oerlikon
metco

Material Product Data Sheet
Iron-Based, High Chromium (Cr > 20 %) Thermal Spray Wires

Thermal Spray Wire Products:
Solid Wires (alloyed): Metco™ 8236, Metco X28
Cored Wires (powder-filled): Metco 8222, Metco 8295

1 Introduction

Iron-based, high chromium electric arc wire materials produce coatings that are characterized by excellent corrosion and oxidation resistance combined with high strength.

Materials with higher carbon content, such as Metco 8222 produce coatings of very high hardness. Metco 8295 is designed to produce very dense, highly erosion resistance surfaces that can be used to resist chemical attack from specific ions, even at elevated temperatures.

High alloy steel materials, such as Metco X28, have a high nickel content for added toughness.

In addition, coatings of any one of these materials can be machined or ground to dimension, with some, such as Metco 8295, able to be lapped or honed to high surface finishes.

1.1 Typical Uses and Applications

- Applications where good corrosion and oxidation resistance is required
- Applications for wear resistance such as erosion and abrasion
- Boiler applications
- Machine element repair and restoration
- Agricultural applications
- Paper and printing machinery
- Textile manufacturing machinery
- Power generation components
- Resistance to chloride-ion attack in marine environments
- As a replacement for hard chrome plating

Quick Facts	
Classification	Wire, Fe-base (high Cr)
Chemical formula	Various
Manufacture	Drawn or powder-filled wires
Purpose	Corrosion and wear resistance
Process	Electric Arc Spray

2 Material Information

2.1 Chemical Composition

	Nominal Composition	Weight Percent (nominal)										
		Fe	Al	B	Cu	Cr	C	Mn	Mo	Ni	Si	Other (max)
Metco 8236	Fe 25Cr 5Al 0.25C 0.25Si	Bal.	5.0	---	---	25.0	0.25	---	---	---	0.25	NR
Metco X28	Fe 31Ni 27Cr 4Mo 1.75Mn 1.1Cu	Bal.	---	---	1.1	27.0	---	1.75	4.0	31.0	---	NR
Metco 8222	Fe 28Cr 5C 1Mn	Bal.	---	---	---	28.0	5.0	1.0	---	---	---	1.5
Metco 8295	Fe 29Cr 4B 1.75Si	Bal.	---	4.0	---	29.0	---	---	---	---	1.75	1.5

NR = not reported

2.2 Morphology and Available Wire Sizes

	Morphology	Recommended Spray Process	Available Wire Diameters
			1.6 mm (14 ga)
Metco 8236	●	⚡	●
Metco X28	●	⚡	●
Metco 8222	○	⚡	●
Metco 8295	○	⚡	●

● Solid wire ○ Cored wire ⚡ Electric Arc Wire Spray

2.3 Key Selection Criteria

- For boiler applications:
  - Coatings of Metco 8295 have a 30 % – 60 % amorphous structure that improves corrosion resistance, particularly in chloride-ion environments, and are very abrasion resistant.
  - Metco 8295 can be used at significantly higher service temperatures than Metco 8222.
  - Metco 8236 is recommended in applications where high temperature oxidation or nitration is a concern.
- For wear applications:
  - Coatings of Metco 8222 offer superior hardness that is appropriate for hardfacing applications.
  - The semi-amorphous structure of Metco 8295 coatings allow them to be ground or lapped to high finishes, similar to that of chrome plating.
- For restoration and build-up applications:
  - Metco 8222 can produce very thick coatings of 5 mm (0.2 in), making this an excellent coating material for heavy build-up machine overlays.
  - Choose Metco 8295 for applications where a high surface finish is required.
  - Metco X28 is a high alloy steel material, that can be used for dimensional build up and repair of components with similar compositions, or to provide a more corrosion resistant surface to low alloy steel components.

2.4 Related Products

- Metco 8238 and Metco 8241 are iron-based cored spray wires with lower chromium content that produce slightly amorphous coatings.
  - Metco 8238 is provides good erosion and friction protection, with high thermal shock resistance.
  - Metco 8241 provides good friction and erosion protection, and corrosion protection in liquid sulphurous environments, but at lower temperatures.
- Oerlikon Metco's Metcoloy™ wires are alloyed wires in a variety of stainless steel chemistries. Chloride-ion corrosion resistance is generally not as good as Metco 8295 and the hardness is not as high as Metco 8222.
- Oerlikon Metco's Sprasteel™ wires are carbon and low alloy steel materials for general purpose wear applications. These materials do not have the corrosion resistance of Metco 8222 and Metco 8295.
- Metco 41C, Metco 41C-NS (similar chemistry to AISI 316 austenitic steel) and Metco 42C (similar chemistry to AISI 431 martensitic stainless steel) are powder materials for the atmospheric plasma spray or combustion powder Thermospray™ processes.

3 Coating Information

3.1 Key Thermal Spray Coating Information

- Coating properties can vary significantly as they are dependant on the chosen equipment, gun hardware, coating parameters and coating thickness.
- When properly applied, these coatings are designed to achieve the surface hardness necessary for good erosion, abrasion and wear resistance appropriate for the applications discussed in Section 1.1.
- Coatings are corrosion and rust resistant.
- These coatings will retain their oxidation resistance at elevated temperatures for applications such as boiler coatings.
- In general, deposit efficiencies of ≥ 60 % can be achieved, when correctly sprayed.
- These coatings can be machined and/or ground when dimensional control or a smooth surface finish is required.
- See Section 2.3 for additional coating selection criteria.

3.2 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 Electric Arc Wire Spray Guns
SmartArc PPG
Metco LD/Schub 5
Metco LD/U2
Tafa (Praxair) Arc Spray Systems

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Wire Diameter	Package Size	Package Type	Availability	Distribution	Origin
Metco 8236	1057744	1.6 mm (14 ga)	15 kg (33 lb)	Dorn Spool	Special Order	Global	Germany
Metco X28	1002885	1.6 mm (14 ga)	15 kg (33 lb)	Dorn Spool	Stock	Global	Germany
Metco 8222	1001602	1.6 mm (14 ga)	25 lb (11.3 kg)	Dorn Spool	Stock	Global	U.S.A.
Metco 8295	1058788	1.6 mm (14 ga)	25 lb (11.3 kg)	Dorn Spool	Stock	Global	U.S.A.

4.2 Handling Recommendations

- Store in the original, closed container in a dry location.

4.3 Safety Recommendations

See the correct SDS (Safety Data Sheet) for the product of interest localized 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).

Product	SDS No.
Metco 8236	50-986
Metco X28	50-931
Metco 8222	50-570
Metco 8295	50-1160

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