



INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES

IULTCS methods of analysis for leather, including equivalent ISO and EN Standards

The IULTCS, through the IULTCS IU Testing Commissions (IUC, IUF and IUP), provides help and protection for the leather tanning industry worldwide by developing and publishing test methods that are explicitly relevant to leather manufacture and leather usage. Without the work of the IU Commissions, which develop these test methods, the leather industry could be open to having to meet performance standards of other materials that bear no relationship to the reality of working with leather.

Following agreements in 1990 and re-affirmed in 2005, the ISO recognises IULTCS as an International Standardising Body. ISO has assigned the responsibility for the development of leather test methods to IULTCS and the resultant test method documents are published as joint IULTCS and ISO Standards.

From 2005 it was agreed that ISO is responsible for publishing all new joint IULTCS and ISO Standards. Member countries of ISO very often use the ISO Standards to establish their own National Standards.

Further, the European Committee for Standardisation (Comité Européen de Normalisation - CEN) has through the CEN/TC 289 Technical Committee "Leather" jointly adopted many of the IU/ ISO Standards.

To co-ordinate the development of leather test methods, the IU Commissions and the CEN TC 289 Working Groups hold their technical meetings together. Consequently, this combined work of the IULTCS IU Commissions, ISO and CEN TC 289 allows the publication of identical leather test methods for IULTCS, International (ISO) and European (EN) Standards.

IULTCS Test methods

Since 2005 the IULTCS / ISO joint test methods are published only by ISO. The joint ISO / IULTCS Standards are available as an ISO Standard from your local national Standards Organisation or online from the ISO website, <https://www.iso.org/store.html>.

If you have any questions or comments relating to leather test methods, please contact the IULTCS.

Dr. Giancarlo Lovato
IULTCS ISO Committee Manager

E-mail: office@iultcs.org

Website: www.iultcs.org

Set out in the following pages is a complete list of the IULTCS official methods together with the reference numbers for the equivalent ISO Standards and European Norm (EN) methods.

Standards marked with * are available but they are currently undergoing revision and an update is in preparation.

Standards marked with ** are new and currently undergoing development.

Standards marked with *** are the Nearest textile International Standard, recommended for use as the International Standard for leather.

Standards with DIS (Draft International Standard) or FDIS (Final Draft International Standard) are in preparation and will be published shortly. These draft Standards can be obtained from your national Standards Organisation but are not yet officially approved ISO Standards.

April 2025



INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES

The IULTCS official methods of analysis for leather, including the equivalent ISO and EN Standards

update version: April 2025

IULTCS - Chemical Test Methods for Leather			
IUC Test method	Method name	ISO Standard	EN Standard
IUC 1 (1965)	General comments	-	-
IUC 2 (2023)	Position and preparation of specimens for testing (same as IUP 2)	ISO 2418:2023	EN ISO 2418
IUC 3 (2017)	Preparation of chemical test samples	ISO 4044:2017	EN ISO 4044
IUC 4 (2018)	Determination of matter soluble in dichloromethane and free fatty acid content	ISO 4048:2018	EN ISO 4048
IUC 5 (2005)	Determination of volatile matter	ISO 4684:2005	EN ISO 4684
IUC 6 (2018)	Determination of water soluble matter, water soluble inorganic matter and water soluble organic matter	ISO 4098:2018	EN ISO 4098
IUC 7 (1977)	Determination of sulphated total ash and sulphated water insoluble ash	ISO 4047:1977	EN ISO 4047
IUC 8 (2018)	Determination of chromic oxide content Part 1: Quantification by titration	ISO 5398-1:2018	EN ISO 5398-1
IUC 8-2 (2009)	Determination of chromic oxide content Part 2: Quantification by colorimetric determination	ISO 5398-2:2009	EN ISO 5398-2
IUC 8-3 (2018)	Determination of chromic oxide content Part 3: Quantification by atomic absorption spectrometry	ISO 5398-3:2018	EN ISO 5398-3
IUC 8-4 (2018)	Determination of chromic oxide content Part 4: Quantification by inductively coupled plasma (ICP-OES)	ISO 5398-4:2018	EN ISO 5398-4
IUC 9 (1984)	Determination of water soluble magnesium salts	-	-
IUC 10 (1984)	Determination of nitrogen and hide substance	ISO 5397:1984	-
IUC 11 (2018)	Determination of pH and difference figure	ISO 4045:2018	EN ISO 4045
IUC 13 (1975)	Determination of zirconium	-	-
IUC 15 (1973)	Determination of phosphorus	-	-
IUC 16 (1969)	Determination of aluminium	-	-
IUC 17 (1980)	Determination of hydroxyproline in materials containing collagen	-	-
*IUC 18-1 (2017)	Determination of hexavalent chromium content – Part 1; Colorimetric method	*ISO 17075-1:2017	*EN ISO 17075-1
*IUC 18-2 (2017)	Determination of hexavalent chromium content – Part 2; Ion chromatographic method	*ISO 17075-2:2017	*EN ISO 17075-2
IUC 19-1 (2021)	Determination of formaldehyde content in leather Part 1: Quantification by HPLC	ISO 17226-1:2021	EN ISO 17226-1
IUC 19-2 (2018)	Determination of formaldehyde content in leather Part 2: Quantification by colorimetric analysis	ISO 17226-2:2018	EN ISO 17226-2
IUC 19-3 (2011)	Determination of formaldehyde content in leather Part 3: Formaldehyde emissions from leather	ISO 17226-3:2011	EN ISO 17226-3
IUC 20-1 (2024)	Chemical tests for the determination of certain azo colorants in dyed leathers Part 1: Determination of certain aromatic amines derived from azo colorants	ISO 17234-1:2024	EN ISO 17234-1
IUC 20-2 (2011)	Chemical tests for the determination of certain azo colorants in dyed leathers Part 2: Determination of 4-aminoazobenzene derived from azo colorants	ISO 17234-2:2011	EN ISO 17234-2



**INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES**

IUC 21 (2003) (now included in IUC 20-1)	Method for the detection of certain azo colourants in dyestuff mixtures. <i>(Method Annexed in the new revision IUC 20-1, ISO 17234-1:2024)</i>	-	-
IUC 22 (2003)	Determination of aluminium oxide content of aluminium tanning agents	-	-
IUC 24 (2003)	Determination of basicity of aluminium tanning agents.	-	-
*IUC 25 (2015)	Determination of tetrachlorophenol-, trichlorophenol-, dichlorophenol-, monochlorophenol-isomers and pentachlorophenol content	*ISO 17070:2015	*EN ISO 17070
IUC 26 (2021)	Determination of free-formaldehyde content in leather processing chemicals	ISO 27587:2021	EN ISO 27587
*IUC 27-1 (2019)	Chemical determination of metal content. – Part 1: Extractable metals	*ISO 17072-1:2019	*EN ISO 17072-1
IUC 27-2 (2022)	Chemical determination of metal content. – Part 2: Total metal content	ISO 17072-2:2022	EN ISO 17072-2
IUC 28-1 (2023)	Determination of ethoxylated alkylphenols in leather Part 1: Direct method	ISO 18218-1:2023	EN ISO 18218-1
IUC 28-2 (2019)	Determination of ethoxylated alkylphenols in leather Part 2: Indirect method	ISO 18218-2:2019	EN ISO 18218-2
IUC 29-1 (2020)	Determination of preservative content (TCMTB-OPP-CMK-OIT) in leather – Part 1; Acetonitrile extraction method	ISO 13365-1:2020	EN ISO 13365-1
IUC 29-2 (2020)	Determination of preservative content (TCMTB-OPP-CMK-OIT) in leather– Part 2: Artificial perspiration extraction method	ISO 13365-2:2020	EN ISO 13365-2
IUC 30-1 (2021)	Leather - Chemical determination of chlorinated hydrocarbons in leather – Part 1: Chromatographic method for short chain chlorinated paraffins (SCCP)	ISO 18219-1:2021	EN ISO 18219-1
IUC 30-2 (2021)	Leather - Chemical determination of chlorinated hydrocarbons in leather – Part 2: Chromatographic method for middle chain chlorinated paraffins (MCCP)	ISO 18219-2:2021	EN ISO 18219-2
IUC 32 (2020)	Quantitative analysis of tanning agents by filter method	ISO 14088:2020	EN ISO 14088
IUC 33 (2013)	Leather - Determination of tan content of synthetic tanning agents	ISO 17489:2013	EN ISO 17489
IUC 34 (2016)	Leather - Determination of N-methylpyrrolidone in leather	ISO 19070:2016	EN ISO 19070
IUC 35 (2016)	Leather - Determination of Cr(VI) and its reductive potential in leather chemicals	ISO 19071:2016	EN ISO 19071
IUC 36 (2023)	Leather - Guidelines for testing critical chemicals in leather	ISO 20137:2023	EN ISO 20137
IUC 37 (2020)	Leather - Determination of degradability by micro-organisms	ISO 20136:2020	EN ISO 20136
IUC 38 (2019)	Leather - Determination of pesticide residues content in leather	ISO 22517:2019	EN ISO 22517
IUC 39-1 (2023)	Leather - Per- and polyfluoroalkyl substances — Part 1: Determination of non-volatile compounds by extraction method using liquid chromatography	ISO 23702-1:2023	EN ISO 23702-1
**IUC 40 (2024)	Leather – Chemical analysis – Determination of glutaraldehyde content	**ISO/DIS 25202:2024	**prEN ISO/DIS 25202
IUC 41 (2018)	Leather - Determination of hexavalent chromium content – Pre-ageing for chemical determination of hexavalent chromium	ISO 10195:2018	EN ISO 10195
IUC 42 (2023)	Leather – Determination of total content of certain bisphenols	ISO 11936:2023	EN ISO 11936
-	Determination of total silicon content – Reduced molybdsilicate spectrometric method	ISO 5400:1984	-
-	Determination of organo-tin compounds in leather by GC/MS method (Project transferred to ISO/TC 216 Footwear)	ISO/TS 16179:2012 (Footwear method)	CEN ISO/TS 16179



**INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES**

IULTCS - Chemical Test Methods for Leather Chemicals			
IUC Test Method	Method name	ISO Standard	EN Standard
IUC 442 (2024)	Chemicals for the leather tanning industry – Determination of total content of certain bisphenols	ISO 21135:2024	EN ISO 21135
**IUC 443 (2025)	Chemicals for the leather tanning industry – Determination of melamine	**ISO/AWI 25172:2025	**EN ISO/AWI 25172
IUC 444 (2025)	Chemicals for the leather tanning industry – Determination of cyclosiloxanes	ISO 23649:2025	EN ISO 23649

If an IULTCS test method exists for leather (e.g. IUC xx), then the leather chemical test method number has the format 4xx.



**INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES**

IULTCS – Physical Test Methods for Leather			
IUP Test method	Method name	ISO Standard	EN Standard
IUP 1 (now included in IUP 2)	Sample preparation (Sample preparation IUP 1 included in the new IUP 2:2023)	-	-
IUP 2 (2023)	Position and preparation of specimens for testing (same as IUC 2)	ISO 2418:2023	EN ISO 2418
IUP 3 (2024)	Specimen and test piece conditioning	ISO 2419:2024	EN ISO 2419
IUP 4 (2016)	Measurement of thickness	ISO 2589:2016	EN ISO 2589
IUP 5 (2017)	Measurement of apparent density	ISO 2420:2017	EN ISO 2420
IUP 6 (2020)	Measurement of tensile strength and percentage elongation	ISO 3376:2020	EN ISO 3376
*IUP 7 (2016)	Measurement of static absorption of water	*ISO 2417:2016	*EN ISO 2417
*IUP 8 (2016)	Measurement of tear load – Double edge tear	*ISO 3377-2:2016	*EN ISO 3377-2
IUP 9 (2024)	Measurement of distension and strength of grain by the ball burst test	ISO 3379:2024	EN ISO 3379
*IUP 10-1 (2011)	Water resistance of flexible leather. Part 1: Linear compression method (Penetrometer)	*ISO 5403-1:2011	*EN ISO 5403-1
*IUP 10-2 (2011)	Water resistance of flexible leather. Part 2: Angular compression method (Maeser)	*ISO 5403-2:2011	*EN ISO 5403-2
IUP 11 (2011)	Measurement of water resistance of heavy leather	ISO 5404:2011	EN ISO 5404
IUP 12 (2002)	Measurement of resistance to grain cracking and the grain crack index	ISO 3378:2002	EN ISO 3378
IUP 13 (1961)	Measurement of two dimensional extension	-	-
IUP 14 (1960)	Measurement of waterproofness of gloving leathers	-	-
IUP 15 (2023)	Determination of water vapour permeability	ISO 14268:2023	EN ISO 14268
IUP 16 (2015)	Measurement of shrinkage temperature up to 100 °C	ISO 3380:2015	EN ISO 3380
IUP 17 (1966)	Assessment of the resistance of air dry insole leathers to heat	-	-
IUP 18 (1969)	Resistance of air dry lining leathers to heat	-	-
IUP 19 (1969)	Resistance of air dry upper leather to heat	-	-
IUP 20 (2022)	Determination of flex resistance. Part 1: Flexometer method	ISO 5402-1:2022	EN ISO 5402-1
IUP 21 (1963)	Measurement of set in lasting	-	-
IUP 22 (1963)	Assessment of scuff damage by use of the viewing box	-	-
IUP 23 (1963)	Measurement of scuff damage	-	-
