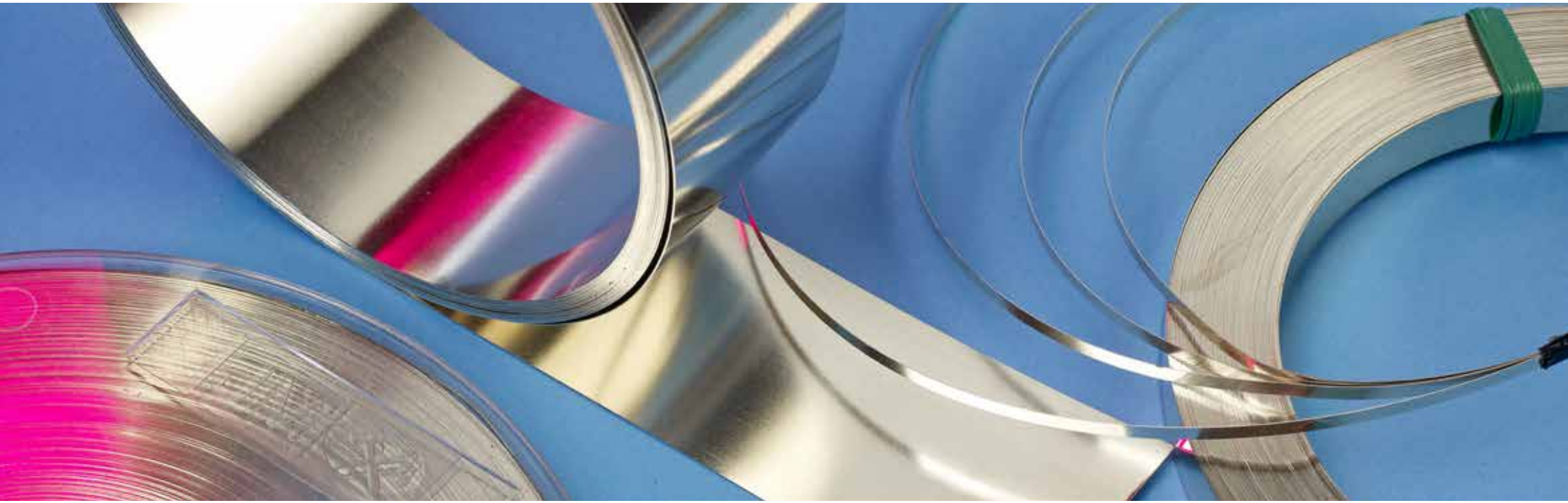
Johnson Matthey



# BRAZING SOLUTIONS FOR TUNGSTEN CARBIDE AND POLYCRYSTALLINE DIAMOND

# SILVER BRAZING FILLER METALS

**Free flowing low temperature brazing filler metals.**

| | Ag | Cu | Zn | Sn | Melting Range | ISO17672 |
|---|---|---|---|---|---|---|
| Silver-flo™ 56 | 56 | 22 | 17 | 5 | 618-652˚C | Ag 156 |
| Silver-flo™ 55 | 55 | 21 | 22 | 2 | 630-660˚C | Ag 155 |
| Silver-flo™ 452 | 45 | 27 | 25.5 | 2.5 | 640-680˚C | Ag 145 |

- Recommended for tungsten carbide segments less than 10mm.
- **Silver-flo™ 55** and **56** are cadmium-free filler metals, which have low brazing temperatures to reduce stresses in the tungsten carbide.
- **Silver-flo™ 452** has the lowest silver content to braze PCD segments below 750˚C without degrading the diamond layer.

