

# HAPTIC



## Measurement and evaluation of surface perception





# HAPTIC

Haptics from Greek: Haptei = Touch

Latin: Visualis = Belonging to Seeing

Theory of the sense of touch, haptic perception by focusing the human as the element of interaction within various contact phases. (Reach & Touch)

- Differentiation between surface sensitactile perception
- And deeper sensibili-kinesthetic perception
- Feedback depending on structure, pressure, vibration, temperature, colours

Visual perception | Surface Sensitivity

- By receptors in the eye
- For fine perception of light

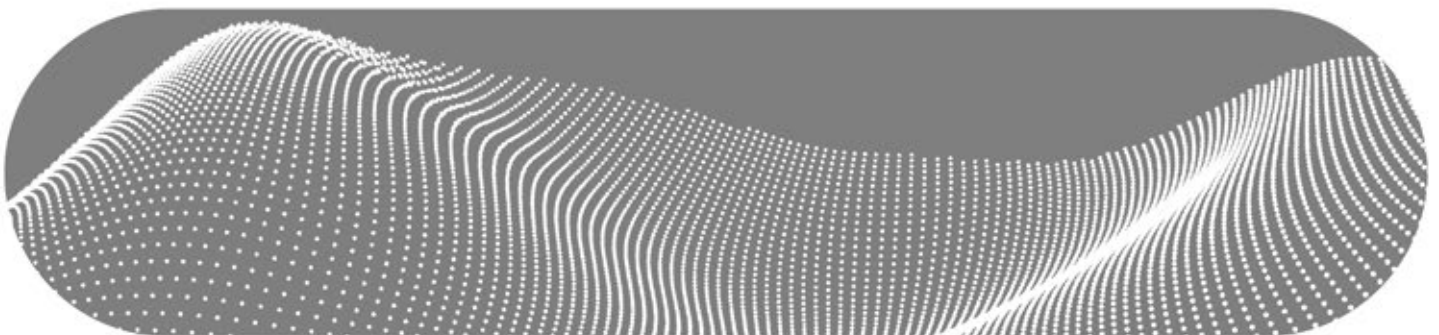
## EVALUATION OF SURFACES

### Requirements:

- High Reproducibility, in-situ micro tribology with High Local Resolution
- *Qualitative* and *Quantitative* test Methods

### Determining Parameters:

- Topographic Parameters (2D and 3D)
- Topography-correlated, dynamic micro-friction coefficient (Profilometry, Microtribology)
- Kinetic energy adsorption (Damping, Viscoelasticity)
- Static/Dynamic Deformation behavior (Standard test, Micro hardness)



## Haptic Study



# Haptic Study

Human physiology based panel study and quantitative haptic evaluation.

### **INNOWEP GmbH**

- Worldwide supplier of finger abrasion and hand abrasion tester, **haptic and panel test service**, and complex material & surface property measuring systems.

INNOWEP is a global leader in design and manufacture of fingertip and hand abrasion testing machine and human physiology based haptic study.

Over the last 30 years, Innowep has been working closely with many industry leading companies, universities, research institutes and government agencies for product design, R&D and industrial standardization.

### **R&D of Surface Measuring and Testing Equipment:**

- 2D/3D Surface Evaluation
- Micro Mechanical Analysis
- Microtribology
- Ageing of Surfaces
- Quality Control (QC)

### **Production of Testing Devices**

### **Testing Laboratory**

### **Worldwide Consultancy, Training and Distribution**

## PROBLEM-ORIENTED TEST ENGINEERING OF SURFACES



### ABREX®

Human fingertip abrasion &  
hand abrasion tester with true simulation.

### UST®

Universal Surface Tester with high  
local resolution for deformation, damping,  
topography, microfriction and many more.



### TRACEiT®

Mobile 3D Optical Profilometer.

### Dyna-SPA®

All-in-one tester for dynamic scratch,  
punch and abrasion.



## **UST® - SURFACE HAPTIC**

Multi Parametric Test for Haptic Properties

How does the surface feel...?  
It happens in the brain. But the probe is the finger tip.



## **UST® - SURFACE HAPTIC** **Haptic MultiParameter Test**



### **Four parameters for haptical measurement:**

1 - Standard Test

2 - Microfriction

3 - 3D topography

4 - Viscoelasticity & Creeping

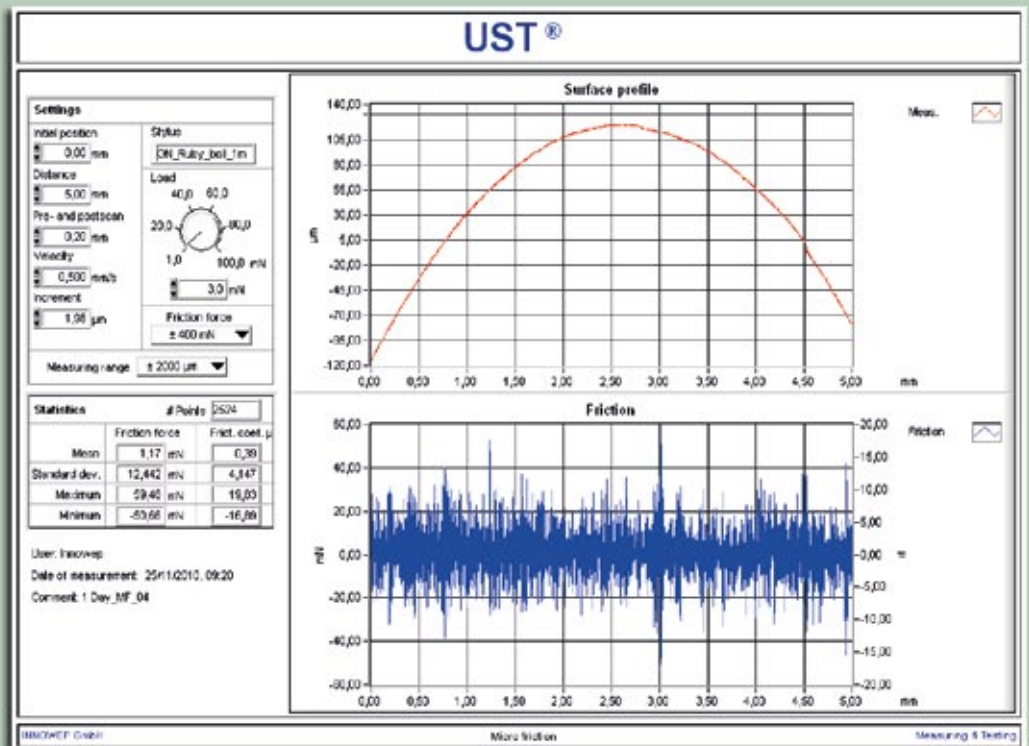


Three tips with different geometries and materials:



