

# DACROMET® Coatings

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SmartHex™ TC bolts coated with Dacromet®



A transmission electron microscope photograph shows a cross section magnification of the DACROMET® film. (Magnification 80,000)

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**For projects requiring corrosion protection**, we recommend DACROMET®, the leading water-based inorganic metal finishing system recognized around the world as a proven and cost effective alternative to both electro and mechanical platings and solvent-based organics. DACROMET® and our various sealers and topcoats can be applied to a variety of substrates in order to provide corrosion protection to ferrous metals. This coating system has gained worldwide acceptance as reliable, proven, corrosion resistant metal finishing systems which protect against road salt, humidity, solvents and other corrosive elements.

**The coating compositions** are proprietary water based coating dispersions containing metal oxides, metallic zinc and aluminum flakes. The zinc and aluminum platelets align in multiple layers forming a metallic silver gray coating. Applied as a liquid material, the coating becomes totally inorganic after curing at 610° F/321°C.

## DACROMET® Benefits

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### 1 Four-Way Corrosion Resistance

1. **Barrier Protection** Many overlapping zinc and aluminum flakes provide an excellent barrier
2. **Galvanic Action** Zinc corrodes to protect steel
3. **Passivation** Metal oxides in matrix slow down corrosion reactions of zinc and steel
4. **Self-Repairing** Damaged areas in the coating fill with zinc oxides and carbonates

### 2 Bimetallic Capabilities

Due to the concentration of aluminum within the coating, good bi-metallic corrosion resistance with aluminum is accomplished

### 3 Solvent Resistant

When DACROMET® is cured on the metal surface, the coating becomes inorganic, and thus resistant to solvents, gasoline, brake fluids, etc.



### 4 Electrically Conductive

The high concentration of metallic flake enables DACROMET® parts to be electrically conductive

### 5 Hydrogen Embrittlement Free

The absence of acids or electrolysis in the coating process assures freedom from Hydrogen Embrittlement, which is commonly associated with the electroplating process

### 6 Paint Base

DACROMET® is a base for most paints, including electro-deposited paint

## Capabilities of DACROMET®

	DACROMET®	DACROMET®+ PLUS®
<b>Salt Spray Performance</b>	500 hrs minimum	1000 hrs minimum
<b>Heat Resistance</b>	550° - 650° F (287° - 343° C)	800° F (426° C)
<b>Solvent Resistance</b>	Excellent	Excellent
<b>Coating Thickness</b>	0.2-0.3 mils	0.2-0.5 mil

# Cleaning & its Importance

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In recent years, the complexity of engineering decisions surrounding threaded fasteners has heightened. The defining criteria for finishes have shifted to include not only functionality and corrosion protection but also environmental compliance.

The beginning of the engineering decision is the cleaning methods employed to ensure that manufacturing oils, miscellaneous soil and heat treat scale are removed from the substrate. This is a vital component to good adhesion to the substrate and ensuring quality performance of the finish.

Common methods are: acid pickling, vapor degreasing, mechanical blasting and alkaline washes. Just as finishes are required to be environmentally friendly, these cleaning methods are also subject to regulations.

**Acid pickling** uses an acid dip that attacks the surface of the part and removes heat treat scale but does not emulsify the oils and completely remove them. Pickling, while producing a good surface for the finish to be applied to and promoting adhesion, also generates wastewater emissions and has the potential of causing Hydrogen Embrittlement.

**Vapor degreasing** uses mostly chlorinated solvents to remove oil and other contaminants from the part. This process does not remove heat treat scale so it must be used in conjunction with another method to provide a clean substrate. Due to the highly regulated solvents used in this process, the number of companies willing to use it has radically decreased.

## Cleaning for DACROMET® (Environmentally Friendly)



Typical tumble blaster used to clean scale from heat-treated parts.

Use of an **alkaline wash solution** removes manufacturing oils and other soils from the surface of parts. These alkaline cleaners are typically environmentally friendly, but they do not remove heat treat scale and a mechanical blast is required if the part has been heat-treated.

**Mechanical blasting** consists of steel shot, grit or glass beads blasting the surface and as a result removing heat treat scale and rust. This is a good cleaning method used to ensure that there are no remaining contaminants on the surface. This method does not remove oils from the surface and is to be used after alkaline cleaning. The most popular cleaning method that provides the necessary cleanliness while complying with environmental regulations is the use of an Alkaline Wash followed by a Mechanical

Blast. A result of this is many finishers have chosen to employ both means in their facility to ensure a quality finish is preceded by a quality cleaning method.

