

PRIMCOTE® PLUS BINDER

Extended Life Primary Binder

Primcote PLUS binder adds the benefit of extended slurry life to your primary slurry. When compared to the original, Primcote PLUS binder has increased primary slurry life by 60% at existing foundries.

Primcote PLUS binder's extended slurry life provides your shell room with:

- Reduced need to scrap a slurry due to issues such as gelation.
- Reduced need to purchase material more frequently to replace scrapped slurry. Primcote PLUS binder is purchased to top off the current slurry tank – requiring fewer material purchases annually.

Primcote PLUS binder also offers improved wetting capabilities over the industry's existing primary binders.

Primcote PLUS binder's improved wetting capabilities offer your shell room:

- Better initial coat coverage, despite pattern cleaner variations reducing potential casting defects such as spalling.
- Consistent coverage through small, tight areas increasing consistency of surface detail reproduction.

Primcote PLUS binder continues to benefit the foundry by eliminating buckling, lifting and cracking of primary shell coats and continues to allow faster drying of primary coats with lower humidity and/or increased air circulation.

Primcote PLUS binder contains a wetting agent, an antifoam agent and a color indicator to monitor shell dryness, as well as other proprietary ingredients. This binder is also compatible with conventional refractory materials and shell room equipment.

Typical Material Properties*

Base Composition	Colloidal Silica
Other Composition	Proprietary
Total Solids Content (Including SiO ₂)	28.5-30.0%/weight
Particle Size (Approximate)	<15 nm
pH at 77 °F (25 °C)	10.3
Specific Gravity	1.17
Weight/Volume	9.70 lbs/gal (1.17 kg/l)
Na ₂ O Content (Weight)	0.35%
Particle Charge	Negative

*These results are based on the testing methods, frequency and procedures of Ransom & Randolph or its approved suppliers. The levels referenced herein are only for general guidance and do not constitute a firm specification.



RANSOM & RANDOLPH

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Formulations

If you currently have a primary slurry formulation, use the same percentages and loadings of your current refractories. The following formulations are for casters just starting out.

Intended Slurry Use	Target Slurry Density (g/ml)	Target Viscosity (sec)**	Formula for 10 Gallons (lbs)			Formula for 10 Liters (kgs)		
			Primcote PLUS binder	Ranco-Sil™ 4 fused silica	Zircon (-200 mesh)	Primcote PLUS binder	Ranco-Sil 4 fused silica	Zircon (-200 mesh)
Ferrous	2.99-3.03	16.5-18.5	43.9	—	206.7	5.28	—	24.85
Non-Ferrous	1.69-1.73	21.8-27.1	47.0	95.4	—	5.65	11.47	—

**Viscosity measured using through the hole method with a #5 Signature Zahn cup.

Application Recommendations

1. Remix the Primcote PLUS binder prior to use to ensure a homogeneous blend of material.
2. For best results, weigh all ingredients when making up a new slurry or making additions to an existing slurry.
3. When building the slurry, add the refractory last. If more than one refractory is used, add the lowest density refractory first: fused silicas (2.2 g/cc), aluminosilicates (2.7 g/cc), zircon (4.5 g/cc). Add refractory slowly for best results.
4. New and makeup slurries must be prepared with a propeller mixer, not in a rotating tank. This ensures proper dispersion of the refractory particles. The propeller mixer must be of adequate HP and RPM. Excessive mixing action can introduce air into the slurry and cause erratic viscosity and/or bubbles in the slurry coat.
5. As with any slurry, the viscosity of the slurry must be stable before use. A stable viscosity is one that does not change by more than 1 second when checked at 1 hour intervals. Viscosity can be increased by adding more refractory and decreased by adding more binder.
6. It is required to replace water lost to evaporation. When water is needed (based on test results for viscosity and/or binder solids), use distilled or deionized water as opposed to tap water, which can contain contaminants that can negatively affect slurry life.
7. Antifoam, wetting and bactericide agents are already formulated into Primcote PLUS binder and other additions may not be compatible. Contact R&R's technical team before making these additions to the slurry.
8. Patterns must be clean and free from silicones or other contaminants before dipping.
9. It is not usually necessary to use a prewet before applying the first primary coat to the wax pattern. If a prewet is needed, use Primcote PLUS binder only.
10. If a prewet is needed between coats, the Primcote PLUS binder should be diluted to 26% binder solids (binder to water ratio of 5.8:1 by volume, 6.9:1 by weight). Drain the prewet well so that no pockets of liquid are left on the pattern.

Slurry Control Procedures

Slurry Control Worksheets are available for download at www.ransom-randolph.com. Slurry Control Worksheets allow you to input data directly and help you calculate values.



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Slurry Testing Frequency

R&R recommends running the following tests accordingly.

Slurry Test	Recommended Testing Frequency
Slurry Viscosity	Two Times Per Shift
Binder Solids	Two Times Per Week
Binder pH	Weekly

Target Binder Solids Range

The target binder solids range for Primcote PLUS binder is 28.8-30.8% by weight.

Specific Gravity	Binder Solids	Specific Gravity	Binder Solids	Specific Gravity	Binder Solids
1.160	26.8	1.173	28.8	1.186	30.9
1.161	27.0	1.174	29.0	1.187	31.0
1.162	27.1	1.175	29.1	1.188	31.2
1.163	27.3	1.176	29.3	1.189	31.3
1.164	27.4	1.177	29.5	1.190	31.5
1.165	27.6	1.178	29.6	1.191	31.6
1.166	27.7	1.179	29.8	1.192	31.8
1.167	27.9	1.180	29.9	1.193	31.9
1.168	28.1	1.181	30.1	1.194	32.1
1.169	28.2	1.182	30.2	1.195	32.3
1.170	28.4	1.183	30.4	1.196	32.4
1.171	28.5	1.184	30.6	1.197	32.6
1.172	28.7	1.185	30.7	1.198	32.7

Storage & Handling

Protect from freezing. Primcote PLUS binder must be maintained above 35°F (2°C) to prevent the material from precipitating irreversibly and making the product unsuitable for use. Keep in a cool, dry, well-ventilated area. Keep containers tightly closed. Binder stored in transparent or translucent containers should be sheltered from direct sunlight. Shelf life is 1 year from date (MMDDYY) in batch lot number on label. Rotate stock to maximize shelf life. Remix before using.

Safety

OSHA-approved respiratory protection should always be worn to avoid inhalation of respirable silica dust, which can result in an irreversible lung disease, silicosis. Such exposure includes slurry makeup, casting, knockout and cleanup. See SDS for more information.

Technical Tips

For additional information and recommendations, refer to the Shell Building, Slurry Control, Autoclaving, FlashFire Dewax Method and Viscosity Cup Correlations Technical Tips available for download at www.ransom-randolph.com.



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