



उत्पाद मानयल
सीधे संचकित पॉलिमरिक तले के साथ चमड़े के सुरक्षा एवं संगरक्षी जूते – विशिष्टि
IS 14544 : 2022 के अनुसार

PRODUCT MANUAL FOR
Leather Safety and Protective Footwear with Direct Moulded polymeric Sole
According to IS 14544 : 2022

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम की स्कीम-I के तहत यह उत्पाद मानयल प्रमाणीकरणके 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 Product	:	IS 14544 : 2022
	शीर्षक Title	:	सीधे संचकित पॉलिमरिक तले के साथ चमड़े के सुरक्षा एवं संगरक्षी जूते – विशिष्टि Leather Safety and Protective Footwear with Direct Moulded polymeric Sole — Specification
	संशोधन संख्या No. of Amendments	:	0 Nil
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	(i) Upper : Shall be made of chrome tanned upper leather (ii) Insole : shall be made of either leather board or cellulose board or strobil insole fabric. The material of the strobil insole fabric may be made from either cotton or polyester or nylon. (iii) In socks : In socks shall be made out of either rubber or polymer or elastomer compound with drill or twill or suitable textile as top covering. For mining operations, compact in socks shall be used. (iv) Stiffener : shall conform to hard or very hard variety as per Cl 6.11 (v) Vamp and Quarter lining : lining shall be made of chrome tan or combination tanned lining leather. (vi) Tongue : tongue of the footwear may be made of the same material as upper or made from a material different either in type or thickness from the upper, and shall comply with the requirement of Cl 6.12 (vii) Closing threads : 3 ply nylon or polyester thread

			complying to Cl 6.13 (vi) Outsole : shall be made of mono-density or bi-density polymeric material. The outsole may be either cleated or non-cleated. The outsole shall not be made of scraps of PVC including medical waste. It shall comply to Cl 6.14 (vii) Laces : Nylon laces or polyester laces complying to Cl 6.15 (viii) Toe caps : Toecaps shall comply to Cl 6.8
b)	समूहिकरण दिशा निर्देश Grouping guidelines	:	कृपया Annex-A देखें Please see Annex-A
c)	नमूनेका परिमाण Sample Size	:	5 Pairs
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-B देखें Please refer Annex –B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer Annex - C
5.	एक दिन में संभावित परीक्षण Possible tests in a day :	:	कृपया Annex-D देखें Please refer to Annex D
6.	लाइसेन्स का कार्यक्षेत्र / Scope of the Licence:		
	IS 14544 : 2022 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 14544 : 2022 with the following scope:		
	उत्पाद का नाम Name of the product	Leather Safety and Protective Footwear with Direct Moulded polymeric Sole	
	Variety	Variety 1 and/ or Variety 2	
	Type	Type 1 and/ or Type 2	
	Sizes and fittings	Sizes as applicable/Fitting G and/or H	
	Additional requirements	Antistatic footwear and/or Conductive footwear and/or Cold insulation of sole and/or Heat insulation of sole	

ANNEX A
To PRODUCT MANUAL
FOR LEATHER SAFETY AND PROTECTIVE FOOTWEAR WITH DIRECT MOULDED
POLYMERIC SOLE AS PER IS 14544 : 2022

GROUPING GUIDELINES

1. IS 14544 classifies Leather Safety and Protective Footwear with direct moulded polymeric sole in the following varieties depending on their use:
 - i) Variety 1 — For use as safety footwear; and
 - ii) Variety 2 — For use as protective footwear
2. The variety above is classified into following types based on design:
 - i) Type 1 — Low shoes; and
 - ii) Type 2 — Ankle boots.
3. Leather Safety and Protective Footwear with direct moulded polymeric sole can be of two fittings – G or H
4. Above classifications may be divided in to 2 groups based on the sizes for drawl of samples for the purpose of GoL/CSoL-

Group	Type	Design	Size (English)	Samples to be drawn
1	Variety 1 and/or 2*	Type 1 and/or 2**	4 to 8	One sample of any size and each fitting ***
2	Variety 1 and/or 2*	Type 1 and/or 2**	8½ to 12	One sample of any size and each fitting ***

* If the Applicant /Licensee applies for both the varieties, testing to be done for each variety separately.

