Calcination following sulfuric acid treatment before burning OR Method D —Automated instrument method)	<u>Apparatus:</u> Crucible made of silica, porcelain, ceramics, fibres, quartz, glass or platinum, Gas burner, Muffle furnace, Analytical balance accurate to 0.1 mg, Pipettes of suitable capacity (for methods B and C only), Desiccator, Weighing bottle, Fume cupboard or other suitable means of ventilation For automated instruments, the following apply: — fully automatic analysis instrument with integrated drying oven, muffle furnace, analytical balance and a sample turntable; <u>Reagents</u> (for method B and C only): Ammonium carbonate, anhydrous, Ammonium nitrate, Sulfuric acid
3	Melt Flow Index, Cl. 4.2.4.1, Sl. No. (a), and Cl. No. 5.1, Table 4 of IS 14434:2023, Reference IS 13360 (Part 4/Sec 1/Subsec 1) / IS 13360 (Part 4/Sec 1/Subsec 2)	<u>Method as per IS 13360(Part 4/Sec 1/ Subsec 1):</u> Extrusion plastometer, Cylinder, Steel piston, Temperature-control system, Dies, Removable load, packing rod made of non-abrasive material, Cleaning equipment., Go/no-go gauge, Temperature-calibration device (thermocouple, platinum-resistance thermometer or other temperature-measuring device), Die plug, Piston/weight support, Preforming device <u>Equipment for procedure A:</u> Cutting tool, Timer, Balance, <u>Equipment for procedure B:</u> Piston displacement transducer/timer OR <u>Method as per IS 13360(Part 4/Sec 1/ Subsec 2):</u> <u>Apparatus:</u> Extrusion plastometer, Cylinder, Piston, Temperature-control system, Die, means of setting and maintaining the cylinder truly vertical, Load <u>Accessory equipment:</u> Packing rod, Cleaning equipment, Go/no-go gauge, Temperature verification device, Die plug, Piston/weight support, Preforming device, Drying equipment (Vacuum ovens or hot air dryers), Equipment for melt mass flow rate determination (Procedure A), Equipment for melt

		volume flow rate determination (Procedure B)
4	Specific Gravity, Cl. 4.2.4.1, Sl. No. (b) and Cl. 5.2, Table 4 of IS 14434:2023, Reference IS 13360 (Part 3/ Sec 10) or IS 13360(Part 3/ Sec 11) or IS 13360 (Part 3/ Sec 12)	<u>IS 13360(Part 3/Sec 10):</u> <u>Method A- Immersion method</u> Analytical Balance, Immersion vessel, Thermometer, Stationary support, Wire, Sinkers, Pycnometer, Liquid Bath, Immersion Liquid <u>Method B- Liquid Pycnometer method</u> Analytical Balance, Stationary support, Desiccator, Pycnometer, Liquid Bath, Immersion Liquid <u>Method C — Titration method</u> Liquid Bath, Glass cylinder, Thermometer, Volumetric flask, capacity 100 ml, Flat-tipped glass rod stirrer, Burette, Immersion Liquid <u>IS 13360(Part 3/Sec 11) :</u> Density gradient column, Liquid Bath, Calibrated glass floats, Balance (LC ± 0.1 mg), Siphon or pipette assembly, Immersion liquids <u>IS 13360(Part 3/Sec 12) :</u> Gas pycnometer, Measurement gas (preferably helium or other non-corrosive and non-adsorbing gas), Thermostatically controlled bath or enclosure
5	Flexural modulus, Cl. 4.2.4.1, Sl. No. (c) and Cl. 5.3, Table 4 of IS 14434:2023, Reference IS 13360 (Part 5/ Sec 7)	Flexural modulus Test equipment, Standard Test pieces
6	Charpy Impact Strength, Notched Cl. 4.2.4.1, Sl. No. (d), and Cl. 5.4, Table 4 of IS 14434:2023, Reference IS 13360 (Part 5/ Sec 5)	Charpy Impact Strength Test machine, Micrometers and gauges
7	Deflection temperature, Cl. 4.2.4.1, Sl. No. (e) and Cl. 5.5, Table 4 of IS 14434:2023, Reference IS 13360 (Part 6/ Sec 3)	Flexural stress apparatus, Heating equipment, Weights, Temperature-measuring instrument, Deflection Measuring Instrument, Micrometers and gauges
8	Additional Requirements (Cl.4.2.5)	

(i)	Electrical Properties, Cl. 4.2.5.2 of IS 14434:2023, Reference IS 3396/ IS 4486	<u>As per IS 3396:</u> DC Voltmeter, Galvanometer, Electrometer, Instrument for Measuring Dimension and Thickness <u>As per IS 4486:</u> Voltage Source, Detector, Schering Bridge or Transformer Bridge or Parallel T Networks or Q Meter or Micrometer Electrode System,
(ii)	Test for Flammability, Cl. 4.2.5.2 of IS 14434:2023, Reference Annex C of IS 14434:2023	Test Chamber Laboratory burner Ring Stand Wire Gauze Gas Supply of Technical Grade Methane Support Fixture as per Annex-C of IS 14434: 2023 Stopwatch
(iii)	Optical Requirements, Cl. 4.2.5.2 of IS 14434:2023 Reference IS 13360(Part 9/ Sec 5)	Haze meter or Recording Spectrophotometer

