Copper-Tin and Tin Soft Soldering Alloys

Johnson Matthey’s 99C™ is a lead free solder which has a short melting range and good flow characteristics. It has been adopted as the universal plumbers solder.

Johnson Matthey’s 97C™ has a longer melting range than 99C™ and consequently builds up greater fillets and is a better gap filler. It is now being used extensively on automotive radiators.

100Sn is 100% tin and is included in this datasheet for completeness. Products made from 100Sn (bar, ingots, wire etc.) are made from virgin tin which is a minimum of is 99.9% tin. It can be used in ingot form to replenish or adjust solder baths, as a solder in its own right.

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Sn</th>
<th>Pb</th>
<th>Cu</th>
<th>Melting Range °C</th>
<th>BS.EN.29453 Ref</th>
<th>EN ISO 9453:2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>97C™</td>
<td>97</td>
<td>-</td>
<td>3</td>
<td>230-250</td>
<td>Alloy No 24</td>
<td>Alloy No. 402</td>
</tr>
<tr>
<td>99C™</td>
<td>99</td>
<td>-</td>
<td>1</td>
<td>230-235</td>
<td>Alloy No 23</td>
<td>Alloy No. 401</td>
</tr>
<tr>
<td>100Sn</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>232</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Uses for These Products

Lead-free solders have replaced the traditional lead containing solders in plumbing, automotive, electrical and many electronic components. Lead free alternatives such as 99C™ and 97C™ should be considered wherever possible.

Conditions for Use

With the correct choice of flux 99C and 99C alloys will join copper and copper alloys, carbon steels and stainless steels.

**Flux**

- Soft Solder Flux No. 1S™ Carbon steel / stainless steel
- Soft Solder Flux No. 2S™ Copper / brass
- Soft Solder Flux No. 3S™ Copper / brass / carbon steel

**Recommended for use on**

- Corrosive/Non-corrosive
- Working Range °C
- Product Availability

<table>
<thead>
<tr>
<th>Flux</th>
<th>Recommended for use on</th>
<th>Corrosive/Non-corrosive</th>
<th>Working Range °C</th>
<th>Product Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft Solder Flux No. 1S™</td>
<td>Carbon steel / stainless steel</td>
<td>Corrosive</td>
<td>350°C</td>
<td>1 litre container</td>
</tr>
<tr>
<td>Soft Solder Flux No. 2S™</td>
<td>Copper / brass</td>
<td>Non Corrosive</td>
<td>350°C</td>
<td>0.5 litre container</td>
</tr>
<tr>
<td>Soft Solder Flux No. 3S™</td>
<td>Copper / brass / carbon steel</td>
<td>Corrosive</td>
<td>350°C</td>
<td>1kg container</td>
</tr>
</tbody>
</table>

**Rosin based or inorganic acid fluxes**

Flux cored wire or soldering paste systems for use with tin-lead or tin-copper solders and containing rosin-based fluxes are available as ‘RMA’ systems without ‘activation’ and only trace halide content or with various levels of ‘activation’ from ‘RA’ (0-0.5% halide content) to ‘HA’ (typically 1% halide content).

Fluxed binder systems in this group are only suitable for soldering copper and brasses. The ability of these binder systems to solder a brass will depend upon the level of activation used within the flux.
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Fumes from rosin containing fluxes present a risk to health and safety and in particular can cause asthma. Fumes should be controlled to prevent exposure to operators.

For more information consult the HSE publications:
COSHH WL17 - Soldering: Hand-held with lead-base, rosin-cored solders
Controlling health risks from rosin (colophony) based solder

Product Availability
Johnson Matthey's 100Sn, 99C™ and 97C™ can be supplied in a variety of forms. Wires, sticks, bars, pellets, flux cored wires powders and pastes. Special order only.