



Xometry

# CNC Metal Finishes

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# Contents

- 3** Standard
- 4** Anodize, Clear
- 5** Anodize, Black and Color
- 6** Anodize, Hardcoat
- 7** Bead Blast
- 8** Chem Film (Chromate Conversion Coating)
- 9** Electroless Nickel Plating
- 10** Electropolishing
- 11** Heat Treatment
- 12** Passivation
- 13** Plating, Gold
- 14** Powder Coating
- 15** Post-Processing Services From Certified Finishing Suppliers





As-milled, Standard  
Machined Finish  
*Available for all  
machined materials*



## Standard

A part with a standard finish is cleaned and deburred. Milling and tool marks may be visible with a Ra 125  $\mu$ m max. All CNC machined parts have this finish by default, and no extra finishes are applied.







## Anodize, Clear

A part with type II anodize has increased corrosion resistance and is used as a base for paint and other finishes. This finish can darken the part slightly. The coating thickness ranges from 0.0002" - 0.0012". This finish conforms to MIL-A-8625.



MIL-A-8625, Type II,  
Class 1 Clear Anodize RoHS  
*Available for aluminum and  
titanium*







MIL-A-8625, Type II,  
Class 2 Blue Anodize

*Available for aluminum  
and titanium*



MIL-A-8625, Type II,  
Class 2 Black Anodize RoHS

## Anodize, Black and Color

A part with a type II anodize finish in black and color has the same properties as anodize clear. This part has increased corrosion resistance and is used as a base for paint and other finishes. Anodized finishes are not electrically conductive. This finish can darken the part slightly. The coating thickness ranges from 0.0002" - 0.0012". This finish conforms to MIL-A-8625.







MIL-A-8625, Type III,  
Class 2, Black Hardcoat Anodize

## Anodize, Hardcoat

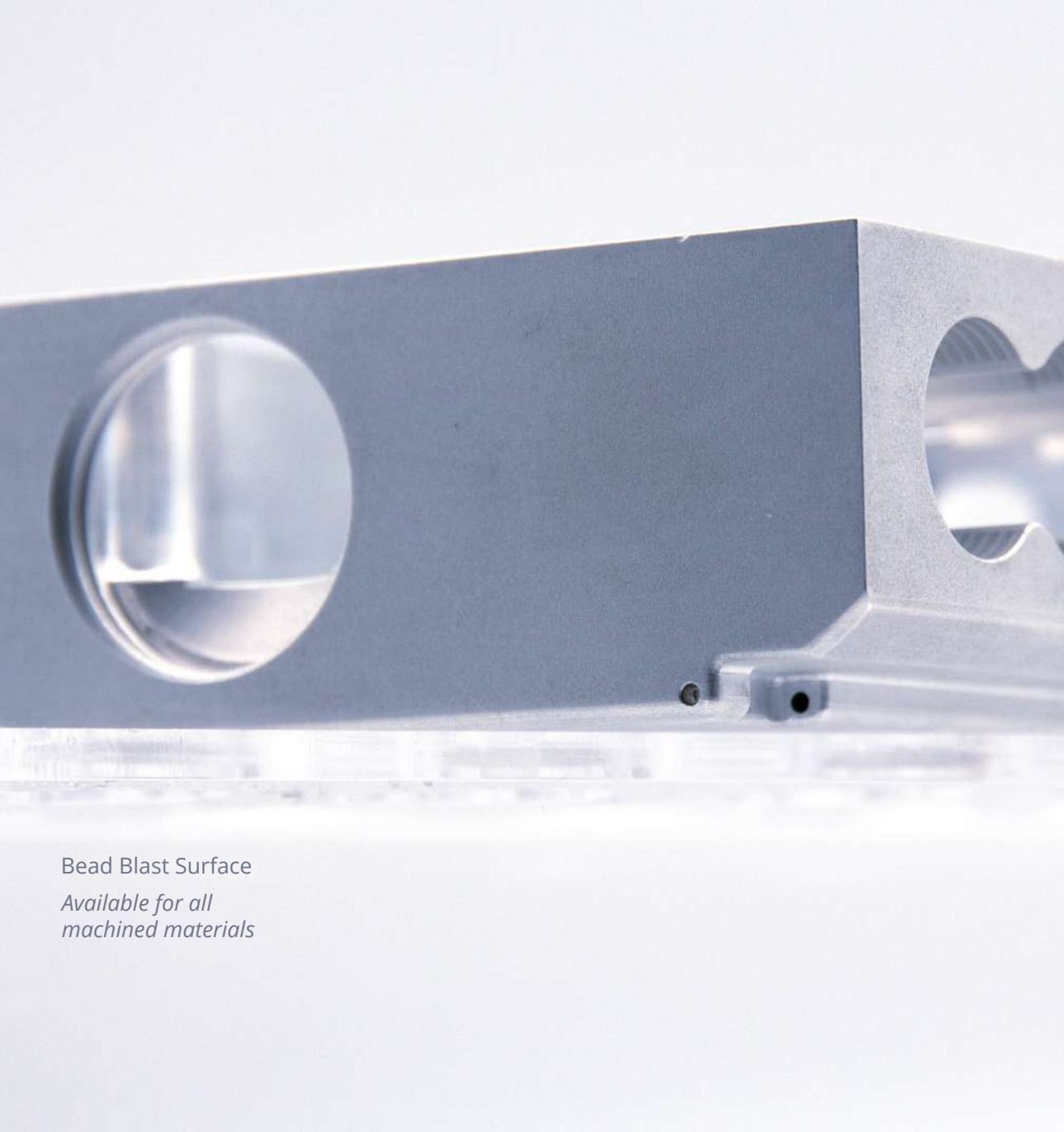
Type III hardcoat anodize offers a thicker layer of coating than standard anodize, which helps increase the durability of a part. This finish can be used as a base for wet paint and other finishes. Anodized finishes are not electrically conductive. While this finish offers colors, note that they may come out slightly dark due to coating thickness, which is generally 0.002". This finish conforms to MIL-A-8625.



MIL-A-8625, Type III, Class 1  
Natural Hardcoat Anodize RoHS  
*Available for aluminum and  
titanium*







Bead Blast Surface

*Available for all  
machined materials*



## Bead Blast

To achieve a bead blast finish, a part is cleaned, deburred, and placed in an abrasive blaster where surface deposits are removed by applying fine glass beads at high pressure. This only introduces as much pressure as necessary to smooth surface, removing tool marks, and will not damage the surface. Bead blasting produces a matte surface finish.







MIL-DTL-5541, Type II,  
Class 1A Clear Chromate RoHS

## Chem Film (Chromate Conversion Coating)

This finish provides corrosion resistance and has good conductivity properties. Chem film can be used as a base for powder coating and may leave a part's surface yellow or gold. The finish adds very little thickness of about 0.00001" - 0.00004" and conforms to MIL-DTL-5541.



MIL-DTL\_5541, Type I,  
Class 1A Yellow Chromate  
non RoHS

*Available for aluminum  
and titanium*







## Electroless Nickel Plating

This finish provides uniform nickel coating, which offers protection from corrosion, oxidation, and wear on irregular surfaces. The finished part will have a bright nickel color and the coating slightly smoothes the underlying surface. This finish thickness starts at 0.0001", and the finish properties conform to MIL-C-26074.

MIL-C-26074, Grade B,  
Class 1 Electroless Nickel RoHS

*Available for all conductive  
metals*





## Electropolishing

Adding an electropolish finish involves the mechanical cleaning steel parts using an electric current to reduce corrosion and improve appearance. This makes the metal brighter and removes about 0.0001" - 0.0025" of the part's metal surface. This finish conforms to ASTM B912.

ASTM B917 , Electropolished Parts  
*Available for all conductive  
metals*







## Heat Treatment

Heat treatment of metal parts can improve material properties. Heat-treated parts may appear darker than the base material depending on the treatment. Types of heat treatments include Rockwell heat treatment and annealing. Heat treatments conform to ASTM B917.

ASTM B917, Heat Treatment  
*Available for steel and  
stainless steel*





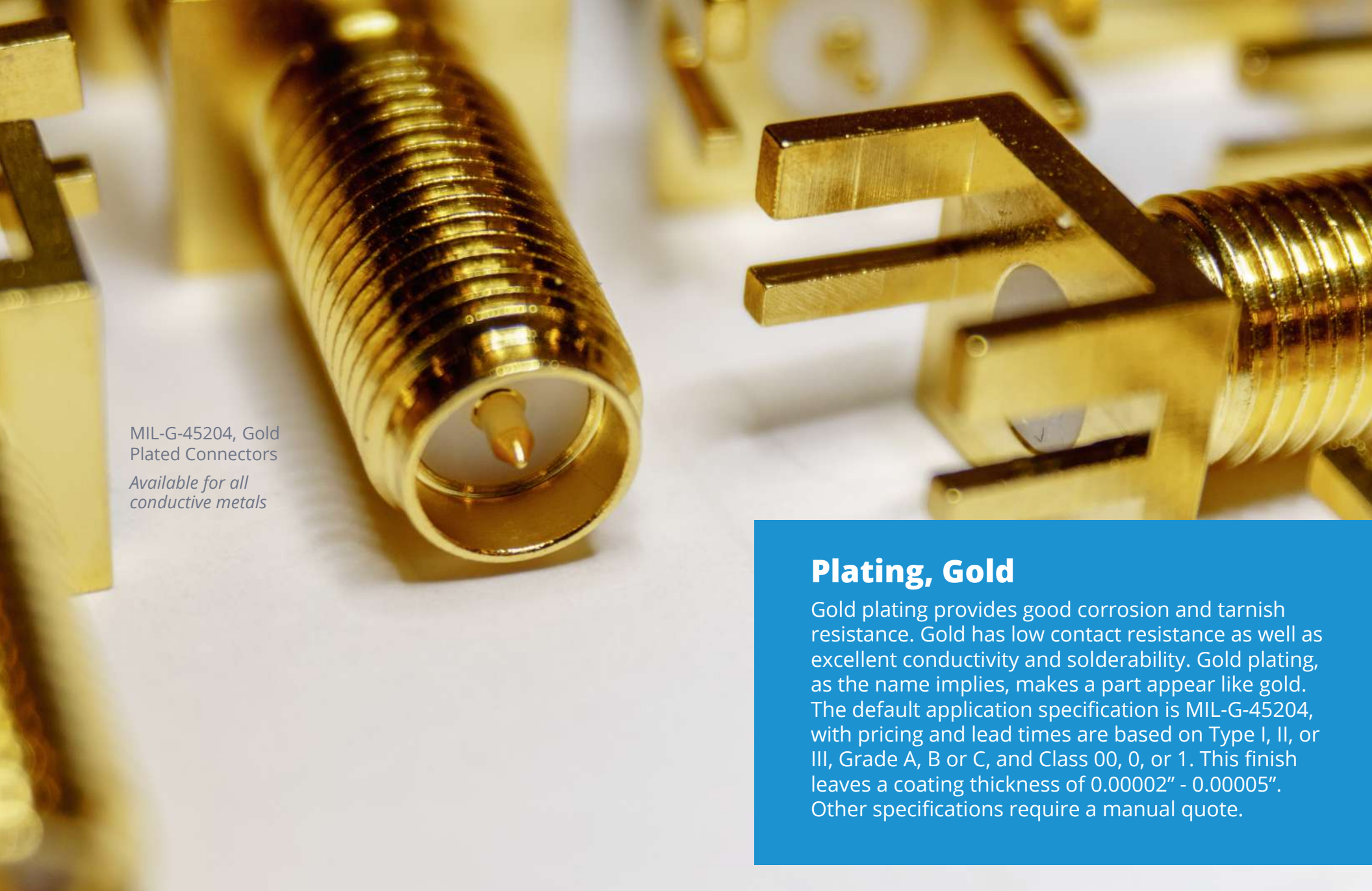
ASTM A967, Passivated  
17-4 PH , Stainless Steel  
*Available for stainless  
steels*

