

Material Product Data Sheet

Pure Nickel Thermal Spray Wire

Thermal Spray Solid Wire Products: Metco Nickel

1 Introduction

Metco™ Nickel is used for corrosion protection in an alkaline environments. It also provides very high corrosion resistance in water, marine and melts. Coatings are well-adhered to the substrate and are relatively dense compared to many wire sprayed coatings. These properties allow this material to be useful for the restoration of nickel-based substrates. When necessary, coatings of Metco Nickel can be machined to dimension with fair surface finishes.

Metco Nickel coatings can also be used for chloride cleaning solutions and chemical applications. It is resistant to 320 °C (610 °F) in sulfuric acid environments. As thermal sprayed nickel coatings are inherently more porous than bulk nickel substrates, a sealer should be considered to fill the coating porosity thereby enhancing the corrosion resistance of the coating.

1.1 Typical Uses and Applications

- Corrosion resistant coating for chemical processing equipment
- Resistance to alkaline environments Corrosion resistance in marine and aqueous environments
- Resistance to sulfuric acid environments

Quick Facts

Classification	Wire, Ni-based
Chemical formula	Ni
Manufacture	Drawn wire
Melting Point	1455 °C (2651 °F)
Purpose	Corrosion protection
Process	Electric Arc Wire Spray or Combustion Wire Spray







2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)	
	Ni	Other
Metco Nickel	99.0 (min)	1.0 (max)

2.2 Morphology and Available Wire Sizes

Product	Morphology	Recommended Spray Process	Available Wire Diameters	
			1.6 mm (14 ga)	3.2 mm (1/8 in)
Metco Nickel	Solid		●	
Metco Nickel	Solid			●

-  Electric Arc Wire Spray
-  Combustion Wire Spray

2.3 Key Selection Criteria

Choose Metco Nickel for coatings that:

- Provide high corrosion resistance in alkaline and marine environments
- Provide corrosion protection on chemical processing equipment
- Resist weak sulfuric acid environments

2.4 Related Products

- Metco NiCu, a Monel-type wire, is a good choice for reducing environments.
- Oerlikon Metco offers wires with a variety of nickel-chromium based chemistries, which can be considered for higher temperature corrosion and oxidation. Please see datasheet DSMTS-0052 for more information on these products.
- Metco AlMg wire is recommended for weak alkaline environments and offshore applications.

- If application using thermal spray processes that employ powder feedstocks are preferred, Metco 56C-NS or Metco 56F-NS pure nickel powder can be used.
- For oxidation resistance up to 1100 °C (2010 °F) or resistance to acidic or alkaline solutions, Amdry 6200, Metco 101NS, Metco 101SF, Amdry 6204 and Metco 6203 can be used effectively. In addition to oxidation and corrosion resistance, those coatings provide good resistance to abrasive and sliding wear and are applied using atmospheric plasma spray.
- For weak acidic environments, particularly for chemical processing equipment, Amdry 6250 is recommended. This material is applied using the atmospheric plasma spray process.
- For more aggressive sulfuric environments, consider choosing an HVOF-sprayed NiCrMo alloy such as Diamalloy 4006.

2.5 Customer Specifications

Product	Customer Specification
Metco Nickel	American Welding Society (AWS) C2.25/C2.25M W-Ni-3

3 Coating Information

3.1 Key Thermal Spray Coating Information

Characteristic	Typical Data
Deposit Efficiency	65 – 75 %
Hardness	55 – 65 HRB
Coating Density	7.55 g/cm ³
Maximum Service Temperature	Dependent on application
Post Coat Processing	Due to the porous nature of coatings, application of a sealer may be needed to inhibit penetration of corrosives. See Sealer Datasheet DSMTS-0049.
Finishing	Machine / Grind

Values shown may vary from actual achieved values depending on the coating process, equipment, gun hardware, parameters used and the thickness of the applied coating. Refer to coating parameter sheets for starting point parameters and typical coating results on specific equipment.

3.2 Coating Parameters

Coating parameters for the following spray guns are available to Oerlikon Metco customers. Please contact your local Oerlikon Metco Account Representative. For specific application requirements, Oerlikon Metco Application Support Services are available.

When coatings with the lowest possible oxides are required, the SmartArc PPG gun is recommended because of its ability to use other types of atomizing gases, such as nitrogen.

Recommended Spray Guns

Electric Arc Wire	Combustion Wire
Metco LD/U2	Metco 16E series
SmartArc PPG	

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Wire Diameter	Package Size	Package Type	Availability	Dist.	Origin
Metco Nickel	1006307	3.2 mm (1/8 in)	25 lb (11.3 kg)	Coil	Stock	Global	U.S.A.
Metco Nickel	1034528	1.6 mm (14 ga)	25 lb (11.3 kg)	Dorn Spool	Special Order	Global	U.S.A.

4.2 Handling Recommendations

Store in the original container in a dry location.

4.3 Safety Recommendations

See SDS 50-235 (Safety Data Sheet) in the localized version for the country where the material will be used. SDS are available from the Oerlikon web site at www.oerlikon.com/metco (Resources – Safety Data Sheets).