

ELECTRO-CHEM ETCH INC.

Electrolytes



Special Features:

- Several formulations available for corrosion free etching & high contrast "dark" marking.
- Additional formulations available for fast, deep etching of ferrous and copper alloys.
- Some formulations meet the MIL-STD-792 Requirements.
- Mark (AC) & Etch (DC) modes.
- Available in Gallon, Quart, and Pint bottles.

The electrolyte is the element that performs the actual etching or marking functions. They are the "chem" part of the electro-chemical etching process. By themselves they are usually neutral salts and are pretty harmless and do not affect the metal much. They only become "potent" in conjunction with the application of an electric field whereby they become ionized and attack the metal, thus performing either the "etching" (i.e., metal removal) or "marking" (i.e., metal oxidation) functions. Thus they are formulated to have either a good etch rate, or dark "color" oxides to produce good contrast for marking. Many of the electrolytes can be used interchangeably on some metals, but have optimum performance characteristics for certain metals. For example the electrolyte SCE-4 has a very good etch rate for most ferrous alloys. Therefore if you want to do deep etching fast, use this electrolyte. Others such as SCE-10 or HFE do not have a good etch rate but produce very dark color oxides. So if you need high contrast markings use these electrolytes.

After the etching or marking process is complete, the electrolyte residue must be removed from the part or it will react with the moisture in the air and cause the part to "rust" a few days later. Therefore it is imperative that the part be thoroughly "cleaned" with the AMC cleaner which removes and neutralizes any electrolyte residues from the part.

However, ELECTRO-CHEM ETCH INC. has formulated some special electrolytes such as HFE (Halogen Free Electrolyte) or CFE (Corrosion Free Electrolytes), and SCE-20 that DO NOT require neutralization and will NEVER cause rusting of the part, while at the same time producing excellent high contrast markings. Many aerospace companies (Honeywell, Pratt & Whitney Canada, Fatigue Technology, to mention a few) now only use HFE exclusively for their marking operations. In addition both the CFE and HFE meet the requirements of MIL-STD 792 specification.

The electrolyte you will need depends on the material you are using. Below is a list of recommended electrolytes for marking metals and alloys. These recommendations are of necessity, general and are intended to be used as a guide. It is always advisable to mark a test piece of similar material prior to your production run.

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ELECTRO-CHEM ETCH ELECTROLYTES – RECOMMENDED APPLICATIONS

These recommendations are of necessity, general, and are intended to be used as a guide. It is always advisable to mark a test piece of similar material prior to your production run. See below for a complete listing of metals and the corresponding electrolytes.

ELECTROLYTE	SPECIAL FEATURES	APPROPRIATE MATERIALS
SCE-1	All purpose, deep etching	Ferrous Metals, Aluminum
SCE-4	Fast deep etch rate	Ferrous Metals, Nickel, Cobalt Alloys
SCE-3	Meets MIL-STD-792	Titanium, Copper Alloys
SCE-5	Black Oxide	
HFE CFE SCE-20	CORROSION FREE PREVENTS RUSTING MIL-STD 792	Ferrous Metals, Nickel, Cobalt Alloys
SCE-11	MIL-STD 792	Titanium, Silver plate, Cadmium plate
CF-17		Titanium, Chromium, Nickel

Complete listing of metals and corresponding electrolytes:

METAL	ELECTROLYTE	COLOR OF MARK	SETTING
Aluminum and its alloys containing <7.0% silicon	SCE-1	Black	DC
All Aluminum alloys	SCE-1 and SCE-4	Black	DC
Magnesium and its alloys	SCE-1 SCE-3	Deep Etch Clear Black	DC AC
Brass, Bronze, Copper, and alloys	SCE-3, SCE-9, HFE and SCE-10	Black	AC
Tin, Silver, and Cadmium Plating	SCE-11, SCE-3	Black	AC
Iron base allows A-286	SCE-1, SCE-4, CFR	Black	AC
17-4PH, PH15-7mo Maraging steel Invar 36	HFE, SCE-10, SCE-4	Deep Etch Clear	DC
Nickel and cobalt alloys such as Inconel, Inconel 718, Hastelloy C, Stellite X750 and Rene' 41	SCE-4, SCE-10, HFE	Black	AC
	SCE-1	Deep Etch Clear	DC
Black Oxide	SCE-5	White	AC

*Buff with Scotch or eraser stick if necessary.

**For exotic metals or metals not listed, consult factory.