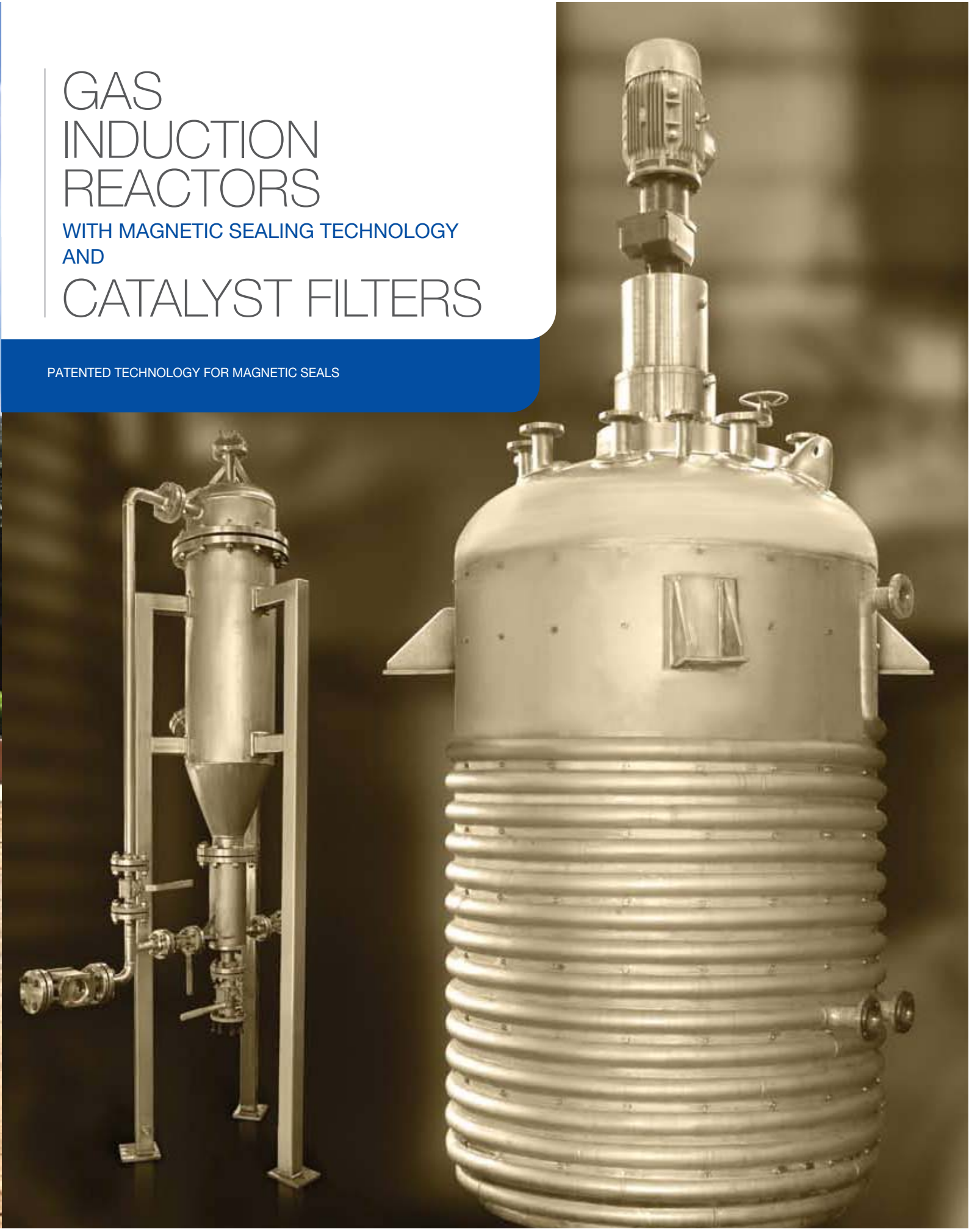
GAS INDUCTION REACTORS

WITH MAGNETIC SEALING TECHNOLOGY AND CATALYST FILTERS

PATENTED TECHNOLOGY FOR MAGNETIC SEALS



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REACTION ENGINEERING

In the process Industry, many chemical reactions are carried out between liquids/slurries and gases. Traditionally, such gas-slurry reactions have been carried out with the help of equipment, where basically, an agitator was used to stir the liquid in the reactor. This somewhat clumsy method resulted in less than satisfactory performance, due to non-ideal mixing, which led to poor catalyst suspension, negligible gas-liquid interfacial areas, as well as low heat and mass transfer coefficients.

