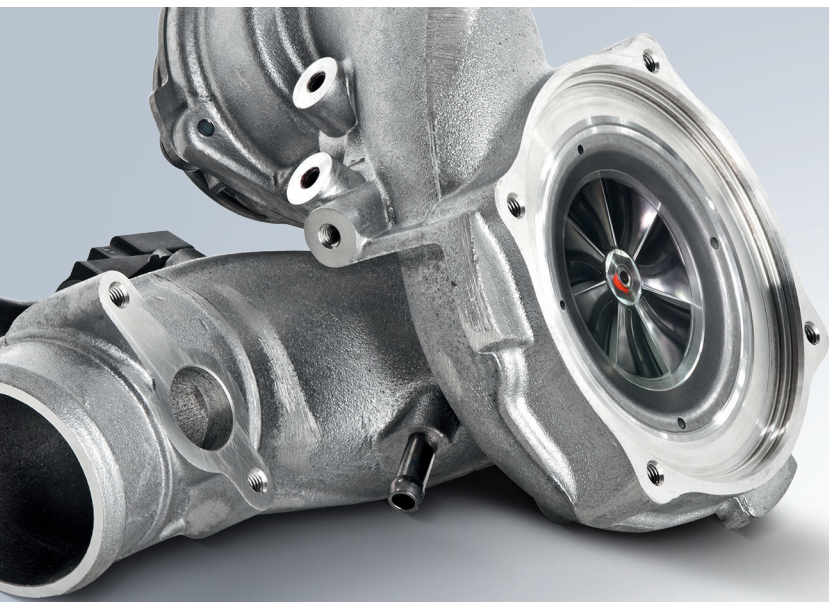




# Investment Casting Filters

Product Line Overview



# Improve Performance via Cleaner Metal

The ASK Chemicals (legacy) has represented superior quality, excellence and innovation within the investment casting filtration market for over three decades. ASK Chemicals developed fully sintered reticulated ceramics in the early 1980's. This revolutionary technology stands as the beginning of filtration within high temperature alloys. Through this advancement investment casters worldwide have now enjoyed higher quality clean metal with exceptional yield enhancements.

ASK Chemicals UDICELL™ reticulated ceramics – world renowned for their quality – stand as the pinnacle brand within the industry. Produced to the very highest standards and using only the finest materials this filter excels in performance, quality and consistency.

Positioned as innovation leaders, ASK Chemicals has introduced major patented technology throughout its history. Our edge-coated offerings alongside our high surface area filters stand as a testament to this fact. Additionally, though, ASK Chemicals has developed a holistic business approach designed

to maximize your value. In conjunction with our superior product portfolio we offer three outstanding complimentary services to our customer-base: Technical Services, Design Services and Research & Development. Maximizing your profitability is our highest priority. With ASK Chemicals we guarantee your expectations will be surpassed.

- Developed fully sintered reticulated ceramics (legacy)
- Over 30 years of innovation
- Highly controlled in-house production
- Custom solutions
- Holistic value added services

# Basic Information

## Investment casting filter families

### ➤ UDICELL™

Highest quality & purity investment casting filters  
Alumina and zirconia based

### ➤ EXACTFLO™ Alumina

Highly pure filters ideal for capturing inclusions

### ➤ UDICELL™ master melt alloy

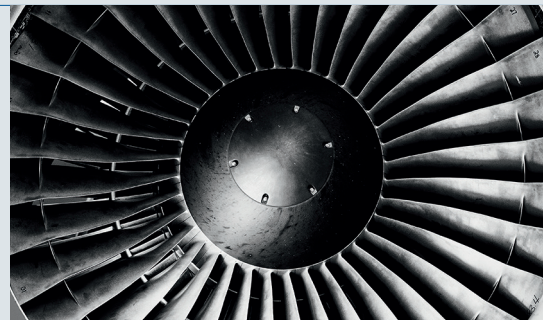
Custom sizes & shapes meant for use in tundish  
furnaces

## Industries served

### Aerospace

Investment casting filtration focuses on structural castings, as well as engine blades & vanes within the aerospace industry

