

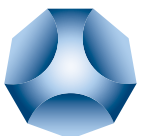


Coatings

Product Line Overview



ASKCHEMICALS
We advance your casting



Industry Leading Coatings for the Ideal Casting

ASK Chemicals is a leading provider of foundry based refractory coatings. Our proprietary formulations are specially designed to add maximum value to our customers. Specifically, our coatings encourage an ideal surface finish, thereby eliminating common surface-based defects. Ultimately, these advantages, enhanced by prolonged coating shelf-life, make ASK Chemicals a valuable time & money saving partner.

Our coatings portfolio, refined over decades, exemplifies quality & innovation. Our environmentally friendly sustainable offerings are a testament to this fact – ensuring safety while maintaining performance. In addition, though, we also offer customized solutions. Our tailor-made coatings are designed specifically to your production process in order to guarantee you're receiving maximum value.

At ASK Chemicals we believe in taking a holistic approach that goes beyond traditional offerings. Our highly advanced coatings exemplify part of this solution. In addition, though, value added services couple to deliver a complete implementation plan that assures your success. Technical Services, Design Services and Research & Development

combine to add lasting value alongside your coatings purchase. Ultimately, maximizing your profitability is our highest priority. Our services integrated seamlessly within our product offerings will help you achieve this goal.





- Decades of coatings expertise
- Comprehensive application portfolio
- Progressive eco-friendly options
- Tailor-made coating solutions
- Holistic value added services

Basic Information

Coating formulation types

➤ Water-based

- Environmentally friendly
- No HAZMAT issues
- No major transportation & handling constraints

➤ Alcohol-based

- Very fast drying
- Frost resistant
- Easy correction of layer thickness

➤ Lost foam & full mold

- Low VOC's
- Excellent shelf life
- Easy handling

ASK Chemicals coating types

➤ MIRATEC™

- Water-based
- Automotive

➤ SOLITEC™

- Water-based
- Non-automotive & specialty

➤ VELVACOAT™

- Alcohol-based
- Non-automotive

➤ CERAMCOTE™

- Lost Foam & Full Mold
- Automotive & non-automotive

General benefits of coatings

- Ensures against many casting defects
- Reduces cleaning room costs
- Improves casting surface quality
- Protection layer between core & casting
- Prevents unwanted chemical/thermal reactions
- Reduces fettling and rework time

Coating application families



Automotive

- Brake disc
- Cylinder head
- Motor block
- Turbo charger
- Axle housing



Non-automotive

- Heavy iron
- Medium iron
- Light iron
- Steel
- Wind power



Specialty

- Melting shop
- Centrifugal casting
- Hydraulic casting
- Aluminum die-cast

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.

VELVACOAT™

The versatile defect preventative alcohol-based coating

ASK Chemicals alcohol-based VELVACOAT™ coatings come in two refractory formulations suited for the non-automotive & specialty sectors. Noted for its versatility, VELVACOAT™ is an ideal coating within multiple applications & metal types. Engineered specifically towards the mitigation of particular casting defects (e.g. burn-in/penetration) VELVACOAT™ contributes minimum carbon pickup, as well as low mineral oxides. These characteristics, in addition to others, make VELVACOAT™ an excellent solution in solving common surface defects. Multiple applications are acceptable with VELVACOAT™ coatings: brushing, spraying, flow coatings and dipping.


Benefits

- Very fast drying time
- Available in cooler burning formulations
- Helps reduce surface defects



