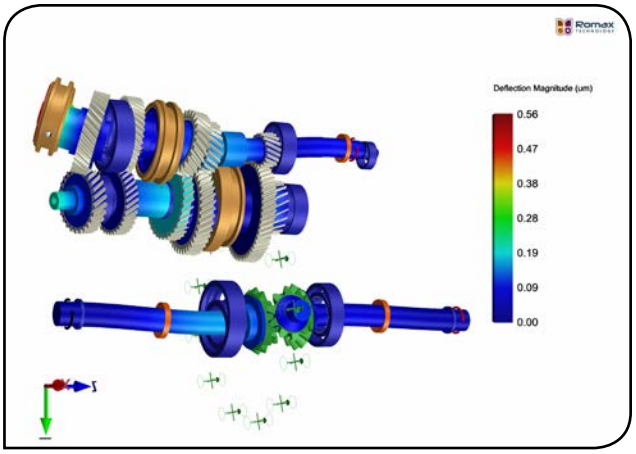
# Romax Technology

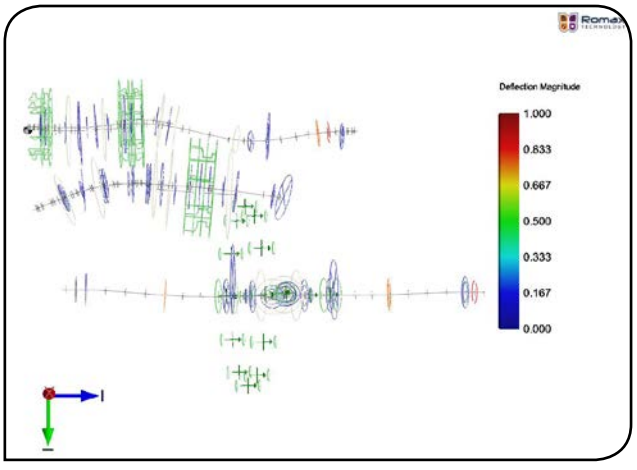
## SUPPORTS VOLKSWAGEN GROUP TO OPTIMIZE THEIR TRANSMISSION DESIGN




Example of mode shape analysis in *RomaxDesigner*.

Romax Technology offers simulation software that allows designers and manufacturers to assess and optimize NVH characteristics while also maintaining or improving efficiency and durability. Issues can be identified at the design stage, checking basic analyses for NVH at a concept level, saving both time and money. Volkswagen Group is one such company that Romax has supported to provide a holistic approach to their design process using *RomaxDesigner* software for gearbox simulation.

Europe's biggest carmaker, Volkswagen Group delivers over 10 million cars to customers each year. Almost one in four new cars (24.8 percent) in Western Europe are made by Volkswagen, a group which comprises 12 leading brands from seven European countries: Volkswagen Passenger Cars, Audi, SEAT, ŠKODA, Bentley, Bugatti, Lamborghini, Porsche, Ducati, Volkswagen Commercial Vehicles, Scania and MAN.




Example of schematic view of mode shape analysis in *RomaxDesigner*.

Its challenge was to develop a reliable validation strategy for gearbox NVH to allow design changes to be made with confidence. Romax's whole system simulation environment offers both a prevention and cure strategy for transmission NVH issues.

Employing over 15,000 people, Volkswagen's primary transmission site at Kassel, Germany, supplies about four million manual and automatic transmissions every year. Volkswagen engineers at Kassel have used *RomaxDesigner* software for more than five years, to support the effective production of gearboxes and to ensure the required NVH quality is achieved. Kassel's Acoustics and System Simulation department focuses on NVH correlation and simulation: "Our main challenge is gear whine, and the need to support our high acoustic standards," said Carsten Schmitt, Ph.D. student of Volkswagen's postgraduate program. "NVH is such an important issue in the industry today because of the rise in electric motor developments, and the simultaneous increase in the production of complex gearboxes. We use *RomaxDesigner* so that we can perform accurate simulation of these new gearbox designs, and assess the NVH performance."

### From trial and error to simulation for development

Previously, sporadic correlation studies on the main parts of a gearbox would be conducted based on eigenfrequencies, which allowed for little correlation guarantee. "We have a requirement to develop simulation models that are representative of the real world, so that our design changes can be made with confidence," said Schmitt. "This gave rise to the need for an integral validation strategy, which we investigated in *RomaxDesigner*. We have already used the software for over five years on multiple projects. The speed and unique system-level simulation which *RomaxDesigner* offers stand it apart from other products currently available on the market."

### An integral validation strategy

The strategy developed by Volkswagen focuses on a step-by-step process, allowing correlation between measurement and simulation along the acoustic transfer path at each of the following stages: gear excitation, shaft systems, bearings, gearbox housing, and whole vehicle testing. "If test and simulation are compared only at the end of the system development, then it is not possible to work out where discrepancies may arise, hence the need to perform correlation at each level. This gives us an understanding of exactly where problems are occurring, so that we can resolve validation errors quickly and easily, and avoid time-consuming investigatory work," Schmitt explains. "And Romax software plays a big part in this investigation. Only with *RomaxDesigner* can we quickly and accurately investigate gear whine phenomena on a system level – looking deeper into models to work out where the problems are. This is what allows us to meet high expectations for NVH within even the most cutting-edge system designs. Romax's unique system level view is a huge benefit to us, as well as its easy-to-use bearing catalogs, which make it easy to model gearboxes even if you are not a bearing expert, and its reliable and accurate transmission error calculations."

### A step-by-step process

The gears are validated first, with testing and simulation performed across a range of loads. The gear contact pat-

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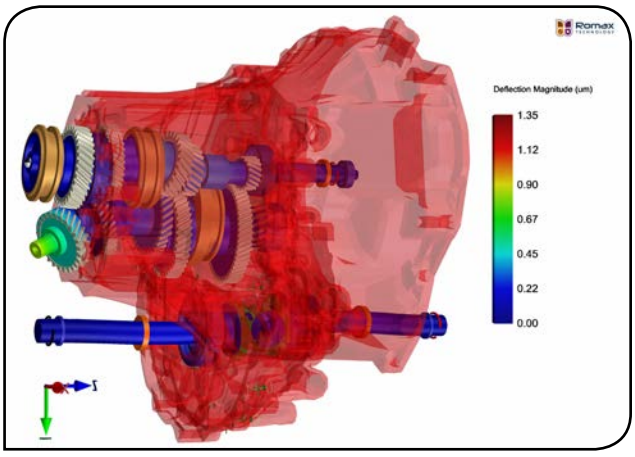
tern is checked; poor correlation indicates either incorrect micro-geometry in the simulation, or deviations in the manufacturing process. The next stage is shaft system validation, which consists of modelling single parts and assemblies, then performing finite element analysis (including pretest analysis and experimental modal analysis, if necessary). This is again validated against test data, and if this is unsuccessful the model must be updated in *RomaxDesigner*. Whenever correlation is not successful, changes can be made which will improve the process for the future, as Schmitt explains: "In the first run we found that the model needed updating. The updates that we performed, including accounting for Young's modulus and part-to-part stiffness connections, improved the correlation significantly."




