

CONTACT

Rebecca Banks
Marketing Content Strategist
Rebecca.banks@stober.com

FOR IMMEDIATE RELEASE**STOBER cLEAN SYSTEM USES PERMANANET MAGNET MOTOR TECHNOLOGY****Enclosed solution prevents premature failure due to water ingress**

[MAYSVILLE, Ky., Dec. 20, 2024] – While many different types of magnetic fields can be used in motors, STÖBER’s cLEAN motor uses innovative permanent magnet technology. This technology provides the product with many benefits, including speed-torque range, IE5 efficiency, running cooler by 80 degrees Celsius, and IP69K and IP68 certifications.

How motors work

Electrical motors used for industrial applications including pumps, conveyors, and saws, use magnetic fields to generate rotational motion. The strength of that magnetic field determines the amount of torque produced by the motor.

Magnetic fields can be generated by passing current through a conductor (electromagnet) or by using magnetic materials such as neodymium rare earth magnets (permanent magnet). Each method has its advantages and disadvantages. For instance, the electromagnet can be turned off or on simply by controlling the electricity. The amount of current applied to an electromagnet can also increase or decrease the strength of the magnetic field. Unfortunately, without electricity, electromagnetic fields do not exist. Conversely, rare earth magnets continuously generate a magnetic field without the need

for electricity, but their magnetic field cannot be turned off or adjusted in intensity.

Many industrial motors work on the principle of induction. They have two main components: the stator and the rotor. The stator contains conductive windings typically made of copper and the rotor contains copper bars commonly referred to as a squirrel cage. By applying a voltage to the conductive windings of the stator a current flow is created. This current flows through the stator inducing (creating) current in the conductive windings of the rotor. This process establishes one electromagnetic field in the stator and another in the rotor. The interaction of these two magnetic fields results in rotational motion.

Simply having two magnetic fields does not produce motion. The magnetic field produced by the stator must change polarity so the magnetic field induced on the stator can react accordingly (like magnetic poles repel and unlike magnetic poles attract). This is accomplished by the windings corresponding to the three phases of alternating current. As the phases alternate, so does the polarity of the magnetic field produced by the stator, which influences the rotor's magnetic field. This switching of magnetic field polarity causes the rotor to spin.

The speed of the electrons flowing through the conductors in the stator determines the speed of the rotor while the magnitude of the current through the conductors determines the amount of torque produced by the motor.

This process to produce rotational mechanical motion requires electrical energy. The amount of torque needed determines the amount of conductive material contained in the motor as well as the amount of electrical energy required. Since the rotor relies on the stator for its magnetic field, more electrical energy is required for this process. Additionally, the rotor's magnetic field always follows the stator's magnetic field; therefore, the rotor always rotates at a rate slower than the stator's magnetic field. This is why induction motors are sometimes referred to as asynchronous motors because the stator and the rotor are not in sync. This offset in speed between the stator and the rotor is referred to as slip and is responsible for the motor's ability to generate torque.

Unfortunately, the other option to produce a magnetic field, rare earth magnetics, cannot be controlled. However, by combining an electromagnetic stator with conductive windings and a rotor embedded with neodymium rare earth magnets, it is possible to reduce the electrical energy required to power a motor while maintaining or exceeding the necessary speeds and torque for rotary applications.

STOBER's cLEAN System features permanent magnet technology

This permanent magnet technology is used in STOBER's cLEAN motor. Although this technology has been around for decades, it has primarily been used in servo motors, which are mostly found in robotics requiring precise velocity and positioning. These motors are controlled by expensive, high-speed computing hardware. However, advancements in technology and the strategic placement of magnets within the rotor have enabled the use of more affordable hardware, such as variable frequency drives (VFDs). While these VFDs do not offer the fast-computing capability of those used with servo motors, they are sufficient for applications such as conveyors, pumps, and saws where velocity and positioning are not critical. VFDs are pivotal in increasing system efficiency by regulating the amount of current used to start the motor. This also results in a gentler motor startup reducing the wear and tear on interfacing components.

Since permanent magnets are embedded in the cLEAN motor's rotor, the stator is not responsible for inducing a magnetic field onto the rotor - it already has one. This eliminates the need for slip to generate torque, since the permanent magnets continuously provide a magnetic field. This results in the stator and the rotor rotating at identical speeds. Combining these attributes gives the cLEAN motor a speed-torque range that trumps that of an induction motor. This means that within an output speed range from 500 – 3000 rpm, the motor can maintain nominal output torque which is not achievable in an induction motor.

Using the technology described above, the cLEAN motor maintains IE5 efficiency and runs up to 80C cooler than a standard induction motor. This allows the motor to be totally enclosed in a stainless-steel housing, eliminating the need for a fan, and sealed to maintain IP69k and IP68 ratings when mated to the STOBBER stainless steel helical bevel KSS gearbox. To ensure sealing integrity, the cLEAN motor is shipped pre-terminated to the cLEAN cable, which is ECOLAB certified and compliant with NFPA 79, Article 12.9. To complete the cLEAN system, the cLEAN drive is a VFD that is shipped pre-programmed for easy installation.

With this system, STOBBER has eliminated failures due to water ingress; therefore, decreasing downtime. The cLEAN motor's ability to maintain nominal torque throughout a speed range from 500 to 3000 rpm, allows for consolidation of gearbox ratios reducing the number of spares needed, saving warehouse space and money. This system also decreases energy consumption by requiring less energy to operate and less energy to maintain facility ambient temperature. The cLEAN System also comes with a 3-year warranty and STOBBER's gold standard customer service.

The STOBBER cLEAN System is built and shipped in less than one week from Maysville, Ky. Visit us at Booth C24175 at IPPE to talk about how the cLEAN System can be a good fit for your application. Learn more at stober.com, contact sales@stober.com, or call (888) 786-2371.

#####

Established in Maysville, Ky., in 1991, STOBBER Drives, Inc. is a U.S. company with a 90-year family-owned German heritage. STOBBER specializes in building quiet, efficient, and durable gear reducers. With two unique lines in Motion Control and Power Transmission, STOBBER puts things in motion integrally and precisely, as a team and with personality, responsibly, and in a forward-looking manner. STOBBER provides products that are backed with superior service, outstanding quality, and the STOBBER guarantee while supporting employees through a culture based on core values and establishing a family-first workplace.