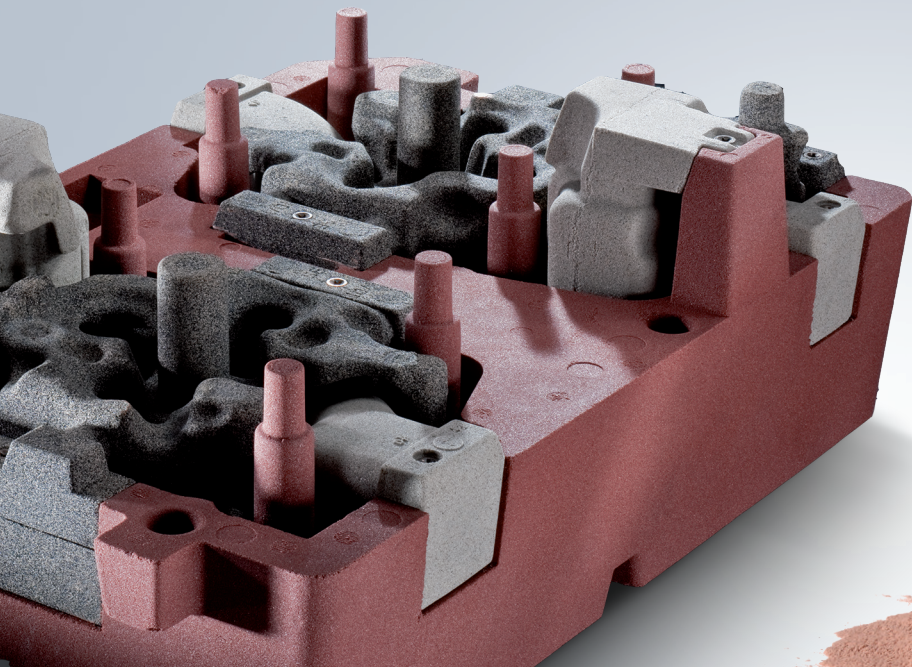




Additives

Product Line Overview



ASKCHEMICALS



Improved Results through Innovative Additives

As part of the measures for preventing casting defects, additives are a tried-and-true solution. A small addition, for instance, can remedy several common defects (e.g. surface-based defects). However, at ASK Chemicals we are advancing additive technology beyond common uses. Our engineers – working alongside our customers – are discovering speciality additives that can reduce the use of expensive sands and, in some instances, replace coatings entirely. Within cold box production, in particular, this revelation could reduce costs substantially and enhance productivity. Dimensional accuracy compliance is equally relevant where additives may substitute coatings in thin-walled castings. Ultimately, coating-free production offers reduced material costs alongside the elimination of peripheral coating equipment, resulting in major savings.

At ASK Chemicals we provide innovation-driven research through our product development approach. We focus specifically on market trends and customer demands because of the increasingly complex requirements our industry is facing: reduced emissions, casting defect prevention, cost efficiency and overall casting quality. Such requirements necessitate more than just strong partnerships and outstanding technologies; rather, we believe that first-class research and development that focuses on efficiency, environmentally friendly solutions and key performance parameters is essential.

In addition, we offer you a holistic approach that goes well beyond merely offering products. Our application technology and technical sales specialists in particular always assess the production process as a whole. Only this approach allows for customer-specific solutions that are precisely tailored to meet your requirements.

Finally, our specialists' expertise is complemented by a broad range of services that offers you real added value. For example, our design services can be systematically deployed to optimize the process as a whole – from conceptual development to actual series production – thereby offering you important savings and process improvement.



- Effective against casting defects
- Improved surface quality
- Uncoated casting
- Substitution of expensive special sands
- Reduced cleaning costs
- Better machine / core box availability
- Environmentally friendly solutions
- Holistic services

Basic Information

Major additive composition types

➤ Organic additives

- Low addition rates
- Good flowability
- Renewable raw material

➤ Inorganic additives

- No gas and odor emissions
- Excellent strength
- Good bench life
- Casting without coating possible

➤ Hybrid additives

- Low gas and odor emissions
- Low addition rates
- Casting without coating possible
- Ideal for steel applications