**Example of mode shape analysis including housing in *RomaxDesigner*.**



The third stage is correlating the bearing stiffness, and the final step is the correlation for the gearbox housing, for which there are two options, as Schmitt explained: "The validation can be performed by building up the components separately using different tools and testing each individually, and then adding them together to make the final model. Alternatively a single model can be created in *RomaxDesigner*, which means just one experimental modal analysis, one correlation analysis, and only one model to update. We found that there was little difference between the methods, so the full housing assembly was done in order to save time and effort – this is a very useful way of doing the correlation."

"Now that we have developed the framework, we are confident the work we have put into this implementation will enable time and cost savings for future projects, as well as maintaining our customer's trust in our ability to deliver their requirements," Schmitt concluded. "We have developed a clear strategy to perform straightforward model updating procedures, and extended the validity and trust of our Romax gear whine models. Our design changes are not reliant on trial and error, but are based on proven, trustworthy simulation."

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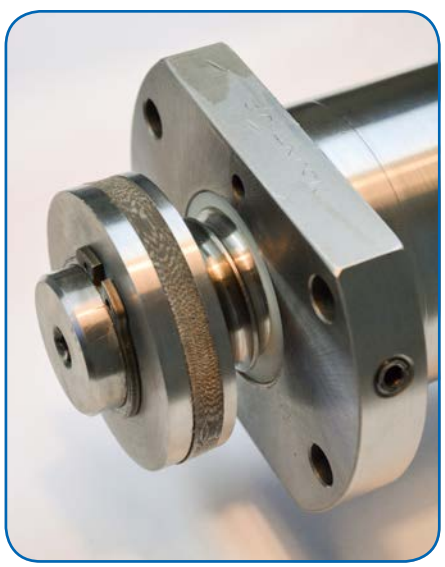
# Ace Controls Inc.

## OFFERS SPECIALIZED ELASTOMER WASHERS TO PROTECT BALL SCREWS AGAINST SHOCK LOAD DAMAGE

Protecting industrial machinery and equipment against shock and vibration is a key requirement for keeping manufacturing operations running smoothly and minimizing downtime. Damping pads are often used to achieve these goals, cushioning equipment and absorbing shock and impact before these forces can have a negative impact on productivity. As an example, PAD plates from Ace Controls are widely specified as shock-absorbing underlayment for industrial presses and large machinery in manufacturing plants, underneath cranes and pipelines and in a wide range of other heavy-duty applications.

Because these rugged fiber and elastomer pads offer such high performance in absorbing shock loads, PAD material is now being specified not just as a way to support heavy machines but also as a way to absorb shock within the machine. One example is PAD's recent adoption as an impact-damping washer in a line of robust ball screws from SKF.



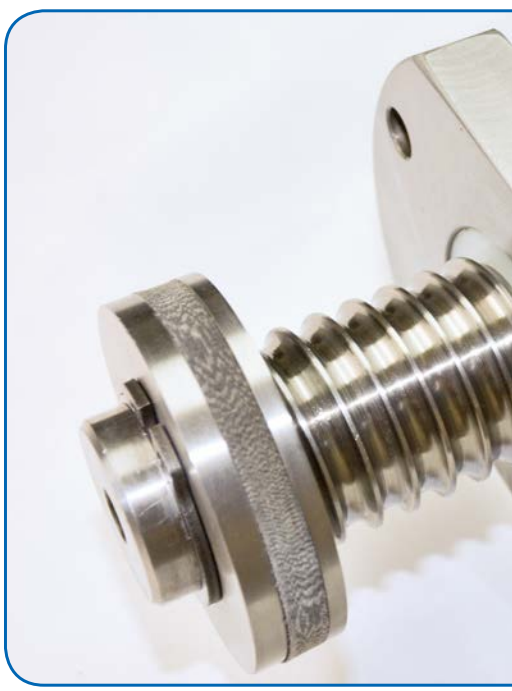
### Overtravel Protection

In this design, PAD washers are inserted between a pair of steel washers and secured by a snap ring at each end of the ball screw. The elastomer washers act as an additional safety mechanism in the event of a machine malfunction and serve to absorb shock loads that might otherwise cause permanent and costly damage to the ball screw itself. Here's how it works: As the nut travels along the ball thread length, there is a risk that the nut may overtravel either end of the ball screw. No matter how well the control system is designed, overtravel scenarios are an inevitable and common occurrence in linear motion applications, especially those involving high speeds and dynamic loads.

To prevent the nut from overtraveling the ball thread length, the PAD washer that is sandwiched between the two steel washers absorbs the shock of the nut when it makes impact. By absorbing this impact energy, the PAD washer helps to prevent machine damage and avoid costly repairs and downtime. Typical examples of shock-induced ball screw damage include cracked screws, broken encoder mounts and ruined raceways, all of which can be avoided by using a rugged elastomer washer as an additional safety feature.

PAD washers are not a replacement for components such as limit switches and end stops. Instead, they provide an inexpensive method of additional insurance against common and unavoidable overtravel crashes. Like an automobile bumper, PAD washers can permanently deform under excessive shock loads and must be replaced after a significant crash. However, keep in mind that replacing a washer for less than $100 is much more economical in terms of both time and expense than replacing a high-end ball screw that costs many thousands of dollars. It is far more economical to destroy a simple washer than a sophisticated screw assembly.

Other impact solutions for ball screws include neoprene washers and springs. However, neoprene often suffers from chemical compatibility issues and does not absorb as much



force at a given thickness compared to PAD elastomer washers. Springs may also be used as shock absorbers, but they are difficult to specify correctly and require a large footprint, taking up valuable ball screw real estate. PAD washers are much more forgiving than springs in terms of both specification challenges and design constraints.

## PAD Washer Properties

Ace Controls offers its PAD material in several different shapes and sizes, including pads, washers and bushings. Since they're easy to produce in any diameter, all washer styles are customizable to fit a wide range of application needs. Loads range from 0 to 2,000 psi. PAD materials combine isolating elastomer damping with the reinforcing effect of fiber inlays, creating robust cushioning for a wide range of heavy-duty tasks. For example, PAD plates can withstand compressive loads to 10,000 psi (69 N/mm$^2$), depending on their size. The material can also be cut and built up in layers. The PAD material displays superior compression properties and a low creep tendency of roughly five percent when under a continuous static load. With regard to dynamic loads, these can be very high with large, fast-moving ball screws. PAD washers provide reliable protection as they can absorb shock loads as high as each ball screw's static peak load rating.

