Johnson Matthey
Metal Joining

MATTIFLUX™
TENACITY™
ALU-FLO™
BRAZING FLUXES
BRAZING FLUXES

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PRODUCTS AT A GLANCE

Compositions
Mattiflux™, Tenacity™ and Alu-flo™ brazing fluxes are specially formulated proprietary products. They each contain a number of inorganic metal salts.

In general the products conform to EN 1045.

Uses for the Products
Mattiflux™ fluxes are used in a variety of silver brazing operations. For example, special grades have been formulated for specific parent metals or heating methods.

Tenacity™ fluxes are intended for use in specialised silver brazing and high temperature copper brazing applications.

Alu-flo™ fluxes are designed to be used with an aluminum brazing filler metal.

Conditions for Use
These products should be used with a compatible brazing filler metal. Ideally they will be applied as a pre mixed paste which should be brushed onto the joint surfaces prior to assembly and subsequent heating.

These fluxes are used when brazing in air using a hand torch, fixed burner system or high frequency induction equipment.
Mattiflux® Silver Brazing Fluxes - General Purpose

These products are popular general purpose silver brazing fluxes. When selecting a flux it is important to match its recommended working range with the liquidus temperature of the brazing filler metal.

**Mattiflux® Flux Powder**

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mattiflux® Flux Powder is a globally renowned white silver brazing flux powder. It is a leading brand flux popular with both distributors and end users. This flux conforms to EN1045 FH10.</td>
<td>Fluidity Good&lt;br&gt;Activity High&lt;br&gt;Life Medium to long&lt;br&gt;Flux Residue Removal Standard Packaging&lt;br&gt;Standard Packaging</td>
</tr>
</tbody>
</table>

**Mattiflux® 100 Flux Paste**

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mattiflux® 100 Flux Paste is an excellent smooth white general purpose silver brazing flux. This flux conforms to EN1045 FH10.</td>
<td>Fluidity Good&lt;br&gt;Activity High&lt;br&gt;Life Medium to long&lt;br&gt;Flux Residue Removal Standard Packaging&lt;br&gt;Standard Packaging</td>
</tr>
</tbody>
</table>

**Mattiflux® Silver Brazing Flux Pastes - Special Purpose**

These products are specially modified flux pastes designed for different applications.

**Mattiflux® Low Temperature Grade Flux Paste**

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mattiflux® Low Temperature Grade Paste is a thin smooth white paste. It is a general purpose silver brazing flux. This flux conforms to EN1045 FH10.</td>
<td>Fluidity Good&lt;br&gt;Activity High&lt;br&gt;Life Medium&lt;br&gt;Flux Residue Removal Standard Packaging&lt;br&gt;Standard Packaging</td>
</tr>
</tbody>
</table>

**Mattiflux® Medium Temperature Grade Flux Paste**

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This is a white general purpose silver brazing flux paste. It is intended for use with low silver content filler metals and on components where brazing times will be protracted. This flux conforms to EN1045 FH10.</td>
<td>Fluidity Good&lt;br&gt;Activity High&lt;br&gt;Life Medium to long&lt;br&gt;Flux Residue Removal Standard Packaging&lt;br&gt;Standard Packaging</td>
</tr>
</tbody>
</table>

**Mattiflux® High Temperature Grade Flux Paste**

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mattiflux® High Temperature Grade Flux Paste is a silver brazing flux, which performs well with extended heating and at the top of its working range. This flux conforms to EN1045 FH10.</td>
<td>Fluidity Medium&lt;br&gt;Activity Medium&lt;br&gt;Life Medium to long&lt;br&gt;Flux Residue Removal Standard Packaging&lt;br&gt;Standard Packaging</td>
</tr>
</tbody>
</table>
## Mattiflux™ Silver Brazing Fluxes – Special Purpose for Specific Markets

### Mattiflux™ K Grade Flux Powder

**Recommended for**
- A working range of 1020-1470°F
- Developed for Swiss, German and Austrian markets
- Use on most common engineering metals including copper, brass and steel (excluding aluminum)

