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उत्पाद मैनुअल

ग्राइंडिंग मीडिया रोल्ड / जाली कार्बन और कार्बन - क्रोमियम स्टील्स

IS 12658:1989 के अनुसार

PRODUCT MANUAL FOR

Grinding Media Rolled/Forged Carbon and Carbon-Chromium Steels

According to IS 12658:1989

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 12658:2024
	शीर्षक Title	:	Grinding Media Rolled/Forged Carbon and Carbon-Chromium Steels
	संशोधनों की संख्या No. of amendments	:	0
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 established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please see Annex-A
c)	नमूने का परिमाण Sample Quantity	:	Chemical analysis: For balls: 5 nos. of cut ball samples x 15mm Thick (approx.) For Cylindrical Cylpebs: 5 nos. For Physical, Mechanical and Metallurgical test: 5 nos. 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	:	Please refer Annex –B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex - C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests. 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.
6.	लाइसेंस का दायरा /Scope of the Licence:		
	License is granted to use Standard Mark as per IS 12658:2024 with the following scope:		
	Name of the product	Grinding Media Rolled/Forged Carbon and Carbon-Chromium Steels	
	Steel Grades /Designation	105C4, 103Cr6	
	Supply condition	Rolled or Forged	
	Heat treatment condition	Normalized/Hardened and Tempered.	
	Shape (Sizes)	Ball/Cylindrical Cylpebs (Diameter from....mm upto and includingmm/ Diameter x height frommm x mm up to and including mm x mm)	
	Options/Supplementary or Special Requirements	With or Without Drop Testing/Integrated Testing	

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002

ANNEXURE A

GROUPING GUIDELINES

1) GRINDING MEDIA ROLLED/FORGED CARBON AND CARBON-CHROMIUM STEELS are grouped as given below for Grant of Licence (GoL)/Change in Scope of Licence (CSoL):

Size (ball)	Group 1	25mm up to and including 60 mm	One sample of any size from the Group shall be drawn and tested to cover all sizes within the Group
	Group 2	Above 60 mm up to and including 90 mm	One sample of any size from the Group shall be drawn and tested to cover all sizes within the Group
	Group 3	Above 90mm up to and including 120 mm	One sample of any size from the Group shall be drawn and tested to cover all sizes within the Group
Size (cylindrical cylpebs)	Group1	All sizes	One sample of the lowest and highest size from the Group shall be drawn and tested to cover all sizes

2) The samples drawn above of different sizes from the Groups shall be drawn in such a way that samples of all Steel grades (105C4,103Cr6) and heat treatment conditions (Normalized, Hardened and Tempered) intended to be covered in the licence are drawn and tested.

3) However, Separate samples from each Group are required to be drawn for each condition of supply (Rolled/Forged).

4) For sizes of Balls/Cylinder Cylpebs , other than those specified in the standard, supplied as per mutal agreement with the manufacturer and purchaser, all such sizes shall be declared by the manufacturer and shall be categorized into the above mentioned Groups during drawl of samples.

5) Scope of licence shall be restricted based on the manufacturing and testing facilities available.

6) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

ANNEXURE B

LIST OF TESTING EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No	Tests Used in with Clause Reference	Test Equipment/Chemicals
1	Preparation of specimen	Rough Polishing Machine, Abrasive Cutting Machine, Fine Polishing Machine, Grinding Machine, Molding machine, Longitudinal cutting machine, Lathe Machine, Electrical discharge machining.
2	7.1, 7.3 (C,S,P,Mn,Si,Cr)	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectro polisher (sample preparation) Spectrophotometer
3	7.1, 7.3 (for C& S, chemical method, alternative to instrumental method)	Strohlein or Leco apparatus with all attachments Barometer with chart, Hotplate, Muffle furnace, Complete range of glassware's, measuring cylinders, Desiccator, porcelain boats or ceramic crucibles, Thermometer, Electronic Balance, Distilled Water, Hot air oven, Oxygen - 99.5 percent minimum purity, ether or acetone, Standard Reference Material (NML) with certificate. Reagents for C: tin granules or pure iron fillings, acidulated water/brine water, methyl red, caustic potash Reagents for S: Ceramic boats/crucibles – desiccators, Fluxes -Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate
4	7.1, 7.3 (Phosphorus content , chemical method, alternative to instrumental method)	Weighing balance, Heater/ Heating element along with energy regulator, Ice water bath, Vol Flask Cap — 1 litre, (Whatman) filter paper No. 040, Suction Filtration Facility, Filter paper pulp pad, Standard Reference Material (NML) with certificate Potassium Permanganate (KMnO ₄), Sodium Nitrite (Na ₂ NO ₃), Ammonium Molybdate [(NH ₄) ₂ Mo ₂ O ₇], Ammonium Phosphate [(NH ₄) ₃ PO ₄], Potassium Nitrate (K ₂ NO ₃), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid (HClO ₄), Sulphurous Acid, Hydrobromic Acid (HBr), other chemicals and reagent as applicable
5	7.1, 7.3 (Manganese content , chemical method, alternative to instrumental method)	Hot plate, Conical flask Reagents: silver nitrate, ammonium persulphate sodium arsenite solution, Dilute Nitric Acid, Phosphoric Acid, Dilute Sulphuric Acid, Concentrated Nitric Acid, NaCl Solution, Permanganic acid

