

# FACHGEMEINSCHAFT TASTATUREN

## FT quality guideline

*March 2011*

### General requirements

- Texts Text must be clearly legible (minimum line thickness 0.3 mm).
- Punctuation marks Punctuation marks must be unambiguously legible.
- Lines and symbols Breaks are not permitted.
- Evenness Kinks and dents are not permitted. Visible raised areas on the front film at the output point of the cable cannot be excluded.  
Entrapment between the various layers may not be visible on the front side.
- Colour coverage Colour coverage is sufficient when the underlying layers and structures are not visible.
- General procedure with errors not described The permitted deviations must be agreed between the customer and the manufacturer. The general appearance must correspond to the permitted errors.
- Scope All standards apply for product delivered but not yet installed. Deviations not described must be assessed within the general criteria of the set standards.

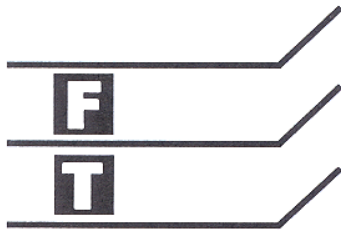
### Print quality of covering prints, transparent colours and printing of windows

- entrapment of dirt and dust / stains/fluff/grooves/scratches

	<i>Normal optical requirements</i>	<i>Raised optical requirements</i>
	(Category 1)	(Category 2)
▷ max. size (mm <sup>2</sup> )	0.25	0.16
▷ with weak colour contrast: - max. size (mm <sup>2</sup> )	0.4	0.25
▷ max. no. /dm <sup>2</sup>	2	1
▷ Minimum distance (mm)	50	80
▷ Lower limit for entrapment (mm <sup>2</sup> )	0.063	

With displays smaller than 1dm<sup>2</sup> the maximum number of irregularities for the entire window surface applies, the minimum distance is: length of the diagonal (mm) / 2

- Scratches Assess as a weak colour contrast.
- Other quality deviations
  - ▷ Colour deviation Recorded in accordance with reference model/threshold sample that has been agreed between the customer and supplier.
  - ▷ Deviation of gloss level In accordance with agreement.
  - ▷ Cloud (colour shadow) Not optically discernible in position for use.



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### Covering prints

- General requirements for covering prints  
Colour samples must be recorded for reference model release with reproducibility of colour tones:  $\Delta E: < 2$  with comparable measurement geometry ( $45^\circ/0^\circ$  or  $d8^\circ/0^\circ$ ; incl. or excl. gloss)

### Dimension tolerances

#### Printing tolerances

- Contour sharpness/edge sharpness (mm)  $\pm 0.15$
- Overlapping printed surfaces  
Overlapping of printed surfaces is necessary for process/technical reasons. Potential colour deviations on overlap are permitted.
- Permitted variations in line thickness  $\pm 10\%$
- Tolerance within printed surface
  - ▷ within a designed imprint (mm)  
In accordance with general tolerances DIN ISO 2768-1 fine:  
 $< 120\text{ mm}: \pm 0.15$   
 $\geq 120\text{ mm} < 400\text{ mm}: \pm 0.2$   
 $\geq 400\text{ mm}: \pm 0.3$
  - ▷ between designed imprints (mm)  
(offset compared to 2nd, 3rd etc., colour)  

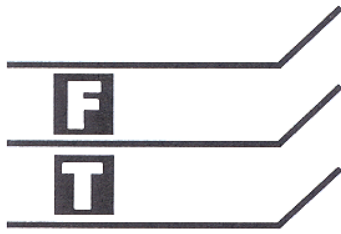
$< 400\text{ mm}$	$\geq 400\text{ mm}$
$\pm 0.3$	$\pm 0.5$

#### Embossing tolerances

- Embossing tolerances for imprints
 

$< 400\text{ mm}$	$\geq 400\text{ mm}$
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  - ▷ Embossing of surface without touch area/frame (mm)  $\pm 0.3$   $\pm 0.5$
  - ▷ Embossing of surface with touch area /frame (mm)  $\pm 0.3$   $\pm 0.5$
  - ▷ Edge embossing (mm)  $\pm 0.3$   $\pm 0.5$
  - ▷ Point embossing (mm)  $\pm 0.3$   $\pm 0.5$
  - ▷ Special embossing form (mm)  $\pm 0.3$   $\pm 0.5$
- Height tolerances of embossing
  - ▷ Standard embossing (mm)  $\pm 0.2$
  - ▷ Special embossing forms (mm) As agreed with the customer



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### Cutting tolerances

- Outer contours and notches (mm)  $\pm 0.3$   
(Narrower tolerances possible in consultation with the customer)
- Cutouts for imprint (mm)  $\pm 0.3$

### **Parameters for ambient conditions**

With a relative air humidity of 50% (normal climate, not condensing)

• Operating temperature	Min	Max
▷ Products with embossing	0°C	+45°C
▷ Products without embossing	-20°C	+70°C
• Storage and transport temperature	Min	Max
▷ Products with embossing	-30°C	+45°C
▷ Products without embossing	-40°C	+80°C

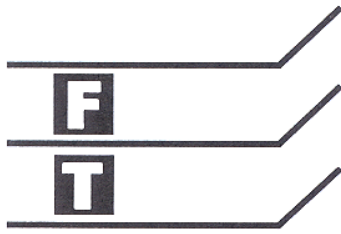
Test conditions in accordance with manufacturer's specifications. Detailed parameters for ambient conditions possible in consultation with customer. Special environmental influences such as harmful gases, high humidity, chemical influence, UV radiation, etc. have to be stated by the customer.

### **Mechanical parameters**

- Operating strength Depending on the construction
- Mechanical load Depending on the construction
- Operating life >1 million operations  
Test procedure in accordance with DIN 42115

### **Characteristic electrical parameters (metal switch element and guide track using silver paste)**

	Min	Max
• Switch voltage (DC)	100mV	42V
• Switch current	0.5mA	100mA
• Switch output	---	0.6 W
• Resistance of silver track	Depending on the length of the cross-section of the silver track: typically 0.1Ω/mm length, width 1 mm	
• Insulation resistance	$10^8 \Omega$ (tested at 100 V)	
• Voltage resistance	In accordance with DIN 42115 part 1	



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- Reverberation time
  - ▷ Surface (with contact surface) < 3 ms
  - ▷ Metal switch element < 10 ms
  - ▷ Dome embossing < 20 ms
- Minimum cable bending radius > R=2 mm

### Test criteria

- Test person Trained, experienced person with normal eyesight
- Viewing distance (mm) 500
- Viewing angle 90°, reflection not permitted  
(compared to viewing direction)
- Lighting
  - ▷ Reflected light 1000 lx standard light D50 or D65
  - ▷ Transmitted light Light table
- Window Test against a black and white background or as agreed with customer
- Scope of the test
  - ▷ Function test 100%  
(Limited to random sample as agreed with customer)
  - ▷ Optical test 100%  
(Limited to random sample as agreed with customer) Assessment of surface unevenness using FT measurement table

• Assessment time/dm<sup>2</sup>(s)  
(in total not longer than 15 seconds)

<i>Normal optical requirements</i>	<i>Raised optical Requirements</i>
(Category 1)	(Category 2)
5	10

Depending on the construction and the size, viewing time is limited, typical is 4 sec.

Fachgemeinschaft Tastaturen · Leostrasse 22 · 40545 Düsseldorf

Tel.: +49 / 211 / 577391-0 · Fax: +49 / 211 / 577391-10

info@fachgemeinschaft-tastaturen.de · www.fachgemeinschaft-tastaturen.de