



उत्पाद मैनुअल

कार्बन ब्लैक

भारतीय मानक 17440: 2020 के अनुसार

**PRODUCT MANUAL
FOR CARBON BLACK
ACCORDING to IS 17440: 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 17440: 2020
	शीर्षक Title	:	कार्बन ब्लैक Carbon Black
	संशोधनों की संख्या No. of amendments	:	1
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement. <i>Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	1. Sample of each grade of carbon black shall be drawn and tested to cover that grade in the scope of licence. 2. To cover optional requirements of Acetone Extract/ Particle size determination/ Oil absorption number (OAN) in the scope of licence, sample shall be tested for each optional requirement additionally.

c)	नमूने का परिमाण Sample Quantity	:	1.5 kg <i>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 (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)</i>
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	1. Grade. 2. Optional requirement, if any, with declared values <i>Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.</i>
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-B
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	All tests except Ash content and Particle Size. <i>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 ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.</i>		
6.	लाइसेंस का दायरा/Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 17440: 2020 with the following scope:		
	Name of the product	Carbon Black	
	Varieties/Type/Grades etc.	Grade I / Grade II / Grade III / Grade IV/ Grade V / Grade VI / Grade VII	
	Optional requirements: 1. Acetone Extract 2. Particle Size Determination 3. Oil absorption number (OAN)	With/Without Optional Requirements.	

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
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ANNEX B**List of Test Equipment*****(INDICATIVE LIST, FOR GUIDANCE ONLY)***

Sr. No.	Tests Used in with Clause Reference	Test Equipment/Chemicals/Glassware
1	Ash Content (Table 1, Clause 3, Sr. no. i)	• Muffle Furnace - Capable of temperature regulation of $\pm 25^{\circ}\text{C}$ at 550°C • Weighing Balance with at least 0.1 mg Least Count • Silica or porcelain Crucible - High form, capacity 15 ml, with cover • Desiccator
2	pH Value (Table 1, Clause 3, Sr. no. ii)	• pH Meter - Equipped with glass and calomel electrodes, having an accuracy of 0.05 pH • Beakers and Watch Glasses • Hot plate • Glass or Porcelain Plate and Spatula or Mortar and Pestle • Container — Stainless steel or copper • Buffer Solutions – pH 4-10 OR • pH Meter — having an accuracy of 0.05 pH and equipped with a combination electrode and RNC connector • Hot Plate • Spatula • Beaker (100 ml) • Watch Glass • Analytical Balance — 0.01 g accuracy • SS Mug with Lid • Mill, mixer or mortar and pestle • Magnetic stir plate and bar • DM Water/Distilled Water • Buffer Solution, of 4.00, 7.00 and 9.18 pH value • Acetone
3	Tinting Strength (Table 1, Clause 3, Sr. no. iii)	• Automatic Muller • Palette Knife or Spatula • Glass Slides • Film of Plastic Material • Film Applicator • Balance — Accurate to ± 0.001 g • Linseed Stand Oil OR • Automatic Muller • Tint Tester • Spatulas • Analytical Balance

		• Oven • Plasticizer — for example Green Flex/Paraplex G-62 • Zinc Oxide (Lab/Analytical Grade) • Acetone • ITRB (Industry Tint Reference Black) • Desiccator • Weighing Balance — at least 0.1 g accuracy • Syringe
4	Pour Density (Table 1, Clause 3, Sr. no. iv)	• Cylindrical container without any pouring lip or deformation of wall and of 1 000 ml capacity • Straight edged spatula • Weighing Balance with at least 1 g Least Count
5	Iodine Adsorption No. (Table 1, Clause 3, Sr. no. v)	• Vials 45 ml capacity / Weighing bottles of 30 ml capacity – with glass stoppers • Oven - capable of maintaining a temperature of $105 \pm 2^{\circ}\text{C}$ • Burette — 25 ml, graduated up to 0.05 ml; or 10 ml, graduated up to 0.02 ml • Pipettes – 25 ml and 20 ml • Centrifuge of speed above 1000 rev/min • Analytical Balance (sensitivity of at least 0.1 mg) • Iodine Solution — 0.0473 N • Standard Sodium Thiosulphate Solution-0.0394 N • Starch Indicator Solution OR • Automatic Burette • Conical Flask • Beakers • Centrifuge Machine • Pipette (20 and 25 ml) • Oven • Desiccator • Sodium Thiosulphate • Iodine • Potassium Iodide • Sodium Bicarbonate • 0.1 N Potassium Dichromate Solution • Starch • 25 percent HCl Solution • 2 L Volumetric Flask • Weighing balance with Least count of at least 0.1 mg • DM water
6	Nitrogen Surface Area (Table 1, Clause 3, Sr. no. vi)	• Multipoint Static Volumetric Gas Adsorption Apparatus with Dewar flasks and Accessories Required • Sample Cells • Analytical Balance • Heating Mantle • Oven