Due to its superior performance as an additional safety measure on SKF's high-precision ball screws, the company is now offering PAD washers as an option on its entire range of one to six-inch-diameter screw sizes. Customer feedback continues to be encouraging, with documented savings in terms of avoiding costly downtime for equipment repairs. Based on the success of this novel ball screw design, engineers at Ace Controls are now recommending the use of PAD material in applications beyond machine underlayment that require shock and vibration damping in an economical and reliable format.

**For more information:**
Ace Controls Inc.
Phone: (800) 521-3320
*www.acecontrols.com*

# Oriental Motor

## INTRODUCES NEW GEARHEADS FOR HIGHER PERFORMANCE

DAN JONES, INCREMOTION ASSOCIATES, INC.

### Introduction

New industrial and commercial requirements have demanded the need for higher-performance gearheads to be mated with both subfractional and fractional hp induction motors. One company, Oriental Motor, has responded by developing the new KII gearhead family that has been combined with single- and three-phase induction motors that range from six watts (1/125 hp) to 200 watts (¼ hp). Permissible- or continuous-load torque has been increased by 100 percent in some gearhead models, and over 300 percent in others.

The gearhead types include the parallel shaft gearheads and, for higher torque capability, the hypoid gearhead in both solid shaft and hollow shaft configurations.

### The New KII Gearheads

The new KII gearhead type was developed from the earlier K gearhead. It is a high-performance gearhead created to handle the higher application loads required by many new industrial applications. The KII in its parallel shaft configuration can be integrated to small, AC induction motors from six watts to 90 watts; they are in fact direct mechanical replacements for earlier world K gear motors. A right-angle hypoid KII gearhead has also been developed for those applications requiring a smaller footprint. It has a higher load capacity than many other gearhead types and is used with the 200 watt, one-quarter-hp AC motor.

The intrinsic strength of the KII family was increased in order to significantly raise the AC gearmotor torque. Figure 1 displays a graph of the permissible torque of the parallel shaft construction KII vs. K gearheads, when mounted on a one-eighth-hp (90 watt), AC induction motor. For example, a 50:1 gear ratio shows a permissible torque value of 31 Nm (275 lb-in) vs. 20 Nm (177 lb-in) — an improvement of 55 percent for the KII parallel shaft gearhead. The superior performance increases at a 100:1 gear ratio to 40 Nm (354 lb-in) vs. the same 20 Nm (177 lb-in) — a 100 percent improvement for the KII gearhead over the conventional K gearhead. Both axial and radial shaft loads for the parallel shaft KII gearhead are at least twice the original K gearheads' capacity.

A similar comparison between the KII hypoid gearhead and the older K parallel shaft gearhead indicates a much larger permissible torque value. The performance difference for a 100:1

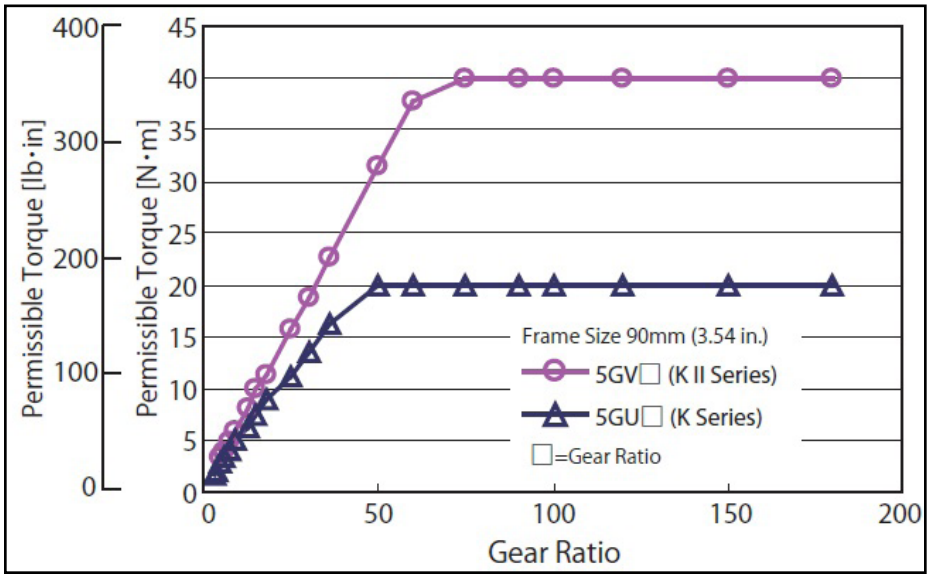



**Figure 1** Comparison maximum-permissible torque parallel shaft gearhead 90 W (⅛ hp).

gear ratio is 50 Nm (442 lb-in) for the KII hypoid gearhead over the K parallel shaft gearhead at 20 Nm (177 lb-in). It increases to 70 Nm (620 lb-in) the KII hypoid gearhead over the K parallel shaft gearhead, while maintaining its 350 percent advantage at 150:1 (Fig. 2). The radial and axial shaft loads for the KII hypoid gearhead exhibits similar improvement percentages over the conventional K gearhead.

What has been done to achieve these impressive improvements?

## New KII Parallel Gearhead Improvements

Two design changes have achieved the improvements within the new KII gearhead structure. First, the many internal gears receive a special carburizing heat treatment. By hardening only near the gear surface, tooth-bending strength and surface pressure strength are significantly improved; impact strength is also improved. Second, the KII gearhead family does not have a housing that supports the bearing via the retaining plates. Rather, its structure was revised so that a larger bearing is directly held within a gear case and gear flange. This enables the bearing diameter to be enlarged; see Figure 3 for KII parallel gearhead configuration.

Another manufacturing process adds a fine finishing treatment on the gear tooth surfaces. Compared to the K gearhead, the KII gearhead noise has been reduced by 6 dB due to this additional operation, shown in Figure 4. The noise testing was done on the 90 watt induction gear motor.

## Hypoid Gearhead

A hypoid geared motor is often used in applications because the gearmotor can be mounted perpendicularly to the motor drive shaft. The hypoid gearhead uses a small hypoid gear that interfaces to a smaller motor shaft gear. It then interfaces to a larger hypoid gear (Fig. 5).

A hypoid gear is in the same gear category as the worm gear in spiral bevel gearing. This is for using the largest possible bearings. The pitch circular diameter of the small gear is larger than the other right-angle gears.

