

Electrolyte Chart/ Knowledge Base

All information refers to a setup with TUS machine, TUS stencil, TUS electrolyte. No obligation of any kind. Please refer to TUS before ordering.

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Item	Etch	Electrolyte/Power/Practice
<p>"NO STAIN" Electrolytes help minimize the tendency to stain. <u>primarily for Stainless Steel</u></p> <p><u>primarily for Carbon/Tool Steels</u></p>	<p>dark</p> <p>dark</p>	<p>SUITABILITY OF AN ELECTROLYTE FOR SPECIFIC APPLICATIONS MUST BE ESTABLISHED BEFORE USE.</p> <p>"NO STAIN" EX-RS1, 12-24VAC, 1-2 sec. cycles EX-61, 12-24VAC, 1-2 sec. cycles</p> <p>"NO STAIN" EX-RC1, 12-24VAC, 1-2 sec. cycles</p>
Aluminum	<p>dark gray/ black</p> <p>deep etch</p>	<p>EX-10, 24VDC,3-4sec. Dark gray; black 2-3 hits, 1.5 sec; EX-9B, 24VDC, 3 sec., EX-21, 24VAC, 2-3 sec. EX-42, 24VDC, 2sec.</p> <p>EX-4, 24VDC, AB, 2-3 sec., prox 1/2 thou. per hit</p>
Black/Blue Oxide	<p>light gray white</p> <p>bright metallic</p>	<p>EX-21 (/22/23/25), 12-24VAC, 1.5-3 sec., 2-4 hits, water pad rub, oil and dry wipe EX-D20, 24VDC,1-2sec., 2-4 hits, water pad rub, oil and dry wipe</p>
Brass (see copper/brass)		
Carbide Tools	<p>black</p> <p>black</p> <p>darkgrey</p>	<p>EX-3, EX-4, 24VAC,2-4sec EX-12, 12-24VAC, 1.5 sec, 2 hits EX-21, 12-24VAC, 2-3 sec</p>
Cd plated bearings	black	EX-61, 12VAC, 1.5 sec.
Chrome Plate Steel, bright and satin	<p>black</p> <p>deep shallow/dark</p>	<p>EX-9B, 12-24VAC, 1-2 sec, AB, 1-2hits EX-10, 12-24VAC, 1-2 sec.</p> <p>EX-9B, 25VAC, 2x 5sec</p>
Chrome plated brass	<p>deep etch into base</p> <p>dark/black etch</p>	<p>EX-9B, 24VDC, 2 sec, 1-4hits</p> <p>(EX-9B,24VAC,3sec,2hits)</p>
Chromated (Cadmium) Steel	dark	<p>EX-60, 24VAC, 2 sec. EX-10, 12-24 VAC, 2-4 sec.</p>
Chromated (Zinc) Steel	dark	EX-D10, 24 VAC, 2 sec
Cobalt Alloy (L605)	gray frosted shallow depth etch	EX-10, 24 VAC, 3sec, 2hits
50% Co alloy, Fansteel	dark/black	EX-9B , EX-21, 24VAC, 1.5-2.5 sec, AB,

Copper / Brass	dark/black deep etch	EX-61, 12/24VAC, 1.5-2 sec EX-21, 24VDC, 2x3sec.
Brass plated (over Ni flash on hardened C-steel)	dark grey gray black	EX-61, 24VAC, 1sec, AB EX-12, 24VAC, 1sec, AB
Brass, polished	shallow depth etch "Copper Red" etch	EX-60, 24VDC, 3sec., 2 hits (.0005-.001") EX-12A, 12VAC, 3sec, 1hit
Al Bronze coating 92 % Cu – 8% Al	Dark / black	EX-60, 12 VAC, 1.5 sec, 1 hit, AB, water rinse, hot air dry , pitch black
Bronze	Black Deep etch .002-.003	EX-9B, 12VAC, 2 sec., 2 hits, pitch black EX-21, 24 VDC, 2 sec, 2-3hits, AB
CopperGraphite CopperTungsten	black	EX-21, 24VDC, 2sec, 1-2 passes, excellent black
Deep Etch		see also stainless steel and aluminum
.005 - over .008" Electrodes, Graphite, CopperGraphite, CopperTungsten	dark background black	EX-D40A, 24VDC, repetitive 1-2sec passes, 1-3 min EX-21, 24VDC, 2sec, 1-2 passes, excellent black
Gold plate	black Shallow depth/clear	EX-10, 12-24VAC, 1-2 sec, one or more hits EX-10, 12-24VDC, 1-2 sec, one or more hits
Graphite	black	EX-21, 24VDC, 2sec, 1-2 hits, excellent black
Hastelloy X,	black / dark	EX-31, 24VAC, 1.5 sec, AB, 1-3 hits
Alloy L605	shallow depth -deep etch, light gray	EX-9B, 24VDC, 1.5-2 sec, AB, 1-2 hits
Ni plate, electroless, crs	black	EX-10, 15B, 22, 12-24VAC, 1.5-3 sec
Ni plate, scissors	black	EX-9B, 12 VAC, 1 hit, 1.5 sec
Ni plate, dull on brass	black clear shallow depth	EX-9B, 24 VAC, 1 hit, 2sec EX-9B, 24 VDC, 1 hit, 2sec
Ni plate bright on brass	black (strong)	EX-61, 12 VAC, 3-4 hits, AB, 1.25 sec,
NiTinol, Ni-Ti shape memory alloy	Black	EX-9B, 12 VAC, 1.5 – 3 sec., 1 or more hits or roll
Silver Plate	Dark	EX-10, 12VAC, 2-4 sec; over time fades to gray, can be rubbed off to frosted mark
Silverplate over Stainless Steel	Dark	EX-9B, 12VAC, multiple passes, good dark, etch into stainless to minimize rub off, 9B somewhat darker than EX-10
stainless 303, blackened	surface etch deep etch	EX-D20, 24VDC, 2sec, AB, 1 hit, nice light white marks EX-D20, 24VDC, 2sec, AB, multiple hits, nice deep gray white marks (prox 1/4-1/2thou depth per hit)
stainless 420/440	deep etch	EX-D20, 24VDC prox 1/2 thou per 1.5-2 sec cycle. alternatively D10/D30
stainless steel 410,420/440/300	dark etch, decorative	EX-9B , 12-24 VAC, AB, 1-2 sec, 1-2 hits)
see also "deep etch" above	deep etch	EX-D20 ; 24VDC, 1.5-2.5 sec, AB, multiple hits (prox. 1/3-1/2 thou/ hit);
Titanium	dark	EX-25, 12VAC, 3sec EX-10, 24 VAC, ¼ sec or less (very fast)
TiN (black) Finish Stainless S	white gray/frosted metallic look	EX-D20 , 24VDC, 1.2 sec, 2-3 hits, AB
	light gray white	EX-D10, 24VDC, 2sec, 2hits, AB

Ti-Nitrided steel (gold)	black	EX-D20, 12VAC, 1.8 sec, 2-3 hits, AB EX-10, EX-12 (for "AB"), EX-12A (for stationary), 24VAC, 1.5-2 sec, 1-3 hits, AB better, stationary OK for fine lines
Sn plate over bronze	black	EX-31, 24VAC, 1.5 sec
Zn coated steel	black	EX-33, 12VAC, 2sec
Zn cast parts	Black	EX-61, 12/24 VAC, 1.5-2 sec EX-10. 24 VAC, 2 x 2 sec. sharp but weaker