This is an indicative list and may not be taken as being exhaustive

ANNEX C
Scheme of Inspection and Testing

1. **LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
- 1.1 The manufacturer shall prepare and implement a calibration plan for the test equipments.
2. **TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.
3. **PACKING AND MARKING** – The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each bag and/or unit package of the product, provided always that the material so marked conforms to each requirement of the specification. Marking to be done on smallest bag and/or unit package that is being sent to customer.
- 3.1 The information as mentioned under clause 8.2 of IS 14434:2023 shall be legibly and indelibly marked on each bag and/or unit package. In addition, the following shall be incorporated on each bag and/or unit package:
 - (i) BIS License Number CM/L—and
 - (ii) BIS website details i.e. —"For details of BIS certification please visit www.bis.gov.in"
4. **CONTROL UNIT** – For the purpose of this scheme entire quantity of material of same designation code produced continuously in a line over a period of one day or part thereof shall constitute a control unit.
5. **TEST CERTIFICATE** - For each consignment of BIS Certified material conforming to IS 14434:2023, there shall be a test certificate which shall contain the Lot/Batch/Control Unit number and the corresponding test results. An indicative format of such Test Certificate is given in Annexure-I.
6. **LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the level of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.
7. **REJECTIONS** – 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 (LEVELS OF CONTROL)
(Para 5 of Scheme of Inspection and Testing)

SI No.	(1)				(2)	(3)		
	Test Details				Test equipment requirement R: required (or) S: Subcontracting permitted	Levels of Control		
	Cl.	Requirement	Test method			No. of Sample	Frequency	Remarks
			Clause	Reference				
i)	4.2.2.2	Ash Content Test	----	IS13360 (Part 8/ Sec 8)	R	One	Each Control Unit	In case of failure, one more sample shall be taken for testing from the same lot. If that sample also fails in retesting, the control unit shall be rejected.
ii)	4.2.4.1, Sl. No. (a) and 5.1, Table 4	Melt Flow Index	--	IS 13360(Part 4/Subsec 1)/ IS 13360(Part 4/Sec1/Subsec2)	R	One	Each Control Unit	
iii)	4.2.4.1, Sl. No. (b) and 5.2, Table 4	Specific Gravity	--	IS 13360(Part 3/Sec 10)/ IS 13360(Part 3/Sec 11)/ IS 13360(Part 3/Sec 12)	R	One	Each Control Unit	
iv)	4.2.4.1, Sl. No. (c) and 5.3, Table 4	Flexural modulus	---	IS 13360 (Part 5/ Sec 7)	R	One	-do-	
v)	4.2.4.1, Sl. No. (d), and Cl. 5.4, Table 4	Charpy Impact Strength, Notched	---	IS 13360 (Part 5/ Sec 5)	R	One	-do-	

vi)	4.2.4.1, Sl. No. (e), and Cl. 5.5, Table 4	Deflection temperature	----	IS 13360 (Part 6/ Sec 3)	R	One	-do-	In case of failure one more sample shall be taken for testing from the same lot. If that sample also fails in retesting, the control unit shall be rejected.
vii)	4.2.5	Additional requirements *	As applicable					
vii)(a)	4.2.5.2	Electrical Properties (optional)*		IS 3396 and IS 4486	S	One	Once in three months	
vii)(b)	4.2.5.2	Flammability requirements as per UL94 (optional)*	Annex C	IS 14434	S	One	Once in three months	
vii) (c)	4.2.5.2	Optical requirements (optional)*	----	IS 13360(Part 9/ Sec 5)	S	One	Once in three months	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for the approval by BO Head.

*Note-3 : In case of additional requirements, testing needs to be done only for those additional requirements which are to be covered in the scope of licence.

ANNEXURE-I
(Indicative format of TEST CERTIFICATE)
(PARA 5 OF SCHEME OF INSPECTION AND TESTING)

ABC LIMITED
(REGISTERED OFFICE ADDRESS AND WORKS ADDRESS)
CM/L-

TEST CERTIFICATE FOR POLYCARBONATE MATERIALS FOR MOULDING AND EXTRUSION

TEST CERTIFICATE NO. _____ DATE: _____ TO

M/S: _____ (NAME AND ADDRESS OF CONSIGNEE)

We certify that the material described below fully conforms to the requirement of IS 14434:2023

Properties of the product as tested in accordance with Scheme of Inspection and Testing contained in the BIS Certification Marks
Licence CM/LNo. _____ are as indicated below against each order
(PLEASE REFER TO IS 14434: 2023 FOR DETAILS OF SPECIFICATION)

REQUIREMENTS)TEST RESULTS

Name and Type of material	Designation Code	Net Mass	Batch Number/Lot Number and Month/year of manufacture	MFI	Specific Gravity	Flexural Modulus	Charpy Impact Strength Notched	Deflection temperature	Additional requirement Electrical properties (if applicable)	Additional requirement Flammability requirements (if applicable)	Additional requirement Optical requirements (if applicable)

REMARKS

WAGON NO./TRUCK NO.

For ABC Company

(for BIS certification details www.bis.gov.in)