

# Material Product Data Sheet

## Amdry 795A High Temperature Braze Filler Metal

### Products: Amdry 795A

#### 1 Introduction

Amdry™ 795A is a gas-atomized, nickel-based braze filler metal developed for those applications where the characteristics of a high-temperature, nickel-chromium-based braze material are desired, but when brazing at a lower temperature is necessary.

**Boron free:** Amdry 795A can be used for longer braze cycles with no risk of erosion.

**High chromium content:** The high chromium content (29% by weight) in Amdry 795A makes it an excellent choice for applications where corrosion resistance is required, and it will provide significant oxidation resistance at temperatures up to 980 °C (1800 °F).

**Lower braze temperature:** Amdry 795A brazes at temperatures lower than NiCrSi braze filler metals, reducing the chance of grain growth during the braze cycle.

**High strength:** Amdry 795A is suitable for use on components where a high burst pressure is specified.

**Low viscosity:** The silicon in Amdry 795A (4 wt.%) makes it free-flowing and suitable for use in very narrow gaps, and for long and/or wide joints such as plates.

**Gas-atomized:** Amdry 795A is produced as a clean, dry powder with a precise and consistent particle size for repeatable processing results.

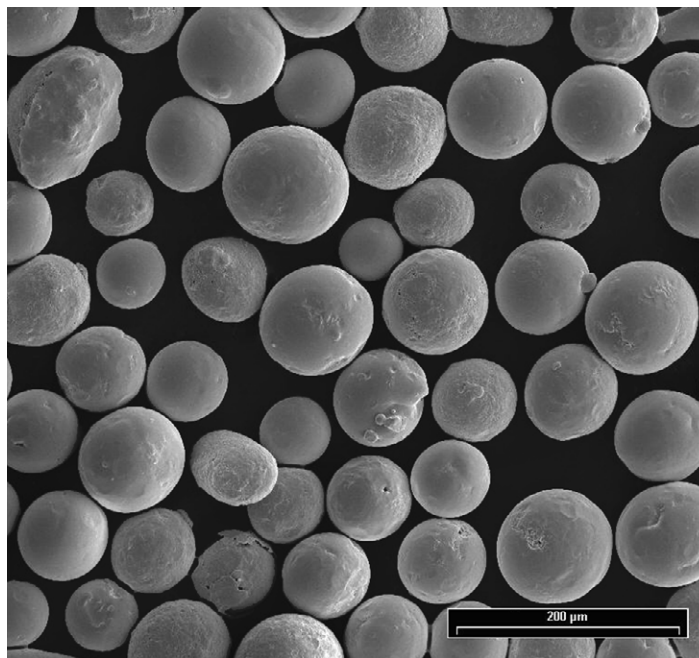
#### 1.1 Typical Use and Applications

Amdry 795A is excellent for applications where a high-strength and corrosion-resistant braze joint must be balanced with a reduced braze temperature:

- Plate and fin type heat exchangers used in corrosive environments such as chemical plants, marine environments, plastics processing and air conditioning.
- Automotive exhaust system components such as EGR coolers, radiators and catalytic converters.
- Components with large surfaces or several braze joints.

#### Quick Facts

Classification	Nickel-based alloy
Chemical formula	Ni 29Cr 6P 4Si
Manufacture	Gas Atomization
Morphology	Spheroidal
Apparent density	3.9 ± 0.5 g/cm <sup>3</sup>
Melting point	985 to 1030 °C (1805 to 1886 °F)
Purpose	Joining
Process	Braze
Gap Size	12.5 – 101.5 µm (0.0005 – 0.004 in)
Viscosity	Free-flowing
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	P	Si
Amdry 795A	Balance	27.5 – 31.5	5.6 – 6.4	3.8 – 4.2

### 2.2 Particle Size Distribution

Product	Nominal Range		
	micrometers (µm)	Mesh (ASTM)	AWS Grade
Amdry 795A	-125 +45	-120 +325	not applicable

