Glycolic Acid Advantages

- Low Corrosiveness
- Low Odor
- Low Toxicity
- Negligable VOC
- Readily Biodegradable
- Freely Water Soluble

Applications

- Aluminum and copper cleaner and finishing
- Electroless plating premix
- Electropolishing electrolytes
- Anodizing and sealer formulations
- Pickling and mill scale
- Acid cleaning and degreasing
- Wheel cleaner
- Buffing compound cleaner

Physical and Chemical Description

Technical grade Glycolic Acid is sold as a clear to light amber solution in a 70% concentration. Glycolic Acid is the first and simplest member of the family of hydroxycarboxylic acids. GA has an acid dissociation constant of $1.47 \times 10^{-4}$, or a $pK_a$ of 3.87. Glycolic Acid has a 7 day biodegradability value of 89.6 percent.

![Chemical Structure of Glycolic Acid](image)

| 70% Technical Grade |  
|---------------------|---------|
| Molecular Weight    | 76.04   |
| Total Acid, %       | 70.0–72.0 |
| Sulfates, ppm       | 800, max. |
| Color, Gardner      | < 3     |
| Formic Acid, %      | < 1, max. |
| Turbidity, NTU      | 6, max. |

Glycolic Acid is an excellent choice for your copper and aluminum metal finishing processes. It is a good raw material for new or reformulated surface cleaner applications when looking for less toxic materials. Glycolic Acid is 100% biodegradable, reducing the impact your finishing application leaves on the environment. It is a great choice for metal cleaning because it has dual functionality. The molecule contains both a carboxylic acid functional group as well as a hydroxyl group and can act as an acid or an alcohol or both. As a fairly strong acid it is a good source of protons for acid to neutral cleaner.
Glycolic Acid as a Metal Cleaner

Glycolic Acid is useful in a wide variety of metal cleaning applications, including equipment, stainless steel boilers, heat exchangers and many other industrial metal surfaces.

The properties listed here contribute to its effectiveness and versatility:

- A relatively strong organic acid. The pH of a 4% solution of Glycolic Acid in water is below 2.0.
- Low volatility. This means little corrosive fumes evolve on heating. Low acid yield loss is experienced, even when hot solutions are used. Non VOC due to low vapor pressure.
- Very mild odor versus the strong objectionable odor created by other acids like acetic. Does not fume as some mineral acids do.
- Dissolves carbonate, oxide, and most casein scales readily. The resulting salts are water soluble. This gives good rinsing properties.
- As supplied, is already in complete solution. Easy to handle as a liquid. There are no “incomplete dissolving” problems, and the 70% concentrate can be quickly diluted to any desired strength with water.
- Relatively low corrosion rate on metals. Specific corrosion data are available upon request from DuPont. These low rates of corrosion can be further reduced by addition of a corrosion inhibitor.
- Contains essentially no chlorides. It can be used for cleaning stainless steels without the possible chloride cracking or embrittlement sometimes experienced in acid chloride systems.
- In formulation, is compatible with many cleaning additives. These can include surfactants, biocidal agents, corrosion inhibitors, scents, colors, other acids, and of course, water.
- Possesses complexing properties. This characteristic may preclude the need to add a special chelating or complexing agent. Enhances the rinsibility property of the cleaner.
- A relatively safe acid to store and handle. Always be sure to follow material safety data sheet guidelines for chemical handling.
- Readily biodegradable, but does not support the growth of bacteria in use.

Starting point formulations for metal cleaning are given in the Glycolic Acid Cleaner Formulary.