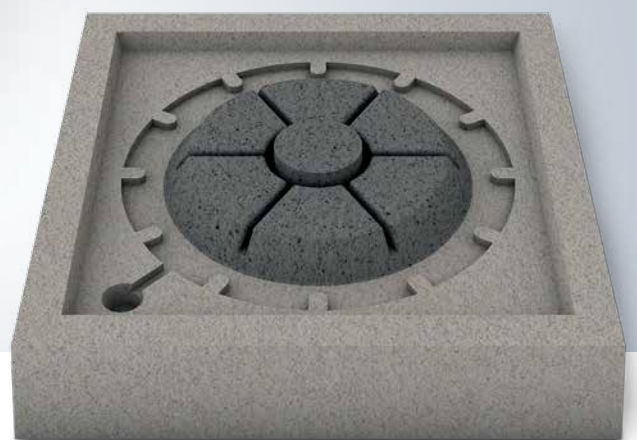




No-Bake

Product Line Overview



ASKCHEMICALS
We advance your casting



A well-established Authority in No-Bake Technology

ASK Chemicals has been a leader in developing No-Bake technology for many years. As innovators in the field, we have been developing and establishing the PEP SET system in foundries since the early 1970s. The development of PU No-Bake systems has revolutionized the manufacture of cores and molds in the foundry industry.

Our solutions are invariably engineered to satisfy the key attributes desired by the market: improved quality, greater productivity and environmental characteristics.

To produce such solutions, the work of our R&D department is vital. This can be described as the interplay of innovation-driven research and customer-driven development. Today's foundries need to satisfy increasingly complex requirements – reduced emissions, consistent high-quality casting, and the ability to cope with the cost pressure that many foundries are facing are just some of the instances here. Such requirements necessitate more than just strong partnerships and outstanding technologies: rather, first-class research and development that focuses on developing efficient, environmentally friendly solutions.

At ASK Chemicals, we provide our customers with valuable services that complement our range of products. Our application technology and technical sales specialists in particular always assess the entire production process as a whole. Only this approach allows for customer-specific solutions that are precisely tailored to meet customer requirements.

Our design service will systematically optimize the entire process jointly with customers – from concept development to serial production – and indicate significant potential savings and improvements in doing so.

- Leaders in all No-Bake technologies
- Unmatched product development
- A focus on sustainability
- Holistic value-added services

Basic Information

Major No-Bake variations

➤ Furan **FNB**

- Ease of processing
- Known for high hot strength and excellent shakeout
- Excellent casting surface

➤ Phenolic **PNB**

- Application similar to furan
- Good thermal resistance

➤ Phenolic Urethane **PUNB**

- High productivity
- Highly controllable curing speed
- For all types of metal casting applications
- User-friendly attributes

➤ Alkaline Phenolic **APNB**

- Water-based resins
- Suitable for large-scale castings
- Recommended for steel castings

➤ Alkyd Oil **AONB**

- Elastic binder bridges
- Ideal for steel castings
- Predictable “first stage through cure”
- Excellent release properties

ASK Chemicals brands

➤ MAGNASET **FNB**

Innovative furan resins for acid curing

➤ ASKURAN, CHEM-REZ

FNB and **PNB**

Multifaceted No-Bake binders for acid curing

➤ PEP SET **PUNB**

A productive and flexible No-Bake system

➤ ALPHASET **APNB**

The No-Bake solution for steel castings

No-Bake classification

$$\frac{\text{System} \rightarrow \text{No-Bake type}}{\text{Number of parts}} = \text{APNB}$$

General benefits of No-Bake

- Production flexibility
- Excels with complex geometries
- User-friendly
- Low capital investment

Differentiating factors

				
Eco-Friendly	Productivity	Quality	Cost	Flexibility
<ul style="list-style-type: none">• Reduced odor• Low emissions• Reduced smoke• Renewable raw materials	<ul style="list-style-type: none">• High reactivity and ease of shakeout• Superior work time / strip time ratio• Instantaneous / uniform through-cure• Ease of reclamation	<ul style="list-style-type: none">• Superior surface finish• High thermal resistance• Resistance to casting defects• Excellent dimensional accuracy	<ul style="list-style-type: none">• Good price performance ratio• Higher reclaim sand yields• Low fettling costs	<ul style="list-style-type: none">• Multiple sand types• Superior temp. and humidity resistance• Multiple metal type usability• Ease of use

Custom solutions

Apart from the system solutions mentioned in this brochure, ASK Chemicals also offers you custom solutions to fit your individual process. Please contact us to discuss your specific needs.

