



PM/7814/1 March 2024

उत्पाद मानुयल  
फॉस्फोर कांस्य शीट पट्टी और पन्नी  
IS 7814: 2005 के अनुसार

PRODUCT MANUAL FOR  
Phosphor Bronze Sheet, Strip and Foil  
According to IS 7814 : 2005

भारतीय मानक ब्यूरो )अनुरूपता मूल्यांकन (विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीयशाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्सप्रमाण 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 7814 : 2005
	शीर्षक Title	:	Phosphor Bronze Sheet, Strip and Foil
	संशोधन संख्या No. of amendments	:	1
2.	नमूनाकरण दिशा निर्देश 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)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	Please refer Annexure - A
c)	नमूने का परिमाण Sample Size	:	1pc of 500 mm x 500 mm for Mechanical Tests and 5 pcs. of 5 cm X 5 cm for chemical tests  <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</i>

			<i>quantity of product sample, as far as possible since raw material sample may not be available in market)</i>
3.	<b>परीक्षण उपकरणों की सूची</b> <b>List of Test Equipment</b>	:	Please refer Annexure - B
4.	<b>निरीक्षण व परीक्षण स्कीम</b> <b>Scheme of Inspection and Testing</b>	:	Please refer Annexure - C
5.	<b>एक दिन में संभावित परीक्षण</b> <b>Possible tests in a day</b>	:	All tests  <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.	<b>लाइसेन्स का कार्यक्षेत्र</b> <b>Scope of the Licence :</b>		
	IS 7814 : 2005 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 7814 : 2005 with the following scope:		
	<b>Name of the product</b>	Phosphor Bronze Sheet, Strip and Foil	
	<b>Form</b>	Sheet/Strip/Foil	
	<b>Grade</b>	I/II/III/IV	
	<b>Condition of Supply / Temper</b>	O/HA/HB/HD/HE/HS/HES	
	<b>Size</b>	Thickness: From .... mm upto and including ... mm Width: From ... mm upto and including ... mm Length (in case of Sheets): From .... mm to up to and including .... mm	

**BUREAU OF INDIAN STANDARDS**  
Manak Bhawan, 9, Bahadur Shah Zafar Marg,  
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**Annexure – A**  
**Grouping Guidelines**

- 1) IS 7814:2005 covers the requirements for Phosphor Bronze Sheet, Strip and Foil.
- 2) Four Grades (Grade I,II,III and IV) of Phosphor Bronze are covered under the standard. Chemical Composition of these grades is specified under Table 1. Grades differ based upon the added Tin (Sn) Content with Grade I having lowest Sn i.e. 3.5-4.5% and Grade IV with the highest Sn i.e. 7.0-9.0%.
- 3) These grades can be supplied in 07 different delivery conditions ( O: Annealed, HA: Quarter Hard, HB: Half Hard, HD:Hard, HE: Extra Spring Hard, HS: Spring Hard, HES: Extra Spring Hard) specified at cl.6 (Condition of Delivery).
- 4) Mechanical Properties of these Grades in different delivery conditions are specified at Table 4.

5) In view of above, the following grouping guidelines shall apply for Grant of Licence (GoL)/Change in Scope of Licence (CSoL):

<b>Grade</b>	<b>Condition of Supply / Temper</b>
I	O/HA/HB/HD/HE/HS
II	O/HA/HB/HD/HE/HS
III	O/HA/HB/HD/HE/HS/HES
IV	O/HA/HB/HD/HE/HS/HES

- a) Two Samples of sheet/strip of Grade Designations, having the lowest and highest Sn content, of any size (thickness/width/length) shall be tested among the Grade Designations applied for to cover all sizes and Grade Designations in the Scope of the Licence. Separate Samples of Grade Designations in each Condition of Delivery are required to be drawn and tested.
  - b) In case the firm intends to cover foils also in the scope of the licence, atleast one sample drawn above shall be of a foil.
- 6) Scope of licence shall be restricted based on the manufacturing and testing facilities available.
- 7) 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 TEST EQUIPMENT**

**(INDICATIVE LIST, FOR GUIDANCE ONLY)**

<b>Sl No.</b>	<b>Test Used in with Clause Reference</b>	<b>Test equipment</b>
1	Chemical Composition, Cl 7	Instrumental methods: Instruments such as Optical emission spectrometer  Chemical Methods: Apparatus, Chemicals and Reagents as per relevant Parts of IS 4027
2	Tensile Strength and Elongation, Cl 8.1, 8.1.1	Universal Tensile Testing Machine, Extensometer
3	Hardness Test, Cl 8.1, 8.1.1	Vicker Hardness Tester
4	Bend Test, Cl 8.2	Universal Tensile Testing Machine, Mandrels of required sizes
5	Dimesions and Tolerances, Cl 9	Vernier calipers, Micrometers, Flat Bench, Straight Edge, Radius Gauges, Feeler Gauges

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

## ANNEX B

### 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 the **entire quantity of the material of the same grade designation, condition of delivery and thickness manufactured continuously on the same line in one go 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 Plans 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](http://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 each package or each coil or on each sheet 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 provisions of the Indian Standard.

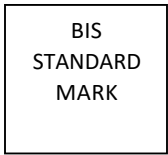
**4. TEST CERTIFICATE** – For each consignment of BIS Certified material conforming to the specification there shall be a test certificate which shall contain the Standard Mark, the lot/cast number and the corresponding test results (as given in Annexure I enclosed).

**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 (FOR GUIDANCE PURPOSE ONLY)**

<b>TEST DETAILS</b>				<b>Test equipment requirement R: required (or) S: Subcontracting permitted</b>	<b>LEVELS OF CONTROL</b>		<b>REMARKS</b>
<b>Clause</b>	<b>Requirements</b>	<b>Test Method</b>			<b>No. of Samples</b>	<b>Frequency</b>	
		<b>Clause</b>	<b>Reference</b>				
7	Chemical Composition	7	IS 4027 (all relevant parts) or Any other established instrumental/chemical method	R	1	Each Cast/Heat	-----
8.1	Tensile Test	8.1	IS 1608 (Part 1)	R	1	Each Control Unit	
8.1	Hardness	8.1	IS 1501 (Part 1)	R	1	Each control Unit	
8.2	Bend	8.2	IS 1599	R	1	Each control Unit	
9	Dimensions and Tolerances	9.1 to 9.5	IS 7814 : 2005	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
5	Freedom from Defects	5	IS 7814 : 2005	R	Firm shall exercise adequate in process controls to ensure that the material is free from harmful defects		

**APPENDIX- I**  
XYZ Company  
(Registered office Address and works address)



**TEST CERTIFICATE FOR PHOSPHOR BRONZE SHEET, STRIP AND FOIL AS PER IS 7814 :  
2005**

TEST CERTIFICATE No. \_\_\_\_\_

DATE \_\_\_\_\_

Supplied To M/s \_\_\_\_\_ (Name and Address of Consignee)

It is certified that the material described below fully conforms to IS 7814 : 2005. The properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks License No. CM/L \_\_\_\_\_ are as indicated below against each order no. etc.

(PLEASE REFER TO IS 7814 : 2005 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order No. & Date	Control Unit/ Batch No./Qty	Size	Grade	Chemical Composition						Condition of Delivery	Mechanical Properties				Remarks
				Cu+Sn+P	Pb	Fe	P	Zn	Sn		TS	El	HV	Bend	

The material supplied conforms to specified requirements of IS 7814 : 2005

REMARKS

Coils/Containers etc

(Signature)  
FOR XYZ COMPANY

(For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in))