

TECHNICAL LEAFLET

RESISTANCE TO CHEMICALS – EGGER LAMINATE



Thanks to its excellent decorative and physical properties EGGER Laminate has a very wide range of applications. By virtue of its melamine resin surface, EGGER laminate also provides high resistance to most chemicals. This leaflet contains information on the resistance of EGGER laminate to a range of substances including its application in laboratories, medical facilities, production sites and in the food industry.

Normative Properties of the Surface

The EN 438:2005 Standard defines special requirements regarding the surface resistance of decorative laminates. This includes testing the laminate surface against various substances for resistance to stains. The test examines how the surface is affected by substances to which the laminate may be exposed during daily use. The laminate surface is brought into direct contact with a range of substances. The exposure times and conditions for contact between each substance and the specimen are prescribed. At the end of the respective exposure time, the specimens are washed and examined for permanent surface changes.

EN 438:2005 DEFINES THE FOLLOWING THREE GROUPS:

GROUP 1

Testing is conducted with an exposure time of 16 hours at ambient temperature. EGGER laminate achieves rating 5 = no visible changes.

This group includes the following substances:

- Acetone
- Other organic solvents
- Toothpaste
- Hand cream
- Urine
- Alcoholic beverages
- Natural fruit and vegetable juices
- Lemonade and fruit beverages
- Meat products and sausage
- Animal and plant fats and oils
- Water
- Yeast suspension in water
- Salt (NaCl) solutions
- Mustard
- Lyes, soap solutions
- Commercial disinfectants
- Citric acid (10% solution)
- Stain or paint removers based on organic solvents
- Cleaning solution consisting of: 23% dodecylbenzene sulfonate, 10% alkyl aryl polyglycol ether, 67% water

GROUP 2

Testing is conducted with an exposure time of 16 hours at ambient temperature. Coffee, tea and milk are tested at a temperature of approximately 80°. EGGER laminate achieves rating 5 = no visible changes.

This group includes the following substances:

- Coffee (120 g coffee per litre of water)
- Black tea (9 g tea per litre of water)
- Milk (all types)
- Cola beverages
- Wine vinegar
- Hydrogen peroxide (3% solution)
- Alkaline cleaning agents (diluted to 10% concentration with water)
- Nail varnish
- Nail varnish remover
- Lipstick
- Watercolours
- Laundry marking inks
- Ballpoint inks
- Ammonia (10% solution of commercial concentrate)

GROUP 3

Testing is conducted with an exposure time of 10 minutes at ambient temperature. EGGER laminate achieves at least rating 4: slight change in gloss level and/or colour, only visible from certain viewing angles.

This group includes the following substances:

- Sodium hydroxide (25% solution)
- Hydrogen peroxide (30% solution)
- Concentrated vinegar (30% acetic acid)
- Bleach and sanitary cleaners containing bleach
- Cleaning agents based on hydrochloric acid ($\leq 3\%$ HCl)
- Acid-based metal cleaners
- Shoe polish
- Hair colouring and bleaching agents
- Iodine
- Boric acid
- Lacquers and adhesives (except fast curing materials)
- Amidosulphuric acid descaling agents ($< 10\%$ solution).
- Mercurochrome (2.7-dibromo-4-hydroxymercur-fluoresein, merbromin disodium salt)

No Surface Change

Apart from the Group 1 and 2 substances and reagents listed in the Standard, there are additional substances that cause no change to EGGER laminate, even after an extended exposure time.

- Activated charcoal
- Aluminium chloride
- Aluminium sulphate
- Formic acid 10%
- Ammonium chloride
- Ammonium sulphate
- Ammonium thiocyanate
- Amyl acetate (acetic acid pentyl ester)
- Aniline
- Arabinose
- Ascorbic acid
- Asparagine
- Asparic acid
- p-aminoacetophenone
- Barium chloride
- Barium sulphate
- Lead acetate
- Lead nitrate
- Blood
- Butyl acetate
- Cadmium acetate
- Cadmium sulphate
- Calcium carbonate (chalk)
- Calcium chloride
- Calcium nitrate
- Calcium oxide
- Quinine
- Cholesterol
- Cocaine
- Caffeine
- Cyclohexane
- Dextrose
- Digitonin
- Dimethyl formamide
- Dulcitate
- Soil
- Acetic acid
- Ethanol
- Ether
- Ethyl acetate
- Formaldehyde
- Fructose
- Animal feed
- Galactose
- Gelatine
- Plaster
- Glucose
- Glycerine
- Glycocoll
- Glycol (ethylene glycol)
- Uric acid
- Urea solution
- Heparin

- Hexane
- Hydroquinone
- Inositol (=cyclohexane hexol)
- Isopropanol
- Caustic potash solution 10%
- Potassium aluminium sulphate
- Potassium bromate
- Potassium bromide
- Potassium carbonate
- Potassium chloride
- Potassium hexacyanoferrate
- Potassium iodate
- Potassium sodium tartrate
- Potassium nitrate
- Potassium sulphate
- Potassium tartrate
- Potato starch
- Casein
- Garlic
- Common salt
- Caffeine
- Charcoal
- Cosmetics
- Copper sulphate
- Lactose
- Laevulose
- Lithium carbonate
- Magnesium carbonate
- Magnesium chloride
- Magnesium sulphate
- Maltose
- Mannitol
- Mannose
- Meso-inositol
- Lactic acid 85%
- Lactose
- Foodstuffs
- Sodium acetate
- Sodium carbonate
- Sodium chloride
- Sodium citrate
- Sodium diethyl barbiturate
- Sodium hydrogen carbonate (sodium bicarbonate)
- Sodium hydrogen sulphate
- Sodium hyposulphite
- Sodium nitrate
- Sodium phosphate
- Sodium silicate
- Sodium sulphate
- Sodium sulphide
- Sodium sulphite
- Sodium tartrate
- Sodium thiosulphate
- Sodium hydroxide solution 10%
- Nickel sulphate
- Nicotine
- Oleic acid
- Paraffin
- Paraffin oil
- Phenol phthalein
- Polishes (creams and waxes)
- 1,2-propylene glycol
- Quicksilver
- Raffinose (melitose)
- Common household cleaners
- Rhamnose
- Rochelle salt
- Cane sugar
- Soot
- Saccharose (sucrose)
- Salves
- Salicylaldehyde
- Salicylic acid
- Saponin
- Soap
- Sorbitol
- Starch
- Stearic acid
- Talcum
- Tannin
- Tetrahydrofuran
- Tetralin
- Thiocarbamide
- Animal feed
- Toluol
- Clay
- Dextrose
- Trehalose
- Trypsin
- Tryptophan
- Uraose
- Vanillin
- Vaseline
- Tartaric acid
- Zinc chloride
- Zinc sulphate

No Surface Change after Brief Exposure Time

In addition to the Group 3 substances listed in the Standard, the surface of EGGER laminate can also be exposed briefly to the substances listed below without resulting in changes. When these substances are spilled, they should be wiped quickly – within 10 to 15 minutes – using a damp cloth, and the surface should then be dried.

- Aniline dyes
- Ammonium hydrogen sulphate
- Boric acid
- Caustic potash solution 50%
- Potassium chromate
- Potassium dichromate
- Potassium hydrogen sulphate
- Potassium iodide
- Potassium permanganate
- Lithium hydroxide 10 %
- Sodium hydrogen sulphate
- Sodium hydroxide solution 48%
- Sodium thiosulphate
- Oxalic acid
- Silver nitrate

Marked Surface Change

The substances listed below lead to surface changes and/or the destruction of the laminate, even after a very brief exposure time.

- Nitric acid 10%
- Hydrochloric acid up to 10%
- Sulphuric acid up to 10%
- Adhesive (chemically hardening)

Aggressive Gases

Frequent exposure to aggressive gases, e.g. bromine, chlorine, nitrous gases and sulphur oxide, leads to surface changes of EGGER laminate.

Disinfectants

Disinfectants are used on EGGER laminates as surface disinfectants.

Various disinfectants are offered by the industry for this application. These vary both in regard to their composition and their effects.

Disinfectants used on surfaces are mainly those that exhibit one of the following active principles and/or are based on one of the chemicals listed here:

- Oxidants
- Halogens (chlorine, iodine)
- Alcohols
- Aldehydes
- Phenols
- Ethylene oxide

In addition to the components listed here, the application instructions for the various disinfectants also differ significantly.

Disinfectants and EGGER Laminate

The large number of available disinfectants with various compositions, effects and application recommendations makes it impossible to issue general approval for the use of these products on EGGER laminate.

For the above reasons, we recommend testing the disinfectants on the EGGER laminate surface in all cases. Only this approach guarantees the fabricator durability of the material for the desired application.

The following disinfectants have been tested in our laboratory according to the requirements of the EN 438-2:2005 test procedure 26 – resistance to staining at ambient temperature - with an exposure time of 16 hours.

| Manufacturer | Product | Concentration | Unit | Result ¹ |
|--------------|---|---------------|--------|---------------------|
| Antiseptica | Acrylan (ready to use solution) | - | Rating | 5 |
| Antiseptica | Biguacid S surface disinfection and cleansing | 1% | Rating | 5 |
| Antiseptica | Biguacid Liquid Big Spray new | - | Rating | 5 |
| Antiseptica | Descocid-N | 2% | Rating | 5 |
| Antiseptica | Descogen Liquid | 3% | Rating | 4 |
| Antiseptica | Descogen Liquid r.f.u | - | Rating | 4 |
| Antiseptica | Descogen-F (Granulat/granulate) Oxygenon-S | 1.5% | Rating | 5 |
| Antiseptica | Biguacid S surface disinfection and cleansing | 2% | Rating | 5 |
| Antiseptica | Flächendesinfektion 7 | 3% | Rating | 5 |
| Antiseptica | Kombi-Flächen Desinfektion Antiseptica Combi Surface | 4% | Rating | 5 |
| B. BRAUN | Hexaquart plus lemon duft | 2% | Rating | 5 |
| B. BRAUN | Hexaquart S mit Fichtennadelduft | 3% | Rating | 5 |
| B. BRAUN | Hexaquart plus | 2% | Rating | 5 |