**Description**
Mattiflux™ K Grade Flux Powder is a special purpose white silver brazing flux powder. It is exclusively offered in Swiss, German and Austrian markets where its brazing characteristics are preferred. This flux conforms to EN1045 FH10.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: 30 min
- Standard Packaging: 1kg
- Temperature: 140°F
- Packaging: 500g, 5kg

### Mattiflux™ A Grade Flux Paste

**Recommended for**
- A working range of 1020-1470°F
- Developed for Swiss, German and Austrian markets where its brazing characteristics are preferred
- Use on most common engineering metals (excluding aluminum)

**Description**
Mattiflux™ A Grade Flux Paste is an excellent smooth white general purpose silver brazing flux. This flux conforms to EN1045 FH10.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium to long
- Flux Residue Removal: 30 min
- Standard Packaging: 1kg
- Temperature: 140°F
- Packaging: 1kg

### Mattiflux™ Stainless Steel Grade Flux Powder

**Recommended for**
- A working range of 1020-1425°F
- Especially for stainless steel components where a higher fluoride content boosts activity
- Suitable for most common engineering metals and on certain aerospace work

**Description**
A general purpose silver brazing flux powder, which offers improved fluxing on stainless steel when used with brazing filler metals with a liquidus temperature up to 1335°F. This flux conforms to EN1045 FH10.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: 30 min
- Standard Packaging: 1kg
- Temperature: 140°F
- Packaging: 500g, 5kg

### Mattiflux™ Stainless Steel Grade Flux Paste

**Recommended for**
- A working range of 1020-1425°F
- Especially for stainless steel components where a higher fluoride content boosts activity
- Suitable for most common engineering metals and on certain aerospace work

**Description**
A general purpose silver brazing flux paste, which offers improved fluxing on stainless steel when used with brazing filler metals with a liquidus temperature up to 1335°F. This flux conforms to EN1045 FH10.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: 30 min
- Standard Packaging: 1kg
- Temperature: 140°F
- Packaging: 1kg

### Mattiflux™ Aluminum Bronze Grade Flux Paste

**Recommended for**
- A working range of 1020-1425°F
- Silver brazing of aluminum bronze and copper alloys where the formation of aluminum oxide prevents standard fluxes from working successfully

**Description**
A specialised silver brazing flux for aluminum bronze and copper alloys with 2-10% aluminum where standard fluxes are unable to dissolve surface aluminum oxide. This flux conforms to EN1045 FH11.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: 30 min
- Standard Packaging: 1kg
- Temperature: 140°F
- Packaging: 1kg

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**Mattiflux™ Silver Brazing Fluxes for Special Applications**

These products are designed for improved performance on specific metals.
### TENACITY™ BRAZING FLUXES - BORON MODIFIED

The addition of elemental boron to brazing fluxes improves filler metal wetting on refractory metals and difficult to wet materials such as tungsten carbide. It should be noted that boron modified fluxes are not suitable for use on low or nickel-free stainless steels if interfacial corrosion is likely to be a hazard in service because they can promote the corrosive mechanism.

#### Tenacity™ No.6 Flux Powder

**Recommended for**
- A working range of 1020-1470°F
- Improving wetting of the filler metal on cemented tungsten carbide
- Tungsten carbide backed PCD
- Grades of cast iron

**Description**
Tenacity™ No.6 Flux Powder is a brown boron modified flux for use on tungsten carbide and materials containing refractory metals. It has superior fluxing activity to many other products of its type. This flux conforms to EN1045 FH12.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: Standard
- Packaging: 500g

### Tenacity™ No.6 Flux Paste

**Recommended for**
- A working range of 1020-1470°F
- Improving wetting of the filler metal on cemented tungsten carbide
- Tungsten carbide backed PCD
- Grades of cast iron

**Description**
Tenacity™ No.6 Flux Paste is a brown boron modified flux for use on tungsten carbide and materials containing refractory metals. It has superior fluxing activity to many other products of its type. This flux conforms to EN1045 FH12.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: Standard
- Packaging: 500g

#### Tenacity™ No.5A Flux Powder

**Recommended for**
- A working range of 1110-1650°F
- Improving wetting of the filler metal on cemented tungsten carbide
- Tungsten carbide backed PCD
- Refractory metals
- Has good 'temperature-time stability' and overheat resistance.