An Omega-Kemix Gas-Induction Reactor offers a radical change from this conventional approach. Instead of churning the liquid mass, a hollow agitator pumps gases from the head space to the lowest part of the reactor vessel, as shown in the picture. A specially designed impeller vigorously disperses these gases into the reactor bottom, resulting in a mixture akin to a boiling liquid. Gas bubbles react with liquid/slurry as they rise. Unreacted gases are re-induced into the liquid.

The self-aspiration agitator of an Omega Gas-Induction Reactor has a highly efficient design, which leads to the following advantages:

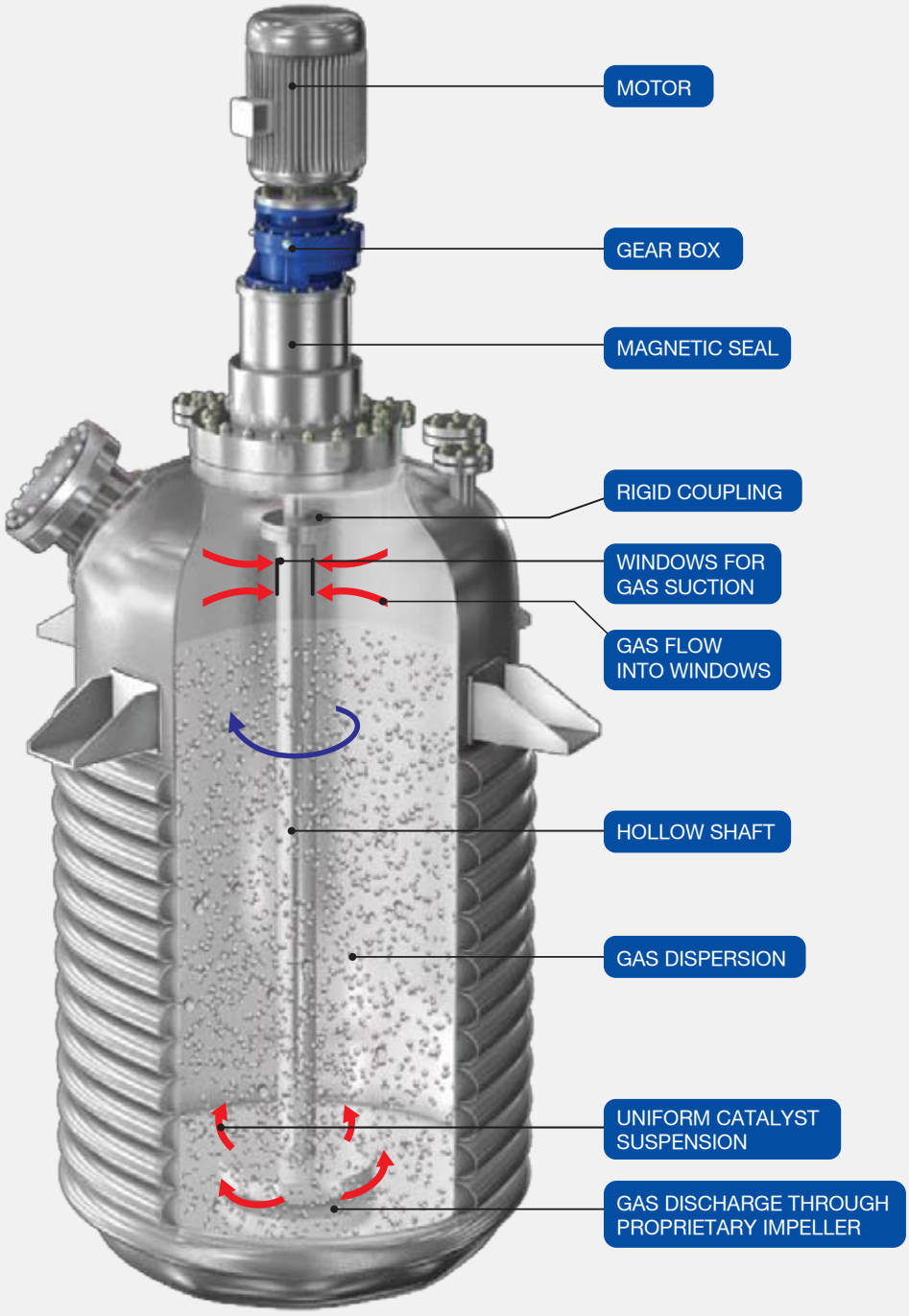
- Vigorous Gas Liquid mixing
- Thorough suspension of solid components (eg., Catalysts)
- Large gas-liquid interfacial areas. (Typical, interfacial area is 100 to 300 m^2 per m^3 of operating volume)
- Enhanced gas-liquid and liquid mass transfer rates
- Very high vessel side heat transfer coefficients, which approach boiling coefficients
- Reduced batch times
- Minimal side reactions
- Excellent batch-to-batch repeatability

