



## Specification Chart

<p><b>Anodizing Type II</b> Anodizing is an electrolytic oxidation process in which the surface of the metal is converted to a coating having desirable protective, decorative, and functional properties. Available in a wide range of colors such as clear, black, red, blue, and gold. Provides corrosion resistance while aesthetically appealing. Electrical insulator.</p>		
<p><b>MIL-A-8625/AMS-A-8625</b></p> <p>Class 1: Non-dyed</p> <p>Class 2: Dyed</p> <p>Type II: Sulfuric acid anodize</p> <p>Type IIB: Thin sulfuric anodizing for use as nonchromate</p>	<p><b>AMS 2471</b></p> <p>Clear Anodize only</p> <p><b>ASTM B580-79</b></p> <p>Type B: Architectural Class I / .0007" min.</p> <p>Type C: Architectural Class II / .0004" min.</p> <p>Type D: Automotive / .0003" min.</p>	<p><b>AMS 2472</b></p> <p>Black, gold, red, or blue</p> <p>Type E: Interior, moderate abrasion resistance / .0002" min.</p> <p>Type F: Interior, limited abrasion resistance</p> <p>Type G: Chromic</p>
<p><b>Black Oxide</b> A conversion coating for ferrous materials applied most commonly on steel. When applied, an attractive black finish is obtained. The high-temperature black oxide process is essentially a chemical conversion of the steel surface with no dimensional</p>		
<p><b>MIL-DTL-13924</b></p> <p>Class 1: Alkaline oxidizing process</p> <p>Alkaline oxidizing. For wrought iron, cast and malleable irons, plain carbon, and low-alloy steel</p>	<p><b>AMS 2485</b></p> <p>Black Oxide on steel</p> <p>For moving parts which cannot tolerate the dimensional change of a more corrosion-resistant finish. For decorative applications and can be used to decrease light reflection.</p>	
<p><b>Cadmium</b> Corrosive-resistant cyanide finish as it functions as a sacrificial coating that enhances corrosion protection and can be applied to cast iron, powdered metal, aluminum, and steel.</p>		
<p><b>QQ-P-416</b></p> <p>Class 1: .0005" min.</p> <p>Class 2: .0003" min.</p> <p>Class 3: .0002" min.</p>	<p>Type I: As plated</p> <p>Type II: Supplementary Chromate Treatment</p> <p>Type III: Supplementary phosphate treatment</p>	
<p><b>Copper</b> The process in which a layer of copper is deposited on steel or aluminum through rack or barrel plating and is plated by using an electrical current. It creates an excellent undercoat for subsequent deposits.</p>		
<p><b>MIL-C-14450</b></p> <p>Class 0 .001"-.005"</p> <p>Class 1 .001" min.</p>	<p>Class 3 .0002" min.</p> <p>Class 4 .0001" min.</p>	<p><b>AMS-2418</b></p> <p>Type I Engineering / .0005"-.0007" min.</p>
<p><b>Electroless Nickel</b> An auto-catalytic chemical process used to deposit a layer of nickel phosphorus on a substrate controlled by a chemical reaction that does not require any source of current. Uniform and consistent finish.</p>		
<p><b>AMS 2404, AMS-C-26074, MIL-C-26074</b></p> <p>Grade A .001" min.</p> <p>Grade B .0005" min.</p> <p>Grade C .0015" min.</p> <p>Class 1: As plated</p> <p>Class 2: Bake at 500+ to harden nickel</p>	<p><b>ASTM-B733-04 (2014)</b></p> <p>SC 0: .000004"</p> <p>SC 1: .0002"</p> <p>SC 3: .001"</p> <p>SC 4: .003"</p>	<p>Type I: No phosphorus requirement</p> <p>Type II: 1-3% Phosphorus requirement</p> <p>Type III: 2-4% requirement</p> <p>Type IV: 5-9% requirement</p> <p>Type V: 10% or Higher</p>

