



AMANNGIRRBACH

THE CoCr REVOLUTION.

 **ceramill sintron<sup>®</sup>**



THE INHOUSE MOVEMENT<sup>®</sup>

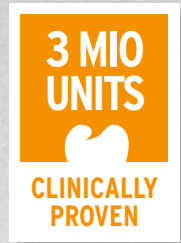




## CoCr SINTER METAL FOR INHOUSE DRY PROCESSING

With the dry-millable Ceramill Sintron sinter metal and the Ceramill Argotherm 2 high-temperature furnace Amann Girrbach provides a process-reliable, easy system for the fabrication of CoCr-based restorations. The perfect interplay of material and sinter furnace results in unprecedented quality in terms of accuracy of fit, homogeneity and reproducibility.

Ceramill Sintron was developed in collaboration with the Fraunhofer IFAM Dresden, Germany ([www.ifam.fraunhofer.de](http://www.ifam.fraunhofer.de)). Independent universities and accredited test laboratories were commissioned with relevant material and procedure testing of Ceramill Sintron. Based on the excellent test results and feedback, the process and material quality has been validated at the highest level and guarantees maximum safety for the user and patients.









FABRICATE A HIGHLY PRECISE CoCr FRAMEWORK  
EASILY, RELIABLY AND EFFICIENTLY.

DESIGN (CAD)



ceramill® mind

PRODUCTION (CAM)



ceramill® mikro 4X

ceramill® mikro 5X



ceramill® motion 2

SINTERING



ceramill® argotherm 2

ceramill® argovent 2

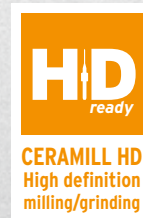
- \_Computer-based inhouse production of CoCr restorations ensures maximum value creation and amortisation turbo of the CAD/CAM system
- \_High saving in time due to digital templates (tooth library) in combination with HD milling strategy replace time-consuming waxing up and accelerate the design
- \_Predictable, reproducible fit with homogeneous framework quality thanks to a sinter process specially coordinated to the material



## DRY MILL CoCr - EASY AS WAX

Ceramill Sintron enables CNC-based dry milling of non-precious restorations using bench-top milling machines inhouse in the laboratory. For a long time it was not possible to fabricate CoCr restorations on “small” laboratory milling machines because of the material hardness. The material can be effortlessly dry milled thanks to the “wax-like” texture of Ceramill Sintron. During the subsequent sintering process in a shielding gas atmosphere, the frameworks achieve their final material properties - a CoCr unit with a very homogeneous structure. Any conventional CoCr framework porcelain can then be used for veneering.

- \_Wax-like texture for minimum cutter wear and effortless milling in the dry mode**
- \_Easy handling thanks to easy reworking and finishing of milled restorations in the green state**
- \_Maximum process reliability thanks to homogeneous, distortion-free framework**
- \_Excellent strength values, bonding strength and biocompatibility**



Ceramill Sintron crown milled and sintered in Ceramill HD quality



Ceramill Sintron blanks



## INTELLIGENT SHIELDING GAS SINTERING FOR CERAMILL SINTRON

Ceramill Argotherm 2 is a high-temperature furnace, which was specially developed for sintering Ceramill Sintron restorations and has been optimally coordinated to the system components of the Ceramill CAD/CAM system. This is because only perfect adaptation of sinter metal, processing in the CAD/CAM system and temperature conditioning in the sinter furnace ensures constantly high material quality - particularly if it concerns the mechanical properties and structure of the finished restoration. Easy to operate at the press of a button, the Ceramill Argotherm 2 controls the sinter programme of the milled CoCr units and guarantees predictable and distortion-free results without contraction cavities. The "core" of the system, the removable sinter chamber Ceramill Argovent 2, ensures minimal consumption of argon gas and homogeneous sintering of the restorations. The compact furnace with minimum space requirements is used as a benchtop model and cools actively after sintering.

- \_Constantly high sinter quality thanks to the specially developed sinter programme**
- \_Integrated compressed-air and shielding gas monitoring ensure maximum process reliability and minimum shielding gas consumption**
- \_Sintering at the press of a button - easy to operate using touch-screen technology with sinter-progress and time-remaining display**
- \_Capacity per sinter cycle: up to 40 units**









## CERAMILL SINTRON INDICATION OVERVIEW



Crowns



Bridges



Telescopes



Attachments



Abutments on titanium bases



Bars







## LONG-SPAN CERAMILL SINTRON BRIDGES - PRECISE, DISTORTION-FREE

Ceramill Sintron enables CAD/CAM-based fabrication of restorations for fixed and removable prosthetic dentures. In addition to the standard indications this also includes telescope crowns, attachments or bars. With Ceramill Float Sintering or the software-based Bridge Split function in combination with laser welding, Amann Girrbach provides two versions for fabricating long-span restorations that guarantee precise, distortion-free end results.

### CERAMILL FLOAT SINTERING

Amann Girrbach has developed a special zircon oxide Float Sintering Disc for the fabrication of long-span bridges. Supporting pins and sintering bars (Float Sintering Support) on the restoration hold the framework stable during the sintering process and ensure predictable and accurate results.