**If the Applicant /Licensee applies for both the types, testing to be done for each type separately.

*** Sample of each fitting to be tested separately. Samples of any size can be taken for considering other sizes in the same group.

5. However, while considering grant of licence/inclusion of additional sizes/designs, it will be ensured that the applicant/licensee has got the complete manufacturing and testing facilities for all the Varieties, types, fittings and sizes intended to be covered.
6. During operation of the licence, BO will ensure that all the Varieties/types/fittings/sizes covered in the licence are tested in rotation.

ANNEX B
To PRODUCT MANUAL
FOR LEATHER SAFETY AND PROTECTIVE FOOTWEAR WITH DIRECT MOULDED
POLYMERIC SOLE AS PER IS 14544 : 2022

LIST OF TEST EQUIPMENT

Sl	Requirement		Sub-clause	Test on Finished Footwear/Material
1	Design	Design	6.2	Steel scale, Vernier Caliper
		Fitting	6.3	lasts for the applicable size and fitting
		Height of Upper	6.4	steel scale, Vernier caliper
2	Whole Footwear	Construction	6.5.1	impact apparatus and accessories as per 5.4 of IS 15298 (part 1) for impact test and compression test machine with accessories as per Cl 5.5 of IS 15298 (Part 1)
		Ergonomic feature	6.5.2	17 + 3 stairs, Treadmill stop watch
		Upper-outsole bond strength	6.5.3	Tensile Testing Machine with jaws with multiple speed complying to 5.2.2 of IS 15298 part 1 :2015, Steel Scale, Knife,
		Slip resistance	6.5.4	Test Machine and material as per Cl. 5.11.2.2 of IS 15298 (Part 1)
		Resistance to fuel oil	6.5.5	2,2,4-trimethylpentane, Shore hardness tester, oven, AC
		Impact resistance of footwear	6.5.6	impact apparatus and accessories as per 5.4 of IS 15298 (part 1) for impact test
		Compression resistance of footwear	6.5.7	compression test machine with accessories as per Cl 5.5 of IS 15298 (Part 1)
		Corrosion resistance	6.5.8	Cotton lawn, sodium chloride solution, Air conditioner
3	Upper	Tear strength	6.6.3	Tensile Testing Machine, Test piece holders, Thickness gauge Steel Scale, Press Knife, Conditioning chamber, Air conditioner
		Tensile strength	6.6.4	Tensile Testing Machine and accessories as per Cl 6.4. 2 of IS 15298 (Part 1)
		Water vapour permeability and coefficient	6.6.5	Permeability Apparatus as per cl 6.6 & 6.8 of IS 15298 (Part-1), Jars or Bottles, Holder, Fan, Silica Gel, Mesh, Conditioning Chamber, Oven, Balance, Stop Watch, Vernier Caliper, Flexometer as per Cl. 6.6.2.8 of IS 15298 (Part 1), Circular Metal Container, Hygrometer, Thermometer, Air conditioner.

4	Vamp and quarter lining	Tear strength	6.7.2	Tensile Testing Machine, Test piece holders, Thickness gauge Steel Scale, Press Knife, Conditioning chamber, Air conditioner
		Abrasion resistance	6.7.3	Martindale Abrasion Machine as per cl. 6.12.2.1 of IS 15298 (Part 1), Reference Abradant Pad, Backing Fabric Punch Weight, Specimen Holder, Abrading Base, Balance, Conditioning Chamber, Dial Gauge, Filler Gauge, Woven felt, Hygrometer, Air conditioner, Thermometer.
		Water vapour permeability and coefficient	6.7.4	Circular metal container, Balance, Stopwatch , conditioning chamber
5	Toecaps	Whole toecap	6.8	Vernier caliper, scale, Equipment for test as per n IS 5852 (Part 1) and/or IS 5852 (Part 2) for variety 1 and 2 respectively.
6	Insole	Thickness	6.9.2	Dial Thickness gauge, Travelling microscope
		Abrasion resistance	6.9.3	Finger Abrasion Tester as per cl. 7.3.2.1 IS 15298 part 1, Wool pads, Abradant fabric, Conditioning Chamber, Distilled Water, other details as per cl. 7.3 of IS 15298 (part 1).
		Water absorption and desorption	6.9.4	Water Absorption & Desorption Tester as per 7.2.2 of IS 15298 part 1, Brass Roller, Platform, Clamp (D) and clamp € IS 15298 part 1, Cotton gauge, Water Supply through flow meter, Press Knife, Balance, Clock, Silicone grease
7	Insocks*	Thickness	6.1	Dial Thickness gauge/Vernier caliper
		Abrasion resistance	6.10.2	Martindale Abrasion Machine as per cl. 6.12.2.1 of IS 15298 (Part 1), Reference Abradant Pad, Backing Fabric Punch Weight, Specimen Holder, Abrading Base, Balance, Conditioning Chamber, Dial Gauge, Filler Gauge, Woven felt, Hygrometer, Air conditioner, Thermometer.
		Water absorption and desorption	6.10.3	Water Absorption & Desorption Tester as per 7.2.2 of IS 15298 part 1, Brass Roller, Platform, Clamp (D) and clamp € IS 15298 part 1, Cotton gauge, Water Supply through flow meter, Press Knife, Balance, Clock, Silicone grease
8	Stiffener	Stiffener	6.11	Requirements of IS 7554

