Ransom & Randolph

EST. 1872

Ransom & Randolph proudly offers the following products for your casting needs:

Ultra-Vest® investment

R&R® ADVANTAGE™ investment

R&R® Solitaire investment

Astro-Vest™ investment

R&R® platinum investment & binder

PreVest™ Americast™ investment

PreVest™ Stone-Brite™ investment

PreVest™ Econovest™ investment

PreVest™ Platinum Plus™ investment & binder

Debubblizer concentrate

HP Injection Wax

Application Instructions

Astro-Vest™ Jewelry Investment

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

UPDATED: SEPTEMBER 2003

ASTRO-VEST investment is ideal for casting platinum & stainless steel. Casters like the consistent results obtained with this investment -- fin-free castings with meticulous reproduction of detail. ASTRO-VEST investment is a quality material that enhances the beauty your craftsmen create.

1. Weigh the required amount of investment powder. Refer to page 3.
2. Measure or weigh the required amount of water (1g = 1ml, 1fluid oz = 29.6ml) and place in the mixing bowl.

   Note: To reduce variations in the working time, water and powder temperatures should be held to 72°F (22°C). If the investment and/or water are too cool, the mix will set slowly. If the investment and/or the water is too warm, the mix will set too fast.

   Working time is defined as the time the powder is added to the water to the time the investment become thick.

   Note: Deionized water is recommended to maintain consistency.

3. Always add the preweighed quantity of investment to water. Adding the water to the powder will make it difficult to mix and will affect the working time.
4. Wet out the powder with a mixing paddle or a wire whip. This should take no more than 30 seconds.
5. Mechanically mix the material at a moderate speed for 1.5 to 2 minutes. Good mixing is important to activate essential ingredients that make the investment perform to its fullest potential.
6. Place the mixed investment in a vacuum chamber and apply enough vacuum to cause a rapid boil. Do not exceed 1 minute. If a longer time is required, the vacuum pump is undersized, need of repair, or there is an air leak in the vacuum system.

   Note: When correctly proportioned with water, the ASTRO-VEST investment mix may appear thicker than conventional investments. Do not add water to thin. The investment will flow freely, despite its thick appearance.

7. Pour the vacuumed investment into and down the side of the flask. Avoid pouring it directly over the patterns to prevent wax pattern breakage.
8. Vacuum the invested flask for less than 60 seconds. Excessive vacuuming will cause the investment to set prematurely. Vibrating or tapping the flask during this operation will assist in releasing air bubbles from the pattern / investment interface.
9. Release the vacuum. Fill the flask the rest of the way. Do not fill above the flask. 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.

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10. Allow the investment to sit, undisturbed, for 2 hours, since this is the amount of time needed for the mold to achieve its maximum green strength.
11. After hardening for 2 hours, gently remove the sprue base and investing collar. Hold the top of the flask under a slow stream of water, while gently rubbing the top of the mold with the palm of your hand. This will aid in the removal of the moisture during the first stages of drying. Failure to do this can lead to surface explosions or even cracking. This investment is soft so extreme gentleness must be exercised to avoid damaging the mold.
12. Load the invested flask, button side down, into a burnout oven. The flask should be elevated at least 1 inch above the oven floor to allow proper air circulation. Do not place flasks too close to the heat source.
13. If steam dewax is used, immediately transfer the flasks directly from the dewaxer into an oven preheated to 300°F (150°C). Do not allow the flasks to stand in room temperature for more than 10 minutes.
14. Follow the suggested wax burnout cycle shown on page 3.

IMPORTANT TIPS

1. Investment should always be added to the water.
2. Equipment must be kept clean and free of set investment.
3. Close the protective bag tightly in the container and close the container when not in use.
4. Always store the investment in a dry area.
5. Date of manufacture is indicated by first 6 digits of lot number (MM/DD/YY). Ransom & Randolph recommends using material within 6 months of manufacture date.

MATERIAL PROPERTIES

Water/Powder Ratio:	27-29 parts water to 100 parts powder by weight
Working Time:	5-6 minutes
Setting Time:	15-25 minutes
Compressive Strength @ 2 hours:	105 psi
Fired Strength:	800 psi
Volume of Mixed Investment:	@ 28/100 - 19.25 in^3/lb powder

WARNING!

