



उत्पाद मैनुअल
दोपहिया सवारों के लिए सुरक्षात्मक हेलमेट के लिए
आई एस 4151 : 2015 के अनुसार

PRODUCT MANUAL FOR
PROTECTIVE HELMET FOR TWO WHEELER RIDERS
ACCORDING TO IS 4151:2015

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 uniformity 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.

1.	मानक संख्या IS No.	:	IS 4151:2015
	शीर्षक Title	:	Protective Helmet for Two Wheeler Riders
	संशोधनों की संख्या No. of Amendments	:	2
2.	नमूना दिशानिर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	Materials - Clause 4 of IS 4151 : 2015
b)	समूहीकरण दिशानिर्देश Grouping guidelines	:	Helmet of each Model/Design, Type and Size shall be tested to cover that variety in the licence.

c)	नमूने का परिमाण Sample quantity	:	9 Helmets + 3m chin strap
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer ANNEX A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer ANNEX B
5.	एक दिन में संभावित परीक्षण Possible tests in a day:		
	(i) Sizes (Clause 5) (ii) Constructional requirement (Clause 6.1 to 6.6) (iii) Peripheral vision (Clause 6.7) (iv) Workmanship and Finish (Clause 6.8) (v) Mass (Class 6.9) (vi) Dynamic test of retention system (Clause 7.5)		
6.	लाइसेंस का दायरा / Scope of the Licence :		
Licence is granted to use Standard Mark as per IS 4151 : 2015 with the following scope:			
Name of the product		Protective Helmet for Two Wheeler Ridders	
Model/ Design of helmet (Including reference to document submitted by licensee/ applicant)			
Type		- With or without lower face cover - With or without Visor	
Size		--- mm	

भारतीय मानक ब्यूरो
 BUREAU OF INDIAN STANDARDS
 मानक भवन, ९, बहादुर शाह ज़फ़र मार्ग
 Manak Bhawan, 9, Bahadur Shah Zafar Marg
 नई दिल्ली- ११०००२
 New Delhi – 110002

ANNEX A
List of Test Equipment

(INDICATIVE LIST, FOR GUIDANCE ONLY)

S. No.	Tests used in with Clause Reference	Test Equipment
1	Metal parts (Clause 4.5)	- Spray cabinet - Temperature controlling arrangement - Salt spray arrangement under pressure and with atomizer - Solution collection device
2	Visor (Clause 4.6)	a) Impact Resistance - Test apparatus - Air conditioner - Steel spherical ball b) Penetration Resistance - Test apparatus - Pointed project with 50 gm weight c) Flammability - Burner - Bare copper wire 0.71 mm - Protractor - Stop watch d) Spherical and cylindrical error and Prismatic error - Standard lenses - Telescope - Adjustable light source with condenser e) Diffuse transmittance and Light Transmission - Haze meter - Integrating sphere f) Mass - Weighing balance with weights
3	Sizes (Clause 5)	Head forms of various sizes as per Annex A of IS 4151
4	Shell (Clause 6.2)	- Vernier calliper / Steel scale - Radius gauges
5	Retention system (Clause 6.4)	- Vernier calliper - Load of 150 N $\pm$ 5 N

6	Peripheral vision (Clause 6.7)	- Head forms of various sizes - Load of 50 N - Angle protractor or gauge to check the angle
7	Mass (Clause 6.9)	- Weighing balance
8	Impact absorption (Clause 7.2)	- As per C-2 of IS 4151
9	Rigidity test (Clause 7.3)	- Loading arrangement on helmet with loads of 630 N and 30 N - Steel scale or Vernier calliper - Stop watch
10	Test for projections and surface friction (Clause 7.4)	
	Method A	- As per E-1.2 of IS 4151
	Method B	- As per E-2.2 of IS 4151
11	Dynamic test of retention system (Clause 7.5)	- Test apparatus - Headform with 15 ± 0.5 kg mass - Falling mass 10 ± 0.1 kg and height 750 ± 5 mm
12	Audibility test (Clause 7.6)	- As per G-1 of IS 4151
13	Retention (Detaching) test (Clause 7.7)	- Retention (Detaching) test apparatus - Headform - Falling mass of 10 ± 0.01 kg from height 0.50 ± 0.01 m height
14	Micro-slip test of the chin strap (Clause 7.8)	- Apparatus for testing slippage of the chin strap - Reciprocating clamp
15	Test for resistance to abrasion of the chin strap (Clause 7.9)	- Apparatus for testing abrasion of the chin strap
16	Tests for retention system relying quick – release mechanisms (Clause 7.10)	
	Inadvertent release by pressure (Clause 7.10.1)	Rigid sphere of 100 mm and load to exert pressure of 100 ± 5 N on helmet
	Ease of release (Clause 7.10.2)	- Force measuring equipment - Dynamometer - Vernier calliper
	Durability of Quick release Mechanisms (Clause 7.10.3)	- Suitable test apparatus - Provision for applying force of 20 ± 1 N - Closed cabinet with spray arrangement temperature control arrangement
17	For conditioning of helmets (Clause 7.1.1)	

