

Material Product Data Sheet

Amdry 770 Series Braze Filler Metals

Products:

Amdry 770, Amdry 7701, Amdry 7703

1 Introduction

The Amdry™ 770 series of braze filler metals are spherical, inert gas atomized, nickel braze alloys containing silicon and chrome.

This alloy offers excellent strength and oxidation resistance at temperatures up to 982 °C (1800 °F). The lower viscosity of the molten alloy allows successful brazing of gaps up to 0.12 mm (0.005 in).

Amdry 770 filler metals are used in furnace brazing of aircraft and aerospace components, commercial products such as food processing equipment and heat exchangers. Components with joints that are exposed to high stresses in service benefit from brazing with Amdry 770 filler metals. The lower chromium content makes these filler metals good choices for nuclear applications.

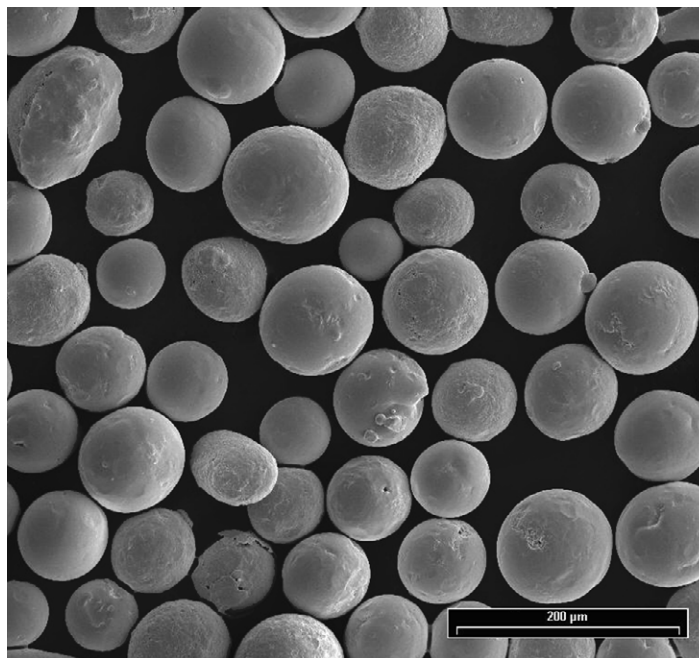
1.1 Typical Use and Applications

Usually used as a brazed filler metal for:

- Joining tool steels, mild steels, stainless steels and nickel-based superalloy components.
- Service conditions up to 982 °C (1800 °F).
- Creates joints with good oxidation and corrosion resistance.
- A good choice for medium gap widths of 0.08 – 0.12 mm (0.003 – 0.005 in) where the joint depth is not extremely deep.
- The braze filler metal works well in a wide variety of brazing atmospheres, making it very versatile for many different applications.

Quick Facts

Classification	Nickel-based alloy
Chemical formula	Ni 7Cr 4.5Si 3B 3Fe
Manufacture	Gas Atomization
Morphology	Spheroidal
Apparent density	7.65 g/cm ³
Melting point	999 °C (1830 °F)
Purpose	Joining
Process	Braze
Gap Size	0.08 – 0.12 mm (0.003 – 0.005 in)
Viscosity	Medium
Joint Strength	Excellent
Ductility	Good



SEM of typical gas atomized braze filler metal powder particles

2 Material Information

2.1 Chemical Composition

Product	Weight Percent				
	Ni	Cr	Si	B	Fe
Amdry 770	Balance	6.0 – 8.0	4.0 – 5.0	2.75 – 3.5	2.5 – 3.5
Amdry 7701	Balance	6.0 – 8.0	4.0 – 5.0	2.75 – 3.5	2.5 – 3.5
Amdry 7703	Balance	6.0 – 8.0	4.0 – 5.0	2.75 – 3.5	2.5 – 3.5

2.2 Particle Size Distribution

Product	Nominal Range	
	micrometers (µm)	Mesh (ASTM)
Amdry 770	-106 +45	-140 +325
Amdry 7701	-106 +45	-140 +325
Amdry 7703	-45	-325

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.
- These filler metal materials are available in powder, paste, tape or preforms. Please see the Commercial Section of this document and Materials Product Datasheets DSMB-0001 (paste) or DSMB-0002 (tape and preforms) for additional information.
- Amdry 915 has a higher chromium content than Amdry 770, but it can be used as an alternative for higher temperature applications.
- Amdry 105 melts within a temperature range similar to that of Amdry 770, and can be used in applications where boron cannot be tolerated.
- 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.
- For more information on braze products appropriate for wide-gap applications, please see DSMB-0003 (Amdry Wide-Gap Braze and Filler Powders).

2.4 Related Products

- Before considering an alternative product, customers should also review product compliance with required specifications.

2.5 Customer Specifications

Amdry 770	AWS A5.8 BNi 2, 140F Honeywell Allied Signal EMS 54752 Type II Rolls-Royce MSRR 9500/97 Rolls-Royce MSRR 9500/97T (tape) SAE International AMS 4777, 140F
Amdry 7701	AWS A5.8 BNi 2, 140C GE B50TF204, Class A Rolls-Royce MSRR 9500/97 SAE International AMS 4777, 140C
Amdry 7703	AWS A5.8 BNi 2, 325 mesh SAE International AMS 4777, 325 mesh

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, Argon or pure dry Hydrogen		
Other atmospheres	Type	pure dry H ₂	
	Dew point	≤ -52 °C	≤ -60 °F
Melting range	Solidus	971 °C	1780 °F
	Liquidus	999 °C	1830 °F
Braze range	1010 °C – 1177 °C		1850 °F – 2150 °F
Viscosity	Medium flowing		
Recommended gap size	0.08 – 0.12 mm		0.003 – 0.005 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 770	Powder	1001419	5 lb (approx. 2.25 kg)	Stock	Global
	CNT Paste	1001417	3.5 oz (approx. 100 g) syringe	Special Order	Global
	CNT Paste	1001418	8 oz (approx. 227 g) cartridge	Special Order	Global
	CNT Paste	1001416	20 oz (approx. 567 g) cartridge	Special Order	Global
	CNT Paste	1032386	4 lb (approx. 1.8 kg) jar	Special Order	Global
Amdry 7701	Powder	1001420	5 lb (approx. 2.25 kg)	Stock	Global
Amdry 7703	Powder	1001421	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 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 pre-forms) 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 770, Amdry 7701, Amdry 7703	Powder	50-1038
	Paste, CNT	50-1095
	Paste, CNG	50-1104
	Tape	50-1117