



COBALT-CHROME ALLOY TECHNICAL CHARACTERISTICS FOR SIMEDA® CUSTOMIZED PROSTHETICS AND RECOMMENDATIONS FOR CERAMISATION

A/ Technical information provided by the alloy manufacturer:

Chemical composition

| Co | Cr | W | Si | Fe | Mn | C | Ni |
|-------------|-------------|-------------|------|-------------|-------------|------|------|
| 57.8 - 62.4 | 27.0 – 30.0 | 8.40 – 9.50 | 1.65 | 0.11 – 0.50 | 0.20 - 0.35 | 0.10 | 0.10 |

Mechanical properties

| | | |
|---------------------------------|--------|-------------|
| Tensile Strength | [MPa] | >900 |
| Modulus of Elasticity E at 20°C | [GPa] | 245 |
| Hardness HV10 | [HV10] | approx. 275 |

Physical properties

| | | |
|--|--------------------------------------|--------------|
| Density | [g/cm ³] | 8.4 |
| CTE – Coefficient of Thermal Expansion 20 – 500°C | [10 ⁻⁶ *K ⁻¹] | 14.2 |
| Liquidus temperature | [°C] | approx. 1320 |
| Veneering temperature | [C°] | max. 1040 |

B/ Veneering recommendation

1. Design

- Minimum thickness of metal 0.4 mm.
- Maximum thickness of ceramic 1.5 mm.
- Avoid all shapes with acute angles in favor of rounded shapes.
- Do not place metal/ceramic transition surfaces on proximal and occlusal contact zones.
- Preferably use a homothetic frame design for a uniform covering of the ceramic.
- Check that the minimum cross-section of the connectors for the bridges is not less than 6 mm². If this is not possible due to aesthetic constraints, make a slim palatine/lingual metallic bar or "bite stop".

2. Finishing

- Do not use diamond burs or a ceramic bond stone.
- Only use tungsten carbide burs in order to ensure that no other alloy can penetrate sensitive areas.
- When retouching, the bur must always be used in the same direction, with a uniform movement.
- The bur must be regularly cleaned with a steam jet or ultrasonic bath.

3. Sandblasting

- Sandblast with 150 µm aluminum oxide at 2 bars of pressure.
- After sandblasting, the surface of the frame must no longer be contaminated.
- The frame is cleaned with a steam jet or boiled in distilled water.
- Do not touch the frame with fingers after cleaning.

4. Oxide firing

- 980°C during 10 minutes.
- The frame will be held in place in a uniform manner to avoid any deformation during the baking phases.
- A regular increase in temperature ensures frame is stable.
- Slow cooling prevents stresses in the frame.
- The color of the oxides must be uniform and there must be no marks.
- After oxide firing, sandblast and clean the frame again as in the paragraph 3.

5. Bonder

- Using a bonder is strongly recommended.
- Follow the bonder manufacturer's instructions.

6. Opaque

- Using a bonder replaces the first layer of opaque.
- Do not make the layers too thick and do not allow the opaque to condense on the frame.
- Apply a uniform layer of opaque in order to completely cover the ceramic areas of the frame.
- Follow the ceramic manufacturer's instructions.

7. Veneering

- Follow the ceramic manufacturer's instructions and baking programs.
- Use a slow cooling process.