## Passivation

This finish improves the corrosion resistance for 200, 300, and 400 series steel and precipitation-hardened, corrosion-resistant steels. It is often used as a cleaning step prior to packaging. The added thickness is extremely thin, at about 0.000001". This finish conforms to ASTM A967.





A close-up photograph of several gold-plated connectors. In the foreground, a cylindrical connector with a threaded exterior and a central pin is shown. To its right, another connector with a more complex, multi-faceted design is visible. The background is filled with other similar components, all exhibiting a bright, reflective gold finish.


MIL-G-45204, Gold  
Plated Connectors

*Available for all  
conductive metals*

## Plating, Gold

Gold plating provides good corrosion and tarnish resistance. Gold has low contact resistance as well as excellent conductivity and solderability. Gold plating, as the name implies, makes a part appear like gold. The default application specification is MIL-G-45204, with pricing and lead times are based on Type I, II, or III, Grade A, B or C, and Class 00, 0, or 1. This finish leaves a coating thickness of 0.00002" - 0.00005". Other specifications require a manual quote.



A close-up photograph of a person's hand holding a black spray gun, applying a bright orange powder coating to a metal part. The metal part is a circular disc with several small holes, hanging from a chain. The background is a blurred industrial setting with a bright light source.

ASTM D7803 Orange  
Matte Powder Coat  
*Available for all  
conductive metals*

## Powder Coating

A powder coat finish provides a continuous, protective color finish on parts using an evenly applied, heat-cured paint. A conductive surface is needed for a powder coat to be applied. This finish has a matte appearance with a typical coating thickness of 0.006" - 0.012". If specified, a semi-gloss or gloss can be achieved. Powder coat conforms to ASTM D7803.





# Post-Processing Services From Certified Finishing Suppliers

## Anodizing:

- Type II Anodize
- Type III Hard coat
- Type III w/ PTFE
- Vortex Anodizing

## Metal Plating:

- Nickel Plating
- Copper Plating
- Electroless Nickel
- Electrolytic Nickel
- Gold
- Nickel Sulfamate
- Silver
- Tin
- Zinc
- Zinc Nickel

## Adhesives and Coatings:

- Dry Film Lubricants
- E-Coat
- Silk Screening and Marking
- Heat Treat
- Powder Coat

- Reflective Coating
- Rubber to Metal
- Adhesive Coating
- Wet Paint
- Zinc Rich Coating

## Conversion and Pretreatments:

- Aluminum Conversion Coating
- Manganese Phosphate
- Parts Washing
- Passivation
- Pickle and Oil
- Zinc Phosphate

## Mechanical Finishing:

- Blasting
- Deburring
- Shot Peening

## Proprietary Finishing Services:

- ARP Acid Etch™

- BLAKTICAL SIX™
- CastGuard™
- EnduraGuard™
- FrostKote™
- Medi-Black™
- NiCoTef®
- NiTuff®
- NorKote™
- NorLast™
- NorLube™
- Optical Black™
- Vortex Anodizing
- Military Spec Coatings

## Certifications:

- ISO 9001:2015
- AS 9100D
- NADCAP AS7004
- NADCAP AS7108
- ITAR
- ISO 98001
- ISO 14001
- ISO 13485
- DRG3
- RoHS

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