

Material Product Data Sheet

Amdry 915 Series Braze Filler Metal

Products:

Amdry 915, Amdry 9150

1 Introduction

The Amdry™ 915 series of materials are specially formulated brazing filler metals that respond well to post-braze diffusion heat treatments. The boron diffuses out of the joint, reducing the reformation of intermetallics while increasing the joint's useful service temperature and corrosion resistance. The presence of iron in these materials improves ductility in high-stress applications.

Gas atomization ensures homogeneity of the elements in Amdry 915 and delivers high purity powders for consistent processing results.

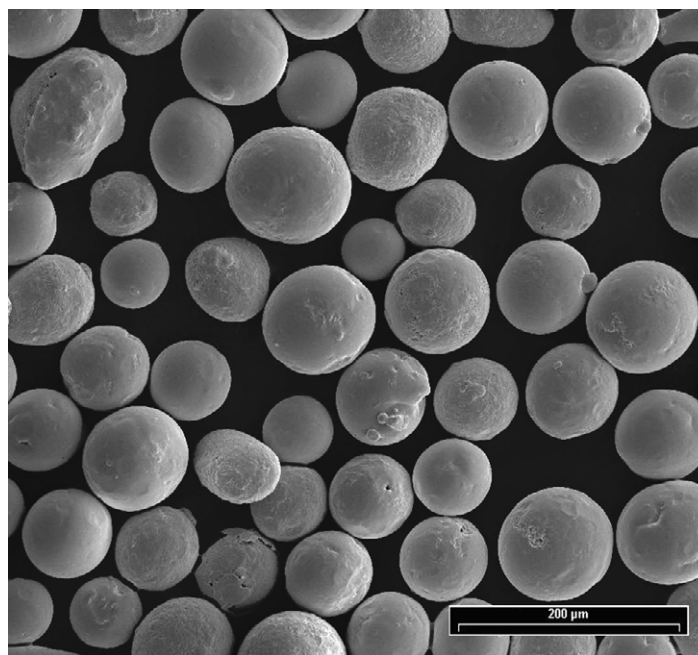
1.1 Typical Use and Applications

Usually used as a brazed filler metal for:

- Joining austenitic stainless steels, martensitic stainless steels, carbon steels, low alloy steels and nickel-based superalloy components
- Applications where outstanding oxidation and corrosion resistance is required
- Components where phase or dimensional changes occur during brazing or heat treating cycles
- Aerospace and industrial components having joints that see high stress in service will benefit from brazing with Amdry 915 or Amdry 9150
- Wide gap brazing of joints up to 0.5 mm (0.02 in)

Quick Facts

Classification	Nickel-based alloy
Chemical formula	Ni 13Cr 4Fe 4Si 2.7B
Manufacture	Gas Atomization
Morphology	Spheroidal
Melting point	Amdry 915: 1127 °C (2060 °F) Amdry 9150: 1077 °C (1970 °F)
Purpose	Joining
Process	Braze
Gap Size	0.05 – 0.5 mm (0.002 – 0.02 in)
Viscosity	Medium
Joint Strength	Excellent
Ductility	Excellent



SEM of typical gas atomized braze filler metal powder particles

2 Material Information

2.1 Chemical Composition

Product	Weight Percent				
	Ni	Cr	Fe	Si	B
Amdry 915	Balance	12.0 – 14.0	4.0 – 5.0	4.0 – 5.0	2.5 – 2.9
Amdry 9150	Balance	13.0 – 15.0	4.0 – 5.0	4.0 – 5.0	2.75 – 3.5

2.2 Particle Size Distribution

Product	Nominal Range		
	Micrometers (µm)	Mesh (ASTM)	AWS Grade
Amdry 915	-106 +45	-140 +325	140C
Amdry 9150	-106 +45	-140 +325	140F

Other particle size distributions may be available on request. Please contact your Oerlikon Metco Account Manager.

2.3 Key Selection Criteria

- Choose the powder that meets the required customer material specification, and/or the particle size distribution suitable to the application method to be used.
- For new applications, Amdry 915 is recommended over Amdry 9150, unless the slightly lower brazing range of Amdry 9150 is a critical factor.
- The Amdry 915 series of materials is available in powder, paste, tape or preforms. Please see the Commercial Section of this document for additional information.

2.4 Related Products

- Before considering an alternative product, customers should also review product compliance with required specifications.
- Amdry 770 has a very similar chemistry to Amdry 915, but with a lower chrome content that makes it possible to braze at a lower temperature.
- A low cost alternative to Amdry 915 is Amdry 805, which is an iron-based braze alloy that provides excellent joint strength, corrosion and oxidation resistance.
- Oerlikon Metco has a broad portfolio of nickel-based braze filler metals that cover a wide variety of applications and service conditions. Please consult with us on your specific needs.

2.5 Customer Specifications

Amdry 915	Pratt and Whitney PWA 996 (except mesh size) Rolls-Royce plc MSRR 9500/705 Rolls-Royce plc MSRR 9500/705T (Tape) Solar Turbine ES9-264
Amdry 9150	American Welding Society AWS BNi-1 a Honeywell EMS 54752, Type XIII SAE International AMS 4776, 140F Tulsa Airfoil Repair MS 1062

3 Braze Processing and Joint Information

3.1 Key Processing Information

		Amdry 915		Amdry 9150	
Substrate preparation		Clean and dry, free of oxides and organic contaminants. Nickel flash substrates rich in titanium or aluminum to improve flow through the joint.			
Flux requirements		None		None	
Recommended atmospheres		Vacuum		Vacuum	
Other atmospheres	Type	Ar or pure dry H ₂		Ar or pure dry H ₂	
	Dew point	≤ -52 °C	≤ -60 °F	≤ -52 °C	≤ -60 °F
Melting range	Solidus	960 °C	1760 °F	977 °C	1790 °F
	Liquidus	1127 °C	2060 °F	1077 °C	1970 °F
Braze range		1135 – 1205 °C	2075 – 2200 °F	1077 – 1204 °C	1970 – 2200 °F
Viscosity		Medium		Medium	
Recommended gap size		0.05 – 0.5 mm	0.002 – 0.02 in	0.05 – 0.5 mm	0.002 – 0.02 in

3.2 Key Braze Joint Information

Joint strength	Excellent
Joint ductility	Very Good
Corrosion resistance	Excellent
Oxidation resistance	Excellent

3.3 Rebrazing

During the braze cycle, the braze filler metal interacts metallurgically with the substrate to alter the braze alloy's

chemical composition, resulting in an increased remelt temperature. The new melting temperature cannot be accurately predicted; therefore, each particular application must be investigated for variation. If a rebraze operation is designed as part of the original manufacturing process, or as a repair operation, it is important to determine the rebraze temperature. To ensure minimal effects on the original braze joint, it is best to braze at the upper limit of the braze range for the maximum time the part can withstand. It is then recommended that subsequent cycles be performed below the original braze temperature.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Form	Order No.	Package Size	Availability	Distribution
Amdry 915	Powder	1020489	5 lb (approx. 2.25 kg)	Stock	Global
	CNT Paste	1001613	3.5 oz (approx. 100 g) syringe	Special Order	Global
	CNT Paste	1032579	4 lb (approx. 1.8 kg) jar	Special Order	Global
Amdry 9150	Powder	1006416	5 lb (approx. 2.25 kg)	Stock	Global

Other product forms and packaging combinations are available on a special order basis. Customized braze tape and preforms are available to meet specific customer requirements. Please contact your local Oerlikon Metco sales office or account representative for additional information.

4.2 Handling Recommendations

- Store powder in the original, closed container in a dry location. Tumble contents prior to use to prevent segregation.
- Paste should be stored tip down in the original packing container. See Materials Data Sheet DSMB-0001 (paste) for additional information.
- Store tape in sealed bags to minimize drying of the tape. Refer to Materials Data Sheet DSMB-0002 (tape and preforms) for additional information.

4.3 Safety Recommendations

See the SDS (Safety Data Sheet) for the product form and 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	Product Form	SDS No.
Amdry 915,	Powder	50-790
Amdry 9150	Paste, CNT	50-1100
	Tape	50-1122