Image:
Iron pump house casting

Non-automotive VELVACOAT™ coatings

Product	Color	Application				Binder				Metals				Application	Properties										
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Croning	Silicate / Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Mating time	Special effects	Density (undiluted) g/ml
VELVACOAT™ A10	Yellow	■	■	■	■	■	■	■	■	■			■	■	■	■	Universal coating (iron & non-ferrous)	I	■	■			■	Aluminum silicate refractory	9.7
VELVACOAT™ A22		■	■	■	■	■	■	■	■	■	■			■	■	■	Heavy iron & steel casting	I	■	■			■	Excellent flow coating properties	17.5
VELVACOAT™ GAC 854	Grey	■	■	■		■	■	■	■	■				■	■	■	Universal coating (e.g. gearbox housings,rotors)	I/N	■	■				Against metallurgical degeneration	9.9
VELVACOAT™ ST 801	Yellow	■	■	■	■	■	■	■	■	■		■	■	■	■	■	Flowcoating heavy section iron & steel casting	I		■			■	Water added for cool burning	15.8
VELVACOAT™ ZA 9078	Yellow	■	■	■	■	■	■	■	■	■		■		■	■		Heavy iron & steel casting	I	■	■			■	Excellent flow coating properties	17.5
VELVACOAT™ MGO 80	Dark Blue	■			■	■	■	■	■	■		■					Manganese steel	I	■	■			○	High purity MGO	13.5
VELVACOAT™ NM 35	Black		■	■	■	■	■	■	■	■			■	■	■		Universal coating (iron & non-ferrous)	I/N	■	■			■	High degree of refractoriness	9.6
VELVACOAT™ ZA 3	Yellow	■	■	■	■	■	■	■	■	■		■		■	■		Heavy iron & steel casting	I/N		■			○	Harder coating than ZA 848	15.3
VELVACOAT™ ZA 848	Light Blue	■		■	■					■				■	■		Heavy iron & steel casting	I/N		■			■	High refractory coating	15.6
VELVACOAT™ AC 110	Light Blue	■	■	■	■	■	■	■	■	■		■		■	■	■	Heavy casting (e.g. machine platforms, wear parts)	I		■			■	Alumina refractory	16.7
VELVACOAT™ CA 76 B	Light Green	■	■	■	■	■	■	■	■	■		■		■	■	■	Heavy iron & steel casting	I		■			■	Zircon / mullite refractory	13.6
VELVACOAT™ GAC 102	Grey	■	■	■	■	■	■	■	■	■			■	■			Heavy casting (e.g. wind power rotor hubs)	I		■			■	Water added for cool burning	15.1
VELVACOAT™ ZAA 103	Light Blue	■	■	■	■	■	■	■	■	■		■		■	■	■	Heavy casting (e.g. machine platforms, wear parts)	I		■			■	Zircon / alumina refractory with water added for cool burning	16.1
VELVACOAT™ ZAC B 850	Dark Blue	■	■	■	■	■	■	■	■	■			■	■			Heavy iron & steel casting	I		■	■		■	Zircon / silica refractory	17.2

I = isopropyl, W = water, ■ = suitable, ■ = particularly suitable, • = slow, ○ = medium

Special features

Avoiding penetration defects

The superior refractoriness of VELVACOAT™ coatings, for iron castings with high graphite, make it an exceptional solution for avoiding surface defects, like penetration. Penetration is caused by a chemical reaction between the mold and molten metal. Identifying this defect is key. The casting surface will ultimately appear rough and uneven. Using a proper coating, such as VELVACOAT™ will help ensure the integrity of your casting.




Zircon-free coatings for heavy iron & steel applications

ASK Chemicals has developed an innovative zircon-free refractory combination for heavy and thick-walled iron, as well as steel castings. In such extreme applications it provides the same or even better casting results as achieved with coatings containing zirconium. Two key advantages of zircon-free coatings include low density and material handling.

Note: Please contact your ASK representative for details regarding our zircon-free coatings (not listed below).



Specialty VELVACOAT™ coatings

Product	Color	Application		Binder			Metals			Application	Properties																
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box / Curing	Silicate / Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g/ml		
VELVACOAT™ A66				■	■	■	■	■	■	■	■		■	■				Heavy iron & steel casting	I	■	■			■	■	Zircon penetrating coating	14.4
VELVACOAT™ CBG 9014					■	■	■	■	■	■			■	■		■		Iron chill coating	I	■	■	■		○	■	Bismuth containing chill coating	10.3
VELVALITE™ CA 954		■		■			■	■	■	■			■	■		■		Heavy iron / steel	I	■	■			○	■	High thermal conductivity chromite coating	15.5
VELVALITE™ ZAK 955		■	■	■	■	■	■	■	■							■		Aluminum castings for surface porosity or magnesium mastings	I		■		■	■		Contains potassium fluoroborate	18.0
VELVACOAT™ AL 7036		■	■	■	■	■	■	■								■		Aluminum castings	I		■	■	■	■		Aluminum metal containing chill coating	12.3
VELVACOAT™ IM 802					■	■	■	■	■	■	■		■	■				Heavy iron & steel casting	I	■	■		■	■		Alumina penetrating coating	13.8

