

Material Product Data Sheet

Amdry BRB Diffusion Braze Alloys

Products:

Amdry BRB, Amdry BRB-325

1 Introduction

The Amdry™ BRB family of materials are spheroidal, inert gas-atomized nickel diffusion braze alloys. Boron is the only element used as a melt suppressant, so these materials readily diffuse into the parent material during brazing or a diffusion thermal cycle.

As a diffusion braze alloy, Amdry BRB can be used for restoration work on stainless steel or superalloy components. Brittle phases are minimized when the boron is diffused out of the joint, leaving a more ductile, machinable deposit.

Diffusion of BRB significantly raises the remelt temperature of the brazed joint, making it a good choice for high temperature applications.

A diffusion cycle of 2 to 4 hours is typical for after brazing Amdry BRB to promote formation of a homogeneous diffusion interface between the joint and base metal.

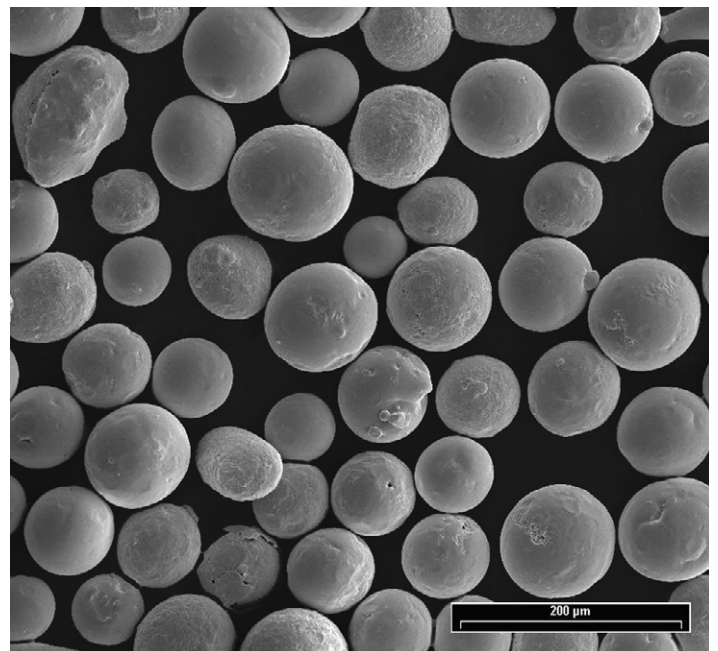
1.1 Typical Use and Applications

Usually used as a brazing filler metal for:

- Joining or repair of superalloy components such as IN713, IN718, MM247 and Rene 80
- Repair of wide cracks or worn or damaged surfaces using BRB with a compatible superalloy powder
- Use in applications with service temperatures up to 1122 °C (2050 °F)

Quick Facts

Classification	Nickel-based diffusion braze alloy
Chemical formula	Ni 13.5Cr 9.5Co 3.7Al 2.5B
Manufacture	Gas Atomization
Morphology	Spheroidal
Density	7.65 g/cm ³
Melting point	1120 °C (2048 °F)
Purpose	Joining, repair and restoration
Process	Diffusion brazing
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	Co	Al	B
Amdry BRB	Balance	13.0 – 14.0	9.0 – 10.0	3.5 – 3.8	2.25 – 2.75
Amdry BRB -325	Balance	13.0 – 14.0	9.0 – 10.0	3.5 – 3.8	2.25 – 2.75

2.2 Particle Size Distribution

Product	Nominal Range	
	micrometers (µm)	Mesh (ASTM)
Amdry BRB	-150 +45 µm	-100 +325 mesh
Amdry BRB -325	-45 +10 µm	-325 mesh +10 µm

Other particle size distributions may be available on request. Please contact your Metco Joining & Cladding 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.
- Amdry BRB is available as a powder. Paste, tape or pre-forms to aid in application of BRB are available on a special order basis.
- Amdry BRB can also be special ordered pre-blended to specific ratios with a filler metal appropriate to the specific application.

2.4 Related Products

- Before considering an alternative product, customers should also review product compliance with required specifications.
- Amdry DF-4B is another diffusion braze alloy with a chemistry similar to that of Amdry BRB. Amdry DF-4B

contains a small amount of yttrium that helps with oxide formation from the aluminum in the braze alloy and substrate.

- Amdry DF-3 has a higher chrome content, making it an excellent choice when corrosion resistance is a critical factor.
- Amdry 775 is a diffusion braze alloy that brazes at a lower temperature than Amdry BRB. Amdry 775 has only boron and chromium as additive elements to the nickel, therefore, it will work well on most nickel-based superalloy components.
- Metco Joining & Cladding offers a number of products appropriate for diffusion brazing joining and repair applications. Please refer to the Product Data Sheet for more information on these products and contact Metco Joining & Cladding with your specific requirements.

2.5 Customer Specifications

Amdry BRB	Chromalloy Arizona BZ003, Type 10 Honeywell EMS 54752, Type XIX MTU MTS 1391
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3 Braze Processing and Joint Information

3.1 Key Processing Information

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	
Recommended atmospheres		Vacuum	
Other atmospheres		None	
Melting range	Solidus	1055 °C	1931 °F
	Liquidus	1120 °C	2048 °F
Braze range		1177 °C – 1232 °C	2150 °F – 2250 °F
Recommended diffusion cycle	2 – 4 h @	1080 °C	1975 °F
Viscosity		Medium	
Recommended gap size		0.05 – 0.5 mm	0.002 – 0.02 in

3.2 Key Braze Joint Information

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

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 BRB	Powder	1001763	5 lb (approx. 2.25 kg)	Special Order	Global
Amdry BRB-325	Powder	1001764	5 lb (approx. 2.25 kg)	Stock	Global

Other product forms and packaging combinations are available on a special order basis. Braze paste, customized braze tape and preforms are available to meet specific customer requirements. Please contact your local Metco Joining & Cladding sales office or account representative for additional information.

4.2 Handling Recommendations

- Store in the original, closed container in a dry location.
- Tumble contents prior to use to prevent segregation.

4.3 Safety Recommendations

See the SDS 50-798 (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 Metco Joining & Cladding web site at www.joiningcladding.com (Resources – Safety Data Sheets).

Information is subject to change without prior notice.