The non-precious metal revolution.
CoCr sinter metal for in-house dry processing using the Ceramill Motion

High innovation power is incorporated in the Ceramill Sintron® CoCr sinter metal from Amann Girrbach. The non-precious metal revolutionises the manufacturing process, as the wax-like texture of the Ceramill Sintron® blanks (CoCr blanks) allows them to be effortlessly dry milled on in-house desktop machines such as the Ceramill Motion 1 and 2. The labour-intensive and error-prone casting procedure and therefore time-consuming manually working stages are no longer required. The sinter process is also extremely easy: the press of a button is sufficient for an excellent result with regard to material quality. Maximum process reliability produces homogeneous, distortion-free frameworks without contraction cavities. Using the new Ceramill Sintron® it is possible to achieve predictable, reproducible fit and framework quality. Ceramill Sintron® can be veneered using any CoCr framework porcelain.

The highlights of Ceramill Sintron®:

- Effortless dry milling on desktop milling machines due to the “wax-like” texture of the blanks
- Maximum convenience - the entire conventional crown and bridge non-precious metal casting procedure is no longer required
- Maximum in-house value creation - outsourcing for non-precious metal is no longer required, no dispatch times
- Great saving in time during manufacture of non-precious restorations due to in-house production and computer-based design process
- Predictable, reproducible fit and framework quality thanks to the digital processing technique

- Manufacturing process analogous to Ceramill Zi
- Amortisation turbo for the CAD/CAM system in the laboratory
- Maximum process reliability - homogeneous, distortion-free framework without contraction cavities
- No need to change the veneering porcelain (any conventional non-precious metal veneering porcelain can be used)
- Digital templates (tooth library) replace waxing up and accelerate the design
- Easy trimming and finishing of the milled framework in the green body state
- No remakes due to miscasts, as the quality is predictable
- Dry milling - no cooling necessary
- Minimal tool wear because of the wax-like texture of the blanks
- Time-consuming spruing for ingates is no longer required
CoCr sinter metal for CAD/CAM dry milling

For the first time Ceramill Sintron® enables CNC-based* dry milling of non-precious metal restorations using desktop milling machines in-house in the laboratory. Up to now it has not been possible to fabricate CoCr restorations on "small" laboratory milling machines because of the material hardness. Due to the "wax-like" texture of the Ceramill Sintron® blanks the material can be easily dry milled in the Ceramill Motion 1 and the Ceramill Motion 2. During the subsequent sinter process with shielding gas flushing the frameworks attain their final state - a non-precious unit with a very homogeneous material structure.

Ceramill Sintron® was developed in collaboration with the Fraunhofer IFAM Dresden, Germany (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.

Indications:
- Anatomically reduced and fully anatomical crown and bridge frameworks in the anterior and posterior region
- Bridge frameworks with a maximum of two connected pontics in the anterior and posterior region and a maximum anatomical length of 50 mm
- Cantilever bridges with a maximum of one bridge pontic (maximum one cantilever unit up to the second premolar maximum).

Contraindications:
- Known incompatibility to the components

Ceramill Sintron®71
- 6 heights of blank (XXS = 10 mm to L=20 mm)
- Expansion factor of approx. 11%
- Developed specially for processing in the Ceramill system
- 25 to 30 units can be milled from one Ceramill Sintron® blank
Ceramill Argovent is a high-temperature furnace and was specially developed for sintering Ceramill Sintron®. The Ceramill Argovent is easily operated at the press of a button and controls the sinter programme of the milled CoCr units. The compact furnace that requires minimal space is used as a benchtop model and actively cools after sintering.

### Technical data:
- **Art. No.**: 178700
- **Dimensions (D x W x H) incl. servicing unit**: 385 x 400 x 465 mm
- **Weight**: 23 kg
- **Electrical connections**: V/Hz 220-240/50-60
- **Power**: 3.5 kW
- **Maximum temperature**: 1,550°C
- **Control current fuse (slow)**: 4A
- **Safety Class – IP20**:
- **Thermal protection class according to DIN EN 60519-2**: Class 0
- **Sound pressure level**: < 80 db (A)
- **Ambient conditions**:
  - **Temperature**: +5 - +40°C
  - **Humidity**: 80%
1. Scanning the model situation
2. Design of the restoration (with virtual articulator)
3. Milling the restoration from the Ceramill Sintron® blank (dry milling in the Ceramill Motion 1 or 2)
4. Positioning the restoration in the sinter tray of the Argovent
5. Placing the sinter tray with fitted sinter cover in the furnace
6. Putting on the sinter retort and starting the sinter process
Ceramill Sintron® restoration after sintering and removal from the Ceramill Argotherm sintering furnace

