TSA

TACTILE SENSATION ANALYZER

Objective measurement of the softness, smoothness and flexibility as well as thermal and optical properties of nonwovens

ADVANTAGES

- measurement of the three parameters, which determine the human feeling:
  - softness, smoothness & flexibility
  to calculate the hand feel value
- objective, accurate, reliable
- very good correlation to the human feeling
- several new features as optional add-on (thermal & optical properties, automatical cloud-based digitization)

USERS

- chemical suppliers
- fiber manufacturers
- manufacturers of base and finished products
- retailers
- universities and institutes

Traditionally, the hand feel of a nonwoven product has been tested by the human hand, in the best case by human hand panels. The human feeling depends on several factors, e.g. personal and market specific preferences, the daily mood and the culture. A further disadvantage is the inability to feel the three basic haptic parameters individually, which determine the overall haptic impression of a material that is touched by the hand.

BASIC

The emtec TSA Tactile Sensation Analyzer objectively measures the micro-surface variations (feeling of softness), the macro-surface variations (feeling of smoothness) and the flexibility (in-plane stiffness) of any kind of nonwoven material (base material and finished products). These are the three basic haptic parameters, which are also felt by the human hand, but the TSA provides a result for each of the three individually. By the help of special algorithms, these three single parameters can be combined to the so-called hand feel (HF) value. With the right mathematical model, a correlation to the human expectation of up to almost 100 percent is possible.

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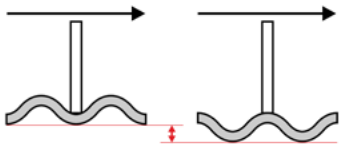
The TSA measuring instrument and measuring method are internationally patented and protected.

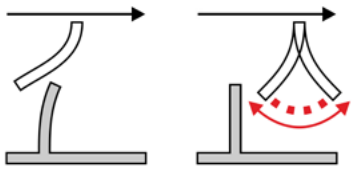
MEASURING PRINCIPLE

First step is a sound analysis: smoothness (TS750) is measured.

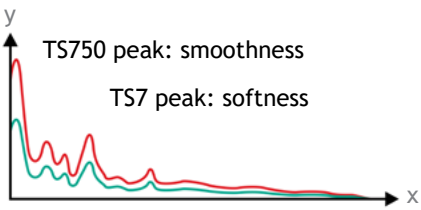


vertical vibration of the nonwoven material varies according to surface structure / smoothness vs. roughness (TS750).

The second step is a sound analysis for the softness (TS7), followed by a deformation measurement for the parameters flexibility (D), hysteresis (H), plasticity (P) and elasticity (E).

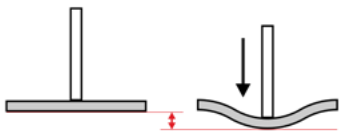


Sound analysis (TS7 - softness): blade vibration varies depending on the softness of the fibers protruding from the material.



y: sound intensity x: frequency

The sound spectrum shows the results of the sound analysis.



The deformation depth varies depending on the flexibility vs. stiffness (in-plane stiffness).

OPTIONAL ADD-ON

surface thermal conductivity

thermal insulation

high resolution picture

all data can be automatically digitized and stored in the Virtual Haptic Library used for quality assurance in real time all over the world & online market place

APPLICATION AREAS

r&d & benchmarking

process & product optimization

quality assurance & incoming control

troubleshooting & complaint management

MATERIALS

base products (top and back sheets of diapers, base material for wet wipes, feminine hygiene products etc.)

finished products (diapers, feminine hygiene products, wet wipes, wound dressings etc.)

TECHNICAL DATA

device dimensions	40.3 x 18 x 35.5 cm (H x W x D)
device weight	approx. 15 kg
power supply	100-240 V AC, 50/60 Hz
standard sample dimension	⌀ 11.28 cm = 100 cm^2

SOFTWARE

Emtec Measurement System EMS

optional: access to the Virtual Haptic Library via a license

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