

Glycolic Acid

Hard Surface Cleaner

Product Information

A hard surface is defined in the household and institutional cleaning fields as a surface or object that cannot be removed to a basin, sink, or mechanical device in order to be washed. It must be done in situ, in place, and usually by hand. Hard surfaces include ceramic tile, grout, porcelain tubs, sinks, counter tops, toilet bowls, and shower doors and stalls.

Glycolic acid has many excellent characteristics that enable it to be utilized (individually or as a blend with other acids) in cleaning formulations.

Characteristics

- Glycolic acid's low pKa, low molecular weight, and organic nature makes it the ideal choice for performance on mineral scales. The most common example of a soil with this characteristic is soap scum, which is easily removed by formulations containing glycolic acid. When cleaning with acid-based cleaners, glycolic acid is the premier builder for cleaning both kitchens and bathrooms.
- Glycolic acid effectively complexes hard water salts. This characteristic makes it an effective bathroom scale remover. The resulting salts are water-soluble and easily rinsed.
- Glycolic acid is more effective in solubilizing inorganic silicates than other organic acids and some mineral acids.
- Glycolic acid's low corrosivity to household surfaces makes it an excellent choice for household applications.



- Formulating with glycolic acid is easier, as it is more compatible than mineral acids with a wider range of ingredients, such as surfactants, biocidal agents, corrosion inhibitors, fragrances, and dyes.
- When blended with other organic and inorganic acids like citric acid and sulfamic acid, glycolic acid improves their cleaning and penetrating effectiveness. For example, when blended with these and similar acids, it enhances iron stain removal.
- Glycolic acid is readily biodegradable; therefore, waste disposal is not a problem.
- Glycolic acid is VOC-exempt.
- Glycolic acid has a very mild odor, which reduces the need for masking agents.

Bathroom “soap scum” soils are complex mixtures of hard water minerals (iron, calcium, and magnesium carbonates and metasilicates) and organic/oily components from soap residues and soils. These soils are hard to remove and can be a breeding ground for molds, mildew, and bacteria. Regular cleaning is necessary to keep bathrooms pleasant and healthy areas in the home or institutions.

Customer Values for Bathroom Cleaners

Consumer Values

- Cleaning efficacy: Removes soils easily and thoroughly
- Aesthetics: Has a pleasant fragrance and color
- Handling ease and safety: Ease of application and does not require rubber gloves
- Low toxicity
- Safer for the environment: Does not harm wildlife and is not bio-accumulative
- Cost-effective

Formulator Values

- Matches up with consumer values
- Ease of formulation: Ingredients should be easy to handle: nonflammable, low toxicity, low corrosivity, good chemical stability, and good water solubility. Ingredients should be easily formulated and compatible with other cleaner components, like solvents, fragrances, surfactants, and colorants.
- Formulations must have good shelf life.
- Supplier support

Glycolic Acid Attributes

- Excellent cleaning capability as described above
- While synthetically produced, it is a naturally occurring compound that is found in sugar cane, the mammalian metabolic system (Krebs Cycle), etc. The synthetic form of glycolic acid has the same structure as the natural form.
- Low toxicity: The LD₅₀ is 4,240 mg/kg in rats.

- It has favorable environmental properties:
 - Low volatility: <0.1 mmHg pressure at 25°C. (77°F) (= VOC-exempt) (per EPA and SCAQMD)
 - Readily biodegradable: 89% degraded in 7 days
 - Low fat solubility: Octanol/water solubility = 8%/92% (KOW = -1.11)
- Low color: Very pale amber.
- Low odor: Very mild, burnt sugar odor.
- Nonflammable
- High water solubility: -19°C (-2°F) for 50%; 10°C (50°F) for 70% (the commercial product)
- Low corrosivity to most common metals and synthetic materials. (Formulations should be tested, particularly on marble or natural stone surfaces, before use.)
- Chemical stability under most conditions (except to active metals or strong oxidizers, like peroxide, hypochlorite, etc.)
- Dedicated sales and technical support

Formulators value good support from their ingredient suppliers. Many formulators have highly sophisticated testing techniques and very extensive formulation experience. Nevertheless, they appreciate technical information that ensures them that their development efforts have a good probability of success.

Glycolic acid is the organic acid of choice for cleaning applications, when all aspects are considered. In a customer prepared formulation, its performance exceeded citric acid. It is less toxic, less corrosive, and, as a liquid, easier to handle than mineral acids, oxalic or sulfamic.

For more information, visit glycolicacid.chemours.com or call (800) 441-9593.

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