9	Tongue	Material	6.12	TC from the supplier, requirements prescribed in 6.6 of IS 14544, Tensile Testing Machine, Test piece holders, Thickness gauge Steel Scale, Press Knife, Conditioning chamber, Air conditioner
10	Closing thread	Properties	6.13	Tensile Testing Machine with flat jaws with 100±20 mm/min speed as per cl.5.2.2 of IS-15298 (part-1), Steel Scale, Knife,
11	Outsole	Thickness, cleat area and cleat height	6.14.2, 6.14.3, 6.14.4	thickness gauge, Vernier caliper
		Tear strength	6.14.5	Press Knife/Cutting die, Tensile Testing M/c
		Abrasion resistance	6.14.6	Abrasion Testing M/c as per ISO 4649, Conditioning Chamber, Analytical Balance, Cutting Die, Weight, Abrasion Sheet
		Flexing resistance	6.14.7	Flexing Testing M/c - Bennwert with Clamping Device & Hinged Plate per clause 8.4.1.1 of IS 15298 Part 1, Cutting Tool (as per ISO 5423), Mandrel, Air conditioner
		Interlayer bond strength	6.14.8	Press Knife/Cutting die, Tensile Testing M/c
12	Laces	Material	6.15.1	TC from supplier, scale
		Colour Fastness	6.15.2	Test device as per Cl 4.1 of IS/ISO 105-E-01, oven ((LC min 0.5), adjacent fabrics, Grey scale (for accessing change in colour and staining), spectrophotometer/colorimeter, set of 11 acrylic resin plates, flat bottomed dish of inert material, Grade 3 water
		Abrasion Resistance	6.15.3	Lace to Lace cycle tester
		Breaking load	6.15.4	Tensile testing M/c, Conditioning chamber
13	Chemical Requirements	Chemical requirements	6.13	as per IS 17011
14	Additional requirements	Antistatic	8.1	Testing equipment as per 5.10.2.1 for measurement of electrical resistance, stainless steel balls as per Cl 5.10.2.2, copper contact plate, conductive lacquer, Device for measuring the conductive resistance of the lacquer, oven, conditioning chamber, AC
		Conductive	8.2	Testing equipment as per 5.10.2.1 for measurement of electrical resistance, stainless steel balls as per Cl 5.10.2.2, copper contact plate, conductive lacquer, Device for measuring the conductive resistance of the

				lacquer, oven, conditioning chamber, AC
		cold insulation	8.3	Insulated cold box, Thermal transfer medium, Temperature probe, Temperature measuring device, Copper plate, containing chamber, as per Cl 5.13.1
		heat insulation	8.4	Sandbath, stainless steel balls, Temperature probe with an accuracy of ± 0.5 °C, Temperature measuring device, as per cl 5.12.1, conditioning chamber

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

ANNEX C

SCHEME OF INSPECTION AND TESTING FOR LEATHER SAFETY AND PROTECTIVE FOOTWEAR WITH DIRECT MOULDED POLYMERIC SOLE AS PER IS 14544 : 2022

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 and implement a calibration plan for the test equipment.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. PACKING AND MARKING – The Standard mark as given in the Schedule of the licence shall be marked permanently on the underside of each footwear provided always that the leather safety and protective footwear to which this mark is thus applied conforms to every requirement of the specification.

