

Product Data Sheet

Type 316L Austenitic Steel Powder for Laser Cladding and PTA

Powder Products: Metco 1016A

1 Introduction

Metco 1016A is a 316L stainless steel powder specifically developed for laser cladding and PTA overlays.

Metco 1016A is widely used in industrial applications where corrosion resistance is the prime objective in markets such as oil & gas, chemical, food processing, geothermal and defense.

Metco 1016A is appropriate for use on iron-based substrates to produce a thin layer of a highly corrosion resistant coating. Overlays are highly resistant to pitting corrosion.

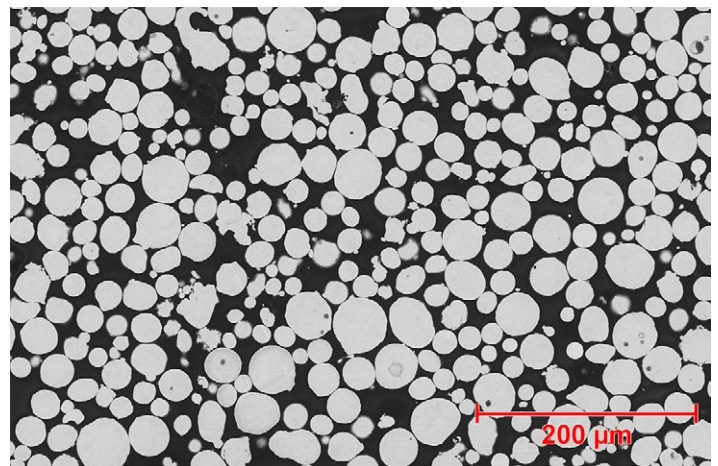
As a 316L material, Metco 1016A is a superior choice for high corrosion and high temperature applications. Since 316L contains less carbon than 316, it has better intergranular corrosion resistance, meaning overlays of Metco 1016A won't decay, unlike overlays of 316 stainless steel.

1.2 Typical User and Applications

- Pipe IDs
- Vessels used in oil & gas, petrochemical and geothermal applications
- Valves
- Heat exchangers
- Separators used in oil & gas and petrochemical applications
- Marine applications
- Augers for food processing
- Dimensional restoration

Quick Facts

Classification	Alloy, iron-based
Chemistry	Fe 17Cr 12Ni 2.5Mo 2.3Si
Manufacture	Gas atomized powder
Morphology	Spherical
Overlay Hardness	190 to 230 HV ₁₀
Wear Resistance	77 mm ³ volume loss (ASTM G65B)
Slurry Abrasion	880 SAR (slurry abrasion response)
Purpose	Corrosion resistance
Processes	Laser Cladding, PTA



SEM photomicrograph showing typical powder morphology for Metco 1016A

2 Material Information

2.1 Chemical Composition (nominal wt. %)

Product	Fe	Cr	Ni	Mo	Si
Metco 1016A	Bal	17	12	2.5	2.3

2.2 Particle Size Distribution and Other Characteristics

Product	Nominal Particle Size Distribution (µm)	Morphology	Manufacturing Method
Metco 1016A	-106 +45	Spheroidal	Gas Atomized

Upper particle size determined by sieve analysis, lower particle size analysis by laser diffraction (Microtrac).

2.2 Key Selection Criteria

- Select Metco 1016A for applications where corrosion resistance is the primary concern and where a 316L overlay offers superior corrosion resistance compared to 316 or 304 stainless steel.
- Metco 1016A is recommended for laser cladding where deposits exhibiting corrosion, pitting and cavitation resistance, creep and stress rupture at elevated temperatures are desired. It can also be used for repair or buildup of steel parts.
- When applied using laser cladding or PTA, deposits of Metco 1016A are non-cracking.
- Deposits of Metco 1016A exhibit better carbide precipitation resistance than 316 stainless steel.
- Metco 1016A overlays can be used in applications where continuous service temperatures up to 857 °C (1575 °F), which is not advisable for AISI 316 surfaces.
- Metco 1016A has low carbon content that desensitizes the

clad deposit to eliminate grain boundary carbide precipitation. The properties are similar to, or better than, that of the bulk material because of the refined microstructure and low dilution during cladding. Silicon levels in Metco 1016A are higher than AISI Type 316L. The higher silicon content acts as a fluxing agent that produces cleaner clad deposits. Please note that cladding parameters may have to be adjusted to accommodate the higher silicon content.

2.3 Related Products

- Metco 1220A has better cavitation resistance than Metco 1016A, and offers better resistance to corrosion, wear, abrasion and scratch formation.
- Metco 1625B is a nickel-based powder similar to Inconel 625 which may have better corrosion resistance than Metco 1016A in some applications.

3 Key Coating Information

3.1 Coating Development

For specific coating application requirements, the services of Metco Joining & Cladding's Coating Solution Centers are available. Please contact your Metco Joining & Cladding Account Manager for more information.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Form	Size	Package Size	Availability	Distribution
Metco 1016A	2280147	Powder	-106 +45 µm	11 lb (5 kg)	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location
- For powders, tumble contents prior to use to prevent segregation
- Open containers of powder should be stored in a drying oven to prevent moisture pickup

4.3 Safety Recommendations

See the SDS (Safety Data Sheet) 50-1600 in the localized version applicable to the country where the material will be used. SDS are available from the Metco Joining & Cladding web site at www.metcojoiningcladding.com (Resources – Safety Data Sheets).