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metco

Material Product Data Sheet
Aluminum-Based Alloyed Thermal Spray Wires

Thermal Spray Wire Products:
Metco™ AlMg, Metco SF Aluminum, Metco SF-NS Aluminum, Metco 8234,
New! Metco 8901

Quick Facts	
Classification	Wire, Al-based alloy
Chemical formula	Various
Manufacture	Drawn wire
Purpose	Corrosion resistance, machine element restoration, anti-slip surfaces
Process	Electric Arc Wire Spray or Combustion Wire Thermospray™

1 Introduction

Aluminum alloys offer enhanced corrosion protection and longer service life over pure aluminum wires. Some of the alloyed elements provide additional environmental protection from atmospheric elements while others offer harder alternatives to pure aluminum. The harder alloys are especially useful for machine element repair.

Although many of the alloys can be used for similar applications, selection should be determined for the specific environment or application requirements.

1.1 Typical Uses and Applications

- Metco SF Aluminum and Metco SF-NS Aluminum (6 % Si) produce coatings appropriate for machine element repair that are harder then pure aluminum but somewhat less corrosion resistant. Recommended for repair of aluminum castings, including blow-hole repair and build up of patterns.
- Metco 8234 (12 % Si) produces very dense coatings used for repair of aircraft inlet cases, gearbox seals, flanges and restoration of aluminum and magnesium based components. Coatings are somewhat less corrosion resistant than Metco SF Aluminum or Metco SF-NS Aluminum.
- Metco AlMg (5 % Mg) provides enhanced environmental protection in seawater or weak alkaline solutions; recommended for use on offshore oil rigs, flu-gas towers and pipeline applications.
- Metco 8901 (3 % Ti) provides corrosion protection in saltwater or salted winter environments and a durable non-slip surface when sprayed with a rough surface texture. It is ideally used on metal walkways, stairs and decks on offshore oil platforms, bridges, ships, loading platforms, truck tailgates, etc.

2 Material Information

2.1 Chemical Composition

Product Name	Nominal Composition	Weight Percent (nominal)			
		Al	Mg	Si	Ti
Metco AlMg	Al 5Mg	Balance	5		
Metco SF Aluminum	Al 6Si	Balance		6	
Metco SF-NS Aluminum	Al 6Si	Balance		6	
Metco 8234	Al 12Si	Balance		12	
Metco 8901	Al 3Ti	Balance			3

2.2 Available Wire Sizes

Product Name	Recommended Spray Process	Available Wire Diameters		
		1.6 mm (14 ga)	2.5 mm (0.098 in)	3.2 mm (1/8 in)
Metco AlMg	Electric Arc Spray		●	
Metco SF Aluminum	Electric Arc Spray	●		
	Combustion Wire Spray			●
Metco SF-NS Aluminum	Combustion Wire Spray			●
Metco 8234	Electric Arc Spray	●	●	
Metco 8901	Electric Arc Spray		●	

2.3 Key Selection Criteria

- Choose Metco AlMg for cathodic or galvanic corrosion protection of iron and steel substrates in seawater.
- Choose aluminum silicon alloys for machine element repair with excellent machined finishes attainable.
- Metco 8234 produces harder, denser electric arc sprayed coatings than Metco SF Aluminum products with 6 % silicon.
- Choose Metco 8901 to apply roughly textured coatings to be used in salt-laden environments, such as saltwater environments or surfaces deiced with salt, where slippery surfaces are hazardous. Coatings of Metco 8901 provide long-lasting, anti-skid surfaces on heavily used areas and readily accept painted over coats.

2.4 Related Products

- Metco Zinc and Metco Zn/Al wires are alternatives to Metco AlMg for corrosion protection, particularly on large steel structures. However Metco Zinc and Metco Zn/Al should not be used at water temperatures above 60 °C (140 °F), acidic conditions or soft water.
- Metco 52C-NS and Amdry 355 are powders for the atmospheric plasma spray and combustion powder spray process that are chemically similar to Metco 8234.

2.5 Customer Specifications

Product	Customer Specification	Certification When Origin Is:	
		U.S.A.	Germany
Metco SF Aluminum	American Welding Society (AWS) C2.25/C2.25M W-AL-4047	●	●
	Honeywell EMS 52504 Sec. 3.3.1.1 only	●	
	Honeywell FP 5045, Type VIII	●	
	Rolls-Royce Corporation EMS 56759	●	
	Rolls-Royce plc MSRR 9507/104	●	●
	SAE International AMS 4190	●	●
	Snecma DMR 33.053	●	●
Metco SF-NS Aluminum	Rolls-Royce plc MSRR 9507/104		●

3 Coating Information

3.1 Key Thermal Spray Coating Information

	Bond Strength	Hardness	Finishing	Max Service Temperature
Metco AlMg	N.D.	N.D.	Machine	100 °C (210 °F) [a]
Metco SF Aluminum	~ 10.3 MPa (1500 psi)	80 – 90 HRH	Machine	450 °C (840 °F)
Metco SF-NS Aluminum	~ 10.3 MPa (1500 psi)	80 – 90 HRH	Machine	450 °C (840 °F)
Metco 8234	~ 10.3 MPa (1500 psi)	96 – 99 HRH	Machine	450 °C (840 °F)
Metco 8901	N.D.	N.D.	Used as sprayed	N.D.

[a] Maximum recommended service temperature when used as a galvanically active, sacrificial coating
N.D. = Not yet determined

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**
SmartArc PPG	Metco 16E Series
Metco LD/Schub 5	
Metco LD/U2	
Metco LD/U3	
Tafa (Praxair) Arc Spray Systems	

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Wire Diameter	Package Size	Package Type	Availability [a]	Dist.	Origin
Metco AlMg	1057652	2.5 mm (0.098 in)	17 kg (37 lb)	Hasp Spool 460	Special Order	Europe [b]	Germany
Metco SF Aluminum	1030508	3.2 mm (1/8 in)	50 lb (23 kg)	Coil	Stock	Global	U.S.A.
Metco SF-NS Aluminum	1002497	3.2 mm (1/8 in)	25 kg (55 lb)	Coil	Stock	Europe	Germany
Metco 8234	1080022	2.5 mm (0.098 in)	100 kg (220 lb)	Iron Spool	Special Order	Europe [b]	Germany
Metco 8901	1087438 1087265	2.5 mm (0.098 in)	60 kg (132 lb) 14 kg (30.8 lb)	Drum Dorn Spool	Stock	Europe	Germany

[a] Minimum order quantities for special order products may apply.
[b] Available in other regions on a special order basis.

4.2 Handling Recommendations

Store in the original 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 AlMg	50-1130
Metco SF Aluminum	50-1128
Metco SF-NS Aluminum	50-1128
Metco 8234	50-644
Metco 8901	50-1806

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