metco
joining & cladding

Material Product Data Sheet
Abrasion-Resistant Nickel-Based Powders for Clad Deposits

Powder Products: Metco™ 1720A, Metco 1720B

Patent pending.

1 Introduction

Metco 1720x family of products are proprietary nickel-based, superalloy hardfacing powders. Overlays of Metco 1720x materials have been optimized to have corrosion resistance similar to that of Inconel 625 overlays, but with superior wear resistance.

The Metco 1720x family was designed for laser cladding processes to produce an overlay that combines good wear and corrosion resistance, especially where a crack-free coating is necessary. It is recommended for applications where the corrosion resistance of an Inconel 625 overlay is sufficient, but better abrasion resistance is required.

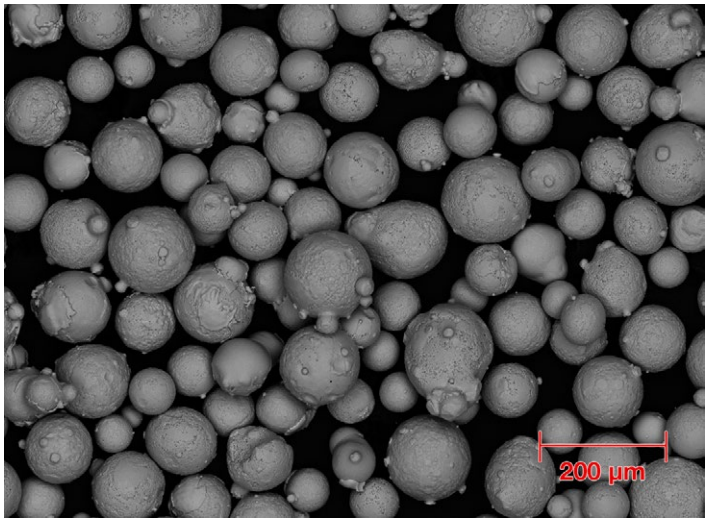
The key to this design is the precipitation of isolated hard phases in a nickel-based, corrosion resistant matrix. The introduction of the hard phases increase abrasion resistance, but as the hard phases form an isolated morphology, they are not detrimental to the crack-resistance of the overlay.

These materials can be clad in multiple layers crack-free, allowing for the overlay to be utilized for rebuild or salvage of undersized parts. The overlay can be ground to a very good finish using silicon carbide wheels.

1.1 Typical Uses and Applications

- Hydraulic cylinder rods operating in corrosive environments such as marine applications
- Replacement of hard chromium plating
- Hard bearing surfaces: bearing journals, fuel pump rotors, sleeves
- Resist abrasive grains (low temperature): cylinder liners, pistons, pump plungers, hydraulic rams, crankshaft bearings
- Resist hard surfaces (low temperature): wire drawing capstans, pump seals, mechanical seals
- Resist particle erosion (low temperature): exhaust fans, hydroelectric valves
- Salvage and build-up of grindable steels: mis-machined parts, worn parts

Quick Facts	
Classification	Alloy, nickel-based
Chemistry	Proprietary
Manufacture	Gas atomized
Morphology	Spherical
Overlay hardness	375 HV_{300} (approx.)
Wear resistance	180 to 190 mm^3 (per ASTM G65-A)
Purpose	Corrosion and Wear Resistance
Process	Laser Cladding, EHLA, PTA



SEM photomicrograph of Metco 1720A showing morphology that is typical of these products.

2 Material Information

2.1 Composition, Particle Size Distribution and Other Physical Properties

Product	Composition	Nominal Range (µm)	Morphology	Manufacturing Method
Metco 1720A	Proprietary	-150 +53	Spherical	Gas Atomized
Metco 1720B	Proprietary	-53 +20	Spherical	Gas Atomized

Screen analysis per ASTM Standard B214 for particle sizes 45 µm and above; sieve analysis for particles sizes below 45 µm via laser diffraction (Microtrac)

2.2 Recommended Application Process

Product	Laser Cladding	High-Speed Laser Cladding (EHLA)	Plasma Transferred Arc (PTA)
Metco 1720A	✓	✗	✓
Metco 1720B	✗	✓	✗

2.3 Key Selection Criteria

- Choose the Metco 1720x family of products when one or more of the following requirements are true:
  - Corrosion resistance: Overlays of Metco 1720x series provide good corrosion resistance comparable to that of Inconel 625. Metco 1720x coatings survive 1,000+ hours in salt fog corrosion testing.
  - Wear Resistance: Coatings produced using the Metco 1720x series of products provide more than 50% additional wear resistance when compared to Ultimet.
  - Crack Resistance: Metco 1720x products can deliver multiple layer, crack-free coatings in laser, EHLA, and PTA processes.
  - Finish: Metco 1720x deposits can be finished as well as an Inconel 625 overlay.
  - Preheat: For the majority of applications, a preheat is not required in order to produce a crack-free overlay.

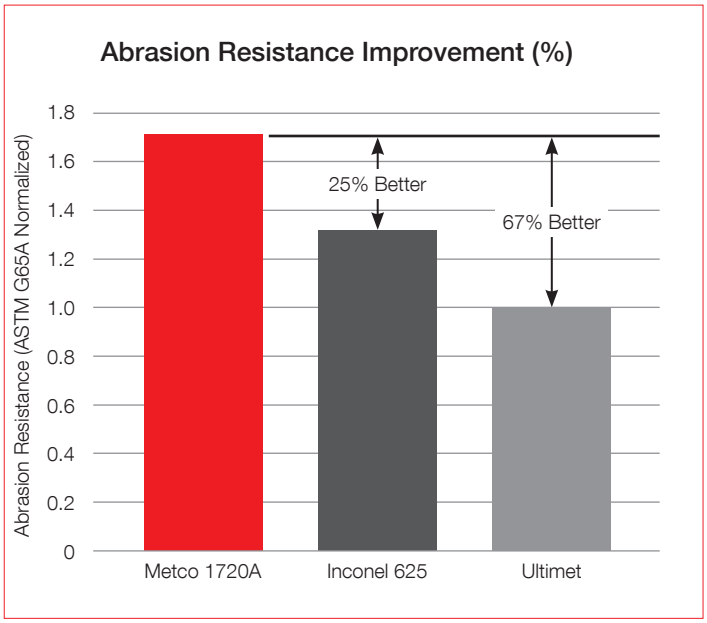
2.4 Related Products

- If corrosion resistance for atmospheric (non-marine) conditions is required, Metco 1020x materials series should be chosen.
- If significantly higher wear resistance is required for applications below 500 °C (930 °F), tungsten carbide nickel powders such as MetcoClad 52025 should be chosen.
- Metco Joining & Cladding offers a wide range of nickel-based superalloy powders and wires for a variety of applications. Please ask your Metco Joining & Cladding sales representative for further details, if interested.

3 Key Processing Information

3.1 Abrasion Resistance

As indicated through ASTM G65-A volume loss testing (chart to the right), the abrasion resistance of overlays of Metco 1720x materials are far better than overlays of Inconel 625 or Ultimet, which are commonly used to protect hydraulic rods in marine applications.



3.3 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.	Package Size	Availability	Distribution
Metco 1720A	1538352	5 kg (approx. 11 lb)	Stock	Global
Metco 1720B	1538353	5 kg (approx. 11 lb)	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location.
- Open containers should be stored in a drying oven to prevent moisture pickup.
- Tumble contents prior to use to prevent segregation.

4.3 Safety Recommendations

See SDS 50-2704 (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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