



Titanium Technical Data Overview



InvariMatte® Titanium

Product Description

InvariMatte® is a non-directional, low gloss, matte textured titanium finish with a dull bead blast appearance and superior soil resistance designed for use in architectural applications. While its lower reflectivity lends itself to roofing applications, it can be applied to wall panels, coping and trim. Since InvariMatte® has no coatings to deteriorate, it will last indefinitely with little maintenance.

Grade Selection

Optimal performance of InvariMatte® is assured by its highly engineered properties, which appear in Table I. Grade 2 is appropriate for most applications. Other grades may be considered where design parameters such as wind resistance require elevated mechanical properties. It should be noted that grades with higher mechanical properties will be somewhat more difficult to fabricate. For most applications, Grade 2 offers a practical balance between formability and strength. InvariMatte® is at home in severe environments, such as seacoast atmospheres subjected to salt water spray.

Pounds Per Piece

Thickness (in.) x Width (in.) x Length (in.) x .163

Available Sizes

Please refer to Table II. Coils and cut lengths up to 288" are available.

Typical Surface Characteristics

| | |
|----------------------------------|-----|
| Spectral Gloss @ 85° | <20 |
| Ra | 85 |
| Peak count per square inch | 200 |

| Table I | | Grade 2 |
|--|-------------|------------|
| CHEMICAL ANALYSIS | | |
| Titanium | | 99.2% min. |
| C, Fe, H, N, O | | .705% max. |
| TYPICAL MECHANICAL PROPERTIES | | |
| Yield Strength (psi) | | 40,000 |
| Elongation in 2 inches | | 20% |
| Hardness (Rockwell B) | | 80 |
| PHYSICAL PROPERTIES | | |
| Density (lb./cu. in.) | | .163 |
| Modulus of Elasticity in Tension (x 10 ⁶ lb./sq. in.) | | 15.0 |
| Mean Coefficient of Thermal Expansion per °F (x 10 ⁻⁶) | 32 - 212°F | 4.8 |
| | 32 - 600°F | 5.1 |
| | 32 - 1000°F | 5.4 |
| Melting Point Range °F | | 3,030 |

| Table II | Size Range (inches) | | | | |
|--------------|---------------------|-----------|---------|----------|----------|
| | WIDTH | | | | |
| THICKNESS | .75 - 18 | >18 - <24 | 24 - 36 | >36 - 48 | >48 - 60 |
| .0291 - .075 | ● | ● | ● | ● | |
| .0178 - .029 | ● | ● | ● | ● | |
| .015 - .0177 | ● | ● | ● | ● | |

Fabrication

InvariMatte® is readily welded or soldered. While formation of a heat tint scale can be avoided through use of shield gasses, care must be taken to remove this scale through chemical means. Flux residue must be thoroughly removed after soldering. Since InvariMatte® is essentially non-directional, it is not necessary to orient panels in relation to the rolling direction. However, to avoid the possibility that any subtle directional differences will be visible, we recommend panels be fabricated to maintain orientation of the original sheet alignment.

Titanium's relatively low modulus of elasticity, compared to other metals like stainless steel, results in substantial springback behavior during forming. This must be accounted for in tooling setups. Further, bend radii that are more generous than those used for most other metals are recommended. Additionally, titanium is more susceptible to galling than other metals and may require a more aggressive lubrication technique.

Fire Resistance

Titanium is a high melting point alloy which will provide superior resistance to fire damage than lower melting point alloys and combustible materials.

Flatness

InvariMatte® is supplied within five I units of flatness, which is well below standard commercial allowances.

Installation

InvariMatte® is supplied with a high grade UV resistant protective plastic covering designed to withstand the elements for several weeks. However, it is advisable to remove this material promptly after installation to prevent adhesive residue from remaining on the finish.

Despite the uniform finish, titanium has a certain degree of natural color variation. It should be further noted that any metallic surface, even a painted one, is sensitive to misalignment of panels on differing planes. Care should be taken to ensure installation within reasonable tolerances in order to maximize visual consistency in panels. After installation is completed, any rust stains from tools or construction debris must be removed.

Maintenance

Designed to be essentially maintenance free, InvariMatte® will last indefinitely without requiring attention. It may, however, be appropriate to clean the surface to maintain its original appearance. Any detergent/ammonia solution can be effective for general cleaning. There are a variety of aerospace cleaners and solvents on the market that are appropriate to address stains and adhesive residues.

Environmental Impact

Titanium is recyclable and extremely stable at ambient temperatures. Further, without VOC emissions, which are inherent in coated products, InvariMatte® is an environmentally sensible solution.

Warranty

For warranty information, please contact a representative.