Application Instructions
R&R® Noble™ investment
AUGUST 2007

R&R NOBLE investment is ideal for casting platinum and palladium alloys - providing casters with both excellent surface finish and easy investment removal. R&R NOBLE investment is mixed with water, eliminating 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" shorter than the height of the flask. Position the liner inside of the flask so ¼" of the flask edge extends beyond the liner at either end. Place a paper or rubber collar around the top of the flask, extending approximately 1" above the top of the flask.

For the flask base, cut non-asbestos material 1" larger in diameter than the flask. Cut a ½" diameter hole in the middle of the base and center the wax tree over hole. The flask should be 1" 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 the entire setup on a metal plate or wooden board so the flask bottom will be supported when handled.

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 avoide 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 another 10-15 minutes to optimize casting surfaces. 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, 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. Place the invested flask on a vacuum table and apply full vacuum 1 to 2 minutes.

Set the flask aside, undisturbed, for 1.5-2 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 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.

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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, than 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 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.

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)	5.0 inches (12 cm)
2.5 inches (6 cm)	12.3 in^3 (201 cm^3)	14.7 in^3 (241 cm^3)	17.2 in^3 (281 cm^3)	19.6 in^3 (321 cm^3)	24.5 in^3 (400 cm^3)
3.0 inches (7 cm)	17.7 in^3 (290 cm^3)	21.2 in^3 (348 cm^3)	24.7 in^3 (405 cm^3)	28.3 in^3 (463 cm)	35.3 in^3 (579 cm^3)
3.5 inches (8 cm)	24.1 in^3 (395 cm^3)	28.9 in^3 (474 cm^3)	33.7 in^3 (553 cm^3)	38.5 in^3 (632 cm)	48.1 in^3 (790 cm^3)
4.0 inches (10 cm)	31.4 in^3 (514 cm^3)	37.7 in^3 (618 cm^3)	44.0 in^3 (721 cm^3)	50.3 in^3 (824 cm^3)	62.8 in^3 (1030 cm^3)

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.

English Measure:

Flask volume (in^3) x 0.0527 = _____ lbs. powder
Flask volume (in^3) x 0.2426 = _____ fl. oz. water

Metric Measure:

Flask volume (cm^3) x 1.4524 = _____ grams powder
Flask volume (cm^3) x 0.4357 = _____ ml water

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