ASK Chemicals additives

VEINO

Organic and renewable additives

- Organic
- Steel/GI/DI/CGI



ISOSEAL

Environmentally friendly additives

- Inorganic
- Steel/GI/DI/CGI/ Copper alloys



VEINO ULTRA

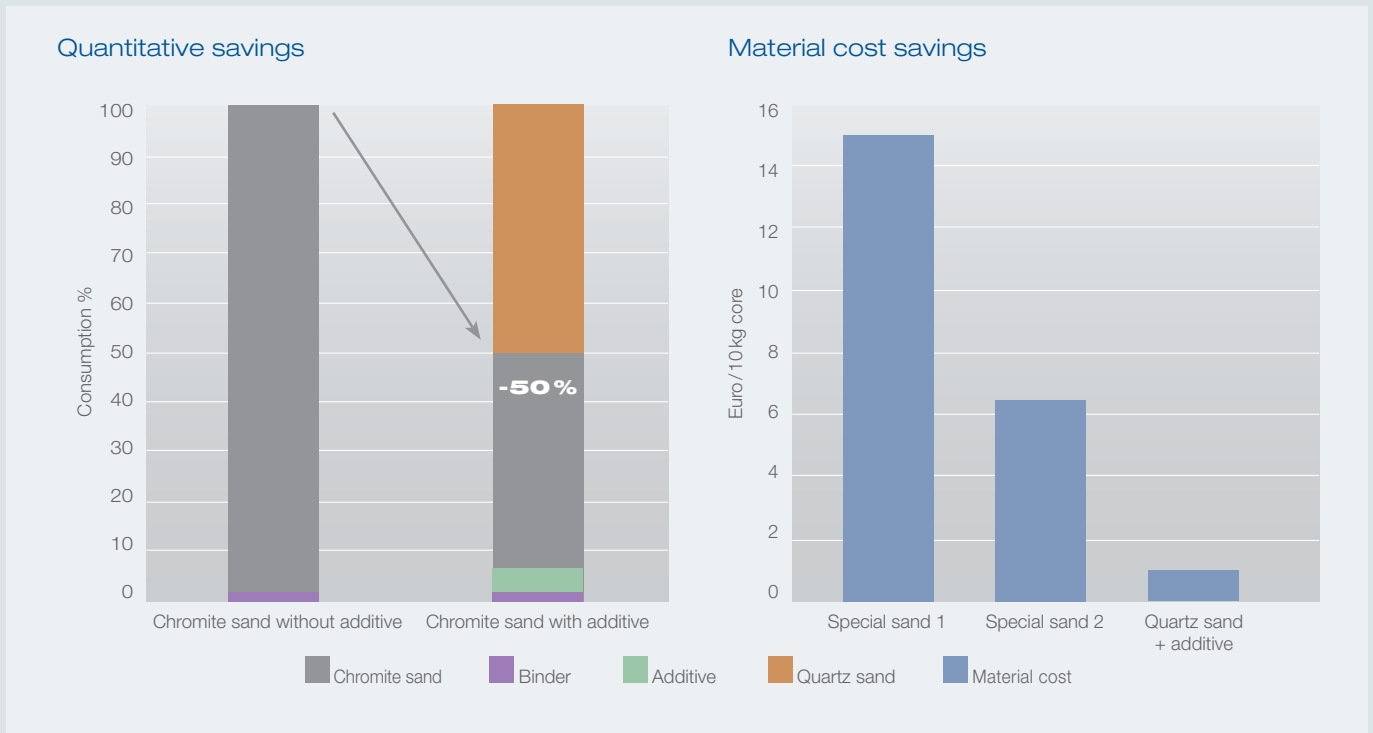
High-performance hybrid additives

- Hybrid
- Steel/GI/DI/CGI/Copper alloys



GI = Gray Iron DI = Ductile Iron CGI = Compacted Graphite Iron

Material and cost savings when using additives



In addition to our range of additives, we can provide you with special sands such as bauxite sand and resin-coated sand. Please contact us.

Custom solutions

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

VEINO

Organic and renewable additives

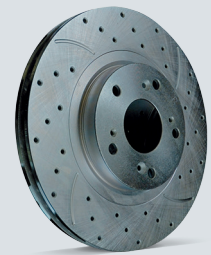
Our organic and renewable VEINO line is a high-performance additive with an extremely low addition rate. This reduced additive consumption level is the lowest in our portfolio and thus leads to cost savings. Performance remains unaffected and the flowability rate of VEINO, which leads to good core compaction, is exceptional. All things considered, VEINO offers quality, performance and minimal investment – an excellent choice for most applications.

Benefits

- Prevents veining
- Improved casting surface
- Excellent dissolution
- Not soluble in water
- 100 % renewable raw material

Creating space with organic components

During casting, the metal heat burns out the starch particles within VEINO. This creates space for silica sand to fill during expansion. This unique compaction method ultimately helps to reduce veining defects. This also reduces cleaning room costs (i.e. fettling costs) due to higher quality castings with excellent surface finish characteristics.



VEINO application chart

Product	Binder application		Metal application					Recommended segments										Effects									
	No-Bake	Cold Box	Steel	CGI	DI	GI	SIMo	Turbo charger	Exhaust manifold	Truck cylinder head	Car engine block	Railway casting	Water jacket	Oil gallery core	Ventilated brake disk	Axle housing	General housings	Pumps	Hydraulic castings	Veining suppression	Penetration protection	Scabbing protection	Clean surface	Good shake out with MF cores	Coating-free casting	Against tension cracks; insulating properties	
VEINO 4312	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO 4086	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO W 39	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

■ = suitable, ■ = highly suitable

ISOSEAL



Environmentally friendly additives

This unique inorganic additive family is the coating-free version our portfolio. A significant cost saver, given the correct circumstances you may eliminate coating use within your process entirely. Additionally, the use of special minerals counteracts sand expansion, thereby allowing for greater compaction.