3.1 Packing and Marking shall be done as per the provisions of the IS 14544 : 2022. In addition, the following details shall be marked on each boot and package:

- a) Licence no (CM/L.....)
- b) BIS Website details: 'For BIS Certification details please visit www.bis.gov.in'

3.2 Sizes of the footwear and trade-mark, if any, shall be incorporated in the mould, so as to make them legible on the waist of the outer sole. Size and fitting number, and year of manufacture shall be marked on insole waist.

4. CONTROL UNIT – For the purpose of this scheme, the control unit shall be as follows:

10,000 pairs or Fortnight production (whichever is earlier) of finished Leather safety and protective footwear with direct moulded polymeric sole of same variety and type manufactured from the same consignment of raw material 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. 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.

TABLE 1
LEVELS OF CONTROL

1				2	3		
Test Details				Test equipment requirement	Levels of Control		
clause	Requirement	Test Method CI Ref	Test Method IS	R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
	Design						
6.2	Design		IS 15298 (Part 2).	R	each size	Each control unit	
6.3	Fitting		IS 1638	R	-do -	Each control unit	
6.4	Height of Upper		IS 15298 (Part 2)/IS 15298 (part3)	R	-do -	-do -	
6.5	Whole Footwear						
6.5.1	Construction	6.5.6 and 6.5.7 of IS 14544 /5.4 and 5.5 of IS 15298 (Part 1)		R	-do -	-do -	
6.5.2	Ergonomic feature		IS 15298 (Part 1),	R	-do -	-do -	
6.5.3	Upper-outsole bond strength	5.2	IS 15298 (Part 1)	R	Every alternate size	-do -	
6.5.4	Slip resistance	5.11	IS 15298 (Part 1),	S	-do -	once in a month	
6.5.5	Resistance to fuel oil	8.6.1 and 8.6.2	IS 15298 (Part 1),	R	-do -	Once in 3 months	
6.5.6	Impact resistance of footwear	5.4	IS 15298 (Part 1),	R	-do -	alternate control unit	
6.5.7	Compression resistance of footwear	5.5	IS 15298 (Part 1),	R	-do -	-do -	
6.5.8	Corrosion resistance	Method 2	IS 17098.	R	-do -	alternate control unit	
6.6	Upper						
6.6.2	Material of Upper					Each consignment/lot	Test Certificate from supplier
6.6.3	Tear strength	6.3 of IS 15298 (Part 1) and ISO 3377-2		R	-do -	Each control unit	
6.6.4	Tensile strength	6.4.1	IS 15298 (Part 1),	R	-do -	-do -	
6.6.5	Water vapour	6.6 and	IS 15298 (Part 1),	S	-do -	once in a month	

	permeability and coefficient	6.8					
6.7	Vamp and Quarter Lining						
6.7.1	Material of vamp and quarter lining					Each consignment/lot	Test Certificate from supplier
6.7.2	Tear strength	6.3 of IS 15298 (Part 1) and ISO 3377-2		R	-do -	Each control unit	
6.7.3	Abrasion resistance	6.12	IS 15298 (Part 1),	S	-do -	once in a month	
6.7.4	Water vapour permeability and coefficient	6.6 and 6.8	IS 15298 (Part 1),	S	-do -	-do -	
6.8	Toe caps	6.8 of IS 14544 and IS 5852 (Part 1) or IS 5852 (Part 2)		S	-do -	Each consignment/lot	No further testing is required if accompanied with test certificate and is ISI marked
6.9	Insole						
6.9.1	Material of Insole					Each consignment/lot	Test Certificate from supplier
6.9.2	Thickness	7.1	IS 15298 (Part 1),	R	each size	Each control unit	
6.9.3	Abrasion resistance	7.3	IS 15298 (Part 1),	S	Every alternate size	once in a month	
6.9.4	Water absorption and desorption	7.2 of IS 15298 (Part 1),		R	-do -	-do -	
6.10	In socks						
6. 10	Thickness	6.1	IS 14544	R	each size	Each control unit	
6.10.1	Material of insocks					Each consignment/lot	Test Certificate from supplier
6.10.2	Abrasion resistance	6.12	IS 15298 (Part 1),	S	Every alternate size	once in a month	
6.10.3	Water absorption and desorption	7.2	IS 15298 (Part 1),	R	-do -	-do -	
6.11	Stiffener		IS 7554.	S	-do -	Each consignment/lot	No further testing is required if accompanied with test certificate and is ISI marked

