

Seal-less drives

New level of green for seal-less drive:

Seal-less *Mag Drive* drives pumps, take the drive to reduce energy consumption and increase environmental protection without sacrificing performance to a new level. Seal-less *Mag Drive* technology provide significant advantages over gear pumps in the quest to reduce energy consumption and cost.

Throughout the world, high energy prices pose an unprecedented profit-robbing threat to every manufacturing operation, large or small. Left unmanaged and unchecked, rising energy expenditures can quietly, and quickly erode a company's stability, performance and productivity. It can also, ultimately, reduce its competitiveness and viability. Confronted by these rising energy costs, manufacturing operations around the globe are implementing energy management processes and procedures that seek to:

- Drive product improvements that increase financial performance.
- Control energy expenses by reducing power consumption without compromising output, while simultaneously increasing production levels.
- Increase operational reliability and process integrity by emphasizing the use of energy-efficient technologies that also support enhanced mechanical efficiency.
- Reduce vulnerability to energy-price volatility - In order to address energy consumption, many areas around the globe are developing and implementing new climate and energy policies that have been designed to create behaviors to moderate energy usage. As an example, in March 2007, the EU announced a series of demanding climate and energy consumption targets that must be met by 2020. These are:
 - A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels.
 - Requiring 20% of EU energy consumption to come from renewable resources.
 - A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency. This climate and energy package was agreed to by the European Parliament and Council in December 2008 and became EU law in June 2009.



Similarly, 2005's wide-ranging Energy Policy Act in the United States elevated the profile and increased discussion of energy use and conservation in the country. Since the inception of EP Act, there have already been enviable gains in energy conservation in the industrial sector, thanks to a series of energy-efficiency assessments that were conducted at more than 400 of the nation's largest manufacturing plants.

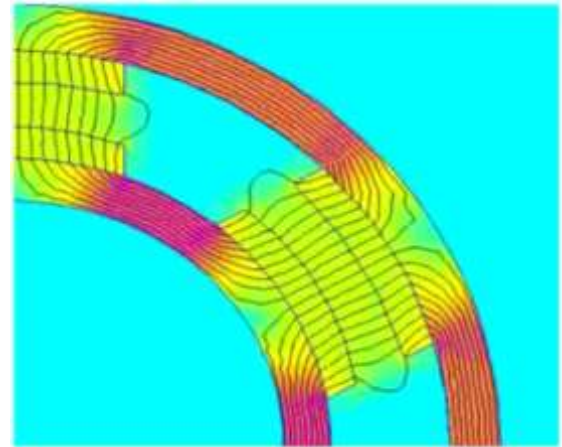
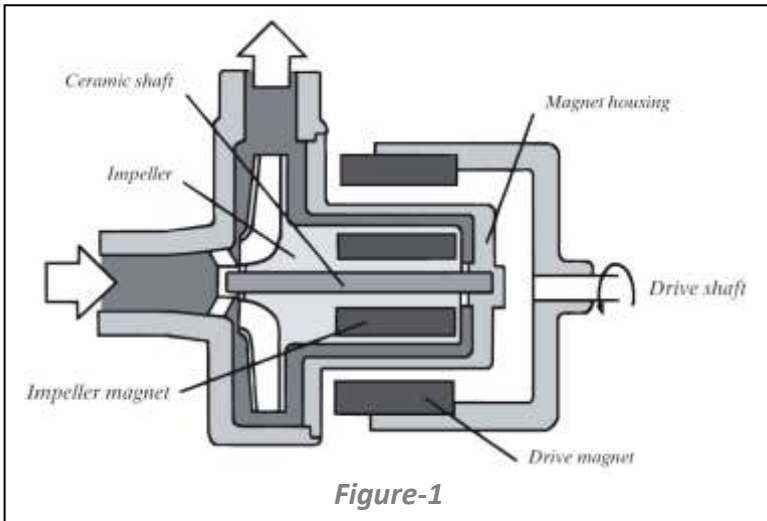


Figure-1

Figure - 1

A Seal-less **MAG DRIVE** pumps – such as this one by **Neoflux** – offer immediate high-value advantages and solutions fulfilling the required energy saving initiatives.

These assessments showed that it is possible for the industrial sector to improve its 'energy intensity' by 25% by the end 2017, or an average of 2.5% per year leading up to that deadline. The key to meeting this goal is instituting a systems approach to energy efficiency and conservation in manufacturing plants, i.e. turning the focus away from individual components and, instead, analyzing both the supply and demand sides of the system as a whole.

However, while it is easy to establish thresholds for energy consumption, identifying and implementing the most efficient means to meet those thresholds can be much more problematic. Using industry as an example, since pumps account for anywhere between 27% and 33% of total electricity used in this sector globally, improvements in pump-system performance can play an important role in minimizing energy costs.

The Challenge:

At their most basic, poor design and improper system operation are the root causes of inefficient pumping systems. As rotating equipment, pumps are subject to wear, erosion, Cavitation and leakage. These problems can be exacerbated through improper pump selection and operation. If they are not selected or operated properly, pumps can waste enormous amounts of energy. They may also need considerable maintenance.