- Superalloy & aluminum



### Land based energy

The land based energy sector utilizes investment casting filters for use in large ground-based castings parts (e.g. blades)

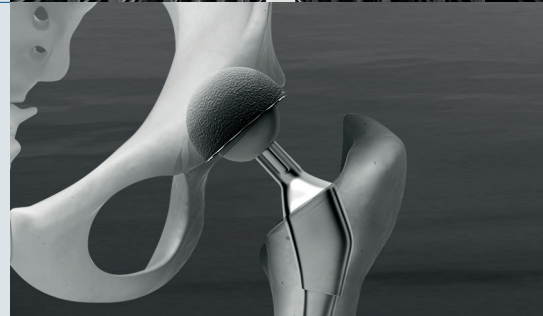
- Superalloys



### Biomedical

The biomedical field utilizes several types of specialty metals for use in prosthetics. Extremely pure filters are required in this application

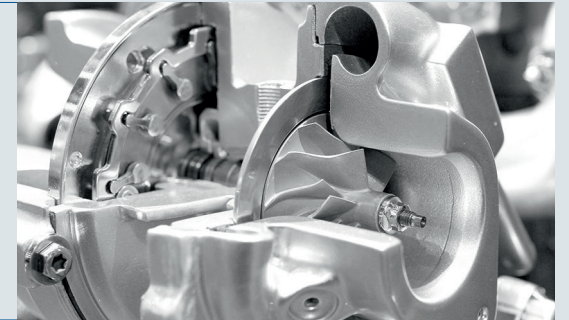
- Superalloys



### Automotive

Increased customer demands have led to highly intricate engines & engine parts. The modern turbo charger represents this change

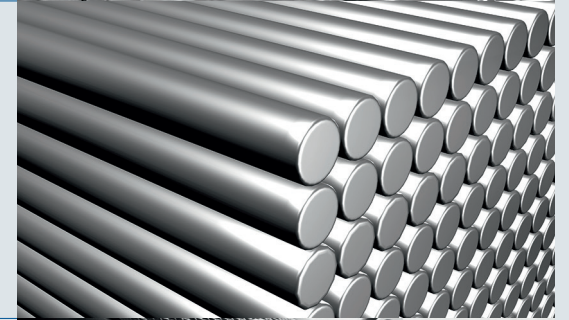
- Steel & superalloys



### Master melt alloys

High quality ingot production within tundish designed furnaces produces the base alloys required in investment casting production

- Alloys



### Firearms

Firearms (e.g. pistols) utilize investment casting filters in the production of frames, triggers & hammers – high impact components

- Steel



### Commercial castings

The sports & recreation industry is extremely broad. Investment casting filters are used in many applications such as boat propellers, motorcycle frames, golf clubs etc.

- Steel & aluminum



### 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.



# UDICELL™ Cup Filters

Top performing filters with multiple options



Cup filters are widely used because of their ease-of-use. Ensuring proper placement within the mold is essentially the key component to master. ASK Chemicals produces the highest quality cup filters in the industry. Our filters are extremely flexible in regards to designability for custom solutions. We also provide our UDICELL™ cup filters in a wide variety of styles, including a full range of pore sizes.

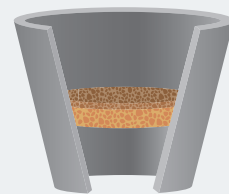
## Benefits

- Removes oxide inclusions
- Provides laminar flow of metal into mold
- Available in tapered design

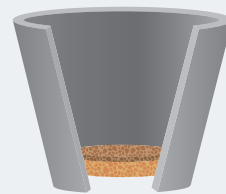
### Cup placement

Proper cup placement ensures the success of your filter. Improperly placed cups will result in inconsistent flow rates and potentially improper sealing that can create gaps for molten metal to flow through.

