



PM/7226/1

Jan 2021

उत्पाद मानुयल  
कोल्ड-रोल्ड मीडियम, हाई कार्बन और लो अलॉय स्टील स्ट्रिप  
फॉर जनरल इंजीनियरिंग पर्पस  
IS 7226:1974 के अनुसार

**PRODUCT MANUAL For  
Cold-Rolled Medium, High Carbon and Low  
Alloy Steel Strip for General Engineering  
Purposes  
According to IS 7226:1974**

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन में रीति और पारदर्शिता के सुसंगतता 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 <b>Product</b>	:	IS 7226:1974
	शीर्षक <b>Title</b>	:	Cold-Rolled Medium, High Carbon and Low Alloy Steel Strip for General Engineering Purposes
	संशोधन संख्या <b>No. of amendments</b>	:	0
2.	नमूनाकरण दिशा निर्देश <b>Sampling Guidelines</b>	:	
a)	कच्चा माल <b>Raw material</b>	:	कोई विशेष आवश्यकता नहीं No Specific requirement
b)	समूहिकरण दिशा निर्देश <b>Grouping Guidelines</b>	:	कृपया Annex-A देखें Please see Annex-A
c)	नमूने का परिमाण <b>Sample Size</b>	:	For Chemical Test: 5 test pieces of 50 mm x 50 mm size/50 g drilling. For Physical Test: 0.5 Sq.mm (Dimensional tests to be done in the factory on full width strip).
3.	परीक्षण उपकरणों की सूची <b>List of Test Equipment</b>	:	Please refer Annex - B
4.	निरीक्षण व परीक्षण स्कीम <b>Scheme of Inspection and Testing</b>	:	Please refer Annex - C
5.	एक दिन में संभावित परीक्षण <b>Possible tests in a day</b>	:	All tests.
6.	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence :		
	IS 7226:1974 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 7226:1974 with the following scope:	
	उत्पाद का नाम <b>Name of the product</b>	Cold-Rolled Medium, High Carbon and Low Alloy Steel Strip for General Engineering Purposes
	<b>Type</b>	Medium carbon/ High carbon/ High carbon low alloy
	<b>Steel Designation</b>	C40, C55...etc
	<b>Size</b>	[Width and Thickness]
	<b>Supply Condition</b>	Annealed/ Annealed and Re-rolled

**BUREAU OF INDIAN STANDARDS**

Manak Bhawan, 9, Bahadur Shah Zafar

Marg, New Delhi – 110002

**ANNEXURE A**  
**TO PRODUCT MANUAL FOR**  
Cold-Rolled Medium, High Carbon and Low  
Alloy Steel Strip for General Engineering Purposes  
**According to IS 7226:1974**

**GROUPING GUIDELINES**

1. Cold-Rolled Medium, High Carbon and Low Alloy Steel Strip for General Engineering Purposes as per IS 7226:1974 are categorized into following groups for the purpose of GoL/CSoL:

<b>Group</b>	<b>Type</b>	<b>Designations</b>	<b>Remarks</b>
1	Medium carbon	C40, C55	One sample from the group of any grade and any size may be tested to cover steel strips of all the grades and sizes of the group.
2	High carbon	C70, C80, C85, C98	One sample from the group of any grade and any size may be tested to cover steel strips of all the grades and sizes of the group.
3	High carbon low alloy	120Cr35, 120Cr35W2	One sample from the group of any grade and any size may be tested to cover steel strips of all the grades and sizes of the group.

2. While considering Grant of licence/inclusion of additional varieties, it shall be ensured that the applicant/licensee has got the complete manufacturing and testing facilities for all the sizes/grades/varieties applied.
3. In case of testing for Dimensions (width), tolerance on edge camber and width (cl.9), freedom from defects (cl.6.1), coils from which samples are drawn for independent testing, may be tested in the factory. Under such circumstances, samples drawn for independent testing are not required to be tested for above physical parameters.

**ANNEXURE B**  
**TO PRODUCT MANUAL FOR**  
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Alloy Steel Strip for General Engineering Purposes  
**According to IS 7226:1974**

**LIST OF TEST EQUIPMENTS**

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Major test equipment essentially required to test as per requirements of Indian Standard.