Benefits

- Prevents veining and penetration
- Improved casting surface finish
- Saves cleaning room (i.e. fettling) costs
- Low resin demand
- Environmentally friendly (no emissions)

The science behind coating-free additives

ISOSEAL additives make the bold claim that they eliminate the need for a coating – this would naturally lead to significant cost savings. ASK Chemicals engineers and researchers have accomplished this feature by formulating ISOSEAL to act as a buffer during the quartz expansion in the pouring process. This creates a barrier layer between the sand grains as a coating itself.



ISOSEAL application chart

Product	Binder application		Metal application							Recommended segments															Effects									
	No-Bake	Cold Box	Steel	CGI	DI	GI	SiMo	Aluminium	Turbo charger	Exhaust manifold	Truck cylinder head	Car engine block	Railway casting	Water jacket	Oil gallery core	Ventilated brake disk	Axle housing	General housings	Pumps	Hydraulic castings	Veining suppression	Penetration protection	Scabbing protection	Clean surface	Good shake out with MF cores	Coating-free casting	Against tension cracks; insulating properties	Improved shake-out	Reduced condensate and gas	Other				
ISOSEAL 1010							■																		■		■		■					
ISOSEAL 4865		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
ISOSEAL 4873		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
ISOSEAL STL 210	■	■	■	■	■	■	■																				■							

■ = suitable, ■ = highly suitable

VEINO ULTRA

High-performance hybrid additives

When developing the VEINO ULTRA additives line our objective was to combine the advantages of both inorganic and organic technology into one environmentally friendly high-performance hybrid additive. The result has proved successful: gas emissions have been reduced, greater surface finish and casting defects have been eliminated. In addition, the possibility of uncoated casting production is now realistic thanks to VEINO ULTRA additives, as is the partial/full substitution of expensive specialty sands.

Benefits

- Prevents veining and penetration defects
- Improves surface finish
- Lower gas emissions than organic varieties
- Minimal effect on tensile strength
- Potential for coating-free application

Our recommendation: VEINO ULTRA 4874

VEINO ULTRA 4874 is the performer in our VEINO ULTRA family. Ultimately, its full potential can be seen best in cold box and PEP SET applications. Most notably, this hybrid additive is extremely effective in preventing casting defects, as well as providing anti-veining effects. VEINO ULTRA 4874 is primarily used in uncoated casting. Here, it has demonstrated positive results in the series production of brake disks and differential housings.



VEINO ULTRA application chart

Product	Binder application			Metal application					Recommended segments												Effects							
	Warm Box	No-Bake	Cold Box	Steel	CGI	DI	GI	SiMo	Turbo charger	Exhaust manifold	Truck cylinder head	Car engine block	Railway casting	Water jacket	Oil gallery core	Ventilated brake disk	Axle housing	General housings	Pumps	Hydraulic castings	Veining suppression	Penetration protection	Scabbing protection	Clean surface	Good shake out with MF cores	Coating-free casting	Against tension cracks; insulating properties	
VEINO ULTRA 4874			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO ULTRA 3030			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO ULTRA 3895	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO ULTRA RS 4			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO ULTRA MBM 2			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VEINO ULTRA 2000			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

■ = suitable, ■ = highly suitable

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 100kg (220.46lb)
- Melting of aluminum up to 160kg (352.74lb)
- 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

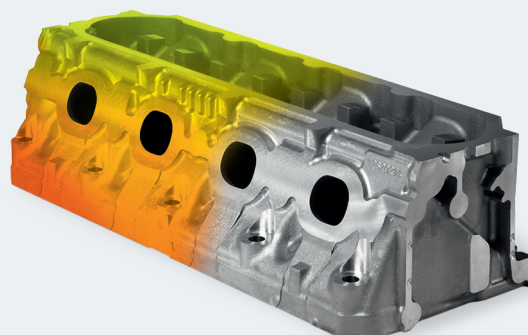
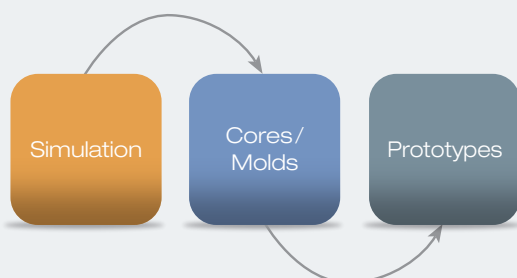
- Higher productivity and optimized catalyst consumption
- Manufacturing process design, including inorganic technology
- Calculation of optimal feed
- Optimized design and manufacture of model plates, core boxes and molds
- Less scrap
- Shorter product launch times
- Quicker time to market

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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ASKCHEMICALS



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