



Tti Testing Laboratories

OVER 30 YEARS OF EXCELLENCE IN QUALITY ASSURANCE



TEXTILES & APPAREL DIVISION

Textiles & apparel testing

From fibre to finished garment.

The region's largest accredited scope in textile testing. Tti Labs offers testing, inspection and sustainability services across the whole textile value chain, from fibres to finished garments and technical applications.

Fibres & yarns

Technical textiles

Apparel

Sports goods

01

About Tti Labs

02

Coverage & market

03

Denim QC

04

Testing services

05

Performance & accessories

06

Colour fastness

07

Fibre & cotton

08

Flammability

09

Child safety

10

Chemical testing

11

PFAS screening

12

ZDHC & sustainability

13

Inspection

14

Pioneers & brands

111 786 001

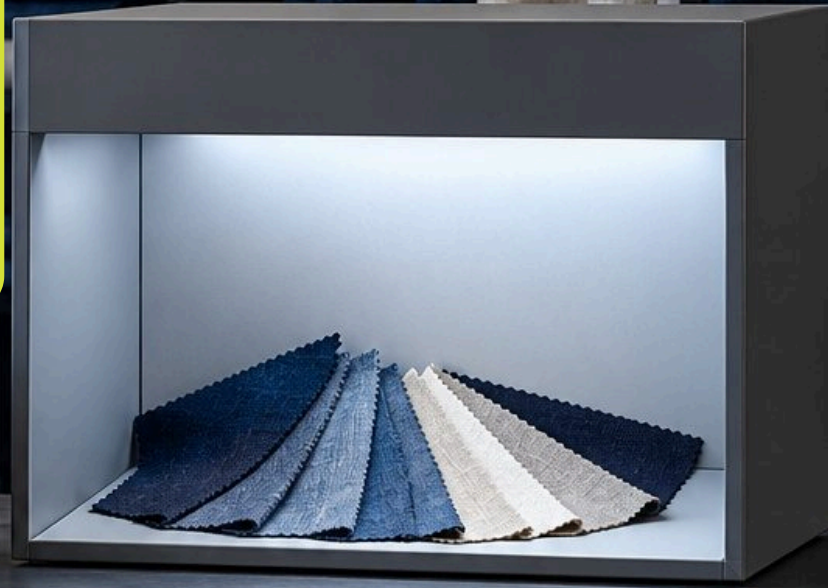
www.ttilabs.net



U.S. CPSC ACCEPTED

Pakistan's first third-party laboratory accepted by the U.S. CPSC for lead and flammability testing.

CPSC Lab ID 1168 · lead 2009 · flammability 2010 · phthalates 2018.



IN SERVICE SINCE 1995

One quality partner, from fibre to garment.

For exporters, manufacturers and regulated industries, compliance is market access. Tti Labs accelerates it through independent verification.

Tti Labs is a testing, inspection and certification partner to leading global buyers. Structured sample handling and secure chain-of-custody controls keep results traceable at every stage.

You get direct access to technical experts. They design quality assurance programmes around your processing lines and batch sizes.

- ISO/IEC 17025 accredited testing laboratory, PNAC Lab 022
- ISO/IEC 17020 accredited inspection body, PNAC IB-006 (Tti Inspections Pvt Ltd)
- U.S. CPSC accepted conformity assessment body
- ZDHC MRSL v3.1 certifier and ZDHC approved wastewater lab
- U.S. IAC certified microbiology laboratory
- 25,000 sq ft purpose-built headquarters in Lahore; offices in Karachi, Faisalabad and Sialkot

544ACCREDITED
METHODS**378**ACCREDITED
PARAMETERS**1,500+**

TESTS A DAY

600+

SAMPLES A DAY

3-daySTANDARD
TURNAROUND**1,500+**GLOBAL
BRANDS

Testing



Inspection



Certification



Sustainability

Six in ten export dollars are textile

Pakistan's textile group exports reached US\$ 17.93 bn in July–June 2025-26. That is 59.5% of all exports, US\$ 30.14 bn. Tti Labs tests every link of that chain.



Fibres & yarns

Cotton, wool, silk, linen, jute, hemp, synthetics and blends; spun, filament and textured yarn



Fabrics

Denim, woven, non-woven and knitwear fabric; yarn and threads



Technical & medical textiles

Functional finishes, flammability and durability; protocols for hygiene-sensitive textiles



Apparel & accessories

Formal and casual wear, institutional uniforms; zippers, buttons, labels and trims



Home textile

Bed linen, blankets, towels, rugs, curtains and table linen



Sports goods & gears

Bagpipes, bags, boxing and cricket equipment, sports and medical balls

Textile exports by group, US\$ million, July–June 2025-26

Knitwear		4,966	Other made-up articles		770
Readymade garments		4,288	Cotton yarn		765
Bed wear		3,113	Art silk & synthetic textile		353
Cotton cloth		1,672	Tents, canvas & tarpaulin		120
Towels		1,062	Yarn other than cotton		29
Other textile materials		791			

Pakistan Bureau of Statistics, exports of selected commodities, July–June 2025-26, provisional. Share derived from the PBS advance release, June 2026.

PAKISTAN'S PIONEERING DENIM TESTING HUB

Denim QC, from roll to washed garment.

Denim passes or fails after the wash, not before it. Shade banding, leg twist and shrinkage appear only once the garment leaves the drum.

Shade

Wash

Measurement

Levi's quality partner since 1998

DEFECT	TEST OR METHOD	STAGE TO RUN IT
Shade change after wash	--- Grey scale vs approved reference	--- Fabric inspection & first bulk wash
Colour fastness to washing	--- ISO 105-C06	--- Pre-production fabric & finished garment
Colour fastness to rubbing	--- ISO 105-X12 · dry & wet	--- Pre-production fabric
Shrinkage after laundering	--- ISO 6330 + ISO 3759	--- Pre-production fabric, before cutting
Leg twist & skew	--- ISO 16322-2 · ASTM D3882	--- Fabric & washed garment

Each defect belongs to the stage that creates it. AQL counts countable defects; inspectors judge shade against an approved reference.

ISO/IEC 17025 ACCREDITED

Tested to the applicable standard, by a validated method.

Tti Labs tests chemical composition, fibre identity, performance and safety parameters. The results are precise, standards-aligned data for confident compliance decisions.

ISO

EN

ASTM

AATCC

DIN

AS/NZS

BS

SASO

GB

KS

01 Mechanical performance

UNDER LOAD AND REPEATED USE

-  Tensile strength (grab, strip)
-  Tear strength (Elmendorf, wing rip)
-  Bursting strength
-  Seam strength & seam slippage
-  Yarn strength & elongation
-  Abrasion resistance (Martindale, Taber)
-  Pilling resistance (ICI, random tumble)
-  Zipper strength

02 Dimensional stability & appearance

AFTER CARE AND OVER TIME

-  Dimensional stability (after wash / dry clean)
-  Stretch properties
-  Recovery & modulus control
-  Spirality, bow & skewness
-  Fabric stiffness
-  Crease recovery
-  Fabric appearance (after wash / dry clean)
-  Garment appearance (after care)
-  Seam & fabric smoothness
-  Print & graphic durability
-  Care label verification

03 Material composition & fibre analysis

AUTHENTICITY AND STRUCTURE

-  Fibre composition (qualitative & quantitative)
-  Organic cotton verification
-  GM cotton screening (recognised by OCA)
-  Weave / knit structure identification

04 Yarn & thread performance

COUNT, TWIST AND STRENGTH

-  Yarn & thread count
-  Determination of yarn twist
-  Breaking strength of yarn
-  Yarn shrinkage (boiling water / dry heat)
-  Sewing thread twist & twist balance



Abrasion resistance

Martindale



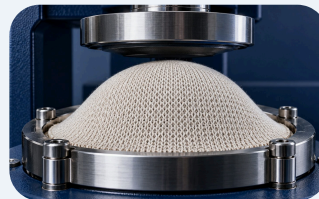
Tear strength

Elmendorf



Pilling resistance

ICI box



Bursting strength

01 Mechanical performance

CONSTRUCTION • FUNCTION • SAFETY

Performance you can measure, down to the zipper.

Tti Labs measures how a fabric is built and how it behaves in use. Garment accessories get their own durability and safety tests.

05 Fabric construction & physical properties

- Fabric weight verification
- Fabric count & thickness
- Fabric stitch density
- Air permeability
- Thermal resistance

07 Safety & specialised performance

- Antibacterial assessment
- Flammability & burning behaviour
- Vertical flame test

08 Safety assessment of garment accessories

DURABILITY & PERFORMANCE

- | | |
|-----------------------------------|---|
| 01 Corrosion resistance | 04 Zipper colour fastness (light, crocking, laundering) |
| 02 Zipper dimensional measurement | 05 Zipper, button & fastener strength |
| 03 Zipper finish durability | 06 Print & embellishment durability |

06 Functional performance

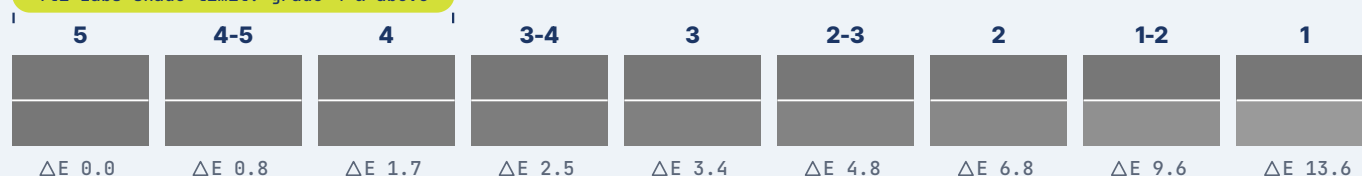
- Moisture & water resistance
- Wicking, absorbency, spray test
- Water & oil repellency
- Soil release
- Durable press rating
- Hydrostatic head pressure

DYE STABILITY AND RESISTANCE TO EXPOSURE

Colour fastness, graded.

Tti Labs rates colour change against the grey scale and measures it instrumentally. That covers CIELAB colour difference, instrumental grey-scale rating and colour coordinates for hi-vis clothing.

Tti Labs shade limit: grade 4 & above



ISO 105-A02 grey scale for assessing change in colour; CIELAB colour difference per grade. Top half: neutral grey reference; bottom half: the paired chip. Rendered for illustration; not a calibrated reference scale.

Accredited colour fastness methods · PNAC Lab 022

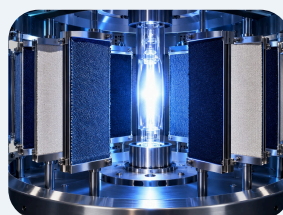
FASTNESS TO	AATCC	ISO
Crocking / rubbing	AATCC TM8:2022e	ISO 105-X12:2016
Perspiration	AATCC TM15:2021e	ISO 105-E04:2013
Light (xenon arc)	AATCC TM16.3:2020	ISO 105-B02:2014
Laundering (accelerated)	AATCC TM61:2020e2	ISO 105-C10:2006 · ISO 105-C06:2010
Water spotting	AATCC TM104:2025	ISO 105-E07:2010
Sea water	AATCC TM106:2025	ISO 105-E02:2013
Water	AATCC TM107:2022e	ISO 105-E01:2013
Dry cleaning	AATCC TM132:2013e3	ISO 105-D01:2010
Non-chlorine bleach (home)	AATCC TM172:2016e2	—
Hypochlorite bleach (home)	AATCC TM188:2017e	—
Bleach spot tests	AATCC TS-001	—
Phenolic yellowing	—	ISO 105-X18:2007

Also offered: ozone · hot pressing · pool water · dye transfer in storage.



Crocking / rubbing

AATCC TM8 · ISO 105-X12



Light (xenon arc)

AATCC TM16.3 · ISO 105-B02

FIBRE COMPOSITION LABORATORY SINCE 2000

Fibre composition & cotton authenticity.

Tti Labs identifies and quantifies natural and synthetic fibres. That helps exporters meet global fibre-content rules.

NATURAL

cotton

wool

silk

linen

jute

hemp

SYNTHETIC & CELLULOSIC

polyester

nylon

viscose

acrylic

blends

YARNS

spun

filament

textured

blended

TEST

METHOD

Quantitative fibre analysis

AATCC 20A-2025 · ISO 1833-1, -2, -3, -4, -6, -7, -8, -10, -11, -12, -16

Qualitative fibre analysis

AATCC TM20-2021

Warp & weft count
(ends/picks)

ASTM D3775-17 (R23) · BS EN 1049-2:1994 · ISO 7211-2:2024

GM cotton screening by
real-time PCR

ISO 5354-1 · ISO/TS 5354-2:2024 · IWA 32

Organic cotton verification

Real-time PCR on high-quality, amplifiable DNA

OCA-RECOGNISED

GM cotton screening by real-time PCR.

It applies to cotton lint, leaf and fibre, and to cotton-fibre-derived materials.

FOUR FIBRE METHODS



Fibre identification

AATCC TM20-2021



Ends & picks

ISO 7211-2:2024



GM cotton

Real-time PCR



Quantitative analysis

ISO 1833



16 CFR 1610 · 1615 · 1616 · 1630 · 1631 · ASTM

Flammability & burning behaviour.

16 CFR Part 1610: one burn time, three classes

CLASS	PLAIN SURFACE	RAISED SURFACE
1 Normal	3.5 s or more	More than 7.0 s, or surface flash only
2 Intermediate	Not applicable	4.0 to 7.0 s, with base burn
3 Rapid & intense	Less than 3.5 s	Less than 4.0 s, with base burn

Classes 1 and 2 are acceptable for clothing; Class 3 is unsuitable.
Source: 16 CFR 1610.4 and 1610.7.

45° specimen

16 mm flame

1 s application

127 mm timed

50 × 150 mm specimen

In 2010 Tti Labs became the first laboratory in Pakistan accepted by the U.S. CPSC for flammability testing.

Accredited flammability methods · PNAC Lab 022

PRODUCT	METHOD
Apparel & clothing textiles	ASTM D1230-25 · 16 CFR 1610 (2008)
Children's sleepwear	16 CFR 1615: sizes 0-6X · 16 CFR 1616: sizes 7-14
Vertical flame resistance	ASTM D6413/D6413M-2022
Blankets	ASTM D4151-23
Carpets & rugs, surface	16 CFR 1630 · 16 CFR 1631
Limited flame spread (PPE)	ISO 15025:2016 · EN 407:2020 · ISO 14116:2015



09

CHILD SAFETY



CPSIA • 16 CFR

Child safety & U.S. compliance.

Tti Labs tests children's products to CPSIA and international consumer product requirements. It was Pakistan's first third-party laboratory accepted by the U.S. CPSC for lead and flammability testing.

CPSC Lab ID 1168

Lead 2009

Flammability 2010

Phthalates 2018

REQUIREMENT	U.S. REFERENCE	METHOD ON TTI LABS' SCOPE
Total lead in substrates	CPSIA Section 101	CPSC-CH-E1001-08.3 (metal) • CPSC-CH-E1002-08.3 (non-metal)
Lead in paint & surface coatings	16 CFR Part 1303	CPSC-CH-E1003-09.1
Phthalates content	CPSIA Section 108	CPSC-CH-C1001-09.4 • ISO 14389:2022
Small parts (choking hazard)	16 CFR Part 1501	Small parts cylinder
Sharp points & sharp edges	16 CFR 1500.48 & 1500.49	16 CFR 1500.48 • 1500.49
Torque & tension	16 CFR 1500.50, .51, .53	ASTM F963-2023
Tracking label verification	CPSIA Section 103	Label check (not on the PNAC scope)
Flammability	16 CFR Part 1610, 1615, 1616	See page 9

 **100 ppm**

Total lead content by weight, any part of a children's product.

CPSIA §101(a)(2)(C), from 14 Aug 2011

 **90 ppm**

Lead in paint and similar surface coatings (0.009%).

16 CFR 1303.1, from 14 Aug 2009

 **0.1%**

Each of DEHP, DBP, BBP, DINP, DIBP, DPENP, DHEXP, DCHP in children's toys and child care articles.

16 CFR 1307.3



REACH · AFIRM · OEKO-TEX · GOTS · CPSIA · PROP 65 · ZDHC

Chemical testing & RSL.

Tti Labs offers a complete chemical management solution for compliance and supply-chain risk intelligence. It tests finished products as well as processes.

Restricted dyes & colorants

Processing auxiliaries

Plasticizers & bisphenols

Organotin compounds

Solvents, VOCs & residuals

Heavy metals

APEOs, phthalates

Chlorinated organic compounds

Restricted substances screening

Chromium VI screening

PFAS screening

EU REACH Annex XVII: limit and accredited method · Regulation (EC) 1907/2006

ENTRY	RESTRICTION	LIMIT	ACCREDITED METHOD
43	Azo dyes releasing listed aromatic amines	30 mg/kg	ISO 14362-1 & -3:2017
72	Formaldehyde in clothing, textiles, footwear	75 mg/kg	ISO 14184-1 & -2:2011
46a	Nonylphenol ethoxylates, washable textiles	0.01%	ISO 18254-1 · ISO 18218-1 · ISO 21084
27	Nickel release: rivets, zippers, metal marks	0.5 µg/cm ² /week	BS EN 1811:2023
79	PFHxA and its salts, in clothing (applies since 10 Oct 2026)	25 ppb	ISO 23702-1 · EN 17681 · TOF screen

Entry numbers and limits from the amending regulations on EUR-Lex: (EC) 552/2009 (entries 27, 43), (EU) 2016/26 (46a), (EU) 2018/1513 (72), (EU) 2024/2462 (79). Methods are on Tti Labs' PNAC Lab 022 scope.

ALSO ON THE ACCREDITED SCOPE Disperse dyes · PAHs · Chlorobenzenes & chlorotoluenes · Bisphenols A, B, S, F · Flame retardants · Preservatives (OPP, OIT, PCMC, TCMTB) · Dimethyl fumarate · Chlorinated paraffins (SCCP, MCCP) · Chlorinated phenols · Quinoline · Extractable metals · pH value · VOCs



PFAS, bisphenols & dyes

LC-MS/MS since 2018



Azo dyes & formaldehyde

ISO 14362 · ISO 14184



Nickel release

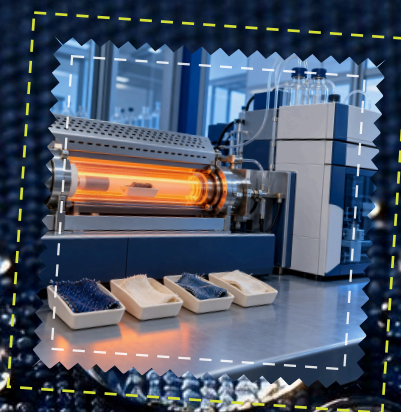
BS EN 1811:2023

EU REACH ANNEX XVII • ENTRY 79

PFHxA restriction for textiles

Applies since 10 Oct 2026 to clothing, related accessories and footwear for the general public. From 10 Oct 2027 it also covers other textiles, leather, furs and hides for the general public.

Limits: 25 ppb for PFHxA and its salts; 1,000 ppb for PFHxA-related substances. Commission Regulation (EU) 2024/2462.



