ALPHABOND DENTAL PTY LTD
Unit 40, 28 Barcoo Street Roseville NSW 2069
(PO Box 431, Willoughby NSW 2068) Australia
Ph: 02 9417 6660 / 1800 643 477

BEGO
Partners in Progress

TROUBLESHOOTING

for BEGO crown and bridge investments

Problem	Cause	Remedy
Investment does not set or sets too slowly	- Working temperature of powder and/ or liquid too low	- The optimal temperature for powder and liquid is **20°C** – colder extends the working time and warmer shortens the working time
	- Mixing time too short	- Adhere to the instructions for use of the investment. Normally spatulate for **15 sec.** and then mix under vacuum for **60 sec.**
	- Incorrect liquid or premix used	- **Adhere to the instructions for use!** - Bellavest SH = BegoSol® HE - Bellastar/XL = BegoSol® K - Bellavest T = BegoSol®/HE
	- Incorrect powder/ liquid mixing ratio	- **Adhere to the instructions for use!** Use the correct mixing ratio and adjust the concentration to match the alloy and indication
Investment sets too quickly	- Working temperature too high	- Adjust to the correct working temperature (20° C)
	- Mixing time too long	- Adhere to the mixing time in the instructions for use
	- Dry, rough inner surface of the mixing bowl	- Moisten (rinse) the inner surface of the mixing bowl before mixing
Castings too large or too small	- Liquid concentration not adjusted sufficiently to match the casting alloy	- Adhere to the instructions for use for the investment. A higher liquid concentration should be selected for non-precious alloys than for precious alloys. Bellavest SH: 80%-90% liquid concentration for **non-precious alloys** and 50%-60% for **precious metal alloys** High concentration = high expansion Low concentration = low expansion
	- Mixing time not according to the instructions for use - Variations in mixing time - Extreme variations in working temperature - e.g. summer/ winter	- Adhere to the mixing times in the instructions for use. Longer mixing produces an **unregulated** reduction in expansion and shorter mixing produces an **unregulated** increase in expansion! It is important to ensure uniform working parameters to produce castings of a consistent quality: - Working temperature - Mixing unit - Size of mixing bowl should correspond to the amount of mixture - Use a conditioning cabinet for powder and liquid
Bridge rocks	- Stresses in the pattern due to thermal contraction of the wax	- Wax up with as uniform a wax temperature as possible. - Separate bridge units to relieve stresses and reconnect immediately before investing. Allow wax or plastic runner bars to cool completely after adapting them to the shape of the arch before waxing them onto the bridge.
Mould splits or cracks during conventional preheating	- Incorrect powder/ liquid mixing rati Mixing time in the instructions for use not adhered to	- Adhere to the instructions for use! Normally spatulate for **15 sec.** and then mix under vacuum for **60 sec.**
	- Ring liner is not flush with the casting ring wall when using a metal ring. Investment flows behind the liner and creates a step. The forces produced by the setting expansion can cause cracks in this region	- Junction (overlap) of the ring liner should be sealed with wax

Problem	Cause	Remedy
Mould splits or cracks during conventional preheating	- Pattern has been placed too close to the walls or base of the mould	- The minimum distance to the base and wall of the is 5 mm. The optimal distance should be 5 mm - 10 mm
	- Mould has been removed too early from the silicone ring (not fully set)	- Allow the investment to set fully and remove carefully from the silicone ring
	- Mould has been placed prematurely in a warm furnace	- Allow the investment to set fully
	- Plastic units used in the pattern have not been covered with wax	- Plastic units (Adapta, pattern resin, solid plastic sprues) should be thinly covered with wax, as the plastic expands initially during heating and could cause the mould to crack
Mould splits or cracks during conventional preheating	- Temperature is too high when the mould is placed in the furnace	- The maximum temperature for placing the mould in the furnace should be 80°C – 100°C
	- Heat rate of the furnace is too high	- **Optimal preheat programme:** - 5° C/min to 250° C - Hold for 30 min. at 250°C - 7° C/min to 575° C - Hold for 30 min. at 575°C - 7° C/min to final temperature Hold at the final temperature for at least 30 min depending on the size of the mould.
Mould splits or cracks during speed (Shock heat) heating	- Times for placing the mould in the furnace not adhered to	- The times for placing the mould in the furnace vary. Adhere strictly to the recommendations in the instructions for use. Bellavest SH after 20-30 min. If the mould is placed in the furnace prematurely, the investment is still too soft. If the mould is placed in the furnace too late, the mould is dried out causing cracks.
	- The mould former is too large	- Only mould former sizes 1; 3 and 6 can be speed heated (Shock heat)
	- Furnace temperature (for placing the mould) is too high/ low	- Select the temperature for placing the mould in the furnace according to the investment used: - Bellavest SH = 900° C - BellaStar/XL = 700° C - 900° C
Bubbles in the investment	- Inadequate vacuum when mixing	- Check the mixing unit, mixing bowl and vacuum hose. **Clean the seals and edge of the bowl!**
Rough casting surfaces	- Metal overheated	- Adhere to the manufacturer's instructions
	- Proportion of old metal too high	- Reduce the proportion of old metal
	- Too much flux applied and not dried	- Apply flux gradually and uniformly and then blow dry immediately
	- Mould held at the final temperature for too long	- Do not hold the mould at the final temperature for longer than 60 minutes
Investment inclusions in the casting	- Sharp edges of investment between the sprues were broken off by molten metal.	- Round off sharp edges between the sprues
	- Foreign bodies included during the setting/ preheat stage	- Allow the mould to set in a clean environment. Place the mould in the preheat furnace with the crucible former facing downwards. Always keep the furnace clean.

BEGO Bremer Goldschlägerei Wilh. Herbst GmbH & Co. KG · Technologiepark Universität · Wilhelm-Herbst-Straße 1
28359 Bremen, Germany · Telefon +49 421 20 28-0 · Telefax +49 421 20 28-100 · www.bego.com · E-mail: info@bego.com
BEGO France · 2, rue du Nouveau · Bercy, 94220 Charenton Le Pont · Téléphone +33 (0) 141 79 12 90 · Fax +33 (0) 145 18 02 35 · www.bego.com · E-mail: france@bego.com
BEGO Canada · 700, bl. du Parc Technologique · Québec G1P 4S3 · Telephone (+1-418) 683-6567 · Fax (+1-418) 683-7354 · www.bego.com · E-mail: info@begocanada.com
BEGO USA Inc. · 24 Albion Road (Suite 103) · Lincoln RI 02865 · Telephone (+1-401) 334-9261 · Fax (+1-401) 334-9265 · www.bego.com · E-mail: info@begousa.com

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