BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

जूते के ऊपरी भाग के चमड़े के लिए डायरेक्ट मोल्डिंग प्रक्रियाएँ — विशिष्टि

(*IS 5677 का दूसरा पुनरीक्षण*)

Draft Indian Standard

Shoe Upper Leather for Direct Moulding Processes — Specification

(*Second Revision of IS 5677*)

(ICS 59.140.35)

Leather, Tanning Materials and Allied Products Sectional Committee, CHD 17	**Last Date for Comments: 24th September 2024**

Leather, Tanning Materials and Allied Products Sectional Committee, CHD 17

FOREWORD

(*Formal clause will be added later*)

Shoe-upper leather, for direct moulding processes, has to withstand exposure to high temperatures for a short period and shall be done through adequate tanning, fat liquoring, and finishing processes.

This standard was first published in 1970 and revised in 1986. In first revision, use of buffalo hides/skins was included in the raw materials. Further, expression of results of solvent extractable substances, water soluble matter and chromium content was modified to zero percent volatile matter basis keeping in line with international practice. The test method on colour fastness was also been deleted and reference was made to IS: 6191-1971.

This revision has been taken up in order to bring out the standard in latest style and format of the Indian Standards. The relevant clauses and test methods have been added and the references have been updated.

In this revision following modifications have been done:

i. Scope has been modified;

ii. Goat and sheep skins have been included in the raw materials
iii. Screening hazardous chemical substances that may harm consumers is included
iv. Physical and Chemical requirements have been modified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*second revision)'.* The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard

Draft Indian Standard

Shoe upper leather for direct moulding processes — Specification

(*Second Revision*)

1 SCOPE

This standard prescribes the requirements, and methods of sampling and test for full-chrome or combination tanned or alternative tanned upper leathers used for direct moulding processes.

2 REFERENCES

The Indian standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Indian standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 Terminology

For the purpose of this standard, the definitions given in the latest edition of IS 1640 apply to this standard.

4 Requirement

4.1 Raw Materials

The material shall be cow/buffalo hides and goat/sheep skins. The material shall be chrome or combination tanned or by other tannages agreed between the purchaser and supplier.

4.2 Treatment with preservatives

At the end of the tanning process and before drying, the leather shall be treated with suitable biocides in requisite proportions to promote mildew resistance. The material shall show no growth of mildew when examined visually. The chosen biocides shall be effective against microorganisms, non-toxic, or within the prescribed limits listed in Table 2.

> **NOTE** – Ever since the restriction on Pentachlorophenol (PCP) was proposed, alternative biocides viz. TCMTB, PCMC, OPP, and OIT, were introduced as preservatives in leather processing. However, citing the toxicology studies, advocacies by the consumer groups to add the other chlorophenol variants of mono, di, tri, and tetra to the restriction list gained momentum. Though the prevalence of PCP in leather processing is negligible, the data from test houses suggests that the other variants of chlrophenols, including its isomers, are still reported but on a declining trend. Given this, the list of chlorophenols expanded to enhance the screening scope to comply with hazardous chemical substances (Table 3). Conversely, the alternative preservatives with allowable limits were prescribed based on the optimisation studies of application.

4.3 Finishing

The leather shall be finished with fast pigment finishes either with protein based finishes or with synthetic resin finishes or aniline or semi-aniline finishes.

The leather shall be free from cuts, open surface blemishes and shall be full and tight grained in the case of full grain leathers and print being bold/prominent in the case of printed leathers.

4.4 Physical Requirements

The leather meant for shoe upper mentioned in this standard shall comply with the physical requirements given in Table 1, when tested in accordance with the relevant methods.

Table 1 Physical Requirements

(*Clause* 4.4)

Sl. No	Characteristics	Requirement	Test Methods
(1)	(2)	(3)	(4)
i)	Tensile strength, N/mm^2, *Min*		

	a) Bovine b) Goat c) Sheep	15 12 10	IS 5914 (Part 8)/ ISO 3376
ii)	Elongation at Break, Percent a) Bovine & Goat b) Sheep	 45 to 75 35 to 75	
iii)	Tear strength (Double edge), N, *Min* a) Bovine b) Goat c) Sheep	 70 40 20	IS 5914 (Part 5/Sec 2) / ISO 3377-2
iv)	Stitch tear strength, N/mm, *Min* a) Bovine b) Goat c) Sheep	 70 40 20	LP 8 of IS 5914
v)	Grain crack load, kg, *Min* a) Bovine & Goat b) Sheep c) Grain crack distension, mm Bovine, Goat & Sheep	 20 12 7	IS 14970/ISO 3379
vi)	Colour fastness to rubbing (Grey Scale Rate)	Marring/Staining	IS 6191 (Part 4)/ ISO 11640
	a) Pigmented finish Dry 150 rubs Wet 50 rubs	 ≥Grade 3 ≥Grade 3	
	b) Suede & Nubuck Dry 50 rubs Wet 20 rubs	 ≥Grade 3 ≥Grade 3	
	c) Protein Finish Dry 150 rubs	 ≥Grade 3	
vii)	Colour fastness to Water Perspiration (Grey Scale Rate)	Staining ≥Grade 3	IS 6191 (Part 6)/ ISO 11641
viii)	Colour fastness to water spotting a) At 30 Minutes b) At 16 hours c) Grey Scale Rate	 No permanent mark No permanent mark ≥ Grade 4/5	IS 6191 (Part 1)/ ISO 15700
ix)	Light fastness Grey scale rate (Additional requirement if leather is sun light resistance)	 ≥Grade 4/5	IS/ISO 105 B02
x)	Flexing endurance a) Dry 100,000 flexes b) Wet 50, 000 flexes	 No crack No crack and no salt spue	IS 5914 (Part 6/Sec 1)/ ISO 5402-1
xi)	Adhesion of finish, N/cm Pigmented/Heavily finished leather a) Dry b) Wet	 3.0 2.0	IS 6191 (Part 5)/ ISO 11644
xii)	Water vapour permeability, mg/cm^2.hr, *Min* Water vapour coefficient, mg/cm^2	0.8 15	LP:21 of IS 5914 & IS 5914 (Part 1)/ ISO 17229
xiii)	Water resistance, *Max*		LP:20 of IS 5914