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CERAMCOTE™



The multifunctional high performing water-based coating

ASK Chemicals CERAMCOTE™ coatings were specifically designed for lost foam & full mold applications. A staple within the industry, CERAMCOTE™ provides superior performance & consistency to the automotive and non-automotive markets. The success of CERAMCOTE™, however, is solely based on its engineering. Utilizing a special proprietary formulation ASK Chemicals has maximized the rheological properties of CERAMCOTE™ (i.e. viscosity & layer thickness). Stable viscosity, for instance, determines the evenness of the coating layer. Thus, unstable viscosity can lead to several casting defects such as, metal penetration, burn-on defects, cracks and scabs. In addition, CERAMCOTE™ offers superior bond strength and ductility. The dried coating, for instance, can withstand even the most severe sand compaction. This coating line is available in a variety of application methods, predominately dipping.

Benefits

- Tailored permeability
- Adopted strength & ductility (dried coating)
- Specially engineered proprietary formulation

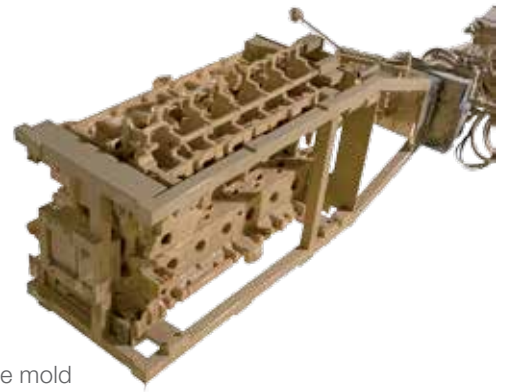



Image:
A foam automotive mold

Automotive CERAMCOTE™ coatings

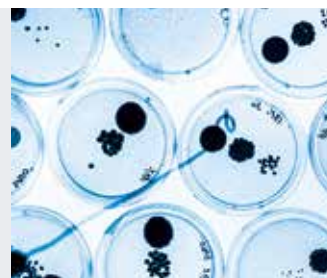
Product	Color	Application			Binder			Metals			Application	Properties														
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Curing	Silicate /Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g /ml	
CERAMCOTE™ EP9 AL 530FF		■														■		Lost foam coating	W	■			●		Designed for aluminum castings	11.0
CERAMCOTE™ EP9 AL MERC		■														■		Lost foam coating	W	■			●		Designed for aluminum castings	11.5

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Special features

Excellent shelf life: avoiding bacterial contamination

CERAMCOTE™ is uniquely formulated to have elongated shelf life, beyond comparable coatings. This product characteristic has several benefits. One primary advantage deals with microbial stability (i.e. bacterial contamination). Spoiled coatings develop bacteria that can reside in the dipping tank and cause alterations to viscosity, pH and layer thickness. With CERAMCOTE™ this problem is essentially eliminated.





The importance of rheology

Rheology is a term describing the measurement/determination of a liquid/solid matter's flowability. The flowability is affected by the deformation of the liquid, as well as solid components. The deformation of matter is basically a reaction to the impact of a specific force. The effects of poor rheology include: insufficient layer thickness, tears, prolonged handling times, inhomogeneity and problems with core prints.



