

## T.C. 277 Liquid Alkaline Aluminum Etchant

### DESCRIPTION

T.C. 277 is an efficient, highly alkaline etchant which combines uniform etching with light cleaning action. Depth of etch is easy to control.

T.C. 277 may also be used as a paint stripper; as a heavy-duty cleaner for railroad trucks, underframes and running gear; as a cleaner for paper mill stock systems and suction rolls; and for neutralizing acid wastes. Chelating agents minimize scale build-up in tank and on coils.

### CHARACTERISTICS

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| Chemical composition                     | Blend of alkalis, low-foaming wetting agents and chelating agents  |
| Physical form                            | As received: light amber liquid<br>As used: clear  |
| Odor                                     | None   |
| Specific gravity                         | 1.53   |
| Bulk density                             | 12.8 pounds/gallon   |
| Viscosity                                | 50 cpm Spindle #1, Brookfield Viscometer, 60 rpm   |
| Flash point                              | None   |
| Foaming tendency                         | Initially slight; quickly subsides   |
| Recommended diluent                      | Water  |
| Maximum solubility                       | Infinite   |
| Behavior in hard water                   | Sequesters   |
| Rinseability                             | Good   |
| Biodegradable                            | Yes  |
| Normal operating temperatures            | 140° to 180°F  |
| Normal working concentrations            | 4% to 25% by volume<br>(depending on application)  |
| pH at working concentrations             | 13.0   |
| Effect of freezing                       | None, upon thawing   |
| Freezing point                           | 45°F   |
| Effect of aging                          | None   |
| Effect of long, high temperature storage | None   |
| Effect of prolonged boiling              | None   |
| Effect on metals                         | None on steel, stainless steel, magnesium; etches zinc; tarnishes brass and copper; etches aluminum (rapid initial attack) |

## **APPLICATION PROCEDURE**

**Aluminum Etching:** If soil is light, pre-cleaning is unnecessary. Where there is considerable soil and stencil ink, a separate cleaning step is needed. To prepare etching solution, add T.C. 277 slowly to cold water at these concentrations: for a light etch, 2% to 4% by volume; medium etch, 4% to 6% by volume; heavy etch, 6% to 8% by volume. Stir thoroughly. Heat solution to 140° to 160°F.

Degree of etching is affected by immersion time, solution concentration, temperature and the amount of aluminate build-up. A 6% concentration at 80°F will etch an 1100-H- 14 alloy at the rate of approximately 0.03 mils per minute. If the temperature is increased to 180°F, the etch rate jumps to 0.66 mils per minute. As aluminum salts build up, etching rate decreases.

To establish uniform etching rates and to extend solution life, constant bleed-off and continuous input of T.C. 277 is recommended. Maintaining average aluminum content at 4 to 6 ounces per gallon will give optimum results. Follow application with a cold running water rinse.

**Paint Stripping:** Apply by immersion or hot flow-on. Use full strength or at 5% to 25% by volume, temperatures up to boiling.

**Cleaning Railroad Trucks, Underframes, Running Gear:** Use at 5% to 8% by volume through a high pressure sprayer. Let soak. Pressure rinse. For faster cleaning, heat to 140° to 180°F.

**Cleaning in Paper Mills:** For stock systems, use at 1% to 6% by volume; for suction rolls, use at 3% to 5% by volume. Follow by a thorough rinsing.

**Neutralizing Acid Wastes:** T.C. 277 is 100% efficient for neutralizing acid wastes. To determine the amount of T.C. 277 needed, take a small measured sample of the acid waste. Add T.C. 277 slowly, with good agitation, until the desired pH level is reached. Then add T.C. 277 to the bulk waste in the proportions determined above.