Technical Data Sheet

ALpHASET® 9040 & 9045
Ester Cured Phenolic No-Bake System

Product Description: ALpHASET 9040 and 9045, which are used in conjunction with the ALpHACURE 100-. 200-series hardeners, represent the latest development in the Ester Cured Phenolic No-Bake System. The new ALpHASET 9040 technology has enabled many foundries • to increase levels of mechanically reclaimed sand greater than 90%, and • has led to improved casting quality by reducing shrinkage defects and enhancing surface finish, without sacrificing any of the benefits of traditional ALpHASET technology. With sand mixes consisting of 100% new sand, tensile strengths may be lower than conventional ALpHASET systems.

ALpHASET 9045 is specifically designed to retain the reclamation advantages of ALpHASET 9040 while providing better strength performance on new sands. In addition, ALpHASET 9045 exceeds the performance of conventional resin ALpHASET 9010 in slow applications (greater than 20-minute strip times.) It offers the option of using ALpHASET 9045 in place of ALpHASET 9040 where, for example, new sand is used for making cores.

Application Parameters: The ALpHASET 9040 or 9045 system is used at the conventional levels of the existing ALpHASET systems; typically, 1.0-1.5% resin B.O.S., and the appropriate ALpHACURE 100- or 200-series coreactant chosen to give the desired strip time, at 28-32% B.O.R.
The addition sequence of the components to continuous mixers or mullers is dependent upon mixer design and efficiency of mixing. More intensive mixers generally result in higher tensile strengths.

Sand Reclamation: Tensile strengths with new sand bonded with ALpHASET Systems are generally lower than for other technologies, such as phenolic urethanes and acid-cured systems. The same is true for reclaimed sand. However, for most applications the tensile strength values are more than adequate for core and mold handling requirements, while significantly improving casting surface quality.

When converting from existing ALpHASET products, such as ALpHASET 9010 straight replacement of the components is all that is necessary. Strengths will be the same with reclaimed sand. Once the sand has been recycled sufficiently to purge the old ALpHASET sand, strengths will increase. At this point, the reclaimed sand may be incrementally increased to a higher level, while maintaining desired handling strengths.

When converting from alternative no-bake chemical technologies to any ALpHASET System, it is recommended to start with new sand or existing reclaimed sand at 40%. This is necessary to

reduce the influence of the residual chemicals that may be present in the reclaimed sand on the ALpHASET curing mechanism.

For applications where high levels (> 70%) of mechanically reclaimed ALpHASET sand are used, ALpHA/BETA MAX may be required to enhance rebonding strengths. The reclamation enhancements, such as ALpHA/BETA MAX 601 are used at 0.1-0.6% B.O.S. and are added and mixed on the sand prior to the addition of the ALpHASET resin and the ALpHACURE hardener. Once the desired levels of reclaimed sand in the mix have been achieved, it requires three to four complete reclamation cycles for the sand to stabilize.

During this period, there may be a reduction in rebond strengths. The final strengths will depend upon the sand and foundry process parameters.

For applications where thermally reclaimed sand is used, it is recommended that ALpHA/BETA MAX 601 be added to the mixer / muller, or to the sand, prior to introduction of the sands into the thermal reclamation unit. This technique will result in efficient thermal reclamation which will promote tensile strength values approaching those of new sand.

Investigations by manufacturers of thermal reclamation equipment have shown that ALpHASET can be successfully reclaimed. Most units can operate with minimal engineering changes. However, it is recommended that the equipment manufacturer and Borden Chemical be involved in the process in order to ensure the desired outcome.

Typical Properties – AlpHASET PHENOLIC RESINS		
	ALpHASET 9040	**ALpHASET 9045**
Viscosity, cps	100	140
Specific Gravity	1.234	1.256
Water Solubility	infinite	infinite
% Solids	47	48
PH	13.0	13.3
Flash Point, ^{o}F	>200	>200
% Free Formaldehyde	< 0.2	< 0.2
% Free Phenol	< 0.4	< 0.7
% Nitrogen	< 1.0	<1.0
Storage Stability @	3 Months	3 Months
@ 75 ^{o} F	4 Months	4 Months
@ 40^{o} F	6 Months	6 Months

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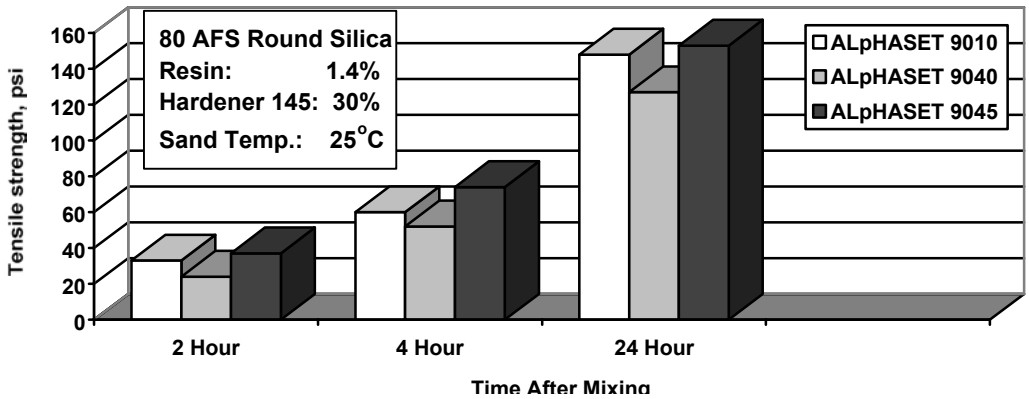
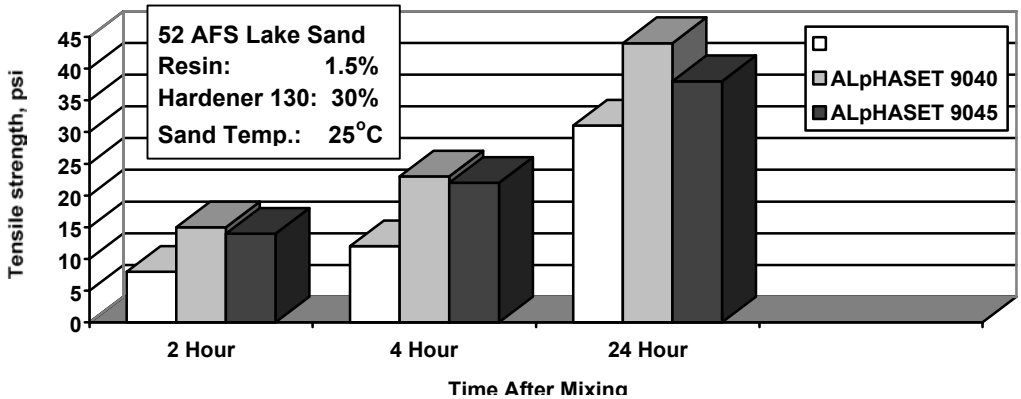
Tensile Properties on New Sand



Tensile Properties on New / Reclaimed Sand (25:75) Blend



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