<p><b>Anodizing Type III</b> A type of coating that penetrates the base material while building up the surface of the material. Hard anodized coatings are typically applied to heavy wear industrial parts intended for use in aggressive or highly corrosive applications. Excellent wear, abrasion resistance, and electrical insulator.</p>		
<p><b>AMS 2482</b></p> <p>0015-.0025" Thickness</p> <p>Type I: Teflon impregnated aluminum oxide</p> <p>Type II: Co-deposited Teflon and aluminum oxide</p>	<p><b>MIL-A-8625</b></p> <p>Class 1: Non-dyed, customer must ask for seal</p> <p>Class 2: Dyed</p> <p>Type III: Hard anodic coatings</p>	<p><b>ASTM B580-79</b></p> <p>Grade A: Engineering Hardcoat</p>
<p><b>Bright Tin</b> Used to protect ferrous and non-ferrous metals. High ductility, heat conductive, non-toxic, and high solder-ability.</p>		
<p><b>MIL-T-10727</b></p> <p>Type I: Electrodeposited</p>	<p><b>ASTM B545-13</b></p> <p>Class A: .0001" min.</p> <p>Class B: .0002" min.</p> <p>Class C: .00032-.0004" min.</p>	<p>Types: Matte, bright</p> <p>Class D: .0006-.0008" min.</p> <p>Class E: .0012" min.</p> <p>Class F: .0006" min.</p>
<p><b>Chromate Conversion</b> A thin gel-like film coating applied on aluminum components that offers excellent corrosion resistance and is a great primer for painting</p>		
<p><b>MIL-DTL-5541</b></p> <p>Type I: Contains hexavalent chrome</p> <p>Type II: Does not contain hexavalent chrome-RoHS Compliant</p> <p>Class 1A: Maximum protection against corrosion</p> <p>Class 3: Corrosion protection with lower electrical resistance</p>	<p><b>AMS 2473</b></p> <p>Class 1A: Yellow</p> <p><b>ASTM B921-08 (2013) RoHS Compliant</b></p> <p>Class 1: Maximum corrosion resistance</p> <p>Class 2: Moderate corrosion resistance used as a paint base</p> <p>Class 3: Decorative, slight corrosion resistance, low electrical resistance</p> <p>Class 4: No corrosion resistance, used as paint base</p>	
<p><b>Dry Film Lubricant</b> Materials which, despite being in the solid phase, are able to reduce friction between two surfaces sliding against each other without the need for</p>		
<p><b>MIL-PRF-4601</b></p> <p>Color 1: Natural product color</p> <p>Color 2: Black</p>		
<p><b>Electropolish</b> An electro-chemical process that removes material. It is used to polish, passivate, and deburr stainless steel.</p>		
<p><b>ASTM B-912-02 (2013)</b></p> <p>Yields maximum tarnish and corrosion resistance in stainless steel. Simultaneously deburrs as it polishes.</p>		

**Gold** A method of depositing a thin layer of gold on a surface of another metal, most often on copper.

<b>MIL-DTL-45204/ASTM B488-11</b> Type I: 99.7% Gold min. Type II: 99.0% Gold min.	Grade A: Knopp 90 max. Grade B: Knopp 91-129 Grade C: Knopp 201 and	<b>AMS 2422</b> .00005" min., unless otherwise specified
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**Nickel** Protects metallic objects from corrosion and promotes a high cosmetic appearance, its good for solderability.

<b>QQ-C-320</b> Class 1: Corrosion protective plating Class 2: Engineering plating Type I: Bright Finish Type II: Satin Finish	<b>ASTM B689-97 (2013)</b> Class 5: .0002" min. Class 25: .001" min. Class 50: .002" min. Class 100: .004" min. Class 200: .008" min.	Type I: No hardeners, brighteners, or stress control additives Type II: Deposit used at moderate temp., contains sulfur or other compound to increase hardness, refine the grain structure, and/or control internal stress Type III: Contains dispersed submicron particles such as silicon carbide to increase hardness and wear resistance
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**Nickel Sulfamate** An electronically deposited process in which a sulfamate bath is used to plate the substrate. A pure deposit of nickel allows soldering and brazing.

<b>AMS 2424</b>	<b>MIL-P-27418</b> Dull gray or silver .002-.0003" Thickness Soft Nickel, Electrodeposited Bath
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**Phosphate** A conversion coding that increases corrosion resistance and increases the overall surface area while promoting adhesion. It provides durability for paint and metal products.

