

# Troubleshooting

**Crown and Bridge Technique**

## ENGLISH

### **Dear Customer,**

Thank you for selecting Dentaurem products for crown and bridge dental prostheses. You decided to purchase high quality products that are precisely adapted to one another and produce accurately fitting, attractive dental prostheses.

The production of high quality dental prostheses is dependent on precision workmanship and close attention to the processing instructions.

However, should you have difficulty in using our products, we would like to assist you in finding a solution.

This brochure contains useful information to help you avoid mistakes in using our products and to identify the cause of problems that might occur.

Should you require further assistance, do not hesitate to call our customer service department. The phone number is: +49 72 31/80 34 10

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**Problem analysis, alphabetical index**

**See number:**

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Dentaurum products:

Castorit <sup>®</sup> -super:	investment material for precious metal crown and bridge alloys
Castorit <sup>®</sup> -super C:	investment material for non-precious metal crown and bridge alloys
Castorit <sup>®</sup> -super all speed:	crown and bridge investment for all alloys
Platorit <sup>®</sup> :	investment material for precious metal crown and bridge alloys
Remanium <sup>®</sup> CD:	CoCrMo porcelain bonding alloy
Remanium <sup>®</sup> CS:	NiCrMo porcelain bonding alloy
Remanium <sup>®</sup> CSe:	NiCrMo porcelain bonding alloy
Remanium <sup>®</sup> 2000:	CoCrMoW porcelain bonding alloy
Remanium <sup>®</sup> 2001:	CoCrMo porcelain bonding alloy
Remanium <sup>®</sup> G-soft:	crown and bridge alloy NiCrMo based

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**Problem analysis after completion of work**

No.	Problem	Cause	Remedy
1	Mixing consistency too thick or too thin.	Incorrect mixing ratio of powder to liquid.	Observe mixing ratio stated in instruction manual.
2	Investment sets too quickly.	Powder and/or liquid too warm.	Ideal processing temperature 18°-22°C / 64°-72°F.
3	Investment sets too slowly or not at all.	Mixing container dirty (plaster, soap, electrolyte, oil). Moisture in investment material. Investment material or liquid too cold.	Keep mixing container clean. Do not allow powder bag to remain open. Observe recommended processing temperature. Store investment and liquid at room temperature 18°-22°C / 64°-72°F.
4	Formation of cracks in ring.	Setting time too short. Ring allowed to bench set too long and has dried out. Incorrect or too rapid preheating of ring. Use of solid plastic parts. Pressure investing. Steam de-waxing. Liquid crystallized. Liquid with red film (bacteria formed).	Observe setting time of 40 minutes. Place ring in burnout furnace after 40 minutes setting time. Keep ring moist over weekend or dry on same day at 250°C / 482°F. Place ring in cold burnout furnace. Heat up slowly (5°C / 41°F per min) and observe holding time of one hour at 250°C / 482°F. Solid plastic parts (sprues) must be coated with wax. Not recommended. Not recommended. Use fresh liquid and keep tightly closed. Liquid stored too long or not properly closed. Use fresh liquid.

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No.	Problem	Cause	Remedy
	Cracks in ring.	<p>Liquid stored too cold or ordered during cold weather.</p> <p>Dirty mixing bowls and beakers.</p> <p>Invested with liner without metal ring.</p> <p>Wrong positioning of ring in burnout furnace.</p> <p>Effect of impact.</p>	<p>Order before beginning of winter. Do not store liquid under 5°C / 41°F.</p> <p>Always keep bowls clean. Do not use them for plaster or clean with soap.</p> <p>Use metal rings.</p> <p>Place rings in burnout furnace with casting funnel pointing downwards.</p>
5	Casting not complete. Round holes in crowns and/or round cervical edges.	<p>Ring temperature too low.</p> <p>Casting (release of centrifuge) delayed too long.</p> <p>Melt too cold.</p> <p>Ceramic crucible not preheated.</p> <p>Insufficient torque in centrifuge.</p> <p>Wrong position of casting object in ring.</p> <p>Wax up too thin.</p>	<p>Allow ring to soak long enough at correct temperature (see instructions) (30 minutes - 1 hour). Check final temperature of burnout furnace. (If necessary re-calibrate burnout furnace).</p> <p>Check burnout furnace temperature. Casting delay time not over 40 seconds Pre-melt metal.</p> <p>Follow instructions for melting metal.</p> <p>Heat crucible.</p> <p>Check centrifuge. If necessary attach air-vents (Ø 1 mm min.).</p> <p>Crowns should not be covered more than 8 mm with investment material (air block). Do not place crowns too close to ring edge.</p> <p>Minimum thickness of wax up, 0.4 mm.</p>