IUP 24 (1964)	Measurement of surface shrinkage by immersion in boiling water	-	-
IUP 26 (1993)	Measurement of resistance to abrasion of heavy leather	-	-
IUP 28 (1969)	Measurement of the resistance to bending of heavy leather	-	-
IUP 29 (2017)	Measurement of cold crack temperature of surface coatings	ISO 17233:2017	EN ISO 17233
IUP 30 (1983)	Measurement of water vapour absorption and desorption (See IUP 42)	-	-
IUP 32 (2014)	Measurement of area	ISO 11646:2014	EN ISO 11646
IUP 35 (2002)	Determination of the dimensional stability of leather (Old title: Measurement of dry heat resistance of leather)	ISO 17227:2002	EN ISO 17227
IUP 36 (2015)	Measurement of leather softness	ISO 17235:2015	EN ISO 17235
IUP 37 (2017)	Measurement of water repellency of garment leather	ISO 17231:2017	EN ISO 17231
*IUP 38 (2017)	Measurement of heat resistance of patent leather	*ISO 17232:2017	*EN ISO 17232
IUP 39-2 (2015)	Determination of flex resistance. Part 2: Vamp flex method	ISO 5402-2:2015	EN ISO 5402-2
IUP 40-1 (2011)	Measurement of tear load – Single edge tear	ISO 3377-1:2011	EN ISO 3377-1



**INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES**

IUP 41 (2011)	Measurement of surface coating thickness	ISO 17186:2011	EN ISO 17186
IUP 42 (2016)	Measurement of water vapour absorption	ISO 17229:2016	EN ISO 17229
*IUP 43 (2016)	Measurement of extension set	*ISO 17236:2016	*EN ISO 17236
IUP 44 (2019)	Measurement of stitch tear resistance	ISO 23910:2019	EN ISO 23910
IUP 45 (2006)	Measurement of water penetration pressure	ISO 17230:2006	EN ISO 17230
IUP 46 (2006)	Measurement of fogging characteristics	ISO 17071:2006	EN ISO 17071
IUP 47 (2006)	Measurement of resistance to horizontal spread of flame	ISO 17074:2006	EN ISO 17074
IUP 48-1 (2020)	Measurement of abrasion resistance. Part 1: Taber method	ISO 17076-1:2020	EN ISO 17076-1
IUP 48-2 (2011)	Measurement of abrasion resistance. Part 2: Martindale ball plate method	ISO 17076-2:2011	EN ISO 17076-2
IUP 49	Measurement of bagginess, creep and relaxation	-	CEN/TS 14689:2006
IUP 50	<i>Free (original document changed to IUP 53-2)</i>	-	-
IUP 51 (Draft: 2002)	Measurement of Surface Friction	-	-
IUP 52 (Draft: 2002)	Measurement of Compressibility	-	-
*IUP 53-1 (2019)	Determination of soiling. Part 1: Martindale method	*ISO 26082-1:2019	*EN ISO 26082-1
IUP 53-2 (2012)	Determination of soiling. Part 2: Tumbling method	ISO 26082-2:2012	EN ISO 26082-2
IUP 54 (2022)	Determination of flexural properties	ISO 14087:2022	EN ISO 14087
IUP 55 (2021)	Determination of dimensional change	ISO 17130:2021	EN ISO 17130
IUP 56 (2020)	Identification of leather with microscopy	ISO 17131:2020	EN ISO 17131
IUP 57 (2015)	Determination of water absorption by capillary action (wicking)	ISO 19074:2015	EN ISO 19074
IUP 58 (2023)	Measurement of leather surface – Electronic techniques	ISO 19076:2023	EN ISO 19076



**INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES**

IULTCS – Fastness Test Methods for Leather (including other test methods)			
IUF Test method	Method name	ISO Standard	EN Standard
IUF 105 (1966)	Numbering code for fastness tests	-	-
IUF 110 (2014)	Leather – Sampling – Number of items for a gross sample	ISO 2588:2014	EN ISO 2588
IUF 120 (2022)	General principles of colour fastness testing of leather	ISO 7906:2022	EN ISO 7906
IUF 131 (1966)	Grey scale for assessing change in colour	***ISO 105-A02:1993	***EN ISO 105-A02
IUF 132 (1966)	Grey scale for assessing staining	***ISO 105-A03:2019	***EN ISO 105-A03
IUF 151 (1975)	Preparation of storable standard chrome grain leather for dyeing	-	-
IUF 201 (1966)	Approximate determination of the solubility of leather dyes	-	-
IUF 202 (1966)	Fastness to acid of dye solutions	-	-
IUF 203 (1966)	Stability to acid of dye solutions	-	-
IUF 205 (1972)	Stability to hardness of dye solutions	-	-
IUF 401 (1972)	Colour fastness of leather to light: Daylight	***ISO 105-B01:2014	***EN ISO 105-B01
IUF 402 (1975)	Colour fastness of leather to light: Xenon lamp	***ISO 105-B02:2014	***EN ISO 105-B02
*IUF 412 (2015)	Change of colour with accelerated ageing.	*ISO 17228:2015	*EN ISO 17228
IUF 420 (1998)	Colour fastness to water spotting	ISO 15700:1998	EN ISO 15700
*IUF 421 (2012)	Colour fastness to water	*ISO 11642:2012	*EN ISO 11642
**IUF 422 (2024)	Colour fastness to sea water	**ISO/DIS 25089:2024	**prEN ISO/DIS25089
IUF 423 (1998)	Colour fastness to mild washing	ISO 15703:1998	EN ISO 15703
*IUF 426 (2012)	Colour fastness to perspiration	*ISO 11641:2012	*EN ISO 11641
IUF 427 (2024)	Colour fastness to saliva	ISO 20701:2024	EN ISO 20701
**IUF 428 (2024)	Colour fastness to hydroalcoholic mixtures	**ISO/DIS 7979:2024	**prEN ISO/DIS 7979
IUF 434 (2009)	Colour fastness of small samples to solvents	ISO 11643:2009	EN ISO 11643
IUF 435 (1998)	Colour fastness to machine washing	ISO 15702:1998	EN ISO 15702
IUF 441 (1972)	Colour fastness in respect of staining raw crepe rubber	-	-
IUF 442 (2022)	Colour fastness to migration into polymeric materials	ISO 15701:2022	EN ISO 15701
IUF 450 (2018)	Colour fastness to cycles of to-and-fro rubbing	ISO 11640:2018	EN ISO 11640
IUF 452 (2024)	Colour fastness to crocking	ISO 20433:2024	EN ISO 20433
IUF 454 (1975)	Fastness to buffing of dyed leather	-	-
IUF 458 (1984)	Colour fastness of leather to ironing	-	-
IUF 470 (2022)	Leather – Test for adhesion of finish	ISO 11644:2022	EN ISO 11644
IUF 472 (2013)	Leather – Determination of surface reflection	ISO 17502:2013	EN ISO 17502
*IUF 474 (2019)	Leather – Measuring colour and colour difference of finished leather	*ISO 22700:2019	*EN ISO 22700

The following textile fastness Standards do not have equivalent IU leather test methods but are recommended for use as the International Standard for leather.

-	Instrumental assessment of the degree of staining of adjacent fabrics	ISO 105-A04:1989	EN ISO 105-A04
-	Instrumental assessment for change in colour for grey scale	ISO 105-A05:1996	EN ISO 105-A05
-	Colour fastness & ageing to artificial light at high temperatures: Xenon	ISO 105-B06:2020	EN ISO 105-B06
-	Oil repellency – Hydrocarbon resistance test	ISO 14419:2010	EN ISO 14419

* Standard is still valid but is undergoing revision and an updated version is in preparation

** Standard is new and currently undergoing development

*** Nearest textile International Standard, recommended for use as the International Standard for leather