**Description**
Tenacity™ No.5A Flux Powder is designed for use on stainless steel, tungsten carbide and materials containing refractory metals in instances where there is a need for a higher temperature flux with improved wetting. This flux conforms to EN1045 FH12.

**Flux Characteristics**
- Fluidity: Medium to low
- Activity: High
- Life: Long
- Flux Residue Removal: NaOH
- Packaging: 500g

#### Tenacity™ No.3A Flux Paste

**Recommended for**
- A working range of 1110-1600°F
- Improving wetting of the filler metal on cemented tungsten carbide
- Tungsten carbide backed PCD
- Grades of cast iron

**Description**
Tenacity™ No.3A Flux Paste is a non-standard boron modified flux for use on stainless steel, tungsten carbide and materials containing refractory metals. This flux conforms to AMS 3411 / EN1045 FH12.

**Flux Characteristics**
- Fluidity: Good
- Activity: High
- Life: Medium
- Flux Residue Removal: Standard
- Packaging: 500g
# Tenacity™ Brazing Fluxes - Medium and High Temperature

These products are designed for components requiring extended heating cycles, low silver or copper-based brazing filler metals.

## Tenacity™ No.4A Flux Powder

<table>
<thead>
<tr>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity™ No.4A Flux Powder is a medium temperature flux intended for use with lower silver content brazing filler metals or where a higher working range flux is needed. This flux conforms to EN1045 FH10.</td>
<td>Fluidity: High Activity: Medium to long Life: Medium to long Flux Residue Removal: NaOH 700g</td>
</tr>
</tbody>
</table>

## Tenacity™ No.5 Flux Powder

<table>
<thead>
<tr>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity™ No. 5 Flux Powder is a high temperature silver brazing flux with a long life and wide working range. It is restrictive when molten and forms insoluble glass-like residues. This flux conforms to EN1045 FH10.</td>
<td>Fluidity: Medium to low Activity: High Life: Medium to long Flux Residue Removal: NaOH 250g 500g 5kg</td>
</tr>
</tbody>
</table>

## Tenacity™ No.20 Flux Powder

<table>
<thead>
<tr>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity™ No.20 Flux Powder is a high temperature flux designed for bronze welding/braze welding/brazing with Argentel™ brass type filler metals. This flux conforms to EN1045 FH21.</td>
<td>Fluidity: Medium to low Activity: High Life: Long Flux Residue Removal: Standard Packaging</td>
</tr>
</tbody>
</table>

## Tenacity™ No.125 Flux Powder

<table>
<thead>
<tr>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity™ No. 125 Flux Powder is a high temperature flux powder suitable for use with Argentel™ and JM Bronze™ filler metals. This flux conforms to EN1045 FH21.</td>
<td>Fluidity: Medium to low Activity: High Life: Long Flux Residue Removal: 400g 4kg</td>
</tr>
</tbody>
</table>

## Tenacity™ No.125 Flux Paste

<table>
<thead>
<tr>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity™ No. 125 Flux Paste is a high temperature flux paste suitable for use with Argentel™ and JM Bronze™ filler metals. This flux conforms to EN1045 FH21.</td>
<td>Fluidity: Medium to low Activity: High Life: Long Flux Residue Removal: Standard Packaging</td>
</tr>
</tbody>
</table>
Specialized tenacity™ fluxes

These products are designed for niche applications.

