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 robust 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 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 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 (≤ 3% HCl)
- Acid-based metal cleaners
- Carbon black suspension in paraffin oil
- 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-hydroxymercurofluoresein, 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 with melamine resin surface, 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
- Dulcite
- 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 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
Urease
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 with melamine resin surface 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 test procedure 26 – resistance to staining at ambient temperature - with an exposure time of 16 hours. In the results column under "Laminate" you will find the test results of the laminates with melamine surface and under "PerfectSense" the results of the lacquer-based surfaces.

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<th>Manufacturer</th>
<th>Product</th>
<th>Concentration</th>
<th>Unit</th>
<th>Result</th>
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* Rating scale resistance to staining

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<th>Grades</th>
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<tr>
<td>Rating 5</td>
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<tr>
<td>Rating 4</td>
<td>Slight change of gloss and/or colour, only visible at certain viewing angles</td>
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<tr>
<td>Rating 3</td>
<td>Moderate change of gloss and/or colour</td>
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<tr>
<td>Rating 2</td>
<td>Marked change of gloss and/or colour</td>
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<tr>
<td>Rating 1</td>
<td>Surface distortion and/or blistering</td>
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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".

Provisional note:
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