metalphoto®

Photosensitive Anodized Aluminum

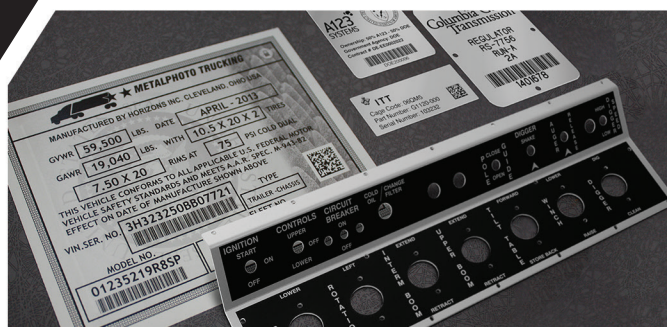
Trusted where permanent identification is critical.

NAMEPLATES

LABELS

PANELS

SIGNS

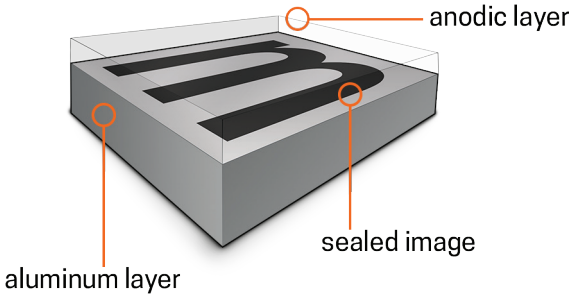


Metalphoto® is photosensitive, anodized aluminum used to make durable, high-resolution nameplates, labels, control panels, and signs.

Metalphoto's durability comes from its image – which is sealed inside of the anodized aluminum, providing resistance to corrosion, sunlight, abrasion, high temperatures and chemical exposure.

Since 1950, Metalphoto has been trusted by leading OEMs, military and government organizations for applications that require one or more of Metalphoto's unique combination of features, including:

Cross Section



DURABLE CONSTRUCTION

Metalphoto's silver-halide based image is sealed inside of anodized aluminum, making it readable after prolonged exposure to harsh operating conditions including weather/sunlight, heat, abrasion, chemicals & salt-spray.

VARIABLE INFORMATION CAPABILITY

Metalphoto labels and nameplates support item-unique serialize data, one-of-a-kind instructions or barcodes of any symbology that reduce data entry errors and speed asset tracking.

PHOTOGRAPHIC RESOLUTION

Metalphoto's high image resolution makes it possible to mark small items or surfaces and provides the option of security printing features such as micro-text and watermarks.

PROVEN PERFORMANCE

Metalphoto has proven itself again and again to major OEMs and government organizations. As a result, most major government, industrial and military organizations specify Metalphoto.

For more information visit
metalphoto.com.

Performance Characteristics:

Condition	Result
Abrasion Resistance	No pronounced image loss, degradation or reduced readability after 7,000 cycles on an abrading wheel.
Acid Corrosion	No deterioration or image degradation after 24 hours in 3% nitric acid.
Heat Resistance	Standard Metalphoto readable up to 500°F, Image Intensified Metalphoto readable up to 800°F. Both tested for a 24-hour oven exposure. Inquire for heat resistance up to 1,000°F with Extra High Temperature (XHT) treatment.
Salt Spray Corrosion	No deleterious effect after a 720-hr salt spray (fog) test. 2,6 "Very Good" corrosion resistance after 113 days seawater exposure.
Accelerated Light and Weather Resistance	No pronounced deterioration of legibility after 400-hr carbon arc weatherometer exposure. (Estimated 20+ year outdoor life)
Accelerated Oxygen Aging	No discoloration or fading after 96-hr/300 psi/ 70°C oxygen bomb aging
Stain Resistance	No black fading when plates are exposed to tincture of iodine.
Cleaning Resistance	No deleterious effects when tested with alkaline cleaners (MILC-87937 or equivalent) for aircraft surfaces.
Low Temperature Resistance	No deleterious effect or image fade after 1 hour at -50°F. No impairment of legibility upon exposure at -67°F.
Organic Solvent Resistance	No softening, staining or noticeable fade after 24-hr exposure to: JP-4 fuel, Gasoline, Mineral Spirits, Methyl Ethyl Ketone, Turpentine, Turbine & Jet Fuel, Kerosene, Xylol, Acetone, Toluol, Heptane, Trichlorethylene, MIL-H-5606 Hydraulic Fluid and MIL-L-7808 Jet Engine Oil.
Fungus Resistance	Visual reading of "0" per ASTM-G21.
Thermal Shock	No deterioration after 3 cycles between -65°C and 125°C
Moisture Resistance	No deterioration after 10 humidity cycles per MIL-STD-202, method 106.

*Horizons ISG does not warrant performance of its materials in any environment.

