



## User instructions

# Vi-Comp® LFC



Cobalt based dental metal-ceramic casting alloy for low fusing high expansion ceramic.

Nickel and beryllium free.

ISO 22674  
ISO 9693



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Made in Germany

### Chemical composition in mass percentage

### Physical and alloying properties (target values)

Rx only

Co	33.5	Type	: IV extra hard	Modulus of elasticity*	: 200 GPa
Cr	29.5	Colour	: White	Melting interval	: 1,280-1,350°C/2,336-2,462°F
Fe	29.5	Density	: 8.2 g/cm <sup>3</sup>	Casting temperature	: 1,450°C/2,642°F
Mo	5.0	Vickers hardness*	: 360 (HV5)	Preheat temp.	: 900°C/1,652°F
Si	1.0	Yield strength*	: 760 MPa (Rp 0,2)	CTE 25-600°C	: 16.1 µm/m.K
Mn	1.0	Elongation*	: 6.0 %	CTE 25-500°C	: 15.9 µm/m.K
N, C	trace	Tensile strength*	: 980 MPa		* after firing

### Indications:

Type IV, dental casting alloy for metal-ceramic and full metal restorations, crowns, bridges, precision milling bars and attachments.

Can be veneered with low fusing, high expansion ceramic, s.a. Carrara Interaction.

### Contraindications:

- If components of the alloy are not tolerated or cause an allergic reaction, use must be terminated.

### Adverse effects:

- In exceptional cases, certain components of the alloy may cause an allergic reaction or sick feeling due to electrochemical processes.

### Interactions:

- In exceptional cases, occlusal or approximal contact with different alloys may cause a sick feeling due to electrochemical processes.

## Processing instructions

### Modelling

Make sure that the minimal object wall thickness can be at least 0.3 mm thick after finishing. Model the crowns and the bridges in line with the anatomical shape of the teeth to form an even ceramic layer.

Avoid sharp edges and undercuts. Create a chamfered transition from metal to ceramic.

We recommend using the indirect method for application of the casting sprues, with runner bars and broad supply sprues:

Runner bars	=	∅ 5 mm
Supply sprue to the bar	=	∅ 4 mm
Casting sprue to the object	=	∅ 2.5 mm
Distance between bar and casting object	=	1.5-2 mm

If the direct method has to be used nevertheless, the sprue must have a diameter of 3.5 to 4 mm. Indirect method for massive dummy's: very short distance between bar and casting object.

Use a phosphate-bonded investment and observe the manufacturer's user instructions.

We particularly recommend the high-expansion phosphatebonded Carrara Universal Dustless investment, as this offers the best conditions for fitting casting objects:

<i>Carrara Universal Dustless Investment</i>	6 kg = 40 x 150 g	Cat. no. 232976050
	6 kg = 100 x 60 g	Cat. no. 232980050
	6 kg = bucket	Cat. no. 232982050
<i>Carrara Universal DL Investment Liquid</i>	1 bottle/1 l	Cat. no. 233522050

### Preheating

Always observe the user instructions for the investment you are using. The following applies when you use the Carrara Universal DL investment:

Preheat the muffles to a temperature of 900°C/1,652°F.

### Required quantity of metal

Calculate the number of Vi-Comp® LFC casting ingots needed for casting by multiplying the object's wax weight (in g, incl. casting sprues) by the Vi-Comp® LFC density (g/cm<sup>3</sup>) of 8.2.

The weight of a Vi-Comp® LFC casting ingot is approx. 5 g.

Vi-Comp® LFC 250 g Cat. no. 5010055

### Melting and casting

Always observe all instructions and safety measures applicable in your country to the handling of the gases and gas mixtures you are using!

### General remarks:

- General: do not overheat the alloy.
- Only use clean crucibles appropriate for the alloy in question.
- Tip: We recommend the use of new metal only, so that the traceability is assured.
- When re-using pre-cast cones: only cast identical alloys.
- Sandblast already cast material until it is clean. Add at least 50% new material. Clean the metal well before re-use, for example by means of sandblasting and steamcleaning.
- Only use ceramic crucibles.

### Cleaning

Clean the metal well before re-use, for example by means of sandblasting and steam-cleaning. (Do NOT use soap, acids, pickling agent or solvents.)

### 1) Casting using an open flame and casting using an automatic casting centrifuge

- When melting in an open flame, wear safety goggles, safety gloves and appropriate safety clothing to protect the eyes and skin from dazzling, high temperatures and heat radiation!
- Balance the centrifuge arm and the casting centrifuge's counterweight to match the size of the muffle.
- For Vi-Comp® LFC, use a propane/oxygen gas mixture and a ceramic crucible used specifically for this alloy.
- Do not use any flux!
- Light the gas mixture and set the flame before melting.
- Put the preheated muffle into the casting machine.
- Put the number of Vi-Comp® LFC casting ingots required for casting in the preheated melting crucible. Keep the burner at approx. 50 mm from the top edge of the melting crucible. Heat the metal evenly by slowly rotating the head of the burner. Casting moment: as soon as the molten metal starts to move under the flame pressure. Careful! The alloy may not be overheated!
- After casting/once the centrifuge stands still, remove the muffle from the centrifuge arm.
- Before disembedding, allow the muffle to slowly cool down to room temperature.
- Do not quench the casting object, as this might cause changes to the mechanical properties. The crucible must be thoroughly cleaned after use.