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No.	Problem	Cause	Remedy
	Frayed cervical edges, sharp edged porosity in casting.	<p>Solid plastic parts used.</p> <p>Adhesive for retention beads not suitable.</p> <p>Investment material inclusions.</p>	<p>Use plastic only when it burns without residue and is coated with wax.</p> <p>Change retention adhesive.</p> <p>Wax connections correctly.</p>
10	Crowns flooded, i.e. broken investment dies.	<p>Wax surface tension reducer used incorrectly.</p> <p>Pressure investment.</p> <p>Steam de-waxing.</p> <p>Pre-heating of ring too rapid.</p>	<p>Wax surface tension reducer (Lubrofilm) must be blown dry.</p> <p>Not recommended.</p> <p>Do not use.</p> <p>See instructions for processing investment material.</p>
11	Porous castings, contraction pits.	<p>Poor metal flow due to incorrect spruing.</p> <p>Use tapered sprues.</p> <p>Investment compound used that contains carbon.</p> <p>Incorrect or old crucible used.</p> <p>Dirty crucible with metal residues from another alloy (e.g. Pd alloy).</p> <p>Incomplete burnout of alien residues.</p>	<p>Use thicker sprues. Use runner bar for larger pieces. Attach sprue to thickest part of wax up.</p> <p>Do not taper sprues towards casting.</p> <p>Use carbon-free investment such as Castorit®.</p> <p>Use casting crucibles for one metal only. Remove slag from crucible and replace old crucibles.</p> <p>Use melting crucibles for one metal only. Keep them clean.</p> <p>Burn out modelling wax and plastic completely. Extend burnout time, raise temperature.</p>

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No.	Problem	Cause	Remedy
12	Crowns too tight.	<p>Ring heated too quickly.</p> <p>Metal cast too hot.</p> <p>Liner (Kera Vlies) used incorrectly.</p> <p>Investment processed too cool.</p> <p>Ratio of powder to liquid not observed.</p> <p>Secondary parts of telescope crowns were made with plastic caps that were not cut.</p> <p><b>Wrong concentration of mixing liquid for powder:</b> Castorit® super</p> <p>Platorit®</p>	<p>Heating rate 5°C / 41°F per minute. Holding time, 250°C / 482°F for 60 mins.</p> <p>Do not overheat melt, otherwise rough surface and tighter fit.</p> <p>Place layer of Kera-Vlies (moistened) in the metal ring.</p> <p>Room temperatures and temperature of powder and liquid should be between 18°C / 64°F and 20°C / 68°F.</p> <p>See instructions for use: less liquid gives looser fit, more liquid gives tighter fit.</p> <p>When plastic caps are used, these must be cut to release tension.</p> <p>If the expansion of the liquid for a certain alloy is not sufficient, the next higher concentration liquid should be used i.e. liquid B instead of liquid A, or C instead of B.</p> <p>Liquid must be used in concentrated form. Additional expansion of both investment materials can be obtained through hygroscopic investing.</p>

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No.	Problem	Cause	Remedy
13	Crowns are too loose.	<p>Ratio of powder to liquid not observed.</p> <p><b>Wrong concentration of mixing liquid for powder:</b> Castorit® super Castorit® super C</p> <p>Platorit®</p> <p>Invested without ring. Uncontrolled expansion.</p>	<p>See instructions for processing investment material; less mixing liquid gives a looser fit, more liquid gives a tighter fit.</p> <p>A tighter fit is obtained by diluting the liquid for the alloy type in question with distilled water. The dilution may be as high as 50%.</p> <p>Depending on the alloy, the concentrated Platorit® liquid can be diluted with up to 20% distilled water.</p> <p>Use metal ring with a layer of Kera Vlies®. Kera Vlies® must be dampened with water beforehand.</p>
14	Bridge rocks.	<p>Wax structure contained stresses.</p> <p>Overall expansion of investment material too high.</p> <p>Invested without metal ring.</p> <p>For further problems, see „Fitting of crowns“.</p>	<p>Wax up free of stress under uniform temperature conditions.</p> <p>A lower degree of expansion of the investment material is achieved by diluting the liquid.</p> <p>Use metal ring with a layer of Kera Vlies®. Kera Vlies® must be dampened with water beforehand.</p>
15	Frame stained after oxide bake.	Wrong casting crucible or old casting crucible.	<p>Use crucible for one metal only.</p> <p>Use new crucible if level of residue is too high.</p> <p>Only use ceramic crucibles.</p>

