



उत्पाद मानुयल
Steel ingots, billets and blooms for the production of
springs, rivets and screws for general engineering
applications
IS 8052:2006 के अनुसार

PRODUCT MANUAL FOR
Steel ingots, billets and blooms for the production of
springs, rivets and screws for general engineering
applications
according to IS 8052:2006

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन में रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

This Product Manual may 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.	उत्पाद Product	:	IS 8052:2006
	शीर्षक Title	:	Steel ingots, billets and blooms for the production of springs, rivets and screws for general engineering applications-specification
	संशोधन संख्या No. of amendments	:	0
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific raw material requirement
b)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	Please refer Annex-A

c)	नमूने का परिमाण Sample Size	:	For physical tests- Dimensions as per cl.10. and Tolerances as per cl.11 shall be carried out in the factory For chemical composition: 5 pieces of 50X50mm/50g drillings (samples are to be drawn by discarding the Heat Affected Zone in case of gas cutting).
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex-B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	Please refer Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	Freedom from defects Dimensions, Tolerances, Chemical Composition: By chemical method – C, S, Mn or by instrumental method –all required elements
6.	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence:		
	IS 8052:2006 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 8052:2006 with the following scope:		
	Name of the product	Steel ingots, billets and blooms for the production of springs, rivets and screws for general engineering applications- specification	
	Product Type	Ingots/Cast Billet Ingots /Billets/Continuously Cast Billets/Blooms/Continuously Cast Blooms	
	Grade Designation	12C5, 17C5, 12C8S12, 55C6, 65C6, 70C6, 75C6, 80C6, 98C6, 113C6, 38Si7, 40Si7, 50Si7, 55Si7, 60Si7, 65Si7, 50Cr4V1, 50Cr4V2, 60Cr4V2, 52Cr4Mo2V1	

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

ANNEXURE A
TO THE PRODUCT MANUAL FOR
Steel ingots, billets and blooms for the production of
springs, rivets and screws for general engineering
applications as per IS 8052:2006

GROUPING GUIDELINES

Grouping has been done on the basis of type and grade designations as under:

SI.No.	Type	Classification		
1.	Type	(a) Ingots/Cast Billet Ingots (b) Billets/Continuously Cast Billets (c) Blooms/Continuously Cast Blooms		
2.	Grade Designation (based upon Si & Alloy content (Cr,Mo,V))	Grade Designation	% Si	Alloy Content (%Cr, %Mo, %V)
		12C5, 17C5, 12C8S12, 55C6, 65C6, 70C6, 75C6, 80C6,98C6,113C6	0.15 -0.35	-
		38Si7,40Si7, 50Si7,55Si7,60Si7,65Si7	1.50-1.90 for 38 Si7 1.50 -2.00 for all other designations	-
		50Cr4V1,50Cr4V2, 60Cr4V2	0.15-0.35	% Cr 0.90-0.1.20 % V 0.07-0.12 for 50Cr4V1 , 0.15-0.25 for 50Cr4V2, 0.15 min for 60Cr4V2
		52Cr4Mo2V1	0.15-0.40	% Cr 0.90-0.1.20, % Mo 0.15-0.25, % V- 0.07-0.12

Groups have been categorized based on percentage Silicon (Si) and addition of other alloying elements such as Chromium (Cr), Vanadium (V) and Molybdenum (Mo) as per table 1 of IS 8052.

Based on the above the product may be divided into the following 4 groups :-

Group-1	12C5, 17C5, 12C8S12, 55C6, 65C6, 70C6, 75C6, 80C6,98C6,113C6
Group-2	38Si7,40Si7, 50Si7,55Si7,60Si7,65Si7
Group-3	50Cr4V1,50Cr4V2, 60Cr4V2
Group-4	52Cr4Mo2V1

1) One sample of any grade designation from each group as above shall be drawn for **chemical testing only**, to cover all the Grade designations of the product within that group.

In case a manufacturer applies for GOL/CSoL of more than one type(Ingot, Billet and Bloom) for the same Grade Designation, separate samples from each product type for chemical test shall not be drawn

2) For testing of Dimensions and Tolerances for considering GOL/CSoL, one sample of any size, grade designation of **any** product type (Ingot or Billet or Bloom) intended to be covered in the licence shall be tested in the factory. Separate samples are not required to be tested for physical parameters for each size/grade designation.

However, while considering inclusion of a new variety (type/grade designation), licensee shall submit factory test report for Dimensions and Tolerances if the dimensions are different from the ones already tested.

