

# 780 INVESTMENT

## Investment for Platinum, Stainless Steel & Other Alloys Cast Above 2200°F (1200°C)

780 investment is ideal for casting platinum and stainless steel to the high quality standards of today's industrial market. Casters like the consistent results obtained with this investment – fin-free castings with meticulous reproduction of detail and excellent surface finish.

### Mixing Instructions

1. Refer to Charts A or B to determine the amount of water and powder required to fill the flask(s). Place the premeasured amount of water in a mixing bowl. Add the preweighed amount of powder to the water.  
**Note:** deionized water is recommended to maintain consistency.
2. Stir by hand to blend the mixture and reduce lumps. Mechanically mix the material at a moderate speed for 1½-2 minutes.
3. Place the mixing bowl on a vacuum table and apply full vacuum until the investment rises in the bowl and collapses.  
**Note:** when correctly proportioned with water, the 780 mix may appear thicker than conventional investments. Do not add water to thin. The investment will flow freely, despite its thick appearance.

### Investing the Flask

1. Pour the investment down the side of the flask, allowing it to flow around and through the patterns until the patterns are covered.
2. Place the filled flask on a vacuum table and apply full vacuum for 45-60 seconds.  
**Note:** excessive vacuuming will cause the investment to set prematurely.
3. Fill the balance of the flask with mixed investment and allow to set for 2 hours before proceeding with dewaxing and burnout.

### Dewaxing & Burnout

1. After allowing the invested flask to set for 2 hours, scrape a thin layer of investment off the top of the flask. This will aid in the removal of moisture during the first stages of dewaxing. Failure to scrape the mold may lead to surface explosions or cracking. The investment may still be soft, so care must be exercised to avoid dragging the investment material.
2. Carefully remove the base plate and remove any loose investment particles from the mold's center cavity and from the outside of the flask.  
**Note:** the invested flask may be stored in a wet cloth or other humid atmosphere until ready for burnout. Dried investment in a flask should be moistened before being placed into the furnace; a dry mold may crack during burnout. If necessary, submerge the flask in water for a few minutes.
3. If the dewax is planned during the normal burnout cycle, each flask should be placed in the oven with the sprue hole down and elevated so the melting wax can flow out of the flask. Position the flasks so they are not touching each other.
4. Small flasks (under 2" x 3") should be placed in a cold furnace so the temperature of the flasks and oven will rise simultaneously. Gradually increase the oven temperature as indicated on the burnout chart.
5. If a separate steam dewaxing process is used, the dewaxed flasks should be placed in an oven preheated to 300°F (150°C). Start this burnout cycle at hour 2.
6. Larger flasks should be placed in a 300°F (150°C) preheated oven. Maintain this temperature during the first 2 hours of the burnout cycle. Increase the temperature according to the cycle indicated on the chart.
7. Small and large flasks may be burned out overnight by using a programmable temperature controller. The time required to achieve a clean burnout will vary and depends on the number and size of the flasks, as well as the types of patterns being eliminated.  
**Note:** a minimum of 2 hours dwell at 1600°F (870°C) is recommended to completely burn out the pattern residue.  
**Note:** the burnout cycles described are recommendations. Adjustments may be required for various furnace types, flask size and oven loading.



## RANSOM & RANDOLPH

3535 Briarfield Boulevard, PO Box 1570 | Maumee, OH 43537 USA  
800.253.4502 | 419.865.9497 | 419.865.9997 (FAX) | [www.ransom-randolph.com](http://www.ransom-randolph.com)



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## Casting

- After burnout, allow the flasks to cool to the proper casting temperature. The flasks may be cast by either the vacuum casting or centrifugal casting method.

**Note:** do not allow the flasks to cool to room temperature and attempt to reheat to casting temperature. The mold integrity will be compromised.

## Cleanout

- After casting, investment is best cleaned from the flask and castings by mechanical means, such as high pressure (1000 psi) water blast or glass bead blast.

## General Information

780 investment should always be stored in a dry location and the container should remain sealed as tight as possible when not in use.

Always premeasure the investment powder and the water according to the ratio suggested. The proper ratio is vital to producing the superior casting results available with this product.

## Typical Material Properties\*

Water/Powder Ratio	27-29/100 by weight
Working Time	5-6 minutes
Setting Time	≤ 12 minutes
Compressive Strength (at 2 Hours)	105 psi
Fired Strength	800 psi
Volume of Mixed Investment (at 28/100)	19.25 in <sup>3</sup> per pound powder

\*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.

