

उत्पाद मानुयल
वोल्यूट तथा कुंडलीनुमा स्प्रिंग्स के निर्माण के लिए इस्पात (रेल डिब्बे)
IS 3195:1992 के अनुसार

Product Manual For
Steel for the manufacture of volute and helical springs (For Railway Rolling Stock)
According to IS 3195 : 1992

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन में रीति और पारदर्शिता के सुसंगत 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 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.	उत्पाद Product	:	IS 3195 : 1992
	शीर्षक Title	:	वोल्यूट तथा कुंडलीनुमा स्प्रिंग्स के निर्माण के लिए इस्पात (रेल डिब्बे) Steel for the manufacture of volute and helical springs (For Railway Rolling Stock)
	संशोधन संख्या No. of amendments	:	2
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	कृपया Annex-A देख Please see Annex-A
b)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	कृपया Annex-A देख Please see Annex-A

c)	नमूनेका परिमाण Sample Size	:	For Chemical tests: i) For instrumental chemical analysis- 5 pieces of 5cm ii) For Wet Chemical analysis - 50 gm drillings iii) For mechanical tests- 2 Nos. x 1 Meter
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-B देखें Please refer Annex –B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer Annex - C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All physical and chemical tests
6.	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence :		
	IS 3195:1992 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 3195:1992 with the following scope:		
	उत्पाद का नाम Name of the product	वोल्यूट तथा कुंडलीनुमा स्प्रिंग्स के निर्माण के लिए इस्पात (रेल डिब्बे) Steel for the manufacture of volute and helical springs (For Railway Rolling Stock)	
	Grade	98C6, ..	
	Delivery	As rolled and straightened, ..	
	Form	Flats/ Rounds/Bevels	
	Size (Diameter)	Size Range as per manufacturing facilities	

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

ANNEXURE A

To Product Manual For Steel for the manufacture of volute and helical springs (For Railway Rolling Stock) According to IS 3195 : 1992

RAW MATERIAL

Steel making shall comprise of Secondary refining or Vacuum Melting. In case Steel Ingots and Billets conforming to IS 8052 are used for manufacture of flats and rounds, they shall be ISI marked.

GROUPING GUIDELINES

1. Grouping of Steel for the manufacture of volute and helical springs (For Railway Rolling Stock) is carried out as under:
 - a. Steel Grade
 - b. Delivery Condition
2. Accordingly, for the purpose of the GOL/CSoL the product is grouped as under:

Group	Designation	Remarks
1	98C6 113C6	One sample of any Designation in the group, of any size and of any form for a given delivery Condition, shall be drawn and tested for covering complete Range of sizes of all forms for Designation(s) in the group for the delivery condition. Note: If samples of different conditions are drawn to consider more than one delivery condition of steel designation(s) in licence scope and the samples so drawn of different delivery conditions are of same cast then only sample may be got tested for chemical composition.
2	55Si7 60Si7 65Si7	-do-
3	50Cr4V2 60Cr4V2 52Cr4Mo2V	-do-

3. It shall, however, be ensured that the applicant/licensee has got complete manufacturing capabilities as well as testing facilities for the sizes/designations/forms/types required to be covered in the licence scope.
4. During the operation of license, BO shall ensure that all steel designations & forms covered in the license are drawn for independent testing on rotation over a period of time.

ANNEX B

To Product Manual For Steel for the manufacture of volute and helical springs (For Railway Rolling Stock) According to IS 3195 : 1992

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sr. No	Test Equipment/Chemicals	Tests Used in with Clause Reference
1.	Rough Polishing Machine, Abrasive Cutting Machine, Fine Polishing Machine, Grinding Machine, Molding machine, Longitudinal cutting machine, lathe, Diamond Paste etc	Preparation of specimen for Chemical composition, inclusion rating, microstructure
2.	<u>Analytical method</u> (1) Carbon & Sulphur: IS 228(P-I) Carbon –Sulphur (Strohlein's type) apparatus-complete set(consisting of glass parts assembled on wooden stand, combustion furnace, thyristor based electronic control panel, Oxygen cylinder, Sulphur cup, combustion boats Barometer, Room temperature thermometer etc. Standard steel of appropriate values of carbon & Sulphur. (2) Silicon: IS 228 (Part 8) Hydrochloric acid, Sulphuric acid, Nitric acid, Silver Nitrate, Perchloric acid, Hydrofluoric acid, Weighing balance 200g, LC 0.1 mg, Muffle furnace up to 1100°C, Platinum Crucibles, Hot Plate, Porcelain dish 300ml, Filter paper pulp. Filter papers General lab glassware (3) Manganese IS 228 (Part 2): Sulphuric Acid, Concentrated Nitric Acid -Relative density 1.42, Phosphoric Acid, Ammonium persulphate, Silver Nitrate, Sodium Chloride, Sodium carbonate, Sodium arsenite, Steel sample of known Manganese Content (4) Chromium IS 228 (Part 6): Wide mouth conical Flask, glass beads, Phosphoric Acid, Sulphuric Acid, Concentrated Nitric Acid, Hydrochloric Acid -, Silver Nitrate, Ammonium Persulphate Solution, Ferrous Ammonium Sulphate, Ammonium persulphate, Potassium Permanganate (AR) Sodium Oxalate (GR) (5) Phosphorus: IS 228 (Part 3). Nitric Acid conc., Potassium Permanganate, Oxidized Ammonium Hydroxide, Sodium Nitrite, ammonium molybdate, Phenolphthalein Solution (1%), Sodium Hydroxide, Potassium hydroxide, Potassium Nitrate, sodium carbonate, Hydrochloric Acid-, Hydrofluoric Acid, Perchloric Acid ferrous sulphate crystals (FeSO₄.7H₂O), Sulphurous Acid, Hydrobromic Acid -filter	Chemical Composition (6)