		• Liquid Nitrogen, 98 Percent or Higher Purity • Ultra High purity Nitrogen Gas • Ultra High Purity Helium Gas OR • Surface Area Analyzer • Sample Cell with Filler Rods • Dewar Flask • Heating Mantle • Vacuum Pump • Oven • Analytical Balance • High Vacuum grease • Petri Dish • Desiccator • Liquid Nitrogen • Nitrogen Gas
7	Sieve Residue on 45 micron (Table 1, Clause 3, Sr. no. vii)	• Apparatus as per J-2 with metal funnel, Tube with 37-micron aperture mesh etc. • Pressure Gauge • Weighing Balance • Watch glass • Hot Air Oven • Sieve – 45 micron
8	Sieve Residue on 500 micron (Table 1, Clause 3, Sr. no. viii)	• Apparatus as per J-2 • Tube with 37-micron aperture mesh • Pressure Gauge • Weighing Balance • Watch glass • Hot Air Oven • Sieve – 500 micron
9	Loss on Heating (Table 1, Clause 3, Sr. no. ix)	• Oven- Capable of temperature regulation of $\pm 2^{\circ}\text{C}$ at 105°C. • Weighing Bottle with stopper • Desiccator • Weighing Balance of 0.1 mg Least Count OR • Oven • Glass Petri Dish with Cover/Weighing Bottle with the Stopper • Analytical Balance (0.1 mg) OR • Moisture Analyzer • Weighing Balance

10	Toluene Discoloration (Table 1, Clause 3, Sr. no. x)	• Spectrophotometer- 20 nm maximum spectral band pass capable of measuring transmittance in the 425 nm range. • Absorption Cells • Analytical Balance (Sensitivity 0.01 mg) • Oven- Gravity convection type capable of temperature regulation of ± 1 deg at 105°C • Filter Paper — Whatman No. 41 or equivalent, diameter 150 mm. • Mechanical Shaker • Mortar and Pestle • Glass Filtering Funnel • Beaker • Erlenmeyer Flask • Toluene — Analytical grade
11	Fines Content (Table 1, Clause 3, Sr. no. xi)	• Three 125 micron sieves conforming to IS 460 (Part 1) • Three spacer sieves • Five Separator Receivers • Sieve Cover • Bottom Receiver Pan • Mechanical Test Sieve Shaker/Alternative Test Sieve Shaker • Weighing Balance (0.1 g) OR • Sieve Shaker • 125 Mesh Sieve • Receiving Pan • Analytical Balance — 0.0001 g accuracy
12	Optional Requirements: Acetone Extract (Table 2, Clause 3, Sr. no.12)	• Soxhlet Extraction Apparatus — With 20 to 30 ml cup • Flat-Bottomed Flask — 150 ml • Whatman Type Paper Extraction Thimbles • Acetone • Oven • Desiccator • Analytical Balance — 0.001 g accuracy
13	Optional Requirements: Particle size determination (Table 2, Clause 3, Sr. no.13)	• Transmission type electron microscope • Image Analysis System • Two Roll Mill • Vacuum Evaporator with ac glow discharge apparatus • Ultrasonic Generator • Dry Box • Analytical Balance — With an accuracy of 0.5 mg • Electrically Heated Tube Furnace • Pyroprobe • Carbon Rods and Carbon Rod Sharpener • Glass Microscope Slides • Test tube • Transfer pipette • rubber bulbs • glass vials • buchner funnel

