

# TSA

## TACTILE SENSATION ANALYZER

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



### ADVANTAGES

- measurement of the three parameters, which determine the human feeling:
  - softness, smoothness & flexibilityto 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

- pulp producers
- chemical suppliers
- tissue makers & converters
- 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.

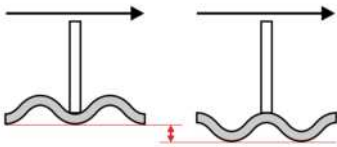
### BASIC

The emtec TSA 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 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.

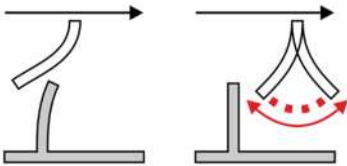


## MEASURING PRINCIPLE

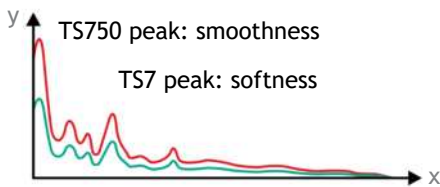
First step is a sound analysis:  
smoothness (TS750) and softness (TS7) are measured.



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

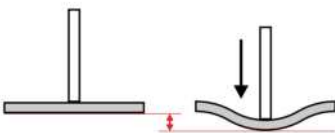


Blade vibration varies according to fiber softness (TS7).



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

The second step is a deformation measurement:  
the flexibility (D) is measured (in-plane stiffness).



The deformation depth varies according to the flexibility.

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

## MATERIALS

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

## 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 <sup>2</sup>

## SOFTWARE

Emtec Measurement System EMS  
optional: access to the Virtual Haptic Library via a license

## NEW DESIGN, NEW FEATURES

*available in 2024!*

*Development of the Virtual Haptic Library in cooperation with Black Swan Textiles.*