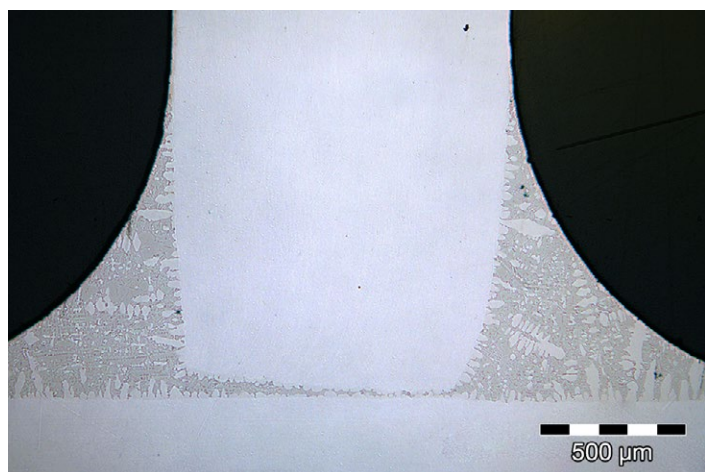
**Note:** Other particle size distributions are available on a special order basis.

### 2.3 Key Selection Criteria

- Amdry 795A is designed for use on most steels, including most types of stainless steel. It will work equally well on nickel or cobalt superalloy components because of its high chromium and nickel content.
- Choose the powder that meets the required customer material specification, and specify the particle size distribution suitable to the application method to be used.
- Amdry 795A is available in powder form. Paste, tape or preforms can be supplied on a special order basis. Please see the Commercial Section of this document and Materials Product Datasheets Amdry Braze Pastes or Amdry Tapes and Preforms for additional information.

### 2.4 Related Products

- Amdry 105 can be used for applications where a lower chromium content is required.
- Amdry 805 can be used for applications where a higher service temperature is required or where a nickel-based braze alloy would be cost prohibitive.
- Amdry 770, which has a similar melting temperature range and is a good alternative when boron in the braze joint is desirable.
- 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.



A T-joint brazed with Amdry 795A demonstrates its ability to fill small gaps while maintaining good fillet characteristics.

### 3 Braze Processing and Joint Information

#### 3.1 Key Processing Information

Amdry 795A contains silicon and phosphorus as temperature suppressants, which enhances wetting during brazing. Its reduced melting range permits the alloy to melt and flow more easily than braze filler metals with wider melting ranges and reduces the possibility of liquation.

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	Pure, dry H <sub>2</sub>	
	Dew Point	< -52 °C	< -60 °F
Melting range	Solidus	985 °C	1805 °F
	Liquidus	1030 °C	1886 °F
Braze range	Optimum	1080 °C – 1100 °C	1976 °F – 2012 °F
Viscosity	Free flowing		
Recommended gap size	12.5 – 101.5 µm		0.0005 – 0.004 in

#### 3.2 Key Braze Joint Information

**Joint strength:** Amdry 795A can be expected to significantly exceed the burst strengths of BNi-2 and BNi-5 filler metals in heat exchangers.

**Joint ductility:** Good.

**Corrosion resistance:** Brazed coupons of Amdry 795A tested for corrosion resistance in solutions of 60% HNO<sub>3</sub>, 5% HN<sub>4</sub>OH, and 5% H<sub>2</sub>SO<sub>4</sub> for 24 h indicated no corrosion damage whatsoever. The coupons were reviewed for stability, etching and strength of the braze joint before and after immersion.

The brazed coupons were also tested for salt spray corrosion and showed no damage.

#### 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	Order No.	Package Size	Availability	Distribution
Amdry 795A	1303742	20 kg (approx. 44 lb)	Special Order	U.S.A.

### 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 for braze paste for additional information.
- Store tape in sealed bags to minimize drying of the tape. Refer to Materials Data Sheet for braze tape and pre-forms for additional information.

### 4.3 Safety Recommendations

See SDS 50-2154 (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](http://www.oerlikon.com/metco) (Resources – Safety Data Sheets).