



CERACAST V (MMI-CERACAST-V) updated Aug 05, 2015

Non-Precious Dental Casting Ceramic Alloy

Technical Specifications

Melting range (°C)	1,165 - 1,207
Yield strength (MPa)	880
Tensile strength (MPa)	1,160
Elongation (%)	7.0
Density (g/cc)	7.9
Coefficient of linear expansion (25-500°C)	13.4

Composition

Nickel	73.0%
Chrome	14.0%
Molybdenum	8.5%
Beryllium	1.8%
Aluminum	1.7%
Titanium	<1%
Silicon	<1%
Cobalt	<1%

Waxing

Waxing procedure is very similar to the application of precious and semi-precious alloys. However, waxing could be as thin as 0.3 mm.

Sprueing

1. Direct for single units. Sprueing should be 1/4" (6 mm) in length. Based on the size and the thickness of crowns use 6-8 gauge sprues.
2. Indirect, for multiple units. Use straight 8 gauge sprue, about 1/8"; (3 or 4 mm) in length, and connect it to the unit.

For long spanned bridges use an additional sprue connected to the last unit.

Investing

Use high heat investments; follow the manufacturer's instructions carefully. Use debubbler. Use one-two ring liner.

After investment has set, scrape the top of the investment to allow gases to escape.

Burnout

Place the ring in the furnace at room temperature (or as high as 600°F if needed) and raise the temperature (to 1700°F for Ni based alloys; 1750°F for Co based alloys). Increase the temperature to 1800°F prior to casting, with one hour holding time. Soaking time: 45-60 minutes. DO NOT heat soak at 1800°F (982°C).

Melting & Casting

Can be melted with the induction machine or with gas/oxygen torch.

1. Torch casting: Use multiple orifice torch tips. Do not use crucible used for other alloys. Move the torch allowing even distribution of heat. Adjust oxygen regulators at approximately 25-30 Lbs. Propane. Adjust valves until the inner flame cone is blue and approximately 1/2"; long; the outside of the flame cone should be 3 1/2"; from the inner cone. Preheat the crucible. Release the casting arm when the ingots lose definition and puddle: molten ingots usually vibrate from the force of the flame. Bench cool the cast until the redness goes away.
2. Induction Casting: Set the temperature to 2700°F (1480°C). Set the casting arm speed between 425 and 450 rpm. Note: For best results use at least 50% new metal with 50% sandblasted and cleaned buttons.

When ingots pool together and shadow disappears, release the arm.

Metal Finishing

Sandblast the investing with pure non-recycled aluminum oxide. Do not smooth the surface of the frame bearing porcelain.

Use carbides, discs, diamonds and stones for metal finishing.

Metal Preparation

Sandblast the area bearing porcelain, and do not touch the area accepting porcelain; clean with ultrasonic cleaner.

De-gasing the metal is to achieve the desirable oxidation. Place the metal work in a furnace at 1200°F (650°C): create a vacuum and increase the temperature 100°F (38°C) per minute to 1900°F (1035°C); brake the vacuum and let it cool down.

Opaque & Porcelain Application

Bonding slurry must be applied to all surface bearing porcelain, apply slurry and dry it quickly in the oven with open muffle; fire the slurry coating in 10° higher temperature, as per instructions for opaque. Quicker method is using the same procedure without degas procedure. Use opaque manufacturer's instructions. Try to complete opaque firing in a single step.

Porcelain Application

Follow the instructions of the ceramics manufacturers. Build up your porcelain and try to save extra firing.

Note

For best results use at least 50% new metal with 50% sandblasted and cleaned buttons.

Caution: This alloy contains Ni & Be, not to be used in individuals with Ni sensitivity. Inhalation of Be dust and fumes can be toxic, grind and polish with adequate ventilation, and wear protective clothing.