### Tenacity™ No.2 Modified Flux Powder

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A working range of 1020-1470°F</td>
<td>Tenacity™ No. 2 Modified Flux Powder is formulated for use as a flux for coating silver brazing rods. It is a specially milled white flux powder which is active early in its working range.</td>
<td>- Fluidity: Medium to low</td>
</tr>
<tr>
<td>- Flux coating on brazing rods</td>
<td>Conforms to: EN1045 FH10</td>
<td>- Activity: High</td>
</tr>
</tbody>
</table>

### Tenacity™ No.14 Flux Powder

<table>
<thead>
<tr>
<th>Recommended for</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A working range of 1020-1380°F</td>
<td>Tenacity™ No. 14 Flux Powder is a specialised silver brazing flux used on brass where red staining due to oxidation of zinc is a problem.</td>
<td>- Fluidity: Medium to low</td>
</tr>
<tr>
<td>- Brass where red staining is a problem</td>
<td>Conforms to: EN1045 FH10</td>
<td>- Activity: High</td>
</tr>
<tr>
<td>- Being active early in its working range</td>
<td></td>
<td>- Life: Medium to low</td>
</tr>
<tr>
<td>- Low temperature hand torch brazing operations</td>
<td></td>
<td>- Flux Residue Removal: H₂SO₄</td>
</tr>
</tbody>
</table>

#### Heating flux to brazing temperatures

- The flux becomes white and solidifies as water is driven off
- The flux becomes clear and watery as it approaches brazing temperature
- Flux protects the component from oxidation as the brazing filler metal flows
**ALU-FLO™ FLUXES FOR BRAZING ALUMINUM**

These products are designed for low temperature aluminum brazing in air.

<table>
<thead>
<tr>
<th>Alu-flo™ No.1 Flux Paste</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended for</strong></td>
<td>A working range of 970-1130°F</td>
<td>Fluidity: Good</td>
</tr>
<tr>
<td></td>
<td>Excellent dispensability</td>
<td>Activity: High</td>
</tr>
<tr>
<td></td>
<td>Use with aluminum silicon/Alu-flo™ HT filler metals</td>
<td>Life: Medium</td>
</tr>
<tr>
<td></td>
<td>Brazing aluminum &lt;1110°F</td>
<td>Flux Residue Removal: 30 min 140°F</td>
</tr>
<tr>
<td></td>
<td>An active chloride based aluminum brazing flux with corrosive flux residues.</td>
<td>Standard Packaging: 1kg</td>
</tr>
<tr>
<td></td>
<td>Conforms to: EN1045 FL10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alu-flo™ No.2 Flux Paste</th>
<th>Description</th>
<th>Flux Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended for</strong></td>
<td>A working range of 1065-1110°F</td>
<td>Fluidity: Good</td>
</tr>
<tr>
<td></td>
<td>Excellent dispensability</td>
<td>Activity: Low</td>
</tr>
<tr>
<td></td>
<td>Use with aluminum silicon/Alu-flo™ HT filler metals</td>
<td>Life: Low</td>
</tr>
<tr>
<td></td>
<td>Brazing aluminum &lt;1110°F</td>
<td>Flux Residue Removal: Not possible</td>
</tr>
<tr>
<td></td>
<td>An active fluoride based aluminum brazing flux with non-corrosive flux residues.</td>
<td>Standard Packaging: 1kg</td>
</tr>
<tr>
<td></td>
<td>Conforms to: EN1045 FL20</td>
<td></td>
</tr>
</tbody>
</table>
THE PURPOSE OF A FLUX

The purpose of a brazing flux is to remove oxides present on the parent materials and the filler metal and those formed during brazing. Fluxes do not prevent oxidation from occurring but a carefully selected flux will remove oxide that is formed during brazing.

A molten brazing filler metal will only wet and flow over a parent material if both are substantially free of surface oxide. Simply removing surface oxide as part of the pre-cleaning process is not effective, since a new oxide layer is rapidly formed on heating. Thus, to achieve an oxide-free surface, it is necessary either to:

1. Remove oxide as it is formed by the use of a suitable brazing flux.  
2. Overcome oxidation during brazing by heating in a protective atmosphere or vacuum.  
3. Use self-fluxing silver/copper/phosphorus filler metals - only applicable when brazing copper to copper.

Flux Performance and Characteristics

Pre-cleaning: Brazing fluxes are only designed to remove oxide films. Where other contaminants such as oil, paint and lacquer are present these should be removed by pre-cleaning before brazing, using either mechanical or chemical methods.