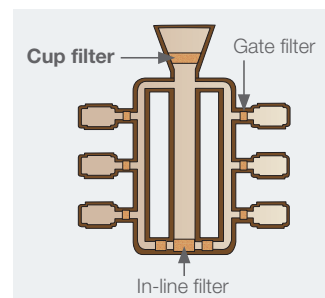
Incorrect placement



Correct placement



### Cup filter



Filter size		Flow rate						Capacity			
inch	mm	10 ppi		15 ppi		20 ppi		Air melt		Vacuum melt	
		kg/sec	lb/sec	kg/sec	lb/sec	kg/sec	lb/sec	kg	lb	kg	lb
2 TODx1	50 TODx25	3.15	7	2.84	6.3	2.55	5.67	50	110	63	141
3 TODx1	75 TODx25	7.20	16	6.48	14.4	5.83	12.96	111	247	143	318
4 TODx1	100 TODx25	12.60	28	11.34	25.2	10.21	22.68	198	440	254	565
5 TODx1	125 TODx25	19.35	43	17.42	38.7	15.67	34.83	309	687	397	883

TOD = Outer diameter  
The details supplied should be regarded as reference values and not warranted values. Other sizes and shapes available on request.

# UDICELL™ Gate Filters

Custom designs for the finest filtration



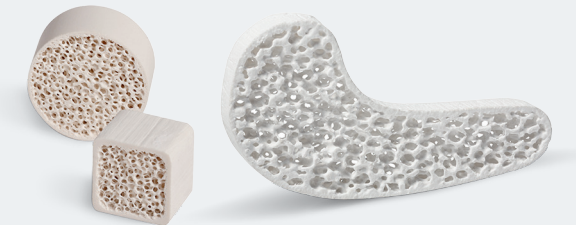
Edge coated gate filters provide the last second filtration closest to the casting(s). Gate filters also allow for the finest filtration. ASK Chemicals offers gate filters in multiple shapes and sizes and are also available with edge coating.

## Benefits

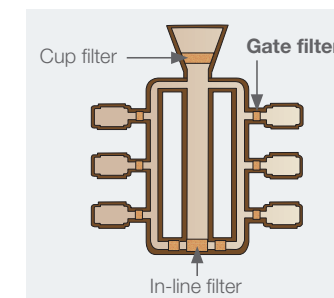
- Filtration nearest casting
- Filtration at last moments
- Available in multiple shapes

### Shapes & sizes

- Round
- Square
- Donut
- Custom



### Gate filter



Filter size		Flow rate						Capacity			
inch	mm	10 ppi		15 ppi		20 ppi		Air melt		Vacuum melt	
		kg/sec	lb/sec	kg/sec	lb/sec	kg/sec	lb/sec	kg	lb	kg	lb
0.50	13	0.19	0.43	0.17	0.39	0.16	0.35	3	7	4	9
0.75	19	0.44	0.97	0.39	0.87	0.35	0.79	7	15	9	20
1.00	25	0.78	1.73	0.70	1.56	0.63	1.40	12	27	16	35

The details supplied should be regarded as reference values and not warranted values. Other sizes and shapes available on request.

# UDICELL™ In-line Filters

Reticulated filters for increased cleanliness



In-line filters provide filtration closer to the castings and allow for finer pore size filtration. In-line filters produce laminar flow and reduce metal turbulence providing greater protection against shell mold erosion. ASK Chemicals offers in-line filters in a variety of edge coats. Various shapes and sizes are also available as dictated by the runner system.

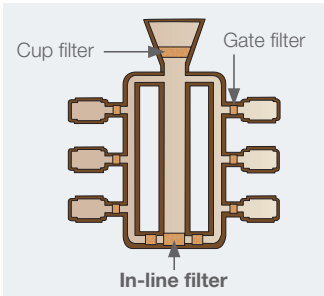
### Benefits

- Provides laminar flow
- Available with edge coating
- Filtration nearer to casting

**Edge coats**

**FG** – Range of fiber gasket materials to ensure a snug fit  
**SEC** – smooth uniform edge coating for straight wall filters  
**FEC** – durable edge coating applied to tapers and special shapes  
**No edge coat** – standard filter webs

### In-line filter



Filter size		Flow rate						Capacity			
inch	mm	10 ppi		15 ppi		20 ppi		Air melt		Vacuum melt	
		kg/sec	lb/sec	kg/sec	lb/sec	kg/sec	lb/sec	kg	lb	kg	lb
2 TOD x 1	50 TOD x 25	3.15	7	2.84	6.3	2.55	5.67	50	110	63	141
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TOD = Outer diameter  
 The details supplied should be regarded as reference values and not warranted values. Other sizes and shapes available on request.

