

Marked Metals

The metal mark is a black engraving on metal using a Co2 laser. The process works like ceramic glaze in that the laser heats the marking solution and causes it to change color and soak into the metal surface. This process can be used on stainless steel, tool steel, chrome, pewter, titanium, aircraft grade aluminum, and other uncoated metal surfaces.

Physical Testing of the Mark

Stainless steel tags were marked and immersed in the following test solutions for one week.

<u>SOLUTION</u>	<u>EFFECT</u>
ORGANIC SOLVENTS:	
Gasoline	no effect
Limonene	no effect
Methyl Ethyl Ketone	no effect
N-Butanol	no effect
Mineral Spirits	no effect
Xylene	no effect
Acetone	no effect
Propylene Carbonate	no effect
Ethanol	no effect
DMSO	no effect
Motor Oil	no effect
ACID/BASES:	
Nitric Acid 68%	no effect
Acetic Acid 99.5%	no effect
Hydrogen Peroxide 30%	no effect
Sodium Hydroxide 25%	no effect
Ammonium Hydroxide 20%	no effect
Hydrochloric Acid	Dissolved 30% of the tag, but left the mark unaffected
Sulfuric Acid	Slightly discolored the mark

OTHER: The mark was not affected when boiled in water or frozen in liquid nitrogen. When the mark was heated by propane flame until red-hot and immediately plunged into liquid nitrogen, the metal tag discolored but the mark was unaffected. The mark can be removed by grinding, sandblasting or resurfacing the metal.