



PM/ IS 3502/ 1
Sept 2019

**PRODUCT MANUAL FOR
Steel Chequered Plates
According to IS 3502:2009**

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.	Product	:	IS 3502:2009
	Title	:	Steel Chequered Plates
	No. of amendments	:	NIL
2.	Sampling Guidelines		
a)	Raw material	:	Base material shall be as per Grade E250A of IS 2062 unless otherwise specified
b)	Grouping Guidelines	:	Not Applicable
c)	Sample Size	:	Mechanical : 500 mm X 300 mm sample (preferably prepared samples for mechanical tests to be drawn and sent to lab) Chemical : 100 gm drilling or 50 mm X 50 mm chips
3.	List of Test Equipment	:	Please refer Annex –A
4.	Scheme of Inspection and Testing	:	Please refer Annex –B
5.	Possible tests in a day	:	All tests
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 3502:2009 with the following scope:		
	Name of the product	Pre-painted Aluminium Zinc Alloy Metallic Coated Steel Strip and Sheet (Plain)	
	Steel Designation	Steel Chequered Plates	
	Sizes	Thickness x Width x Length (Based on manufacturing capacity available)	

**ANNEXURE A
TO PRODUCT MANUAL FOR
Steel Chequered Plates
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LIST OF TESTING EQUIPMENT

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.	Vernier Callipers	Cl.10& 15
2.	Micrometer	Cl. 10& 15
3.	Steel Scale ,Try-square, Radius gauges, Filler Gauges, Depth gauges, Straight edges, MagneticV-block, Angle Protector (combination set), Protector outside and inside calliper, Carbon Paper	Cl. 10& 15
4.	UTM (0-1000KN)	Cl.10
5.	Steel Mandrels (for bend tests), Templates(for Bend test), UTM attachments/clamps/vice/Magnifying glass	Mandrels is required on the basis of thickness of the products as given in Table-2 as per Cl.11.1 to 11.3
6.	Analytical balance (0-200g,Lc:0.1mg)	Cl.8
7.	Weigh M/c	Cl.15
8.	Steel tape	Cl.15
9.	Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry. Spectrophotometer	Cl 8.1,8.2 for C,S,P,Mn,Si,Al, Cu, Microalloying and alloying elements content Mn,S,P,Si
10.	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	cl.8.1, 8.2 –C& S (chemical method, alternative to instrumental method)

	Reagents for S: Ceramic boats/crucibles – desiccators, Fluxes -Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate	
11.	<p>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</p> <p>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</p>	Phosphorus content Cl8.1,8.2 (chemical method, alternative to instrumental method)
12.	<p>Hot plate, Conical flask</p> <p>Reagents:</p> <p>silver nitrate, ammonium persulphate sodium arsenite solution, Dilute Nitric Acid, Phosphoric Acid, Dilute Sulphuric Acid, Concentrated Nitric Acid, NaCl Solution, Permanganic acid</p>	Manganese content Cl8.1,8.2 (chemical method, alternative to instrumental method)
13.	<p>Medium textured filter paper, Porcelain casserole, platinum crucible, filter paper pulp, hot plate, hot air oven, muffle furnace</p> <p>Reagents: Silver nitrate solution, concentrated nitric acid, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydrofluoric acid</p>	Silicon content Cl8.1,8.2 (chemical method, alternative to instrumental method)
14.	<p>Plate, Muffle Furnace, porcelain or silica crucible,</p> <p>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</p>	Cu content Cl8.1,8.2 (chemical method, alternative to instrumental method)
15.	<p>ashless paper pulp, paper pulp pad, hot plate, dessicator,</p> <p>Reagents: ammonium nitrate, methyl red, dilute ammonium hydroxide, Concentrated hydrochloric acid, Concentrated nitric acid, Perchloric acid, Hydrofluoric Acid</p>	Ni content Cl8.1,8.2 (chemical method, alternative to instrumental method)



PM/ IS 3502/ 1
Sept 2019

16.	Hot plate, stop watch Reagents: dilute sulphuric acid and phosphoric acid mixture, concentrated nitric acid, ammoniumpersulphate, silver nitrate, dilute hydrochloric acid, ferrous ammonium sulphate, standard potassium permanganate solution.	Cr content Cl8.1,8.2 (chemical method, alternative to instrumental method)
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Nitrogen content shall be occasionally tested.

.Least Count and Range should match the values/parameters/tolerances mentioned in the Indian Standard.

The above list is meant only for guidance and may not be treated as exhaustive.



PM/ IS 3502/ 1
Sept 2019

**ANNEXURE B
TO PRODUCT MANUAL FOR
Steel Chequered Plates
According to IS 3502:2009**

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.

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. MARKING –The Standard Mark, as given in the Schedule of the license shall be marked on the top of each steel chequered plate provided that the material thus marked conforms to the requirement of the specification.

3.1 Marking shall be done as per the provisions of the standard. In addition, details of BIS Certification i.e. BIS Licence Number CM/L—and BIS website shall be marked on the top plate of each pile of chequered plates or shown on a tag attached to each pile as follows “For details of BIS certification please visit www.bis.gov.in”

4. CONTROL UNIT – For the purpose of this scheme the material or part thereof manufactured from steel of the same grade and from the same cast subject to a maximum of 40 tonnes 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 this specification 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).

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 resalable be sheared or cut or deformed in such a manner that it cannot be used for any other purpose. A separate record shall be maintained giving information on quantity and batch number/control unit number, as applicable, relating to all such rejections/defective/substandard 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
(Clause 5 of SIT)

(1)				(2)	(3)		(4)
TEST DETAILS				Test equipment requirement R: required (or) S: Sub-contracting permitted	LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method			No. of Samples	Frequency	
		Clause	Reference				
5	Freedom from defects	5	IS 3502	R	Adequate inspection to ensure each item to be free from surface defects.		
4	Material	4	IS 228 (Various Parts) Or any established Chemical/ Instr. method	S	One sample from each 100 MT of material or part thereof rolled from the same cast (See Note 3)		
8	Tensile Test		IS 1608 (Part 1)	R	One	Every Control Unit	
10.1 to 10.2	Dimensions and Rolling Tolerances		IS/ISO 7452	R	Adequate inspection to ensure each item conforms nominal dimensions and tolerances stipulated in relevant standard.		
6 & 10.3	Pattern & Chequered Height	6 & 10.3	IS 3502:2009	R	Adequate inspection to ensure each item conforms nominal dimensions and tolerances stipulated in relevant standard.		

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 empaneled by the Bureau.



PM/ IS 3502/1
Sept 2019

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 chemical testing is required if material is ISI marked and received with test certificate

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

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 Chequered Plates According to IS 3502:2009

TEST CERTIFICATE No. _____

DATE _____

To M/s _____

We certify that the material described below fully conforms to IS 3502:2009

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 3502:2009 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. and date	Nominal Size in mm (TxWxL)	Cast/Lot No.	Steel grade	Quantity (tonnes)	Chemical Composition				Mechanical Properties				Remarks	
					C%	Mn%	S%	P%	YS (Mpa)	TS (Mpa)	Elongation%	Bend Test		

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY