



**Tti Testing Laboratories**

TEXTILE TESTING INTERNATIONAL · EST. 1995

ISO/IEC  
**17025**  
ACCREDITED

ISO/IEC  
**17020**  
ACCREDITED

U.S.  
**CPSC**  
ACCEPTED



01 DIVISION

# Textiles & apparel

**From fibre to finished garment: the region's largest, internationally accredited scope in textiles & apparel testing**

Comprehensive testing and compliance services across the entire textile value chain, from fibres to finished garments and technical applications

Fibres & Yarns

Technical Textiles

Apparel

Sports Goods

**111 786 001**  
[www.ttilabs.net](http://www.ttilabs.net)



# Pakistan's pioneering denim testing hub

From fibre to finished garment, Tti supports brands, manufacturers and exporters with accredited testing, compliance and sustainability solutions aligned with global regulations.

**543**

ACCREDITED METHODS

**377+**

TESTING PARAMETERS

**2,000+**

TESTS PER DAY

**600+**

SAMPLES PER DAY

**3**days

STANDARD TURNAROUND

**1,500+**

GLOBAL BRANDS SERVED

## DIVISION 01 SCOPE

### Textiles

✓ Denim fabric

✓ Woven fabric

✓ Non-woven fabric

✓ Knitwear fabric

✓ Yarn &amp; threads

### Apparel

✓ Socks

✓ Denim

✓ Woven

✓ Knitwear

### Home textile

✓ Bed linen

✓ Blankets

✓ Plaids

✓ Towels

✓ Carpets &amp; rugs

✓ Curtains &amp; drapes

✓ Table linen

### Garment accessories

✓ Trims

✓ Labels

✓ Zippers

✓ Buttons

ISO/IEC 17025 · ISO/IEC 17020 · U.S. CPSC LAB ID 1168

# Pioneers in Pakistan textiles testing



**Pakistan's first third-party lab accepted by the U.S. CPSC for lead & flammability testing**



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



## Nominated & approved by 41 brands

TTI GLOBAL REFERENCE PUBLICATION, 2026

- 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
- Stoker
- Sweet Home
- Tally Weijl
- Tape A L'Oeil
- TCC
- Tom Tailor
- Williams Sonoma
- Woman Within
- Wünsche Group