3) If mutually agreed between purchaser and manufacturer for carrying out Sulphur print and macro-examination, Hardenability and Inclusion content on the samples prepared as per clause 7.2, separate samples for each size, irrespective of Grade designation may be drawn for testing in-house. In case no test facilities are available, details maybe sought from the applicant with respect to the arrangement proposed for testing of optional requirements. In the absence of conduct of these tests in-house/arrangement for testing, the manufacturer shall submit an undertaking that no claim for conformity of the product to such requirements will be made.

4) If the above sample passes, then the licence may be granted/inclusion be done for the Designations of the Group. However, it shall be ensured that the firm is having all necessary manufacturing and testing facilities for the Grade Designations/Product Type of Steel to be included in the licence.

5) During the operation of license, BO shall ensure that all Grade Designations covered in the license are drawn for independent testing on rotation over a period of time.

ANNEXURE B
TO PRODUCT MANUAL FOR
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LIST OF TEST EQUIPMENT

Sl. No.	Test Equipment/Chemicals and Identification Numbers(Where applicable)	Tests Used in with Clause Reference
1.	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	Cl 6.1, cl.6.2 for C, S, P, Mn, Si, Cr, Mo & V Mn, S, P, Si
2.	Strohlein or Leco apparatus with all attachments Barometer with chart, Hot plate, Muffle furnace, Complete range of glass wares, 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	Cl.6.1, cl.6.2.–C&S (chemical method, alternative to instrumental method)
3.	Weighing balance, Heater/Heating element along with energy regulator, Ice water bath, Vol Flask Cap – 1litre, (Whatman) filter paper No.040, Suction Filtration Facility, Filter paper pulp pad, Standard Reference Material(NML) with certificate Potassium Permanganate (KMnO ₄), Sodium Nitrite(NaNO ₂), Ammonium Molybdate[(NH ₄) ₂ MoO ₇], Ammonium Phosphate[(NH ₄) ₃ PO ₄], Potassium Nitrate (KNO 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 reagents as applicable	Phosphorus content Cl.6.1, cl.6.2. (chemical method, alternative to instrumental method)

4.	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	Manganese content Cl 6.1, cl.6.2. (chemical method, alternative to instrumental method)
5.	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	Silicon content Cl 6.1, cl.6.2. (chemical method, alternative to instrumental method)
8.	Hot plate, stop watch 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.	Cr content Cl 6.1, cl.6.2. (chemical method, alternative to instrumental method)
9.	Hot Plate, Reagents: distilled water, Acid Mixture (700 ml of perchloric acid (rd=1.67), Phosphoric acid (rd=1.70) and Nitric Acid (rd=1.42), Concentrated Hydrochloric Acid (rd=1.16), Dilute sulphuric Acid 1:1 and 1:5, Potassium Thiocyanate solution, 100g/Ltr, Stannous Chloride Solution, N-Butyl Acetate, Iron Molybdenum Free (Mo < 0.001 percent), Standard Molybdenum solution (1 ml = 0.01 mg Mo)	Mo content Cl 6.1, cl.6.2 (chemical method alternative to instrumental method)
10.	Direct control—inspection through naked eye or using a magnifier (VCM) at a magnification of 3 to 6 times. Indirect control using more sophisticated optical and optoelectronic apparatuses and devices. This covers endoscopes, periscopes and TV cameras.	Freedom from Defects (Cl 8)
12.	i) metal-saw cutting machine/gas cutting equipment/abrasive cutting wheel ii) Machine grinding unit with metallographic polish paper No.00,000 for finer finish iii) Lathe/shaper	Macro-examination (Cl.9)

	iv) Cleaning Agent; v) Stiff Fibre Brush; vi) Hotplate; vii) Etching tank(Dish/tray of porcelain, corrosion resistant glass/Heat resistant glass/corrosion resistant alloys) Resistant Container; and viii) Etching Reagents as per Table1 of IS11371 ix) Thermometer x) Stop Watch xi) Water Bath xii) alcohol	
13.	i) Machine grinding unit ii) Lathe/shaper iii) Photo-sensitive paper/flat film iv) Sulphuric Acid($\rho_{20}=1.84\text{g/ml}$) v) Sodium thiosulphate(hyposolution):15-20% vi) Water Bath with Heater vii) Stop Watch viii) wad of wet cotton wool ix)Surface Roughness Tester(optional) x)Rubber roller	Sulphur Print Tests(Cl.9)
14	i. Metal Saw cutting machine/ gas cutting machine ii. Heating Furnace for sample preparation iii. Forging or rolling provision inline with clause 7.2 of IS 8052:2006 iv. Sample perpetration facility as per Cl 4.1 of IS 3848 v. Muffle Furnace for controlled heating of the specimen. vi. Hardening apparatus as per fig 2 of IS 3848 vii. Stop Watch viii. Rockwell hardness tester along with standard sample (IS 1586)	Harden-ability (Cl 9)
15	ix. Sample Cutting machine x. Mechanical or mounting machine xi. Polishing machine with required polishing papers and material xii. Microscope with adequate Magnification (100X+/-2X on the ground glass. xiii. Standard charts with respect to type of inclusions	Inclusion Content (Cl 9)
16.	i) Measuring Tape;and ii) Vernier Caliper	Dimensions(cl.10) Tolerances (cl.11.)