MAGNASET



Innovative generation of furan resins

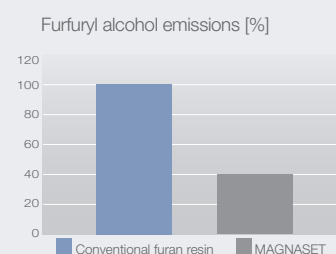
MAGNASET are furan resins with a low furfuryl alcohol content that are characterized by their good molding and casting properties. They represent a new generation of binders whose performance is comparable with that of standard furan resins. The lower monomeric furfuryl alcohol content in MAGNASET resins can reduce furfuryl alcohol emission at the workplace by up to 60 %.

Benefits

- Reduced VOC
- No system conversion necessary, comparable to conventional furan systems
- Good molding properties and excellent casting surfaces
- 60% less furfuryl emissions at the workplace

MAGNASET for a wide range of castings

MAGNASET binders cover a wide range of different casting types. Thanks to their good sand and casting properties, MAGNASET Binders are an emission-reduced alternative to "standard furan resins"



	Attributes	Application	Quick reference			
			<div>Major</div> <div>Minor</div>			
Premium	Reduced furfuryl alcohol content as a monomer, resulting in lower emissions Ease of shakeout High reactivity and high strengths	Ductile iron and steel Small to large castings Most sand types	 Eco-friendly	 Quality	 Productivity	 Flexibility

ASKURAN and CHEM-REZ

Multifaceted No-Bake binders for large castings

ASKURAN and BERANOL are binders designed for acid curing. Curing speed can be controlled by the dosage and quality of the hardener to almost any extent. The strengths achieved are very high and permit minimal amounts of binder to be added. They guarantee a good casting surface. Depending on the individual requirement, ASK Chemicals provides furan (FNB), phenol (PNB) or furan-phenol binder systems.

Benefits

- Ease of use
- Variable/adjustable cure rates
- Good flowability
- Ease of reclamation and shakeout
- Good through-cure

Sulphur-reduced and highly productive

ASKURAN RS, a reduced-sulfur system, leads to a reduction of sulfur in the mold material and of sulfur dioxide emissions during the casting process. The air quality inside the foundry and the working conditions in the foundry are improved significantly. ASKURAN RS also provides a first-class casting surface.



		Attributes	Application	Quick reference				
				<div>MajorMinor</div>				
Standard Premium	Controllable reactivity and ease of shakeout Low cost in use Sulfur reduction	Steel and iron Medium to large castings Most sand types	<div><div></div><div>Quality</div><div></div><div>Eco-friendly</div><div></div><div>Productivity</div><div></div><div>Flexibility</div><div></div><div>Cost</div></div>					
	Economic overall quality Economic high hot strength	Steel and iron Medium to large castings Most sand types	<div><div></div><div>Cost</div><div></div><div>Flexibility</div><div></div><div>Productivity</div><div></div><div>Quality</div><div></div><div>Eco-friendly</div></div>					

PEP SET

A productive and flexible No-Bake system

Known for its exceptional quality and almost fully controllable curing reactions, PEP SET has long been the standard in No-Bake excellence. When used in an automated production line (roller-loop or turn table) PEP SET can produce fully cured molds in less than 90 seconds! Clearly, speed, application flexibility and overall ease of use make PEP SET ideal for satisfying any core and mold-making requirement.

Benefits













- Controllable cure times
- Superior work time/strip time ratio
- Excellent core and mold strengths
- Ease of reclamation

Unrivalled emission reduction

The PU No-Bake System PEP SET Quantum is characterized by low smoke and odors during pouring, cooling, shake out and mixing.

The new PU-No-Bake-Binder PEP SET Silver additionally leads to a strong reduction of the phenol emissions as well as to a reduction of phenol concentrations in reclaimed sands. With PEP SET Silver, ASK Chemicals is setting new standards in reducing emissions in PU no-bake foundries.



	Attributes	Application	Quick reference			
			Major		Minor	
Premium	Premium overall performance Overall eco-friendliness Low reportable HAP quantities	Ferrous and non-ferrous Small to large castings Most sand types	 Eco-friendly	 Productivity	 Quality	 Flexibility
Standard	Predictable/repeatable cure times Good speed, strength and productivity Cost in use	Ferrous and non-ferrous Small to large castings Most sand types	 Productivity	 Quality	 Flexibility	 Cost
Polyol	Overall flexibility Improved shakeout	Non-ferrous aluminum Non-ferrous magnesium	 Flexibility	 Productivity	 Eco-friendly	 Quality

ALPHASET

The No-Bake solution for steel castings

This two-part binder system composed of a water-based resole resin cured with a liquid ester co-reactant can be used in most casting processes. ASK Chemicals offers a wide range of co-reactants, allowing for varying levels of productivity. ALPHASET is ideal in most large-scale casting production, especially in steel applications. Due to the alkaline properties of this technology, we recommend the use of ALPHASET additives for the reclaim of sands. This considerably increases the quality of the reclaimed sand.