Non-automotive CERAMCOTE™ coatings

Product	Color	Application		Binder		Metals		Application	Properties																
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Croning	Silicate /Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g / ml
CERAMCOTE™ EP9 ACP		■								■			■	■	■		Lost foam coating	W		■	■		•	Designed for iron and non-ferrous castings	13.0

I = isopropyl, W = water, ■ = suitable, ■ = particularly suitable, • = slow, ○ = medium



The multifunctional high performing water-based coating

ASK Chemicals water-based SOLITEC™ coatings come in two application varieties specially engineered for non-automotive & specialty castings. Designed for safety and performance, SOLITEC™ assures exceptional quality alongside a safe workplace environment. Application specialists utilizing the brushing method (i.e. a method requiring close proximity) will enjoy the low-VOC advantage of SOLITEC™. Additionally high-performance formulations (e.g. zircon free) vastly improve surface finish leading to reduced cleaning costs. SOLITEC™ is also offered in several innovative color-changing formulations that visually represent when the coating is dry. This unique characteristic ensures the integrity of your coating within your production process. Multiple applications are acceptable with SOLITEC™ coatings: brushing, spraying and flow coating.













Image:
A large wind energy hub casting

Benefits

- Excellent release properties
- No application marks
- Short air drying time & enhanced refractoriness
- Environmentally friendly
- Casting defect prevention

Non-automotive SOLITEC™ coatings

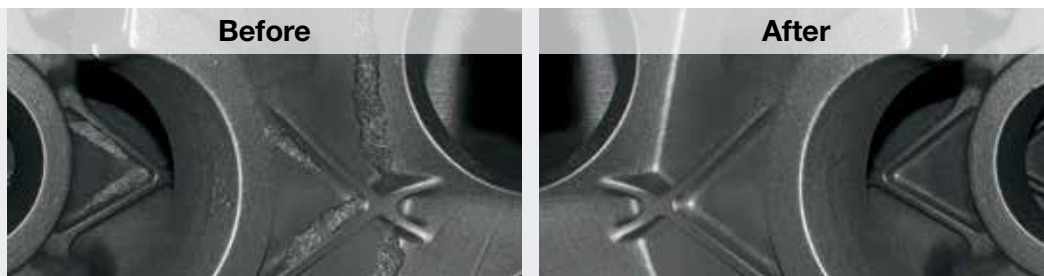
Product	Color	Application		Binder			Metals			Application	Properties															
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Croning	Silicate /Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g /ml	
SOLITEC™ ZWR DI				■		■	■			■	■		■					High solids zircon for heavy steel castings	W	■			■	•	Color change pink to yellow	21.0
SOLITEC™ ST 903		■		■	■	■		■		■	■		■		■	■		High solids zircon for heavy steel castings	W		■		■	•	Excellent for extreme torching	20.0
SOLITEC™ W10		■	■	■	■	■	■	■	■	■			■		■	■		Universal coating (iron & non-ferrous)	W	■	■		■	○	Good dip coating	9.7
SOLITEC™ W20-4		■	■	■	■	■	■	■	■	■	■		■					Heavy iron and steel castings	W	■	■		■	○	Excellent flow coating	19.7
SOLITEC™ ZW FDI		■	■	■	■	■	■	■	■	■	■		■					Heavy iron and steel castings	W	■	■		■	○	Color change pink to yellow	20.4
SOLITEC™ ZW SF 081		■	■	■	■	■	■	■	■	■	■		■	■				Heavy iron and steel castings	W	■	■		■	○	Color change blue to yellow	19.0
SOLITEC™ CAW 111 V2.5		■	■	■	■	■	■	■	■	■	■	■	■			■	■	Heavy & steel casting wear parts/ground engaging V-Process	W		■		■	■	Color change pink to yellow	15.4
SOLITEC™ ZW TXB 8090		■	■	■	■	■	■	■	■	■	■		■	■				Heavy iron & steel castings (railway, pumps housing)	W	■	■	■	■	○	Color change blue to yellow	17.0
SOLITEC™ HI 601		■	■	■	■	■	■	■	■	■	■		■		■	■		High purity alumina with graphite – heavy iron castings	W		■		■	■	Color change green to yellow; Alcohol dilutable	13.0

I = isopropyl, W = water, ■ = suitable, ■ = particularly suitable, • = slow, ○ = medium

Special features

Hybrid Coatings: Performance & Flexibility

- Dilute with water or alcohol
- Safe handling & storage
- Cost competitive

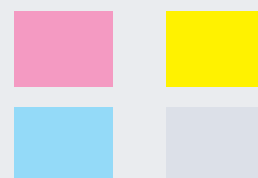


Color Changing Coatings – Engineered to reveal a coatings' dryness


A special variety of SOLITEC™ coatings are formulated with color changing properties. This unique characteristic helps users precisely identify when a coating is completely dry. Color changing coatings are highly recommended for larger scale casting applications where large amounts of coatings are required.

