oerlikon
metco

Material Product Data Sheet
Pure Zinc and Zinc Alloy Thermal Spray Wires

Thermal Spray Wire Products:
Metco Zinc, Metco ZnAl

1 Introduction

Metco™ Zinc and Metco Zn/Al are excellent material choices for corrosion protection in both atmospheric and marine environments. Using either the electric arc spray or combustion wire process, wire coatings of these materials act as sacrificial anodes, galvanically protecting iron or steel substrates. Decades of field work using these coatings has clearly demonstrated that they are far more effective and longer-lasting than hot dip galvanizing.

Coatings of Metco ZnAl often have better corrosion resistance than either pure zinc or aluminum, by combining the advantages of both materials. This is particularly true in areas where crevices exist and residual moisture and contamination is present, and in areas where the coating has been scratched or scraped, resulting in coating voids and exposed substrate.

Using the electric arc spray process, coatings of these materials are often used in the electronics industry for EMI and RF shielding, or as conductive coatings on capacitors.

1.1 Typical Uses and Applications

- Atmospheric and immersion corrosion protection on large steel or iron structures such as bridges, roadway barriers, posts and poles, offshore structures and marine structures.
- Atmospheric corrosion protection on steel or iron components such as tanks and gas bottles
- EMI and RF shielding on plastic components (electric arc spray only)
- Electrical conductance on components such as the conductive areas on insulators and capacitor end caps (electric arc spray only)

Quick Facts	
Classification	Wire, zinc-based
Chemical formula	Zn 99.9 %+ or Zn15Al
Manufacture	Drawn wire
Purpose	Corrosion protection and electrical conductivity
Process	Electric Arc Wire Spray or Combustion Wire Spray

2 Material Information

2.1 Chemical Composition

Product	Nominal Composition	Weight Percent (nominal)		
		Zn	Al	Other (max)
Metco Zinc	Zn 99.9+	Balance	---	0.1
Metco ZnAl	Zn 15Al	Balance	15	---

2.2 Other Material Properties

Product	Density g/cm³	Available Wire Diameters							
		1.45 mm (15 ga)	1.62 mm (14 ga)	2.0 mm (0.079 in)	2.3 mm (11 ga)	2.5 mm (0.098 in)	3.0 mm (0.118 in)	3.2 mm (1/8 in)	4.8 mm (3/16 in)
Metco Zinc	7.14	● ▲	● ▲	●	● ▲	●		▲	▲
Metco ZnAl	7.18		● ▲	●		●	▲	▲	

● Electric Arc Wire Spray ▲ Combustion Wire Spray

2.3 Key Selection Criteria

- Metco Zinc is usually easier to apply than Metco ZnAl.
- In general, coatings of Metco ZnAl offers superior corrosion protection compared to coatings of Metco Zinc and, unlike zinc, can be used in slightly acidic environments.
- Choose Metco ZnAl for service in industrial environments where SO2 is present.
- Coatings of Metco ZnAl can be used in water at much higher service temperatures, has better bond strength on properly prepared surfaces and better coating erosion resistance than coatings of Metco Zinc.

2.4 Related Products

- Metco AlMg is the preferred choice for corrosion protection in immersed salt water environments.
- Metco Aluminum, Metco SF Aluminum or Metco 8234 can be used at much higher service temperatures than either Metco Zinc or Metco ZnAl.
- Coatings of Metco ZnAl provide better galvanic protection than aluminum or aluminum alloys, such as Metco Aluminum, Metco SF Aluminum and Metco 8234 in dry atmospheres or environments with a pH of 6 – 12.
- In acidic environments (pH ≤ 6), saltwater and salt atmospheres, choose an aluminum-based material such as Metco Aluminum or Metco SF Aluminum.
- Metco Copper can also be used for anti-corrosion in marine environments, particularly on copper-based substrates or when fouling is an issue.

2.5 Customer Specifications

Product	Customer Specifications	Certification When Origin Is:	
		U.S.A.	Germany
Metco Zinc	American Welding Society (AWS) C2.25/C2.25M W-Zn-1 Rolls-Royce plc MSRR 9507/106	●	● ●

3 Coating Information

3.1 Key Thermal Spray Coating Information

Specification	Metco Zinc		Metco ZnAl	
Macrohardness HRH	20 – 30		40 – 45	
Bond Strength (on grit-blasted steel) [a]	6.9 – 15.0 MPa	1000 – 2175 psi	20.7 – 24.1 MPa	3000 – 3500 psi
Coating Density g/c3	6.36		5.2	
Coating Porosity (approximate %)	4		3	
Coating Thickness	> 5.0 mm	> 0.200 in	> 3.8 mm	> 0.150 in
Maximum Service Temperature [b]				
Aqueous Environments [c]	60 °C	140 °F	315 °C	600 °F
Dry Atmospheres	250 °C	480 °F	250 °C	480 °F

[a] Bond strength dependent on the spray process used. Values shown were determined using FM1000 film. If epoxy glues are used, bond strength values will be highe than those listed above as a result of glue penetration.
[b] Maximum service temperature for galvanically active, sacrificial coating applications
[c] Metco ZnAl can be used in steam and boiling water environments. Metco Zinc should only be used in water at the temperatures indicated.