	paper pulp pad.	
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	(6) Molybdenum: IS 228 (Part 10) Reagents: Perchloric Acid, Phosphoric Acid, Nitric Acid, Hydrochloric Acid, Dilute sulphuric acid, potassium thiocyanate solution, stannous chloride solution, n-butyl acetate, Iron-Mo free, molybdenum metal (99.9 pc pure) Spectrophotometer, Volumetric flask, conical flask, titration apparatus (burette, pipette etc.), hot plate, thermometer, separating funnel, dry filter paper and other laboratory glassware and apparatus	
3.	Instrumental Method - Optical Emission Spectrometer (OES) with requisite channels and certified reference materials	C, S, P, Mn, Si, Cr, Mo V (6)
4.	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, Standard Reference Material with certificate	C, S, P, Mn, Si, V, Cr, Mo (6)
5.	Brinell Hardness Tester of suitable Range preferably 300 BHN with Standard Reference Blocks of Thickness 6mm, 12mm and 16mm. Conditioning Facilities - control the temperature within a range, such as $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$.	Hardness (7)
6.	Optical microscope with image Analyser	Decarburization (8)
7.	Metallurgical Microscope of suitable magnification (100x) polishing machine, Polishing paper, velvet cloth, Diamond compound, Muffle furnace, Nitric acid, alcohol	Inclusion Rating (9)
8.	Vision-based inspection system	Surface Defects (9)
9.	Vernier Calipers, Micrometer, Scale, Cord, Measuring Tape, spirit level bench, surface plate, Weighing Scale Feeler gauge, Straight Edge of sufficient length	Dimensions and Tolerances (11), Calculation of Mass (12)

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

ANNEXURE C

Product Manual For Steel for the manufacture of volute and helical springs (For Railway Rolling Stock) According to IS 3195 : 1992

Scheme of Inspection And Testing

1. 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.

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. PACKING AND MARKING – The Standard Mark as given in Column (1) of the First Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated, 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, stencilled content or label affixed on top of package shall also contain the phrase 'Please visit www.bis.gov.in for BIS certification details'.

4. CONTROL UNIT – For the purpose of this scheme the material or part thereof representing the same cast, condition and form, processed to same nominal thickness under uniform conditions of production in a day 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.

All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

General requirements relating to supply of material shall conform to IS 8910.

6. TEST CERTIFICATE- 1) For each consignment of BIS Certified material conforming to IS 3195:1992 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. 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.

TABLE 1
Levels of Control

PM/ IS 3195/ 3 Sep 2023

(1)				(2)	(3)		
Test Details				Test equipment requirementR: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
6	Chemical Composition	IS 228 or any other established instrumental/chemical method					
	Ladle Analysis	6.1,6.2 Table1	IS 3195:1992 IS 8052	R	One	Each Heat	Applicable for manufacturers with steel making facilities only
	Productanalysis	4.2, 13.1.1, Table1& 2		R	NIL	NIL	Applicable for manufacturers with steel making facilities only
				S	One	Each Cast	Applicable for Re-rollers. No further testing is required if the material received is ISI marked and is received with Test Certificate
7	Hardness	7.1 Table-2	IS 3195:1992 IS 1500 Pt.1	R	One	Each Control Unit	
8	Decarburization	8.1 to 8.6.3 Table-3	IS 6396	R	-do-	-do-	
9	InclusionRating	9	IS 3195:1992 IS 4163	R	-do-	-do-	
10	Freedom fromDefects	10.1 to10.3	IS 3195:1992	R	Each finished product shall be inspected toensure free from any harmful defect.		
11	Dimensions and Tolerances	11.1 to11.4	IS 3195:1992	R	Adequate inspection to ensure each item tobe within the limits of specification.		
12	Calculation ofMass	12	IS 3195:1992	R	Eachitem	Each item	Requirements shall be subjected to agreement between manufacturer and purchaser.

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.

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Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

Annexure-I

BIS
STANDARD
MARK

(Para 6 of the Scheme of Inspection and Testing) XYZ COMPANY
(Registered office Address and works address)

TEST CERTIFICATE FOR Steel for the manufacture of volute and helical springs (For Railway Rolling Stock)

TEST CERTIFICATE No. _____

DATE _____

TO M/s _____

We certified that the material described below fully conforms to IS 3195:1992 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 3195:1992 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

Test Results

Order No. & Date	Form	Batch / Control Unit number	Size & Weight [#]	Quantity	Dimensions & Tolerances	Chemical Composition								Physical Properties			Remarks
						C	Si	Mn	Cr	S	P	Mo	V	Hardness	Inclusion Rating	Decarburization	

as agreed between

REMARKS
WAGON NOTRUCK NO

FOR XYZ Steel COMPANY

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