# UDICELL™ Tube & Dam Filters

Filters for master alloy production



Tube and dam filters are exclusively used in master melt alloy production within a Tundish furnace. ASK Chemicals offers custom shapes and sizes to accommodate different Tundish designs. Additionally, dual pore filters comprised of multiple pore sizes also exists.

### Benefits

- Ability to accommodate various tundish designs
- Available with edge coats, NewWave and dual pore
- Multiple tubular sizes
- Allows for double or triple filtration of metal

**Dual pore**

ASK can produce a filter with multiple pore sizes allowing for double filtration of metal within a single filter. The coarser, stronger filter webs on the inlet face of the filter protect the finer filter webs on the outlet face. Filters are available in any combination of pore sizes.

**NewWave**

ASK Chemicals NewWave design increases the surface area of the filter face providing benefits to the metalcaster. The undulating surface reduces molten metal splash during pouring and aides in quicker priming of the filter.

# EXACTFLO™ Alumina Filters

Superior inclusion capturing for the highest demands



Alumina filters for aerospace industry have excellent oxide inclusion capturing capabilities for the most demanding of applications. Available in dual pore, edge coatings, various pore sizes and various sizes and shapes.

## Benefits

- Ability to capture inclusions in aluminum alloys
- Available in multiple special features
- Comes in a variety of sizes & shapes
- Customizable

### Aerospace – Alumina filters

The aerospace industry utilizes castings in the most demanding of applications. Consequentially, the quality & performance required of these castings naturally is of utmost importance. EXACTFLO™ Alumina filters are an ideal solution for the non-ferrous aerospace castings market. Their fully sintered composition provides excellent strength and removal of oxides from the molten metal.



# 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

## Technical expertise at your service

ASK Chemicals supports our investment casting customer-base via technical expertise. Our team of experts partners with our customers to find the ideal filter for their specific application(s). We consider every critical factor: metal type, metal temperature, pour weight, pour time, required filter shape, filter placement and type of casting. All of these must be considered...one size filter simply doesn't fit all situations.

## 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

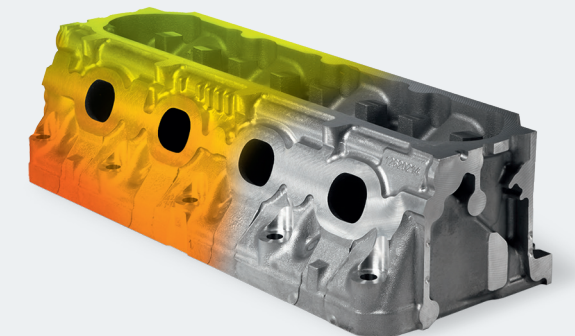
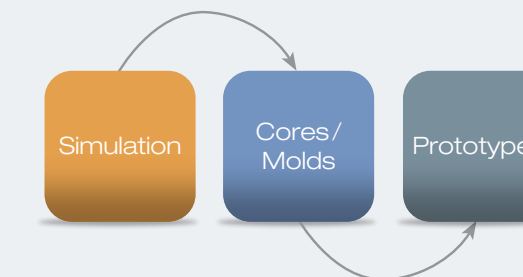
- Higher productivity and optimized catalyst consumption
- Optimized design and manufacture of model plates, core boxes and molds
- Manufacturing process design, including inorganic technology
- Less scrap
- Calculation of optimal feed
- Shorter product launch times
- Quicker time-to-market

## 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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#### ASK Chemicals L.P.

495 Metro Place South  
Suite 250  
Dublin, OH 43017  
Phone: +1 800 848 7485  
Fax: +1 614 761 1741  
info.usa@ask-chemicals.com  
www.ask-chemicals.com

ASKCHEMICALS

