

CUSTOMCOTE® BINDER



Customcote binder produces strong ceramic shells with many potential benefits over standard colloidal silica and ethyl silicate shells.

Customcote binder can be used for primary and backup shell coats. It can also be used with a variety of refractories depending on the individual foundry's process and casting requirements.

Customcote binder's excellent wetting property eliminates the need for prewets. The binder's lower slurry viscosity allows for better coverage in slots and shorter drain times.



The thinner, yet stronger, shell results in reduced shell material consumption and less shell material for disposal. Shell weights versus standard colloidal silica shells can be reduced significantly depending on the number of shell coats the foundry currently uses.

Typical Material Properties*

Base Composition	Colloidal Silica
Other Composition	Proprietary
Total Solids Content (Including SiO ₂)	27.5%/weight
Particle Size (Approximate)	10 nm
pH at 77°F (25°C)	10.6
Specific Gravity	1.15
Weight/Volume	9.51 lbs/gal (1.14 kg/l)
Viscosity at 77°F (25°C)	<10 cps
Na ₂ O Content (Weight)	0.41%
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

Due to the unique nature of the product, the formulation implemented will vary from foundry to foundry. This flexibility allows the foundry to obtain the maximum number of benefits from Customcote binder. The following formulation is for casters just starting out.

% Refractory	Target Slurry Density (g/ml)	Target Viscosity	Formula for 10 Gallons (lbs)		Formula for 10 Liters (kgs)	
			Customcote binder	Ranco-Sil™ fused silica**	Customcote binder	Ranco-Sil fused silica
64%	1.64-1.68	10-12 sec/#5 Zahn	50.0	88.5	6.0	10.6

**This formula can be used with Ranco-Sil 2 fused silica, Ranco-Sil 4 fused silica or Ranco-Sil 140 fused silica.

Application Recommendations

1. Remix the Customcote 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 silica 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 Customcote binder and other additions may not be compatible. Contact R&R's technical team before making these additions to the slurry.

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.

Slurry Testing Frequency

R&R recommends running the following tests accordingly.

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



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Target Silica Solids Range

The target silica solids range for Customcote binder is 23.0-25.0% by weight.

Specific Gravity	Silica Solids	Specific Gravity	Silica Solids	Specific Gravity	Silica Solids
1.134	20.8	1.15	23.0	1.166	25.1
1.135	20.9	1.151	23.1	1.167	25.3
1.136	21.1	1.152	23.2	1.168	25.4
1.137	21.2	1.153	23.4	1.169	25.5
1.138	21.4	1.154	23.5	1.17	25.7
1.139	21.5	1.155	23.6	1.171	25.8
1.14	21.6	1.156	23.8	1.172	25.9
1.141	21.8	1.157	23.9	1.173	26.1
1.142	21.9	1.158	24.1	1.174	26.2
1.143	22.0	1.159	24.2	1.175	26.3
1.144	22.2	1.16	24.3	1.176	26.5
1.145	22.3	1.161	24.5	1.177	26.6
1.146	22.4	1.162	24.6	1.178	26.7
1.147	22.6	1.163	24.7	1.179	26.9
1.148	22.7	1.164	24.9	1.18	27.0
1.149	22.8	1.165	25.0	1.181	27.2

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. Refer to SDS for specific details.

Storage & Handling

Keep from freezing. Customcote binder must be maintained above 35 °F (2 °C) to prevent the material from precipitating irreversibly and making the product unsuitable for use. 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.

Technical Tips

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



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