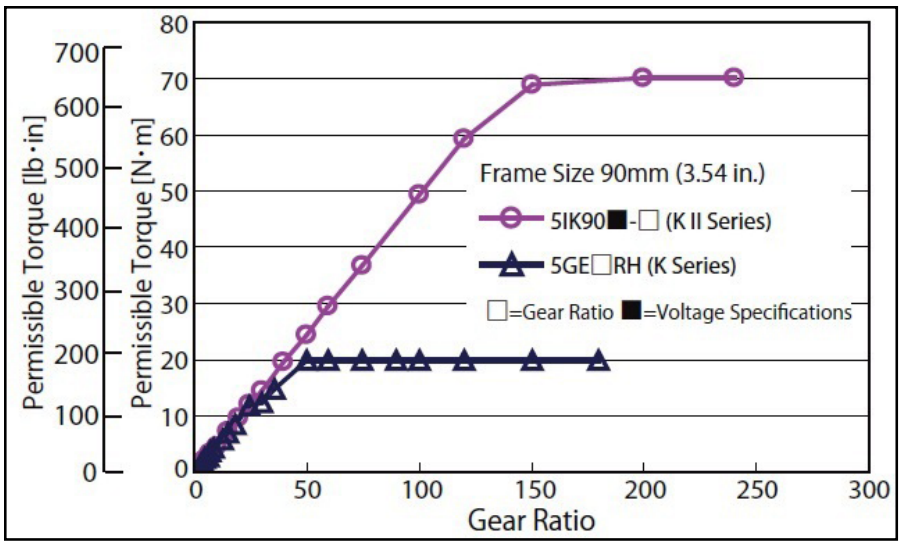



**Figure 2** Comparison maximum-permissible torque hypoid gearhead 90W (⅛ hp).

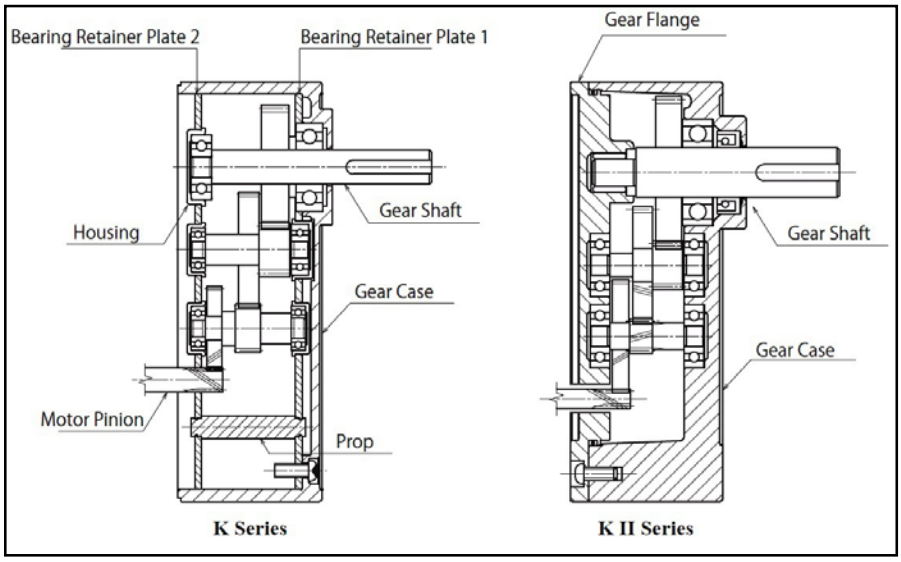



**Figure 3** Structural comparison of parallel shaft gearheads.

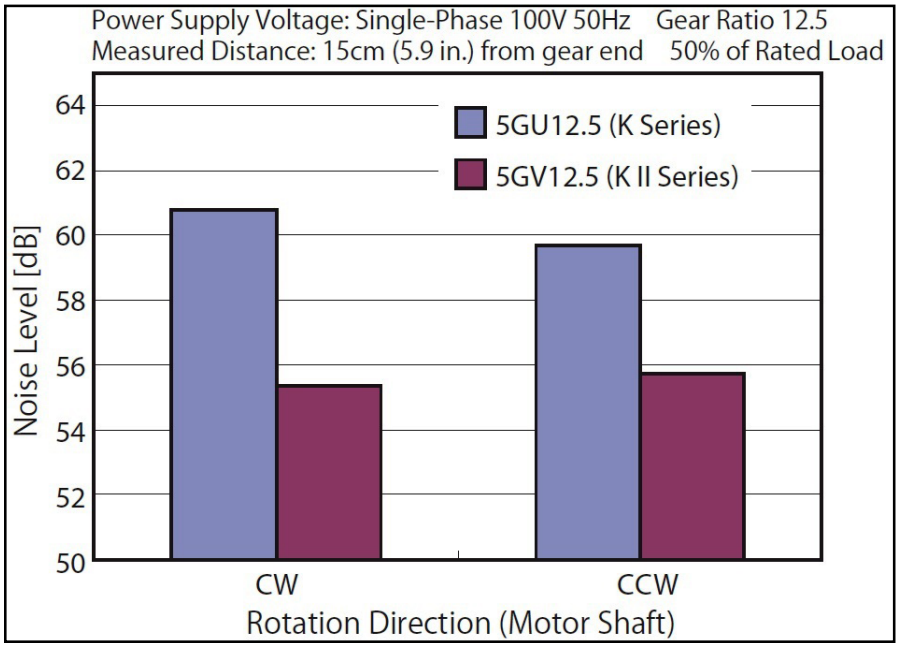



**Figure 4** Noise level comparison of parallel shaft gearhead 90W (⅛ hp).

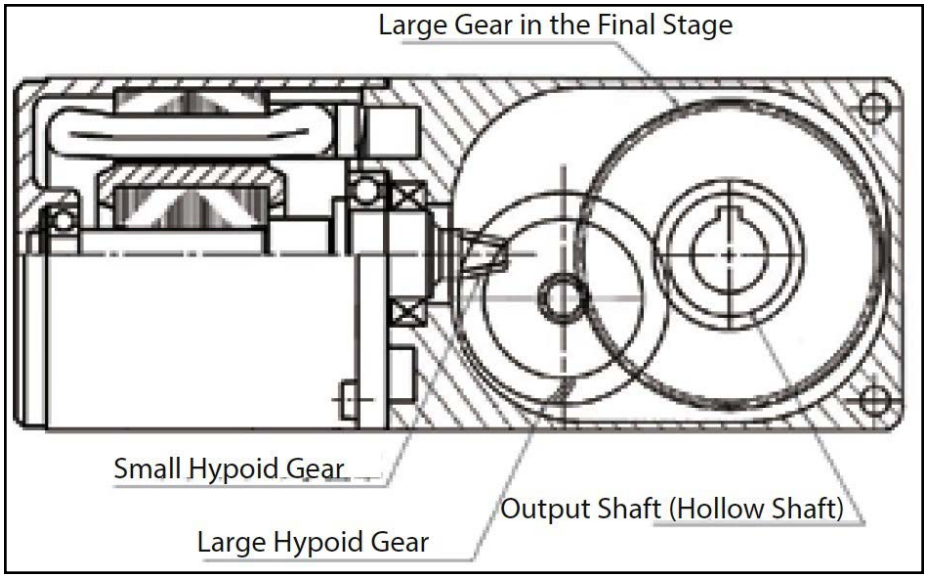



**Figure 5** Structural drawing of hypoid gearmotor.

Therefore the small hypoid gear (that is larger than the worm and bevel types) offers more strength and a higher meshing ratio. It is also possible to increase the hypoid gear ratio by reducing the number of teeth on the small gear. In the areas where the two gears mesh/slide extensively is a complicated motion. The hypoid gearhead's advantages include higher gear strength, higher gear ratios, and higher transmission efficiency. This does result in a higher manufacturing cost.

