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## **Accreditation No: LAB 022**

### **Awarded to**

### **Tti Testing Laboratories (Textile Testing International) Lahore, Pakistan.**

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **13-05-2006** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **08-08-2024**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

**PAKISTAN NATIONAL ACCREDITATION COUNCIL**

06-04-2023

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Director General

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### Testing Laboratory.

Accreditation Scope of **Tti Testing Laboratories** (Textile Testing International), 347-S, Quaid-e-Azam Industrial Estate, Kot Lakhpat, 54770, Lahore.

### Permanent laboratory premises

Materials/ Products tested	Testing field (e.g. environmental testing or mechanical testing)	Types of test/ Properties measured	Reference to standardized method (e.g. ISO 14577-1:2003)/ Internal method reference
<b>Textiles</b>	Physical	Yarn number by skein method (Yarn count)	ASTM D1907/ D1907M-12 (2018)
	Physical	Twist in yarn (TPI)	ASTM D1422/ D1422M-13 (2020)
	Physical	Yarn strength	ASTM D2256/ D2256M-21 ISO 2062:2009
	Physical	Warp & weft count (Ends /picks)	ASTM D3775-17 BS EN 1049-2 :1994 ISO 7211-2:1984
	Physical	Yarn number - short length specimen	ASTM D1059-17
	Physical	Abrasion Resistance - Martindale a) Specimen break down b) Mass loss c) Appearance change	ASTM D4966- 22 BS EN ISO 12947-1:1998 BS EN ISO 12947-2:2016 BS EN ISO 12947-3:1998 BS EN ISO 12947-4:1998
	Physical	Pilling resistance (Martindale)	ASTM D4970/D4970M-16 BS EN ISO 12945-2: 2020
	Physical	Pilling resistance (Random tumble)	ASTM D3512/D3512M-16
	Physical	Pilling resistance (ICI pilling)	BS EN ISO 12945-1:2020 EN ISO 12945-1: 2020 ISO 12945-1: 2020
	Physical	Bursting strength	ASTM D3786/D3786M-18 BS EN ISO 13938-1:2019
	Physical	Tear strength (Elmendorf)	ASTM D1424:21 BS EN ISO 13937-1:2000
	Physical	Tear strength (Tongue-single rip)	ASTM D2261-13 (2017) ISO 13937-2:2000

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<b>Textiles</b>	Physical	Tear strength (Wing shaped)	BS EN ISO 13937-3:2000
	Physical	Tensile strength	ASTM D5034-21 ASTM D5035-11 (2019) BS EN ISO 13934-1:2013 BS EN ISO 13934-2:2014
	Physical	Seam slippage	ISO 13936-1:2004 ISO 13936-2:2004
	Physical	Failure in sewn seams	ASTM D1683/ D1683M-22
	Physical	Stretch properties of fabrics woven from stretch yarns	ASTM D3107-07 (2019)
	Physical	Stiffness of fabrics by the circular bend procedure	ASTM D4032-08 (2016)
	Physical	Flammability of apparel & clothing textiles	ASTM D1230-22 16 CFR 1610 (2008)
	Physical	Mass per unit area	ASTM D3776 / D3776M-09a (2020) BS EN 12127:1998
	Physical	Water repellency: spray test	AATCC 22:2017 BS EN ISO 4920:2012
	Physical	Absorbency of textiles	AATCC 79-2018
	Physical	Oil repellency: Hydrocarbon resistance Test	AATCC 118:2020
	Physical	Soil release: Oily stain release method	AATCC 130:2018
	Physical	Vertical Wicking	AATCC 197:2022
	Physical	Colorfastness to crocking / rubbing	AATCC 8:2022 ISO 105-X12:2016
	Physical	Color fastness to perspiration	AATCC 15:2021 ISO 105-E04:2013
Physical	Color fastness to light (Xenon arc)	AATCC 16.3:2020 ISO 105-B02:2014	

