

Product Data Sheet

Iron-Chromium Amorphous Alloy

Wire Products: Metco 8280

US patent protected with additional patents pending

1 Introduction

Metco™ 8280 coatings are specifically designed to perform in aggressive environments possessing abrasive and erosive wear at ambient and elevated temperatures. Metco 8280 is the cleanest, most applicator-friendly electric arc wire spray material available that consistently produces high performance, high quality coatings.

Metco 8280 was computationally designed to create coatings that form a combination of extremely hard amorphous particles and crystalline glue particles. Metco 8280 can be used to combat metal-to-metal wear, low stress abrasion and high stress abrasion.

1.1 Typical Applications

Metco 8280 is excellent for machine element applications as it does not require a bond coat. Metco 8280 coatings exhibit low oxide content and a highly amorphous microstructure that result in excellent advantages for coating applicators are easy to apply, produce minimal dust and have a large processing window that helps to eliminate rework.

Oil and gas applications:

- Mud motors
- Stabilizers
- Centralizers
- Stop collars
- Fractionating pump sleeves
- Fractionating pump impellers
- Fractionating blender pumps

Machine element applications:

- Shaft journals
- Paper rolls
- Gear boxes
- Drive rollers
- Impellers

Steel Processing:

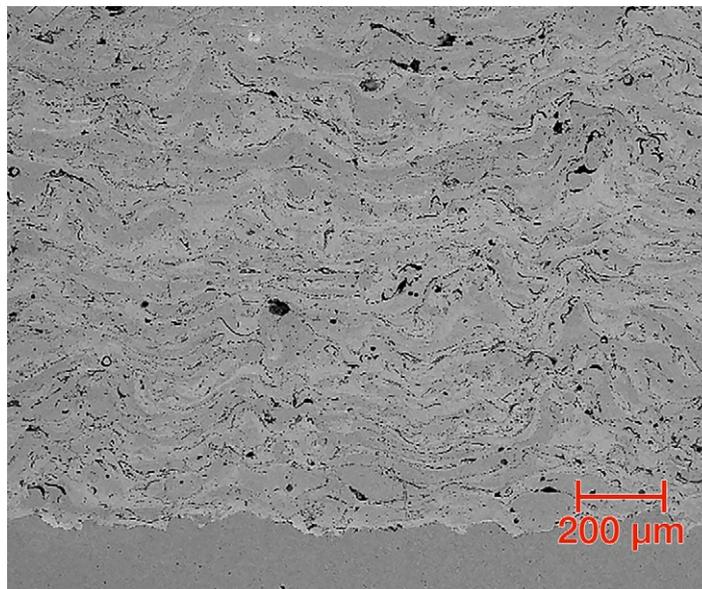
- Cold rolling mill
- Hot rolling mill
- Galvanizing lines
- Continuous pickling lines

Power Generation:

- Augers
- Bag houses
- Ducts
- Chutes and troughs
- Fan inner diameter
- Coal pipeworks

Quick Facts

Classification	Alloy, Iron-Based
Chemistry	Proprietary
Manufacture	Composite wire
Abrasion Resistance	0.2 g loss (ASTM G65B)
Bond Strength	≥ 69 MPa (10 000 psi)
Deposit Efficiency	> 70%
Maximum Coating Thickness	≤ 20 mm (0.800 in)
Microhardness	> 1000 HV300
Macrohardness	> 66 HRC (converted)
Purpose	Abrasion and sliding wear
Process	Electric Arc Wire



Typical as-sprayed coating microstructure of Metco 8280.