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No.	Prpblem	Cause	Remedy
	Frame stained after oxide bake.	<p>Incorrect grinding materials used for preparation.</p> <p>Contamination by incorrect blasting and cleaning.</p> <p>Unsuitable solder used.</p>	<p>Use grinding material for one metal only.</p> <p>Use clean grinding material.</p> <p>Observe recommendations of porcelain manufacturer for cutting tools (e.g. carbide burs for CARMEN®).</p> <p>Use clean Aluminium oxide. Ultrasonic cleaning with distilled water.</p> <p>Use Rema® Sold solder.</p>
16	Discolouring of porcelain.	<p>Wrong crucible used (different alloy).</p> <p>Frame not cleaned between bakes.</p> <p>Wrong grinding materials.</p> <p>Wrong solder used.</p>	<p>Use crucible for one alloy only.</p> <p>Clean frame between bakes (brush under running water after every porcelain bake).</p> <p>Use grinding materials for one metal only.</p> <p>Use only clean grinding materials.</p> <p>Use Rema® Sold solder or laser welding.</p>
17	Chipping of ceramic coating (poor adhesion).	<p>Old metal reused.</p> <p>Casting metal overheated.</p>	<p>Use new metal only.</p> <p>Release centrifuge sooner.</p>

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No.	Problem	Cause	Remedy
	Chipping of ceramic coating (poor adhesion).	<p>Did not use separate crucible (Remanium® CS, CD, Remanium® 2000, Remanium® G soft).</p> <p>Frame surface not properly prepared.</p> <p>Blasting media too fine.</p> <p>Unsuitable opaque paste used.</p> <p>Cooling phase in porcelain furnace unsuited for alloy.</p> <p>Frame not sufficiently cleaned after sand blasting.</p> <p>Opaque firing done with one bake only.</p>	<p>Use separate crucibles (Remanium® CS, CD, Remanium® 2000, Remanium® G soft).</p> <p>Follow porcelain manufacturer's recommendations for grinding instruments (e.g. carbide-tipped burs for CARMEN®).</p> <p>Grind in one direction only.</p> <p>Use coarser Aluminium (125 - 250 µ), blasting pressure 2 - 3 bar).</p> <p>Use opaque suitable for ceramic system.</p> <p>Longer cooling for Remanium® CD and possibly also Remanium® 2000 (see instructions for processing).</p> <p>Ultrasonic cleaning with distilled water.</p> <p>Opaque firing with two bakes: Bake 1: wash bake, Bake 2: covering See porcelain manufacturer's instructions.</p>
18	Chipping of cervical edges.	Frayed edges in cervical area.	Minimum metal thickness 0.2 mm.
19	Chipping of cervical edges during blasting of inner crown sides after glazing.	Blasting pressure too high.	Use less pressure for blasting, cover edges with wax.

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No.	Problem	Cause	Remedy
20	Cracks in the porcelain.	<p>Slow-cooling not observed.</p> <p>Faulty frame wax up.</p> <p>Baking of base material at low temperature (opaque).</p> <p>Individual teeth not separated down to the opaque at time of dentin bake.</p> <p>Bonding agent used.</p> <p>Wrong solder used.</p> <p>Bridge buffed or polished at too high a temperature after glazing.</p>	<p>Slow-cooling of non-precious metal alloys according to instructions of the porcelain furnace manufacturer. Allow dentin and glaze bake to cool to 600°C / 1112°F in the baking chamber (approx. 8 minutes).</p> <p>When waxing up frame, ensure that not too much material is used when applying ceramic. Maximum thickness of porcelain 2 mm (follow processing instructions for alloy used).</p> <p>After baking, the opaque should have a silky finish. Increase bake temperature.</p> <p>Separate the porcelain down to the opaque with a razor blade or similar tool.</p> <p>Do not use bonding agents. Good adhesion is achieved if the frames are correctly prepared.</p> <p>Use only Rema® Sold solder.</p> <p>Polish and buff with care.</p>