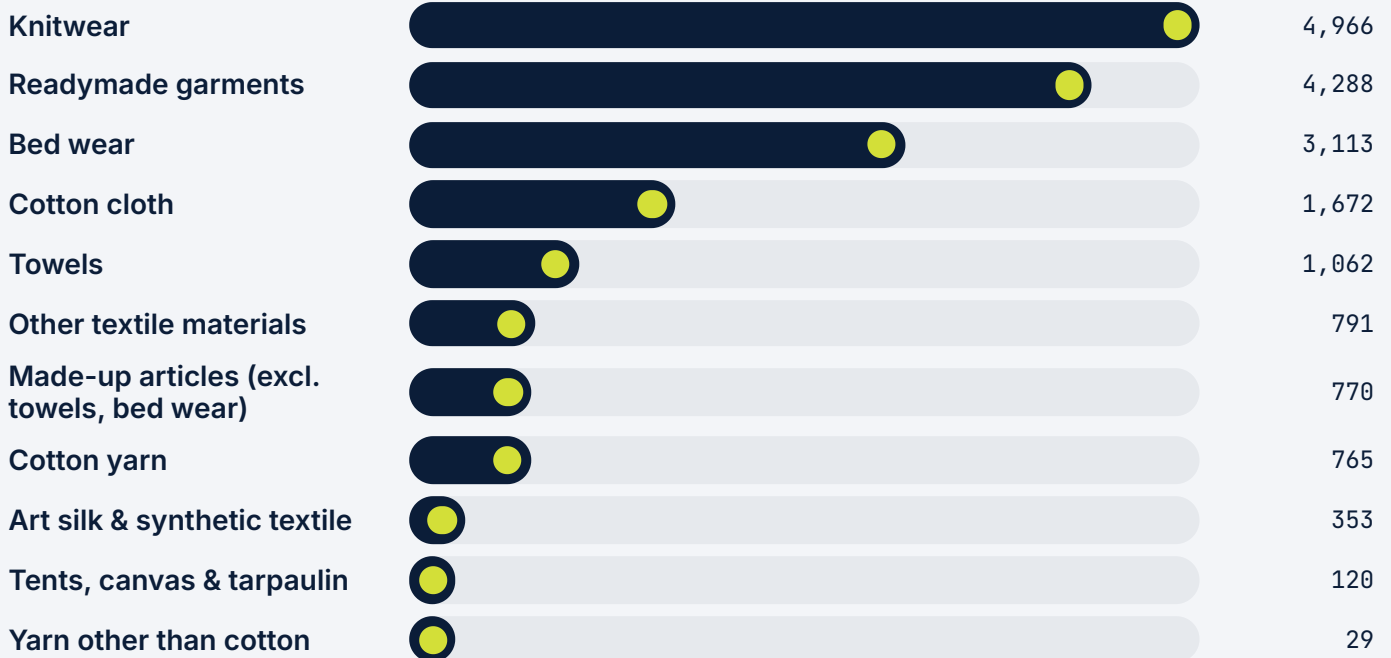
PAKISTAN BUREAU OF STATISTICS · JULY–JUNE 2025-26

# Six in ten of Pakistan's export dollars are textile

**US\$ 17.93<sup>bn</sup>**  
TEXTILE GROUP EXPORTS

**59.5%**  
OF US\$ 30.14 BN TOTAL  
EXPORTS

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



US\$ million, July–June 2025-26

## COVERAGE ACROSS THE TEXTILE VALUE CHAIN

### Fibres & yarns

Cotton, wool, silk, linen, jute, hemp · polyester, nylon, viscose, acrylic, blended fibres · spun, filament, textured and blended yarn

### Technical textiles

Functional finishes · flammability & burning behaviour · quality, safety, durability · regulatory compliance · medical textiles

### Apparel & accessories

Formal and casual wear, institutional uniforms, labelling compliance · scarves, belts, fashion gloves, zippers, buttons, elastics, threads, labels

### Sports goods & gears

Bagpipes, bags, boxing equipment, cricket equipment, sports balls, medical balls · custom QA for other sporting equipment



Warp-faced twill: the warp carries the indigo, the weft stays undyed (illustration)

Shade

Wash

Measurement

# Denim QC, from roll to washed garment

A denim order is judged after the wash, not before it. Shade banding, leg twist and post-laundry shrinkage appear only once the garment leaves the drum. Each defect belongs to the stage that creates it.

## 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



**AQL counts countable defects; shade is judged against an approved reference**

## DYE STABILITY AND RESISTANCE TO EXPOSURE

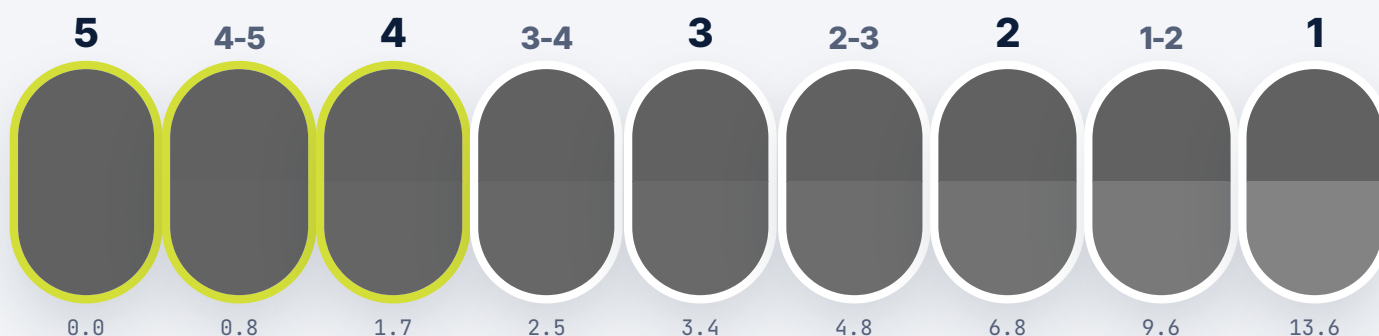
# Colour fastness, graded

Colour change is rated against the grey scale and measured instrumentally: spectrophotometric colour and colour-difference evaluation (CIELAB), instrumental assessment of grey scale rating, and colour coordinates for high-visibility clothing.



## ISO 105-A02 grey scale for assessing change in colour

9-STEP SCALE · CIELAB



Top half: neutral grey reference. Bottom half: the paired chip, lighter by the colour difference the standard specifies for each rating (CIELAB units).

Rendered for illustration; not a calibrated reference scale.

ACCREDITED COLOUR FASTNESS METHODS · PNAC LAB 022

✓ Tti shade limit: grade 4 & above

### 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 · instrumental colour (CIELAB) · colour coordinates for hi-vis clothing

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

# Flammability & burning behaviour

In 2010 Tti became the first laboratory in Pakistan accepted by the U.S. Consumer Product Safety Commission for flammability testing.

## 16 CFR Part 1610: one burn time, three classes

BURN TIME IN SECONDS

### Plain surface

Burn time

Class 3

Class 1 · normal flammability

### Raised surface

Burn time with base burn

Class 3

Class 2

Class 1

0

3.5 4

7

10

Class 1: normal    Class 2: intermediate (raised surface only)    Class 3: rapid & intense

Classes 1 and 2 are acceptable for clothing; Class 3 is unsuitable. A raised-surface fabric is also Class 1 when it shows a surface flash only, without the base fabric burning. Source: 16 CFR 1610.4 and 1610.7 (eCFR).

45°

Specimen angle

16 mm

Test flame

1s

Flame application

127 mm

Burn distance timed

50 × 150 mm

Specimen

## ACCREDITED FLAMMABILITY METHODS · PNAC LAB 022

### 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

ISO/IEC 17025 ACCREDITED

# Testing services

Accredited testing across chemical composition, fibre identification, performance and safety parameters, aligned with global standards and regulatory frameworks:

ISO

EN

ASTM

AATCC

DIN

AS/NZS

BS

SASO

GB

KS



## 01 Mechanical performance

- 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

## 03 Material composition & fibre analysis

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

## 02 Dimensional stability & appearance

- 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

## 04 Yarn & thread performance

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

## 05 Fabric construction & physical properties

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

## 06 Functional performance

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

## 07 Safety & specialised performance

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

## 08 • Safety assessment of garment accessories

DURABILITY & PERFORMANCE

01 Corrosion resistance

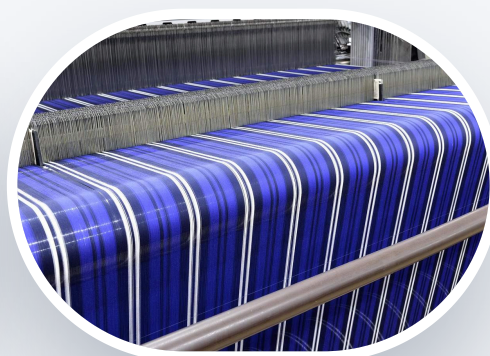
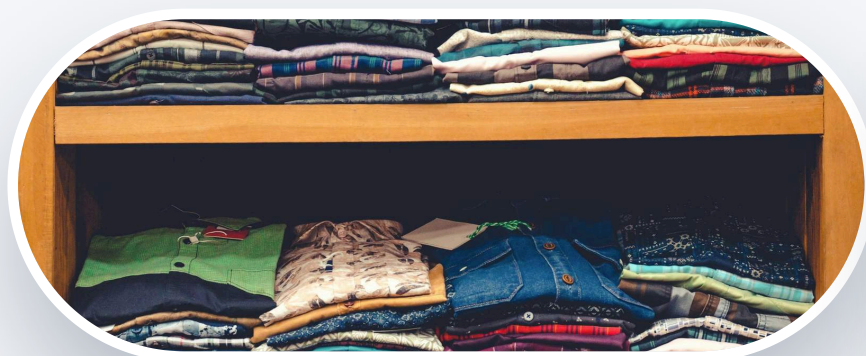
02 Zipper dimensional measurement

03 Zipper finish durability

04 Zipper colour fastness (light, crocking, laundering)

05 Zipper, button & fastener strength

06 Print & embellishment durability



FIBRE COMPOSITION LABORATORY SINCE 2000

# Fibre composition & cotton authenticity

Fibre composition and analytical testing across natural and synthetic fibres, supporting exporters in meeting global fibre-content regulations.



## Natural fibres

Cotton

Wool

Silk

Linen

Jute

Hemp

## Synthetic & cellulosic

Polyester

Nylon

Viscose

Acrylic

Blends

## Yarns

Spun

Filament

Textured

Blended

## Quantitative fibre analysis

AATCC 20A-2025

1833 -1

1833 -2

1833 -3

1833 -4

1833 -6

1833 -7

1833 -8

1833 -10

1833 -11

1833 -12

1833 -16

ISO 1833 parts on the accredited scope; qualitative analysis by AATCC TM20-2021.

ENDS (WARP)

PICKS (WEFT)



## Warp & weft count (ends/picks)

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

OCA-RECOGNISED · ISO/TS 5354-1 &amp; -2:2024

## GM cotton screening by real-time PCR

Organic cotton identification using real-time PCR on high-quality, amplifiable DNA.

Cotton lint, leaf and fibre

Cotton-fibre-derived materials

ISO 5354-1 · ISO/TS 5354-2 · IWA 32

CPSIA · 16 CFR

# Child safety & U.S. compliance



Aligned with CPSIA and international consumer product requirements. **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'S SCOPE                                       |
|---------------------------------------------|-------------------------------------|-------------------------------------------------------------|
| <b>Total lead in substrates</b>             | <b>CPSIA Section 101</b>            | CPSC-CH-E1001-08.3 (metal) · CPSC-CH-E1002-08.3 (non-metal) |
| <b>Lead in paint &amp; surface coatings</b> | <b>16 CFR Part 1303</b>             | CPSC-CH-E1003-09.1                                          |
| <b>Phthalates content</b>                   | <b>CPSIA Section 108</b>            | CPSC-CH-C1001-09.4 · ISO 14389:2022                         |
| <b>Small parts (choking hazard)</b>         | <b>16 CFR Part 1501</b>             | Small parts cylinder                                        |
| <b>Sharp points &amp; sharp edges</b>       | <b>16 CFR 1500.48 &amp; 1500.49</b> | 16 CFR 1500.48 · 1500.49                                    |
| <b>Torque &amp; tension</b>                 | <b>16 CFR 1500.50, .51, .53</b>     | ASTM F963-2023                                              |
| <b>Tracking label verification</b>          | <b>CPSIA Section 103</b>            | Label check against the requirement                         |

## 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

A complete chemical management solution for regulatory compliance and supply-chain risk intelligence, testing 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
- ✓ Chromium VI screening
- ✓ PFAS screening

## EU REACH Annex XVII: limit and accredited method

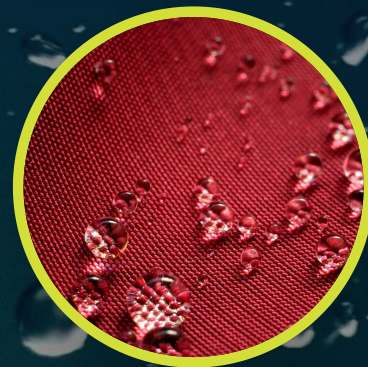
REGULATION (EC) 1907/2006

|     |                                                  |                              |                                             |
|-----|--------------------------------------------------|------------------------------|---------------------------------------------|
| 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 <sup>2</sup> /week | ----- BS EN 1811:2023                       |
| 79  | PFHxA, its salts, in clothing (from 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's 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



Textiles &amp; apparel

Leather

PPE &amp; protective clothing

Coated &amp; laminated materials

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

## TOF screen

by CIC

**Below threshold** Safe zone: PFAS risk is low**Fluorine detected** Targeted PFAS testing required

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

## 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

### EU REACH ANNEX XVII · ENTRY 79

## PFHxA restriction for textiles

**10 Oct 2026**

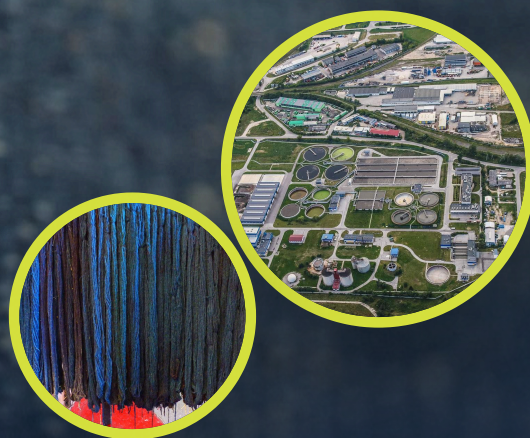
Textiles, leather, furs and hides in clothing and related accessories, and footwear, for the general public

**10 Oct 2027**

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.



