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उत्पाद मैन्युअल
प्लास्टिक - नम्य एव दृढ़ उपभोक्ता पैकेजिंग हेतु प्रयुक्त पॉली प्रोपाइलिन पॉलीईथीलीन (पीई) से प्राप्त पुन चक्रित पी पी एंव (पीई) मिश्रण
IS 16591 Part 1: 2016 के अनुसार

Product Manual for
Plastics - Mixtures of Polypropylene (PP) and Polyethylene (PE) Recyclate Derived from PP and PE used for Flexible and Rigid Consumer Packaging: Part 1 Designation System and Basis for Specification According to IS 16591 (Part 1): 2016

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 16591 (PART 1): 2016
	शीर्षक **Title**	:	Plastics - Mixtures of Polypropylene (PP) and Polyethylene (PE) Recyclate Derived from PP and PE used for Flexible and Rigid Consumer Packaging: Part 1 Designation System and Basis for Specification
	संशोधनों की संख्या **No. of amendments**	:	01
2.	नमूना दिशानिर्देश **Sampling Guidelines**		
a)	कच्चा माल **Raw material**	:	No specific requirement. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be establishedduring Grant of Licence/Change in Scope of Licence /Factory Surveillance
b)	समूहीकरण दिशानिर्देश **Grouping Guidelines**	:	कृपया Annex-A देखें Please refer ANNEX - A

c)	**नमूने का परिमाण** **Sample Quantity**	:	3 KG Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (incase of market surveillance, effort may be made to procure therequired quantity of product sample, as far as possible since raw material sample may not be available in market)
3.	**परीक्षण उपकरणों की सूची** **List of Test Equipment**	:	कृपया Annex-B देखें Please see Annex – B
4.	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	कृपया Annex-C देखें Please see Annex – C
5.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**		
	(i) Melt Flow Rate (Cl 3.5.2), (ii) Density (Cl 3.5.3), (iii) Color (Cl 3.3), (iv) Form (Cl 3.3) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS IS 16591 Part 1 : 2016 with the following scope: IS 16591 Part 1: 2016 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है		
	Name of the product		Plastics - Mixtures of Polypropylene (PP) and Polyethylene (PE) Recyclate Derived from PP and PE used for Flexible and Rigid Consumer Packaging
	Designation		Designation as per Cl 3 Example: Thermoplastics IS 16591(Part 1)-PE-M1(REC), NG1,, 020-95,, (or) IS 16591(Part 1)-PE-M1(REC), CG1,, 020-95,,

ANNEXURE A

GROUPING GUIDELINES

1. The manufacturer shall declare, in their application for considering grant of licence and/or change in scope of license, each designation code which they intend to cover in the scope of the license. 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 license, 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	Code-letter indicating the composition of mixtures of PP and PE recyclate	Manufacturer shall declare code-letter for each type of composition intended to be covered in the scope of licence as per Table 1. One sample of each type of composition as per data block 1 shall be tested to cover the code-letter in scope of licence
Data Block 2	Code-letter used for colour and form of materials	Manufacturer shall declare code-letter for colour and form of materials intended to be covered in the scope of licence as per Table 2.
Data Block 4	Code-number used for melt mass-flow rate and density	Manufacturer shall declare Code-number used for melt mass-flow rate intended to be covered in the scope of licence as per Table 3 Manufacturer shall declare Code-number used for density intended to be covered in the scope of licence as per Table 4 One sample of highest and lowest range of Melt mass-flow rate against code number as per Table 3 shall be tested to cover the entire range of Melt mass-flow rate in the scope of licence. One sample of highest and lowest range of density against code number as per table 4 shall be tested to cover the entire range of density in the scope of licence.
Data Block 5	Additional requirements	Manufacturer shall declare additional requirements (with compliance values) intended to be covered in the scope of licence as per clause 3.6 of IS 16591 (Part1): 2016 for each combination. (This is only to be provided only as information to BIS and has no bearing on the testing)

