

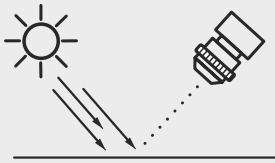
Optical Black

Uniquely Designed Anodize for Demanding Environments

Enhancing Performance Across Ultraviolet (UV), Visible, and Infrared (IR) Spectrums

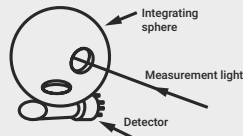


BRDF Reflectivity (5° AOI)



Optical Black	Conventional Anodize
0.82 2.19 Steradians	1.74 0.58 Steradians

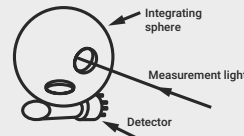
Anti-Reflective (ASTM E903)



Spectrum	Optical Black	Conventional Anodize
Ultraviolet 250-380nm	3.34%	5.70%
Visible 380-780nm	3.63%	9.30%
Infrared Near IR	7.37%	54.70%
Mid IR	7.90%	18.18%

Avg Reflectivity

Solar Absorptivity (7° AOI) (ASTM E903)



Optical Black	Conventional Anodize
0.96	0.66

Thermal Emittance (ASTM E903)



Optical Black	Conventional Anodize
0.93	0.85

Where x = 1 is Max Efficiency

Core Purpose: Satellite Application

- Visual Concealment
- Thermal Management
- Survivability (UV Resistant)
- Anti-Outgas (Inorganic Color Stability)

Core Applications

- Satellite Structure
- Opto-Communications
- Electronic Guidance



About Pioneer Metal Finishing

Starting in 1945, Pioneer has focused on being a premier metal finisher partner for our customers. We exist to be an extension of our customers' business, providing value-added services that improve the performance of their products. This focus has led us to operate 11 facilities in the United States and Mexico, providing a full spectrum of finishing services.

ISO 9001
Registered

Nadcap



FFL Accredited



11 NORTH AMERICAN LOCATIONS
4,000 INDUSTRY SPECIFICATIONS
800,000 SQ. FT. OF MANUFACTURING
600,000,000 PARTS PROCESSED ANNUALLY

All Pioneer Processes

Adhesives & Coatings

Dry Film Lubricant
Heat Reflective Coating
Paint
Powder Coating
Rubber to Metal
Adhesive Coating
Zinc Rich Coating

Aluminum Anodize

Type II Anodize
Type III Hardcoat
Type III with PTFE

Conversions & Pretreatments

Aluminum Conversion
Coating
Aluminum Heat
Treatment
Manganese Phosphate
Zinc Phosphate
Pickle & Oil
NDT: Non-Destructive
Testing

Finishing

Blasting
Parts Washing
Electropolishing
Aluminum Passivation
Stainless Steel
Passivation

Plating

Black Nickel
Copper
Electroless Nickel
Electrolytic Nickel
Functional Hard
Chrome
Gold
Nickel Sulfamate
Silver
Tin
Zinc

Proprietary Finishing Services

ARP Acid Etch™
CastGuard™
EnduraGuard™
FrostKote™
Medi-Black™
NiCoTef™
NiTuff®
NorGuard™
NorKote™
NorLast™
NorLube™
Optical Black®
Steri-Safe™
Vortex Anodizing

Request a quote at: rfq@pioneermetal.com



Pioneer
METAL FINISHING

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