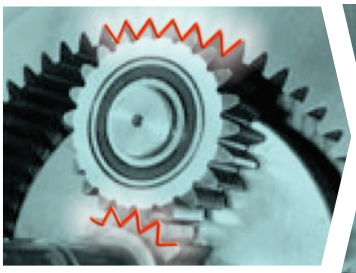
Magnomatics®

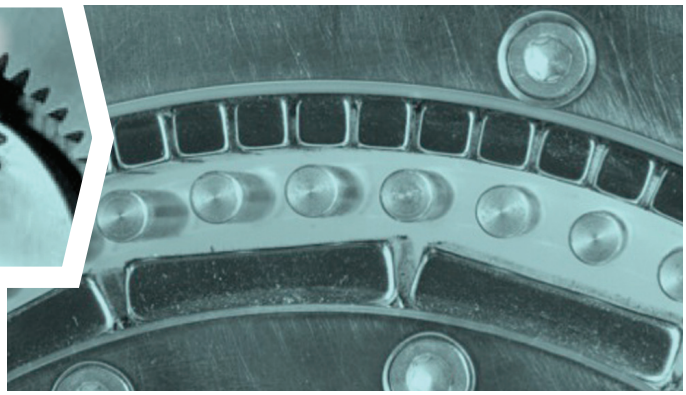
Revolutionary Magnetic Drivetrains

Revolutionary ultra high torque motors, generators and contact free gearing, utilising proprietary magnetic transmissions. Suitable for a wide range of drivetrain applications where high reliability, low maintenance and high efficiency are required.

## No More Gears



Mechanical Gear with meshing teeth



Contactless Magnetic Transmission

Magnomatics' products transmit high torque without contact using powerful permanent magnets. A gear ratio is achieved by modifying the magnetic fields between two magnet rotors with an array of steel segments, removing the requirement for a mechanical gearbox. Torque transmission is comparable to that of mechanically-geared systems.

### Benefits of magnetic transmissions

Improved reliability

Increased efficiency

Reduced maintenance

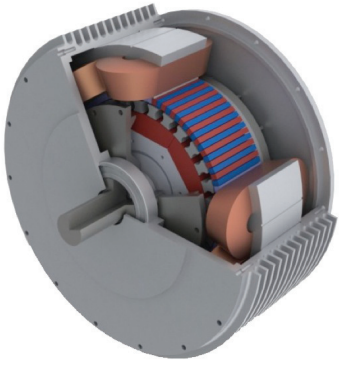
No transmission oil

Reduction of drive train pulsations

Low noise and vibration

Inherent overload protection

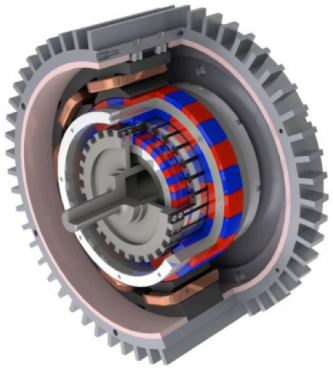
## Our Products



### PDD®

Ultra high torque motors and generators with integrated magnetic transmission

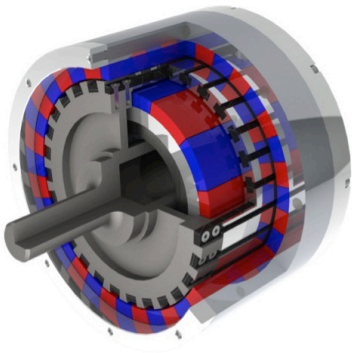
- Removes gearbox from drivetrain
- High reliability
- Very high efficiency
- Low maintenance
- Significantly smaller and lighter than direct drive equivalents
- Low cooling requirements
- Inherent torque overload protection
- Standard power electronic converter



### Magnetic CVT

Continuously variable magnetic transmission

- Controllable gear ratio
- High efficiency
- Compact
- No lubrication
- Power split operation
- Matches fixed-speed prime mover to variable load



