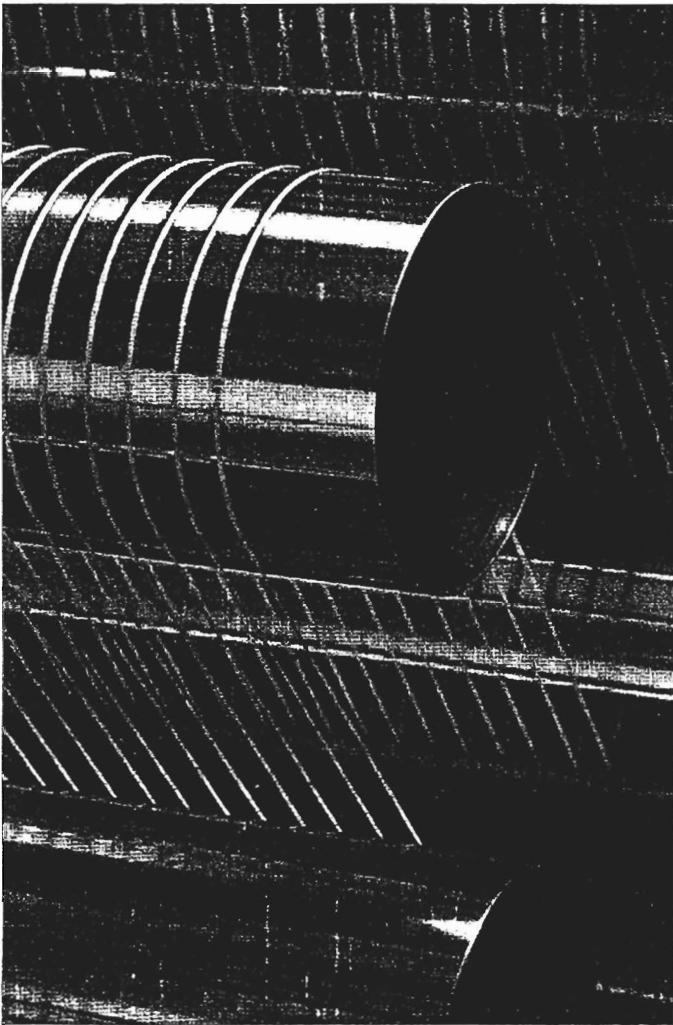


Permanent Magnet Synchronous Motors Save Operating Cost

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Welco Vari-Hertz motors driving high-speed godet rolls.

Since fiber manufacturers switched from line shaft technology to individual position winders in the late 1950s, synchronous motors have been counted on to provide precise speed control. These motors have traditionally been the reluctance type because of their lower perceived initial cost. But today, when it comes to reducing total operating costs, more fiber industry manufacturers are turning to permanent magnet machines like Welco Technologies' VARI-Hertz® permanent magnet synchronous motors, to put more proven cost-saving measures in place

VARI-Hertz permanent magnet synchronous motors reduce energy consumption, lower current usage, decrease the size of electrical equipment down stream, increase process throughput and provide accurate speed regulation without expensive feedback controls. The motors are the lowest-cost solution in applications where high-performance motors are required.

VARI-Hertz motors are permanently excited, three-phase synchronous motors with a squirrel-cage rotor. The design precludes rotor or excitation losses found in reluctance-type motors. The layout and material characteristics of the permanent magnets in the rotor create a constant flux in the air gap, resulting in the best motor performance possible from an AC design.

VARI-Hertz extends the nominal speed range of fiber industry machines from 50 - 10,000 RPM. They can simplify drive systems by eliminating the need for speed-reduction devices and are designed for variable frequency applications. This means savings in installation time, system complexity and lower capital equipment expenditure costs.

The motors use permanent magnets that are made from rare-earth samarium cobalt, a very powerful magnetic material, with high flux density and high magnetization. It also resists demagnetization as a result of strong opposing fields, such as those which can occur during synchronization, stalling or very high temperature operation.

Because VARI-Hertz permanent magnet synchronous motors have no rotor slip losses, the rotor of the permanent-magnet motor stays cooler than reluctance- or induction-type motors. This means smaller frame sizes at higher torque rating as compare to reluctance-style synchronous motors. Also when VARI-Hertz motors are run with a PWM inverter drive, their temperature rise is on average 15° cooler than reluctance motors at the same rated torque and frame size. This leads to higher reliability and less unplanned shutdowns because of motor insulation or bearing failures.

Welco Technologies offers thousands of custom designs and can produce a custom-engineered motor to meet any requirement. Special motor housings, bearings, demand for critical speeds, class H insulation and low-vibration amplitude are all standard features of Welco Technologies VARI-Hertz permanent magnet synchronous motors. When the process calls for accurate speed control or coordination of multiple interconnected operations, Welco Technologies VARI-Hertz motors provide a proven solution. □

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