

# Application Instructions

## R&R® Noble™ investment

### JANUARY 2008

*R&R NOBLE investment is ideal for casting platinum and palladium alloys - providing casters with both excellent surface finish and easy investment removal. While R&R NOBLE investment is processed similar to current 2-part platinum products, it is mixed with water which eliminates the need to ship, store and handle a hazardous acid binder. R&R NOBLE investment vacuums easily, rising and breaking in the bowl in one cycle. The burnout process is also simple - no need to reprogram ovens or include additional process holds. R&R NOBLE investment removes easily from the casting when compared to other high temperature investments.*

#### FLASK PREPARATION

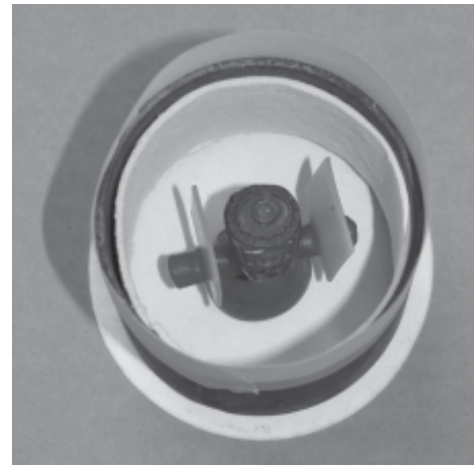
Prepare the flask by cutting a non-asbestos absorbent liner ½" (125 mm) shorter than the height of the flask. Position the liner inside of the flask so ¼" (60 mm) of the flask edge extends beyond the liner at either end.

Prepare a base using non-asbestos paper material which is at least 1" (250 mm) larger in diameter than the flask. Cut a ½" (125 mm) diameter hole in the middle of the base and center the wax tree over hole. The flask should be 1" (250 mm) taller than the tree. Seal the wax tree to the base by using wax or hot glue. Position the flask around the tree and seal against the base with wax or hot glue.

Place a paper or rubber collar around the top of the flask, extending approximately 1" (250 mm) above the top of the flask.

Place the entire setup on a metal plate or wooden board so the flask bottom will be supported when handled.

The photo (right) shows a properly completed flask set up for comparison.



#### INVESTMENT MIXING

**Step 1:** To determine the proper amount of water and powder to use per flask, locate the volume of the flask you are using on the chart below.

CUBIC VOLUME BY FLASK SIZE				
Height — Diameter	2.5 inches (6 cm)	3.0 inches (7 cm)	3.5 inches (8 cm)	4.0 inches (10 cm)
2.5 inches (6 cm)	12.3 in <sup>3</sup> (201 cm <sup>3</sup> )	14.7 in <sup>3</sup> (241 cm <sup>3</sup> )	17.2 in <sup>3</sup> (281 cm <sup>3</sup> )	19.6 in <sup>3</sup> (321 cm <sup>3</sup> )
3.0 inches (7 cm)	17.7 in <sup>3</sup> (290 cm <sup>3</sup> )	21.2 in <sup>3</sup> (348 cm <sup>3</sup> )	24.7 in <sup>3</sup> (405 cm <sup>3</sup> )	28.3 in <sup>3</sup> (463 cm <sup>3</sup> )
3.5 inches (8 cm)	24.1 in <sup>3</sup> (395 cm <sup>3</sup> )	28.9 in <sup>3</sup> (474 cm <sup>3</sup> )	33.7 in <sup>3</sup> (553 cm <sup>3</sup> )	38.5 in <sup>3</sup> (632 cm <sup>3</sup> )
4.0 inches (10 cm)	31.4 in <sup>3</sup> (514 cm <sup>3</sup> )	37.7 in <sup>3</sup> (618 cm <sup>3</sup> )	44.0 in <sup>3</sup> (721 cm <sup>3</sup> )	50.3 in <sup>3</sup> (824 cm <sup>3</sup> )

For applications requiring larger flask sizes, please contact the  
R&R Technical Department to determine appropriate mixing requirements.



**R&R**  
**DENTSPLY**

**Ransom & Randolph**

3535 Briarfield Blvd.  
Maumee, OH 43537 USA  
**USA Phone: (800)800-7496**  
Phone: (419)865-9497  
FAX: (419)865-9997  
www.ransom-randolph.com

**Step 2:** Using the volume located in the previous step, calculate the weight of powder and the volume of the water for your flask size using the following equations. The general mixing ratio is water (in volume)/powder (in weight) = 25/100. For heavier pieces, use a water/powder ratio of 24/100.

