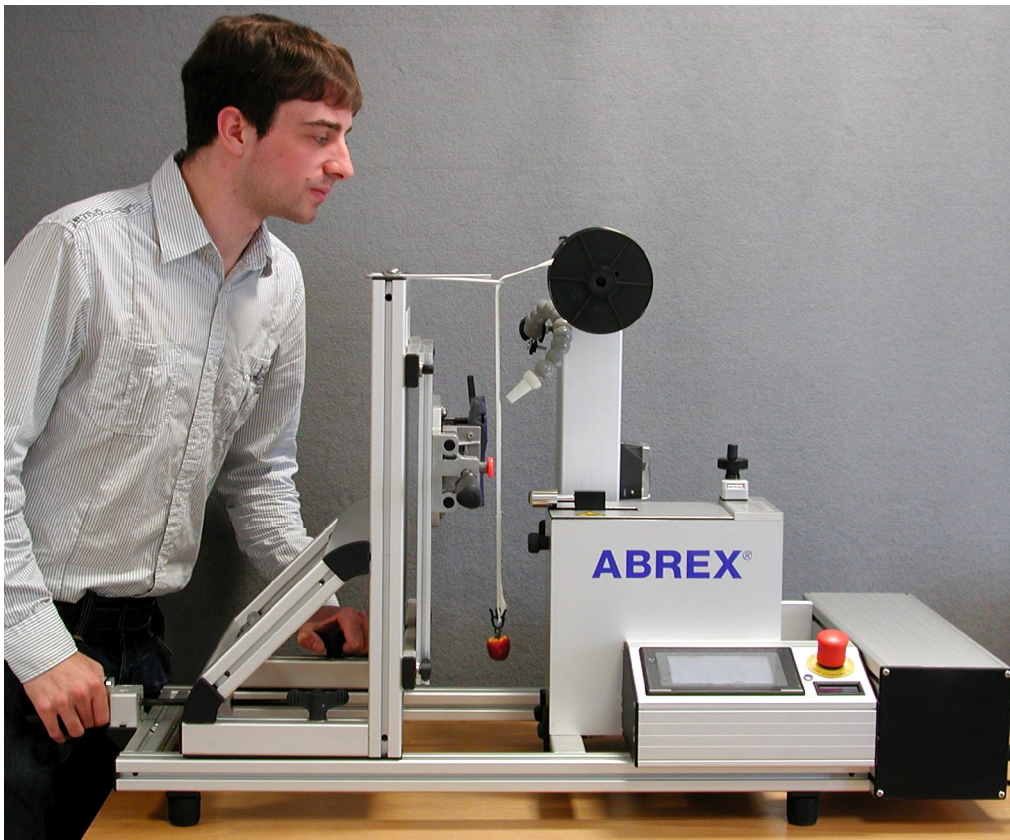


# Test report ABREX<sup>®</sup>

standardized chemo-mechanical hand abrasion tester



Würzburg, 2009-11-26

Customer: xxxx  
Samples: Keyboard  
Report no.: 09-25-05  
Test engineer: Dr. Thomas Schüßler  
Report by: Dr. Thomas Schüßler

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(sign)

## 1. Description of the ABREX® system

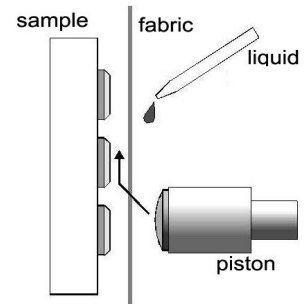
Measurements of hand abrasion with the ABREX instrument according to DIN EN 60068-2-70 / IEC 68-2-70.

This procedure assures a one to one simulation of continuous abrasion due to contact with the human hand even on extremely curved and structured surfaces.

A silicone load piston with defined shape and viscoelasticity is pressed onto a surface in a combined impact, fulling and friction movement. Located between specimen and load piston a specific standardized fabric guarantees constant standardized impact and friction.

To permit realistic chemo-mechanical testing the friction material will automatically be moistened with testing fluids. (i.e. artificial sweat, lotions, ...)

ABREX is constructed to assure natural hand-abrasion. All parameters concerning the above standard are automatically observed.



## 2. Task

The task was to measure the abrasion resistance of a keyboard.

For the test the keyboard was held in place in the ABREX using several screws (see picture). The test was performed on the "ENTER" key. The test direction is indicated by the arrow on the sample.



### 3. ABREX<sup>®</sup> test results

Parameter	Description
Test piston	Silicone, hardness 47±5 Shore A, Ø 20mm, bending diameter 20 mm
Test load	10 N
Friction path	4 mm
Strokes	100000, with photographic inspection every 10000 strokes
Test fabric	standard abrasion fabric DIN 60068-2-70, with periodic wetting by artificial sweat (pH 6.5)



after 0 strokes



after 10000 strokes



after 20000 strokes



after 30000 strokes

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After 20000 strokes the fabric was blackened by a residue from the plastic. After 10000 strokes the white color already started to smear (around the letter "R"). This smearing became a lot more pronounced as the test reached 30000 strokes, extending also to the letter "T". At 30000 strokes the residue started to blacken the letter "N".



*High resolution scan*

## 4. Note

In accordance with the customers wishes the test was canceled after 30000 strokes.