6.12	Tongue	6.6 of IS 14544:2022 and 6.3 of IS 15298 (Part 1).		S/R as applicable	-do -	As applicable	1) Same as Cl 6.6.2 to 6.6.5 if the tongue of the footwear is made of the same material as upper. 2) If different either in type or thickness from the upper, then same as Cl 6.6.3
6.13	Closing thread	6.13	IS 14544	R	-do -	Each control unit	
6.14	Outsole						
6.14.1	Material of Outsole	6.14	IS 14544			Each consignment/lot	Test Certificate from supplier
6.14.2, 6.14.3, 6.14.4	Thickness, cleat area and cleat height	8.1.2	IS 15298 (Part 1),	R	each size	Each control unit	
6.14.5	Tear strength	8.2	IS 15298 (Part 1),	R	Every alternate size	-do -	
6.14.6	Abrasion resistance	8.3	IS 15298 (Part 1),	S	-do -	Once in a month	
6.14.7	Flexing resistance	8.4	IS 15298 (Part 1),	S	-do -	-do -	
6.14.8	Interlayer bond strength	5.2	IS 15298 (Part 1),	R	-do -	Each control unit	
6.15	Laces						
6.15.1	Material of laces	6.15.1	IS 14544	R	each size	-do -	
6.15.2	Colour Fastness		IS/ISO 105-E01	R	Every alternate size	alternate control unit	
6.15.3	Abrasion Resistance	Method 1 of ISO 22774 (for lace to lace) and Method 3 of ISO 22774 (lace to eyelet)		S	-do -	Each consignment/lot	
6.15.4	Breaking load	IS 1969 (Part 1) or IS 1969 (Part 2), Annex H of IS 15844		R	-do -	Each control unit	
7	Chemical requirements	7.1	Chemical as per Table 1 of IS 17011.	S	-do -	Once in six months	
		7.2	Volatile content	R	-do -	alternate control unit	
8	Additional Requirements						
8.1	Antistatic	5. 10	IS 15298 (Part 1),	R	-do -	alternate control	Please see note 3

						unit	
8.2	Conductive	5. 10	IS 15298 (Part 1),	R	-do -	-do -	
8.3	cold insulation	5.13	IS 15298 (Part 1),	R	-do -	-do -	
8.4	heat insulation	5.12	IS 15298 (Part 1),	R	-do -	-do -	

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.

Note 2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head

Note 3: Different additional requirements are specified in the Indian Standard. It follows that, these tests are to be carried by Licensee as per the level of control specified in the above table only where it is applicable and accordingly testing facilities for applicable additional requirements are required to be established.

Note 4: Effort shall be made to take sample from the finished product. If it is not possible to obtain a large enough test piece, then a sample of the material from which the component has been manufactured may be used instead and this should be noted in the test report

ANNEX D
To PRODUCT MANUAL
FOR LEATHER SAFETY AND PROTECTIVE FOOTWEAR WITH DIRECT MOULDED
POLYMERIC SOLE AS PER IS 14544 : 2022

Possible Tests in a day

	Requirement	Sub-clause
Design	Design	6.2
	Fitting	6.3
	Height of Upper	6.4
Whole Footwear	Construction	6.5.1
	Ergonomic feature	6.5.2
	Upper-outsole bond strength	6.5.3
	Slip resistance	6.5.4
	Impact resistance of footwear	6.5.6
	Compression resistance of footwear	6.5.7
Upper	Tensile strength	6.6.4
Vamp and quarter lining	Tear strength	6.7.2
Insole	Thickness	6.9.2
Insocks	Thickness	6.10
Closing thread	Properties	6.13
Outsole	Thickness, cleat area and cleat height	6.14.2, 6.14.3, 6.14.4
	Tear strength	6.14.5
	Interlayer bond strength	6.14.8
Laces	Breaking load	6.15.4
Chemical requirements	Volatile content	7.2
Additional Requirements	Antistatic	8.1
	Conductive	8.2
	cold insulation	8.3
	heat insulation	8.4