

## REMOVING THE BARRIERS TO FLUID CLEANLINESS

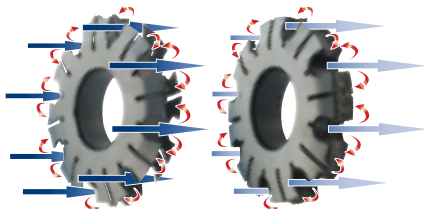
**The Magnom™, as used in Formula 1 gearboxes, is a revolutionary product in advanced fluid conditioning. Using field effect technology, the Magnom™ reduces operating costs and simultaneously benefits the environment.**

Through its unique patented design, the Magnom™ removes contaminant particles of less than one micron from a variety of fluids. This includes the smallest and most abrasive particles that are responsible for the destructive chain reaction of wear in many processes, including gears.

Unlike conventional fluid conditioning components, the Magnom™ produces minimal pressure drop in the fluid.

It has no moving parts and is 100% scaleable. It also functions in a diverse range of fluid pressures, temperatures and flow rates.

The Magnom™ is easily installed in a wide variety of applications - either as part of new systems or as a replacement to enhance existing processes.



### Magnom™ - The Process

The Magnom™ has wide flow channels that allow the process fluid to pass with minimal pressure drop.

As the fluid flows through the Magnom's™ field effect areas, ferrous contaminants are drawn into special collection zones. These zones hold significantly more contaminant than a conventional filter - without obstructing fluid flow or risking "wash-off". Therefore, the Magnom™ can operate for very long periods without service (4 years in some power stations) and - when contaminants need to be removed - is easily cleaned and re-used.

## Large Scale Industrial Gearboxes some typical applications

(where conventional filtration is limited due to pressure drop)

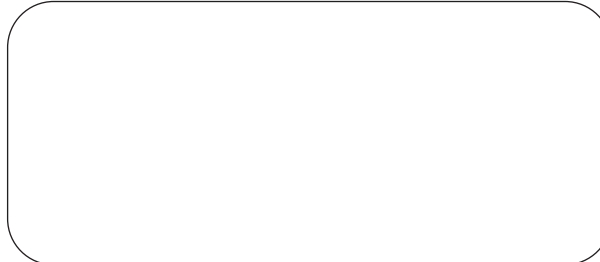
- Coal fired power stations on coal crushing transmissions
- Sugar mills on pulp press, diffuser tower and other transmissions
- Cement plants on kiln transmissions, coal crushing transmissions and cement pulverising transmissions
- Aluminium plants on roller transmissions



(Contaminated Magnom core after only 6 weeks operation - Bridgnorth Aluminium Hot Rolling Mill Transmission)

- Rubber manufacturing plants on mixing and calendaring transmissions
- Pharmaceutical manufacturers on mixing and drying kiln transmissions
- Paper, pulp and plasterboard plants on roller and mixer transmissions
- Mining and mineral extraction large scale transmissions (crushing, grinding, milling)

For case studies relevant to your own application please contact:



For further details or to order  
Telephone: +44 (0) 1926 623 170  
or visit: [www.magnom.com](http://www.magnom.com)

© Fluid Conditioning Systems Ltd. All rights reserved.  
The information in this leaflet is for guidance only and is not binding.



## INDUSTRIAL GEARBOX PROTECTION





### The Benefits

**The environmental award winning and cleanable Magnum™ delivers the following advantages when used in lubrication circuits to protect industrial gearboxes:**

FAST PAY BACK

(in some cases less than 1 month)

by **reduced transmission failures**  
(typically £50K refurbishment cost)

**increased plant uptime**  
(major cost benefit!!)

**extended lubricant life**  
(typically three times)

**reduced/eliminated filter spares**

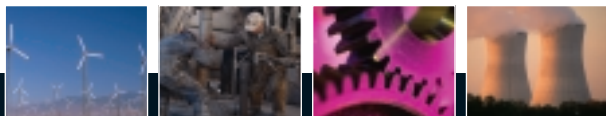
by **removing the most damaging wear elements**