Note: The above is an indicative list for the purpose of guidance only

ANNEXURE C
TO PRODUCT MANUAL FOR
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According to IS8052:2006

SCHEME OF INSPECTION AND TESTING

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 equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING & MARKING–

The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated, and the marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conforms to all the requirements of the specification.

3.1 Unless otherwise agreed otherwise, the material shall be marked as prescribed in 13.1 and 13.2. The ends of ingots and billets shall be painted with a suitable colour code conforming to IS 2049.

3.2 Each ingot, billet and bloom shall be legibly stamped or painted with the cast number, grade and identity of the source of manufacture.

4. CONTROL UNIT–All steel ingots or semi-finished products representing same cast, grade designation and manufactured under uniform conditions of production in the same place shall constitute a control unit.

5. LEVELS OF CONTROL–The tests as indicated in column 1 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. TEST CERTIFICATE–For each consignment of BIS Certified material conforming to IS 8052:2006 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)

7. 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. Any rejected material which is potentially re-salable be sheared or cut or deformed in such a manner that it cannot be used for any other purpose except re-melting. A separate record shall be maintained giving information on quantity and cast number/coil number/control unit number, as applicable, relating to all such rejections/defective/sub-standard material of the production not conforming to the requirements of the Specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the Specification. The Standard Mark (if already applied) on rejected material should be defaced.

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SCHEME OF INSPECTION AND TESTING

TABLE1: LEVELS OF CONTROL

(1)				(2)	(3)			(4)
TEST DETAILS					LEVELSO F CONTROL			REMARKS
Clause	Requirement s	Test Method		Test equipment requirement R: required(or)S: Sub- contractingper mitted	No. of Samples	Freque ncy		
		Clause	Reference					
6	Chemical Composition		IS 8052& IS 228 (Variou sParts) Or any established Chemical/I nstr. method					
	Ladle Analysis	6.1, Table-1	-do-	R	One	Eac hCa st	-----	
	Product Analysis	6.2 Table-2	-do-	R	One	Eac hCa st	-----	
8	Freedom from Defects	cl.8.1, cl.8.1.1., cl.8.2.	IS 8052	R	Adequate inspection on each item to ensure freedom from defects			
9	Macro- examination	cl.9.	IS8052& IS11371	S	As mutually agreed to between manufacturer and purchaser.			
	Sulphur Print Tests	cl.9.	IS8052& IS12037	S	-do-			
	Harden ability	9	IS 8052 & IS 3848	S	-do-			
	Inclusion Content	9	IS 8052 & IS 4163	S	-do-			

10& 11	Dimensions & Tolerances	10.1 10.2 ,10.3, 10.4, 11.1 11.2	IS8052	R	Adequate inspection to ensure each item conforms to nominal dimensions as agreed between and Tolerances as stipulated in the standard.
13	Marking	13.1, 13.2,	IS 8052	R	Unless otherwise agreed the Material shall be marked as given in 13.1,13.2 of IS 8052:2006

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

ANNEXURE-I

(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR STEEL INGOTS, BILLETS AND BLOOMS FOR THE PRODUCTION OF
SPRINGS, RIVETS AND SCREWS FOR GENERAL ENGINEERING APPLICATIONS**BIS
STANDARD
MARK

TEST CERTIFICATE No. _____

DATE _____

To M/s _____

We certified that the material described below fully conforms to 8052:2006 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 _____ areas indicated below against each order No.

(PLEASE REFER TO IS 8052:2006 FOR DETAILS OF SPECIFICATION
REQUIREMENTS)

TEST RESULTS

Order No. & Date	(nom Size)	Control Unit No.	Grade& Quality	Quantity in tonnes	CHEMICAL COMPOSITION								PHYSICAL PROPERTIES						Colo ur code	Remarks
					C %	S %	P %	Si %	Mn %	Cr %	Mo %	V %	Freedom from defects	Dimensions and Tolerances	#Sulphur print test	#macro-examination	#Hardena bility	# Inclusion Content		

#If agreed between

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY