FTT®
Fabric Touch Tester
Comfort is perhaps the most basic prerequisite when a consumer selects clothing for purchase. Although comfort is a highly subjective perception, researchers have developed various objective measurement methods to quantify the sensations when touching a fabric. The way that the fabric feels has been described as “fabric hand”, which has been traditionally used in the textile and clothing industries as a description of fabric quality and prospective performance.

Clothing is one of the most intimate objects associated with our daily life. It covers and interacts with most of our body throughout the day and night. Since the skin is extremely sensitive to pressure, friction, and heat transfer due to millions of receptors all over the body, there is a need to characterize the tactile sensory properties of textile contact during wear.

Now, the innovative FTT® from SDL Atlas is available to measure skin touch comfort objectively and quantitatively. The comprehensive, sophisticated design of the FTT enables it to measure all the mechanical and surface properties of fabric hand in one simple test.

Determination of Sensations of Fabric — Skin Touch

Determine the Hand and Skin Touch comfort of fabric, objectively and quantitatively.
The FTT Fabric Touch Tester provides the objective assessment of fabric quality and performance with 18 indices through the measurement of the following properties:

<table>
<thead>
<tr>
<th>Fabric Thickness</th>
<th>Fabric Compression</th>
<th>Fabric Bending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric Surface Roughness</td>
<td>Fabric Surface Friction</td>
<td>Fabric Thermal Properties</td>
</tr>
</tbody>
</table>

**Physical Indices - Bending Module:**
The bending module of the FTT measures physical properties as bending average rigidness and bending work (in both warp and weft directions). A sample measurement curve is shown:

**Physical Indices - Surface Module:**
The Surface module of the FTT Measures surface friction coefficients and surface roughness, wave amplitude and wavelength (in both warp and weft directions). Sample measurement curves are shown:

**Physical Indices - Compression Module**
The compression module of the FTT measures compression work, compression recovery rate, and compression average rigidity (under compression and recovery). A sample measurement curve is shown:

**Physical Indices - Thermal Module:**
The thermal module of the FTT measures thermal conductivity (under compression and recovery) and maximum thermal heatflux (Qmax). A sample measurement (heatflux vs. time) curve is shown:

**Physical Touch/ Hand Predicted Values:**
Statistical analysis of the FTT indices reveals strong correlation to human sensations. Modelling of these indices can be developed to predict the primary touch and hand feels on smoothness, softness and warmth.

Primary touch feel means the subjective (human) feeling when contacting textile samples passively, i.e. wearing. Primary hand feel means the subjective feeling when contacting textile samples actively, i.e. hand evaluation.

FTT primary hand values illustrate the predicted touch/hand feels of samples. The higher value of fabric primary touch/hand - smoothness means a smoother surface; the higher value of fabric primary touch/hand - softness means a softer sample; and the higher value of fabric primary touch/hand - warmness hand means a warmer sample.

The FTT tests a fabric’s physical properties on both its face side and back side. Results obtained from face side are used to calculate hand feels while those from back side are used for hand/touch feels. Total comfort measurements under both circumstances are evaluated as well.

A sample fingerprint chart of the FTT primary hand and touch is shown:
Transferring Subject Sensations to Objective Data

The testing area of the FTT consists of an upper plate and a lower plate. An “L” shaped specimen to be tested is prepared which includes both the warp and weft directions. A constant 10 degree C temperature difference between the upper and lower plates is established before the test is started. Different measurements within the multiple modules (thermal-compression, surface friction and roughness, and bending) are performed with the downwards and upwards movement of the upper and lower plates.

Studies have shown that the measurements from the FTT Fabric Touch Tester have strong correlation with human subjective touch sensations, thus the FTT is able to measure and distinguish fabric touch comfort properties. This innovative instrument permits quality control and research and development laboratories to measure and predict the comfort perception of the fabrics, from product design, to processing control, to end products for consumers.

The FTT is the only instrument available that has proven correlations to the Kawabata system and subjective human panel evaluation studies.

QC Evaluation Module

QC-FTT Features

- Radar Chart for comparing Primary Sensory Indices (PSI) from the FTT test results of different fabrics
- Calculate the differences of multiple fabrics’ PSI to a reference fabric’s
- User defined Quality Control upper and lower limits of the PSI
- Quality Control PASS/FAIL decision based on user defined tolerance

<table>
<thead>
<tr>
<th>No.</th>
<th>Total</th>
<th>Warmth</th>
<th>Softness</th>
<th>Smoothness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>0.583</td>
<td>0.711</td>
<td>0.680</td>
<td>0.452</td>
</tr>
<tr>
<td>1</td>
<td>-0.075</td>
<td>-0.041</td>
<td>-0.185</td>
<td>-0.024</td>
</tr>
<tr>
<td>2</td>
<td>-0.021</td>
<td>-0.076</td>
<td>-0.037</td>
<td>-0.018</td>
</tr>
<tr>
<td>3</td>
<td>-0.303</td>
<td>0.206</td>
<td>-0.521</td>
<td>-0.436</td>
</tr>
<tr>
<td>4</td>
<td>-0.003</td>
<td>-0.222</td>
<td>-0.014</td>
<td>0.122</td>
</tr>
</tbody>
</table>

Fig. 1 Differences of PSI of fabrics from the reference fabric.

Fig. 2 Radar Chart of Primary Sensory Indices (PSI) of Active Touch Feel (Hand Feel) for different fabrics.
## Product Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (Width x Depth x Height)</td>
<td>510 mm x 598 mm x 840 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>85 kg</td>
</tr>
<tr>
<td>Electric</td>
<td>115-230 V, Single Phase, 60/50 Hz, 2.5 A</td>
</tr>
<tr>
<td>Fuse</td>
<td>2.5 A, 250 V, Fast Acting</td>
</tr>
<tr>
<td>Test Specimen</td>
<td>310 mm x 310 mm letter “L” Width= 110 mm</td>
</tr>
<tr>
<td></td>
<td>Cross Area 110 mm x 110 mm</td>
</tr>
<tr>
<td>Max. Thickness</td>
<td>5 mm</td>
</tr>
<tr>
<td>Test Plate</td>
<td>120 mm x 120 mm, Brass</td>
</tr>
<tr>
<td>Test Travel</td>
<td>0~50 mm</td>
</tr>
<tr>
<td>Max. Pressure</td>
<td>70 g/cm²</td>
</tr>
<tr>
<td>Standard Pressure</td>
<td>42 g/cm²</td>
</tr>
<tr>
<td>Heating Time</td>
<td>About 5 Minutes</td>
</tr>
<tr>
<td>One Test Duration</td>
<td>About 10 Minutes</td>
</tr>
<tr>
<td>Laboratory Environment</td>
<td>21 +/-3°C / 60 +/-5%</td>
</tr>
<tr>
<td>Control</td>
<td>FTT® Tester Software, USB to PC Connect, PC Soft Analysis Interface and Control for Windows XP/Win 7</td>
</tr>
</tbody>
</table>

## Applications

- Compares production fabric to designer standard
- Determines quantitative values for Fabric Hand and Fabric Touch
- Measures all the mechanical and surface properties related to hand
- Correlates with human subjective touch sensations
- Eases communication across the supply chain

## Ordering Information

- 107052 FTT® Fabric Touch Tester
  - Sample Cutting Template
  - Software Disk with Data Cable
  - Power Cables (EU & USA)
- 107740 QC Evaluation Software

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A Research Project of HKRITA Research Institution
Providing Confidence

For over 60 years, the SDL Atlas companies have been providing confidence in standard based testing through expertise and global partnering. Our customers can be assured that they are making informed decisions based on accurate test results.

SDL Atlas experts work closely with standards committees and retailers on development of standards. Our engineers develop instruments to meet these standards. Our service team calibrates the instruments to exacting UKAS and internal standards. High quality consumables that are consistent from batch to batch are also produced and distributed by SDL Atlas.

Fabrics and Consumables
Consumables are a critical part of many textile tests. SDL Atlas produces and distributes a complete line of consumables. Each batch is thoroughly tested to ensure conformity and consistency from batch to batch.

Our consumables offerings include:
- Multifiber
- Cork Liners
- Abradents
- Phenolic Yellowing
- Detergents
- Ballasts
- Crocking Fabric

Calibration & Service
- UKAS calibration
- ISO calibration
- Service support
- Factory trained representatives
- SDL Atlas service technicians
- Crocking Fabric

With UKAS accredited technicians located in Europe, Asia, and North America, we are prepared to support our customers in maintaining their investment and their confidence in their test instruments. SDL Atlas calibration certificates are accepted by all accreditors.