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<b>Textiles</b>	Physical	Color fastness to laundering: accelerated	AATCC 61:2020 ISO 105-C10:2006 ISO 105-C06:2010
	Physical	Color fastness to water spotting	AATCC 104:2014 ISO 105-E07:2010
	Physical	Color fastness to sea water	AATCC 106:2013 ISO 105-E02:2013
	Physical	Color fastness to water	AATCC 107: 2022 ISO 105-E01:2013
	Physical	Color fastness to dry cleaning	AATCC 132:2013 ISO 105-D01:2010
	Physical	Color fastness to non-chlorine bleach in home laundering	AATCC 172:2016
	Physical	Color fastness to sodium hypochlorite bleach in home laundering	AATCC 188:2017
	Physical	Color fastness to chlorine bleach (Spot test)	AATCC TS-001
	Physical	Color fastness to non-chlorine bleach (Spot & Soaking)	AATCC TS-001
	Physical	Color fastness to phenolic yellowing	ISO 105X-18:2007
	Physical	Dimensional changes after home laundering	AATCC 135:2018 AATCC 150:2018 BS EN ISO 3759:2011 BS EN ISO 5077:2008 BS EN ISO 6330:2021
	Physical	Appearance after home laundering	AATCC 143-2018 ISO 15487:2018
	Physical	Skewness changes/garment twisting	AATCC 179-2019
	Physical	Bow and skew in woven and knitted fabrics	ASTM D 3882-08 (2020)

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	Physical	Spirality after laundering	ISO 16322-1:2005 ISO 16322-2:2021 ISO 16322-3:2021
	Chemical	Fiber analysis: Qualitative	AATCC 20-2018
<b>Textiles</b>	Chemical	Fiber analysis: Quantitative	AATCC 20A-2018e ISO 1833-1:2020 ISO 1833-2:2020 ISO 1833-3:2020 ISO 1833-4:2017 ISO 1833-6:2018 ISO 1833-7:2017 ISO 1833-8:2006 ISO 1833-10:2019 ISO 1833-11:2017 ISO 1833-12:2020 ISO 1833-16:2019
	Chemical	pH	AATCC 81-2022 ISO 3071:2020
	Chemical	Formaldehyde	AATCC 112-2020 ISO 14184-1:2011 ISO 14184-2:2011
	Chemical	Aromatic amines from azo colorants	BS EN ISO 14362-1:2017 BS EN ISO 14362-3:2017
	Chemical	Phthalate content- Tetrahydrofuran method	ISO 14389:2022 CPSC-CH-C1001-09.4
	Chemical	Formaldehyde (Spot test)	Lab Developed Method, AATCC 94
	Chemical	Disperse Dyes	DIN 54231:2022
	Chemical	Chlorinated Phenols	LFGB B 82.02-8
	Chemical	Total Heavy Metals	BS EN 16711-1:2016
	Chemical	Extractable heavy metals from fabrics	DIN EN 16711-2:2016
<b>PPE Products, Woven / Non- Woven Textile</b>	Physical	Hydrostatic Head Pressure	AATCC 127-2017(2018) e ISO 811:2018 EN 20811:1992

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<b>Materials &amp; Medical Products</b>	Physical	Air Permeability	ASTM D737-18 ISO 9237:1995
	Physical	Seam Strength	ASTM D751-19 EN 14325:2018
	Physical	Tear Strength	ASTM D 5733-99 ASTM D 5587-15 (2019)
	Physical	Water Resistance Impact Penetration	AATCC 42-2017e
<b>Textile Materials / PPE and Medical Devices</b> (Coveralls, Masks, Gowns, Drapes etc)	Physical Testing	Pneumatic Bursting	ISO 13938-2:2019
	Physical Testing	Particle Filtration Efficiency (PFE)	ASTM F2299 / F2299M – 03 (2017)
	Physical Testing	Differential Pressure (Breathability)	EN 14683:2019+AC:2019
	Physical Testing	Synthetic Blood Penetration	ASTM F1862 / F1862M - 17 ISO 22609:2004 ASTM F1670 / F1670M - 17a ISO 16603:2004
	Microbial Testing	Antibacterial finish	AATCC 100-2019 AATCC 147-2011(2016) e ASTM E2149 - 20
	Microbial Testing	Bacterial Filtration Efficiency (BFE)	ASTM F2101-19 EN 14683:2019+AC:2019
	Microbial Testing	Bio burden	ISO 11737-1:2018/Amd 1:2021 EN 14683:2019+AC:2019
	Microbial Testing	Dry Microbial Penetration Wet Bacterial Penetration	ISO 22612:2005 ISO 22610:2018en
<b>Textile &amp; Leather</b>	Chemical Testing	AP & APEOs	BS EN ISO 18254-1:2016, BS EN ISO 18218-1:2015, BS EN ISO 21084:2019
	Chemical Testing	Volatile Organic Compounds (VOCs)	USEPA 5021A, Tti/ORG/SOP-009
	Chemical Testing	Poly Aromatic Hydrocarbons (PAH)	ISO 16190, AfPS GS 2019-01
	Chemical Testing	Chlorinated Organic Compounds (COC)	EN 17137:2018
<b>Metals</b>	Chemical	Nickel Release	BS EN 1811:2011+A1:2015

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<b>Metal Products</b>	Chemical	Total lead in children's metal products (including jewelry)	CPSC-CH-E1001-08.3 Acid digestion method (ICP-OES / AAS)
<b>Non-Metal Products</b>	Chemical	Total lead in children's non-metal products	CPSC-CH-E1002-08.3 Acid digestion method (ICP-OES / AAS)
<b>Paint / Surface Coating</b>	Chemical	Lead in paint & surface coatings	CPSC-CH-E1003-09.1 16 CFR 1303 Acid digestion method (ICP-OES / AAS)
<b>Plastics</b>	Chemical	Cadmium content	BS EN 1122:2001
<b>Toys</b>	Chemical	Migration of certain elements	BS EN 71-3:2019 + A1 2021
<b>Toys</b>	Physical	Torque test, Tension test, Sharp Point, Sharp edge, Small parts	ASTM F 963-2017 16 CFR 1500.50, 51, 53 16 CFR 1500.48, 16 CFR 1500.49 16 CFR 1501
<b>Protective Gloves and Clothing</b>	Physical	Limited flame spread / Burning behavior	EN 407:2020 EN 12477:2002+A1:2005 ISO 11611:2015 ISO 11612:2015 ISO 14116:2015 ISO 15025:2016 (TM)
	Physical	Contact heat	EN 407:2020 EN 12477:2002+A1:2005 ISO 11612:2015 ISO 12127-1:2015 (TM)
	Physical	Convective Heat	EN 407:2020 EN 12477:2002+A1:2005 ISO 11612:2015 ISO 9151:2016 (TM)
	Physical	Radiant Heat / Heat transfer	EN 407:2020 ISO 11612:2015 ISO 11611:2015 ISO 6942:2002 (TM)

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	Physical	Small splashes of molten metal	EN 407:2020 EN 12477:2002+A1:2005 EN 348:1992 (TM) ISO 11611:2015 ISO 9150:1988 (TM)
	Physical	Large quantity of molten metal	EN 407:2020 ISO 11612:2015 ISO 9185:2007 (TM)
	Physical	Heat shrinkage/ Resistance	ISO 11612:2015 ISO 17493:2016 (TM)
	Physical	Seam strength	ISO 11612:2015 ISO 11611:2015 ISO 13935-2:2014 (TM)
	Physical	Tear Strength	EN 407:2020
<b>Protective gloves / clothing</b>	Physical	Impact abrasion (Darmstadt & Cambridge) Restraint resistance	EN 13594:2015 (TM) EN 17092-1,2,3,4,5,6 EN 13594:2015 EN 17092
<b>Leather / Footwear / Gloves</b>	Physical	Abrasion resistance	BS EN 388:2016+A1:2018 (6.1)
	Physical	Blade cut resistance	BS EN 388:2016+A1:2018 (6.2) ISO 13997:1999 ASTM F2992-15
	Physical	Tear resistance	BS EN 388:2016+A1:2018 (6.3)
	Physical	Puncture resistance	BS EN 388:2016+A1:2018 (6.4)
	Physical	Anti-static properties	ISO 20344:2021
	Physical	Toe impact test	EN ISO 20344: 2021
	Physical	Glove sizing, Dexterity/ Protective gloves-general requirements and test methods	BS EN ISO 21420:2020
	Physical	Thickness	ISO 2589:2016 (IULTCS/IUP 4), SLP 4

