

उत्पाद मैनुअल
अतप्त बेल्लन प्रयोजनों हेतु तप्त बेल्लित कार्बन इस्पात की पती -विशिष्ट
IS 11513:2017 के अनुसार

PRODUCT MANUAL FOR
Hot Rolled Carbon Steel Strip for Cold Rolling Purposes
According to IS 11513:2017

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 IS No.	:	IS 11513:2017
	शीर्षक Title	:	Hot Rolled Carbon Steel Strip for Cold Rolling Purposes
	संशोधनों की संख्या No. of amendments	:	1
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific raw material requirement <i>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</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex - A
c)	नमूने का परिमाण Sample Size	:	For Chemical Test: 5 test pcs of 50 mm x 50 mm size For Physical Test: NA (No physical tests prescribed in IS. Dimensional tests to be done in the factory on full width strip) <i>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 (incase of market surveillance, effort may be made to procure therequired quantity of product sample, as far as possible since raw material sample may not be available in market)</i>

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 tests are possible to be carried out in a day <i>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 readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.</i>
6.	लाइसेंस का दायरा /Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 11513:2017 with the following scope:		
	Name of the product	Hot Rolled Carbon Steel Strip for Cold Rolling Purposes	
	Grades	[Mention grade i.e. CR0, CR1 etc.]	
	Size	Thickness fromxx...mm to up to and includingxx.. mm, Width fromxx... mm to up to and includingxx... mm	

BUREAU OF INDIAN STANDARDS
ManakBhawan, 9, Bahadur Shah ZafarMarg,
New Delhi – 110002

ANNEXURE A

GROUPING GUIDELINES

- a) Grouping has been done on the basis of different process used for manufacturing of the product and also taking into consideration % C, P & S

Group	Designations	
1	CR0 CR1 CR2 CR3 CR4 CR5	A. Without addition of micro-alloy elements: One sample of any size of higher formability grade, with lower C%, is to be tested from the group for considering all grades without addition of Micro-alloy elements. If sample is tested for higher formability steel grade then recommendation for grant of licence / inclusion may include lower formability steel grades also. If the firm does not intend to cover micro alloyed grades then the exclusion of the same should be mentioned in the scope of licence. For example CR0 to CR3 is to be covered, then one sample of CR3, the highest formability grade has to be drawn and tested. All lower formability grades CR0, CR1, & CR2 can also be covered. B. With addition of micro-alloy elements: In case the firm intends to cover the grades CR0 to CR4 with addition of „micro-alloying“ elements as well then one sample of any grade with micro-alloying and another sample of a grade with

		higher formability & without micro-alloying should be drawn (i.e two samples). If the firm intends to cover the grades CR0 to CR5 with addition of „micro-alloying“ elements as well then testing of one sample of CR5 with micro-alloying would serve the purpose as it is the highest formability Grade within the group and also has permissible micro alloying elements upto 0.15 Max.
2	CR6 CR7	One sample of any size from the group is to be tested for considering the grades CR6 & CR7 for grant of licence/inclusion. For covering the grades CR6 & CR7 in scope of licence , one sample of CR6 or CR7, preferably with high % C , % Mn and micro-alloy elements, is to be tested.
3	CR8 to CR15	One sample of any size from the group of each grade applied for, preferably with high % C, % Mn and micro-alloy elements is to be tested for considering the grades for grant of licence/inclusion.

- b) Scope of licence shall be restricted based on the manufacturing and testing facilities available.
- c) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEXURE B

LIST OF TESTING EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl.No.	Test used in with clause Reference	Test Equipment
1.	For Chemical Composition (Cl. 6)	Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels OR • Carbon Sulphur (Strohlein's type) Apparatus – Complete set consisting of glass parts, combustion furnace, oxygen cylinder , combustion tubes/ boats etc. • Porcelain boat (capable of withstanding 1150 deg.C) • Weighing Balance • Hot plate • Muffle furnace • Induction Furnace • Barometer, Thermometer • Burette, Pipette and Full Range of Lab. Glassware like : Conical Flasks , Beakers, Funnel, Pipettes Glass rod, watch Glass, Brush etc. • Standard Reference Material • Platinum Crucible for Silicon Test • Dessicator • Filter paper, Whatman Filter Paper & Ash less clippings • Arrangements for nitrogen testing • Drilling machine Chemicals and reagents as applicable (Indicative element wise list of test apparatus, chemicals and reagents is enclosed)
2.	Dimensions and tolerances (Cl.9) and Weight (Cl. 10)	Micro meter (Flat Type), Vernier Calipers and Steel Measuring Tape, Weigh bridge or weighing scale of appropriate capacity
3.	Freedom from defects (Cl.8)	Visual Based Inspection System

ANNEXURE B

LIST OF TESTING EQUIPMENT (contd.)