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# DACROTIZING® and DACROSEALING®

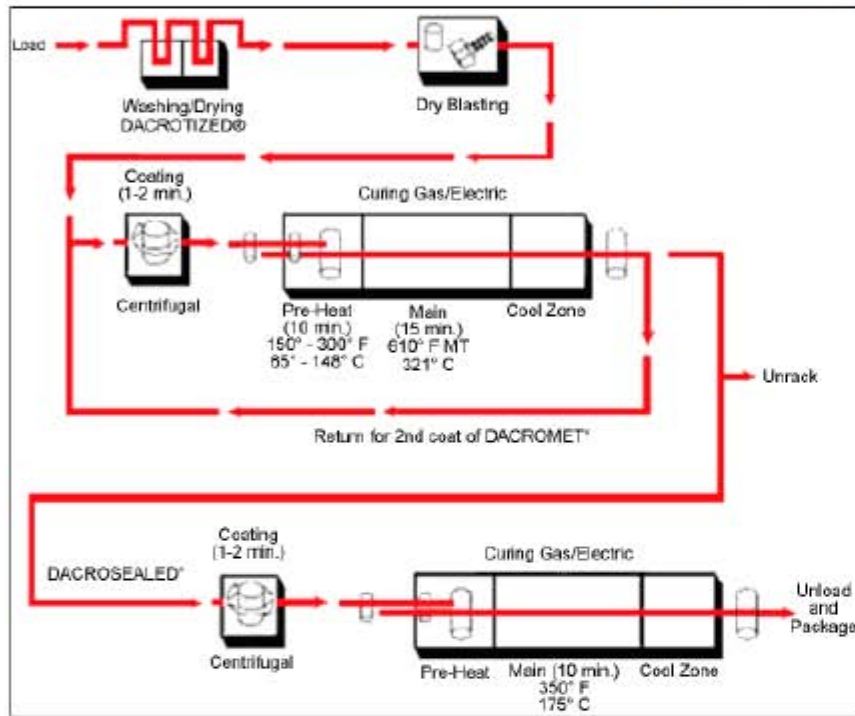
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**DACROTIZING®** is the process of applying sufficient coating weight of DACROMET® to fasteners, springs, stampings, and various other metallic and powder metal parts.

**DACROSEALING®** is the process of applying a PLUS® sealer to a DACROTIZED® article. The following are the methods used in DACROTIZING® and DACROSEALING®

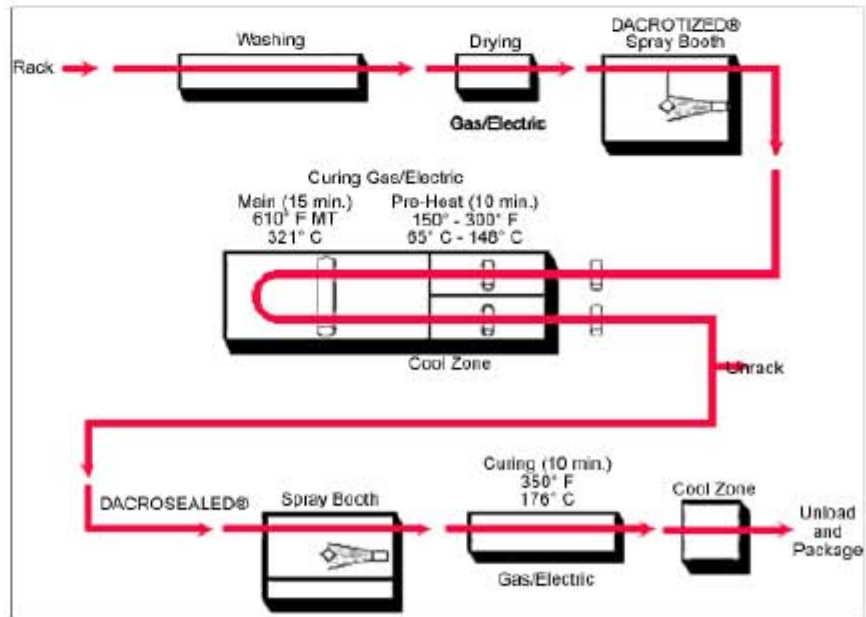
## Dip-Spin Processing (Process used for most fasteners)

Parts are shot blasted to clean (no acids used) and placed in a metal basket and dipped into the DACROMET® liquid. The excess is then spun off before delivery to the curing oven.



## Spray Processing (Used for Large Diameter Fasteners)

Parts are shot blasted to clean (no acids used) and racked on a conveyerized line and the DACROMET® coating is sprayed—either by air, airless or electrostatic equipment.



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# DACROMET® Corrosion Resistance

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## Salt Spray

The DACROMET® coating systems provide Salt Spray protection (per ASTM B-117) that exceeds commercially available finishes.

### 500 Hours Salt Spray Test



### 1000 Hours Salt Spray Test



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## DACROMET® over Galvanizing

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### THIN FILM

#### DACROMET®

- 5-7 microns (.2-.3 mils)
- No overtapping/retapping necessary

#### Galvanizing

- 25-37 microns (1-1.5 mils)
- Must be overtapped/retapped

### HYDROGEN EMBRITTLEMENT

- No Acid Pickling/Electrolysis in process = NO Hydrogen Embrittlement

- Acid Pickling in process causes infusion of hydrogen to steel = Hydrogen Embrittlement

### CONSISTENT TORQUE / TENSION VALUES

- Consistent lubricity with no degradation after time

- Lubricant varies by applicator and degrades after time

### SELF-REPARATION

- Binder system provides Self-Reparation and Passivation of Zinc

- No Self-Reparation or Passivation (Excessive White Corrosion)

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