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## PERCEPTION BY EYE

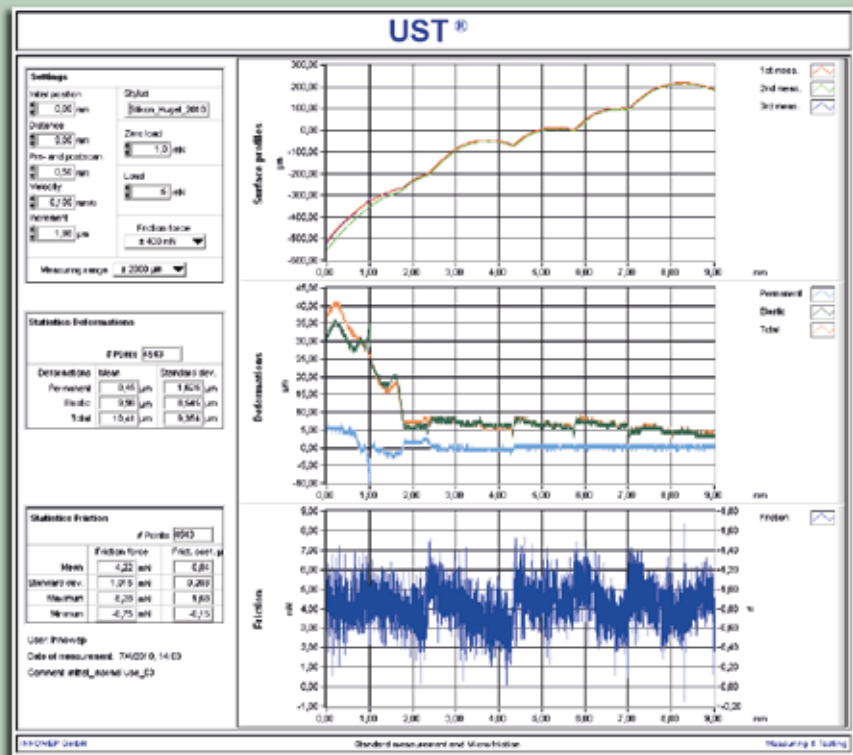


### Micro Friction: Measuring in NaCl Solvent



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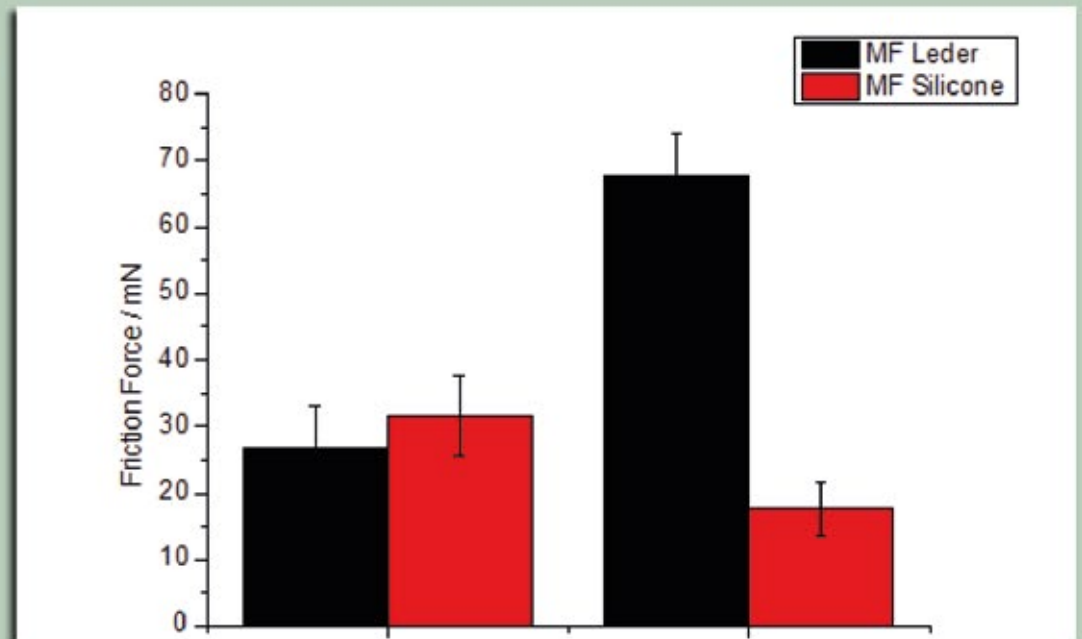
## PERCEPTION ON THE CHIN



### Standard Measurement + Micro Friction

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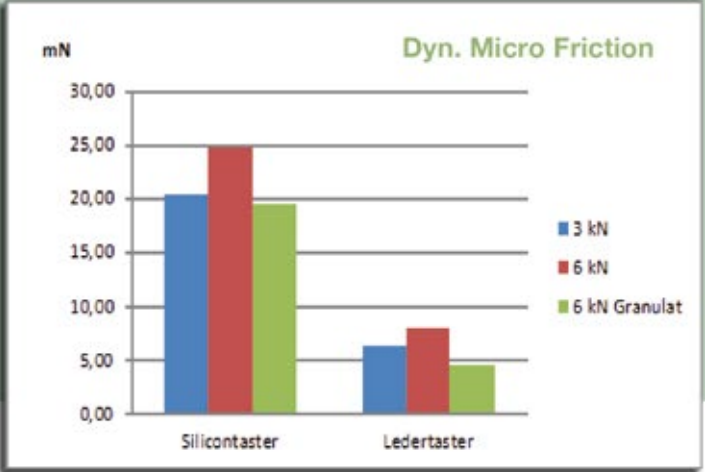
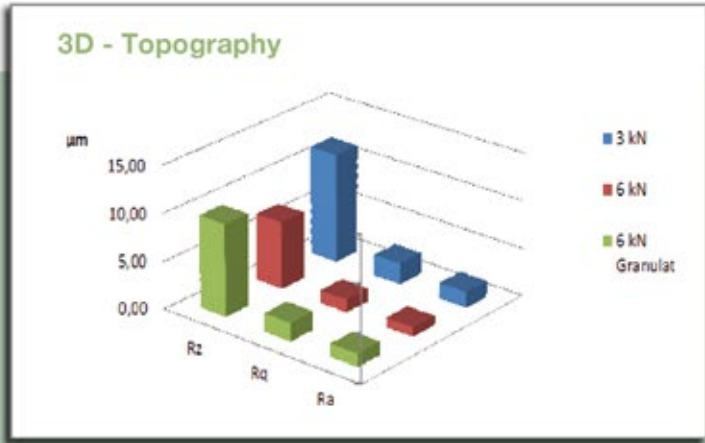
PERCEPTION INSIDE THE HUMAN BODY



**Dyn. micro friction on measurement device  
with and without lubricant.**

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## PERCEPTION IN THE MOUTH



**Investigation of pills;  
Measurements - dry and wet**