Sl. No.	Test Equipment/Chemicals and Identification Numbers (Where applicable)	Tests Used in with Clause Reference
1.	<b>Instrumental methods</b>  Spectrometer: Atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry.  Spectrophotometer	Cl. 4.1, 4.2 for C, Mn, Si, S, P, Cr, W Content           For 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. 4.1, 4.2 –Carbon & Sulphur Content (chemical method, alternative to instrumental method)
3.	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	Cl. 4.1, 4.2- Phosphorus Content (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, Sodium Chloride Solution, Permanganic acid	Cl. 4.1, 4.2- Manganese Content (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	Cl. 4.1, 4.2- Silicon Content (chemical method, alternative to instrumental method)

	Reagents: Silver nitrate solution, concentrated nitric acid, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydrofluoric acid	
<b>6.</b>	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, and standard potassium permanganate solution.	Cl. 4.1, 4.2- Chromium Content (chemical method, alternative to instrumental method)
<b>7.</b>	Hot plate, glasswares, filter paper, stop watch Potassium thiocyanate, hydrochloric acid, titanium trichloride, stannous chloride, sulphuric acid, phosphoric acid, Nitric Acid, Sodium Hydroxide, Standard Tungsten Solution, Sodium tungsten dihydrate, pure iron.	Cl. 4.1, 4.2- Tungsten Content (chemical method, alternative to instrumental method)
<b>8.</b>	Rockwell Hardness Testing Machine/ Vickers Hardness Testing machine	Cl. 5.1, 5.2
<b>9.</b>	Microscope with Magnification (upto 1000x)	Cl. 6.1
<b>10.</b>	Vernier Calipers, External Micrometer	Cl. 9.1
<b>11.</b>	Measuring Tape, Cord, Flat bench, Feeler Gauge	Cl. 9.2

**Nitrogen content shall be occasionally tested.**

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

**ANNEXURE C**  
**TO PRODUCT MANUAL FOR**  
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Alloy Steel Strip for General Engineering Purposes  
**According to IS 7226:1974**

**SCHEME OF INSPECTION AND TESTING**

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**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, PACKING** - The Standard Mark as given in schedule of the licence 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 conform to all the requirements of the specification.

**4. CONTROL UNIT** - For the purpose of this scheme material produced continuously from the same cast under uniform conditions to same dimensions in a day in the same place shall be considered as one 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.

**6. TEST CERTIFICATE** - For each consignment of BIS Certified material conforming to IS 7226:1974 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.

**ANNEXURE C**  
**TO PRODUCT MANUAL FOR**  
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**HEME OF INSPECTION AND TESTING**

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**TABLE 1: LEVELS OF CONTROL**

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S:Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
4	Chemical Composition						
	Ladle Analysis	4.1, Table 1	IS 7226 & IS 228 (Various Parts) Or any established Chemical/ Instr. method	R	One	Each Heat	Applicable for manufacturers with steel making facilities
	Product Analysis	4.2, Table 1	-do-	R	Nil  One	Nil  Each Cast	Applicable for manufacturers with steel making facilities.  *Applicable for manufacturers feeding to rolling mills through reheating furnace (see Note-3)

5	Hardness Test	5.1, 5.2	IS 7226 & IS 1586 (Various Parts)	R	1	Every Control Unit	
6	Freedom from Defects	6.1	IS 7226	R	Adequate inspection to ensure each item to be free from defects which are detrimental to subsequent processing and ultimate use.		
8	Edge Condition	8.1	IS 7226	R	Each coil to be checked for edge condition. Unless otherwise specified by purchaser, the coil shall be supplied with mill, trimmed or slit edges		
9	Rolling Tolerances	9.1, 9.2	IS 7226	R	Adequate inspection to ensure that each coil conforms to tolerances stipulated in the standard.		
10	Surface Finish	10.1	IS 7226	R	Each Cold-rolled steel strips shall be supplied with bright finish		
11	Packing	11.1	IS 7226	R	Each coil shall be suitably packed to prevent them from rusting and damage during transit.		

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.

Note -3: No testing for product analysis is required if material fed to rolling mills is ISI marked and received with test certificate

## ANNEXURE I

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(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR COLD-ROLLED MEDIUM, HIGH CARBON AND LOW ALLOY  
STEEL STRIP FOR GENERAL ENGINEERING PURPOSES**BIS  
STANDARD  
MARK

Test Certificate No. \_\_\_\_\_

DATE\_\_\_\_\_

To M/s\_\_\_\_\_

We certified that the material described below fully conforms to IS 7226: 1974 Chemical composition and Mechanical 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 7226: 1974 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order No. & Date	Section (nom Size)	Control Unit No.	Grade	Quantity in tonnes	CHEMICAL COMPOSITION					MECHANICAL PROPERTIES			Type and Designation	Remarks
					C %	S %	P %	Si %	Mn %	Hardness	Edge Condition	Supply Condition		

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY