

Metalphoto® Case Study:

Transportation Asset Identification

A leading manufacturer of tractor trailers and shipping containers found that nameplates made of Metalphoto® photosensitive anodized aluminum have greater durability and legibility than etched stainless steel at a fraction of the price.



Problem: Difficult to Read Data Plates

Many truck trailer and container manufacturers, historically used etched and filled stainless steel for CSC Safety Approval Plates and VIN Data Plates. However, after years of abuse from road salt, impact abrasion and sunlight exposure, the etched plates can be difficult to read. Illegible nameplates can lead to replacement costs, inability to track trailer location and maintenance, safety hazards and, in some cases, regulatory fines.

Also, because etched plates are stamped with human-readable numbers, they can lead to human error and added labor cost. After a series of failures from damaged or illegible plates, a leading transportation equipment OEM needed a VIN Data Plate solution that would both last the life of the trailer and support machine readable bar codes.

Solution: Metalphoto®

Metalphoto® photosensitive anodized aluminum was identified as a solution. Metalphoto incorporates variable data barcode labels into VIN Data Plates while providing better image durability and lower cost than etched steel. Metalphoto has five key advantages over etched stainless steel:

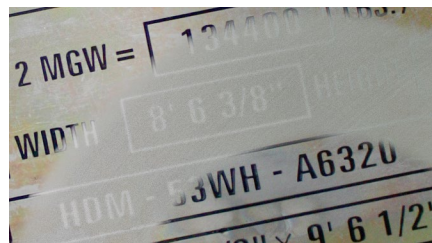
Causes of VIN Plate readability failure.



Weather/Sunlight Degradation and Fading



Road Salt Corrosion Damage



Abrasion Damage

- **Durability:** The Metalphoto image remains readable after prolonged exposure to salt water, synthetic road salts, sunlight/weather and impact abrasion.
- **Legibility:** Metalphoto graphics are cleaner and of higher resolution than etched stainless steel. That makes for great looking VIN plates but more importantly, it allows one to effectively incorporate the use of machine readable bar codes for asset tracking.
- **Affordability:** Metalphoto parts typically cost 10-20% less than etched and filled stainless steel.
- **Availability:** Metalphoto is available from a network of qualified converters worldwide. Alternatively, Metalphoto can be produced on site for just-in-time printing requirements.
- **Sustainability:** Metalphoto is an environmentally sustainable process that has minimal environmental impact.

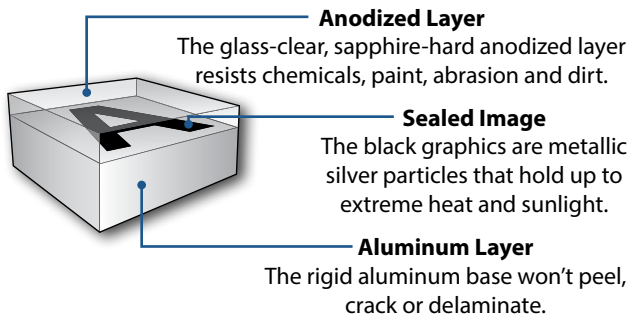
Metalphoto Durability

Trailers, chassis and converter dollies and shipping containers are subject to prolonged exposure to extreme elements. Degradation from road salt, ocean spray, abrasion, sunlight and weather threatens the readability of CSC Safety Approval Plates and VIN Data Plates. Metalphoto photosensitive anodized aluminum is a unique imaging technology that stands up to harsh operating conditions. The UV-stable, inorganic Metalphoto image is permanently sealed inside of anodized aluminum, offering unparalleled durability and image resolution. Since 1958, Metalphoto has been specified for applications where durability is critical.

Metalphoto Application	Environmental Conditions	In Use Since
Aircraft Landing Gear Labels	<ul style="list-style-type: none"> • Extreme temperature cycling • Hydraulic & brake fluid exposure • Sunlight & humidity exposure 	1988 to present
International Space Station Labels	<ul style="list-style-type: none"> • Extreme temperature cycling • Sunlight UV radiation exposure 	2000 to present
Off-Shore Crane Nameplates, Labels and Operator Control Panels	<ul style="list-style-type: none"> • Sustained sunlight/weather exposure • Impact abrasion • Salt-spray corrosion • Hydraulic fluid exposure 	1987 to present
Bradley Fighting Vehicle & Abrams Tank	<ul style="list-style-type: none"> • Sustained sunlight/weather exposure • Sand & impact abrasion • Extreme temperature cycling 	1995 to present
USS Ronald Reagan Nimitz-Class Nuclear-Powered Aircraft Carrier Shipboard Labels	<ul style="list-style-type: none"> • Sustained sunlight/weather exposure • Salt-spray corrosion • Impact abrasion 	1998 to present