INDICATIVE LIST OF TEST APPARATUS, CHEMICALS AND REAGENTS FOR CHEMICAL ANALYSIS THROUGH CHEMICAL METHODS AS PER IS 228

1.	cl.8.1, 8.2 – C & S(chemical method, alternative to instrumental method)	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
2.	Phosphorus content Cl 8.1,8.2 (chemical method, alternative to instrumental method)	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 Potassium Permanganate (KMnO₄), Sodium Nitrite (Na₂NO₃), Ammonium Molybdate [(NH₄)₂ Mo₂O₇], Ammonium Phosphate [(NH₄)₃ PO₄], Potassium Nitrate (K₂NO₃), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid (HClO₄), Sulphurous Acid, Hydrobromic Acid (HBr) , other chemicals and

	reagent as applicable	
3.	Manganese content Cl 8.1,8.2 (chemical method, alternative to instrumental method)	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
4.	Silicon content Cl 8.1,8.2 (chemical method, alternative to instrumental method)	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
5.	Cu content Cl 8.1,8.2 (chemical method, alternative to instrumental method)	Plate, Muffle Furnace, porcelain or silica crucible, Reagents: Hot Wash Solution (dilute sulphuric acid solution 1 : 99 v/v with hydrogen sulphide), dilute sulphuric acid, hydrogen sulphide, Dilute Nitric Acid, Sodium Fluoride, solid, Dilute Ammonium Hydroxide, Acetic Acid, Potassium Iodide, Starch Solution, Sodium Thiosulphate Solution, Ammonium Bifluoride Solution

6.	Ni content CI 8.1,8.2 (chemical method, alternative to instrumental method)	ashless paper pulp, paper pulp pad, hot plate, dessicator, Reagents: ammonium nitrate, methyl red, dilute ammonium hydroxide, Concentrated hydrochloric acid Concentrated nitric acid, Perchloric acid, Hydrofluoric Acid
7.	Cr content CI 8.1,8.2 (chemical method, alternative to instrumental method)	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.	
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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, each strip of the same dimensions and manufactured from the same cast of raw material 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 the Schedule of the licence shall be incorporated legibly and indelibly on the product and on the test certificate, provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

4. TEST CERTIFICATE: For each consignment of BIS Certified material conforming to IS 11513 there shall be a test certificate which shall contain the Standard Mark, the lot/cast 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)		(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				
6	Chemical composition		IS 11513:2017(relevant parts of IS 228 or any other established Instrumental/chemical method)				Records of condition supplied shall be maintained
	a) Ladle Analysis	6.1 Table 1	IS 11513:2017 (relevant parts of IS 228 or any other established Instrumental/chemical method)	R	Each heat	Each heat	Applicable for manufacturers with steel making and hot rolling facilities
	b) Product Analysis	6.2 Table 2	IS 11513:2017	R	i) NIL ii)Each Cast	i)NIL ii) Each Cast	i)Applicable for manufacturers with steel making and hot rolling facilities ii) Applicable for manufacturers not having steel making facilities and are procuring slabs from outside for Hot Rolling.

					ii)Each Cast	ii)Each Cast	No further testing is required if the input material (slabs) fed to Hot Rolling Mills are ISI marked and received with test certificate.
8	Freedom from Defects	8	IS 11513:2017 IS 1730 IS/ISO 16160	R	Firm shall exercise adequate in-process controls to ensure that each strip is free from harmful defects		
9	Dimensions and Tolerances	9.1	IS 11513:2017(relevant parts of IS 228 or any other established Instrumental/chemical method)	R	Adequate inspection to ensure that each strip conforms to the requirements of the specification Any special tolerances to suit Specific requirements shall be mutually agreed to between the manufacturer and the customer and records of the same shall be maintained.		
	i)Standard	9.2					
	Dimensions	9.3					
	ii)Thickness	9.4					
	iii)Crown	9.5					
	iv) Nominal Width						
	v)Edge Camber						

ANNEXURE-I

TEST CERTIFICATE FORMAT

ANNEXURE I
XYZ IRON AND STEEL COMPANY

TEST CERTIFICATE FOR HOT ROLLED CARBON STEEL STRIP FOR COLD ROLLING PURPOSES

TEST CERTIFICATE NO. _____ DATED _____
TO M/s _____

It is certified that the material described below fully conforms to 11513:2017. Chemical composition 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 11513:2017 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no and date	Dimensions	Grade	Cast and Coil No.	Mass of Coil (in Kg/tonnes)	Chemical Analysis (in %)								Crown	Camber	Condition (type of killing/rimmed etc.)
					C	Si	Mn	P	S	Cu*	Al	Microalloying elements			

*For copper bearing quality

The material supplied conforms to specified tolerances

REMARKS

SHIPPING ADVICE NO.

WAGON NOS.

FOR XYZ IRON AND STEEL COMPANY

(It is suggested that size A-4 paper be used for this test certificate)