Instructions for use
Ag-Pd-Au Alloys for Inlays, Crown and Bridgework

Mixing of different alloys or alloys of similar types is not allowed! Wear darkened eye protection and protective gloves when melting.
Protect eyes, hands and breathing when pickling.
Protect eyes and breathing during processing with rotating instruments with an aspirator device.
With the publication of these instructions for use all previous editions are no longer valid.
The manufacturer refuses any liability for damages due to disregard of the instructions for use below.

Directions for Ag-Pd-Au-Alloys for Inlays, Crown and Bridgework
Due to the low density and the high palladium- and silver content these alloys are of especially good value. They have, however, a tighter processing tolerance than the high gold and gold reduced metal alloys. This group contains alloys with differing mechanical and physical properties. Therefore an alloy can be chosen, which, according to its composition, is best suited for the kind of work to be executed. The alloys can be soldered without problems and can be used for the casting-on technique. When using plaster based investment compounds care has to be taken not to exceed a preheating temperature of 700°C in order to prevent an embrittlement of the alloy by the uptake of sulphur.
Pd-based alloys absorb carbon in the melted condition. Therefore graphite based investment compounds should not be used. Also, these alloys should only be melted in ceramic or vitrified carbon crucibles to prevent embrittlement of the alloy during frequent remelting.

General instructions for use

Modelling
Usual modelling technique for ceramic-fused-to-metal works. Minimal wall thickness 0.4 mm. With bridgework the connections must have a minimum section of 6–9 mm². Modelling of garlands or inlay shaped reinforcements in the palatinal region will give added stability.
The application of air and cooling vents improves casting results.

Investing
The following investments are recommended for this type of alloys:
CM-10 (plaster based)
CM-20 (based on quartz and cristobalite without graphite for the rapid preheating technique)

Re-use of alloy
Only use perfectly cleaned (by sand-blasting with aluminium oxide) buttons and sprues and add at least ⅓ of new alloy.

Traceability of lot numbers
If different lots of an alloy are being used for the realisation of a restoration, all lot numbers concerned must be noted in order to assure traceability.

Surface quality of cast objects
In order to prevent corrosion the cast object must have a surface free of shrink holes and porosities after trimming and polishing.

Cooling of castings
Do not quench the casting cylinder after casting, but bench cool to room temperature.

Hardening
After casting, some of the alloys have not yet obtained their maximal mechanical properties. For long-span bridgework and for works with attachments in combustible plastic or ceramic spacer technique, the alloys must be hardened. (Firing data see table overleaf).

Removal of oxide layers
Oxides arising from casting or soldering can be removed by sandblasting.
Note: Do not pickle with nitric acid (HNO₃) or hydrochloric acid (HCl). These acids destroy the alloy.

Polishing
Free metal surfaces must be polished to a high shine in order to completely remove the oxide layer.

Disinfection
Each prosthetic restoration must be cleaned and disinfected before try-in or definite insertion in the mouth of the patient.

Further information
on processing precious metal alloys, soldering and casting-on are included in the Dental documentation of Cendres+Métaux and in the website www.cmsa.ch/dental.

Allergies
With patients having an existing allergy to one or several elements contained in any one alloy, this particular alloy must not be used. With patients suspected of having an allergy to one or several elements contained in any one alloy, this alloy can only be used after preliminary allergological testing and proof of a non-existing allergy.

Rx only
### Physical and mechanical properties

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Indications</th>
<th>Colour</th>
<th>Composition in weight %</th>
<th>First solder</th>
<th>Second solder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
</tr>
<tr>
<td><strong>Pallorag® 33</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Strator 3</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**ISO 22674**

<table>
<thead>
<tr>
<th>Indications</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>Inlays, onlays, crowns</th>
<th>Single crowns</th>
<th>Short-span bridgework</th>
<th>Long-span bridgework</th>
<th>Milled work</th>
<th>Clasps, lingual bars, palatinal plates</th>
</tr>
</thead>
<tbody>
<tr>
<td>First solder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S.G 810</td>
<td>S.G 750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second solder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S.G 810</td>
<td>S.G 750</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* The use of solders not mentioned in the table is subject to the user’s risk. In case of uncertainties, consult the instructions of the manufacturer involved.

### Alloy properties

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Density</th>
<th>Melting range</th>
<th>Casting temp.</th>
<th>Crucible</th>
<th>Hardness as cast</th>
<th>Hardness annealed</th>
<th>Hardness hardened</th>
<th>Young's Modulus</th>
<th>0.2 % proof stress, Rp</th>
<th>Elongation A5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>g/cm³</td>
<td>°C</td>
<td>°C</td>
<td></td>
<td>HV₅ *</td>
<td>HV₅ @ *</td>
<td>HV₅ @ *</td>
<td>GPa *</td>
<td>MPa *</td>
<td>%</td>
</tr>
<tr>
<td><strong>Pallorag® 33</strong></td>
<td>11.1</td>
<td>935–1020</td>
<td>1120–1170</td>
<td>● ●</td>
<td>170</td>
<td>135</td>
<td>230</td>
<td>95</td>
<td>430</td>
<td>280</td>
</tr>
<tr>
<td><strong>Strator 3</strong></td>
<td>11.0</td>
<td>860–910</td>
<td>1010–1060</td>
<td>● ●</td>
<td>175</td>
<td>125</td>
<td>165</td>
<td>75</td>
<td>315</td>
<td>230</td>
</tr>
</tbody>
</table>

* Graphite crucible  ● Universal ceramic crucible  Vitrified carbon crucible

* 100 % selfhardening after casting in the cylinder or soldering block, otherwise particular instructions for use ● and ●

* The values indicated result from measurements obtained under exactly defined conditions. Individual deviations of ± 10 % are possible and to be considered as normal.

### Particular instructions for use

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Preheating temperature</th>
<th>Recommended casting systems (not compulsory)</th>
<th>Vacuum-pressure casting with electric resistance furnace</th>
<th>Centrifugal casting with electric resistance furnace</th>
<th>High frequency induction in atmosphere</th>
<th>High frequency induction in protective gas atmosphere</th>
<th>Annealing</th>
<th>Hardening in the ceramic furnace</th>
<th>Sandblasting with glass beads</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pallorag® 33</strong></td>
<td>700°C</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>700 °C / 10 min / H₂O</td>
<td>400 °C / 15 min / air</td>
<td>✓</td>
</tr>
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<td><strong>Strator 3</strong></td>
<td>700°C</td>
<td>✓</td>
<td>✓</td>
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