oerlikon
metco

Material Product Data Sheet
Polyester Powder

Thermal Spray Powder Products:
Metco™ 600NS, Metco 600NS-1

1 Introduction

Oerlikon Metco's Polyester Powders are high temperature, materials that can be thermal sprayed to create low friction, self-lubricating coatings. They can be applied using standard Oerlikon Metco atmospheric plasma spray equipment, using argon/hydrogen or argon/helium plasma process gases. These materials cannot be plasma sprayed using nitrogen/hydrogen process gases, nor can they be applied using combustion powder Thermospray™ equipment.

Coatings of these materials can be finished by machining or grinding. They can be used at service temperatures up to 325 °C (600 °F).

Polyester coatings are useful for applications where a moderately low-friction, self-lubricating surface is required. Under light compressive loads, the coating surface becomes glazed and exhibits good sliding wear properties. Heavy compressive loads destroy the coating.

Metco 600NS and Metco 600NS-1 are often used as filler constituents in abradable powder compositions, either as a dislocation phase that remains in the coating or as a fugitive phase that can be burned out after the coating is applied to create a friable, porous coating structure. However, coatings of pure polyester are not recommended for abradable seals in clearance control applications.

1.1 Typical Uses and Applications

- As a filler constituent, either dislocator or fugitive, in abradable coating materials (note: pure polyester is not recommended for abradable coating applications).
- Applications where a moderately low friction, self-lubricating surface is required.
- Suitable for service temperatures up to 325 °C (600 °F).
- Suitable for use in applications with light compressive loading. Not recommended for heavy compressive loads or where resistance to impact required.
- Good sliding wear properties under light compressive loads.
- Not recommended where it is necessary for the coating to hold a sharp edge after machining.

Quick Facts	
Classification	Polyester powder
Chemistry	Crystalline aromatic powder
Manufacture	Reactor product
Morphology	Rounded
Purpose	Low friction, self-lubricating coating; filler constituent for abradable coatings
Apparent Density	0.6 g/cm^3
Service Temperature	≤ 325 °C (600 °F)
Decomposition Temperature	427 °C (800 °F)
Process	Atmospheric Plasma Spray

2 Material Information

2.1 Particle Size Distribution

Product	Nominal Range µm	Mean µm (approx.)
Metco 600NS	-125 +45	60
Metco 600NS-1	-150 +45	60

Tested using sieve analysis in accordance with AS™ B214, modified for wet sieving.

2.2 Other Physical Characteristics

Product	Apparent Density	Melting Point	Maximum Service Temperature	Decomposition Temperature
Metco 600NS	0.6 g/cm^3	N/A	325 °C (600 °F)	427 °C (800 °F)
Metco 600NS-1	0.6 g/cm^3	N/A	325 °C (600 °F)	427 °C (800 °F)

2.3 Key Selection Criteria

Metco 600NS and Metco 600NS-1 are identical products, differing only in particle size distribution. Therefore, choose the most appropriate distribution for the application and processing requirements.

2.4 Customer Specifications

Product	Customer Specification
Metco 600NS	Chromalloy C-68 GE A17B111A1 Praxair PS-55007 Rolls-Royce plc MSRR 9507/64 Technetics RM-1050
Metco 600NS-1	Pratt & Whitney PWA 36097

3 Coating Information

3.1 Key Thermal Spray Coating Information

Specification			Data (all materials)	
Plasma Spray Process Gases			Argon/Hydrogen or Argon/Helium	
Substrate Preheat Temperature			93 – 120 °C	200 – 250 °F
Maximum Application Rate per Pass			0.05 mm	0.002 in
Surface Roughness	(Ra)	as-sprayed	15 – 23 µm	600 – 900 µin
		buffed (soft brass wheel)	5 – 9 µm	200 – 350 µin
		machined	4 – 5 µm	150 – 200 µin
Macrohardness [a]			35 ± 10 HR15Y	
Coating Density			1.2 g/cm^3	
Coating Weight			0.12 kg/m^2/0.1 mm	0.006 lb/ft^2/0.001 in
Bond Strength [b]			< 3.45 MPa	< 500 psi

[a] Please review Section 3.4 Coating Thickness for Hardness Measurement
[b] Substrate grit-blasted with Metcolite C

3.2 Spray Processing

- The substrate temperature during spray processing is very important as excessive heat will decrease the coating hardness. The substrate temperature should not be allowed to exceed 177 °C (350 °F).
- Use atmospheric plasma spray equipment. Coatings cannot be applied using Oerlikon Metco combustion powder Thermospray™ equipment.
- These materials cannot be applied using nitrogen/hydrogen plasma process gases.
- Coatings sprayed with argon/hydrogen parameters will be lighter in color than coatings sprayed with argon/helium. Except for color, the physical properties of the coatings sprayed with either combination of plasma gases are the same.

3.3 Coating Thickness Limits

The maximum recommended thickness for coatings of Metco 600NS or Metco 600NS-1 is 1.3 mm (0.050 in) thick because of the high shrink and weak bonding properties inherent in these coatings. Coatings as thick as 2.5 mm (0.100 in) have been produced on flat panels and 25 mm (1.0 in) diameter shafts made of low carbon steel; but, as a general rule, coatings thicker than the recommended maximum should be avoided.

3.4 Coating Thickness for Hardness Measurement

An incorrect hardness figure will result if the coating is less than 1.8 mm (0.070 in) thick; therefore, the coating thickness of specimens for hardness testing should be equal to or greater than this value. Note that this applies to the coating thickness for hardness testing only and is contrary to Section 3.3 Coating Thickness Limits.

3.5 In Service Observations

The coating surface becomes glazed under light compressive loads. This does not have any adverse affects on the coating characteristics.

3.6 Coating Parameters

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

Recommended Atmospheric Plasma Spray Guns
Metco 3MB series
Metco 9MB series

4 Commercial Information

4.1 Ordering Information and Availability

	Order No.	Package Size	Availability	Distribution
Metco 600NS	1000571	5 lb (approx. 2.25 kg)	Special Order	Global
Metco 600NS-1	1031864	5 lb (approx. 2.25 kg)	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location.
- Tumble contents prior to use to prevent segregation.
- Open containers should be stored in a drying oven at temperatures below 38 °C (100 °F) to prevent moisture pickup.

4.3 Safety Recommendations

See SDS 50-188 (Safety Data Sheet) in the localized version applicable to 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).

www.oerlikon.com/metco
info.metco@oerlikon.com