## Extending Motor Life

The new construction revisions for the KII gearhead have improved the operating life to 10,000 hours, or twice as long as the original K family gearheads. The KII hypoid gearhead requires a more comprehensive solution. There are two major causes of leaking lubricating grease. One is due to worn seal lips; the other is due to performance degradation caused by highly repetative bidirectional operation. In order to prevent the grease from leaking, highly reliable oil seals are installed in three areas including the I/O shaft location (Fig. 5). The new seal structure for the hypoid gearhead is designed to operate for 10,000 hours.

The KII family redesigns have significantly improved overall torque and power performance, including development of the KII hypoid gearhead for much larger application loads. The doubling of the KII gearmotor's operating life has been well received by the industrial equipment maufacturers.

**For more information:**
Oriental Motor Company
Phone: (310) 715-3300
*www.orientalmotor.com*

**Dan Jones** received his B.S. degree in electrical engineering from Hofstra University and a M.S. degree in mathematics from Adelphi University. He has since 1962 been a chief engineer and staff engineer with numerous companies. Either as a direct employee or consultant, he has applied his technical skills and experience working on DC motors, step motors, AC motors, brush and brushless motors, electronic drives, and on control systems in applications for the military, industrial, and commercial markets. Jones is a former president of the Association of International Motion Engineers (AIME) and has served on the Board of Directors of the Small Motor Manufacturers Association (SMMA). Jones is now president of Incremotion Associates, a firm combining the capabilities of engineers and marketing focusing on the motion control and power conversion industries.

# Pittman

## OFFERS COMPACT ENCODERS FOR OEM DESIGNS


The new Pittman E21 family of 21 mm optical incremental encoders satisfy the demands of volume OEM precision-motion control applications. The E21 represents a huge improvement over its predecessor with a 40 percent lower profile, multichannel outputs and options yielding up to 32 times the resolution and up to 24 times the frequency response. Creative packaging also makes this an economical drop-in replacement for other encoder providers.

The E21C and E21D encoders are 5 V, two and three channel optical encoders available in many different configurations. This modular encoder package comes in a compact size with alternate mounting arrangements. Connections are available in a locking radial or optional axial connector in addition to standard radial. The E21C and E21D encoders operate from -20 to +85°C and weigh only 2.5 grams.

The E21C encoder has resolutions of 120, 125, 128, 200, 250, 256, 300 and 360 CPR. It outputs two-channel quadrature signals that are TTL compatible and available with optional complimentary channels. Operating frequency is 40 kHz (100 to 360 CPR).

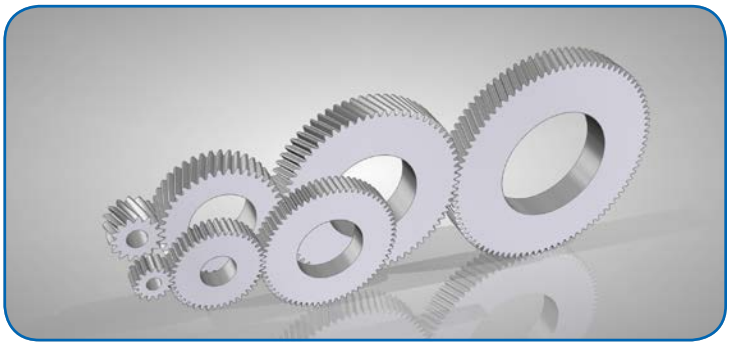
The E21D has resolutions of 500, 512, 1000, 1024, 1600, 2000, 2048, 3200, 4000, 4096, 6400, 8000 or 8192. It outputs two-channel quadrature signals that are TTL compatible with an optional third channel index output. Complementary outputs also are available. Operating frequency is from 55 kHz to 960 kHz depending on resolution.

The E21C and E21D encoders are available in kit form and adapt easily to many Pittman motors. The E21 will fit shafts of different diameters up to 5 mm. Prototype encoders are available now on request.

**For more information:**
Pittman Motors (Ametek, Inc.)
Phone: (267) 933-2105
*www.pittman-motors.com*

# GWJ Technology GmbH

## OFFERS NEW CALCULATION MODULES FOR CYLINDRICAL GEARS



GWJ Technology GmbH, a manufacturer of calculation software for machine elements and gearboxes, has upgraded its web-based calculation software *eAssistant* — the engineering assistant — with two new modules for cylindrical gears. Brand-new modules are the modules for three- and four-gear train systems. These modules allow a fast and easy calculation of geartrain systems with three or four spur or helical gears.

The new modules have all typical functions of the *eAssistant* cylindrical gear pair module to determine the geometry. To calculate the load capacity, the standards DIN 3990 and ISO 6336 are available. Alternating stress of the tooth root is automatically taken into account for the intermediate gears. Furthermore, there are new versions of the popular *eAssistant* 3D CAD plugins for *Solidworks*, *Solid Edge* and *Autodesk Inventor*.

The plugins enable the user to open all *eAssistant* calculation modules directly through the CAD menu. At the push of a button, the part, including the accurate gear tooth form, can be created as a 3D part on the basis of the previously calculated data. With just one click, the design table with all manufacturing details of the gear can be placed on the manufacturing drawing. The appearance and size of that table is individually configurable. In addition, *eAssistant* supports the output format DXF.

The *eAssistant* software allows calculation, design and optimization of machine elements, including shafts, bearings, gears, bevel gears, shaft-hub connections, bolted joints, timing belts and springs.

The software is available in a variety of pricing plans, including pay-as-you-go plans that allow the purchase of blocks of time on the system. Interested individuals can apply online for a free test account, which allows up to five hours of credit to try it out. Visit *www.eassistant.eu* for more information.