Long-span Ceramill Sintron bridge with supporting sinter pins and bars on the float sintering disc



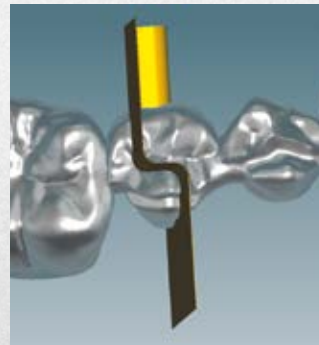
Milled frameworks on Float Sintering Disc in the Ceramill Argovent 2



Distortion-free and accurately fitting final results

### BRIDGE SPLIT WITH LASER WELDING

The Bridge Cut tool of the Ceramill Mind software provides an alternative fabrication possibility in combination with laser welding. Using the Bridge Cut function one or more 3D separating cuts are placed, which divides the restoration into segments. The three-dimensional geometry of the separating cut ensures easy and precise assignment of the framework elements. Exact interlocking of the restoration elements creates an optimum basis for stable weld seams, which guarantee distortion-free bridge frameworks.



Placing the digital 3D separating cut using the bridge split function in the CAD software



The 3D geometry of the separating cut ensures that the restoration elements interlock accurately



Distortion-free and accurately fitting final results



### SAVING IN WORKING TIME

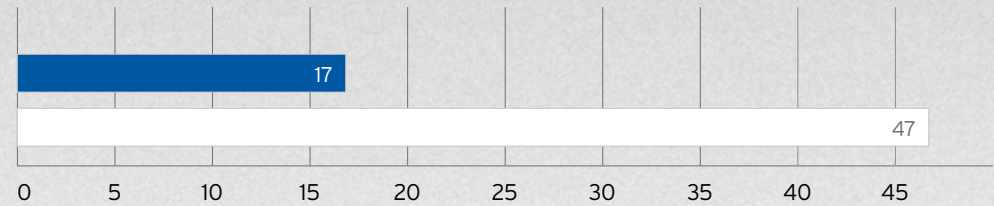
Comparison of the fabrication method (in minutes)

Work stages taken into account with Ceramill Sintron:  
scanning > designing > nesting > sending data to the milling machine > separating connection > fitting > finishing

Work stages taken into account with the casting technique:  
Waxing up > spruing & investing > deinvesting > sandblasting > separating connectors > fitting > finishing

Source: Amann Girrbach R&D

**ceramill sintron®**  
Manual casting technique



### BOND STRENGTH

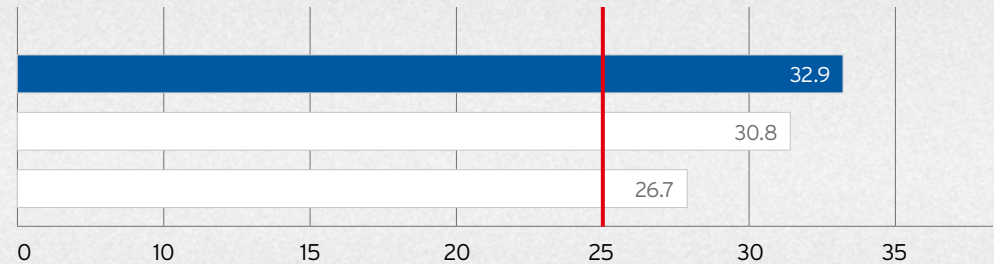
The coefficient of thermal expansion (25-500 °C) of Ceramill Sintron is  $14,5 \times 10^{-6}/K$ .

Ceramill Sintron can therefore be veneered with all conventional non-precious metal veneering porcelains.

The bond strength (MPa) of Ceramill Sintron to veneering porcelain (Creation CC) achieves higher values than the bond strength between Girobond NB (casting alloys) or Ceramill NPL (SLM) and veneering porcelain.

Source: A Novel CAD/CAM Base Metal Compared to Conventional CoCrMo Alloys - An in-vitro Study of the Long-term Metal-ceramic Bond Strength; (Bogna Stawarczyk - LMU (Ludwig Maximilian University) Munich, Germany)

**ceramill sintron®**  
**ceramill® npl**  
**girobond® nb**



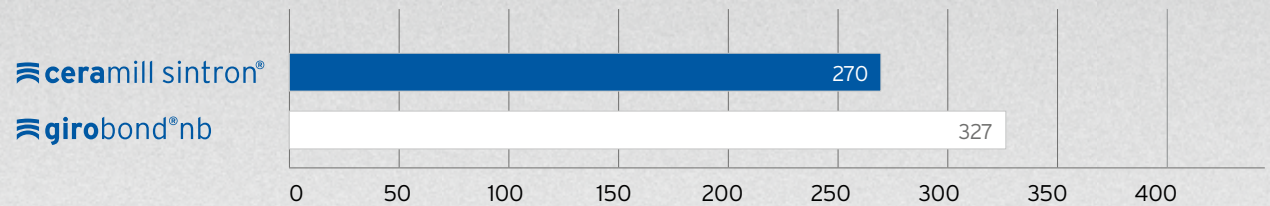
— Threshold value for meeting the standard



## VICKERS HARDNESS HV 10

In the densely sintered state Ceramill Sintron has a lower hardness than CoCr casting alloys, which facilitates workability/polishability.