TOTAL ORGANIC FLUORINE • CIC

“Is fluorine present in my product at all?”

Total organic fluorine (TOF) measures all fluorine bound to organic compounds in a material. It does not target individual PFAS; it is the prerequisite for PFAS testing.

Tti Labs runs Pakistan's first TOF screening, by combustion ion chromatography (CIC).

TOF screen by CIC
 TOTAL ORGANIC FLUORINE

Below threshold: safe zone, PFAS risk is low

Fluorine detected: targeted PFAS testing required
Why TOF screening?

- Rapid PFAS risk identification
- Cost-effective alternative to blind PFAS testing
- Detects known and unknown fluorinated chemistries
- Ideal for high-volume compliance screening
- Reduces risk of rejections, recalls and penalties
- Prevents false confidence from limited PFAS lists

PFAS testing is essential for:

- Textiles & apparel
- Leather & leather products
- PPE & protective clothing
- Coated & laminated materials

Accredited: total fluorine ASTM D7359 · EN 14582 · EN 17813; PFAS ISO 23702-1:2023 · CEN/TS 15968:2010 · EN 17681:2025.

ZDHC & sustainability, under one roof

Tti Labs is a ZDHC MRSL v3.1 approved certifier and an approved wastewater laboratory. It supports the Roadmap to Zero programme with complete solutions for chemical and wastewater compliance.

ZDHC MRSL v3.1 Approved Certifier

ZDHC Approved Wastewater Lab

Microfibre 2030 Commitment Signatory



ZDHC MRSL certification

Formulator chemicals certified by testing, screening and SDS review



ZDHC Wastewater v2.2

Every discharge category on the ZDHC list, from ZLD verification to trace-level detection



Sustainable supply chains

Supplier mapping, due diligence and ESG audits; Digital Product Passport readiness



Circular economy

Recycling assessments, durability testing and life cycle assessment (LCA)



Microfibre 2030

Commitment signatory, recognised by The Microfibre Consortium



Tti Labs Sustainability Center

Carbon accounting, ESG reporting, sustainable chemistry and agriculture



MRSL certification covers all dye classes (reactive, disperse, direct, vat, acid, basic, speciality), auxiliaries, and textile, leather and polymer chemicals. Tti Labs also runs training for sustainable manufacturing.

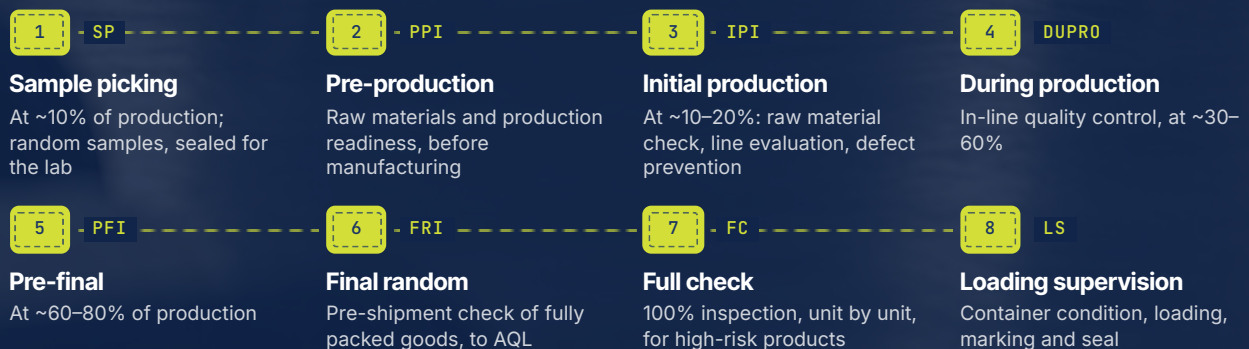
Tti Labs helps organisations shift from a take-make-waste approach to a [regenerative model](#). Materials are reused, recovered and given new life.

ISO/IEC 17020 · PSQCA APPROVED

Booked within 24 hours, reported within 24 hours of inspection.