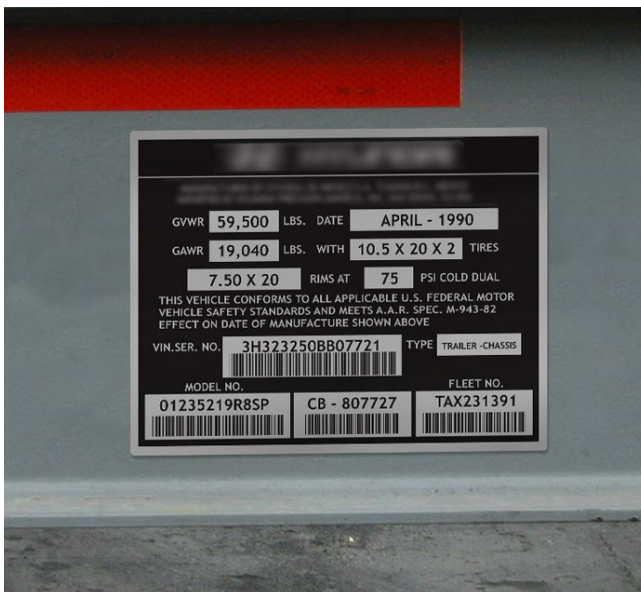
Detailed Metalphoto performance specifications are available at www.metalphoto.com.

Metalphoto Technology



Metalphoto Legibility

As a photographic medium, Metalphoto affords ultra-high image resolution and contrast – ideal for bar code labels. Machine readable bar code labels reduce human error and labor cost. Reducing errors and saving time is especially critical in the transportation industry where equipment must be where it needs to be, when it needs to be there and in working order. Etch and filled stainless steel is simply unable to hold consistently readable linear and data matrix bar code symbols. For this transportation OEM, Metalphoto's ability to hold durable bar code labels was a key advantage.



Metalphoto Affordability

In addition to the ability to incorporate long-lasting and durable bar codes, the high cost of stainless steel was of concern. Metalphoto nameplates can cost up to 30% less than etched and filled stainless steel due to material cost and processing labor costs.

- **Material Costs:** an equivalently sized Metalphoto nameplate (same gauge, same area) is typically 10-20% less than a similar product made of stainless steel due to the lower cost and weight of aluminum (aluminum = 2.70 g/cm³ vs. steel = 7.85 g/cm³).
- **Labor Processing Costs:** imaging and fabricating Metalphoto is a less labor intensive process than etched and filled stainless steel. Etching steel requires four steps (coat, expose, acid etch, ink fill) where as Metalphoto only requires three quick (expose, develop, seal). Moreover, steel's hardness adds complexity to fabrication.

Metalphoto Availability

Customers interested in integrating the durability of Metalphoto into their product designs can purchase finished parts from Metalphoto of Cincinnati. MPC is trusted by leaders in the transportation industry, and our experience with a variety of medium and large OEMs and shippers in the transportation space gives us the ability to properly design and manufacture a variety of identification items.

Metalphoto Sustainability

The Metalphoto Processing System is designed for reduced environmental impact. Processing solutions use low VOCs and all waste streams are neutralized or collected during the production process. Additionally, Metalphoto is designed for permanency – it

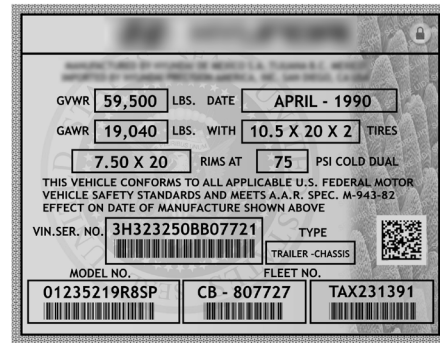
4 Metalphoto of Cincinnati

will not need to be replaced. If replacement is desired, Metalphoto is easily recycled.

Conclusion

Leading OEMs trust Metalphoto because of its superior durability, ability to hold variable information bar codes and affordable price. However, others are beginning to take notice of Metalphoto's versatile characteristics. Beyond durability, the Metalphoto material enables several value-added options that remove human error and protect assets from counterfeiting and destruction:

- **Anti-counterfeit:** because Metalphoto is a photographic technology, it affords covert and overt anti-counterfeit measures that make it a trusted deterrent for highly counterfeited products.
- **SandShield™:** for extreme durability in caustic or ultra-abrasive environments, Metalphoto's SandShield over-laminate adds extra protection.



About Metalphoto:

For over 50 years, industrial and military engineers have specified Metalphoto photosensitive anodized aluminum in applications where permanent product identification is critical. Metalphoto's proprietary technology permanently seals a UV-stable image inside of anodized aluminum, offering the confidence of unparalleled durability, image resolution and readability. Metalphoto is used for component labels, machine nameplates, barcode labels, operator control panels, maintenance schematics, architectural signage and many more applications where permanent identification is critical.



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