	Solvent conditioning (Clause 7.1.1.1)	- Cotton cloth - Octane - Toluene - Stop watch - Steel scale
	Ambient temperature and hygrometry conditioning (Clause 7.1.1.2)	- Arrangement for maintaining temperature 25 ± 5 ° C and humidity 65 ± 5 % - Stop watch
	Heat conditioning (Clause 7.1.1.3)	- Arrangement for maintaining temperature 50 ± 5 ° C - Stop watch
	Low temperature conditioning (Clause 7.1.1.4)	- Arrangement for maintaining temperature $- 20 \pm 2$ ° C - Stop watch
	Ultraviolet –radiation conditioning and moisture conditioning (Clause 7.1.1.5)	- Xenon filled quartz lamp of 125 W with range 25 cm - Water spraying arrangement - Timer

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 : Helmets of same Model/Design, Type and Size manufactured under similar conditions in a day 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 **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 clearly and indelibly marked on each helmet provided always that the product so marked conforms to each requirement of the specification.

3.1 Marking on the helmet shall be done as per Clause 9 of IS 4151:2015.

3.2.1 In addition, if visor is provided with the helmet, it shall be marked with manufacturer's name or trade mark, year of manufacture and identification in code or otherwise for traceability.

3.2.2 Each visor shall also be tagged with a printed card having the following information:

- a) To maintain a good field of vision, formation of scratches and accumulation of dirt on the visor screen shall be avoided.
- b) No organic solvents or materials containing organic solvents such as metal polish, wax and polish shall be used to clean the visor screen.
- c) A soft cloth shall be used to wipe the visor for removing dust, dirt etc.

3.3 Additional Marking requirements: Each helmet, shall also be marked with the following additional requirement:

“For BIS certification details please visit www.bis.gov.in”

4 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

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.1	Shell	4.1	IS 4151	S	One	Each consignment	Material shall conform to the requirements.
4.2	Protective padding	4.2	IS 4151				
4.3	Comfort padding	4.3	IS 4151				
4.4	Retention system	4.4	IS 4151				
4.5	Metal Parts (Corrosion resistance)	4.5	IS 4151 IS 9844	S	Two samples for each component.	Each consignment	No further testing is required if accompanied with the test certificate. However, random sample counter check on each component may be carried out once in three months.
4.6 and 6.1.2	Visor (If provided)	4.6	IS 4151 IS 9973	R	One sample for each shape and size	Each lot	No further testing is required if accompanied with the test certificate or ISI marked. However, for non-ISI visors, random sample counter check may be carried out once in a month.
5	Sizes	5.1	IS 4151	R	Eight	Each control unit	-
6	CONSTRUCTIONAL REQUIREMENTS						

6.1	General (Except visor)	6.1.1 , 6.1.2 6.1.3	IS 4151	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.		
6.2	Shell	6.2.1 to 6.2.7	IS 4151				
6.3	Protective padding	6.3	IS 4151				
6.4	Retention system	6.4	IS 4151				
6.5	Characteristics of material of helmet	6.5	IS 4151				
6.6	Safety of wearer	6.6	IS 4151				
6.7	Peripheral vision	6.7, Annex B	IS 4151				
6.8	Workmanship and finish	6.8	IS 4151				
6.9	Mass	6.9	IS 4151				
7.2	Impact absorption test	7.1, 7.2, Annex C	IS 4151	S	Five samples for each shape and size	Once in three months	
7.3	Rigidity test	7.1, 7.3, Annex D	IS 4151	R	Two samples for each shape and size from every 30 control units		
7.4	Test for projections and surface friction	7.4, Annex E	IS 4151	R			
7.5	Dynamic test of retention system	7.5, Annex F	IS 4151	R	One	Each control unit	-

7.6	Audibility test	7.6, Annex G	IS 4151	S	One sample for each shape and size	Once in 6 month	
7.7	Retention (Detaching) test of helmet	7.1, 7.7, Annex H	IS 4151	R	One sample	Each control unit	
7.8	Micro-slip test of the Chin strap	7.8, Annex J	IS 4151	S	One sample for each shape and size	Once in three month	
7.9	Test for resistance to abrasion of the Chin strap	7.9, Annex K	IS 4151	S	One sample for each shape and size	Once in three month	
7.10	Test for retention systems relying on quick release mechanisms	7.10	IS 4151	S	One sample for each shape and size	Once in three month	