**For more information:**
GWJ Technology GmbH
Phone: +49 (0) 531-129 399-0
*www.gwj.de*

# Brother Gearmotors

## UPGRADE CONDUIT BOXES FOR EASY INSTALLATION

Brother Gearmotors, a division of Brother International Corporation that offers a wide range of ultra-reliable, sub-fractional AC gearmotors and reducers for the food and beverage, packaging and material handling industries, is introducing new, larger conduit boxes – complete with stud type terminal blocks – as a standard offering for its 1–3 horsepower gearmotors.

All orders placed after July 1 will come with the next-generation conduit box and stud type terminal blocks. The upgrade replaces existing E-Boxes and features several important benefits including increased efficiency, easier wiring, quicker installations and greater flexibility.

All Brother gearmotors in the 1–3 hp range are compliant with the new government (DOE) mandate for small electric motors that took effect June 1, 2016.

"We anticipate complete satisfaction with our new conduit boxes, and believe their efficiency and flexibility will enhance our customers' experience with Brother's high-efficiency, hypoid bevel gearmotors," said Matthew Roberson, senior director of Brother Gearmotors.

**For more information:**
Brother Gearmotors
Phone: (866) 523-6283
*www.brother-usa.com/gearmotors*

# Ruland Beam Couplings

## BENEFIT STEPPER- AND SERVO-DRIVEN SYSTEMS

Ruland beam couplings are designed to couple stepper and servo motors to encoders, lead screws, and light duty actuators in a variety of industries. They are zero-backlash, have high torsional stiffness, accommodate all forms of misalignment and have a balanced design creating a highly accurate and flexible coupling.

Stepper and servo driven systems benefit from the multiple beam design of Ruland couplings. They consist of two overlapping spiral cuts to increase torque capabilities and torsional stiffness when compared to the commodity style single beam coupling. Separating the spiral cuts into two sets gives the coupling better parallel misalignment capabilities while easily accommodating angular, complex, and axial misalignment.

Ruland beam couplings are available with four or six beams in inch, metric, and inch to metric bore combinations ranging from 3/32" (3 mm) to 3/4" (20 mm). Four beam couplings are more flexible with lower bearing loads and are ideal for encoders while six beam couplings feature a larger body size with shorter spiral cuts to provide increased torque capability, repeatability, and torsional stiffness. Ruland manufactures beam couplings in 7075 aluminum for improved flexibility and low inertia or 303 stainless steel for higher torque capacity.

All Ruland beam couplings are designed and manufactured in our Marlborough, Massachusetts factory. They are made from select North American bar stock and utilize metric fastening hardware that tests beyond DIN 912 12.9 standards. Beam couplings are RoHS2 and Reach compliant.

**For more information:**
Ruland Manufacturing Co., Inc.
Phone: (508) 485-1000
*www.ruland.com*

# KISSsoft

## INTRODUCES RAPID 3D MODELING IN KISSSYS

Modeling in *KISSsys* has been radically simplified in the latest *KISSsoft Release 03/2016*. Now, for example, when elements are added, the part geometries are prefilled with default values. At the same time, the shafts are positioned intelligently, to suit the gearing types involved, such as cylindrical gear pair, bevel gear or planetary stage. The user can now see the modeling progress immediately in the 3D view. Another new feature is the option of adding assemblies (such as planetary stages) to a model, and also adding shafts, if required. Would you like to find out more about *KISSsys* functionalities for quickly sizing entire drivetrains? Training courses (held in English) e.g. Basic Training, which runs from August 30 to September 1, and Planetary Stage Gearboxes, which runs from December 6–7, are the ideal opportunities to attend and learn from KISSsoft software experts.

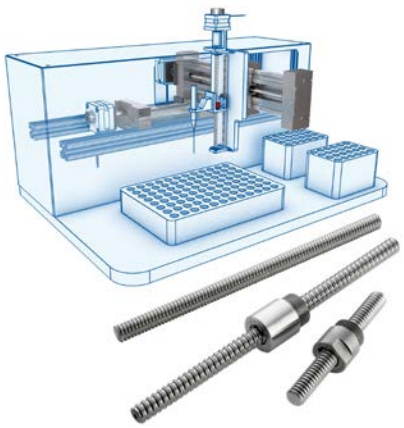
**For more information:**
KISSsoft USA LLC.
Phone: (815) 363-8823
*www.kisssoft.com*

# Thomson Industries

## EXPANDS MINIATURE METRIC BALL NUT STYLES

Thomson Industries, Inc., a manufacturer of mechanical motion control solutions, has built upon its selection of miniature metric precision ball screws to include three common interface styles: flanged, threaded and rounded. This comprehensive offering equips customers with even more options when designing small-space applications. These metric ball screws deliver a host of performance, supply chain and pricing benefits for users seeking smooth, quiet operation and best-in-class load capacities and lifecycles.

Joining the family's threaded style (TSI) mounting interface are flanged (FSI) and rounded (RSI) styles, which benefit from a unique multi-liner ball return system that provides smooth operation and increased load capacity. Ideal for laboratory, medical and mechatronics components, the miniature metric ball screws are available in a wide range of standardized diameters (Ø6 mm–Ø14 mm) to create a truly flexible solution. Though small in stature, they have been known to achieve twice the capacity of comparable models in most sizes.



With North American manufacturing and logistics, Thomson is able to provide customers with shorter lead times and lower-cost logistics. "Our state-of-the-art production facility precision-manufactures ball screws that help our customers design faster, safer and more optimized products for their customers," said Jeff Johnson, global product line manager – screws for Thomson. "We're also able to custom-machine screws and nuts within a matter of weeks to help meet customers' tight production schedules."

**For more information:**
Thomson Industries, Inc.
Phone: (540) 633-3549
*www.thomsonlinear.com*

# Force Control Industries

## POSIDYNE CLUTCH BRAKES REDUCE MOTOR SHAFT AND KEYWAY DAMAGE

Posidyne long coupled C-Face clutch brakes from Force Control Industries are an excellent option for high cycle (50 to 300 CPM) applications because they eliminate the damage to keyways and motor shafts that commonly occur. When indexing with a clutch brake, each clutch engagement transfers a torque spike to the connection between the motor shaft and the input shaft of the clutch brake. High cycle applications can cause continuous, severe, hammering on the shaft connection of the motor to the clutch brake. For convenience and ease of assembly, a standard C-Face connection is often used. In this arrangement, the motor shaft installs into the hollow bore of the clutch brake input shaft. However, the loose fit required for ease of assembly causes all of the torque to transfer through the key and keyway, resulting is early failure. A coupling that is shrink fitted or clamped to both shafts for a 360° connection transfers the torque through the shaft and not just the key. The long coupled Posidyne clutch brake offers both the simplicity of C-Face mounting, and the tight fitting coupling.