<b>TT-C-490</b> Grade A Zinc Phosphate coating with no additional sealer Grade B Zinc Phosphate coating with a dry organic sealer Grade C Zinc Phosphate with a supplemental protective oil type compound Grade D Zinc Phosphate with a supplemental protective oil type compound
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**Tin Lead** Excellent solder-ability. In critical electrical applications, eliminates the potential for tin whisker formation. Matte appearance. 50-70% Tin, remainder lead.

<b>MIL-P-81728 B</b>	<b>ASTM B579-73 (2015)</b> SC4 Very Severe (Steel .0003"/Copper 0003") SC3 Severe (Steel 0002"/Copper .00015") SC2 Moderate (Steel .0001"/Copper .0008") SC1 Mild (Steel .005"/Copper .005")
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**Hard Chrome** Delivers high corrosion, wear, and friction resistance. Fights friction without changing component dimensions. Excellent hardness (68-74 RC).

<b>QQ-C-320</b> Class 1: Decorative plating Class 2: Engineering plating	Type I: Bright Type I: Satin
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**Nickel Chrome** The process of electroplating a thin deposit of chromium onto nickel for a decorative finish, great corrosion resistance.

<b>QQ-C-320</b> Class 1: Corrosion protective plating Class 2: Engineering plating Type I: Bright Finish Type II: Satin Finish	<b>ASTM B689-97 (2013)</b> Type I: Solutions that do not contain hardeners, brighteners, or stress control additives Type II: Moderate temp, deposit contains sulfur or other compounds to increase hardness, refine the grain structure, and/or control inner stress Type III: Contains dispersed submicron particles such as silicon carbide to increase hardness and wear resistance	Class 5: .0002" min. Class 25: .001" min. Class 50: .002" min. Class 100: .004" min. Class 200: .008" min.
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**Passivate** The removal of free irons or iron compounds from the surface of stainless steel by means of chemical dissolution. Most typically by a treatment with an acid

<b>QQ-P-35</b> Type II: Medium temp nitric with sodium dichromate <b>AMS-2700</b>	<b>AMS-QQ-P-35</b> Type II: Medium temp nitric with sodium dichromate Type VI: Low temp nitric acid	<b>ASTM 967</b> Nitric 1 Nitric 2 <b>ASTM-A380</b>
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**Silver** An electro-deposited coating for electrical, decorative, or solderable surfaces.

<b>QQ-S-365</b> Grade A: With supplementary tarnish-resistant treatment Grade B: Without supplementary tarnish-resistant treatment	Type I: Matte Type II: Semi-bright Type III: Bright	<b>ASTM B700-08 (2014)</b> Grade A: Matte Grade B: Bright Grade C: Bright Grade D: Semi-bright
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**Zinc** Provides the most effective and economical way to protect steel against corrosion. Zinc plating protects steel by providing a physical barrier as well as cathodic

<b>ASTM B 633-13</b> SC 1: .0002"/SC 2: .0003" mins. SC 3: .0005"/SC 4: .001" mins. Type I: As plated Type II: With colored chromate Type III: With colorless coatings Type IV: With phosphate conversion coatings Type V: With colorless passivate RoHS Type VI: With colored passivate	<b>QQ-Z-325</b> Class 1: .001" min. Class 2: .0005" min. Class 3: .0002" min. Type I: No dip (chromate) Type II: Yellow chromate Type III: Phosphate treatment	<b>AMS 2402</b> Class 1: .001" min. Class 2: .0005" min. Class 3: .002" min. Clear Chromate unless otherwise indicated by customer
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**Zinc-Nickel** It provides 10 times the corrosion resistance of zinc plating. Gives exceptional sacrificial corrosion resistance and can be readily passivated. Available in yellow, clear, and black chromate that provides enhanced paint adhesion, solder-able properties, and conductive properties.

<b>AMS 2417</b> Grade A: Yellow Chromate Grade B: Clear Chromate Type I: No dip Type II: With chromate treatment	<b>ASTM B841-99 (2010)</b> Class q: 5-12% Nickel Type A: Clear Chromate Type B: Yellow Chromate Type C: Dark Yellow Chromate Type D: Black Chromate
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