BioEthic®
Instructions for use

Universal precious metal alloy for veneering with high-fusing ceramic or with dental resin

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 during pickling.

Protect eyes and breathing during processing with rotating instruments with an aspirator device.

With the publication of these instructions of use all previous editions are no longer valid.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 ceramic-fused-to-metal alloys for universal use

The high gold alloy BioEthic® corresponds, based on its ceramic-fused-to-metal properties, to the standard ISO 9693 (Dental ceramic-fused-to-metal restorative materials). Due to its balanced mechanical and physical properties this alloy can be applied in all fields of indication. The alloy can be veneered with usual medium fusing and high fusing ceramic compounds as well as with composites.

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 alloy: Cendres + Mètaux-Ceramicor® (phosphate-based, containing graphite).
CM-20 (based on quartz and cristobalite without graphite for the rapid preheating technique).
The plaster-based investment CM-10 is specially indicated for precision-castings of inlays and crowns.

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.

Thermal treatments
After casting, BioEthic® has not yet obtained its maximal mechanical properties. For long-span bridgework and for works with attachments in combustible plastic or ceramic spacer technique which will not be veneered with ceramic, a simulation firing of the work in the as cast condition (cleaned frameworks, sprues not yet removed) in the ceramic furnace can be done. This procedure has the following advantages:
The hardness increase allows easier and faster trimming of the frameworks. Grinding overlaps are prevented. Possible tensions due to the casting process are reduced. (Firing data see table overleaf).

Pickling
After firing or soldering pickle in a warm, freshly prepared (clean) solution of 10 vol. % sulphuric acid (H₂SO₄)

Note: When using other pickling agents follow the instructions for use of the respective manufacturer.

Rx only

The products carry the CE sign.
See packaging for details.
Gilding of frameworks
Gilding is carried out at the user’s own risk.

Polishing
After the last firing 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.

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.
### Physical and mechanical properties

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Indications</th>
<th>Colour</th>
<th>Composition in weight %</th>
<th>Solder before firing</th>
<th>Solder after firing</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>BioEthic®</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
</tbody>
</table>

ISO 22674 / ISO 9693

**Indications**
- a: Inlays, onlays
- b: Single crowns
- c: Short-span bridgework
- d: Long-span bridgework
- e: Milled work
- f: Clasps, lingual bars, palatinal plates

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.

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Density</th>
<th>Melting range</th>
<th>Casting temp.</th>
<th>Crucible</th>
<th>Hardness</th>
<th>Young's Modulus</th>
<th>0.2 % proof stress, Rp 0.2 %</th>
<th>Elongation A5</th>
<th>Linear coefficient of thermal expansion CTE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>g/cm³</td>
<td>°C</td>
<td>°C</td>
<td>GPa</td>
<td>GPa</td>
<td>GPa</td>
<td>GPa</td>
<td>%</td>
<td>°C⁻¹</td>
</tr>
<tr>
<td>BioEthic®</td>
<td>18.9</td>
<td>1030–1150</td>
<td>1250–1300</td>
<td>190</td>
<td>95</td>
<td>220</td>
<td>90</td>
<td>6</td>
<td>30</td>
</tr>
</tbody>
</table>

* 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 temperatures</th>
<th>Investments</th>
<th>Recommended casting systems (not compulsory)</th>
<th>Thermal treatment of the framework before surface treatment (not compulsory)</th>
<th>Annealing</th>
<th>Hardening</th>
<th>Trimming of the framework surface with ceramically bonded grinding stones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plaster-based</td>
<td>Phosphate-based</td>
<td>Pre- and oxygen flame</td>
<td>Vacuum-pressure casting with electric resistance furnace</td>
<td>High frequency induction in atmosphere</td>
<td>High frequency induction in protective atmosphere</td>
<td>900°C / 15 min</td>
</tr>
<tr>
<td>BioEthic®</td>
<td>700°C</td>
<td>850°C</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Sandblasting with non-recycled aluminium oxide (Al₂O₃) 50µm</th>
<th>Cleaning with steam jet</th>
<th>Oxide firing with vacuum</th>
<th>Pickling after oxide firing in a warm and proper solution of 10 vol. % sulphuric acid (H₂SO₄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BioEthic®</td>
<td>✅</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alloys</th>
<th>Special indications for veneering with ceramic compunds</th>
<th>Tested compatible ceramic compound</th>
<th>Other ceramic compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slow cooling</td>
<td>Normal cooling</td>
<td>Rapid cooling</td>
</tr>
<tr>
<td>BioEthic®</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>