Sandblasting the restoration and preparing for porcelain veneering

Porcelain veneering of Ceramill Sintron®

Polishing the fully anatomical sections

Checking the fit and occlusion

Veneered and polished Ceramill Sintron® restoration
Comparison of the saving in working time of the fabrication technique

Working stages taken into account: scanning > designing > nesting > sending data to the milling machine > separating connection > fitting > finishing

Source: Amann Girrbach R&D

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Corrosion resistance and biocompatibility

<table>
<thead>
<tr>
<th>Test start</th>
<th>Standard</th>
<th>Fulfilled?</th>
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</thead>
<tbody>
<tr>
<td>Corrosion</td>
<td>DIN EN ISO 10271:2001</td>
<td>✓</td>
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<tr>
<td>Tarnish resistance</td>
<td>DIN EN ISO 22674:2006, Pkt. 8.6</td>
<td>✓</td>
</tr>
<tr>
<td>Static immersion test</td>
<td>DIN EN ISO 10271:2011-10, Pkt 4.1</td>
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<tr>
<td>Static immersion test</td>
<td>DIN EN ISO 10271:2011-10, Pkt 4.5</td>
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<tr>
<td>Sensitisation (allergenicity)</td>
<td>DIN EN ISO 10993-10</td>
<td>✓</td>
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<tr>
<td>Cytotoxicity (after 24 h and 72 h)</td>
<td>DIN EN ISO 10993-5</td>
<td>✓</td>
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<tr>
<td>Systemic toxicity</td>
<td>DIN EN ISO 10993-11</td>
<td>✓</td>
</tr>
<tr>
<td>Intracutaneous reactivity</td>
<td>DIN EN ISO 10993-10</td>
<td>✓</td>
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</tbody>
</table>

_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_

Source: BIOSERV Analytik und Medizinprodukte GmbH, Rostock, Germany

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Chemical composition

<table>
<thead>
<tr>
<th>Components [%]</th>
<th>Casting alloy</th>
<th>Sinter alloy</th>
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<tbody>
<tr>
<td></td>
<td>Girobond NB</td>
<td>Ceramill Sintron®</td>
</tr>
<tr>
<td>Cobalt (Co)</td>
<td>62</td>
<td>66</td>
</tr>
<tr>
<td>Chrome (Cr)</td>
<td>25</td>
<td>28</td>
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<td>Molybdenum (Mo)</td>
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<td>Tungsten (W)</td>
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<td>Silicon (Si)</td>
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<td>Cerium (Ce)</td>
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<td>Iron (Fe)</td>
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<td>Niobium (Nb)</td>
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<tr>
<td>Manganese (Mn)</td>
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</tbody>
</table>

Both alloys are free of nickel, beryllium, gallium and cadmium in accordance with DIN EN ISO 22674:2007.

The chemical composition of Ceramill Sintron® is comparable to that of CoCr casting alloys.

Source: Amann Girrbach R&D
Ceramill Sintron® greatly surpasses the strength requirements of ISO 22674 for Class 4 alloys (Rp 0.2: 360 MPa).
The strength values are comparable with those of CoCr casting alloys.
Source: Amann Girrbach R&D

The coefficient of thermal expansion (25-500°C) of Ceramill Sintron® is 14.5x10⁻⁶/K.
Ceramill Sintron® can therefore be veneered with all conventional non-precious metal veneering porcelains.
The bond strength of Ceramill Sintron® to veneering porcelain (in this case Creation CC) is comparable to the bond strength between CoCr casting alloys and veneering porcelain.
Source: Amann Girrbach R&D
Vickers hardness HV 10

Vickers hardness according to ISO 6507

Girobond NB 327
Ceramill Sintron® 280

Solderability / Laserability

In the densely sintered state Ceramill Sintron® has a lower hardness than CoCr casting alloys, which facilitates workability/polishability.
Source: Amann Girrbach R&D

The weldability and solderability of Ceramill Sintron® is given as analogous to CoCr casting alloys without restriction.
Source: Amann Girrbach R&D

Ordering information

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<th>Quantity per pack</th>
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<tbody>
<tr>
<td>761101</td>
<td>Ceramill Sintron® 71XXS, CoCr blank, dental arch form</td>
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<td>761102</td>
<td>Ceramill Sintron® 71XS, CoCr blank, dental arch form</td>
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<td>761103</td>
<td>Ceramill Sintron® 71S, CoCr blank, dental arch form</td>
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<td>761104</td>
<td>Ceramill Sintron® 71, CoCr blank, dental arch form</td>
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<td>761105</td>
<td>Ceramill Sintron® 71M, CoCr blank, dental arch form</td>
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<td>761106</td>
<td>Ceramill Sintron® 71L, CoCr blank, dental arch form</td>
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