Esteticor® N2
Instructions for use
Pd-based dental casting alloy for metal-ceramic work
according to ISO 22674 and ISO 9693, Type 4.

Indications
The alloy Esteticor® N2 corresponds to the standards ISO 22674 / type 4 and ISO 9693 and is compatible with all ceramic compounds having a medium CTE.

- Fixed implant and dentally supported crowns, short-span and especially long-span bridgework
- Restorations with attachments made of non residual burnout resin

- Single crowns
- Milled work
- Short-span bridgework
- Clasps, lingual bars, palatinal plates
- Long-span bridgework

Physical properties
Composition in weight %

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Au + Pt group metals</td>
<td>67.60</td>
</tr>
<tr>
<td>Au</td>
<td>15.20</td>
</tr>
<tr>
<td>Pt</td>
<td>0.20</td>
</tr>
<tr>
<td>Pd</td>
<td>52.00</td>
</tr>
<tr>
<td>Ag</td>
<td>20.00</td>
</tr>
<tr>
<td>Sn</td>
<td>5.40</td>
</tr>
<tr>
<td>In</td>
<td>6.00</td>
</tr>
<tr>
<td>Ga</td>
<td>1.00</td>
</tr>
<tr>
<td>Ru</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Colour
white

Density g/cm³
12.0

Melting range °C
1150 – 1265

CTE (25 – 500 °C) 10^-6 K^-1
14.1

(25 – 600 °C) 10^-6 K^-1
14.4

Young's Modulus GPa *
120

Mechanical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness HV5*</td>
<td>295</td>
<td>260</td>
</tr>
<tr>
<td>0.2 % Proof stress, Rp 0.2 % MPa*</td>
<td>645</td>
<td>565</td>
</tr>
<tr>
<td>Yield strength (Rm) MPa*</td>
<td>895</td>
<td>855</td>
</tr>
<tr>
<td>Elongation A5 %*</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>

State
1. as cast
2. after firing

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

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

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

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

The products carry the CE Mark.
See packaging for details.
5. Preheating of the casting cylinders
Final temperature: 850 °C
Further information on the preheating technique can be obtained in the instructions for use of the Cendres+Métaux-Ceramicor® or CM-20 investment.

6. Re-use of alloy
Only use perfectly cleaned (by sandblasting with aluminium oxide) buttons and sprues and add at least \( \frac{1}{3} \) of new alloy.

7. Melting and casting, (recommended casting temperatures)

**Recommended casting systems** (not compulsory)
- Propane-oxygen flame
- Vacuum-pressure casting with electric resistance furnace (1365 – 1415 °C)
- Centrifugal casting with electric resistance furnace (1365 – 1415 °C)
- High frequency induction in atmosphere
- High frequency induction in protective gas atmosphere

8. Melting
If the alloy is molten in atmosphere in a ceramic or vitrified carbon crucible, the addition of a minimal amount of melting powder (borax) may suppress the oxidation of the alloy surface and thus allow for a better determination of the correct starting of the casting procedure. When using a propane-oxygen flame, the addition of melting powder is not necessary, if the ceramic crucible has been coated with a borax layer prior to its first use.

8.1 Continued heating times in seconds
As soon as the alloy reaches at the liquid state, the following continued heating times apply prior to start the casting procedure:
- Propane-oxygen flame 30 – 50 s
- Electric resistance furnaces 120 – 180 s
- High frequency induction 5 – 15 s

9. Cooling and devesting of cast objects
Do not quench the casting cylinder after casting, but bench cool to room temperature. Never use a hammer, but remove the investment by carefully using plaster-tweezers or a pneumatic hand-chisel.

10. Conditioning of the framework for veneering with ceramic
Trim the frameworks with tungsten cutters, then fine trim the surfaces to be veneered using ceramically bonded grinding stones. Always maintain the same grinding direction in order to avoid overlaps on the surface. Don’t use diamond coated grinders!

11. Sandblasting
Sandblast the trimmed framework with non-recycled aluminium oxide (Al\(_2\)O\(_3\))
- Grain size 50 \( \mu \)m
- Pressure 2 – 4 bar

12. Cleaning
Clean the sandblasted frameworks thoroughly with a steam-jet.
13.1 Oxide firing
Massive-sized (heavy) cast frameworks require a general reduction of the heat rate to 40–50 °C/min. in order to ensure a regular heat soaking of the framework.
Oxidize at 980 °C / 5 min. with vacuum
The oxide layer resulting from the thermal treatment must not be removed.

13.2 Highest recommended firing temperature
Max. 980 °C.

14. Veneering with ceramic
Compatible, tested ceramics:
(ISO 9693): Vita VMK 95

14.1 Support of the frameworks
Bridgework with 3–6 units can be supported with the usual firing pins, placed in each abutment crown. Larger and more massive bridgework should be supported with an individually crafted firing support. The use of an individual support might make it necessary to raise the final firing temperatures by 10–20 °C, depending on the type of ceramic furnace.

15. Gilding of frameworks
Gilding is carried out at the users own risk.

16. Joining techniques
16.1 Soldering before firing for the use of ceramics with firing temperatures > 900 °C:
CM-solder S.W 1100 for the joining of bridgework with more than 7 units. If possible, prepare the soldering-areas already at the modelling stage and ensure, that the width of the soldering gap does not exceed 0.2 mm. In case of unplanned soldering before firing (imprecise fit), separate the framework by cutting through an intermediary element in order to obtain a large and stable soldering area.

16.2 Soldering after firing: First brazing material S.G 810 / second brazing material S.G 750 for furnace soldering after firing. Prepare the soldering areas so that the solder strip has contact with both metallic parts. The width of the soldering gap must not exceed 0.2 mm. After the hardening of the soldering block and the removal of the fixations of sticky wax or modelling resin, the now accessible soldering gap must be filled with soldering flux (Flux C of Cendres+Métaux), then placed in a preheating furnace at 500 °C and held at this temperature for 20–40 minutes, depending on the size of the bridgework. Then remove the soldering block, wet the soldering gap and the solder again with soldering flux, then solder in a ceramic furnace. Adjust the soldering temperature to 870 °C for the first brazing material and to 810 °C for the second brazing material. Attention: Prior to soldering after firing, check the last firing temperature of your ceramic, this must not be below 890 °C for the first brazing material and 830 °C for the second brazing material.

16.3 Laser welding
Esteticor® N2 can be laser-welded with the laser welding wire LW N° 3, Ø 0.4 mm, as filler metal. The ideal welding-parameters (basic values for connecting and filling of an x-shaped joint) can be found in the instructions for use of the laser welding wire. Further information on laser welding can be obtained from the Cendres+Métaux-brochure «Laser welding» (edition 04.04) and on the website www.cmsa.ch/dental.

17. Polishing
After the last firing free metal surfaces must be polished to a high shine in order to completely remove the oxide layer.

18. Oxide removal
The removal of residues of flux after firing can be done by pickling in a warm and clean bath of 10 Vol.-% sulphuric acid (H₂SO₄) or in a pickling agent. Note: When using other pickling agents follow the instructions for use of the respective manufacturer. The removal of oxides after ceramic firing inside of the functional inner parts of the implant supported crowns or the inside of a conventional crown can only be done by a very careful sandblasting, using non-abrasive agent (Glass beads) and a pressure of max. 2 bars.

19. Further information
On processing precious metal alloys, soldering and casting-on are included in the Dental documentation of Cendres+Métaux (04.99 edition) and on the website www.cmsa.ch/dental. The above mentioned instructions for use are based on our own experience and test results and should therefore be understood as basic guidelines. We reserve the right to improve the product or adapt these instructions for use.