oerlikon
metco

Product Data Sheet
Highly Machinable, Austenitic Iron Nickel Chromium Alloy

Wire Products: Metco 8293

Patent pending

1 Introduction

Metco™ 8293 is an iron-based product for coating application using the electric arc wire spray process. It is an excellent choice for dimensional restoration and repair. Its iron-based composition makes it more cost effective than nickel-aluminum coating materials.

Metco 8293 possesses all the key attributes to ensure highly reliable coating deposits:

- Exceptionally high bond strength
- Minimal dust production during thermal spray processing
- Corrosion resistance of 300 series stainless steel alloys
- Ease of high-throughput machining
- Thickness readability up to 1.5 mm (0.06 in)

The combined high bond strength and low hardness of Metco 8293 enables job efficiency through minimizing rework. Also, the thickness of Metco 8293 coatings can be measured with a standard electromagnetic thickness gauge for quick, accurate job control.

1.1 Typical Uses and Applications

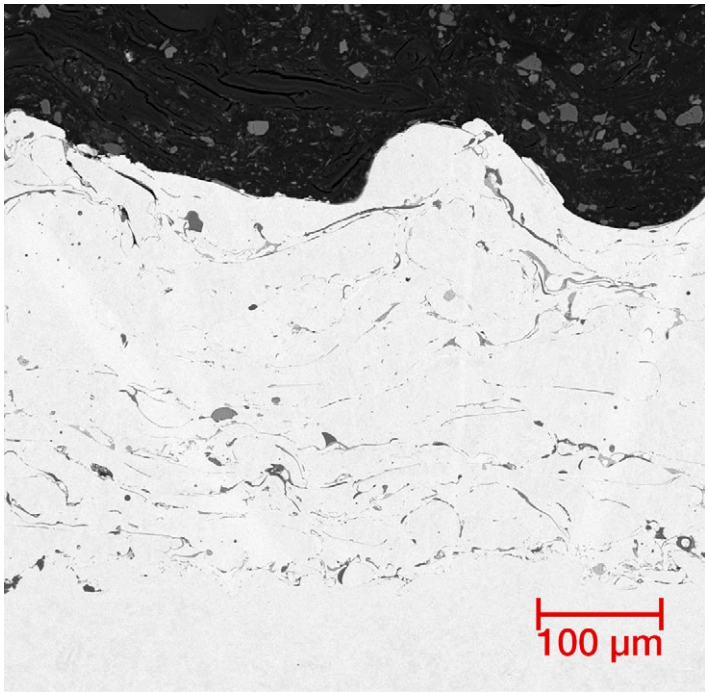
Metco 8293 is a perfect materials for many challenging build-up applications, including application on rough machined surfaces.

Suggested applications include:

- Rebuild of rough machined engine decks
- Build up of internal diameters and bores
- General dimensional restoration work

Quick Facts

Classification	Alloy, Iron-Based
Chemistry	Proprietary FeNiCr Alloy
Manufacture	Composite wire
Service Temperature	≤ 540 °C (1000 °F)
Microhardness	> 150 HV300
Bond Strength	≥ 55 MPa (8000 psi)
Deposit Efficiency	> 70 %
Maximum Coating Thickness	6 to 8 mm (0.25 to 0.3 in)
Thickness Readability	Yes, ≤ 1.5 mm (0.06 in)
Purpose	Restoration and build-up
Process	Electric Arc Wire Spray



Typical as-sprayed coating microstructure of Metco 8293.

2 Material Information

2.1 Physical Properties and Characteristics

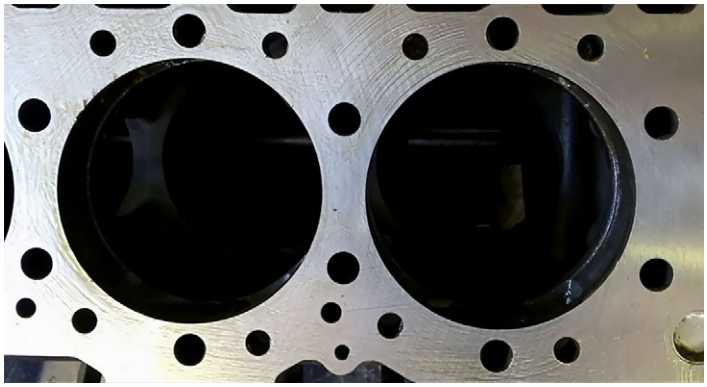
Product	Nominal Chemistry	Product Form	Size	Recommended Process	Previously Sold As
Metco 8293	Proprietary	Composite Wire	1/16 in (1.6 mm)	Electric Arc Wire	Vecalloy Machinable

2.2 Key Selection Criteria

- Metco 8293 is specifically engineered and designed for high build up and restoration of engine decks. It offers a wide application window and high adhesion that provides increased coating reliability for this application.
- **High Bond Strength:** Metco 8293 produces coatings with uniquely high bond strength and inter-coating adhesion — higher than typical thermal spray bond coats.

