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उत्पाद मैनुअल
Aluminium alloy forging stock and forgings (Alloy 24345) for aerospace applications –
Specification
IS 7902 : 2001 के अनुसार

PRODUCT MANUAL
FOR Aluminium alloy forging stock and forgings (Alloy 24345) for aerospace applications –
Specification
ACCORDING TO IS 7902 : 2001

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.	मानक संख्या Product	:	IS 7902 : 2001
	शीर्षक Title	:	Aluminium alloy forging stock and forgings (Alloy 24345) for aerospace applications – Specification
	संशोधनों की संख्या No.of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		

a)	कच्चा माल Raw material	:	The alloy made from primary or virgin aluminium shall comply to the requirements of IS 23. Conformity may be established through test certificate of manufacturer, test report of BIS recognized/empaneled lab or NABL accredited lab or in house testing. No testing is required if material is ISI marked and received with test certificate. 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 refer Annex-A
c)	नमूने का परिमाण Sample Size	:	5 pcs of 5 cm x 5 cm for chemical tests and prepared test specimen for physical tests to be cut from the forging/forging stock and sent to lab. Visual and dimensional tests on the full forging/stock to be done in the factory during factory testing. 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).
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 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:		
	“Licence is granted to use Standard Mark as per IS 7902:2001 with the following scope:		
	Name of the product	Aluminium alloy forging stock and/or forgings (Alloy 24345) for aerospace applications	

	Form/type and Sizes	For Forging Stock: i. Billets of sizes from.. mm up to and including ... mm, and/or ii. Bars of sizes (dia.) from.. mm up to and including ... mm iii. Rods of sizes (dia.) from.. mm up to and including ... mm iv. Sections of types... and sizes from.. mm up to and including ... mm
		For Forgings: Size of forging (dia/thickness) and Drawing No. with date (Copy of drawing of each forging duly signed and sealed by the firm's authorized representative shall be a part of the licence scope)

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

ANNEX – A

GROUPING GUIDELINES

For Grant of Licence (GoL)/Change in Scope of Licence (CSoL), the following grouping guidelines shall apply

i) In case of forging stock, samples of any form/type (billets, bars, rods or sections) and size may be tested to cover the forms/type and sizes of forging stock being manufactured, in the scope.

ii) In case of forgings, sample of each forging intended to be covered in the scope of the licence shall be tested. Each forging duly identified by Drawing No. and Date shall be endorsed in the scope of licence and the Copy of drawing of each forging duly signed and sealed by the firm's authorized representative shall also be a part of the licence scope

Scope shall be restricted based on the manufacturing and testing facilities available.

During operation of licence, all varieties covered in the scope of licence shall be tested in rotation, to the extent possible.

ANNEX-B

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

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Chemical composition, Cl. 7	Laboratory apparatus and reagents as per IS 504 in case of chemical method or suitable instrument such as ICP-OES in case of instrumental method
2	Tensile Test, Cl. 10.1	Tensile Testing Machine
3	Hardness, Cl. 10.2	Brinell Hardness Tester
4	Ultrasonic and Dye penetrant tests, Cl. 12.2.1	Ultrasonic testing machine, dye penetrant
5	Macro and Micro examination, Cl. 12.2.2	Metallurgical Microscope, Etcants, polishing and grinding machines.
6	Dimensions, Cl.11	Vernier caliper, micrometer etc.

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, entire quantity of forging and forging stock of the same size manufactured from the same raw material in a single heat shall be taken as one 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 on the product 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 Indian Standard.

4. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to IS **7902:2001** 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.

TABLE1 (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 Methods Clause Reference			No. of Sample	Frequency	Remarks
5	Manufacture (raw material)		IS 23	S	One	Each consignment	Conformity may be established through test certificate of manufacturer, test report of BIS recognized/empaneled lab or NABL accredited lab or in house testing. No testing is required if material is ISI marked and received with test certificate
6	Freedom from defects	6	IS 7902	R	Firm shall exercise adequate in-process controls to ensure that the material is free from harmful defects.		
7	Chemical Composition, Cl. 7		IS 504/Any established instrumental or chemical method	R	One	Each control unit	
9	Heat treatment	9	IS 7902	R	Manufacturer shall ensure that heat treatment is done as per the requirement of		

					the standard and condition of supply required, and maintain records thereof		
10	Mechanical properties						
10.1	Tensile Test		IS 1608 (Part 1)	R	One	Each control unit	
10.2	Hardness		IS 1500 (Part 1)	R	One	Each control unit	
11	Dimensions and Tolerances	11	IS 7902	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		
12.2	Special Tests						
12.2.1	Ultrasonic Test		IS 3664	S	As agreed between purchaser and manufacturer		
12.2.1	Dye penetrant test		IS 3658	S	As agreed between purchaser and manufacturer		
12.2.2	Macro and Micro Examination	12.2.2	IS 7902	S	As agreed between purchaser and manufacturer		

**ANNEXURE I
TEST CERTIFICATE FORMAT**

XYZ ALUMINIUM COMPANY

TEST CERTIFICATE FOR ALUMINIUM ALLOY FORGING STOCK AND FORGINGS (ALLOY 24345) FOR AEROSPACE APPLICATIONS

TEST CERTIFICATE NO. _____ DATED _____

TO M/s _____

It is certified that the material described below fully conforms to IS 7902:2001. Chemical, 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. etc.

(PLEASE REFER TO IS 7902 : 2001 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order Number and date	Quantity in tonnes	Lot No and date of mfg	Condition (O/HB/HD)	Shape and Size in mm	Chemical analysis (in %)	Mechanical properties	Special tests	Freedom from defects
					Cu – Mg – Mn – Si – Ti – Etc...	TS (Mpa) EL% Hb	Ultrasonic test, dye penetrant test, macro and micro examination	

Drawing No, and date (in case of forging) (copy of drawing to be attached)

The material supplied conforms to specified tolerances

REMARKS

SHIPPING ADVICE NO.

WAGON NO.

“For details of BIS certification please visit www.bis.gov.in”

FOR XYZ ALUMINIUM COMPANY