Note: Please see the "Special effects" column within the graphs to see other color-changing coating varieties

Wet vs. Dry



Specialty SOLITEC™ coatings

Product	Color	Application			Binder			Metals			Application	Properties														
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Curing	Silicate /Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminum	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g/ml	
SOLITEC™ CC ASG 1 J			■	■						■	■		■	■	■	■		Centrifugal coating	W	■	■		■	■	All purpose centrifugal cast pipe specifically designed for high alloys	1.8
SOLITEC™ CC ASG 1 PWD			■	■						■	■	■	■	■	■	■		Centrifugal coating	W	■	■		■	■	Powder version of the ASG1 coating	1.8
SOLITEC™ CC RFU 401			■	■							■	■	■	■	■	■		Ready for use centrifugal coating	W	■	■		■	■	High insulating coating	
SOLITEC™ CC SPG 8			■	■	■									■	■	■		Centrifugal coating	W	■	■			■	Excellent for heavy section rolls	
SOLITEC™ IM 802					■	■	■	■	■	■	■	■	■	■	■	■		Heavy iron & steel casting	W	■	■		■	■	Alumina penetrating coating	2.2
SOLITEC™ IM 901					■	■	■	■	■	■	■	■	■	■	■	■		Heavy iron & steel casting	W	■	■		■	○	Zircon penetrating coating	1.5
SOLITEC™ TE 25		■		■	■	■	■	■	■	■	■		■	■	■	■		Iron shill coating	W	■	■		■	○	Tellurium containing chill coating	1.9
SOLITEC™ TE 75		■		■	■	■	■	■	■	■	■		■	■	■	■		Iron shill coating	W	■	■		■	○	Tellurium containing chill coating	1.5
SOLITEC™ CW 8059		■		■	■	■	■	■	■	■	■		■	■	■	■		Heavy iron / steel	W	■	■		○		High thermal conductivity chromite coating	2.3

I = isopropyl, W = water, ■ = suitable, ■ = particularly suitable, ● = slow, ○ = medium

MIRATEC™



The multifunctional high performing water-based coating

ASK Chemicals water-based MIRATEC™ coatings are the highest performing in their class. Applied using the dipping method MIRATEC™ is ideal for automotive applications, as well as for general use. Try ASK Chemicals MIRATEC™ coating today and you will see that it not only performs well but also saves you time and money in the long-run.

Benefits

- Excellent peel properties
- Short manipulation time
- Enhanced refractoriness



Image:
automotive iron diesel engine

Special features

MIRATEC™ TS – The special coating for clean motor block casting

- Easy to peel coating in castings difficult to shot-blast
- Reduced cleaning efforts
- Significantly less motor part deposits
- Environmentally friendly