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<b>Leather / Footwear / Gloves</b>	Physical	Tensile strength & percentage extension	ISO 3376:2020 (IULTCS/IUP 6), SLP 6
	Physical	Tear load (Single edge tear)	ISO 3377-1:2011 (IULTCS/IUP 40-1), SLP 40
	Physical	Tear load (Double edge tear)	ISO 3377-2:2016 (IULTCS /IUP 8), SLP 7
	Physical	Distension and strength of surface (Ball burst method)	ISO 3379:2015 (IULTCS/IUP 9)
	Physical	Abrasion resistance using a rotating cylindrical drum device	ISO 4649:2017
	Physical	Water resistance of flexible leather	ISO 5403-1:2011 (IULTCS/IUP 10-1)
	Physical	Flex resistance - Flexometer method	ISO 5402-1: 2022 (IULTCS/IUP 20) SATRA TM 55
	Physical	Flex resistance - Vamp flex method	ISO 5402-2:2015 SATRA TM 25
	Physical	Water vapor absorption	ISO 20344:2021 BS EN ISO 21420:2020
	Physical	Water vapor permeability	ISO 14268:2023 (IULTCS/IUP 15) ISO 20344:2021 BS EN ISO 21420:2020
	Physical	Softness	ISO 17235:2015 (IULTCS/IUP 36)
	Physical	Abrasion resistance	ISO 17704:2004 ISO 20344:2021
	Physical	Out Sole Flex resistance	ISO 17707:2005 ISO 20344:2021
	Physical	Resistance of footwear to flexing	SATRA TM 92
	Physical	Rapid Sole adhesion test	BS 5131:1990 SATRA 404
	Physical	Color fastness to light	ISO 105 B02:2014 SATRA TM 160
	Physical	Color fastness to cycles of to- and-fro rubbing	ISO 11640:2018 (IULTCS/IUF 450) SATRA TM 167
	Physical	Color fastness to perspiration	ISO 11641:2012 (IULTCS/IUF 426)

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<b>Leather / Footwear / Gloves</b>	Physical	Color fastness to water	ISO 11642:2012 (IULTCS/IUF 421)
	Physical	Color fastness of small samples to solvents	ISO 11643:2009 (IULTCS/IUF 434) SLF 434
	Physical	Color fastness to water spotting	ISO 15700:1998 (IULTCS/IUF 420)
	Physical	Color fastness to migration into polymeric material	ISO 15701:2022 IUF 442
	Physical	Color fastness to machine washing	ISO 15702:1998 (IULTCS/IUF 435)
	Physical	Color fastness to mild washing	ISO 15703:1998 (IULTCS/IUF 423)
	Physical	Color fastness to crocking	ISO 20433:2012 (IULTCS/IUF 452) SLF 452
	Physical	Color fastness to Water or perspiration	SATRA TM 335
	Physical	Seam Strength	EN 13594:2015 6.7 and Annex B, BS EN 17092-1:2020
	Physical	ANSI Classification (Blade cut, Needle puncture & Abrasion)	ANSI/ISEA 105-2016 5.1 ASTM F2992 / F2992M – 15 ASTM F 2878:19 ASTM D3389:16 ASTM D3884 - 09 (2017)
	Physical	Tear Resistance	ISO 4674-1:2016, BS EN 17092-1:2020
	Chemical	pH	EN ISO 4045:2018 (IULTCS/IUC 11), SLC 13, ISO 20344 BS EN ISO 21420:2020
	Chemical	Chromic oxide content	ISO 5398-3:2018 (IULTCS/IUC 8-3)
	Chemical	Organotin	ISO/TS 16179:2012
	Chemical	Dimethyl fumarate (DMFu)	ISO/TS 16186:2021
Chemical	Dimethyl formamide (DMFa)	ISO/TS 16189:2021 BS EN ISO 21420:2020	

