

# Dr. Mitsching - Laboratory for Hygiene & Microbiology

Examinations - Consulting - Expert Opinions

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**Test report nr.:** 2017/19676

**Test sample:** InduProof® Smart Classic  
TKG-106-IP68-WHITE-USB-DE (item no. KG19268)

**Description of test product:** white computer keyboard with 106 buttons, coated with silicone, completely waterproof

**Manufacturer:** GETT Gerätetechnik GmbH

**Analyse request:** The keyboards are considered for use in fields with high hygienic requirements, therefore it was examined if they are practicable for disinfection after application of germs and high organic load.

**Date of delivery:** 2017-08-02

**Storage of test product:** at room temperature as packed by the manufacturer

**Start of testing:** 2017-11-08  
**End of testing:Prüfzeitraum:** 2017-11-12

**Testing method:**

The testing procedure was based on the germ carrier test for surface disinfection without mechanical action according to method nr 14.1 of the „Requirements and Methods for VAH certification of Chemical Disinfection Procedures“ (2015-04-02).

VAH = Verbund für Angewandte Hygiene (*Alliance for Applied Hygiene, former German Society for Hygiene and Microbiology*)

**Procedure of testing:**

1) Contamination of the keyboard with test germs

In each case contamination was carried out on a single keyboard button. A gram-positive and a gram-negative bacterial test strain as well as a yeast with clinical relevance were chosen for testing.

The following test strains were used:

- *Staphylococcus aureus* DSM 799 = ATCC 6538 (= gram-positive bacterium)
- *Pseudomonas aeruginosa* DSM 939 = ATCC 15442 (= gram-negative bacterium)
- *Candida albicans* DSM 1386 = ATCC 10231 (= yeast)

**Preparation of the germ suspensions:**

The bacteria suspensions were adjusted to a germ content of  $1.5 - 5.0 \times 10^9$  cfu / ml, whereas the suspension of *Candida albicans* was adjusted to  $1.5 - 5.0 \times 10^8$  cfu / ml.

1 ml of the organic load solution (containing 3 % bovine serum albumine and 3 % sheep erythrocytes) were added to 9 ml of each germ suspension. This means an organic load of 0.3 % bovine serum albumine and 0.3 % sheep erythrocytes in the test suspension (= high organic load). For each test germ 0.05 ml of this test suspensions were applied on four keyboard buttons of the same size.

2) After surface drying of the test suspension the contaminated spots were covered with 0.1 ml of the particular disinfectant. In parallel one contaminated spot per germ was treated with water of standardised hardness (WSH = positive control).

3) After an exposure time of five minutes, the survival of germs on the tested area was examined. Therefore the test spots were wiped off with swabs. Each swab was transferred into 5 ml of a media containing disinfectant neutralising reagents (3 % Tween 80 + 0.3 % lecithine + 0.1 % histidine + 0.5 % sodium thiosulphate). The germ content in this solution was examined after a neutralisation time of five minutes.

The following three disinfectants based on different active ingredients were chosen:

| Active ingredient   | disinfectant            | manufacturer     | Application concentration of disinfectant            |
|---|-------------------------|------------------|--|
| alcohol (37.0 % n-propanol + 24.0 % ethanol)  | Destix MA61             | Kleinmann GmbH   | undiluted  |
| quaternary ammonium compounds (10 % quats)  | Wofasept FL             | Kesla Hygiene AG | 7.5 %  |
| alkaline activated peracetic acid<br>component A: 11 - 15 % peracetic acid<br>component B: alkali | 1+1 Wofasteril SC super | Kesla Hygiene AG | System of two components;<br>0.5 % of each component |

**Test results:**

test strain: *Staphylococcus aureus*

| disinfectant<br>(active ingredient)               | exposure time | Reisolated germs   |                  | Germ reduction |
|---|---------------|--------------------|------------------|----------------|
|   |               | cfu/test spot      | lg cfu/test spot | lg cfu         |
| water of standardised hardness (positive control) | 5 min         | $8.55 \times 10^7$ | 7.93             | -              |
| Destix MA61 (alcohol)                             | 5 min         | 5                  | 0.70             | <b>7.23</b>    |
| Wofasept FL (quats)                               | 5 min         | 325                | 2.51             | <b>5.42</b>    |
| 1+1 Wofasteril SC super (peracetic acid)          | 5 min         | 30                 | 1.48             | <b>6.45</b>    |