Source: Amann Girrbach R&D



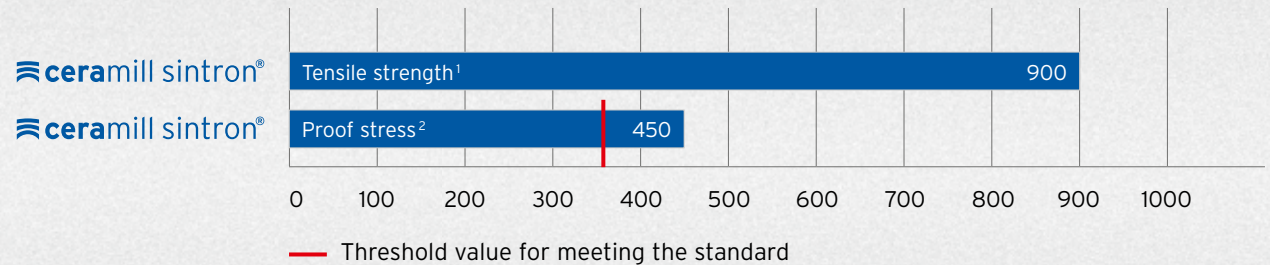
## MECHANICAL PROPERTIES

Ceramill Sintron greatly surpasses the strength requirements of ISO 22674 for Class 4 alloys (Rp 0.2: 360 MPa).

Source: Amann Girrbach R&D

<sup>1</sup> Tensile strength (Rm) MPa

<sup>2</sup> 0.2% Proof stress (Rp 0.2) MPa



## CORROSION RESISTANCE AND BIOCOMPATIBILITY

Ceramill Sintron successfully passed all corrosion and biocompatibility tests. Ceramill Sintron fulfils all standard requirements in relation to corrosion resistance and biocompatibility that are applicable for metal materials in dentistry.

Quelle: BIOSERV Analytik und Medizinprodukte GmbH, Rostock, Germany







## ORDER INFORMATION

761101R	△ Ceramill Sintron 71XXS, CoCr blank	h = 10 mm	1 pc.
761102R	△ Ceramill Sintron 71XS, CoCr blank	h = 12 mm	1 pc.
761103R	△ Ceramill Sintron 71S, CoCr blank	h = 14 mm	1 pc.
761104R	△ Ceramill Sintron 71, CoCr blank	h = 16 mm	1 pc.
761105R	△ Ceramill Sintron 71M, CoCr blank	h = 18 mm	1 pc.
761106R	△ Ceramill Sintron 71L, CoCr blank	h = 20 mm	1 pc.
761107R	△ Ceramill Sintron 71 XL, CoCr blank	h = 25 mm	1 pc.
761132	○ Ceramill Sintron 98x10 N, CoCr blank	h = 10 mm	1 pc.
761130	○ Ceramill Sintron 98x12 N, CoCr blank	h = 12 mm	1 pc.
761128	○ Ceramill Sintron 98x14 N, CoCr blank	h = 14 mm	1 pc.
761126	○ Ceramill Sintron 98x16 N, CoCr blank	h = 16 mm	1 pc.
761124	○ Ceramill Sintron 98x18 N, CoCr blank	h = 18 mm	1 pc.
761122	○ Ceramill Sintron 98x20 N, CoCr blank	h = 20 mm	1 pc.
761120	○ Ceramill Sintron 98x25 N, CoCr blank	h = 25 mm	1 pc.
761600	⊗ Ceramill Sintron ZZ 95x10, CoCr blank	h = 10 mm	1 pc.
761601	⊗ Ceramill Sintron ZZ 95x12, CoCr blank	h = 12 mm	1 pc.
761602	⊗ Ceramill Sintron ZZ 95x14, CoCr blank	h = 14 mm	1 pc.
761603	⊗ Ceramill Sintron ZZ 95x16, CoCr blank	h = 16 mm	1 pc.
761604	⊗ Ceramill Sintron ZZ 95x18, CoCr blank	h = 18 mm	1 pc.
761606	⊗ Ceramill Sintron ZZ 95x25, CoCr blank	h = 25 mm	1 pc.
178730	Float Sintering Disk 2		1 pc.
178740	Ceramill Argotherm 2 (inkl. Ceramill Argovent 2)		
178745	Ceramill Argovent 2		

## TECHNICAL DATA CERAMILL ARGOTHERM 2

Dimensions D/W/H	500/461/480 mm
Weight	32 kg
Electrical connections	220-240V 50/60Hz
Power	3.5 kW
Fuse (fast)	12.5 A
Safety class	IP20
Thermal protection class according to	DIN EN 60519-2: Class 0
Ambient conditions	+5 to +40°C
Humidity	80 %







AMANNGIRRBACH

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