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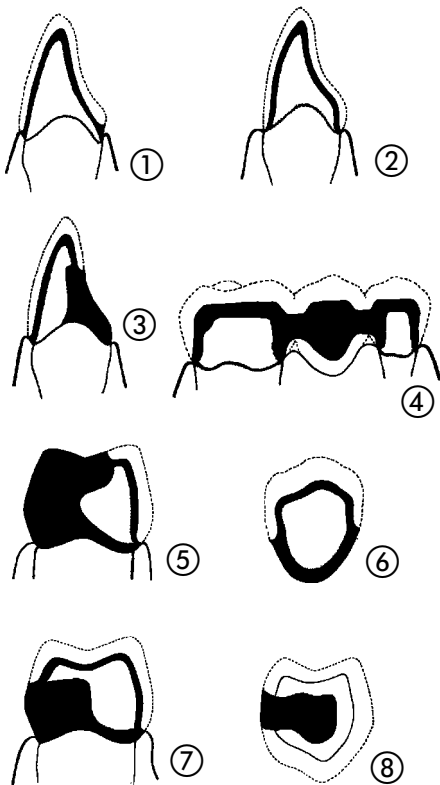
No.	Problem	Cause	Remedy
21	Bubbles formed in porcelain.	<p>Wrong torch setting when casting with torch.</p> <p>Porosity in frame.</p> <p>Overlapping in frame preparation.</p>	<p>See instructions for casting alloy in question.</p> <p>Use thicker sprues. For larger workpieces use runner bars. Attach sprue to the thickest part of wax up.</p> <p>Grind in one direction only. Follow porcelain manufacturer's recommendations regarding preparation of frame.</p>

### Waxing-up

Minimum preparation for metal and porcelain:

single crowns: 1.3 – 1.5 mm

bridgework: 1.5 – 2.0 mm



Before the wax-up, the preparations should be coated with release agent. The size of the metal crown should be reduced to correspond to that of the final prosthetic crown, missing portions of the teeth should be compensated for: ④ + ① – ⑧.

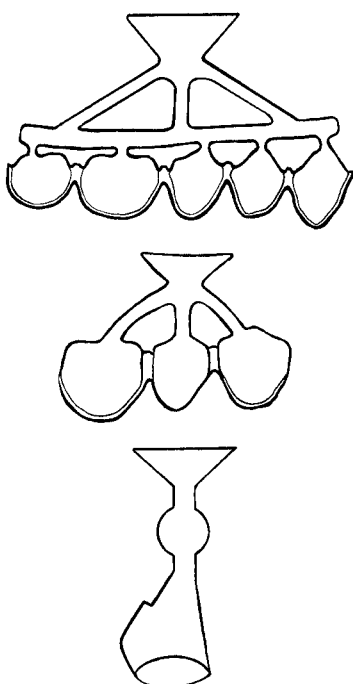
A cross-sectional wall thickness of 0.4 mm at the occlusal surface will ensure successful castings.

Uniform porcelain thickness ensures stress-free bonding ① – ⑧.

In order to avoid chipping of the porcelain, the lingual metal margin should be placed below the incisal region.

Contact surfaces, provided for soldering, should be flat ⑤, ⑦ + ⑧.

Rounding of the metal-porcelain interface ensures cleaner margins and an esthetic colour ① – ⑦. The outstanding properties permit very thin connections to be used between the crowns and pontics. During the later porcelain baking process the individual teeth can be seated clear of the the adjacent teeth. This avoids a block appearance.



### Spruing

For large castings with up to four pontics, use the indirect method. (Runner bar).

Casting button sprue: 3 – 3.5 mm dia.

Runner bar: 4 – 5 mm dia.

Connection to the crowns: 2.5 – 3 mm dia.,  
length 3.5 mm

Use the direct method for single crowns and small bridges.

For normal crowns, sprue diameter 2.5 mm, length 6 – 10 mm. Larger crowns and connecting pontics: 3.0 mm dia., length 6 – 10 mm.

Sprue reservoir by the direct method: distance to the object to be casted ca. 1.5 mm.

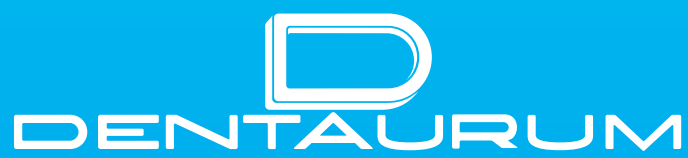
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### **Storage of investment powder**

Mixing liquid	Protect from excessive cold and direct sunlight. Close the bottles immediately after use. Store at room temperature (18° – 22°C/64° – 72°F). In warm weather, store the liquid in a refrigerator (not in a freezer!). Liquid containing crystals or sediment should not be used. Observe the date of manufacture. Storage period in unopened bottle, 15 months. To avoid frost damage during transport, the liquid should be ordered in November before the beginning of winter.
Investment powder	Close bag tightly immediately after removing powder. Store in dry area. Storage period in original unopened bags, 24 months.
Measuring beakers	Replace soiled measuring beakers with new ones. Order these from manufacturer.

### **Service**

In all processing matters not dealt with in the information brochure, please contact our dental technology department.  
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