

TSA

TISSUE SOFTNESS ANALYZER

Objective measurement of the softness, roughness and stiffness of tissue paper



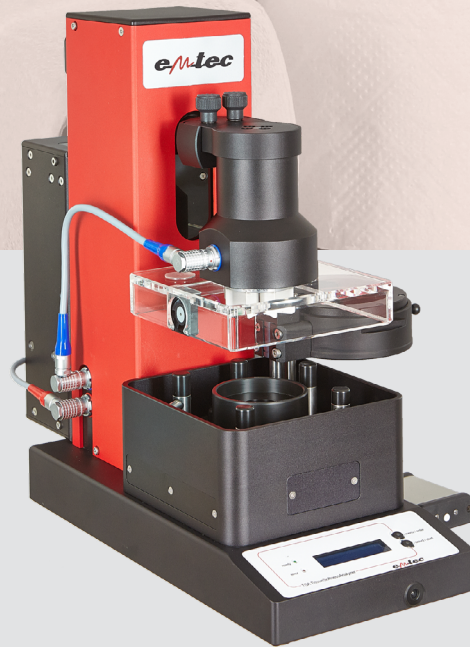
ADVANTAGES

- measurement of the three parameters, which determine the human feeling:
 - softness
 - roughness
 - in-plane stiffnessto calculate the hand feel value
- objective
- accurate
- reliable
- very good correlation to the human feeling



USERS

- pulp producers
- chemical suppliers
- tissue makers
- tissue converts
- tissue machine builders
- retailers
- universities and institutes



Traditionally, the hand feel of a tissue 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.

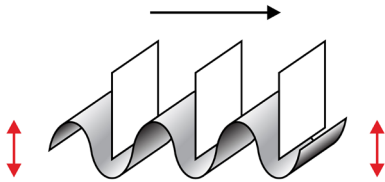
BASIC

The emtec TSA Tissue Softness Analyzer objectively measures the micro-surface variations (feeling of softness), the macro-surface variations (feeling of roughness) and the in-plane stiffness of any kind of tissue paper (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.

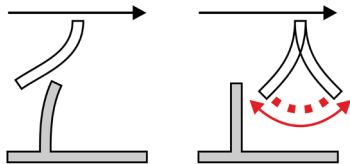
MEASURING PRINCIPLE

First step is a sound analysis:

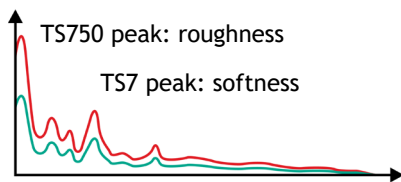
roughness (TS750) and softness (TS7) are measured.



vertical vibration of tissue samples varies
according to surface structure / roughness (TS750).



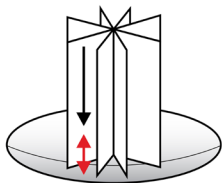
Blade vibration varies according to fiber softness (TS7).



The noise spectrum shows the results of the sound analysis.
y: noise intensity x: frequency

The second step is a deformation measurement:

the in-plane stiffness D is measured.



The deformation depth varies
according to the in-plane stiffness.

APPLICATION AREAS

r&d
process optimization
product optimization
incoming control
quality assurance
troubleshooting
complaint management
benchmarking

MATERIALS

base tissue
finished products (TP, facials, ...)
hand sheets

TECHNICAL DATA

device dimensions	44 x 19 x 47 cm (H x W x D)
device weight	19 kg
power supply	115-230 VAC, 50/60 Hz
standard sample dimension	Ø 112.8 mm = 100 cm ²

SOFTWARE

Emtec Measurement System EMS