## Chart A: English Units Proportioning Chart at 28/100 Ratio

Flask Height	Flask Diameter					
	2.0" water/powder	2.5" water/powder	3.0" water/powder	3.5" water/powder	4.0" water/powder	5.0" water/powder
2.0"	48 cc/6 oz	71 cc/9 oz	99 cc/12.5 oz	135 cc/17 oz	175 cc/22 oz	302 cc/2 lb 6 oz
2.5"	56 cc/7 oz	87 cc/11 oz	123 cc/15.5 oz	167 cc/1 lb 9 oz	214 cc/1 lb 11 oz	341 cc/2 lb 11 oz
3.0"	64 cc/8 oz	103 cc/13 oz	147 cc/18.5 oz	199 cc/1 lb 9 oz	254 cc/2 lb	405 cc/3 lb 3 oz
3.5"	79 cc/10 oz	119 cc/15 oz	190 cc/1 lb 8 oz	230 cc/1 lb 13 oz	302 cc/2 lb 6 oz	476 cc/3 lb 12 oz
4.0"	87 cc/11 oz	135 cc/17 oz	199 cc/1 lb 9 oz	270 cc/2 lb 2 oz	349 cc/2 lb 12 oz	548 cc/4 lb 5 oz
5.0"		171 cc/21.5 oz	246 cc/2 lb 5 oz	333 cc/2 lb 10 oz	437 cc/3 lb 7 oz	683 cc/5 lb 6 oz
6.0"			341 cc/2 lb 11 oz	397 cc/3 lb 2 oz	524 cc/4 lb 2 oz	810 cc/6 lb 6 oz
7.0"				45 cc/3 lb 11 oz	603 cc/4 lb 12 oz	953 cc/7 lb 8 oz



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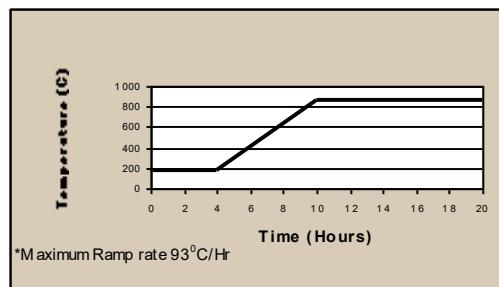
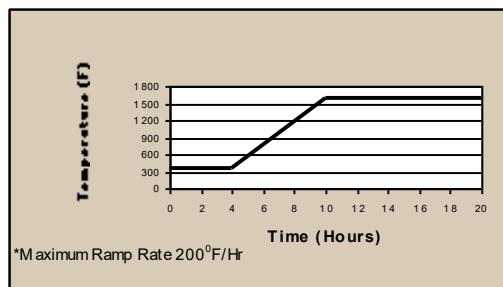
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**Chart B: Metric Units Proportioning Chart at 28/100 Ratio**

Flask Height	Flask Diameter					
	5 cm water/powder	6.4 cm water/powder	7.6 cm water/powder	8.9 cm water/powder	10 cm water/powder	12.7 cm water/powder
5 cm	48 ml/170 g	71 ml/255 g	99 ml/354 g	135 ml/482 g	175 ml/624 g	302 ml/1077 g
6.4 cm	56 ml/198.5 g	87 ml/312 g	123 ml/439.5 g	167 ml/595 g	214 ml/765.5 g	341 ml/1219 g
7.6 cm	64 ml/227 g	103 ml/368.5 g	147 ml/524.5 g	199 ml/709 g	254 ml/907 g	405 ml/1446 g
8.9 cm	79 ml/283.5 g	119 ml/425 g	190 ml/680 g	230 ml/822 g	302 ml/1077 g	476 ml/1701 g
10 cm	87 ml/312 g	135 ml/482 g	199 ml/709 g	270 ml/964 g	349 ml/1247 g	548 ml/1956 g
12.7 cm		171 ml/609.5 g	246 ml/879 g	333 ml/1191 g	437 ml/1559 g	683 ml/2438 g
15.2 cm			294 ml/1049 g	397 ml/1417.5 g	524 ml/1871 g	810 ml/2892 g
17.8 cm			341 ml/1219 g	468 ml/1673 g	603 ml/2155 g	953 ml/3402 g

**Chart C: 780 Investment Burnout Cycle\*\***



\*\*This burnout cycle is a starting point for a new caster. The actual time and temperature may vary according to flask size, type of furnace (kiln) and furnace loading.

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

EU: Danger. Causes damage to lungs through prolonged or repeated exposure. Contains respirable crystalline silica. See SDS for more information.

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