APPLICATIONS

- Catalytic hydrogenation
- Gas-liquid reactions with suspended Solids
- Gas-slurry reactions
- Ozonisation/Oxidation
- Amination/Aminolysis

GAS INDUCTION REACTORS

- HYDROGENATION
- OXIDATION
- OZONISATION
- CARBOXYLATION
- AMINATION
- AMINOLYSIS
- ETHOXYLATION
- SIMILAR GAS - SLURRY REACTION



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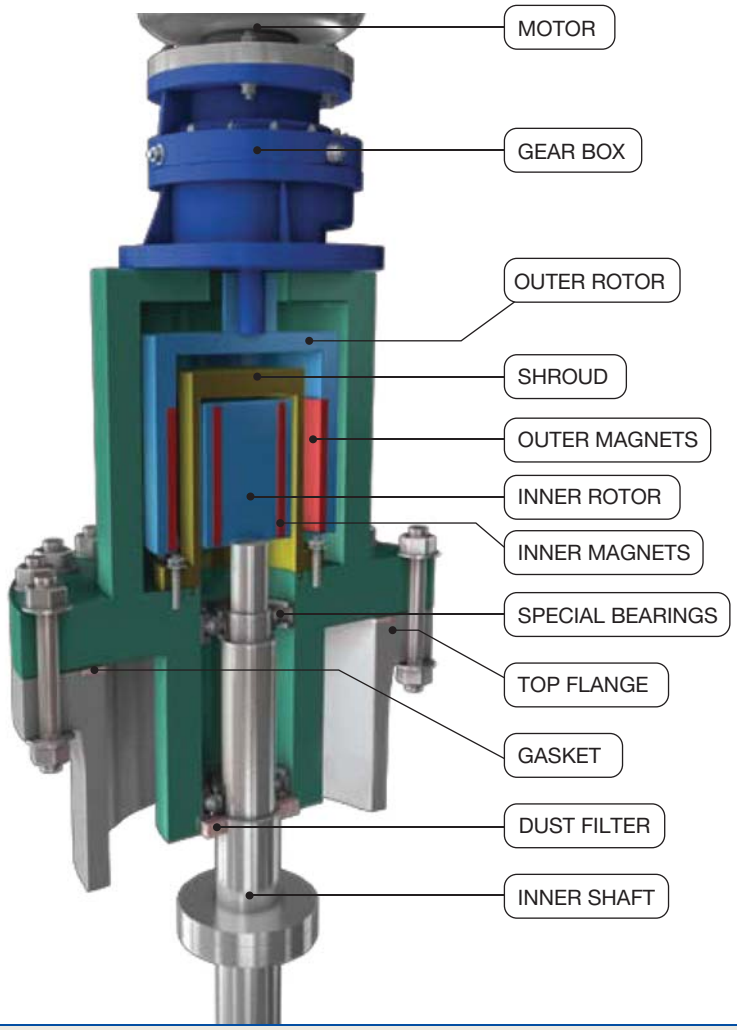
About Our

MAGNETIC SEALING TECHNOLOGY



Top Entry Magnetic Seals

Several important chemical reactions are carried out in many hazardous conditions. Examples of such reactions are as follows:

- Pressure Reactions, such as Hydrogenation, Amination etc.
- Reactions with noxious gases.
- Manufacture of potent pharmaceuticals, such as hormones, oncology products, etc.
- Any other reactions requiring complete containment, and where there are zero leakage requirements.

