

★
MICROSTAR®
HS™ INVESTMENT
UNIVERSAL PHOSPHATE BONDED INVESTMENT

INSTRUCTIONS FOR USE

Material Data	1
Mixing Instructions	1
Mixing Cycles	2
Mixing Tips	2
Casting - Rush Technique	3-4
Casting - Conventional or Overnight	4
Pressing- Rush Technique	5-6
Pressing- Conventional or Overnight	6
Tips and Troubleshooting	8

Material Data

Mixing Ratio: 100g powder to 25ml liquid
60g powder to 15ml liquid

Mixing Time: 60 seconds

Mixing Speed: 360-450 rpm

Working Time: 5-7 minutes

Setting Time: Approximately 15 minutes

Mixing Instructions

1. Measure liquid using an appropriately sized cylinder or pipette
2. Wet mixing bowl with water, and shake excess water out
3. Pour measured liquid into bowl
4. Add powder and mix by hand with spatula until no dry powder remains (approx 10-15 seconds)
5. Assemble bowl, and apply vacuum for 15-20 seconds prior to mixing
6. Mix for 60 seconds
7. Vibrate after mixing (under vacuum) for 10-20 seconds
8. Pour investment into ring up to the level of the patterns
9. Adapt investment to inside of patterns using a clean, dry waxing instrument. Do not use a brush.
10. Finish filling ring and vibrate carefully for a few seconds

Mixing Cycles

Suggested mixing cycles for specific vacuum mixers

WhipMix VPM2

Mix Time	60 sec	Default Premix	Yes
Mix Speed	450 rpm	Pre Vac	No
Premix	Yes	Post Vac	10 sec

Renfert Twister Evolution

Mix Time	60 Sec	Default Premix	Yes
Mix Speed	450 rpm	Pre Vac	20 sec
Premix	Yes, "softstart"	Post Vac	10 sec

Amann Girbach Smartmix X2

Mix Time	60 sec	Default Premix	Yes, adjustable
Mix Speed	450 rpm	Pre Vac	20 sec
Premix	Yes	Post Vac	10 sec

Mixing Tips

- Mix no more than 600g of investment at a time
- Take care to measure liquid volumes precisely
- For ultimate accuracy, weigh powder before mixing
- Debubblizers are not usually necessary when care is taken with investing. Alcohol free debubblizers may be used if desired
- If debubbler is used, ensure it is completely dry prior to investing
- Do not over vibrate (use moderate vibration)
- If desired, investments can be placed in a pressure pot after pouring. Use 60-80 psi of air pressure, for 7-8 minutes.

Casting- Rush Technique

1. Preheat burnout oven to 1600°F
2. Dry scrape end of ring
3. Place rings directly into hot oven after prescribed bench set
4. Burnout at 1600°F for 30-40 min plus 10 min per each additional 100g of investment in burnout furnace (by volume, not rings)
5. Lower oven temperature to recommended burnout temp (if casting temp is below 1600°F) 20-30 minutes prior to casting

SUGGESTED STARTING RATIOS FOR 100g PACKAGES:

These ratios are starting recommendations that work well in our laboratory. Your results may vary.

- To **increase** expansion, use more liquid and less water.
- To **decrease** expansion, use less liquid and more water.
- Do NOT go below 50% liquid when using ringless formers.

Alloy Type	Expansion Liquid	Water
High Noble PFM	14 ml	11 ml
Noble PFM	17 ml	8 ml
Base PFM	25 ml	0 ml
C&B Alloys	14 ml	11 ml

BENCH SET WITH RINGLESS FORMERS:

We recommend allowing the ring to set for 15 to 20 minutes in the ring former, *plus an additional minute or two after removing the former, to allow for the release of steam (preventing ring failure).*

The following chart provides set times for various ring sizes:

Ring Size:	Set Time in Former:	After Removing Former:
90 - 100g	15 - 17 Minutes	1 Minute
180 - 200g	15 - 18 Minutes	2 Minutes
270 - 300g	20 - 22 Minutes	3 Minutes

Casting- Rush Technique

BENCH SET WITH METAL RING FORMERS:

Ring Size	Set Time †
60g*	20 Minutes
90 - 100g	17 - 19 Minutes
180 - 200g	17 - 19 Minutes
270 - 300g	21 - 24 Minutes

*Extended set times are usually required when using 60g rings. Alternately, shorter set times can be used if the mixing time is extended. We achieve a 17min bench set using a mix time of 90 seconds.

† Because of metal rings, there is no 'out of ring' bench set time noted

Casting- Conventional or Overnight

1. Bench set rings for one hour **minimum**
2. Dry scrape end of ring
3. Put rings in center of cold burnout oven
4. Use a two stage burnout:
 - a. Stage 1 – Raise temperature at 10-12°F per minute to 570°F.
 - b. Soak at 570°F for 45-60 minutes
 - c. Stage 2 – Raise temperature at 10-12°F per minute to 1600°F
 - d. Soak at 1600°F for 30-45 minutes
 - e. Lower oven temp to recommended burnout if desired, soak for 20-30 minutes.

NOTE: Rings for overnight technique should be sealed in “baggies” to retain inherent moisture (add **NO** additional liquid)

SUGGESTED STARTING RATIOS FOR 100g PACKAGES:

These ratios are starting recommendations that work well in our laboratory. Your results may vary.

- To **increase** expansion, use more liquid and less water.
- To **decrease** expansion, use less liquid and more water.
- Do NOT go below 50% liquid when using ringless formers.

