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उत्पाद मानुअल
गोलाभ और नोडूलिय ग्रेफाइट वाली लोह ढलाइयाँ -
विशिष्ट
IS 1865:1991 अनुसार

**PRODUCT MANUAL FOR
IRON CASTINGS WITH SPHEROIDAL OR NODULAR GRAPHITE**
According to IS 1865:1991

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 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 licence/certificate.

1.	Product	:	IS 1865:1991
	Title	:	IRON CASTINGS WITH SPHEROIDAL OR NODULAR GRAPHITE
	No. of amendments	:	0
2.	Sampling Guidelines		
a)	Raw material	:	No specific raw material requirement
b)	Grouping Guidelines	:	For the purpose of GoL/CSoL: Each grade shall be tested for for each type ie a) Grades Based on Mechanical Properties Measured on Separately-Cast Test Samples b) Grades Based on Mechanical Properties Measured on Cast - on Samples- In case of Grades based on Mechanical Properties measured on Cast on Samples, separate samples for each Casting Thickness Range (30 mm to 60 mm , 61 mm to 200 mm) are required to be drawn and tested.

			In case Grades are classified based upon Hardness (based upon mutual agreement between manufacturer and purchaser) each Grade shall be tested for the requirements specified at Annex A.
c)	Sample Size	:	I) For the purpose of GoL/CSoL: a) Tensile Test, Impact Test, Microstructure- 01 test bar each for each test b) Chemical tests: chilled sample of quantity 5 pieces of 5cm X 5cm c) In case of Grades classified based upon Hardness (based upon mutual agreement between manufacturer and purchaser) - 01 Casting or 1 Test Knob II) The above sample sizes are also applicable for surveillance purposes (both factory and market)
3.	List of Test Equipment	:	Please refer Annex - B
4.	Scheme of Inspection and Testing	:	Please refer Annex - C
5.	Possible tests in a day	:	All tests are possible to be carried out in a day
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 1865:1991 with the following scope:		
	Name of the product	Iron Castings with spheroidal or nodular graphite	
	Grade (s)	Grades based on Mechanical Properties measured on Separately Cast Test Samples : SG 900/2,SG 800/2 Grades based on Mechanical Properties measured on Cast-On Test Samples: SG700/2A,SG600/3A Grades classified on the basis of Hardness (as per mutual agreement between manufacturer and purchaser) : H330,H300.....	
	Coating Thickness (applicable for Grades on Mechanical Properties measured on Cast-On Test Samples)	30 mm to 60 mm, 61 mm to 200 mm	

ANNEXURE B

LIST OF TEST EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Test Equipment/Chemicals and Identification Numbers (Where applicable)	Tests Used in with Clause Reference
1	Microscope 100X with computer and software, Polishing machine, etchant	Microstructure (9)
2	Universal Tensile Testing Machine 0-600kN, LC-10N, Extensometer	Tensile Strength (13.1)
3	Brinell Hardness Tester (along with tungsten indenter of appropriate size, measuring device) 0-400 BHN	Hardness (13.2)
4	Test arrangement for Impact test	Impact Test (13.3)
5	Dial Vernier Caliper Outside Micrometer	Castings Dimensions (6.2)
6	Spectrometer	Chemical composition (5.1)

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 : All castings poured from the same ladle of treated metal and where applicable have been submitted to same heat treatment 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/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 licence and Licence Number (i.e. CM/L) shall be incorporated legibly on each casting and on the test certificate accompanied along with each consignment, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conform to all the requirements of the specification.

3.1 Packing and Marking shall be done as per the provisions of the standard.

4. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to IS **1865:1991** 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				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Chemical Composition	5.1,5.2	IS 1865	S	One	Each Cast/Heat	If required by purchaser.
6.1	Workmanship and Finish	6.1	IS 1865 IS 8350	R	Manufacturer shall exercise adequate in process controls to ensure that each casting is accurately moulded in accordance with the pattern equipment and/or working drawings supplied by the purchaser.		
6.2	Dimensions and Tolerances	6.2	IS 1865 IS 8350	R	Manufacturer to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard or as per agreement between manufacturer and purchaser. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
9	Microstructure	9.1, 9.1.1	IS 1865:1991IS 7754	R	One	Each Control Unit	---
8	Freedom from Defects	8.1, 8.2	IS 1865:1991	R	Manufacturer shall exercise adequate in process controls to ensure that each casting is free from harmful defects.		
12,13	Tensile Test, Elongation and Proof Stress	12, 13.1 Table 1 and 2	IS 1865:1991 IS 1608 Pt.1	R	One	Each Control Unit	---
13	Hardness Test	13.2, Annex A Table 5	IS 1865:1991 IS 1500 Pt.1	R	One	Each Control Unit	---
13	Impact Test	13.3 Table 4	IS 1865:1991	R	One	Each Control Unit	--

ANNEXURE I
XYZ CASTING COMPANY
(Registered office Address and works address)
TEST CERTIFICATE FOR
Iron Castings with spheroidal or nodular graphite



TEST CERTIFICATE No. _____ DATE _____
To M/s _____ We certified that the material described below fully conforms
to IS 1865:1991 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 Licence No. CM/L _____ are as indicated below against each order No.

(PLEASE REFER TO IS 1865:1991 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Control Unit No.	Grade	Dimensions/ Drawing No.	Qty in tonnes	Chemical composition @	Mechanical Properties			Hardness*	Micro structure	Impact value
						Tensile Test	0.2% Proof stress	Elongation			

*If required by purchaser

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ Casting COMPANY