

# Instructions for Use

## Starbond CoS Powder 16, 30, 45, 55



**Product:** Cobalt-Chromium bonding alloy powder for the manufacturing of removable and fixed restorations by Selective Laser Melting (SLM). The alloy is a type 5 alloy according to ISO 22674. Free of nickel, beryllium, cadmium and lead. This alloy should be used by qualified and trained personnel for the designated scope of application.

**Indications:** Dental prosthesis

**Composition in % by mass:**

Co	Cr	W	Mo	Si	C, N, Fe, Mn
59.0	25.0	9.5	3.5	1.0	<1.0

**Technical Properties\*:**

Proof stress (Rp0.2)	720–1130 MPa	Density	8.8 g/cm <sup>3</sup>
Ultimate tensile strength	990–1250 MPa	Solidus-liquidus interval	1305–1400°C
Elongation	2–10%	Thermal expansion coefficient 20–600°C	14.4 x 10 <sup>-6</sup> K <sup>-1</sup>
Elastic modulus	195–200 GPa	Laser weldable	Yes
Vickers hardness	345–490 HV 10	Type (DIN EN ISO 22674)	5

\* Standard values, dependent on specific machine settings

**Model:**

The walls of the virtual model shall be at least 0.4 mm so that the final wall thickness after finishing or before ceramic and acrylic veneering will be at least 0.3 mm. Dental prosthesis are to be designed in accordance with the anatomical form of the teeth to provide for a consistent ceramic layer. Avoid sharp edges and undercut areas. Connectors of dental prosthesis are to be designed as thick and high as possible (at least 3 mm x 3 mm).

**Finishing and Cleaning:**

Sandblast frameworks after separation using aluminium oxide (approx. 110–250 µm) at 2–4 bar. Trim frameworks with clean carbide burs suitable for CoCr alloys or with diamond burs. Only trim in one direction in order to avoid overlapping that might result in bubbles during the subsequent ceramic build-up. Clean the surfaces to be veneered afterwards with fresh aluminium oxide (approx. 110–250 µm) at a pressure of 2–4 bar. Thoroughly steam clean framework or clean under running tap water. Degrease with ethyl alcohol.

**Oxide-firing:**

No oxide-firing necessary. If oxide-firing is optionally performed in order to visually check the metal surface, sandblast again with fresh aluminium oxide (approx. 110–250 µm). Clean framework again.

**Veneering:**

As long as the used ceramic allows for it, Starbond CoS Powder does not require long-time cooling. Please observe indications of ceramics manufacturer. The thermal expansion coefficient is 14.4 x 10<sup>-6</sup>K<sup>-1</sup>.

Further processing has to be performed according to the ceramic manufacturer's instructions, especially what the cooling-time after firing is concerned.

**Soldering:**

To avoid a mix of materials, soldering should generally be avoided. Should nevertheless soldering be necessary, the soldering model should be kept as small as possible; preheat model in furnace for 10 min at 600°C. Already before heating, the surfaces to be soldered should be covered with flux. The gap should not be larger than 0.2 mm (Recommended solder: Starbond Lot). Let soldered objects cool down slowly. After opaque firing no soldering should be performed anymore. Alternative joining techniques such as laser welding or gluing are to be applied.

**Laser welding:**

As filler wire commonly available laser welding wires suitable for the alloy (e.g. S&S Scheftner Starwire) are to be used. Observe the welding parameters recommended by the manufacturer of the welding laser.

**Polishing:**

Smooth out the visible metal surfaces by grinding with ceramic bonded stones. Finish with rubber polishers, prepolish with S&S Scheftner Black Diamond pre-polishing paste and polish with S&S Scheftner DiaStar polishing paste until high-polish effect is reached. Finally carefully steam clean or clean with ultrasonic cleaner.

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### Security notes:

The inhaling of Starbond CoS Powder is to be avoided. Please observe medical security data sheet for Starbond CoS Powder and indications of SLM-system manufacturers.

### Secondary effects :

such as allergies to contents of the alloy or electrochemically based reactions may very rarely occur.

### Reciprocal actions:

In case of occlusal or approximal contact of different alloys electrochemically based reactions may very rarely occur.

### Reactions:

In case of known incompatibilities and allergies to contents of the alloy.

### Applied standards:

DIN EN ISO 14971, DIN EN ISO 22674, DIN EN 15223, DIN EN 1641

# GC Initial INmetalbond



Buffer between GC Initial metal ceramics and dental alloys.

## GC Initial INmetalbond

INmetalbond is used as a thin layer between the alloy and the first Opaque layer.