### Magnetic Transmission

Passive, fixed ratio gearing

- High reliability
- Low maintenance
- No lubrication
- Transmission through a barrier
- Automatically resetting torque fuse
- Very low acoustic noise and vibration
- Compliant transmission eliminates drivetrain pulsations

# Markets

### Renewable Energy

Wind turbines typically utilise a gearbox to increase the input speed, reducing generator size and cost. Unfortunately gearboxes reduce turbine efficiency, require regular maintenance and can be a costly point of failure, whereas alternative direct drive generators are large and expensive. Magnomatics compact, light-weight PDD® generator fits inside a conventional nacelle without a gearbox, reducing maintenance costs. Higher turbine availability and significantly enhanced efficiency both increase energy production, making the PDD® a highly cost effective solution.

### Marine Systems

Magnomatics' PDD® motors offer dramatic benefits for both in-hull & external pod propulsion systems and are typically less than 30% of the size of current motors. This enables the motor to be placed closer to the stern, freeing up valuable space, while still maintaining an optimum rake angle for efficient propeller operation. The PDD® also enables high power to be delivered within a low diameter pod for improved hydrodynamic efficiency.

### Vehicles

PDD® traction motors deliver significant torque in a small volume, giving increased flexibility to vehicle designers. The removal of gear stages increases fuel efficiency, reduces maintenance requirements and increases reliability. The high torque capability of the PDD® is particularly suitable for commercial, construction, and defence vehicles. Magnomatics' CVT is a compact, robust and highly efficient device that enables the dynamic control of power distribution within hybrid vehicles of all sizes.

### Aerospace

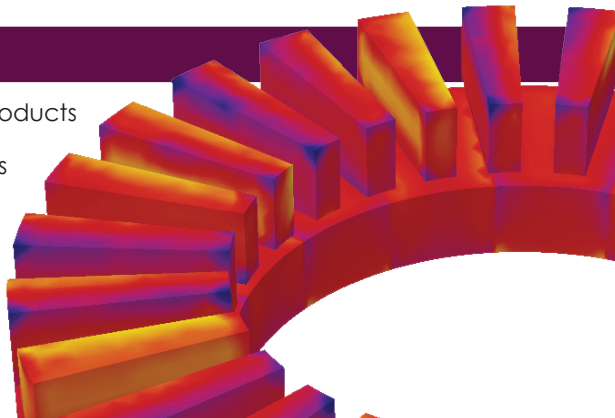
The desire to reduce the number of hydraulic systems on aircraft has resulted in a requirement for fault tolerant electromechanical actuators. A lightweight PDD® actuator can be realised with safety-critical winding configurations and can additionally supply the anti-jamming capability of a hydraulic system. Should the actuator be overloaded, the internal magnetic transmission element will harmlessly slip, thus protecting the rest of the system. The actuator automatically resumes full functionality once the overload condition has passed.

### Industrial Automation

Magnomatics' drivetrain products offer multiple benefits for a broad range of industrial automation systems. For many applications they remove the gearbox and the requirement for lubrication, offering an attractive solution for food, chemical and pharmaceutical industries. The torque-fuse functionality protects systems, enabling down-rating of other components. Contactless transmission through a sealed barrier, removes the requirement for dynamic seals to separate wet and dry regions. The PDD® can free up space and its high efficiency delivers operating cost savings. Applications include conveyors, mixers, stirrers, pulverisers, ball mills, valve actuators, etc.

# Services

Magnomatics can provide electromechanical design services to develop products based on both its proprietary range of magnetic transmissions, motors and generators and a broad range of generic rotary and linear electric machines and electromagnetic actuators. Our engineers have core expertise in electromagnetic, thermal, mechanical and system modelling. We can assist customers at all stages of product development, from verifying the feasibility of a proposed solution, through to the realisation of optimised hardware. Our modelling capabilities are supported by the latest FEA and CAE software.



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