	(Additional requirement if leather is water proof/resistant) a) Water absorption at 60 min, percent b) Water transmission, gram	 30 0.2	

4.5 Chemical Requirements

The leather meant for shoe upper mentioned in this standard shall comply with the restricted/hazardous chemical requirements given in Table 2, when tested in accordance with the relevant methods

Table 2 Compliance with Hazardous Chemicals

(Clause 4.5**)**

Sl. No.	Critical Chemical Substances	Requirements	Test Methods (IS/ISO)
i)	Aromatic amines of azo dyes (individual or sum of the listed amines), mg/kg, *Max*	30.0	IS 582 (Part 5/Sec 1)/ ISO 17234-1 & IS 582 (Part 5/Sec 2)/ ISO 17234-2
ii)	Chlorophenols (individual or sum of the listed chlorophenol variants, including isomers), mg/kg, *Max*	5.0	IS 14575: 2024/ ISO 17070
iii)	Formaldehyde, mg/kg, *Max*	Adults: 150.0 Children: 75.0	IS 16297 (Part 1)/ ISO 17226-1 & IS 16297 (Part 2)/ ISO 17226-2
iv)	Chromium VI, mg/kg, *Max*	3.0	IS 582 (Part 11/Sec 1)/ ISO 17075-1 & IS 582 (Part 11/Sec 2)/ ISO 17075-2
v)	**Preservatives** a) 2-(thiocyanomethylthio)-benzothiazole, (TCMTB), mg/kg, *Max* b) 4-chloro-3-methylphenol, (PCMC), mg/kg, *Max* c) 2-phenylphenol, (OPP) mg/kg, *Max* d) 2-octylisothiazol-3(2H)-one, (OIT), mg/kg, *Max* e) Phenol, mg/kg, *Max*	 300 300 750 100 100	IS 582 (Part 8/Sec 1) / ISO 13365-1
vi)	**Alkylphenolethoxylates** a) Octylphenolethoxylate, mg/kg, *Max* b) Nonylphenolethoxylate, mg/kg, *Max*	 500 500	(CHD/17/24673)/ ISO 18218-1

3.6 Sizes and Shape

The leather shall be supplied in the form of full pieces or sides, trimmed free of toggle, punch and nail marks.

4 MARKING AND PACKING

4.1 Marking

The area of the skins or sides shall be marked legibly in square decimetres on individual pieces at the tail end on the flesh side.

4.1.1 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act,* 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

4.2 PACKING

4.1 The leather shall be packed as agreed to between the purchaser and the supplier.

4.2 The leather shall be so packed that they shall during transit and in storage, be acceptably protected against moisture, exposure to direct sunlight and mechanical damages.

4.3 The packages shall be marked with the name of the manufacturer or recognized trade-mark, if any; type; number of pieces of leather; total area and mass and month and year of manufacture.

5 SAMPLING AND CRITERIA FOR CONFORMITY

5.1 Scale of Sampling

The number of pieces to be selected (sample size) for ascertaining conformity of the material shall be taken out in accordance with the procedure prescribed in Table 1 of IS 5868.

5.2 Sampling Location

The location for taking out test pieces from individual skins or sides shall be in accordance with IS 5868

5.3 Criteria for Conformity

5.3.1 *Examination for Visual Requirements*

All the pieces in the sample selected from a lot shall be individually examined for each of the visual requirements, such as finish, size and shape. No defective piece shall be allowed when the sample size is up to 12 and one defective shall be allowed when the sample is from 15 to 20 for acceptance of the lot (*see* IS : 5868). If any further piece is found to be defective than the prescribed number, the entire lot shall be examined in respect of the visual requirements in order to remove all the defective pieces from the lot.

5.3.2 *Tests for Physical Requirements*

Each piece in the sample shall be tested for all the physical requirements individually. The lot shall be considered to have met the physical requirements, if each piece individually satisfies all the requirements, otherwise the lot shall be rejected without further testing.

5.3.3 *Tests for Restricted/Hazardous/Critical Chemical substance Requirements*

If the lot has been found satisfactory in respect of physical requirements, it shall be subjected to the tests for all other requirements of this specification. The lot shall be declared to have met the requirements of this specification if all the test results, obtained by following the specified testing procedures, satisfy the relevant requirements of the specification.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARD
