

Material Product Data Sheet

Amdry 790 Series Braze Filler Metals

Products:

Amdry 790, Amdry 7901

1 Introduction

Amdry™ 790 products are inert gas atomized, nickel braze alloys that contain boron and silicon as the temperature suppressants. When fully melted during brazing, Amdry 790 is viscous with a sluggish flow that is capable of filling larger braze joints. This material is the alloy of choice for components where large fillets are desirable or where the joint will be machined after brazing. Its low diffusion characteristics make it very appropriate for brazing thin wall components.

Gas atomization ensures homogeneity of the elements in Amdry 790 and delivers high purity powders for consistent processing results.

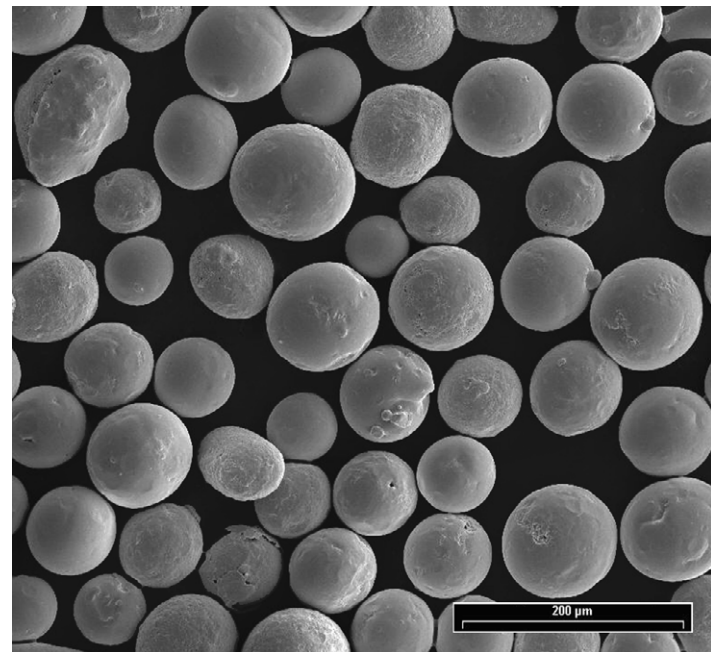
1.1 Typical Use and Applications

Usually used as a brazed filler metal for:

- Joining steels, stainless steels and nickel-based superalloy components
- Large joints and fillets that are easily machined
- Aerospace or industrial applications where the joints are under stress in service
- Joint gaps of 0.05 – 0.3 mm (0.002 – 0.012 in)
- Honeycomb brazing
- Joining thin-walled components
- Aircraft engine components

Quick Facts

Classification	Nickel-based alloy
Chemical formula	Ni 3.5Si 2B
Manufacture	Gas Atomization
Morphology	Spheroidal
Melting point	1065 °C (1950 °F)
Purpose	Joining
Process	Braze
Gap Size	0.05 – 0.3 mm (0.002 – 0.012 in)
Viscosity	Medium
Joint Strength	Good
Ductility	Excellent



SEM of typical gas atomized braze filler metal powder particles

2 Material Information

2.1 Chemical Composition

Product	Weight Percent		
	Ni	Si	B
Amdry 790	Balance	3.0 – 4.0	1.50 – 2.20
Amdry 7901	Balance	3.0 – 4.0	1.50 – 2.20

2.2 Particle Size Distribution

Product	Nominal Range		
	Micrometers (µm)	Mesh (ASTM)	AWS Grade
Amdry 790	–106 +45	–140 +325	140F
Amdry 7901	–106 +45	–140 +325	140C

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 7901 is required when the material must meet the General Electric specification.
- These filler metal materials are available in powder, paste, tape or preforms. Please see the Commercial Section of this document and the Materials Product Datasheets for paste or the datasheet for tape and preforms for additional information.
- Suitable for applications where chrome is not desirable. Amdry 780 is less viscous, filling gaps smaller than Amdry 790.
- Amdry 770 is a good alternative when lower braze cycles are required.
- For applications where higher joint strength is required, Amdry 9150 can be used.
- Metco Joining & Cladding offers 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.

2.4 Related Products

- Before considering an alternative product, review product compliance with required specifications.
- Amdry 780, like Amdry 790, is a chrome-free braze alloy

2.5 Customer Specifications

Amdry 790	AWS A5.8-04 BNi-4, 140F National Oilwell Varco FCMS-041 Rolls-Royce plc MSRR 9500/700 Rolls-Royce plc MSRR 9500/700T (Tape) SAE International AMS 4779, 140F
Amdry 7901	GE B50TF206 Class A Honeywell Allied Signal EMS 54752 Type X Rolls-Royce plc MSRR 9500/700 Rolls-Royce plc MSRR 9500/700T (Tape) SAE International AMS 4779, 140C

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	Type	Ar or pure dry H ₂	
	Dew point	≤ -52 °C	≤ -60 °F
Melting range	Solidus	980 °C	1800 °F
	Liquidus	1065 °C	1950 °F
Braze range		1065 °C – 1175 °C	1950 °F – 2150 °F
Viscosity		Medium	
Recommended gap size		0.05 – 0.3 mm	0.002 – 0.12 in

3.2 Key Braze Joint Information

Joint strength	Good
Joint ductility	Excellent
Corrosion resistance	Good
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 790	Powder	1001429	5 lb (approx. 2.25 kg)	Stock	Global
	CNT Paste	1001428	3.5 oz (approx. 100 g) syringe	Special Order	Global
	CNT Paste	1020715	8 oz (approx. 227 g) cartridge	Special Order	Global
Amdry 7901	Powder	1001430	5 lb (approx. 2.25 kg)	Special Order	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 Metco Joining & Cladding 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 the Materials Data Sheet for paste for additional information.
- Store tape in sealed bags to minimize drying of the tape. Refer to the Materials Data Sheet for 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 Metco Joining & Cladding web site at www.metcojoiningcladding.com (Resources – Safety Data Sheets).

Product	Product Form	SDS No.
Amdry 790, Amdry 7901	Powder	50-1039
	Paste, CNT	50-1099
	Paste, CNG	50-1108
	Tape	50-1121