English Measure:

Small/Medium Pieces (25/100)

Flask volume (in<sup>3</sup>) x 0.0517 = \_\_\_\_\_ lbs. powder

Flask volume (in<sup>3</sup>) x 0.1984 = \_\_\_\_\_ fl. oz. water

Heavy Pieces (24/100)

Flask volume (in<sup>3</sup>) x 0.0517 = \_\_\_\_\_ lbs. powder

Flask volume (in<sup>3</sup>) x 0.1904 = \_\_\_\_\_ fl. oz. water

Metric Measure:

Small/Medium Pieces (25/100)

Flask volume (cm<sup>3</sup>) x 1.432 = \_\_\_\_\_ grams powder

Flask volume (cm<sup>3</sup>) x 0.358 = \_\_\_\_\_ ml water

Heavy Pieces (24/100)

Flask volume (cm<sup>3</sup>) x 1.432 = \_\_\_\_\_ grams powder

Flask volume (cm<sup>3</sup>) x 0.344 = \_\_\_\_\_ ml water

## INVESTING

At the beginning of the mixing cycle the investment is very thick and will put a lot of stress on a kitchen type mixer. Therefore, a planetary type mixer (Hobart) is required for mixing. As mixing continues, the investment will thin out and become very fluid. NOTE: It is important to avoid shearing the investment.

Place the water in the mixing bowl. Do not add all the powder initially. Add the powder slowly while mixing. Once all the powder has been added, mix for a total of 10-15 minutes to optimize casting surfaces. As material thins during mixing a smooth, creamy slurry will result. Do not vacuum while mixing.

Place the mixing bowl on a vacuum table and apply full vacuum until the slurry rapidly boils. Do not exceed 2 minutes. If a longer time is required to produce a rapid boil, the vacuum pump is undersized, is in need of repair, or there is an air leak in the vacuum system.

Pour the investment slurry down the side of the flask, allowing it to flow around and through the patterns. Completely cover the wax patterns, filling to the top of the flask at minimum. Place the invested flask on a vacuum table and apply full vacuum 1 to 2 minutes.

Set the flask aside, undisturbed, for a minimum of 2 hours and a maximum of 4 hours. The flask is now ready for burnout. You may burnout the same day or overnight.

## SAME DAY BURNOUT

Place the flask in a furnace at room temperature. Raise the temperature to 200°F (93°C) over 15 minutes and hold temperature for 1 hour. Raise the temperature to 350°F (175°C) during the next hour and hold at 350°F (175°C) for 30 minutes. Raise the temperature to 1600°F (871°C) over the next 2½ to hours. Hold at this temperature.

The holding time at 1600°F (871°C) will depend on the size and number of flasks in the oven, as well as the type of pattern material being melted. Longer burnout times may be required with non-wax patterns. A proper pattern burnout is confirmed by a pure white flask surface when you look down the sprue cavity. The flask is ready to cast when a proper burnout has been confirmed.



**R&R**  
**DENSPLY**

Updated: January 2008  
Replaces: December 2007

**Ransom & Randolph**

3535 Briarfield Blvd.  
Maumee, OH 43537 USA  
**USA Phone: (800)800-7496**  
Phone: (419)865-9497  
FAX: (419)865-9997  
www.ransom-randolph.com

## OVERNIGHT BURNOUT

Place the flask in a furnace at room temperature. Raise the temperature to 200°F (93°C) over a period of 30 minutes, then hold at this temperature for 2 hours. Raise the temperature to 350°F (175°C) during the next hour and hold at this temperature for another hour. Raise the temperature to 1600°F (871°C) over the next 5 hours. Hold at this temperature.

The holding time at 1600°F (871°C) will depend on the size and number of flasks in the oven, as well as the type of pattern material being melted. A proper pattern burnout is confirmed by a pure white flask surface when you look down the sprue cavity. The flask is ready to cast when a proper burnout has been confirmed.

## TIPS & TECHNIQUES

### BENCH CURE

1. Bench cure times longer than 4 hours are not recommended.
2. If there is still water present on mold tops at 4 hours, this is an indication that more absorbent material is needed. The flask and its absorbent base may be placed onto newspaper or dry investment powder to increase the absorption rate of the water.
3. Flasks can be cured inside an oven on a time delay.

### BURNOUT

1. At burnout, do not strip the absorbent base off of the flask. Process the entire set up through the burnout cycle.

Ransom & Randolph's technical advice, whether verbal or in writing, is designed to assist the user in using Ransom & Randolph's product. Such advice does not expand Ransom & Randolph's limited warranty or relieve the user of testing Ransom & Randolph's products to determine their suitability for the intended uses and procedures. The user assumes all risk and liability for damages arising out of the improper use of Ransom & Randolph's product.

In the event of a defect in material or workmanship in Ransom & Randolph's product, Ransom & Randolph's liability is limited, at Ransom & Randolph's option, to replacement of the defective product or part thereof, or reimbursement of the actual cost of the defective product. In order to take advantage of the limited warranty, the defective product must be returned to Ransom & Randolph. In no event shall Ransom & Randolph be liable for any indirect, incidental, or consequential damages.

EXCEPT AS EXPRESSLY PROVIDED, THERE ARE NO WARRANTIES, BY RANSOM & RANDOLPH, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES WITH RESPECT TO DESCRIPTION OR FITNESS FOR A PARTICULAR PURPOSE.



**R&R**  
**DENTSPLY**

**Ransom & Randolph**

3535 Briarfield Blvd.  
Maumee, OH 43537 USA  
**USA Phone: (800)800-7496**  
Phone: (419)865-9497  
FAX: (419)865-9997  
[www.ransom-randolph.com](http://www.ransom-randolph.com)