(from less than a micron up to over 1cm)

**without incurring a significant pressure drop**  
(even in lubricant up to 12,000 CST)

**without contaminant wash-off**

and with **cleaning intervals of up to four years**  
(the Magnum™ is sized to coincide with plant maintenance intervals)



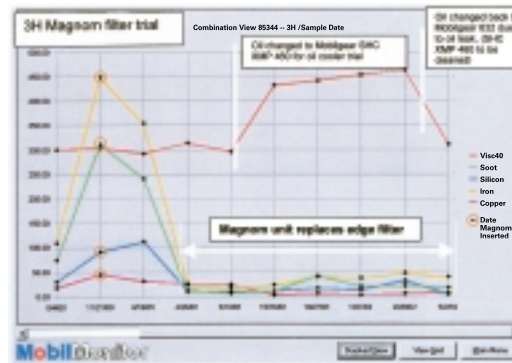
### Power Station Application

Didcot A, the 2040MW coal fired power station operated by Innogy Plc, recently embarked on a project to improve the reliability of coal pulverising gearboxes (these had been prone to failure at a rate of four per annum). The company looked at introducing additional filtration to the system, this was considered to be particularly challenging due to the high viscosity of the synthetic lube oil in use (ISO VG320 and 460).

A Magnum™ Process Unit was installed, importantly no discernible pressure drop was recorded across the unit, this was subsequently maintained. More significantly, the resulting improvement in oil cleanliness was truly dramatic with a reduction in ferrous contaminant (450 ppm down to far less than 50 ppm very quickly) and additional reductions in Aluminium, Silicon, Copper and Soot levels.



Kidney loops available subject to application



Following this dramatic success, Innogy carried out a planned schedule to integrate Magnum™ into all 32 coal mill gearboxes on site. The benefits of extended oil life and reduced consumption, coupled with exceptional dirt holding capacity, means that routine maintenance has been reduced to a minimum, with the units requiring cleaning every three to four years only, well within the schedule for routine outages. Innogy has not experienced a single failure in a Magnum™ gearbox.

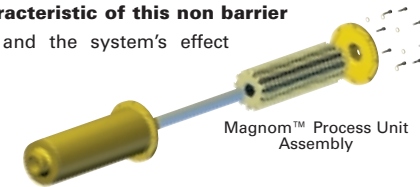
No Magnum™ equipped gearboxes have failed since installation.

### Cement Industry Application

Rugby Cement at Barrington (UK) employ a conventional rotary kiln. The kiln utilises a girth gear transmission drive with an open lubrication system with synthetic lube oil, Mobilgear SHC 3200, spray fed directly onto the gears.

Routine fluid analysis evidenced serious contamination indicating significant wear to the pump and gear teeth. The lubrication system had clearly been accumulating and recirculating damaging debris for a significant period of time leading to a chain reaction of wear and very likely failure of the system in the next month.

To alleviate this problem a two inch nominal bore **Magnum™ 'Process Unit' was fitted on the suction side of the system pump, this being possible due to the negligible pressure drop characteristic of this non barrier magnetic device** and the system's effect was monitored.



After one week's operation the Magnum™ core was removed for inspection and was found to be laden with 4 kg of contaminant. Subsequent analysis showed this to be both ferrous and non-ferrous with a significant number of large (5mm+) ferrous particles assumed to originate from the gear teeth. The unit was cleaned and returned to operation.



Periodic inspection and cleaning showed a continuous improvement in system cleanliness, this has subsequently been maintained and the gearbox has continued to operate.

Magnum™ has been successfully employed in diverse stages of Cement production:

- Cement kiln drive
- Cement mill drive
- Coal pulverising mill
- Slurry pump protection
- Hydrostatic conveyor drive

