



उत्पाद मैनुअल

IS 5149:2020 के अनुसार

**PRODUCT MANUAL FOR
MALEIC ANHYDRIDE, TECHNICAL
ACCORDING TO IS 5149 : 2020**

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 5149:2020
	शीर्षक Title	:	Maleic Anhydride, Technical
	संशोधनों की संख्या No. of amendments	:	4 5
2.	नमूना दिशानिर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	No specific requirement
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	NA

c)	नमूने का परिमाण Sample Quantity	:	500 grams
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer ANNEX – <u>A</u>
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer ANNEX – <u>B</u>
5.	एक दिन में संभावित परीक्षण Possible tests in a day :		
	All the tests mentioned in the IS are possible to be carried out in a day.		
6.	Scope of the Licence		
	Licence is granted to use Standard Mark as per IS 5149 : 2020 with the following scope:		
	Name of the product	Maleic Anhydride, Technical	

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar
Marg, New Delhi – 110002

ANNEX-A

LIST OF TEST EQUIPMENT (INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No	Test used in with clause Reference	Test Equipment
1	Determination of Crystallization point, Clause 2.2, Table – 1, Sl. No. i	The crystalizing point apparatus as shown in fig.1.— A thick glass tube of nominal size 100 x 25 mm which is placed inside larger glass test tube of nominal size 150 x 50 mm which is supported centrally by the metal covered plate. 1000 ml Tall form beaker Glass Stirrer The crystalizing point apparatus as specified in fig.1 of ISS Stop Watch Thermometer as specified in Annex-A of ISS Thermometer Thermometer having Range: 24 to 78 °C. Graduation 0.2 deg. Immersion: 100 mm Overall length, Max. 385 mm Stem diameter: 5.5 to 8.00 mm Bulb shape: Cylindrical Bulb length: 15 to 20 mm Length of main Scale, Min: 190 mm Distance from bottom of bulb to bottom of Main scale, Min : 125 mm Longer lines at each: 1 deg. Scale error not exceed: $\pm 0.2^{\circ}\text{C}$ Any thermometer of convenient range and similar requirements and accuracy may be used. Or by any other instrumental method that gives consistent result
ii.	Measurement of Colour of the molten material , Clause 2.2, Table – 1, Sl. No. ii	Identical flat based colorimetric Tubes (Two) - Heat resistant and approximately 20 mm in external diameter, having a graduation mark 100 mm above the base. One – Mark Graduated Flasks of 250 and 500 ml capacities (see IS 915). Electrically-Heated Aluminum Block - capable of maintaining temperature at $65 \pm 3^{\circ}\text{C}$ with holes 22 mm in diameter and at least 120 mm depth. Reagents: Cobaltous Chloride, Hexahydrate Hydrochloric Acid — Relative density 1.16 (see IS 265) Chloroplatinic Acid — Dissolve 250 mg of platinum in a small quantity of aqua regia contained in a glass or porcelain basin by heating on a water bath. When the metal has dissolved, evaporate the solution to dryness. Add 1 ml of hydrochloric acid and again evaporate to dryness. Repeat the operation twice more.