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 Spray Guns	
Electric Arc Wire	**Combustion Wire Spray**
SmartArc PPG	Metco 16E Series
Metco LD/Schub 5	Metco 5K
Praxair / Tafa Wire Arc Guns	
Metco LD/U2	
Metco LD/U3	

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Wire Diameter	Package Size	Package Type	Availability [a]	Dist. [b]	Origin
Metco Zinc	1030497	1.45 mm (15 ga)	500 lb (227 kg)	Drum	Stock	Global	U.S.A.
Metco Zinc	1031592	1.62 mm (14 ga)	25 lb (11.3 kg)	Dorn Spool	Stock	Global	U.S.A.
Metco Zinc	1031601	1.62 mm (14 ga)	500 lb (227 kg)	Drum	Stock	Global	U.S.A.
Metco Zinc	1072722	1.62 mm (14 ga)	150 kg (330 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1002446	1.62 mm (14 ga)	20 kg (44 lb)	Dorn Spool	Stock	Europe	Germany
Metco Zinc	1002510	1.62 mm (14 ga)	250 kg (551 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1072728 [c]	2.0 mm (0.079 in)	250 kg (551 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1002503	2.3 mm (11 ga)	250 kg (551 lb)	Drum	Special Order	Europe	Germany
Metco Zinc	1072725 [c]	2.3 mm (11 ga)	250 kg (551 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1002511	2.5 mm (0.098 in)	20 kg (44 lb)	Hasp Spool	Stock	Europe	Germany
Metco Zinc	1057571	2.5 mm (0.098 in)	250 kg (551 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1072723 [c]	2.5 mm (0.098 in)	250 kg (551 lb)	Drum	Stock	Europe	Germany
Metco Zinc	1030499	3.2 mm (1/8 in)	50 lb (22.7 kg)	Coil	Stock	Global	U.S.A.
Metco Zinc	1030495	3.2 mm (1/8 in)	500 lb (227 kg)	Drum	Stock	Global	U.S.A.
Metco Zinc	1004609	3.2 mm (1/8 in)	25 kg (55 lb)	Coil	Stock	Europe	Germany
Metco Zinc	1030498	4.8 mm (3/16 in)	50 lb (22.7 kg)	Coil	Stock	Global	U.S.A.
Metco Zinc	1030494	4.8 mm (3/16 in)	500 lb (227 kg)	Drum	Stock	Global	U.S.A.
Metco Zinc	1072724	4.8 mm (3/16 in)	25 kg (55 lb)	Coil	Stock	Europe	Germany

4.1 Ordering Information and Availability (continued)

Product	Order No.	Wire Diameter		Package Size		Package Type	Availability [a]	Dist. [b]	Origin
Metco Zinc	1067047 [c]	4.8 mm	(3/16 in)	250 kg	(551 lb)	Drum	Special Order	Europe	Germany
Metco ZnAl	1035633	1.62 mm	(14 ga)	150 kg	(330 lb)	Drum	Stock	Europe	Germany
Metco ZnAl	1064356	2.0 mm	(0.079 in)	30 lb	(13.6 kg)	Hasp Spool	Special Order	Europe	Germany
Metco ZnAl	1072720	2.0 mm	(0.079 in)	200 kg	(440 lb)	Drum	Special Order	Europe	Germany
Metco ZnAl	1072716	2.5 mm	(0.098 in)	200 kg	(440 lb)	Drum	Stock	Europe	Germany
Metco ZnAl	1072713	3.2 mm	(1/8 in)	20 kg	(44 lb)	Coil	Stock	Europe	Germany
Metco ZnAl	1002513	3.2 mm	(1/8 in)	200 kg	(440 lb)	Drum	Stock	Europe	Germany
Metco ZnAl	1072714	3.2 mm	(1/8 in)	200 kg	(440 lb)	Drum	Stock	Europe	Germany
Metco ZnAl	1064498	3.2 mm	(1/8 in)	500 lb	(227 kg)	Drum	Stock	Global	U.S.A.

[a] Minimum order quantities for special order products may apply.
[b] Some European products may be available in other regions on a special order basis. Contact Oerlikon Metco for more information.
[c] When considering similar products, these products have better availability and may be lower cost.

4.2 Handling Recommendations

- Store in the original container in a dry location.
- Do not stack drums; keep drums upright and avoid excessive vibration during transport to prevent decoiling issues.

4.3 Safety Recommendations

See the applicable SDS (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).

Product	SDS No.
Metco Zinc	50-231
Metco ZnAl	50-230

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