

# Rust Never Sleeps

PLATINGS & COATINGS CHART							
PROPERTIES	TYPE	PHOSPATING	ZINC CROMATING	DACROTIZING	HOT DIPPING	GrabberGard®	STAINLESS STEEL
	BASE	PHOSPHATE CONVERSION	ELECTROPLATED ZINC	HOT DIPPED ZINC COATING	ELECTROPLATED ZINC		<p>Superior in composition, stainless steel is a formulation of alloys, not base metal with coatings applied by dipping, electroplating, or peening.</p> <p>These alloy formulations come together to provide specific properties and degrees of corrosion resistance as they relate to screw applications.</p> <p>For example, the 302 to 316 series is a formulation that includes nickel and chromium for superior resistance to common corrosion such as constant water exposure or the high levels of tannic acid in cedar and redwood.</p> <p>(316 is formulated with molybdenum for superior corrosion resistance in areas of high salt water and/or acid rain exposure concentrations.) They are also non-magnetic.</p> <p>410 grade sacrifices a bit of corrosion resistance for strength and is used for self drilling screw applications.</p>
	SUPPLEMENT	RUST PREVENTION OIL	Cr6+ (0.2u)	+ AlnCr203mCr03	N/A	CHEMICAL CONVERSION & COATING	
SALT SPRAY TEST (ASTM B117)	12, 24, 48, 96 Hour	24, 48, 72, Hour	120 Hour	240 Hour	1000 Hours		
KESTERNICH TEST (DIN 50018 SFW02S)	2 Cycle	2 Cycle	3 Cycle	5 Cycle	15 Cycle		
HEAT RESISTANCE (JIS K54007.1)	150 deg. C X 2H	70 deg. C X 1H	250 deg. C X 7H	250 deg. C X 7H	250 deg. C X 7H		
ACID RESISTANCE (5% HYDROCHLORIC ACID)	Basic Metal Soluable < 5 Min.	Decoating in Less than 1 Min.	Decoating in Less than 1 Min.	Decoating in Less than 5 Min.	No Change in 24M		
ALKALI RESISTANCE (3% SODIUM HYCLORIDE)	24H	24H	24H	48H	72H		
WETHERING TEST (JIS K54007.6.17)	Red Rust in 500H	White Rust in 500H	Decoloring in 500H	White Rust in 500H	No Change in 500H		
GALVANIC CORROSION	Heavy	Heavy	Heavy	Heavy	Least		
ADHESION (PULL OF TAPE)	Weak	Chromate Film is Weak	Weak	Strong	Very Strong		
COVERING POWDER	Red Dust Soon	Acid Apt to Remain Inside Recess	Hard to Coat Inside Recess	Hard to Apply Thin Coat Properly	No Problem		
DEFECTS THAT COULD OCCUR TO METAL	Least	Softens Hardness	Softens Hardness	Softens Hardness	Least		
ENVIRONMENTAL CONCERNS	Need Facilities for Effluent Treatment	Need Facilities for Chromic Acid Waste & Effluent Treatment	Need Device for Exhausting Gases	Need Device for pH Adjustment	No Effluent		
REMARKS	Suitable for Short Term Corrosion Resistance	Extra Chromating Process After Hydrogen Embittlement Prevention Treatment	Unsuitable with Hardened Parts Could Soften Hardness. Stoving is 300 deg. C. Lower Temp. Will be Less Anti-Corrosive	Unsuitable with Hardened Parts Could Soften Hardness.	Backing at 150-200 deg. C Prevents Hydrogen Embittlement		
SIMPLIFIED ILLUSTRATION						Chromium, Manganese,	
					GrabberGard®	Molybdenum, Nickel,	
	OIL	CHROMATE			CHROMATE CHEMICAL CONVERSION	Silicon, Phosphorus,	
	Zn(Mn) Phos.	Zn	N Zn nCr203mCr03	Zn	Zn	Sulphur,	
BASIS METAL	BASIS METAL	BASIS METAL	BASIS METAL	BASIS METAL	BASIS METAL	Iron, Carbon	



## SCREW RUST & CORROSION RESISTANCE

**What Really is Corrosion?** In laymens terms, corrosion is the deterioraton of metal by either chemical or electrochemical reaction with our environment. That includes everything from acid rain, to proximity to salt water, to tannins in wood. Just a few reasons why rust (corrosion) never sleeps!

**Electrochemical Reaction** - When metals with different electrical potentials contact each other in the presence of an electrolyte ( That being fog, dew, humidity, or water.)

**Galvanic Corrosion** - Occurs with non-compatible metals contact each other in the presence of an electrolyte ( water, fog, etc.)

**Plating Thickness:** The service life of a fastener is usually proportional to the thickness of the plating. Thicker plating, longer life (resistance to corrosion).

**Plating Metals** - Zinc, Chromate and Aluminium are common. Cadmium is no longer used in the United States because of environmental issues.

**What's Plating and Coating?** Taking a base metal and depositing a protective metal shell by either electroplating, hot dipping or mechanically depositing metal. (Passivation is a cleaning process for stainless steel by which the fastner is immerced in a nitric acid/ water bath to eliminate foreign matter.)

**Electroplating** - Current is applied to a water based chemical compound. This "attaches" the chemical to the submerged base metal. Thickness range from commercial grades of .000015 to .00005 inches. Thicker platings are generally economically impractical

**Hot Dip Galvanizing** - Carbon steel is suerged in a molten zinc "bath" at 959 degrees. Viola! The zinc alloy bonds to the base metal. HDG produces very thick coatings. .0021 is standard. Heavier coatings can be spec'd to .0034

**Mechanical Plating** - Glass beads, coated with plating material, tumble against base metal and physically "cold weld" plating to base metal. Platings are comparable in thickness to HDG products.

**The Real Deal on Stainless Steel**  
**Stainless Steels** is a family of ferrous alloys that include iron, carbon, chromium, molybdenum and nickel. (nickel being the most impo rtant.) The key to stainless is its ability to form a thin oxide "film" or protective skin on its surface. This film prevents oxidation, and in the right formulations, hold out rust and corrosion far longer.

**Austenitic Stainless** - The 18-8 and 300 series stainless, Non-heat treatable and non-magnetic, comprised of 18% chromium and 8% nickel. The best for corrosion resistance.

**Ferritic Stainless** - Magnetic iron - chromium magnetic alloys. Non-heat treatable Used for high temperature applications. Type 430

**Martensitic Stainless** - Iron-chromium alloys with 12 to 17% chromium. Heat treatable and magnetic. 410 is the least expensive stainless coating and offer more corrosion resistance than zinc and zinc chromates.

For more details on Corrosion, Coatings and Plating and Stainless Steel go to [www.grabberman.com](http://www.grabberman.com) or contact your local GRABBER representative.