6	7.1, 7.3 (Silicon content, chemical method, alternative to instrumental method)	Medium textured filter paper, Porcelain casserole, platinum crucible, filter paper pulp, hot plate, hot air oven, muffle furnace Reagents: Silver nitrate solution, concentrated nitric acid, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric acid, Perchloric acid, Tartaric acid and hydrofluoric acid
7	7.1, 7.3 (Cr content, chemical method, alternative to instrumental method)	Hot plate, stopwatch Reagents: dilute sulphuric acid and phosphoric acid mixture, concentrated nitric acid, ammonium persulphate, silver nitrate, dilute hydrochloric acid, ferrous ammonium sulphate, standard potassium permanganate solution.
8	8 (Freedom from defects)	Vision-based inspection system (10X magnifying glass), Stereo microscope
9	9 (Microstructure)	Metallurgical Microscope with image analyzer or Metallurgical Microscope (100 X or better resolution), Sample preparation using compression mounting, 3 % Nital as etchant. EDM Machine Band saw machine, Belt grinder, micropolisher, sample polishing machine, auto mount.
10	10 (Hardness)	Brinell Hardness Tester, Rockwell Hardness Tester or Vickers Hardness tester
11	12, 12.1 (Dimensions and Dimensional Tolerances)	Vernier Calipers, Micrometer
12	13 (Drop test)	Ball Drop Test apparatus

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 : **For the purpose of this Scheme, a control unit is defined as Balls/Cylebps of the same Supply Condition, Grade/Designation, Heat treatment condition, and Size, in a day from same production line.**

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 Schedule of the license and Licence Number (i.e. CM/L) shall be incorporated on the Test Certificate and on the package in case the material is supplied in the packed condition, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked and packed conforms to all the requirement of the specification. In addition, details of BIS website shall be marked as follows: —For details of BIS certification please visit.

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

4. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to IS 12658:2024 there shall be a test certificate which shall contain the Standard Mark, the cast/Control Unit number and the corresponding test results (as given in Annexure-I enclosed)

5. 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)

(1)				(2)	(3)		
Test Details					Levels of Control		
Clause	Requirement	Test Method		Test equipment requirement R: Required (or) S: Subcontracting permitted	No. of Samples	Frequency	Remarks
		Clause	Reference				
7.0	Chemical composition: a) Ladle Analysis	7.0 & 7.1	IS 12658	R	i) One	i) Each Heat	i) Applicable for manufacturers with steel making facilities. ii) Re-rollers shall maintain records in support of the material used which shall include certificate for inputs/starting material certificate indicating ladle analysis, steel manufacturing process, size of input material, etc.
7.3	b) Product Analysis	7.3	IS 12658	R	i) NIL	i) NIL	i) Applicable for manufacturers with steel making facilities.
				R	One	Each Cast	i) Applicable for manufacturers without steel making facilities. If the billets/blooms/slabs/bars procured by them for further rolling/forging are ISI marked and are received with Test Certificate, further testing for chemical composition is not required in such cases.
8.0	Freedom from defects	8.0	IS 12658	R	Firm shall exercise adequate in-process controls to ensure that all grinding media is free from harmful defects		

9.0	Microstructure	9.1, 9.2	IS 12658	R	One	Each control unit	-
10.0	Hardness	10.1, 10.2, 10.3	IS 12658/ IS 1586/ IS 1500	R	One	Each control unit	-
12.0	Tolerance on Size	12.1	IS 12658	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
13.0	Drop Testing a) Magnetic particle inspection b) Dye penetration test c) Drop test	13.1	IS 12658 IS 3703 IS 3658	S	Optional Requirements. As agreed between the manufacturer and the purchaser.		

Annexure – I
XYZ IRON AND STEEL COMPANY
(Registered office address and works address)

TEST CERTIFICATE FOR GRINDING MEDIA ROLLED / FORGED CARBON AND CARBON-CHROMIUM STEELS

TEST CERTIFICATE No. _____ DATE _____

To M/s _____

We certify that the material described fully confirms to IS 12658:2024 Chemical composition and Physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks License No. CM/L _____ are as indicated below against each order no.

(PLEASE REFER TO IS 12658:2024 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & date	Size / Shape	Designation	Supply Condition	Lot No.	Quantity	Chemical Composition						Mechanical Properties (Hardness)	Microstructure	Drop Test/ DPT/MPI * (Optional Requirements)	Remarks
						C %	Si %	Mn %	P %	S %	Cr %				

The material supplied conforms to the specified dimensions and tolerances.

REMARKS : _____

WAGON NO. : _____

TRUCK NO. : _____

FOR XYZ IRON AND STEEL COMPANY

(It is suggested that size A4 paper be used for this test certificate)