Astro-Vest investment contains respirable crystalline silica (RCS). Do not breathe dust. May cause delayed lung injury (silicosis, pneumoconiosis). See Material Safety Data Sheet (MSDS) for detailed information.

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1. To determine the proper amount of water and powder to use per flask, locate the volume of the flask size 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 (9 cm)**	**4.0 inches (10 cm)**	**5.0 inches (13 cm)**	**6.0 inches (15 cm)**	**7.0 inches (18 cm)**	**8.0 inches (20 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 (401 cm^3)	29.5 in^3 (481 cm^3)	34.4 in^3 (561 cm^3)	39.3 in^3 (642 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^3)	35.3 in^3 (579 cm^3)	42.4 in^3 (695 cm^3)	49.5 in^3 (811 cm^3)	56.5 in^3 (927 cm^3)
3.5 inches (9 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^3)	48.1 in^3 (790 cm^3)	57.7 in^3 (948 cm^3)	67.4 in^3 (1106 cm^3)	76.9 in^3 (1261 cm^3)
4.0 inches (10 cm)	31.4 in^3 (515 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)	75.4 in^3 (1236 cm^3)	88.0 in^3 (1441 cm^3)	100.5 in^3 (1647 cm^3)
5.0 inches (13 cm)	49.1 in^3 (810 cm^3)	58.9 in^3 (965 cm^3)	68.7 in^3 (1126 cm^3)	78.5 in^3 (1287 cm^3)	98.2 in^3 (1609 cm^3)	117.8 in^3 (1931 cm^3)	137.4 in^3 (2252 cm^3)	157.1 in^3 (2574 cm^3)
6.0 inches (15 cm)	70.7 in^3 (1158 cm^3)	84.8 in^3 (1390 cm^3)	99.0 in^3 (1622 cm^3)	113.1 in^3 (1853 cm^3)	141.4 in^3 (2317 cm^3)	169.6 in^3 (2780 cm^3)	197.9 in^3 (3243 cm^3)	226.2 in^3 (3707 cm^3)

2. Using the volume located in the previous step, calculate the weight of powder and the volume of water for your flask size using the following equation:

HEAVY CASTINGS = 27/100 WP (Men's rings or pieces with thick sections)

English measure:

Volume (in^3) x .0528 lbs = _____ lbs powder

Volume (in^3) x .219 fl oz = _____ fl oz water

Metric measure:

[Volume (cm^3) x 1.462 g]/1000 = _____ kg powder

Volume (cm^3) x .395 ml = _____ ml water

NORMAL CASTINGS = 28/100 WP (Ladies' rings)

English measure:

Volume (in^3) x .0520 lbs = _____ lbs powder

Volume (in^3) x .223 fl oz = _____ fl oz water

Metric measure:

[Volume (cm^3) x 1.440 g]/1000 = _____ kg powder

Volume (cm^3) x .403 ml = _____ ml water

DELICATE CASTINGS = 29/100 WP (Filigree and small pieces)

English measure:

Volume (in^3) x .0512 lbs = _____ lbs powder

Volume (in^3) x .228 fl oz = _____ fl oz water

Metric measure:

[Volume (cm^3) x 1.418g]/1000 = _____ kg powder

Volume (cm^3) x .411 ml = _____ ml water

Wax Burnout Schedule

Flask size: up to 2.5 × 5.0 in. (6.3 cm x 12.7 cm)	**Flask size: up to 4.0 × 6.0 in. (10.2 cm x 15.2 cm)**	**Flask size: up to 6.0 x 12.0 in. (15.2 cm x 30.5 cm)**
Hold at 300F (150C) for 4 hours	Hold @ 300F (150C) for 4.5 hours	Hold @ 300F (150C) for 5 hours
Elevate to 1600F (870C) over the next 6 hours	Elevate to 1600F (870C) over the next 7 hours	Elevate to 1600F (870C) over the next 8 hours
Hold at 1600F (870C) for 3 hours	Hold at 1600F (870C) for 3.5 hours	Hold at 1600F (870C) for 4 hours
Reduce to casting temperature & hold 1 hour before casting.	Reduce to casting temperature & hold for 2 hours before casting.	Reduce to casting temperature & hold for 3 hours before casting.

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