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<b>Leather / Footwear / Gloves</b>	Chemical	Chlorinated phenols	ISO 17070:2015 (IULTCS/IUC 25)
	Chemical	Extractable metals	ISO 17072-1:2019 (IULTCS/IUC27-1)
	Chemical	Total metal contents	ISO 17072-2:2019 (IULTCS/IUC 27-2)
	Chemical	Chromium (VI) content	ISO 17075-1 :2017, ISO 10195-2018 (IULTCS/IUC 18-1), SLC 22, ISO 20344 BS EN ISO 21420:2020
	Chemical	Formaldehyde content (HPLC method)	ISO 17226-1:2021 (IULTCS/IUC 19-1)
	Chemical	Formaldehyde content (colorimetric method)	ISO 17226-2:2018 (IULTCS/IUC 19-2), SLC 23
	Chemical	Aromatic amines from azo colorants	ISO 17234-1:2020 (IULTCS/IUC 20-1) ISO 17234-2:2011 (IULTCS/IUC 20-2) BS EN ISO 21420:2020
<b>Petroleum Products</b>	Physical Testing	Flash & Fire Points by Cleveland Open Cup Tester	ASTM D 92-18
	Physical Testing	Flash Point by Pensky-Martens Closed Cup Tester	ASTM D 93-20
	Physical Testing	Kinematic viscosity	ASTM D 445-21
	Chemical Testing	Acid number	ASTM D 974-22
	Chemical Testing	Base number	ASTM D 2896-21
	Chemical	Aromatic Amines from Azo Colorants	ISO 14362 Modified
	Chemical	Phthalate content	ISO 18856 USEPA 8270 E
	Chemical	AP/APEO	ISO 18254-1 Modified
	Chemical	Poly Aromatic Hydrocarbons PAH	EPA 8270 D, E (Tti/Org/SOP-27)

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<b>Water / Waste Water &amp; Sludge</b>	Chemical	Chlorinated Organic Compounds (COC)	US EPA 8270 D, E (Tti/Org/SOP-26)
	Chemical	Organotin Compounds	ISO 17353 (Tti/Org/SOP-28)
	Chemical	Chlorinated Phenols	EPA 8270 E (Tti/Org/SOP-29)
	Chemical	pH value	APHA 4500 H <sup>+</sup> B
	Chemical	Conductivity	APHA 2510 B
	Chemical	Hardness	APHA 2340 C
	Chemical	Alkalinity	APHA 2320 B
	Chemical	Chloride	APHA 4500 Cl- B
	Chemical	Heavy Metals (Pb, Ba, Cd, Co, Hg, As, Sb, Sn, Fe, Ni, Cu, Cr, Mn, Zn)	APHA 3030, 3111, 3120 (ICP-OES, AAS)
	Chemical	Oil & Grease	APHA 5520 B
	Chemical	Chemical Oxygen Demand (COD)	APHA 5220 B & D
	Chemical	Dissolved Solid, Total (TDS)	APHA 2540C
	Chemical	Suspended Solids, Total (TSS)	APHA 2540D
	Chemical	Sulphates	APHA 4500 SO <sub>4</sub> E
	Chemical	Nitrates	APHA 4500-NO <sub>3</sub> <sup>-</sup> B
	Chemical	Fluoride	APHA 4500F D
	Microbial Testing	Total Coliform	APHA 9221B, EN ISO 9308-1, BAM Ch 4
	Microbial Testing	Faecal Coliform	APHA 9221E

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<b>Food, Water &amp; other relevant matrix</b>	Microbial Testing	E. coli	BAM Ch 4, EN ISO 9308-1
	Microbial Testing	Total Plate Count / Aerobic Colony Count	MFHPB-18, APHA-9215B
	Microbial Testing	Detection of Salmonella spp.	BAM Ch 5, ISO 6579
	Microbial Testing	Enumeration of Staph aureus	ISO 6888-1
<b>Food &amp; Feed samples</b>	Chemical Testing	Pesticides Residues Analysis (Carbendazim, Tebuconazole, Triazophos, Chloropyrifos, Acetamypid, Amidacloprid, Tricyclazole, Pendimethiline, Metolachlor, Profenophos, Difenoconazole)	Tti/SOP/FTL-01 based on EN 15662: 2018
	Chemical Testing	Aflatoxin (B1, B2, G1)	Tti/SOP/FTL-02 AOAC 990.34 & ISO 16050
	Chemical Testing	Heavy Metals (Pb, Cd, As, Fe, Cu, Cr, Mn, Zn, Co)	AOAC 999.10, 975.03, 985.01, 984.27
<b>Agricultural Soil</b>	Chemical Testing	Total heavy metals	EPA 3052
<b>Pharma Products</b>	Chemical Testing	Nitrosamines (NDMA, NDEA)	FY18-176-DPA-S, FY20-058-DPA-S

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