metco
joining & cladding

Material Product Data Sheet
Nickel-Based Superalloy Powders and Wires

Powder Products:
Amdry 718 Cl. B, Metco™ 1625 Series,
Metco 1700 Series

Quick Facts	
Classification	Alloys, nickel-based
Chemistry	NiCrMo (various)
Manufacture	
Powder	Gas or water atomized
Wire	Solid drawn wire
Morphology (powder)	Spheroidal or irregular
Purpose	Corrosion and oxidation resistance
Service Temperature	
Oxidation:	≤ 980 °C (1800 °F)
Corrosion & Wear:	≤ 875 °C (1600 °F)
Process	laser cladding, laser sintering, gas metal arc welding (GMAW), plasma transferred arc (PTA)

1 Introduction

Nickel-based superalloy products are well known for their resistance to many types of corrosive media, oxidation and creep at elevated temperatures.

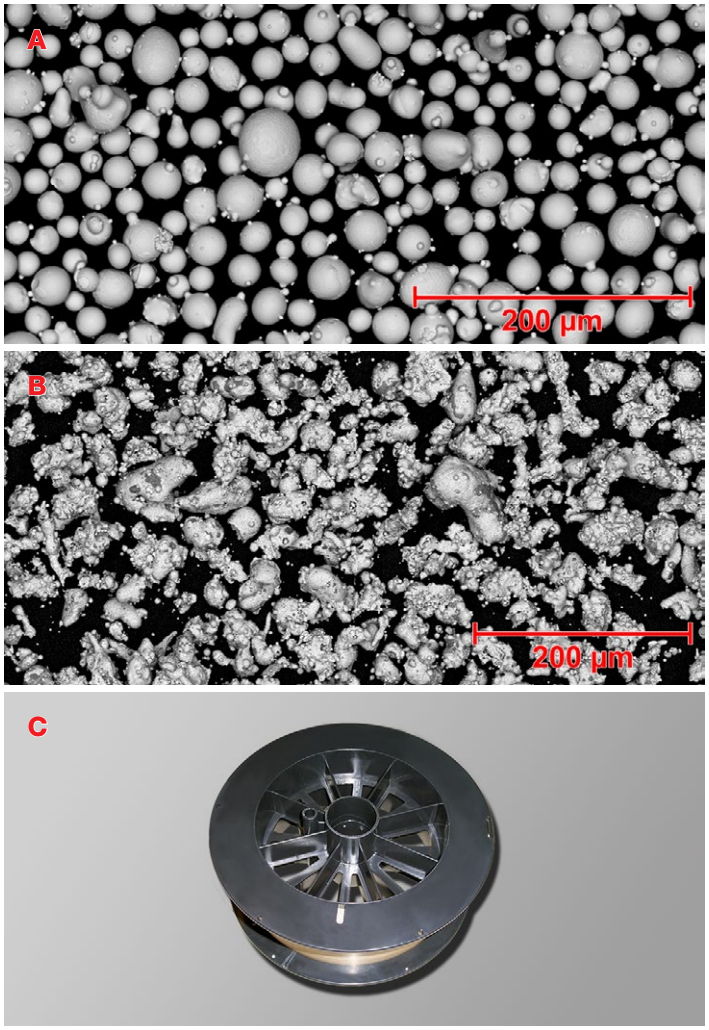
Metco Joining & Cladding offers a wide range of products for surfacing and restoration having compositions that are similar to well-known nickel-based superalloys on the market. In addition, our portfolio of products covers products optimized for laser cladding.

When choosing a composition from this portfolio, customers should consider the service environment and corrosive media involved. Some products in this portfolio contain hard phase components, or develop hard phase components during processing , that impart a degree of wear resistance, as well. Please see Section 2.4 for more information.

Powder products are atomized alloys ensuring that particles have a consistent composition. Wire products are all drawn solid alloys for best surfacing results.

1.1 Typical Uses and Applications

- Surface restoration of nickel-based superalloy components
- Repair of nickel-based superalloy components with similar base composition
- Overlay coatings to protect less noble substrates from corrosion and oxidation



A: Typical morphology of gas-atomized products. **B:** Typical morphology of water-atomized products. **C:** Dorn-style spool for wire products.

2 Material Information

2.1 Chemical Composition (nominal wt. %)

Product	Ni	Cr	Mo	Fe	W	Nb +Ta	Co	Ti	Cu	Al	Mn	C	Si	Zr	Other (max)
Powders:															
Metco 1700A	Bal.	15.5	16.0	4.0	4.5	---	---	---	---	---	---	---	---	---	1.0
Metco 1700B	Bal.	15.5	16.0	4.0	4.5	---	---	---	---	---	---	---	---	---	1.0
Metco 1625B	Bal.	21.5	9.0	≤ 5.0	---	4.0	---	---	---	---	---	---	---	---	2.0
Metco 1625F	Bal.	21.5	9.0	≤ 5.0	---	4.0	---	---	---	---	---	---	---	---	2.0
Amdry 718 Cl. B	Bal.	19.0	3.0	18.0	---	5.1	0.95	---	---	0.5	---	0.05	---	---	N.R.
Metco 1718A	Bal.	19.0	3.0	18.0	---	5.0	---	1.0	---	---	0.08	0.05	0.2	---	<0.5