		Potassium Chloroplatinate Estimation of colour By Pt-Co Colour scale Colour measuring instrument as specified in IS 1448(P-178) Absorption cells Glass tubes
iii	Maleic Acid Content, percent by Mass Clause 2.2, Table – 1, Sl. No. iii	150 ml Conical Flask 500 ml Flask Weighing Balance Reagents: Phthalic Acid Ethyl Methyl Ketone Bromophenol Blue Indicator Standard Triethylamine Solution (in Ethyl Methyl Ketone) Or by Autopotentiometer
iv)	Maleic Anhydride content, percent by mass, Clause 2.2, Table – 1, Sl. No. iv	Reagents: <i>Potassium Hydrogen Phthalate</i> — Previously dried for 2 hours at 120°C. <i>Phenolphthalein Indicator</i> — Dissolve 0.5 g of phenolphthalein in 100 ml of rectified spirit. Add standard sodium hydroxide solution until the indicator is faintly pink. <i>Standard Sodium Hydroxide Solution</i> - 0.5 N, Distilled Water(see IS 1070), Weighing Balance (range 0.0001 to 210 gms.), Conical flask 250 ml & 500 ml capacity, Burette, Water bath
v)	Determination of Ash Clause 2.2, Table – 1, Sl. No. v	Weighing Balance (range 0.0001 to 210 gms.), Furnace - Capable of maintaining temperature within 600 ± 25 °C Platinum or Silica basin. Desiccator
vi)	Determination of Iron Content Clause 2.2, Table – 1, Sl. No. vi	Method A (Volumetric Method) - One – mark graduated flasks – 1000 ml and 250 ml capacities (See IS 915) Nessler cylinders – Two, 100 ml capacities (See IS 4161) Water bath Stirrer of Platinum wire / glass rod Conical flask 250 ml, Pipette 5ml, 10 ml, 25 ml & 50 ml, Indicator Bottle 100 ml, Burette Reagents: Hydrochloric acid - Relative density 1.16 (See IS 265) Dilute sulphuric acid Dilute nitric acid Urea solution Hydroxylammonium chloride solution Ammonium acetate solution 2-2'' -bipyridyl solution Standard iron solution

		Method B (Spectrophotometric or Photoelectric Absorption-metric Method) – Spectrophotometer or photoelectric absorptiometer Stirrer of platinum wire/glass rod One – mark graduated flasks – Eight, 100 ml capacity Water bath Reagents: Hydrochloric acid - Relative density 1.16 (See IS 265) Dilute sulphuric acid Dilute nitric acid Urea solution Hydroxylammonium chloride solution Ammonium acetate solution 2-2'' -bipyridyl solution Standard iron solution
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ANNEXURE- 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 entire quantity of the material produced in a day from similar raw materials shall constitute a 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**.

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/empanelled 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 packaging 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 packaging:

- 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.

ANNEX B
SCHEME OF INSPECTION AND TESTING
FOR MALEIC ANHYDRIDE, TECHNICAL
ACCORDING TO IS 5149 : 2020

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 a calibration plan for the test equipment.

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 marked on each package, provided always that material to which this mark is thus applied, conforms to every requirement of the specification.

3.1 Marking—Each package shall be legibly and indelibly marked to give the information as per clause 4.2.1 of IS 5149. In addition, the following details shall be mentioned on each package legibly and indelibly:

a) BIS Licence No. CM/L and

b) BIS website details i.e. “For details of BIS certification please visit www.bis.gov.in”.

3.2 Packing—The material shall be packed as per clause 4.1 of IS 5149.

4. CONTROL UNIT: For the purpose of this scheme, total quantity of the material produced in a day under similar conditions shall constitute a control unit.

5. LEVELS OF CONTROL—The tests as indicated in column 2 of Table 1 and the levels 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.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. 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)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S:Subcontracting permitted	Levels of Control		
Clause	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
2.1	Description	2.1	IS 5149:2020	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity			
2.2 & Table 1, Sl. No. i	Crystallization point	Annex A-2	IS 5149:2020	R.	One	Each Control unit	
2.2 & Table 1, Sl. No. ii	Colour of the Molten Material	Annex A-3	IS 5149:2020	R.	One	Each Control unit	
2.2 & Table 1, Sl. No. iii	Maleic Acid Content	Annex A-4	IS 5149:2020	R.	One	Each Control unit	
2.2 & Table 1, Sl. No. iv	Maleic Anhydride content	Annex A-5	IS 5149:2020	R.	One	Each Control unit	
2.2 & Table 1, Sl. No. v	Ash content	Annex A-6	IS 5149:2020	R.	One	Each Control unit	
2.2 & Table 1, Sl. No. vi	Iron Content (as Fe)	Annex A-7	IS 5149:2020	R.	One	Each Control unit	