cfu = colony forming units

test strain: *Pseudomonas aeruginosa*

| disinfectant<br>(active ingredient)                     | exposure<br>time | Reisolated germs       |                  | Germ reduction   |
|---|------------------|------------------------|------------------|------------------|
|   |                  | cfu/test spot          | lg cfu/test spot | lg cfu           |
| water of standardised<br>hardness (positive<br>control) | 5 min            | 3.80 x 10 <sup>7</sup> | 7.58             | -<br>-           |
| Destix MA61<br>(alcohol)                                | 5 min            | < 5                    | < 0.70           | <b>&gt; 6.88</b> |
| Wofasept FL<br>(quats)                                  | 5 min            | 1.45 x 10 <sup>4</sup> | 4.16             | 3.42             |
| 1+1 Wofasteril SC<br>super (peracetic a-<br>cid)        | 5 min            | < 5                    | < 0.70           | <b>&gt; 6.88</b> |

test strain: *Candida albicans*

| disinfectant<br>(active ingredient)                     | exposure<br>time | Reisolated germs       |                  | Germ reduction   |
|---|------------------|------------------------|------------------|------------------|
|   |                  | cfu/test spot          | lg cfu/test spot | lg cfu           |
| water of standardised<br>hardness (positive<br>control) | 5 min            | 1.90 x 10 <sup>6</sup> | 6.28             | -                |
| Destix MA61<br>(alcohol)                                | 5 min            | < 5                    | < 0.70           | <b>&gt; 5.58</b> |
| Wofasept FL<br>(quats)                                  | 5 min            | 215                    | 2.33             | 3.95             |
| 1+1 Wofasteril SC<br>super (peracetic a-<br>cid)        | 5 min            | < 5                    | < 0.70           | <b>&gt; 5.58</b> |

cfu = colony forming units

**Evaluation of test results:**

According to the guidelines for germ carrier tests under practical conditions of the VAH a disinfectant is considered sufficiently effective if it yields to a 5-*lg* reduction for bacteria and a 4-*lg* reduction for *Candida albicans*.

Normally tests with spray disinfectants (surface disinfection without mechanical action) are performed with plain metal germ carriers. This test had to be slightly modified for the examination of the keyboard.

The required germ reduction for bacteria and yeast could be fulfilled with the disinfectants based on alcohol and peracetic acid for all three test strains within an exposure time of five minutes.

The testing with the disinfectant *Wofasept FL* (based on quaternary ammonium compounds) did not succeed sufficiently into the required reduction of *Pseudomonas aeruginosa* and *Candida albicans* within an exposure time of five minutes.

### Summary of test results:

The keyboard TKG-106-IP68-WHITE-USB-DE (item no. KG19268) is fully coated with silicone which is practicable for cleaning and disinfection.

Due to the watercoated surface the keyboard can be submerged completely into cleaning and disinfectant solutions. A disinfection can also be achieved by spraying the disinfectant onto the surface of the keyboard.

The intention of the testing was to examine how well the silicone surface can be decontaminated by common active ingredients in disinfectants under practical conditions.

Therefore the surface of the keyboard was contaminated with a suspension of the different test strains and organic load consisting of bovine serum albumine and sheep erythrocytes.

Without previous cleaning the buttons with the surface dried suspensions were covered with a layer of the chosen test disinfectants.

After an exposure time of five minutes the survival of germs on the tested area was examined and calculated in relation to the control surfaces treated with water of standardised hardness (WSH).

All three tested disinfectants led to an obvious germ reduction compared to the positive control with WSH.

However, taking the VAH's required germ reduction rates as basis, only the products based on alcohol as well as peracetic acid reached an adequate disinfection within five minutes exposure time.

A sufficient effect of the disinfectant based on quats could not be achieved under the tested conditions. Maybe the requested germ reduction rates can be achieved by an extension of exposure time for these active ingredients. This has to be highly considered due to the fact that quaternary ammonium compounds (quats) are often used as disinfectants in medical practice and hospitals.

In summary a good to very good practicability for disinfection can be attested to the examined keyboard. Hence, the keyboard is suitable for use in hygienically sensible areas (e. g. medical, pharmaceutical and food industry).

Disinfectants based on alcohol or peracetic acid are recommended for this keyboard. In doing so, disinfectants listed by VAH should be used. An audit of the testing procedure under practical conditions (e. g. efficiency control with contact plates) is recommended.



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- head of laboratory -

The test results in this test report only relate to the tested samples and the examined parameters during the test period.