ANNEX – B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No.	Tests used in with Clause Reference	Test Equipment
1.	**Composition (PP and PE Ratio)** (Cl 3.2)	FTIR Spectrometer, test roll machine, PE-LLD: MFR = 1,0 g/10 min, density = 0.926 g/cm3 PP (Homo-PP): MFR = 7.7 g/10 min
2.	**Melt Mass Flow Rate Test** Cl 3.5.2	Extrusion Plastometer, Cylinder, Standard Die, Piston, Temperature Control System, Timing Device, Level as per Cl 5 of ISO 1133-1, Go/No-Go Gauge, Funnel, Packing Tool, Spatula, Balance, Weight Support, Die Plug, Micrometer
3.	**Density** Clause 3.5.3	**Gas Pyknometer Method** Analytical balance, Gas pyknometer, measurement gas, Thermostatically controlled bath or enclosure **Immersion method, Liquid Pyknometer method and Titration method** **Method A Immersion method** Analytical balance or instrument specifically designed for measurement of density, Immersion vessel, Stationary support,, Thermometer, Wire (if required), corrosion-resistant, Sinker, Pycnometer, with a side-arm overflow capillary equipped with a thermometer LC 0.1 °C Range 0 °C to 30 °C (for determining the density of the immersion liquid when the liquid is not water). Liquid bath LC ±0,5 °C, distilled or deionized water, **Method B — Liquid pycnometer method** Balance, Stationary support, Pycnometer, Liquid bath, Dessicator,, Immersion liquid, **Method C Titration method** Liquid bath, Glass cylinder, Thermometer, Volumetric flask, Flat-tipped glass rod stirrer, Burette, Immersion liquids **Density gradient column method** Analytical Balance, Density Gradient Column, Glass Floats, Siphon or pipette assembly, calibrated glass floats, Immersion liquids
4.	**Charpy Notched Impact Test (Optional)**	Charpy Impact Tester,

	As per IS 16591 (Part 2): 2016 Table1	Micrometer/Thickness Gauge
5.	**Tensile Modulus Test (Optional)** As per IS 16591 (Part 2): 2016 Table1	Universal Testing Machine i) Grips ii) Force Indicator iii) Strain Indicator iv) Extensometers v) Strain Gauges Vernier Caliper & Micrometer
6.	**Preparation of Test Specimens** As per IS 16591 (Part 2): 2016 Table1	Injection Moulding (Clause 3.4) or Compression Moulding Machine (Clause 3.4) with Sample Moulds and Hot Air Oven
7.	**Conditioning Requirements** As per IS 16591 (Part 2): 2016 table1	Hot Air Oven, Humidity Chamber with Relative Humidity and Temperature Indicator, Hygrometer, Thermometer, Stop Watch, Air Conditioner

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan 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 defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : the total quantity of product of the same designation code produced from the same type of raw materials under similar condition

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

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. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 **Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as "R" in Column 2 of Table 1)**, where different tests given in the specification shall be carried out in accordance with the method given in the specification**.** They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 **TEST RECORDS**- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

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 that is being delivered to the customer, provided always that the material so marked conforms to each requirement of the specification.

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

3.2 **Additional Marking requirements**: The material shall also be marked with the following additional requirement on each bag and/or unit package that is being delivered to the customer:

a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - All 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
(ONLY FOR GUIDANCE PURPOSE)

TEST DETAILS				Test equipment requirement R: required (or) S: Sub-contracting permitted	LEVELS OF CONTROL		REMARKS
Clause	Requirement	Test Method			No. of Sample	Frequency	
		Clause	Reference				
3.2	Composition	Cl.6	IS 16591 (Part 2): 2016	S	One	Once in a month	
3.3	Colour & Form	Cl 3.3	IS 16591 (Part 1): 2016	R	One	Each Control Unit	Visual
3.5.2	Melt Mass Flow Rate	-	ISO 1133-1	R	One	Each Control Unit	
3.5.3	Density	-	IS 13360 (Part 3/Sec 10) : 2021 ISO 1183-1 : 2019 IS 13360 (Part 3/Sec 11) : 2021 ISO 1183-2 : 2019 IS 13360 (Part 3/Sec 12) : 2016 ISO 1183-3 : 1999	R	One	Each Control Unit	
3.6	Additional Requirements (Optional)						
3.6	Optional Requirements (e.g. Charpy Impact Strength Tensile Yield Stress and Tensile Stress at Break, Flexural Modulus and Flexural Strength, etc)		ISO 18263-2/IS 16591 (Part 2): 2016	S	Testing to be done as per ISO 18263-2/ IS 16591 (Part 2): 2016, if applicable		