In conventional reactors, the reaction mixture is agitated by an impeller connected to a rotating shaft. Necessarily, the shaft punctures the Reactor.

Omega-Kemix can supply reactors with Top Entry Magnetic Seals. This sealing system comprehensively eliminates all possible leakage risks, by incorporating non-contact magnetic seals. The agitator shaft does not puncture the Reactor Vessel.

OPERATING PRINCIPLES

A Magnetic seal comprises of a sealed chamber (Shroud), which contains a rotating Inner Shaft, which is embedded with powerful Inner Magnets. This inner shaft is supported on Upper and Lower Bearings. These are special Bearings, capable of with standing harsh environments present inside the reactor. A special barrier filter prevents dust from entering the bearing area.

The output shaft of Motor/Gearbox assembly is locked on to an Outer Rotor, which is fitted with an outer magnet assembly. When the motor is switched on, the outer rotor rotates and magnetic flux causes the inner shaft to rotate synchronously with the outer rotor.

Top entry magnetic seals are the safest method for sealing agitated reactors. Their applications include high pressure autoclaves such as hydrogenators, as well as reactors used for handling sensitive or hazardous products.

Omega-Kemix manufactures a wide range of top entry magnetic seals, for use in their reactors. These are suitable for reactors of up to 50000 liters capacity, temperature up to 300°C, and for pressure up to 100 Bars. Reactors of higher capacities and ratings can be supplied with special designs.

Advantages of MAGNETIC SEALING TECHNOLOGY

- 100% Sealing. **Zero leakage**
- Shaft does not puncture the reactor
- Long equipment life
- Trouble-free operation
- Zero emission of hazardous fluids
- Minimal friction saves power
- Suitable for pressure fluctuations
- No maintenance required. No spares required
- Zero downtime
- Extremely safe
- Cutting edge of shaft sealing technology
- Various capacities available
- Customisable
- Compact Design
- Eliminates use of Barrier Fluids (Thermosyphon, Forced Lubrication)
- No external contamination

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About the

CATALYST FILTERS

Catalyst Filters for Hydrogenators and Autoclaves

Catalyst filtration is an important aspect of a Hydrogenation system. Omega Kemix supplies a cost effective system, which incorporates.

- Complete filtration
- Operational safety
- Full backwash
- Minimal holdup of the reaction mass

The filter is

- Fitted with sintered candles
- Has a special Heel filter
- Provided with a sight flow indicator
- Provided with special valves for effective dislodgement of catalyst cake

Omega-Kemix make filter has the following advantages

- Safe procedure for catalyst filtration from the Autoclave
- There is no spillage of expensive catalyst
- Closed circuit operation avoids fire hazards in case of pyophoric catalysts
- High efficiency candles result in very low losses, which are often below measurable limits
- The filtration system pays for itself through high rate of catalyst recovery

About OMEGA-KEMIX

INDIA'S ONLY COMPANY THAT PROVIDES
PATENTED MAGNETIC SEALING TECHNOLOGY

Omega-Kemix, a company promoted by qualified and experienced technical personnel, was founded in 1985. Our innovative approached to Static and Dynamic Mixing Technology has enabled us to successfully develop a wide range of Gas-Induction Reactors, with capacities upto 1, 00,000 Liters.
In the ultimate analysis, our greatest source of satisfaction is that our customers have been successful, and have achieved excellent results with Omega-Kemix Gas-Induction Reactors.

SECTORS SERVED

- Pharma Industry
- Dyes & Intermediates
- Aromatic Chemicals
- Agro Chemicals
- Fine Chemicals
- Speciality Chemicals

Our Engineering Strengths

Enhanced process performance of any equipment can only be achieved when each component is structurally sound. Our reactor vessels are designed and manufactured as per international standards such as ASME, BS, DIN, as well as IS Codes, using computer aided stress analysis and drafting techniques.

All manufacturing processes are carried out under the stagewise inspection of our quality control engineers. Starting with testing of raw materials and bought-out components, our engineers are trained to check every stage of manufacture. We even have our own specifications for packing of reactor components for dispatch. Such attention to detail results in ease of installation and commissioning, and also ensures a long, productive and trouble-free life for your Gas-Induction reactor.

OMEGA-KEMIX PVT. LTD.

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