Formula 1 for Milled PMMA Materials

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Formula 1 is a high performance phosphate investment designed to meet all of your pressing and casting needs with **milled PMMA materials**.
It features rapid burnout as well as easy pouring and divesting processes. In addition, Formula 1 provides the widest expansion range and the best surface qualities of any investment available. To ensure success with Formula 1, please follow the instructions carefully.

Recommended Liquid:
Special Liquid Concentrate Plus

Physical Properties:

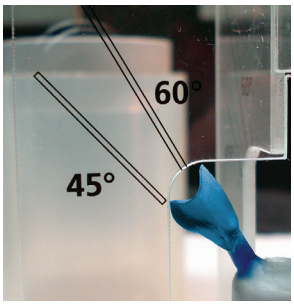
- Liquid/Powder Ratio: 22 ml/100 gm
- Working Time: 6–8 minutes
- Setting Expansion: 1.6%
- Thermal Expansion: 0.65%
- Compressive Strength: 1,350 psi (9.2 MPa)

Spruing for pressing ceramics:

- Sprue the patterns using wax sprues with a minimum 3mm width and a maximum 8 mm length.

- Prior to investing, the pattern weight – including the sprues – must be determined to calculate the required number of pellets.

- Attach sprues to the crucible former at the angle recommended by the ceramic/alloy manufacturer. For pressing, the angle is usually between 45°– 60° toward the ring wall. Keep the distance between the pattern and the wall at a minimum of 10 mm.



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Pattern Preparation:

- Attach sprue to the pattern using sticky wax.
- Mount the patterns on crucible former base. Junctions of the sprue, the pattern and the crucible former must be rounded. Avoid sharp point angles and line angles.
- If casting alloy, lightly spray a Wax Pattern Cleaner. Gently blow excess cleaner from pattern.
- If pressing ceramic, *do not use* Wax Pattern Cleaner or debubblizer. Follow your pressable ceramic manufacturer's directions.

Ring Preparation:

- If metal ring is used, line the ring with a ceramic or dry paper liner positioned 6 mm short of each end. Do not wet the ceramic liner. If using a paper-lined ring, soak in water for a minimum of 1 minute. Shake excess water from ring before investing.
- Place ring over patterns and onto former base.

Mixing:

- **For best results, store and use powder and liquid at room temperature (between 20°C (68°F) and 25°C (77°F). To ensure the proper ratio of liquid/water/powder, use an Aquaspense SL.**

- Prepare liquid at suggested concentration following the chart below (distilled water recommended for dilution).
- Rinse bowl with water and shake out excess. Use separate mixing bowls for phosphate and gypsum investments.
- Add measured liquid to mixing bowl. Incorporate powder by hand mixing 10–15 seconds.

- To achieve proper mixing speed and time, use a VPM2 Mixer. Mix under vacuum, slow speed (350–600 RPM) for **2 minutes (120 seconds).** Reducing mix time may cause cracking. Higher RPM mixers may require decreased mix time (90 seconds).

NOTE: Different paddle designs and mixer speed may require varying mixing time.

NOTE: If using a VPM2 mixer it is not necessary to incorporate powder by hand mixing.

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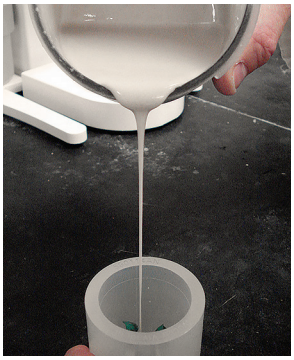
Investing

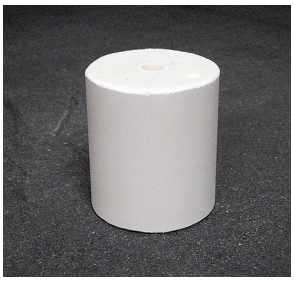
- Use light vibration to help move investment in the ring.
- Invest the inside of the patterns first.
- Pour a thin stream of Formula 1 investment into the ring to avoid the formation of bubbles.

  Fill the ring with the investment no more than ¼ inch or 6mm over the top of the pattern.



Benchset:

- Once the mold is poured, **benchset 20 minutes.**
- Trim glaze off top of mold before burnout.
- For best results, place in preheated oven within 30 minutes of investing.
- Use a silicon ring in humid climates:
  Bench set 15 minutes. Remove from ring. Bench set an additional 5 minutes outside of ring.



Burnout:

- **Rapid Burnout Technique for Pressed Ceramics (preheated oven) *Recommended***

  <u>100g ring</u>

  - Place mold(s) in preheated oven at 850°C (1,562°F).
  - Heat soak for a *minimum* of 40 minutes before pressing.
  - Add 10 minutes heat soak time for each additional ring in the burnout oven.