| Manufacturer | Product | Concentration | Unit | Result ¹ |
|--------------------------------------|--|---------------|--------|---------------------|
| B. BRAUN | Meliseptol | - | Rating | 5 |
| B. BRAUN | Meliseptol Foam pure | - | Rating | 5 |
| B. BRAUN | Meliseptol rapid | - | Rating | 5 |
| B. BRAUN | Softa-Man (Softalind) Visco Rub | - | Rating | 5 |
| B. BRAUN | Softa-Man (Softalind) pure (ready to use solution) | - | Rating | 5 |
| B. BRAUN | Softasept N gefärbt / ungefärbt | - | Rating | 5 |
| PAUL HARTMANN AG Bode Chemie GmbH | Dismozon pur | 4 % | Rating | 5 |
| PAUL HARTMANN AG Bode Chemie GmbH | Microbac Forte | 2.5% | Rating | 5 |
| PAUL HARTMANN AG Bode Chemie GmbH | Kohrsolin Extra | 6% | Rating | 5 |
| PAUL HARTMANN AG Bode Chemie GmbH | Kohrsolin FF | 3% | Rating | 5 |
| PAUL HARTMANN AG Bode Chemie GmbH | Bacillol AF | 100% | Rating | 5 |
| Dr. Schuhmacher | Optisept | 7% | Rating | 5 |
| Dr. Schuhmacher | Decosal | 0.25% | Rating | 5 |
| Dr. Schuhmacher | Descosept PUR | - | Rating | 5 |
| Dr. Schuhmacher | Optisal N | 0.125% | Rating | 5 |
| Dr. Schuhmacher | Ultrasol active | 1% | Rating | 5 |
| Dreiturm | Hexawol | 0.7% | Rating | 5 |
| Dreiturm | Hexawol plus | 1% | Rating | 5 |
| Dr. Nüsken | Kamasept Spray | - | Rating | 5 |
| Dr. Nüsken | Nüscosept | 0.5% | Rating | 5 |
| Dr. Nüsken | Nüscosept OF | 1% | Rating | 5 |
| Dr. Nüsken | Nüscosept Plus | 0.4% | Rating | 5 |
| Dr. Nüsken | Nüscosept Clin | 1% | Rating | 5 |
| ECOLAB | Incidin Extra N | 2% | Rating | 5 |
| ECOLAB | Incidin Rapid | 2% | Rating | 5 |
| ECOLAB | Incidin perfekt | 3% | Rating | 5 |
| ECOLAB | Incidin PLUS | 8% | Rating | 5 |
| Fresenius Kali | Ultrasol F | 5% | Rating | 5 |
| Hagleitner Hygiene | hygienicDES Forte (ready to use solution) | - | Rating | 5 |
| Henkel | SIDOL Küchenkraft | - | Rating | 5 |
| Schülke & Mayr | Pursept | 100% | Rating | 5 |
| Schülke & Mayr | Pursept-A Xpress | - | Rating | 5 |
| Schülke & Mayr | Pursept-AF | 6% | Rating | 5 |
| Schülke & Mayr | antifect extra | 2.5% | Rating | 5 |
| Schülke & Mayr | Mikrozid HF Liquid (ready to use solution) | - | Rating | 5 |
| Schülke & Mayr | Mikrozid (ready to use solution) | - | Rating | 5 |
| Schülke & Mayr | Mikrozid PAA wipes | - | Rating | 5 |

| Manufacturer | Product | Concentration | Unit | Result*1 |
|----------------|------------------|---------------|--------|----------|
| Schülke & Mayr | Perform | 3% | Rating | 5 |
| Schülke & Mayr | Perform | 0.5% | Rating | 5 |
| Schülke & Mayr | Terralin Protect | 50% | Rating | 5 |
| Schülke & Mayr | Terralin Protect | 0.5% | Rating | 5 |
| Schülke & Mayr | TPH protect | 2% | Rating | 5 |
| Suma | Suma BAC D10 | 1% | Rating | 5 |
| Suma | Suma MULTI D2 | 1% | Rating | 5 |

***1 RATING SCALE RESISTANCE TO STAINING**

| Grades | Requirement |
|----------|--|
| Rating 5 | No visible change |
| Rating 4 | Slight change of gloss and/or colour, only visible at certain viewing angles |
| Rating 3 | Moderate change of gloss and/or colour |
| Rating 2 | Marked change of gloss and/or colour |
| Rating 1 | Surface distortion and/or blistering |

EGGER laminate surfaces must be cleaned regularly during the period of use. More detailed information can be found in our leaflet "EGGER laminate cleaning and use instructions".

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