Flux Application Method

It is recommended that flux should be applied as a paste to both joint surfaces before assembly. Application of flux after assembly places great demands on the fluidity of the molten flux and its ability to penetrate capillary joints. Powders should be mixed into a smooth paste of double cream consistency with the addition of a drop or two of liquid detergent.

Working Range and Temperature Effects

If a flux is not heated up to its working range surface oxides will be present on the components and there will be insufficient heat in them to melt the filler metal. The filler metal will not melt and flow on the surface of the components. If a flux is heated beyond its working range it will rapidly become exhausted, the components and flux residues will blacken and the flux will stop working. The brazing filler metal will melt but not flow or wet out on the oxidized metal surfaces.

To be effective the flux must be both molten and active before the brazing filler metal melts, and it must remain active until the brazing filler metal flows through the joint and solidifies on cooling. The working ranges of Johnson Matthey’s brazing fluxes are given in the table on page 10. It is good practice to select a flux which is active at least 120°F below the solidus of the brazing filler metal and which is still active at a temperature at least 120°F above the liquidus of the brazing filler metal. This will ensure that the flux is effective during the brazing operation.

Flux Volume

The volume of flux required will vary depending on the nature of the application. Usually it is sufficient to coat the joint faces and the surrounding component surfaces with a layer of paste using a brush. Using an excess of flux is in no way detrimental to the quality of the brazed joint, and can assist flux residue removal. Application of flux to surfaces away from the joint helps to prevent oxidation of the components. The use of too little flux can lead to flux exhaustion resulting in unsound brazed joints. It is, therefore, usually best practice to use too much rather than too little flux.

Flux Fluidity

Molten fluxes exhibit different levels of viscosity, which can change during the heating cycle. In most cases it is desirable to have a fluid flux with low viscosity which allows the filler metal to flow freely and displace the flux. Certain fluxes are less fluid resulting in less filler metal spread beyond the joint area. The more fluid a flux is when molten the easier it will be displaced by the filler metal

Flux Activity

Johnson Matthey Mattiflux™ and Tenacity™ fluxes are suitable for use on copper, brass, mild steel and most other common engineering materials. Certain metal oxides are less readily removed by chemical fluxes. In these cases a specialised or more active flux is necessary to break down the oxides formed and allow good filler metal flow and wetting. Special purpose fluxes exist for aluminum bronze, stainless steel, tungsten, molybdenum and tungsten carbide. Silver brazing fluxes are not effective on aluminum, magnesium, titanium or their alloys.

Flux Life

Flux has to remove the oxides on the component and must continue to remove fresh oxide until the completion of the brazing cycle. There is a limit to the amount of oxide that the flux can dissolve. The longer the heating cycle the more likely it is that the flux will become exhausted and the residues and components exhibit a blackened appearance. There is no fixed time for which a flux will be effective since this is dependent on the operating temperature, volume of flux and the type of parent metal.

For short rapid heating cycles it may be possible to use a flux above its recommended maximum working temperature. With long heating cycles additional flux may be added during brazing. However, flux exhaustion may occur and the use of flux with a higher working range would be recommended.

Using Flux as a Temperature Guide

During heating it is possible to use the flux as a temperature guide. Once the flux becomes a clear fluid it is an indication that brazing temperature has been approached.

Flux residue removal

In most cases flux residues should be removed after brazing as they can be corrosive. See page 11 for correct removal method.
### Fluxes and Their Applications

 Flux plays a vital role in virtually all air brazing processes. Selecting a flux to match the specific requirements of application, brazing filler metal, parent materials and heating methods, is vital to obtain the best possible results. Johnson Matthey offers a wide range of fluxes, which can lead to improved quality through selecting the optimum flux for any application.