Benefits

- Ease of use
- Low odor during core and mold-making
- Suppression of casting defects
- Excellent casting surface quality, especially in steel

Reclamation recommendation – ALPHASET RSA

ASK Chemicals recommends using ALPHASET RSA reclaim sand additive with all ALPHASET applications. This unique additive maximizes the removal of residual binder to increase reclaimed sand yields. ALPHASET RSA enables the use of a higher percentage of reclaimed sand during mold-making, which results in a lower cost per ton of sand.



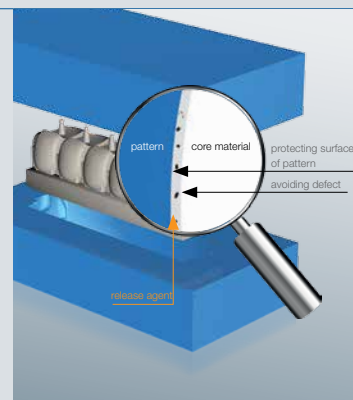
	Attributes	Application	Quick reference				
			<div>Major</div> <div>Minor</div>				
Standard	Low odor during core and mold-making Excellent casting surface	Ferrous and non-ferrous primarity steel castings Small to large castings Most sand types					
			Quality	Cost	Productivity	Flexibility	Eco-friendly

Our Auxiliaries Portfolio

Release Agents

ASK Chemicals' highly engineered release agents come in a variety of formulations to accommodate various applications.

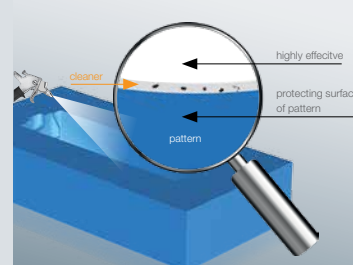
- ZIP SLIP are release agents for all gas-curing, cold-curing and hot-curing core and mold making processes as well as green sand applications.
- BENTOGLISS solvent-free release agents are highly recommended for bentonite-bonded molds from the pattern.
- ECOPART are eco-friendly and efficient release agents for all gas-curing, cold-curing as well as hot-curing core and mold making processes.



Metal Cleaners

Reduce time and money spent on cleaning with one of ASK Chemicals' superior ZIP CLEAN metal cleaning solutions.

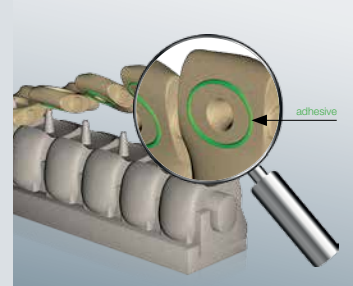
- Metal cleaners free of NMP available
- Low odor



Adhesives

ASK Chemicals' adhesive solutions – suitable for automatic metering devices – encourage high production profitability, reducing your handling and cycle time. ASK Chemicals' adhesives are suitable for air-drying, oven-drying and microwave-drying.

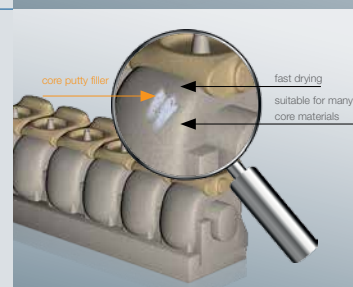
- Water-based
- Hot melt glues
- 2 component glues
- Quick glue



Core Putty Fillers

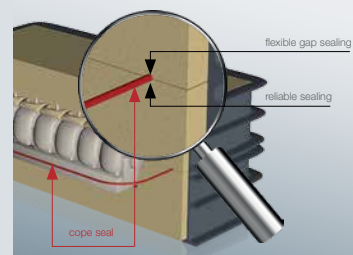
With ASK Chemicals' ASKOPASTE core putty fillers you can reduce your scrapped cores by simply repairing them.

- Ideal for the repair and reworking of minor core defects and damaged contours
- Optimized packaging for efficient transport and application



Cope Seals

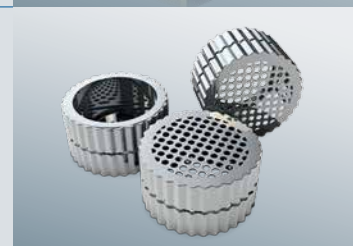
ASK Chemicals' ASKOROPE cope seals are ideal for when you need to prevent leakage from the mold through the mold joint, particularly in the in-gate area.



