

# TRIUMPH™ Trouble Shooting

Problem	Cause	Solution
<b>Mold Blowup or Mold Top Pops Off</b>	Excessive vibration	Fill ring using a thin stream, use light vibration only around patterns.
	Too much investment on top of pattern	Allow only 1/4" of investment to cover the top of the pattern.
	Investment poured past the initial set	Do not use investment if it is too thick, warm, and hard to pour because it will not set evenly. TRIUMPH™ provides about 4 minutes working time after mixing.
	Liquid & powder mixed when too cold	Maintain liquid and powder as close to 72° F. as possible. If product is too cold, full chemical reaction will not be completed. Mixing bowls should also be maintained at the same temperatures.
	Worn or glazed walls on mixing bowl	Mixing bowls that are very worn or exhibit a layering of material on the walls will not produce the necessary friction during the mixing process to "kick start" the chemical reaction necessary for proper expansion and setting, also resulting in tight fits.
	Mixing time not long enough	Hand mix until the powder is incorporated with the liquids. Machine mix for 60 seconds, which allows the chemical reaction to be completed.
	Setting time not long enough	Allow mold to bench set for a minimum of 15 minutes prior to insertion into a hot oven.
<b>Cracking</b>	Improper Burnout	Do not use "multi stage" burnout technique with TRIUMPH™. Refer to instructions
	Excessive vibration	Use little or no vibration. Fill ring using a thin stream down the side of the ring, use vibration at patterns
	Too much (Special) liquid	Do not use more than the recommended total liquid volume. Do not use more than 50% Special Liquid.
<b>Tight or Loose Fits</b>	Check liquid/water ratio	For loose fits, use more water, less special liquid. For tight fits, use more special liquid, less water <b>Important: Always maintain total liquid amount adjusting only the special liquid/water ratio.</b>
	Crystal formation in bottom of graduate	Make sure graduates are rinsed with water after use.
	Wet bowls	Mixing bowls should be store filled with 50% water between uses. The bowl should be wiped out prior to use. Mixing bowls depending on size that are well worn and scratched can harbor one to eight milliliters of water in the scratches even after shaking the bowl. The hidden liquid will alter expansion as well as weaken the investment. See "Worn or Glazed Walls" above.
	Mixing time too short	If not mixed long enough the reaction will not be completed and will produce tight fits. Mix minimum of sixty seconds.
<b>Rough Castings</b>	Over vibration	Excessive vibration when investing will cause the grains to separate and produce an uneven mass in the ring. The investment's mixture should be poured into the ring in a thin stream.
	Casting Machine Take Off	Suggested windings, High gold content alloys, 2 windings in casting machine. High palladium content alloys 3 windings. Base alloys 4 windings. Balance casting machine to prevent turbulence.
	Vacuum	The mixing unit must pull a minimum of 27" Hg. Check vacuum at bowl not just by the gauge reading.
<b>Porosity</b>	Too much old alloy used	Use at least 50 % new alloy
	Overheated alloy	Cast immediately when alloy reaches molten state.
	Overheated mold	Refer to alloy manufacturer suggested temperature
<b>Holes through casting</b>	Mold heated at too high a temperature for alloy used	Refer to alloy manufacturer suggested temperature
<b>Fins</b>	Used more liquid than required	<b>Total liquid amount</b> must be maintained. If more is used, the investment will weaken and fins will occur.
	Wet Pattern or mold base	Patterns must be dried as well as mold base of any remaining liquids i.e. debubblers
	Over vibration	No or minimal vibration needed
	Bench set too fast	15 minutes minimum bench set time prior to insertion into a hot oven.
	Wet Bowl	Read tight or loose fits (Wet bowls)
<b>Incomplete castings</b>	Cold melt	Casting temperature should be at least 100 °F to 150 °F above listed fusion temperature. Note: Gold based-palladium rich and palladium based ceramic alloys, when in a shiny button stage of melting, are still too thick to produce a good casting. They must be heated past the shiny pool stage until the melt has a flat white color on its surface.
	Improper burn-out	Calibrate oven. Check manufacturer suggested burnout temperature. In addition, add 10 minutes more for each ring in an oven.
	Inadequate spruing	Sprues too thin to allow molten alloy to completely fill mold before cooling in the sprue. Use 6 or 8 Ga. Patterns should be placed above the heat zone center of the ring. Use reservoirs on large pontics.
	Under-wound machine or weak spring	Give the lower specific gravity alloys (Pd-Ag) (base alloys) an extra wind. There must be enough take-off force of the machine to completely fill the mold before cooling begins.
	Entrapped gas	Allow only 1/4" of investment to cover the top of the pattern. Before burnout, remove the glazed investment from the top of the mold, allowing for easy escape of gases.
<b>Round Margins</b>	Melted wax margins	When attaching sprues and sprue bases to pattern, hold in horizontal instead of an upright position to prevent the heat from the hot spatula from rising to the pattern and distorting the sharp margins.
	Cold mold	Check alloy manufacturer suggested temperature. Calibrate burnout furnace.
	Cold alloys	Heat alloys to 100 °F (38°C) to 150 °F (66°C) above the fusion temperature.
	Sprue size and length	Recommend the use 6 or 8 ga. and reservoirs on larger pontics.
<b>Suck backs</b>	Alloy too hot	Overheated alloy remains liquid for too long a period of time, causing excess gases to form between the investment and the alloy, resulting in a suck back.
	Too much alloy	There is a minimum and maximum alloy ratio. The minimum amount should be equal amount of alloy in the button as in the casting. The maximum is three times the alloy in the button as in the casting. If the button is too large, the alloy will stay molten too long causing suck back.
	Inadequate spruing	Use adequate sized sprues, 6-8 gauge, reservoirs on large pontics. Position patterns 1/4" from top of ring.
<b>Warped castings</b>	Ring quenched in water	Bench cool
	Tension caused by plastic sprues	Plastic sprues have memory. Check technique on how to use plastic sprues. Plastic sprues should be coated with wax for rapid burnout technique.
	Over vibrated	If needed, set vibrator to low speed and place finger between mold and vibrator
	Cold air	Remove all excess moisture from pattern by blotting with tissue or blowing by mouth. Forced cold air from air hose may distort the pattern.
<b>Pitted casting</b>	Dirty button and crucible	Clean button before remelting. Clean crucible of slag, grindings.
	Dirt in work	Keep wax fully covered and free of alloy grindings and ceramic particles
	Dirty spatula	Clean carbon build up from spatula by buffing with pumice.