The INmetalbond blocs the escaping metal oxides and neutralizes differences in the expansion coefficient.

The bonder does not increase the bonding strength as such but allows a wider span of CTE compatibility.

## Recommended indications

Can be used on all PFM alloys, precious as well as non-precious.

## Instruction For Use

- Metal framework needs to be prepared according manufacturer's instructions.
- Oxidation firing again according manufacturer's instructions.
- Stir paste before using.
- Apply the Bonder in a thin layer but mask the metal completely.

### IMPORTANT:

- To change the consistency of the INmetalbond paste, use the "GC Initial Paste Opaque Thinner".
- Only use it in very small quantities.
- To avoid drying out, close the cap after using.
- The fired Bonder should have a yellowish, slightly shiny surface.

### NOTE:

- The colour of the fired bonder can vary depending on the composition of the alloys.
- When using NPA (non-precious alloys) with the INmetalbond, the final temperature of the Opaque Washbake does not need to be increased by 20°C anymore.

e.g.: 1st Opaque Firing on NPA:

GC Initial MC = 940°C

GC Initial LF = 830°C

## Firing instructions

Preheating Temp.	Drying Time	T° increase	Vacuum	Final Temp.	Holding Time
550°C	6min	80°C/min	Yes	980°C	1min no vacuum

## Storage

Store in a cool, dry place.

## Shelf life

GC Initial INmetalbond: 5 years

## Packages

GC Initial INmetalbond, 2x4gr.

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Prior to use, carefully read  
the instructions

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**Before using the product, please read instructions for use carefully.**

## **1. Indication range**

Ceram Bond is a ceramic material which is used as a layer between all metals and ceramic. It compensates differences in the expansion coefficients between metal and ceramic and blocks escaping metal oxides.

## **2. Processing**

2.1. Preparation of the object:

After finishing, sandblast the framework with aluminium oxide. Then clean thoroughly with distilled water in the ultrasonic unit for ten minutes or using the steam cleaner. Afterwards the metal surface must not be touched any more.

2.2. Applying Ceram Bond:

Use a brush for stains to apply one covering coat with a uniform layer thickness onto the metal surface.

2.3. Predrying Ceram Bond in the ceramic furnace:

Open the ceramic furnace which has been preheated to 650° C and dry the framework onto which Ceram Bond has been applied for one minute in the open furnace.

2.4. Firing Ceram Bond in the ceramic furnace:

Firing of Ceram Bond is started at 650° C and continued up to 980° C. The temperature increase rate is 55° C/minute. Firing is performed under vacuum. After completion of the firing process, the framework is immediately removed from the furnace. After firing, the framework should exhibit a beige to golden yellow color.

2.5. Opaque firing and further processing:

Apply the opaque material – according to the tooth shade – onto the fired Ceram Bond. A wash bake is not required. Then further processing is carried out according to the instructions of the manufacturer of the ceramic material.

## **3. Error sources and their elimination:**

To ensure successful use, we recommend to test the desired alloy with Ceram Bond.

3.1. Cracks in Ceram Bond: Ceram Bond was applied too thickly (very fine cracks are acceptable/normal)! Sandblast the material and reapply as described above.

3.2. Bubbles in Ceram Bond: The metal must be degased. Sandblast Ceram Bond and degas the framework at 980° C under vacuum for ten minutes before Ceram Bond is applied again.

3.3. Green and/or blacks spots in Ceram Bond: Ceram Bond was applied too thinly or the framework was wet or greasy.

3.4 Cracks in the ceramic: If Ceram Bond reveals a rusty brown color after firing, the alloy is not suitable. Please use a different alloy.

The following alloys have proved to be unsuitable: Crutanium by Krupp Austenal, Crysatalloy by Shofu and Ticonium.

## **4. Safety recommendations and hazard warnings**

4.1. Personal protective equipment:

When processing Ceram Bond, protective gloves, safety goggles and protective working clothes must be worn.

4.2. Skin contact: Wash off immediately using water and soap and rinse carefully.

4.3. Eye contact: Rinse eyes for several minutes under running water with eyelid being opened.

4.4. After swallowing: If complaints persist, seek medical attention.

## **5. Storage and durability:**

5.1. The product must be stored in the sealed container under dry conditions. If proper storage is ensured, the product features unlimited durability.

5.2. Proper disposal: Ceram Bond can be disposed of together with the regular household garbage.

## **6. Additional information**

The information contained in these instructions for use is always updated according to the latest knowledge and experience. Therefore we recommend to read the instructions for use again before using a new package.



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