2.2 Particle Size Distribution (Powders) and Other Characteristics

Product	Nominal Particle Size Distribution (µm) or Wire Diameter	Morphology	Manufacturing Method	Similar To	Previous Sold As
Powders:					
Metco 1700A	-125 +53	Spheroidal	Gas Atomized	Hastelloy C-276	MetcoClad C276-A
Metco 1700B	-125 +45				
Metco 1625B	-90 +45			Inconel 625	MetcoClad 625
Metco 1625F	-53 +20				MetcoClad 625F
Amdry 718 Cl. B	-90 +45			Inconel 718	
Metco 1718A	-90 +45				MetcoClad 718

Particle size equal to or above 45 µm determined by sieve analysis; below 45 µm by laser diffraction (Microtrac)

2.3 Recommended Processes

Product	LC / LS	GMAW	PTA
Powders:			
Metco 1700A	●		●
Metco 1700B	●		
Metco 1625B	●		
Metco 1625F	●		
Amdry 718 Cl. B	●		
Metco 1718A	●		

LC / LS = Laser Cladding / Laser Sintering; **GMAW** = Gas Metal Arc Welding (MIG), **PTA** = Plasma Transferred Arc

2.4 Key Selection Criteria

- In general, choose the product best suited to the application and processing requirements. When applicable, choose the product specified by the OEM.

Metco 1700 series

- Coatings of these materials exhibit excellent corrosion protection in a wide range of mediums and applications. Coatings are resistant to crevice corrosion, pitting, sulfuric acid, sour gas, chlorine and other halides.
- Consider these materials for components exposed to these environments, such as pulp digesters, bleach plants, flue gas desulfurization equipment, evaporators, heat exchangers or mixers.
- Clad deposits (Metco 1700A) resist the formation of grain-boundary precipitates in the heat-affected zone making this product an excellent choice for many chemical and petrochemical applications.

Metco 1625B and Metco 1625F

- These products produce coatings that are resistant to oxidation and hot gas corrosion at elevated temperatures. They are also resistant to a wide range of corrosive media and protect against intercrystalline, pitting and crevice corrosion. When heated, coatings of these materials may form a stable passive film that protects the surface against additional chemical attack.
- Choose these products for applications exposed to seawater, mechanical stresses, oil and gas applications where sulfur is present, flue gas and flare stacks and hydrocarbon processing in tar sands and oil-shale recovery equipment.
- When laser cladding, choose Metco 1625B for most commonly used cladding nozzles and for thicker deposits at high deposition rates. Choose Metco 1625F for thin deposits as thin as 0.2 mm (0.008 in) and high speed laser cladding applications.

Amdry 718 Cl. B, Metco 1718A

- These products are appropriate for resistance to corrosion in a variety of media, creep resistance and excellent oxidation resistance up to 700 °C (1290 °F).
- Clad deposits (Amdry 718 Cl. B) are resistant to creep and stress rupture at elevated temperatures
- Consider these products for repair of nickel-based superalloy gas turbine and high-speed air frame parts, coatings for chemical processing equipment, and as a corrosion-resistant coating on steel components.

2.5 Related Products

- For materials similar to Stellite, Ultimet or MarM-509, please refer to our portfolio of cobalt-based superalloy materials designed for a variety of coating and industrial processes.
- Metco Joining & Cladding also offers a wide range of standard nickel-chromium and stainless steel powders and wires that can be used for bond coats, salvage or restoration, or as oxidation-resistant coatings.
- For higher temperature coatings that resist oxidation and hot corrosion, choose one of our MCrAlY materials. These materials provide excellent protection for gas turbine hot section components, such as on blades and vanes, or as a bond coat material for ceramic thermal barrier coatings used on combustor components, after burners, blades and vanes, as well as ceramic abradables used on shrouds and seals.

2.6 Customer Specifications

Product	Specification
Amdry 718 Cl. B	CFM International CP 6025 GE B50TF202, Cl B GKN Aerospace PM 819-59 MTU MTS 1376 MTU MTS 1439

3 Coating Information

3.1 Coating Parameters

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

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Wire Diameter (if applicable)	Package Size	Availability	Distribution
Metco 1700A	2280104	---	5 kg (approx. 12 lb)	Stock	Global
Metco 1700B	2280148	---	5 kg (approx. 12 lb)	Stock	Global
Metco 1625B	2295585	---	5 kg (approx. 12 lb)	Stock	Global
Metco 1625F	2280146	---	5 kg (approx. 12 lb)	Stock	Global
Amdry 718 Cl. B	1001048	---	5 lb (approx. 2.25 kg)	Stock	Global
Metco 1718A	2277038	---	5 kg (approx. 12 lb)	Stock	Global

Notes:
1. All wire products shipped on Dorn-style spools (plastic reels).
2. When purchasing many of these products from an Metco Joining & Cladding facility in Germany, an authorized German export license (BAFA) is required. Please contact your Metco Joining & Cladding Account Representative or Customer Service for more information.

4.2 Handling Recommendations

- Store in the original container in a dry location.
- For powder products, tumble contents gently prior to use to prevent segregation.
- Open containers of powder should be stored in a drying oven to prevent moisture pickup.
- Remove desiccant prior to use, if applicable.

Product	SDS No.
Metco 1700A	50-1324
Metco 1700B	50-1324
Metco 1625B	50-1470
Metco 1625F	50-1470
Amdry 718 Cl. B	50-789
Metco 1718A	50-789

4.3 Safety Recommendations

See the SDS (Safety Data Sheet) 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).

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