Construction:

- Cement chutes
- Cement pipeworks
- Bag houses

Agricultural:

- Disk harrows
- Shear bars
- Harvester blades and disks
- Ground engaging tools

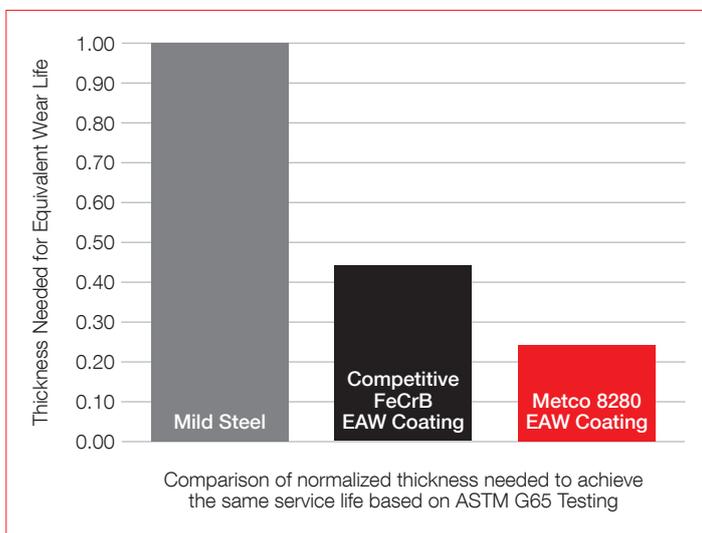
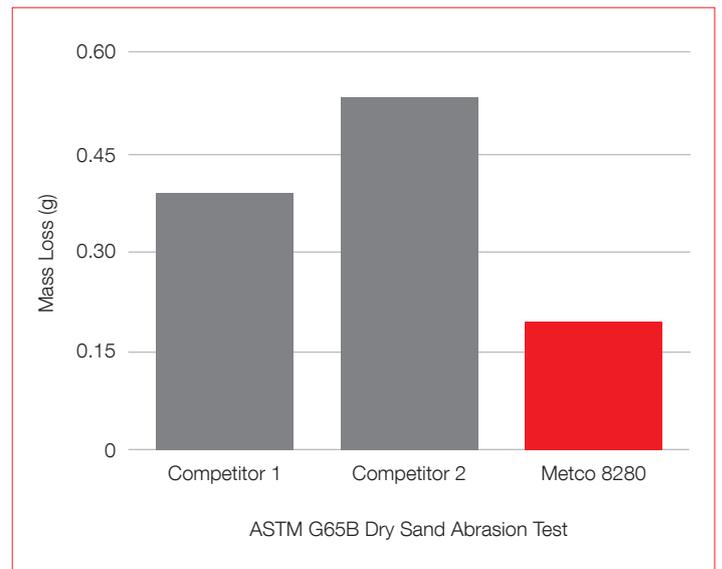
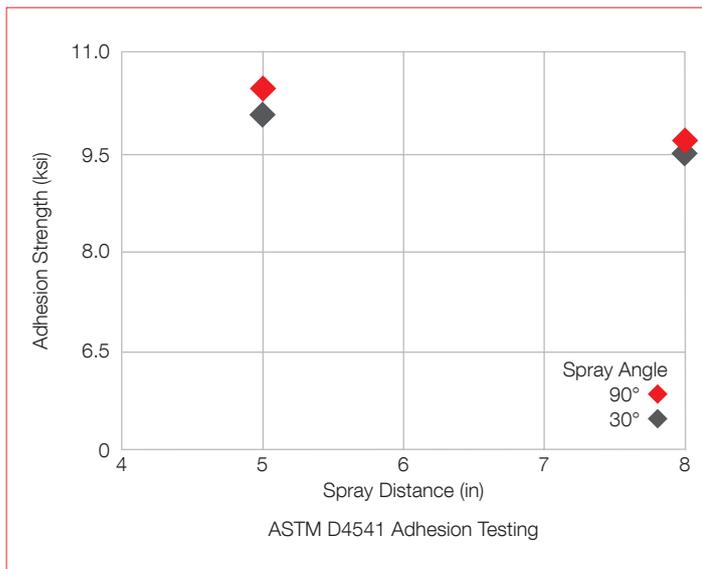
2 Material Information

2.1 Physical Properties and Characteristics

Product	Nominal Chemistry	Product Form	Size	Recommended Process	Previously Sold As
Metco 8280	Proprietary	Composite Wire	1/16 in (1.6 mm)	Electric Arc Wire	Vecalloy B