Posidyne clutch brakes feature oil shear technology that allow rapid and precise stopping, starting, reversing, speed change and positioning – all without adjustment and virtually no maintenance. Ideal for applications with frequent start/stop cycles, these unique motion control devices allow higher cycle rates (as high as 300 cycles per minute), increased production rates, all while reducing downtime. Higher production rates coupled with significantly longer service life than traditional (dry) clutch/brakes (five to 10 times longer in many cases) yields increased uptime, and improved productivity. No adjustment, virtually no maintenance, multi-year service life, minimal parts inventory, reduced parts and replacement ordering cost, adds up to higher production at significantly lower maintenance costs.

Designed with low inertia cycling components makes the Posidyne clutch brake more efficient, requiring less motor horsepower to accelerate the load, and less torque to stop the load. Their totally enclosed design is impervious to dust, chips, chemicals, coolants, caustic washdown, weather, and more, making them ideal for hostile environments.

**For more information:**
Force Control Industries
Phone: (513) 868-0900
*www.forcecontrol.com*

# Leine and Linde

## ENCODERS OFFER SPEED MONITORING

The Leine and Linde 1000 series rotary encoder with speed monitoring capabilities is used in applications where secure speed feedback is critical in order to protect motors, machinery or operators from risk of failure. This is especially useful on heavy moving machinery such as hoists, lifts, cranes and mining equipment, to name a few.

Leine and Linde's overspeed electronics on the 1000 series consist of a speed detection system that senses rotational speed and direction. These electronics control three different relay switches which can be programmed for identification of critical speeds or errors in direction. In addition, a fourth relay can be set to detect overspeed conditions, or be set to detect any functional error in the unit itself.

As critical speeds can vary for different applications, the ability to program application specific set-points offers considerable flexibility. With this capability, a standard 1000 series encoder with overspeed electronics can be supplied and programmed for each installation. Speed limits can be set for direction, over and under speed from 0 to 6,000 rpm. PC-based software is provided to configure the encoder using a standard USB port.

**For more information:**
Leine and Linde (Heidenhain)
Phone: (805) 562-1160
*www.heidenhain.us*

# SG Transmission

DESIGNS AND MANUFACTURES
PERMANENT MAGNETIC CLUTCH

SG Transmission has designed and manufactured a permanent magnetic clutch for a global, medical device manufacturer, replacing the need for a brake and clutch saving money and weight.

The fail-safe clutch utilizes rare earth permanent magnets to generate the magnetic field keeping the clutch engaged, should the power fail. The innovative clutch was designed for a blue chip manufacturer to replace the existing clutch in a drive mechanism, which needed power to engage the clutch.

The existing configuration could, in the event of power failure, allow the mechanism to potentially become free moving in an uncontrolled manner. Standard practice would be to use a fail-safe brake in this arrangement to control the free movement, which would create an additional cost.

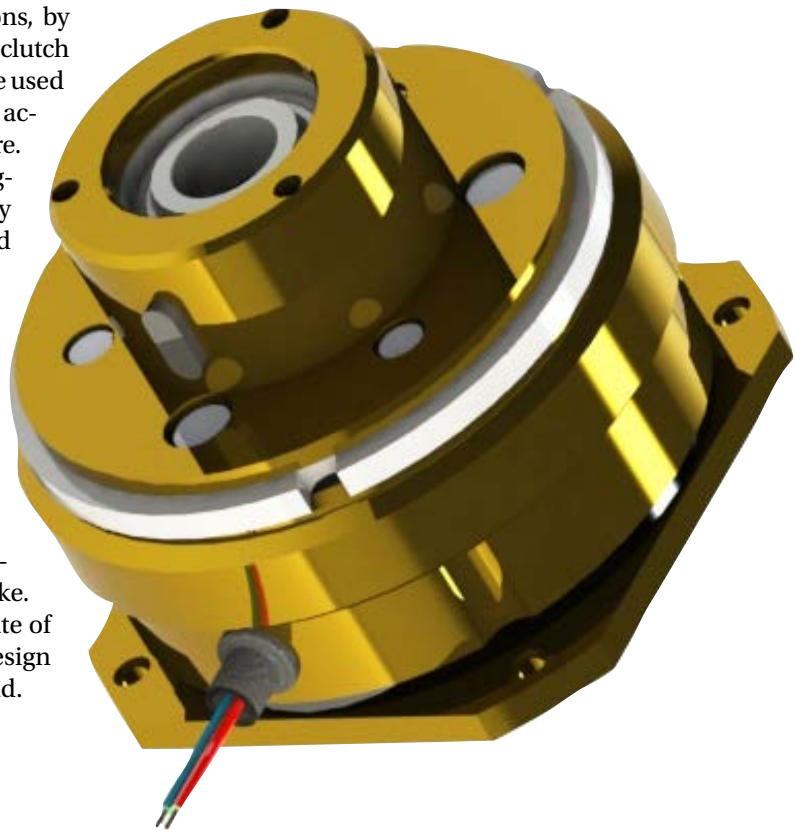
The innovative permanent magnetic clutch has the potential to replace both components and not only save space, weight and part count, but there is also a cost saving.

Paul Short, technical manager, said: "If the drive system uses a gearbox where the output shaft cannot be 'back driven' then, in some applications, by employing a permanent magnet clutch this mechanical advantage can be used to provide a positive stop/hold action in the event of a power failure. Therefore, the permanent magnetic clutch is suitable for many sectors including medical and military, where a permanently engaged clutch would be advantageous."

SG Transmission is one of the only U.K. electromagnetic clutch and brake manufacturers to offer the permanent magnetic clutch to a global portfolio. Earlier this year, SG Transmission launched the ultra-slim permanent magnetic brake. The manufacturer operates a state of the art facility and in-house design office in the north east of England.