<table>
<thead>
<tr>
<th>Filler Metal Melting Range</th>
<th>Standard Recommendation</th>
<th>Situation Where Alternative Flux May Improve Brazeing</th>
<th>Alternative Flux For This Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Melt below 1380°F</strong></td>
<td>Mattiflux™ Flux Powder</td>
<td>For brazing copper and copper alloys</td>
<td>Mattiflux™ Low Temperature Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td>Mattiflux™ 100 Flux Paste</td>
<td>For brazing ferrous alloys</td>
<td>Mattiflux™ 100 Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For brazing stainless steel components</td>
<td>Mattiflux™ Stainless Steel Grade Flux Powder or Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For copper based parent metals containing 2-10% aluminum</td>
<td>Mattiflux™ Aluminum Bronze Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For tungsten carbide, PCD and cast iron</td>
<td>Tenacity™ No.6 Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For tungsten carbide, PCD and cast iron where paste is required</td>
<td>Tenacity™ No.6 Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For specific heating situations or application methods</td>
<td>Mattiflux™ Low Temperature Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapid heating cycles—especially induction heating</td>
<td>Mattiflux™ Medium Temperature Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application by dipping</td>
<td>Mattiflux™ High Temperature Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where good vertical hold during heating steel components is required</td>
<td>Tenacity™ No.6 Dispersible Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For tungsten carbide, PCD and cast iron where a dispensable grade of paste is required</td>
<td>Mattiflux™ 100 Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where one flux is required to deal with several different heating methods used in production</td>
<td></td>
</tr>
<tr>
<td><strong>Melt between 1380°F and 1425°F</strong></td>
<td>Mattiflux™ High Temperature Grade Flux Paste</td>
<td>For stainless steel where overheating occurs</td>
<td>Tenacity™ No.5 Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For large copper alloy components where extra flux life is needed</td>
<td>Tenacity™ No.4A Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For specific heating situations or application methods</td>
<td>Mattiflux™ Low Temperature Grade Flux Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For rapid heating and shorter heating cycles</td>
<td>Mattiflux™ Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mattiflux™ 100 Flux Paste</td>
</tr>
<tr>
<td><strong>Melt between 1425°F and 1650°F</strong></td>
<td>Tenacity™ No 5 Flux Powder</td>
<td>For refractory metals/stainless steel where filler metal wetting is a problem but interfacial corrosion* is not a factor</td>
<td>Tenacity™ No.5A Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Seek advice on this point]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For specific heating situations or application methods</td>
<td>Tenacity™ No.125 Flux Powder or Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where overheating or extended heating may occur</td>
<td>Tenacity™ No.125 Flux Powder or Paste</td>
</tr>
<tr>
<td><strong>Melt between 1650°F and 1830°F</strong></td>
<td>Tenacity™ No.20 Flux Powder</td>
<td>For tungsten carbide to steel and especially for use with JM Bronze™ Tiller metals</td>
<td>Tenacity™ No.125 Powder or Paste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For mild or carbon steel pipework in bronze or braze welding operations</td>
<td>Tenacity™ No.20 Flux Powder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For specific heating situations or application methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Furnace brazing in a reducing atmosphere, partial pressure inert gas or vacuum</td>
<td>Flux is not normally required</td>
</tr>
</tbody>
</table>

*Note: Interfacial corrosion refers to the corrosion that occurs at the interface of two materials, such as metal and flux, where one material is more susceptible to corrosion than the other.*
Metal Joining

Key to Flux Residue Removal

- Residues are generally soluble in hot water (~140°F). Immerse for ~30 minutes.
  
- Brush in a stream of warm water.
  
- Residues are virtually insoluble in water.
  
- Immerse in a warm 10% sodium hydroxide solution.
  
- Residues are insoluble in water.
  
- Grit blasting or other mechanical means of removal are necessary.
  
- Residues are virtually insoluble in water.
  
- Immerse in a warm 10% sulfuric acid solution.
SILVER BRAZING FILLER METALS

FOR TUNGSTEN CARBIDE AND PCD

Metal Joining

FOR BRAZING OF STAINLESS STEEL JOINTS FOR WET ENVIRONMENTS

Metal Joining

BRAZING FLUXES

GOLD AND PALLADIUM BASED BRAZING FILLER METALS

BASE METAL BRAZING FILLER METALS

SILVER/COPPER-PHOSPHORUS BRAZING FILLER METALS

FIILLER METALS & FLUXES FOR SOFT SOLDERING

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