**Medium flow brazing filler metals with Ni and Mn for improved wetting.**

| | Ag | Cu | Zn | Ni | Mn | In | Melting Range | ISO17672 |
|---|---|---|---|---|---|---|---|---|
| Argobraze™ 49H | 49 | 16 | 23 | 4.5 | 7.5 | - | 680-705˚C | Ag 449 |
| Argobraze™ 502 | 50 | 20 | 28 | 2 | - | - | 660-705˚C | Ag 450 |
| Argobraze™ 64 | 64 | 26 | - | 2 | 2 | 6 | 730-780˚C | - |
| Argobraze™ 40 | 40 | 30 | 28 | 2 | - | - | 670-780˚C | Ag 440 |

- Recommended for tungsten carbide segments between 10 and 20mm.
- **Argobraze™ 502** and **49H** have medium flow properties, which artificially thicken the joint reducing cracking in the tungsten carbide.
- **Argobraze™ 64** is used for brazing tungsten carbide tipped components, which have to be treated with a PVD coating.
- **Argobraze™ 40** can be used when brazing tungsten carbide provided that the higher liquidus of 780˚C can be tolerated without causing post braze cracking.

# BRAZING FLUXES

## Easy-flo™ Flux Powder


General purpose brazing flux with excellent activity.

**Properties**

| | |
|---|---|
| Working range | 550 - 800˚C |
| Fluidity | Good |
| Activity | High |
| Life | Medium |

## Tenacity™ No.6 Flux Powder / Paste

Brown boron modified brazing flux that improves wetting of brazing filler metal onto tungsten carbide.


**Properties**

| | |
|---|---|
| Working range | 550 - 800˚C |
| Fluidity | Good |
| Activity | High |
| Life | Medium |

- Johnson Matthey supplies a wide range of brazing fluxes for specialised applications.

## SILVER BRAZING FILLER METALS

**Provide a solution for situations where cracking may occur in brazed tungsten carbide segments.**

| | Ag | Cu | Zn | Ni | Mn | Melting Range | ISO17672 |
|---|---|---|---|---|---|---|---|
| Argobraze™ 49LM Tri-foil | 49 | 27.5 | 20.5 | 0.5 | 2.5 | 670-710˚C | - |
| Argobraze™ 502 Tri-foil | 50 | 20 | 28 | 2 | - | 660-705˚C | Ag 450 |
| Argobraze™ 40 Tri-foil | 40 | 30 | 28 | 2 | - | 670-780˚C | Ag 440 |

- Recommended for tungsten carbide segments larger than 20mm.
- **Argobraze™ Tri-foils** are designed to artificially thicken a joint relieving stress and reducing the incidence of cracking.
- **Argobraze™ Tri-foils** are composite materials with the brazing filler metal on either side of a central copper core.

## ACTIVE-BRAZE™ FILLER METALS

**For brazing of hard materials, ceramics and titanium alloys.**

| | Ag | Cu | Ti | In | Melting Range |
|---|---|---|---|---|---|
| Active-braze™ No.2 | 68.8 | 26.7 | 4.5 | - | 830-850˚C |
| Active-braze™ No.10 | 70 | 28 | 2 | - | 780-800˚C |
| Active-braze™ No.12 | 59 | 27.25 | 1.25 | 12.5 | 605-715˚C |

- **Active-braze™ No.2** and **No.10** are suitable for brazing solid PCBN, single crystal and CVD diamond.
- **Active-braze™ No.12** is recommended for brazing PCD.

## BRAZING FLUXES

**Tenacity™ No.6 Flux Powder / Paste**

**Easy-flo™ Flux Powder**


## BRAZING PASTES


Johnson Matthey can supply most brazing filler metals as brazing pastes.