Alloy Type	Expansion Liquid	Water
High Noble PFM	13 ml	12 ml
Noble PFM	15 ml	10 ml
Base PFM	20 ml	5 ml
C&B Alloys	12.5 ml	12.5 ml

Pressing- Rush Technique

Rush technique is recommended for pressing both all-ceramics (including lithium disilicate) and press-to-metal ceramics.

1. Preheat burnout oven to 1600°F
2. Scraping the end of the ring is not required for pressing
3. Place rings directly into hot oven after prescribed bench set
4. Burnout at 1600°F for 45 minutes/ 100g ring, 60 minutes/ 200g ring, 100 minutes/ 300g ring, +12-15 minutes per each additional 100g of investment in burnout furnace (by volume, not rings)
5. Rings should not be at high temperature for more than 2.5-3 hours

SUGGESTED STARTING RATIOS FOR 100g PACKAGES:

These ratios are starting recommendations that work well in our laboratory. Your results may vary.

- To **increase** expansion, use more liquid and less water.
- To **decrease** expansion, use less liquid and more water.
- Do NOT go below 50% liquid

Restoration Type	Expansion Liquid	Water
Inlay*	12.5 ml	12.5 ml
Crown	17 ml	8 ml
Veneer	17 ml	8 ml
PTM**	Same as Casting	Same as Casting

**HS investment is a high expansion investment. It is difficult to press ceramic inlays into HS and achieve a satisfactory fit. We recommend using the Microstar Inlay Maker, and if excessive expansion still results in tight fitting inlays, use Microstar HS-PC investment.*

***When pressing to metal, technicians should use the same ratio of liquid to water that was used to make the castings.*

RUSH TECHNIQUE (PRESSING) (1560-1600°F / 850-870°C high temp)

Ring Size	Bench Set	
	In flex ring (min)	Out of flex ring (min)
100g	15-17	1
200g	15-18	2
300g	20-22	3

Pressing- Conventional or Overnight

1. Bench Set rings for one hour **minimum**
2. Scraping the end of the ring is not required for pressing
3. Put rings in center of cold burnout oven
4. Use a two stage burnout:
 - a. Stage 1 – Raise temperature at 10-12°F per minute to 570°F.
 - b. Soak at 570°F for 45-60 minutes
 - c. Stage 2 – Raise temperature at 10-12°F per minute to 1600°F
 - d. Soak at 1600°F for 30-45 minutes for 100g ring, 60-100 minutes for 200-300g rings

SUGGESTED STARTING RATIOS FOR 100g PACKAGES:

These ratios are starting recommendations that work well in our laboratory. Your results may vary.

- To **increase** expansion, use more liquid and less water.
- To **decrease** expansion, use less liquid and more water.
- Do NOT go below 50% liquid when using ringless formers.

NOTE: Rings for overnight technique should be sealed in “baggies” to retain inherent moisture. Add NO additional liquid).

NOTE: SLOW TECHNIQUE 100g RATIOS

Restoration Type	Expansion Liquid	Water
Inlay*	Not Recommended	N/A
Crown	15 ml	10 ml
Veneer	15 ml	10 ml

*Not recommended due to increased setting expansion of the standard/overnight technique.

Tips and Troubleshooting

EXPANSION & FIT

- Consistency in technique is paramount for consistent fit.
- Measure liquids very carefully using appropriately sized cylinders or pipettes. For maximum control, liquids can be weighed: for HS expansion liquid 1ml = 1.18g and for water 1ml = 1g
- Mixing times and bench set times must be accurately controlled
- Make all effort to ensure that the mixing bowl is damp but not wet prior to introduction of liquid and powder. Get in a habit of wetting the bowl, draining the bowl, and shaking the excess out. Use the same number of shakes each time you invest.
- Room temperature may impact expansion slightly. If your lab is warmer, expect slightly looser castings.
- Do not store materials, either powder or liquid, in the refrigerator.

CRACKING OF RINGS

- Quality vacuum in the mixer is necessary for proper investment strength. Do not assume the vacuum is good just because the vacuum gauge on the mixer reads high – a clog in the vac line will give you a high reading on the gauge with poor vacuum in the bowl.
- Bench set times must be carefully controlled, especially with the rush technique. It is important that the ring be hot from the investment exotherm when it goes into the hot oven. Bench set times may vary from lab to lab or season to season due to local differences in temperature and humidity.

- Investment strength is dependent upon the concentration of expansion liquid. Do not use less than 50% expansion liquid in your mix, unless the investment is supported with a metal casting ring.
- In some labs, especially those with high humidity, the amount of bench set time after removal of the ring former is critical. If rings are cracking in the burnout oven, extend this delay time to the maximum recommended time for the size ring being used.

AIR BUBBLES ON CASTINGS/PRESSINGS

Positive bubbles on castings and pressings are almost always due to one or more of the following:

- Poor vacuum in the mixing bowl
- Careless technique when mixing, pouring, or adapting the investment to the patterns.
- Deviation from recommended mixing cycle
- Excessive wear of mixing equipment

As with all products from Jensen Dental, our expert Technical Service staff is available to help you with technical questions. Call us at 1-800-243-2000.

Microstar® Family of Products

HS INVESTMENT

Universal	100 x 100g
Universal	144 x 60g
Expansion Liquid	1L

DISPOSABLE PLUNGERS

2g	50 per box
5 g	28 per box
13mm	50 per box

THIXO DIESTONE

Golden Yellow	55 lbs.
Pastel Ivory	55 lbs
Yellow Brown	55 lbs

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