Specified by Government, Industrial and Military Organizations for Over 65 Years:

- Federal Specification GGP-455B
- MIL-DTL-15024G
- MIL-STD-130
- MIL-P-19834B
- A-A-50271 Class-2 Composition C
- MIL-DTL-19834C
- MIL-P-6906B
- MIL-A-8625F
- SAE-AMS-QQ-A-250/1
- UL / REACH / RoHS Certified

Specified By:

Lockheed Martin · U.S. Army · Honeywell · Boeing · BFGoodrich · Sikorsky (A United Technologies Company) · Underwriters Laboratories Inc.® · NASA · Great Dane Trailers · National Oilwell Varco · General Dynamics · Huntington Ingalls Industries

For more information visit **metalphoto.com**.

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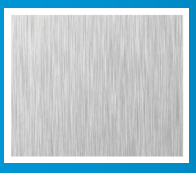
Product Characteristics:

- Material: anodized aluminum (1100 alloy)
- Sizes: 10" x 12", 12" x 20", 20" x 24", 20" x 40", 24" x 40"
- Thicknesses: .003", .005", .008", .012", .020", .032", .039", .063", .090", .125"

Finishes:

Matte

Non-reflective with dull finish.



Satin

Semi-gloss medium reflective material.

#4

Brushed to resemble a stainless steel finish.

Gloss

Highly reflective; mirror-like.

METALPHOTO® DURABILITY CHARACTERISTICS

SPECIFIC CHARACTERISITIC	TEST CONDITION	EFFECT
Exterior Exposure	**Black and silver image exceeds 400 hr. Weatherometer Test GG-P-455b, estimated equivalent to 20 yr. exposure**	**No effect**
Abrasion Resistance	**Taber Abraser with CS17 wheel, a total of 1000 gm. load, 7000 cycles**	**Slight dulling of surface**
Temperature Resistance	**No legibility loss or surface degradation when exposed to temperatures up to 750°F for one hour with image-intensified Metalphoto (non-intensified Metalphoto achieves similar results at 400°F). Heat resistance of up to 1,000°F is achievable. Please contact Horizons ISG to learn more.**	
Salt Spray	**5% at 95°F for 700 hrs.**	**No corrosion**
Chemical Resistance		
MIL-S-3136 111 Hydrocarbon Fluid	1 hr. immersion	No effect
MIL-L-5161C-Turbine and jet engine fuel	1 hr. immersion	No effect
JP-4 fuel	72 hr. immersion	No effect
Kerosene	12 hr. immersion	No effect
Skydrol (Hydraulic Fluid)	24 hr. immersion, at both room temperature and boiling point	No effect
Methyl Ethyl Ketone (MEK)	24 hr. immersion	No effect
Ethyl Acetate	24 hr. immersion	No effect
Xylol	72 hr. immersion	No effect
Heptane	72 hr. immersion	No effect
Ethyl Alcohol	72 hr. immersion	No effect
Ferric Chloride	10% solution, 16 hr. immersion	No effect
Ammonium Hydroxide	10% solution, 16 hr. immersion	Slight dulling
MIL-P-21563 soap solution	16 hr. immersion	No effect
MIL-C-25179 AIN in heptane	25% solution, 1 min. immersion (cleaning solution)	No effect
Sulfuric Acid	10% solution, 24 hr. immersion	No effect
Phosphoric Acid	1% solution, 12 hr. immersion	No effect
Nitric Acid	3% solution, 72 hr. immersion	No effect
TSP (Trisodium Phosphate)	1% solution, 40 hr. immersion	No effect

METALPHOTO PRODUCT SPECIFICATIONS

SPECIFICATION	PUBLICATION	DETAIL	DESCRIPTION
GG-P-455b	Federal Specification	Type I, Grade A or B Classes 1 & 2	Photosensitive anodized aluminum impregnated with silver compounds printable on one or two sides—all finishes and thicknesses.
MIL-P-15024G	Military Specification	Type H & G	Totally anodized aluminum with characters integrated into the anodized layer photographically using silver compounds.
MIL-P-19834B	Military Specification	Type I or II, Style III or IV	Metalphoto .003" thick plates with the proper adhesive applied meets or exceeds all of the performance requirements of this spec.
MIL-P-514D	Military Specification	Composition C	Photosensitive aluminum plates, grade and class as specified in federal specification GG-P-455b.
Industrial—Commercial Products	Original Equipment Panel Fronts Nameplates	Metalphoto products	Material shall be Metalphoto. Image (black on silver or silver on black) shall be sealed into the anodized layer with photosensitive silver compounds; colors other than black may be imbedded by resist or screen process.

*Metalphoto is a registered trademark of Horizons Research Incorporated.

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METALPHOTO

A DIVISION OF HORIZONS RESEARCH INCORPORATED

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