# Rust Never Sleeps

## PLATINGS & COATINGS CHART

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>TYPE</th>
<th>PHOSPHATING</th>
<th>ZINC CROMATING</th>
<th>DACROTIZING</th>
<th>HOT DIPPING</th>
<th>GrabberGard®</th>
<th>STAINLESS STEEL</th>
</tr>
</thead>
</table>
| BASE | PHOSPHATE CONVERSION | ELECTROPLATED ZINC | HOT DIPPED ZINC COATING | ELECTROPLATED ZINC | ELECTROPLATED ZINC | CHEMICAL CONVERSION & COATING | Superior in composition, stainless steel is a formulation of alloys, not base metal with coatings applied by dipping, electropolishing, or peening. These alloy formulations come together to provide specific properties and degrees of corrosion resistance as they relate to screw applications. 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. (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.

#### SALT SPRAY TEST (ASTM B117)
- 12, 24, 48, 96 Hour: 24, 48, 72, Hour: 120 Hour: 240 Hour: 1000 Hours

#### KESTERNICH TEST (DIN 50018 SFW25)
- 2 Cycle: 2 Cycle: 3 Cycle: 5 Cycle: 15 Cycle

#### HEAT RESISTANCE (JIS K54007.1)

#### ACID RESISTANCE (5% HYDROCHLORIC ACID)
- Basic Metal Soluable < 1 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 (2% SODIUM HYCLORIDE)

#### 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: Weak: Weak: Strong: Very Strong

#### COVERING POWDER

#### 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 & Exhausting Gases: Need Device for pH Adjustment: No Effluent

#### REMARKS

#### SIMPLIFIED ILLUSTRATION

- **OIL**: CHROMATE
  - Zn(Mn) Phos.: Zn: N Zn nCr203mCr03: Zn: Zn
  - BASIS METAL: BASIS METAL: BASIS METAL: BASIS METAL: BASIS METAL

---

**Diagram:**

- **Exterior**: Best
- **Interior**: Good
- **Average**: Average

**Legend:**
- **STAINLESS STEEL**
- **GRABBERGARD®**
- **HOT DIPPED/DACRO**
- **YELLOW ZINC**
- **CLEAR (SILVER) ZINC**
- **BLACK PHOSPHATE**

---

**Footnote:**

- **GrabberGard®**: Chromium, Manganese, Molybdenum, Nickel, Silicon, Phosphorus, Sulphur, Iron, Carbon
What Really is Corrosion? In laymen's terms, corrosion is the deterioration 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 fastener is immersed 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 surged 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 specified 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 important.) 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 offers more corrosion resistance than zinc and zinc chromates.

For more details on Corrosion, Coatings and Plating and Stainless Steel go to www.grabberman.com or contact your local GRABBER representative.