PLASTICAST® PT INVESTMENT & BINDER

A Water-Based, Two-Part System for Casting Rapid Prototype Pattern Materials & High Temperature Alloys

The Plasticast PT investment & binder system was developed, and is ideally suited for, the investing and burnout of commonly used plastic or wax/plastic pattern materials. The high expansion of these pattern materials requires an equally high expanding, extra high strength investment.

The Plasticast PT investment & binder system provides jewelry casters with a mold material that meets those demands while maintaining mold surface and dimensional integrity for high temperature metal casting.

The Plasticast PT investment & binder system can also be used with standard wax patterns for high temperature metal casting.

In addition to excellent performance with rapid prototype pattern materials, this system offers casters the following benefits over traditional two-part platinum investments:

- Eliminates the acid-based binder hazard associated with common two-part platinum investments.
  - Operators are not exposed to a hazardous liquid.
  - Storage for hazardous liquid is eliminated.
  - Shipping costs and special transportation requirements for hazardous liquid are eliminated.

- Eliminates special investing flask preparation requirements.
  - Costs associated with absorbent liners are eliminated as they are not needed.
  - Time associated with complicated flask preparation is eliminated.

Typical Material Properties*

Diluted Binder/Powder Ratio	By Volume 24 parts diluted binder by volume to 100 parts powder by weight	By Weight 28 parts diluted binder by weight to 100 parts powder by weight
Working Time	< 5 minutes	
Setting Time	6-11 minutes	
Slump	108-127 mm	

*These results are based on the testing methods, frequency and procedures of Ransom & Randolph or its approved suppliers. The levels referenced herein are only for general guidance and do not constitute a firm specification.

Application Instructions

1. Dilute Plasticast PT binder prior to use for investing. The water to binder dilution ratio is 60:40 W:B by weight or 70:30 W:B by volume. Example: for 1 gallon (3.8 liter) of diluted binder, mix 5.8 pounds (2.6 kg) water with 3.9 pounds (1.8 kg) binder.

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2. Weigh the required amount of Plasticast PT investment. To determine the proper amount of diluted binder and powder to use per flask, use the online flask calculator located at www.ransom-randolph.com or calculate the volume of your flask ($V = \pi r^2 h$) and multiply by the appropriate factor in the chart below.

	Diluted Binder (by weight) : Powder (by weight) 28/100	
	Per in^3 volume	Per cm^3 volume
Investment Needed		
Grams **Pounds** **Ounces (Weight)**	25.4 0.056 0.90	1.56
Diluted Binder Needed		
Grams **Pounds** **Fluid Ounces**	7.12 0.0157 0.21	0.44

Note: If using volume calculation, the dilution ratio is 24 parts binder (by volume) to 100 parts powder (by weight).

3. Measure or weigh the required amount of diluted binder and place in mixing bowl.
   Note: changes in temperature affect working time, to reduce variations, binder and powder temperatures should be held to 72-85°F (22-29°C). R&R recommends 72-75°F (22-24°C), warmer temperatures will significantly reduce working time. Working time is defined as the time the powder is added to the binder to the time the investment becomes thick.
4. Always add the preweighed quantity of investment to binder. Adding the binder to the powder will make it difficult to mix and will affect the working time.
5. Wet out the powder with a mixing paddle or a wire whip. This should take no more than 30 seconds.
6. Mix with mechanical mixer for 1 minute. Good mixing is important to activate essential ingredients that make the investment perform to its fullest potential.
   Note: if using a vacuum investment mixing unit, mix for 30 seconds with no vacuum on slow speed until the powder is completely wetted, engage mechanical mixing under vacuum for an additional 1 minute.
   Note: Monitor mixing speed as aggressive mixing reduces working time. Suggested mixing speed is 360-500 rpm.
7. Place the mixed investment in a vacuum chamber and apply enough vacuum to cause a rapid boil. The investment should be vacuumed until it rises and breaks. Monitor this process closely as the material is high rising.
8. Pour the vacuumed investment into and down the side of the flask. Avoid pouring it directly over the patterns to prevent pattern breakage. Fill flask at least 1" (2.54 cm) over pattern.
   Note: if using a vacuum investment mixing unit, pour the investment down along the inside of the flask allowing it to flow up, around, through and over the top row of patterns.
9. Vacuum the invested flask about 1 minute. Vibrating or tapping the flask during this operation will assist in releasing air bubbles from the pattern/investment interface. Release vacuum and fill the flask to the top of the metal edge. Do not overfill.
   Note: if using a vacuum investment mixing unit, after flasks are filled, continue to vacuum for 2 minutes. Vibration may be applied, if available.
10. Immediately transfer the invested flask to a vibration free storage area. It is extremely important not to disturb the flask during the gloss-off phase as well as during the initial hardening process.
11. To achieve appropriate green strength, allow the investment to sit undisturbed (bench cure) for 1 hour. Molds should be placed in a well-ventilated area as they will emit a slight ammonia smell. This system is exothermic and molds will be hot to the touch.
    After bench curing for 1 hour, remove the sprue base and investing collar.
12. Ideally, flasks should be loaded into a burnout oven, preheated to 200°F (93°C), button side down. Flasks should be elevated at least 1" (2.54 cm) above oven floor to allow proper air circulation and pattern drainage. Do not place flasks too close to the heat source or to each other.
    Note: if loading into a cold oven, 200°F (93°C) temperature must be reached as fast as possible.

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13. Follow the pattern burnout schedule suitable for your application.
Note: pattern burnout schedules described are recommendations. Adjustments may be required for various furnace types, flask sizes and oven loading.

Pattern Burnout Schedule			
	Flash Burnout *(for 1-2 patterns only)*	**Same Day Burnout**	**Overnight Burnout**
Ambient to 200°F (93°C) as fast as possible (can be preheated)	Not applicable	Hold 1 hour	Hold 2 hours
Raise to 350°F (175°C)	Not applicable	Raise over 1 hour Hold 30 minutes	Raise over 1 hour Hold 1 hour
Raise to 1600°F (871°C)	Start at 1600°F (871°C) Hold 2 hours	Raise over 2½ hours Hold 2 hours	Raise over 5 hours Hold 3 hours
Reduce to casting temperature and allow for stabilization	Hold 1 hour	Hold 2 hours	Hold 2 hours

Note: refer to the mold casting temperatures recommended by your alloy supplier.

Important Tips

- Only for use with supplied binder.
- Binder must be protected from freezing or it will not be effective.
- Product designed for mixes using less than 6 pounds of investment.
- Keep separated from gypsum investments and use only dedicated equipment that has NOT come into contact with gypsum investments.
- Investment should always be added to the binder.
- Equipment must be kept clean and free of set investment.
- Close the protective bag tightly in the container of unused investment powder and close the container when not in use.
- Always store investment in a dry area.
- Leave a minimum clearance from the patterns of ¼" (.05 cm) at the sides and 1" (2.54 cm) at the top and bottom.
- Do not use with gold, silver, brass, bronze or other low temperature alloys.

North America: Danger. Contains crystalline silica. May cause cancer by inhalation. Causes damage to lungs through prolonged or repeated exposure by inhalation. See SDS for more information.
EU: Danger. Contains respirable crystalline silica. Causes damage to lungs through prolonged or repeated exposure. See SDS for more information.

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