  While most applications do not require extremely high bond strength and adhesion, Metco 8293 coatings provide an additional level of insurance that the coating will be well-adhered when applying it onto more challenging surfaces. A quality coating that adheres to the substrate consistently will reduce rework and decrease job costs.
- **Low Hardness:** Metco 8293 is specifically engineered to have a low as-sprayed hardness. This enables the coating to be machined quickly and easily, thereby reducing tool wear.
- **Thickness Readability:** Readable coatings ensure that the proper coating thickness is quickly and accurately achieved during the job. Coating thickness reading on components with complex geometries or even for flat surfaces is simplified with Metco 8293. The readability of Metco 8293 helps to further increase productivity and reduce overall processing costs.

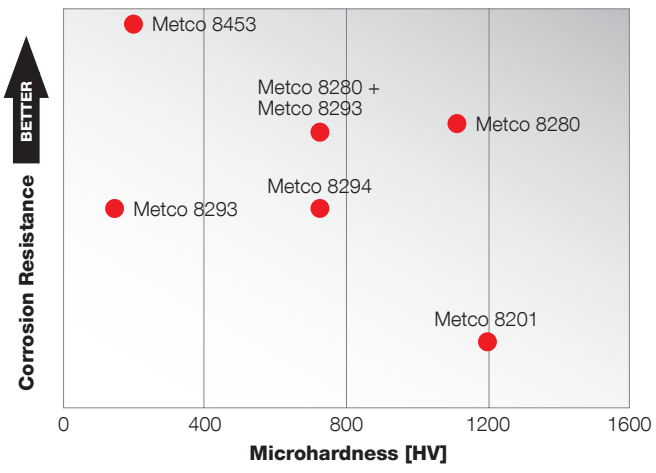
  Please note that per the normal limitations of thickness gauges, such as an Elcometer, a maximum coating thickness of approximately 1500 µm (0.060 in) can be read.



Engine deck restored with Metco 8293.

2.3 Related Products

- For a more corrosion resistant coating, consider Metco 8453. It allows for high thickness buildup for restoration applications.
- For better sliding wear and abrasion resistance, Metco 8280 can be used. Its amorphous nature also provides very good corrosion resistance.
- For applications where hot corrosion and erosion resistance may be needed, consider Metco 8294. It is also thickness readable like Metco 8293.
- For applications where a chromium-free wear coating is needed, consider Metco 8201.
- Oerlikon Metco produces a wide range of other products in wire and powder form that can be used for salvage and restoration or worn or damaged parts. Please contact your Oerlikon Metco Account Manager for more information.



Corrosion and hardness comparison for electric arc wire coating materials

3 Key Coating Information

3.1 Using Metco 8293

Metco 8293 is currently available in 1/16 in (1.6 mm) cored wire. It can be used with most electric arc spray systems that can use that wire diameter and type. Partial starting point parameters are provided here.

Coating thickness per pass	0.05 to 0.08 mm (0.002 to 0.003 in)
Spray rate per 100 amps	76 g/min (10 lb/h)
Coverage	0.96 kg/m^2/0.1 mm (0.05 lb/ft^2/0.001 in
Microhardness (average)	150 HV300
Bond strength	≥ 55 MPa (8000 psi)

3.2 Coating Parameter Availability

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.

3.3 Using Metco 8293 in Co-Spray Applications Requiring a Superior Surface Finish

To produce a coating that can be machined to a superior surface finish, Metco 8293 can be co-sprayed in combination with a Metco 8280 (e.g., on an electric arc wire system use one wire of Metco 8293 and one wire of Metco 8280).

The coating produced will be an advanced, composite structure with semi-amorphous characteristics. It combines the superfinishing capabilities of a hard, tungsten carbide HVOF-applied coating with the high throughput and coating processing ease of electric arc wire spray.

The resulting coating will also perform well in abrasive and erosive environments over a relatively wide range of operating temperatures.

Please note that the coating will be considerably harder than coatings of Metco 8293 on their own. As such, some of the machining ease of Metco 8293 will be lost.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Form	Size	Package Size	Availability	Distribution
Metco 8293	1301262	Wire	1/16 in (1.6 mm)	25 lb (11 kg) spool	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location.

4.3 Safety Recommendations

See SDS (Safety Data Sheet) 50-2293 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).

The Oerlikon Metco Difference:

Metco 8293 was developed using our patented and proprietary **Scoperta™** high throughput computational metallurgical process to evaluate millions of candidate alloy compositions. Potential candidates are then experimentally evaluated using an advanced screening process where both properties and alloy microstructure are measured.

The combined **Scoperta** computational and experimental approach allows Oerlikon Metco to rapidly design the final material with a much better accuracy than conventional empirically-based methodologies.

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