**For more information:**
SG Transmission
Phone: +44 (0) 1388 770
*www.sgtransmission.com*





# Amacoil/Uhing

## INTRODUCES LINEAR MOTION SYSTEM

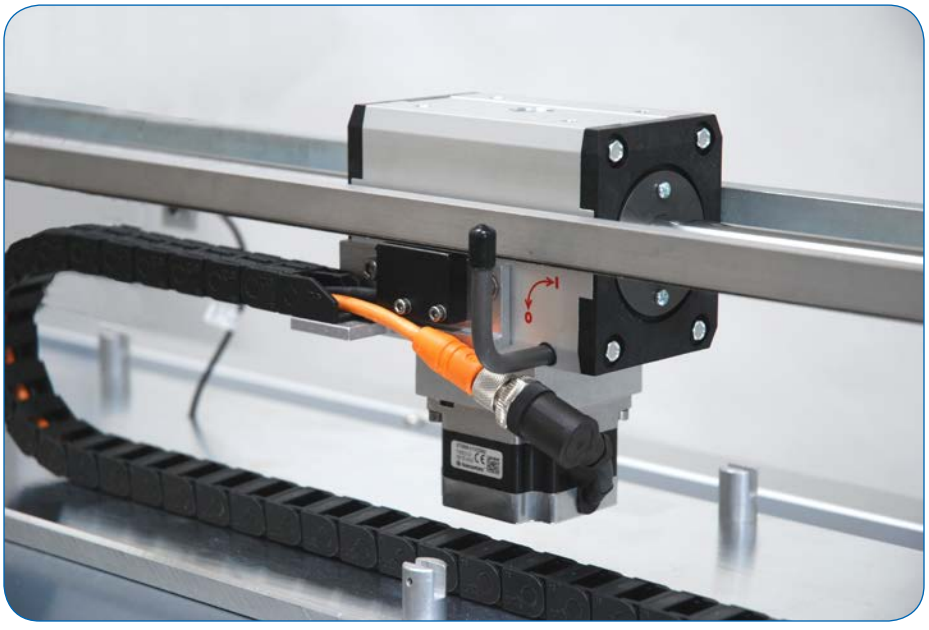
New from Amacoil/Uhing is the Precision Motion Drive System. This is a Model RG rolling ring linear drive integrated with a motion controller for precision linear motion applications. The Precision Motion Drive is fully programmable and meets application requirements for precision winding/spooling, pick-and-place machines, X-Y coordinate tool movement, metrology equipment and other machinery providing fast, accurate positioning and reciprocating linear motion. Depending on the size of the RG drive nut in the system, the Precision Motion Drive System provides from 7 to 800 pounds of axial thrust.

Linear movement of the drive head is defined via software and monitored by sensors feeding back to the electronic control unit. The Precision Motion Drive stores up to 20 programs which are easily recalled at the touch of a button. While meeting application requirements for most precision linear movement applications, the system is especially well suited for precision winding of a wide range of materials including wire/cable, PVC tubing, string, fiber, rope, rubber hose and vinyl strips. The new system also handles custom winding patterns and irregularly shaped spools.

The Precision Motion Drive System offers virtually unlimited flexibility with regard to specialized linear movement of the drive nut. Stop/start, travel direction, linear pitch, travel speed, repetitive processes, ramp up/down and essentially all other variables pertaining to drive nut movement may be programed into the system to meet application requirements. A single system may be set up to control multiple stations making it unnecessary to invest in multiple systems in order to help sustain high production rates.

A stepper motor controlled by a Siemens S7 PLC is included in the package. Fast, simple operation is enhanced with intuitive prompts displayed on a touch screen control panel. The shaft on which the Precision Motion Drive runs is smooth case hardened steel. There are no threads which makes the system useful in applications where particulate contaminants could fall into threads causing jams or clogs. The shaft rotates in one direction only. Drive nut travel direction, linear pitch and other motion parameters are controlled by the angle of the rolling ring bearings inside the drive unit. The angling and pivoting of the rolling rings is, in turn, controlled by user programming.

**For more information:**
Amacoil, Inc.
Phone: (610) 485-8300
*www.amacoil.com*



# Alliance Sensors

## EXPANDS PRODUCT OFFERING WITH LR-19 INDUCTIVE LINEAR POSITION SENSORS

H. G. Schaevitz LLC Alliance Sensors Group has expanded its sensor product offering by adding a line of LR-19 Series Inductive Linear Position Sensors using LVIT Technology; contactless devices designed for factory automation and a variety of industrial or commercial applications such as motor sport vehicles, automotive testing, solar cell positioners, wind turbine prop pitch and brake position, and packaging

equipment. With their compact design and excellent stroke-to-length ratio, LR-19 sensors are ideal for both industrial testing laboratories and OEM applications. Operating from a variety of DC voltages, the LR-19 series offer a choice of four analog outputs and all include ASG's proprietary SenSet field recalibration feature. The LR series also includes two larger body versions, the LR-27 and LRL-27, for those applications needing a heavier duty unit and a spring loaded version called the LRS-18. Technical data sheets and additional information can be found at the website below.

**For more information:**
H. G. Schaevitz LLC, Alliance Sensors Group
Phone: (856) 727-0250
*www.alliancesensors.com*

# Haydon Kerk Motion Solutions

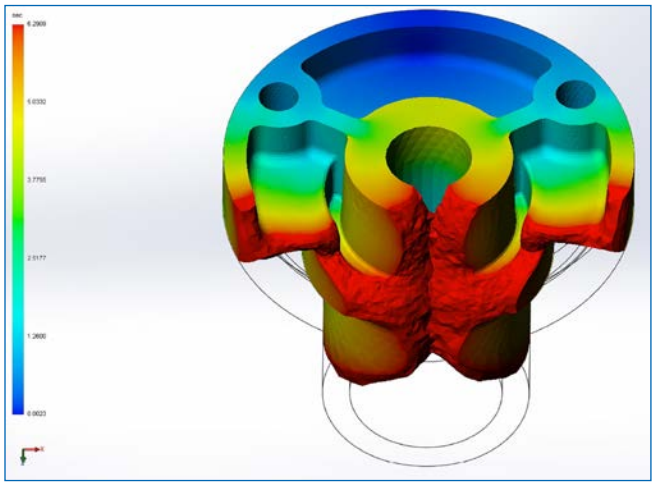
## ADDS MOLD FLOW ANALYSIS SOFTWARE TO LINEAR MOTION SOLUTIONS

Haydon Kerk Motion Solutions recently added a powerful mold flow analysis software to help with the design of custom-molded lead screw and linear motion components. *Solid Works Plastic Professional* is an engineering tool used by Haydon Kerk's experienced tooling engineers to help speed up the design process and offer customized solutions to fit customer's application needs.

The use of mold flow analysis helps engineers run critical calculations to expedite the design of custom part and mold features, such as gate location, parting line location, design geometry, material flow, fiber alignment, vent locations, weld-line analysis, and cooling-line locations. All of these design considerations affect custom parts in areas such as ease in part strength, reduction in part voids/improved fill, reduction in cooling/cycle times, reduction in material waste and more.

Haydon Kerk's experience with the use of over 60 molded materials, including the Kerkite composites, PEEK and PPS base materials, combined with the capabilities of this new software, allows engineers to reduce the time required for the design and build process for custom molds. The combination of on-site tooling and molding machines also reduces the time to production for custom parts for existing Haydon Kerk polymers or customer-specified materials.

**For more information:**
Haydon Kerk Motion Solutions
Phone: (203) 756-7441
*www.haydonkerk.com*



Haydon Kerk has added mold flow analysis software to help with the design of lead screw and linear motion components.