The pump-selection process can be complicated by the fact that many different types of pumps can be applicable to a single operation. In addition, when making the final choice in type of pump, the list of crucial factors that need to be taken into account can be daunting. They include required flow rate, differential pressure, temperature, viscosity, shear sensitivity, the corrosiveness of the liquid being handled, etc. Moreover, facility managers have a tendency to resort to lowest-common-denominator thinking when outfitting their pumping system, and simply choose to go with oversized pumps. While installing an oversized pump ensures that the needs of the system will be met under all operating conditions, the added energy cost inherent in operating oversized equipment is generally ignored.

As manufacturers work to align their energy-efficiency initiatives with their business goals, pump system improvements will play an increasingly important role in this effort. Since there is no 'one pump fits all' solution, particular attention to proper pump selection will become increasingly important in the effort to select the right pump that will not only deliver productivity gains, but will also work just as well at controlling energy consumption.

With this in mind, by virtue of their inherent energy- and mechanically efficient designs, **Neo-Mag's** Magnetic Drive Pump Technology (*Figure-1*) offer manufacturers immediate, high-value advantages and solutions in fulfilling their energy-saving initiatives.

The *Mag-Drive* solution:

Of the leading Centrifugal Displacement technologies, *Mag-Drive* pumps are generally among the most energy efficient. Significant design advancements have given *Mag-Drive* technology a decisive advantage over other pumps, specifically with regards to optimized performance, Seal-less capability, lowest life-cycle cost and best energy efficiency. This is in part because it replaces with innovative **Neo-Mag magnetic coupling** (often called Magnetic Capsule) which eliminates the need for the shaft seal or packing which is the most high maintenance component on a centrifugal pump of this kind. The **Neo-Mag** Coupling is constructed of plated high grade Rare-Earth Magnets encapsulated with Polypropylene that eliminates energy-robbing slip, eddy currents and promotes high volumetric efficiency, even after a substantial time in service.

This makes *Mag-Drive* pumps much more efficient and desirable for many applications than gear pumps. **For example:-** Gear pumps use the meshing of gears to pump fluid by displacement – this results from day one in constant tooth wear, which increases the internal clearances, in the process reducing flow capacity and volumetric consistency while increasing the possibility that 'slip' will occur. All of these operational deficiencies result in not only decreased pump performance and increased maintenance occurrences, but also in wasted energy, which increases costs.

Neo-Mag's *Mag-Drive* pumps operate through the use of a G2.5 balanced Close-Ended Impeller for better hydraulic efficiency, Vibration free operation and lower energy consumption. The Pump incorporates *Split Volute Casing* for better hydraulic efficiency & Performance. Volute design builds higher head compared to traditional Circular Casing. Due to its Volute Design, the casing will steer & evenly distribute water power towards impeller's periphery. This type of design guarantees fixed displacement volume with minimal pressure variance, meaning that energy-wasting slippage and turbulence are minimized and high volumetric efficiency is maintained.

While the technology behind a *Mag-Drive* pump delivers the energy-conscious operation that manufacturers seek, one area in their construction that has traditionally remained problematic has been in pump shaft sealing. Though often ignored, this can have a direct influence on a pump's power consumption in a variety of ways:

- By its basic design, the more friction a pump generates, the more of a 'power eater' it will be. From that standpoint, shaft packing is a less efficient solution.

- In many cases, a pump's shaft-sealing system may need additional cooling, either by a separate fluid (a mechanical seal flush, for instance). This additional cooling requires more energy to work and decreases the pump's energy efficiency. In the case of **Neo-Mag Mag Drive** pump, its revolutionized bushing design with Cooling channel circulation on surfaces of the bearing contributes to rapid heat dissipation. The circulation leakage of the seal-less pump is fully utilized to reinforce convectional heat transfer to thermally balance internal temperatures and prevent damage even under dry running conditions.
- Most of the shaft-sealing solutions are heat generators and can dry run for only very short periods of time, or even not at all. When choosing a pump-shaft seal, this parameter must be mastered, especially in a potentially explosive atmosphere. Therefore, temperature sensors, flow meters and power monitoring often have to be added, which generate other energy-consumption concerns. **Neo-Mag** incorporates an additional fluid flow path around the bushing. This additional path allows the process fluid, or air, to cool the bushing of the impeller through the internal spiral cooling channel. This unique feature of Heat Dispersing Technology prevents the heat build-up that so often damages or completely disables the shaft bushing and gives *DRY-RUN* capability for hours.

The result is a decrease in energy consumption with a corresponding increase in operational efficiency, all without added installation complexity. Compared with other centrifugal pumps technology, the **Neo-Mag** pumps create up to a 70% higher return in operating efficiency & upto 15% higher return in energy efficiency.

Conclusion:

Mag-Drive technology is being used worldwide to reduce energy cost and consumption, and create a more efficient pumping system. While world-renowned for its ability to offer the best in increased suction, reduced product shear and consistent volumetric efficiency, *Mag-Drive* technology has been taken to the next level with the introduction of 'Seal Less Drive' technology.

This offers even more advantages over other pumps like gear pumps in the quest to reduce energy consumption and cost without sacrificing performance and reliability – especially in these increasingly energy-conscious times.

We look forward to being of assistance in your process equipment requirements.

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