SUPPORTING ROADMAP TO ZERO · TTI SUSTAINABILITY CENTER

# ZDHC & sustainable supply chains

ZDHC MRSL v3.1 Approved Certifier

ZDHC Approved Wastewater Lab

Microfibre 2030 Commitment Signatory



## ZDHC MRSL certification

Chemical conformance certification for formulators, based on analytical testing, screening and review of the Safety Data Sheet, as per ZDHC MRSL v3.1.

All dyes: reactive, disperse, direct, vat, acid, basic, speciality

Auxiliaries: surfactants, detergents, finishing agents, softeners

Textile, leather and polymer chemicals



## ZDHC Wastewater v2.2

From zero liquid discharge (ZLD) verification to trace-level detection of hazardous substances, chemical loads managed to the ZDHC Wastewater Guidelines.

- ✓ Approved wastewater laboratory
- ✓ All four discharge categories, including ZLD
- ✓ Complements MRSL certification



## Sustainable supply chains

Transparent, ethical and resilient supply chains, and readiness for the EU Digital Product Passport.

- ✓ Supplier mapping & traceability
- ✓ Supply chain due diligence
- ✓ Material compliance, ESG audits & action plans
- ✓ Responsible sourcing & supplier capacity building



## Circular economy

Demonstrate recyclability and product circularity, a key requirement for global exports and environmental labelling.

- ✓ Waste recovery & recycling assessments
- ✓ Product durability & material testing
- ✓ Life cycle assessment (LCA)

ISO/IEC 17020 · PSQCA REGISTERED

# Inspection services

Independent inspection for quality control, risk reduction and confident supply chain decisions. Booking within 24 hours; report within the next 24 hours after inspection.



## The 8-stage softlines inspection cycle

GARMENTS · FABRIC · DENIM · HOME TEXTILE

1 SP

### Sample sealing / picking

Random sampling; samples sealed with identification for the lab.

2 FI

### Fabric inspection

Before cutting: visual, dimensional, colour fastness, fabric strength. ASTM D5430-13 4-point grading.

3 IPI

### Initial production

At 20% completion: raw material check, production line evaluation, defect prevention.

4 DPI

### During production

Process evaluation, random sampling and real-time status.

5 PM

### Production monitoring

Continuous presence with daily reporting on quality issues and progress.

6 FRI

### Final random inspection

Fully packed goods, AQL ANSI/ASQ Z1.4-2008.

7 FC

### 100% full check

Unit by unit for high-risk products, with custom criteria.

8 LS

### Loading supervision

Container condition, load witness, marking and labelling, seal at completion.

AQL · ANSI/ASQ Z1.4-2008 · GENERAL INSPECTION LEVEL II

0

Critical

2.5

Major

4.0

Minor

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

#### Photography

Unsplash: Michaela St, Esther Ní Dhonnacha, Victor Volkov, Sergio Gonzalez, engin akyurt, Ekaterina Grosheva, Baby Natur, Michael Förtsch, Jacques Dillies, Gowtham AGM, Nellie Adamyan, Bozhin Karaivanov, Georg Eiermann, Will Goodman, Roozbeh Eslami. Pixabay: Digital\_Expert, Erbs55, OsloMetX, LoggaWiggler, Guillaume1966, stevepb, dostigla, jarmoluk, Saddlemomma, jhenning, Bru-nO, medyamen2, fezailec. All photographs are object-only illustrations, not Tti facilities.



**Tti Testing Laboratories**

**For exporters,  
manufacturers and regulated  
industries, **compliance is  
market access.** Tti  
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

**111786 001**

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