# COPPER BASED BRAZING FILLER METALS

**Special products designed for high temperature brazing of carbide components.**

| | Cu | Zn | Ni | Mn | Co | Other | Melting Range | ISO17672 |
|---|---|---|---|---|---|---|---|---|
| B Bronze™ | 97 | - | 3 | - | - | 0.03 B | 1081-1101˚C | Cu 186 |
| C Bronze™ | 86.85 | - | 2.15 | 11 | - | - | 965-995˚C | - |
| D Bronze™ | 86 | - | - | 10 | 4 | - | 980-1030˚C | - |
| F Bronze™ | 58 | 38 | - | 2 | 2 | - | 890-930˚C | - |
| H Bronze™ | 52.5 | - | 9.5 | 38 | - | - | 880-920˚C | - |
| J Bronze™ | 67.5 | - | 9 | 23.5 | - | - | 925-955˚C | - |
| Argentel™ No.1 | 60 | 39.7 | - | - | - | 0.3 Si | 875-895˚C | Cu 470a |

- The addition of manganese, nickel or cobalt improves wetting and bonding on tungsten carbide.
- **B Bronze**™ and **C Bronze**™ are brazing filler metals used in a reducing atmosphere or vacuum furnace when brazing tungsten carbide.
- **D Bronze**™ and **F Bronze**™ are brazing filler metals commonly used for the brazing of rock drills. They show good wetting, strength and an ability to allow simultaneous heat treatment of the drill shank during brazing.
- **H Bronze**™ and **J Bronze**™ are manganese containing filler metals used in road planing tools and drills. They are high strength filler metals with good elevated temperature properties.
- **Argentel**™ **No.1** is used as a low cost brazing filler metal in paste form.

# BRAZING FLUXES

## Tenacity™ No.125 Flux Powder / Paste

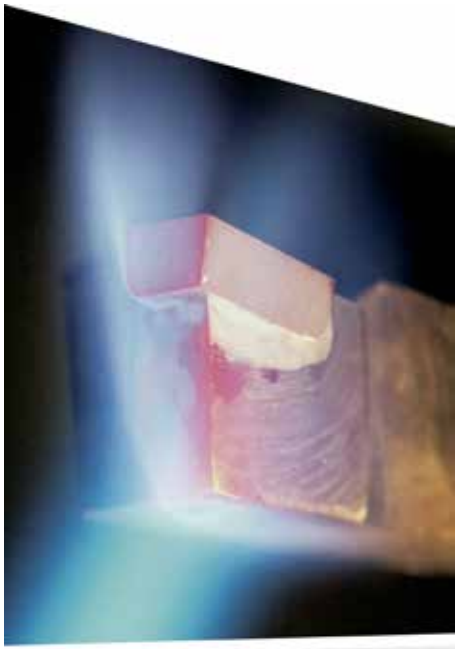
High temperature brazing flux powder or paste for copper based brazing filler metals.


### Properties

| | |
|---|---|
| Working range | 750 - 1200˚C |
| Fluidity | Medium to low |
| Activity | High |
| Life | Long |

# STANDARD FORMS OF SUPPLY

- Rod
- Paste
- Wire
- Powder
- Strip
- Ring
- Foil
- Preform



## PRODUCTS AND SERVICES

Request a quotation and/or our new brochure to find out more about our products serving the tungsten carbide market and other industries.

## TECHNICAL SUPPORT AND TRAINING

Bespoke customer visits, samples and technical advice.
Organiser of International Brazing Seminar on the Brazing of Tungsten Carbide and PCD-tipped Tungsten Carbide see www.jm-metaljoining.com for more information.

Johnson Matthey
Metal Joining

## CONTACT OUR TEAM

**Tel. +44 1763 253 200**

**Tel. +44 1763 253116**

**Tel. +41 44 307 19 30**

**Tel. +44 1763 256 080**

### Europe and Worldwide Distribution

Johnson Matthey Metal Joining
York Way, Royston,
Hertfordshire, SG8 5HJ, UK.
Tel. +44 (0)1763 253200, Fax. +44 (0)1763 253168
Email: mj@matthey.com
**www.jm-metaljoining.com**

### Switzerland, Germany and Austria

Johnson Matthey & Brandenberger AG
Glattalstrasse 18, Postfach 485
CH-8052 Zürich
Telefon +41 (0) 44 307 19 30, Fax +41 (0) 44 307 19 20
Email: info@johnson-matthey.ch
**www.johnson-matthey.ch**