

# Platinum Plus<sup>®</sup> Investment & Binder

PLATINUM PLUS investment & binder is ideal for casting platinum because of its ability to meet the ever increasing demands for consistency and quality. Unlike other binders, PLATINUM PLUS binder will not settle out, thus giving more consistent results from mix to mix.

## Flask Preparation

Prepare the flask by cutting a non-asbestos absorbent liner  $\frac{1}{2}$ " shorter than the height of the flask. Position the liner inside the flask so  $\frac{1}{4}$ " 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  $\frac{1}{2}$ " 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.

## Binder Preparation

PLATINUM PLUS binder is concentrated and therefore must be diluted before using. The dilution ratio is 1 part binder concentrate to 14 parts distilled water (by volume). To prepare the investment binder solution, slowly add the concentrate to the water according to the following chart(s).

Dilution in milliliters (ml)				
Binder Concentrate	+	Distilled Water	=	Diluted Binder
25 ml		350 ml		375 ml
30		420		450
40		569		600
45		630		675
50		725		750
100		1400		1500
225		3150		3375
450		6300		6750
900		12600		13500

Dilution in fluid ounces (oz)				
Binder Concentrate	+	Distilled Water	=	Diluted Binder
1 oz		14 oz		15 oz
4		56		60
8		112		120
16		224		240

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## Investment Mixing

- To determine the proper amount of binder 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 <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> )	24.5 in <sup>3</sup> (400 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> )	35.3 in <sup>3</sup> (579 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> )	48.1 in <sup>3</sup> (790 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> )	62.8 in <sup>3</sup> (1030 cm <sup>3</sup> )

- Using the volume located in the previous step, calculate the weight of powder and the volume of the diluted binder for your flask size using the following equations. The general mixing ratio is diluted binder (in volume)/powder (in weight) = 30/100.

English Measure	Metric Measure
Flask Volume (in <sup>3</sup> ) x 0.0527 lbs = ____lbs powder	Flask Volume (cm <sup>3</sup> ) x 1.4524 g = ____g powder
Flask Volume (in <sup>3</sup> ) x 0.2426 fl oz = ____fl oz water	Flask Volume (cm <sup>3</sup> ) x 0.4357 ml = ____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.

Place the diluted binder 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 15-20 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 for 1 to 2 minutes.

Set the flask aside, undisturbed, for 90 minutes. The flask is now ready for burnout. You may burnout the same day, or overnight.

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## 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 2-½ 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. 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.

## 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.

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.

Danger. Binder causes severe skin burns and eye damage. See SDS for more information.

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