Independent inspection supports quality control, risk reduction and confident supply-chain decisions. Tti Labs checks goods against international standards and buyer specifications, and reports risks and compliance gaps. Centralised coordination answers queries swiftly.

The 8-stage softlines inspection cycle GARMENTS · FABRIC · DENIM · HOME TEXTILE



AQL

ANSI/ASQ Z1.4-2008, general
inspection level II.

CRITICAL MAJOR MINOR

0 2.5 4.0

CHECKS

- ☒ Fabric: ASTM D5430-13, 4-point
grading
- ☒ Shade limit: grade 4 & above
- ☒ Measurements: 3 pieces per
size, all colours
- ☒ Customisable inspection
checklists

SPECIALISED SERVICES

- ☒ Sample evaluation & product
review
- ☒ Defect analysis & root cause
investigation
- ☒ Post-delivery inspection support
- ☒ Product labelling compliance

NOMINATED & APPROVED BY 41 BRANDS

Pioneers in Pakistan textile **testing.**

1st

Pakistan's first third-party laboratory accepted by the U.S. CPSC for lead and flammability testing.

1st

Pakistan's first inspection body with ISO/IEC 17020 accredited scope for textiles & apparel.

- Absolute Apparel
- ASDA
- Basic Resources Inc
- C5 Group
- Caplait
- Carhartt
- Créaprim
- DeFacto
- DiBella Longlife Textiles
- DRT
- F&F
- Fanatics
- FBB
- FOXA OY
- GAP
- HEMA
- Isa-Traesko
- J. Junaid Jamshed
- Kettelhack
- KiK Textil-Diskont
- Krayons
- Levi's
- Lipsy London
- Majid Al Futtaim
- Manto
- Next
- PPresent Team
- Scandia
- Sheet Street
- Socks World
- SOK
- Sol's
- Stooker
- Sweet Home
- Tally Weijl
- Tape A L'Oeil
- TCC
- Tom Tailor
- Williams Sonoma
- Woman Within
- Wünsche Group

SINCE 1995

1995

Founded in Lahore, July 1995

1998

Levi's Singapore laboratory acquired

2000

Fibre Composition & Analysis Laboratory

2003

Global nomination by Levi's

2006

ISO/IEC 17025 accreditation, PNAC Lab 022

2009

First CPSC acceptance in Pakistan: lead

2010

First CPSC acceptance in Pakistan: flammability

2018

CPSC acceptance: phthalates

2018

LC-MS/MS for PFAS, bisphenols & carcinogenic dyes

2021

First IAC-certified laboratory in Pakistan

2025

CIC laboratory: first accredited TOF in Pakistan

2025

OCA-approved lab; recognised by The Microfibre Consortium



Tti Testing Laboratories

Confidence, verified.

For exporters, manufacturers and regulated industries, compliance is market access. Tti Labs accelerates it through independent verification.

ISO/IEC 17025 Accredited

ISO/IEC 17020 Accredited

U.S. CPSC Accepted · Lab ID 1168

ZDHC MRSL Certifier & Wastewater Lab

111 786 001



www.ttilabs.net
quotations@ttilabs.net
marketing@ttilabs.net



Lahore Office

Headquarters & Laboratories

347-S Quaid-e-Azam
Industrial Estate,
Kot Lakhpat, Lahore-54770

(92-42) 111 786 001



Karachi Office

3rd Floor, Plot No. 7c,
Sunset Commercial St.
No. 1, Phase 4, DHA,
Karachi-75500

(92-21) 111 786 001



Faisalabad Office

Office # 145, 1st Floor,
Centre Point Plaza,
Jaranwala Road,
Faisalabad-38000

(041) 8733001



Sialkot Office

Opposite Mag Town Masjid,
Kashmir Road, Sialkot-51310

(052) 3573367

Images are illustrative and AI-generated; they do not show Tti Labs premises, clients or samples. Methods and limits are listed as supplied; confirm scope and method edition when you order.