# TROUBLE SHOOTING TRIUMPH™ INVESTMENT WHEN USED FOR PRESSING CERAMICS

- \* Make sure burnout furnace is calibrated.
- \* Make sure pressing furnace is calibrated.
- \* Pressing furnace should be physically as close as possible to burnout furnace.
- \* Pressing furnace should be in a separate dedicated electric circuit.
- \* Pressure when pressing should be no more than 70psi (4.5 bars).

<b>If mold cracks occurs during burnout</b>	If using paper rings, smooth seam in the mold.
	Make sure your mixing bowl does not have a crust inside.
	Make sure your mixing bowl is not worn out.
	Liquid and powder should be close to 72° F.
<b>If molds crack occurs during pressing</b>	Pressure when pressing should be no more than 70psi (4.5 bars).
	When pellets are inserted into mold, wait until temperature comes back up. If using 1 pellet      Hold for 5 minutes at temperature before the start of pressing cycle. If using 2 pellets      Hold for 10 minutes at temperature before the start of pressing cycle.
	Adjust the ceramic push rod speed to 2-2.5 seconds. Make sure mold sits level and perpendicular to the furnace base.

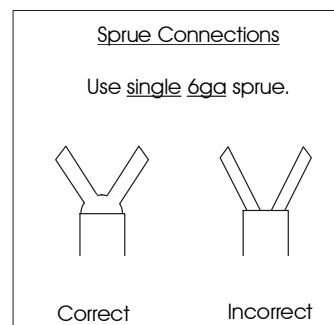
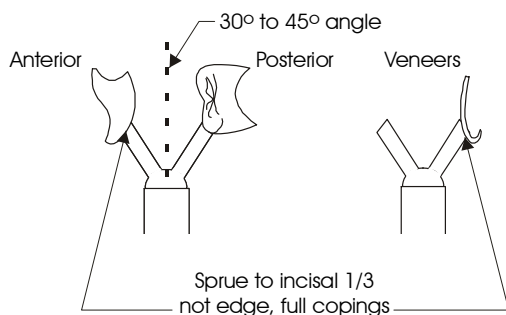
<b>If you have porosity in the margins</b>	You are using the wrong die lube, oil base die lubes are not recommended.
<b>If you have porosity all over your pressings</b>	The temperature is too high.

## Spruing Tips

- Use 6 gauge direct wax sprues.
- Length of sprues should be 4-6 mm.
- Sprues/patterns should be in line with flow of ceramic material, 30°-45°.
- Restoration and sprue length no longer than 16 mm.
- If facings, sprue incisal 1/3 edge of restoration.
- If crown, sprue to incisal occlusal surface.
- If inlay or onlay, attach to bottom of restoration.

## Weight pattern with sprues

- More than .6 gram 2 pellets.
- Less than .5 gram 1 pellet.
- Less than .25 gram use 1 pellet with an empty sprue as per drawing.



The principle for a fluid ceramic pressing is the same as for casting alloys. If the alloy is not molten properly (cold), the alloy won't flow and if it goes into a cold mold, it will not flow and will harden causing a short casting.

Basically, the ceramic should be in the soft plastic stage while being pressed and the molds hot enough so that the ceramic material can flow.