Core Box Vents

ISOVENTS shorten gassing times, minimize cleaning and extend the service life of the vents, thereby increasing foundry productivity.

- Available in multiple sizes



Added Value for our Customers

Application technology and technical sales – for complete process transparency

Application technology and technical sales at ASK Chemicals offer our customers comprehensive expertise in all areas of foundry technology and metallurgy. We offer a comprehensive service that focuses on the production process as a whole and helps customers not only to cut costs but also to enhance their processes. ASK Chemicals also conducts casting defect analyses and offers its customers the opportunity to have tailored training sessions on the customer's own premises.

Benefits

- Improved decision-making thanks to greater transparency
- Reliable recommendations
- Quick response
- Customized solution development
- Cost-in-use reporting (i.e. savings)
- Casting defect analyses
- On-site training sessions

Our pilot foundry – more than just state-of-the-art

ASK Chemicals offers fully equipped test foundries at its sites in Hilden and Dublin (Ohio). Modern core shooting machines allow ASK Chemicals to replicate the process on the customer's own premises, perform troubleshooting and systematically advance technologies and products in collaboration with our R&D department.

Highlights

- Ultramodern core shooting machine on an industrial scale for all current processes
- Advanced core shooting machine on a laboratory scale for quality assurance and process control
- Mold production, including all inorganic processes
- Melting of flake graphite and nodular graphite cast iron up to 100 kg (220.46 lb)
- Melting of aluminum up to 160 kg (352.74 lb)
- Metallurgical studies, e.g. spectral analyses of iron and aluminum structures



Design Services – for perfect casting results

Our Design Services team monitors the entire process from the development of the design concept and validation right up to the production of the cast part prototype. Our engineers have a wide range of experience and a clear understanding of all aspects of foundry technology and metallurgy. Our Design Services team has the right combination of design, production and simulation expertise, co-operates with external companies and service providers, and enjoys extensive industry experience. ASK Chemicals' simulation service offers wide-ranging technical knowledge and understanding combined with state-of-the-art simulation programs.

Benefits

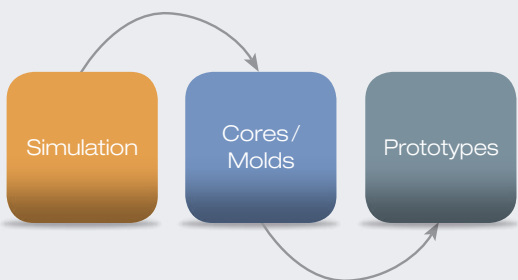
- Higher productivity and optimized catalyst consumption
- Manufacturing process design, including inorganic technology
- Calculation of optimal feed
- Optimized design and manufacture of model plates, core boxes and molds
- Less scrap
- Shorter product launch times
- Quicker time to market

Simulation services

The simulation of casting processes provides foundries with invaluable casting mold information. Specifically, this benefit allows for the optimization of gating and feeding systems, overflows, venting design and risers. Moreover, it provides critical insight into the influences and effects directly related to casting integrity, such as cooling and heating measurements, filling and solidification times.

From the idea to the prototype

ASK Chemicals supports your entire process from the concept to prototype production. Your benefit: you enjoy wide-ranging expertise from a single source.



Research and development – for innovation near you

Our Research and Development department performs both innovation-driven groundwork as well as market and customer-driven development. Interaction between these three areas is of fundamental importance in terms of offering our customers technologically sophisticated products and efficiency-enhancing solutions at all times. Through close cooperation and the constant exchange of ideas with our application technology and technical sales specialists, research and development at ASK Chemicals is always in tune with the market and also maintains a presence on the customer's own premises.

Benefits

- Many years of experience
- Global presence and availability
- Comprehensive knowledge of the regional sand types and technological requirements
- Short response times for our customers
- First-class equipment

Comprehensive research and development services

Pilot foundry

- Fully equipped research foundry
- Mold production, mold/core package assembly and casting
- "Real world" foundry process representation

Metallurgical investigations

- Comprehensive examination of the graphite structure and metallic matrix: graphite size, number of nodules, degree of dispersion, nodularity, ferrite/pearlite ratio
- Preparation of metallurgical reports

Sand laboratory

- Examination of high-temperature materials
- Testing of tensile strength, compression and transverse loading
- Sand characterization and analysis

Product development and technical support

- Casting defect analysis
- Full spectrum chemical and polymer analysis
- Product, process and test method development



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