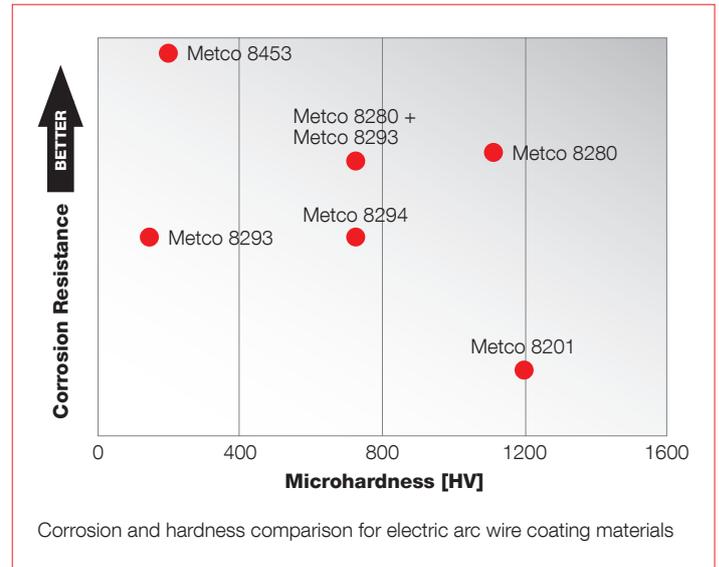
2.2 Key Selection Criteria

- Choose Metco 8280 when an electric arc wire coating having high abrasion and/or sliding resistance with a high bond strength is needed.
- Metco 8280 produces coatings with significantly lower oxide content than many other 'amorphous' coating materials. The higher metallic fraction of Metco 8280 results in a high bond strength when applied using electric arc wire systems. No bond coat is required.
- Use Metco 8280 to apply very thick coatings. Coatings as thick as 8 mm (0.315 in) have been applied successfully.
- Metco 8280 coatings are not susceptible to cracking.
- Coatings of Metco 8280 exhibit excellent inter-particle adhesion and can be ground to good surface finishes with little or no pull-out.
- Metco 8280 can be applied using manual spray with excellent results, as it will consistently produce a high quality coating result over a range of spray angles and spray distances.
- Metco 8280 is a ideal coating material for agricultural applications. Coatings have high adhesion, excellent abrasion resistance and rapid application. It offers low cost for both of the material and the application and provides lasting performance providing up to twice the service life.



2.3 Related Products

- For applications where corrosion resistance is the primary concern, consider Metco 8453. This nickel-based material performs well in corrosive media, but is not as hard or wear resistant as Metco 8280.
- When a chromium free material is desired, Metco 8201 can be used. It offers very good abrasion resistance, but lacks the corrosion resistance of Metco 8280.
- If a highly machinable coating material is needed, then Metco 8293 can be used. It offers good corrosion resistance but does not produce coatings that are as hard as Metco 8280.
- For coatings that have a good balance of corrosion resistance and wear resistance, consider Metco 8294. While it is neither as hard nor as corrosion resistance as Metco 8280, it produces iron-based coatings that are thickness readable on iron-based substrates
- Oerlikon Metco produces a wide range of wear-resistant materials in wire and powder form that can be used for different coating processes and service conditions. In addition, Oerlikon Metco offers a complete portfolio of stainless steel powders and wires. Please contact your Oerlikon Metco Account Manager for more information.



3 Key Coating Information

3.1 Using Metco 8280

Metco 8280 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 20 mm (0.002 to 0.800 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)	> 900 HV300
Expected adhesion	> 69 MPa (10 000 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 Superfinish Applications

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

The coating produced will be an advanced, composite structure with semi-amorphous characteristics. It combines the



A thick coating of Metco 8280 hand-sprayed at a distance of 200 mm (8 in). Notice the light gray, metallic appearance of the coating. This is indicative of the low oxide microstructure of Metco 8280, which results in high bond strength and consistent coating quality.

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. However, please note that some of the performance characteristics of standard Metco 8280 coatings will be lost.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Form	Size	Package Size	Availability	Distribution
Metco 8280	1501831	Wire	1/16 in (1.6 mm)	12.5 kg (27.5 lb) spool	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location.

4.3 Safety Recommendations

See SDS 50-2207 (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).

The Oerlikon Metco Difference:

Metco 8280 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.