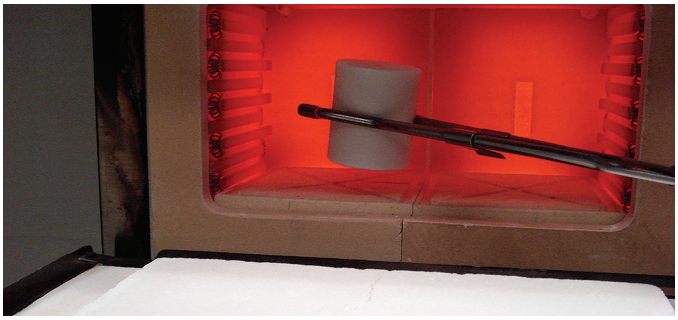
  <u>200g ring</u>

  - Place mold(s) in preheated oven at 850°C (1,562°F).
  - Heat soak for a *minimum* of 50 minutes before pressing.
  - Add 10 minutes heat soak time for each additional ring in the burnout oven.

- **Rapid Burnout Technique for Alloy Casting (preheated oven)**

  <u>Low Temperature Alloys</u>

  - Place mold(s) in preheated oven at 760°C (1,400°F).



  - Heat soak for a *minimum* of 30 minutes.
  - Adjust temperature downward to alloy manufacturer's recommended casting temperature.

  <u>High Temperature Alloys (above 760°C (1,400°F)</u>

  - Place mold(s) in oven at alloy manufacturer's recommended casting temperature.
  - 100g ring: Heat soak for a *minimum* of 40 minutes.
  - 200g ring: Heat soak for a *minimum* of 50 minutes.

  NOTE: Maximum preheat entry temperature for a metal ring is 870°C (1,600°F).

Casting (Alloy):

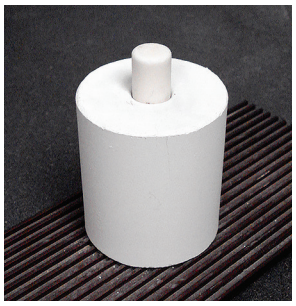
- Upon removal from oven, immediately cast according to alloy manufacturer's instructions.

Pressing (Pressable Ceramics):

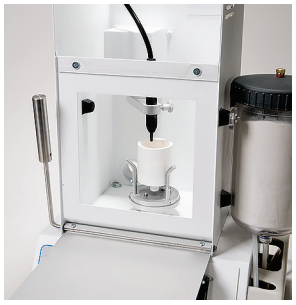
- Press according to ceramic manufacturer's instructions.
- Use 200g mold for restorations requiring 2 ingots.

Divesting:

- Allow metal castings and pressed ceramic to cool completely before divesting or removing from the ring.



- Divest carefully using a hand-held microblaster or a WHIP Mix Xcavator automatic blasting unit to save time and labor.



- **NOTE:** Must use Special Liquid Concentrate Plus
- Decreasing liquid/powder ratio will increase expansion and improve surface quality.
- To correct tight fits: Increase special liquid to water concentration. If using metal rings, you may also use a double thickness of the liner.

- To correct loose fits: Decrease the liquid to water concentration (refer to Expansion Ratio Chart).
- Special Liquid Concentrate PLUS may freeze during shipment in cold weather. If liquid has crystallized upon arrival, it will no longer be usable. Keep liquid from freezing.

WARNING: Investments contain free silica — **DO NOT BREATHE DUST.** May cause delayed lung injury (silicosis/lung cancer)

Expansion Ratio Chart

TWO-MINUTE MIX TIME				LIQUID CONCENTRATION	60 GRAM 13 ML/60 GRAM LIQUID (ML)	60 GRAM 13 ML/60 GRAM WATER (ML)	100 GRAM 22 ML/100 GRAM LIQUID (ML)	100 GRAM 22 ML/100 GRAM WATER (ML)	150 GRAM 33 ML/150 GRAM LIQUID (ML)	150 GRAM 33 ML/150 GRAM WATER (ML)
EXPANSION	ALLOY	MORE		100% 90%	13.0 12.0	0.0 1.0	22.0 20.0	0.0 2.0	33.0 30.0	0.0 3.0
		OPTIMUM	Base Noble High Noble	80% 75% 70%	11.0 10.0 9.0	2.0 3.0 4.0	18.0 16.5 15.0	4.0 5.5 7.0	27.0 25.0 23.0	6.0 8.0 10.0
		LESS		60% 50%	8.0 6.5	5.0 6.5	13.0 11.0	9.0 11.0	20.0 16.5	13.0 16.5
	CERAMIC	MORE		90% 80%	12.0 11.0	1.0 2.0	20.0 18.0	2.0 4.0	30.0 27.0	3.0 6.0
		OPTIMUM	Crowns, Veneers Inlays, MODs	70% 60%	9.0 8.0	4.0 5.0	15.0 13.0	7.0 9.0	23.0 20.0	10.0 13.0
		LESS		50% 40%	6.5 5.0	6.5 8.0	11.0 9.0	11.0 13.0	16.5 13.0	16.5 20.0

*Recommended concentrations are approximate and can be adjusted to optimize fit. To increase expansion, use more liquid and less water. To decrease expansion, use less liquid and more water. Always maintain total liquid / water volume.

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