Perfect casting
with
MIRATEC™ TS



Casting with
residue



Automotive MIRATEC™ coatings

Product	Colour	Application				Binder				Metals				Application	Properties												
		Dipping	Flowcoating	Spraying	Brushing	Epoxy-SO ₂	Cold Box	Hot Box /Croning	Silicate /Resol-CO ₂	No-Bake	Steel	Manganese steel	Heavy iron	Light and medium iron	Copper	Aluminium	Typical application	Solvent	Veining suppression	Metallization protection	High gas permeability	High layerforming possible	Matting time	Special effects	Density (undiluted) g / ml		
MIRATEC™ CGW 085		■	■	■	■	■	■		■					■	■	■		Universal coating (e.g. gearbox housings) in warm box	W	■	■			■	○	Excellent properties for hot cores	11.5
MIRATEC™ LVT GREY		■	■	■	■	■	■	■							■	■	■	Automotive casting (e.g. brake disks)	W	■	■	■		■		Short matting time	10.9
MIRATEC™ CGW 9055		■		■			■	■	■		■			■	■		■	Universal coating (e.g. gearbox housings) rotors	W	■	■			■	■	Short matting time	10.7
MIRATEC™ CGW 9022		■	■	■	■	■	■	■	■		■				■	■	■	Universal automotive coating, blocks, gear boxes	W		■		■		○	Universal iron coating	11.1
MIRATEC™ MB 508		■					■	■	■		■				■	■	■	Universal automotive coating primarily for dipping	W	■	■	■		■	■	High film thickness possible	10.6
MIRATEC™ TGW 053		■	■	■	■	■	■	■	■		■			■	■	■	■	Universal automotive coating and heavier section iron castings	W	■	■			■		High graphite for excellent peel	11.5

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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 analysis and offers tailored training sessions on the customer's own premises.

Benefits

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

The one-of-a-kind "mobile mini-laboratory"

The mobile mini-laboratory runs a self contained continuous mixer that can utilize several different resin systems. Alongside many additional benefits its premier advantage is its ability to conduct trials without ever interrupting production.

- Uninterrupted production
- Multi-functional mobile tool
- Fast results



Currently, available to NA customers only

Design Services – for perfect casting results

Our Design Services team monitors the entire casting development process from initial design to final production of actual cast parts (i.e. prototypes). Our highly experienced engineers enjoy a wide range of knowledge within all aspects of foundry technology and metallurgy. In addition, we use only the most advanced simulation software offered today: MAGMA, Novacast, FLOW-3D and Arena-Flow®. Beyond fully optimized designs and simulation expertise, the Design Services team cooperates with external companies and service providers to assure proper project alignment for unparalleled results and guaranteed customer satisfaction.

Benefits

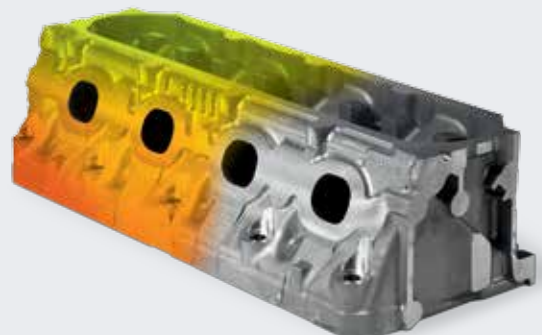
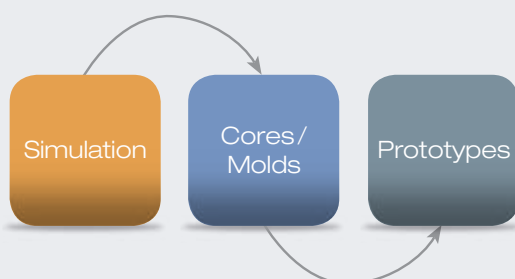
- Higher productivity and optimized catalyst consumption
- Manufacturing process design, including inorganic technology
- Calculation of optimal feed
- Optimized design and manufacture of model plates, core boxes and molds
- Less scrap
- Shorter product launch times
- Quicker time-to-market

Simulation services

The simulation of casting processes provides foundries with invaluable casting mold information. Specifically, this benefit allows for the optimization of gating & 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 & heating measurements and filling & solidification times.

From the idea to the prototype

ASK Chemicals supports your entire process from concept to prototype production. How you benefit: comprehensive expertise from a single source.



Research and development – for innovation near you

Our R&D department performs innovation driven groundwork as well as market and customer driven development. Interaction between these three areas is of fundamental importance in 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, R&D at ASK Chemicals is always in tune with the market and also has a presence on the customer's own premises itself.

Benefits

- Highly experienced researchers
- 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 & polymer analysis
- Product, process and test method development



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This information is based on our current state of knowledge and does not represent assurance of the properties of the products described. We are only liable for product-related advice and information within the scope of duties of disclosure included in collateral contractual agreements unless expressly agreed otherwise. (12/14)

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