

# Astro-Vest® Investment

1. Weigh the required amount of ASTRO-VEST investment. To determine the proper amount of water and powder to use per flask, use the online flask calculator located at [www.ransom-randolph.com](http://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.

	W:P 27/100		W:P 28/100		W:P 29/100	
	Per in <sup>3</sup> volume	Per cm <sup>3</sup> volume	Per in <sup>3</sup> volume	Per cm <sup>3</sup> volume	Per in <sup>3</sup> volume	Per cm <sup>3</sup> volume
<b>Investment Needed</b>						
Grams	26.9	1.64	26.6	1.62	26.2	1.60
Pounds	0.06		0.06		0.06	
Ounces (Weight)	0.90		0.90		0.90	
<b>Water Needed</b>						
Grams	7.30	0.44	7.40	0.45	7.60	0.46
Pounds	0.02		0.02		0.02	
Fluid Ounces	0.20		0.30		0.30	

2. Measure or weigh the required amount of water (1 g = 1 ml, 1 fluid oz = 29.6 ml) and place in the mixing bowl.  
**Note:** changes in temperature affect working time, to reduce variations, water temperature should be held constant. For best results, we recommend using cold water (40-60 °F [4-16 °C]). Working time is defined as the time the powder is added to the water to the time the investment becomes thick.  
**Note:** deionized water is recommended to maintain consistency of the working time.
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 1½ 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. The investment should be vacuumed until it rises and breaks. Do not exceed 1 minute. If a longer time is required, the vacuum pump may be undersized, there may be an air leak or the vacuum system may be in need of repair.  
**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. Fill flask at least 1" (2.54 cm) over pattern.



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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. Release vacuum and fill the flask to the top of the metal edge. Do not overfill.
9. 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.
10. To achieve appropriate green strength, allow the investment to sit undisturbed (bench cure) for 2 hours.
11. After bench curing for 2 hours, gently remove the sprue base and investing collar. 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. Ideally, flasks should be loaded into a burnout oven, preheated to 300 °F (150 °C), button side down. Flasks should be elevated at least 1" (2.54 cm) above the oven floor to allow proper air circulation and wax drainage. Do not place flasks too close to the heat source or to each other.  
**Note:** if loading into a cold oven, 300 °F (150 °C) temperature must be reached as fast as possible.
13. If steam dewax is used, transfer the flasks immediately from dewax into an oven preheated to 300 °F (150 °C). Do not allow flasks to stand at room temperature for more than 10 minutes.
14. Follow the suggested wax burnout schedule shown below.

Wax Burnout Schedule				
		Flask size: up to 3" x 3" (7.6 cm x 7.6 cm)	Flask size: up to 4" x 6" (10.2 cm x 15.2 cm)	Flask size: up to 4" x 8" (10.2 cm x 20.3 cm)
<b>Water Removal</b>	Ambient to 300°F (150°C) as fast as possible (can be preheated)	Hold 4 hours	Hold 4½ hours	Hold 5 hours
<b>Thermal Transition</b>	Raise to 1600°F (870°C)	Raise over 6 hours Hold 3 hours	Raise over 7 hours Hold 3½ hours	Raise over 8 hours Hold 4 hours
	Reduce to casting temperature and allow for stabilization	Hold 1 hour	Hold 2 hours	Hold 3 hours

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



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## Important Tips

- Use deionized water for best results.
- Investment should always be added to the water.
- 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 the 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.
- 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.

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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