### 2) Casting with an ECM casting machine

Preferably use an induction casting machine with temperature control.

Use a preheated Vitalium® crucible without graphite crucible insert. Do not add flux!

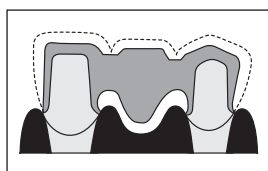
Standard crucible for ECM casting machines  
1 package = 6 units Cat. no. 8031106

We recommend using new alloys whenever possible.

When precast Vi-Comp® LFC alloys are reused, at least 50% new alloy material must be used to ensure that the physical and mechanical properties are preserved.

Before any new casting process, pre-cast Vi-Comp® LFC must be sandblasted thoroughly to prevent the formation of surplus oxide and slags (resulting in bubbles).

- Observe the melting and operating instructions of the casting machine you use.
- Melt the alloy and cast immediately after the glow no longer produces shadows.
- Before disembedding, allow the muffle to cool down slowly to room temperature.
- Do not quench the casting object, as this might change the mechanical properties.



### Setting the ECM casting machines:

- Temperature: 2,640°F Vitalium® Scale (1,450°C)
- Pyrometer position: towards the back (towards the casting cylinder)
- Setting the speed control:
  - for small quantities of metal 10
  - for large quantities of metal 30
- Soak time: 15 sec.

### 3) Casting with a VAC pressure casting machine

- After the glow no longer produces shadows, continue heating for approx. 3 seconds and then cast.

### Disembedding and sandblasting

- Allow the muffle to cool down in the open air.
- Then carefully remove the casting object from the muffle and remove investment residues.
- Sandblast the object using an aluminium oxide blasting agent. Do not sandblast the edges of the crown directly!

### Finishing and cleaning

- Only use ceramic bonded instruments for finishing.

### Preparations for ceramic firing

- Use high-expansion ceramic with a thermal expansion coefficient appropriate for the alloy (e.g. Carrara Interaction).
- Observe the manufacturer's instructions for use!
- Always sandblast the surfaces to be fired using aluminium oxide 250 µm, blasting pressure 3-4 bar.
- Thoroughly clean the sub-structure (steam blasting or scalding in distilled water). Do NOT use soap, acids, pickling agent or solvents.
- Oxidizing: 850°C/1,562°F, 10 minutes without vacuum.
- Always blast oxide using aluminium oxide 250 µm and thoroughly clean again (steam blasting or scalding in distilled water).
- Prevent any contact with greasy materials.
- After cleaning, only hold the object using arterial clamps and do not touch it.

### Opaque and dentin firing

- Observe the ceramics manufacturer's processing instructions for application and firing.
- Always apply the opaque twice.
- Apply a thin first layer and fire it in accordance with the firing table.
- Apply a covering second layer and fire it in accordance with the firing table.
- Build-up and fire the dentin and the incisal material, etc., in accordance with the instructions for use.
- For firing with Carrara ceramics, a quick cooling down phase is recommended (0 minutes).

### If the object requires repair:

- Remove the ceramic using only a mechanical method.
- Hydrogen fluoride (HF) affects the metal structure and may be unsuitable!

### Soldering Vi-Comp® LFC

For soldering Vi-Comp® LFC, we recommend the following soldering materials and fluxes from the product range:

### Soldering before firing

Denti®-Lot (approx. 1,150°C/2,102°F) 4 g incl. flux  
Catalogue no. 7672601005

### Safety instruction:

- Metal and grinding dust and vapours are hazardous to your health, so always use an extracting system during processing and sandblasting!

- See www.elephant-dental.com for material safety data sheets (MSDS).

### Guarantee:

Our processing recommendations given in writing, orally or by practical presentation are based on our own experience and/or trials as well as on the use of materials and devices manufactured by Elephant Dental B.V.; they are non-binding in all respects. It is the responsibility of the user to test incoming merchandise and check our recommendations with regard to the envisaged use. Any claims for damages will be limited to the value of the merchandise supplied by us. In all other respects, our terms and conditions of sale and delivery applicable at the time of the contract of purchase shall apply. Claims which are not expressly allowed in said terms and conditions are excluded unless we are liable by mandatory law in cases of (wrongful) intent or gross negligence. As we are committed to the improvement of our products we reserve the right to make changes in composition, design, unit supplied and packaging.