		• filter paper • carbon coated electron microscope • wire screening with openings approximately 1 mm² • tweezers • spatulas • fluorocarbon duster • lens tissue • porcelain boats • centrifuge • beakers • Chloroform, reagent grade • Tetrahydrofuran, reagent grade • 1,2-Dichloroethane, reagent grade • Ethyl Acetate, reagent grade • Poly (Vinyl Formal) Resin • Cellulose Acetate Butyrate Resin • Phthalate Type Plasticizer
14	Optional Requirements: Oil Absorption Number (Table 2, Clause 3, Sr. no. 14)	• Absorptometer — equipped with constant rate burette that delivers 4 ± 0.024 ml/min. • Analytical Balance — 0.01 g accuracy • Spatula • Petri-dish • Oven • Desiccator • Stainless Steel Beaker — 150 ml • DBP oil/Epoxidised fatty acid ester (EFA) oil/Paraffin oil • Standard Reference Black

The above list is indicative only and may not be treated as exhaustive.

ANNEX – C**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: Carbon Black of particular grade manufactured using same raw material, under similar conditions of manufacturing in a day.

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 licence shall

be incorporated legibly and indelibly on each bag packaging and on the Label/Test Certificate / Certificate of Analysis supplied along with Bulk Container provided always that the material so marked conforms to each requirement of the specification.

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

3.2 **Additional Marking requirements:** Additionally, the following shall also be marked on bag packaging or Label/TC/CoA in case of bulk:

- a) "For BIS certification details please visit www.bis.gov.in"
- b) Applicability of Optional requirements, if any
 - i. With nominal specifications against the Optional requirements i.e. Maximum value for Acetone Extract and/or Maximum value of Particle size determination and/or Oil absorption number (OAN) with nominal/declared tolerance, as applicable.

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		
<i>Clause</i>	<i>Requirement</i>	<i>Test Methods</i>		<i>No. of Sample</i>	<i>Frequency</i>	<i>Remarks</i>
		<i>Clause</i>	<i>Reference</i>			
3	Description	3	IS 17440	One	Each control unit	
4	Packaging	4	IS 17440	One	Each consignment of packaging received	
3, Table 1, Sl. No. i)	Ash Content	Annex A	IS 17440	One	Each control unit	
3, Table 1, Sl. No. ii)	pH value	Annex B	IS 17440	One	Each control unit	
3, Table 1, Sl. No. iii)	Tinting Strength	Annex D	IS 17440	One	Each control unit	
3, Table 1, Sl. No. iv)	Pour Density	Annex E	IS 17440	One	Each control unit	
3, Table 1, Sl. No. v)	Iodine Adsorption No.	Annex F	IS 17440	One	Each control unit	
3, Table 1, Sl. No. vi)	Nitrogen Surface Area	Annex H	IS 17440	One	Each control unit	
3, Table 1, Sl. No. vii)	Sieve Residue on 45 Micron	Annex J	IS 17440	One	Each control unit	

3, Table 1, Sl. No. viii)	Sieve Residue on 500 Micron	Annex J	IS 17440	One	Each control unit	
3, Table 1, Sl. No. ix)	Loss on Heating	Annex K	IS 17440	One	Each control unit	
3, Table 1, Sl. No. x)	Toluene Discolouration	Annex M	IS 17440	One	Each control unit	
3, Table 1, Sl. No. xi)	Fines Content	Annex N	IS 17440	One	Each control unit	
Optional Requirements (if applicable):						
3, Table 2, Sl. No. 12	Acetone Extract	Annex C	IS 17440	One	As agreed between the interested parties	
3, Table 2, Sl. No. 13	Particle size determination	Annex G	IS 17440	One		
3, Table 2, Sl. No. 14	Oil Absorption number (OAN)	Annex P	IS 17440	One		