

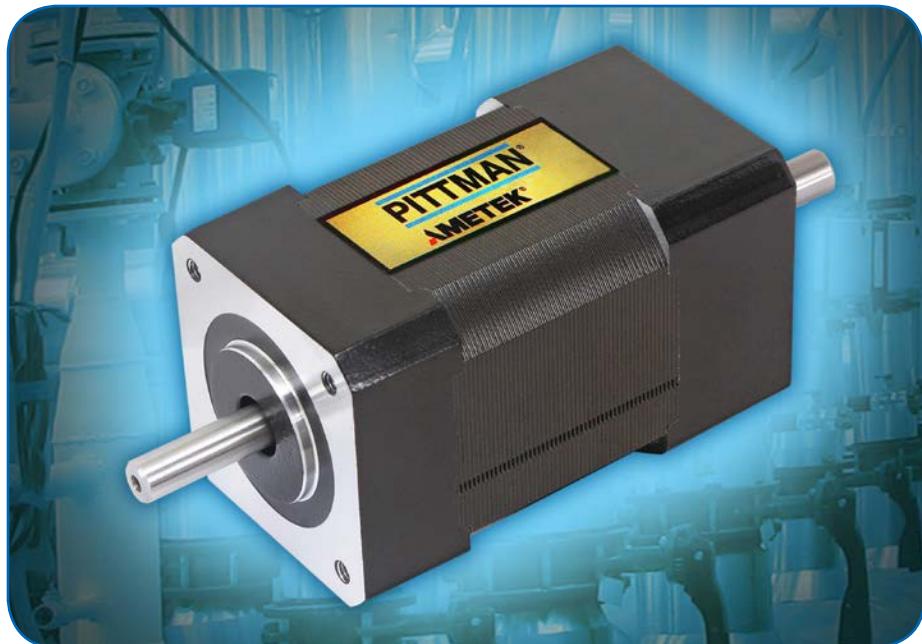
Pittman Motors EC042B Brushless DC Motor

DESIGNED AS AN ECONOMICAL, HIGH-PERFORMANCE GENERAL PURPOSE SERVO MOTOR

Pittman Motors recently introduced the EC042B brushless DC motor series, its latest DC brushless motor.

The high torque density model is designed as an economical, yet higher performance, general purpose servo motor. Its Nema 17 mounting configuration is adaptable to most metric mounting requirements.

The EC042B motor is available in three motor lengths with a continuous torque range of 11 Ncm - 31 Ncm and a peak torque range of 35 Ncm - 99 Ncm. The EC042B has a maximum speed of 9,000 RPM and can be used with DC bus voltages up to 96 volts. There are eight standard winding variations to suit most every application. Custom windings are available.



The EC042B's motor construction features a high-energy, 4-pole rotor with rare earth magnets for a high torque to inertia ratio. The stator assembly is designed with low-loss materials for higher-speed applications. The motor shaft is supported by shielded ball bearings that are preloaded for low vibration and quiet operation.

EC042B motors are available with optional Pittman PLG42S and PLG52S planetary gearboxes. Optical incremental encoders also are an option with line counts up to 2048, three channels, and line driver.

For more information:
Phone: (267) 933-2105
www.Pittman-Motors.com

Festo Bionic Learning Network

SHOWS OFF THREE NEW TECHNOLOGIES

Festo recently introduced featured developments for 2015 in the company's Bionic Learning Network—the basic research effort designed to use biomimicry and emerging technologies, like superconductors, to make automated processes even more efficient and productive.

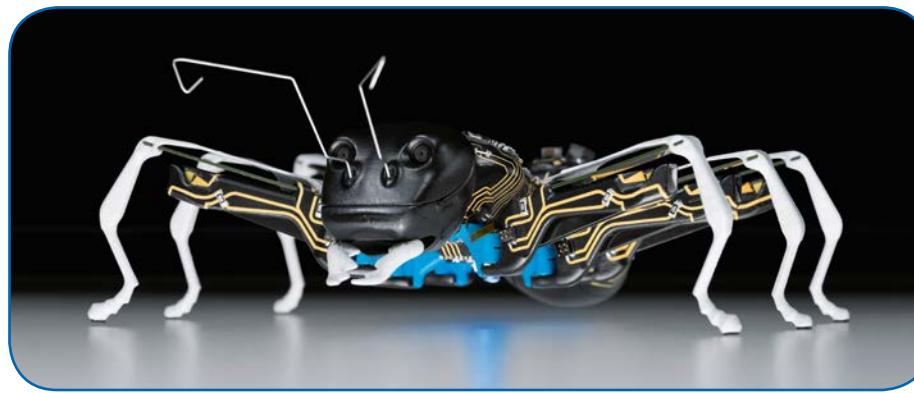
This year's projects were designed to illustrate how individual systems can

use communication to merge into an intelligent overall system, and how the intelligence of decentralized systems contributes to this process.

The technology carrier BionicANTS uses the cooperative behavior of ants as a model. Engineers from Festo used regulation algorithms to transfer the behavior of these insects to the world of technology. Just like their models

from nature, the BionicANTS cooperate in accordance with clearly defined rules. This enables the BionicANTS to react autonomously to different situations as individual units, to coordinate their behavior with each other, and to perform actions as a networked overall system. By pushing and pulling in a coordinated manner, BionicANTS shift loads that one ant could not move alone. All actions are based on a distributed catalog of rules that was devised in advance by means of mathematical model building and simulations and then programmed into each ant. The individual insects are thus able to make decisions autonomously, while nevertheless subordinating themselves to the common aim; each ant thus contributes its share to solving the task at hand.

The required exchange of information between the ants is conducted





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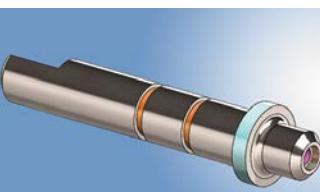
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via radio modules in each torso. The regulation strategy comprises a multi-agent system, in which the participants have equal rights. With the 3D stereo camera in their heads, the ants recognize an object to be grasped and can determine their own locations.

To manufacture BionicANTS, laser-sintered components are fitted with visible circuit structures in a Molded Interconnect Device (3D MID) process. The electrical circuitry is attached to the outer surface of the components, which assumes both a structural and an electrical function.

BionicANTS are fitted with piezo-ceramic bending transducers in their mouthparts for gripping objects, and also for their leg movements. When the upper bending transducer is deformed, the ant raises its leg. With a lower pair of piezo elements, each leg can be precisely moved forward or backwards.

The bionic butterflies likewise illustrate complex topics from the world of future production such as functional integration, ultra-lightweight construction, and real-time optimized networked communication between individual systems.

An external, networked guidance and monitoring system coordinates the individual eMotionButterflies autonomously and safely in three-dimensional space. The communication and sensor technology used constitutes an indoor GPS system that controls the butterflies' collective movement. The combination of integrated electronics and external camera technology using a host computer ensures process stability. To emulate the flight behavior of butterflies as closely as possible, the artificial butterflies are fitted with integrated electronics. These control the wings precisely and individually to effect the rapid flight movements.

A human pilot is not required to control the eMotionButterflies. Pre-programmed flight paths for the bionic

butterflies' maneuvers are stored on the host computer. By means of additionally stored behavior patterns, however, they can also fly autonomously. In this case, there is no direct communication between the eMotionButterflies. In devising the control system for the artificial butterflies, the developers benefited from the knowledge gained with the projects involving the BionicOpter and the eMotionSpheres. The indoor GPS that was already used for the hovering spheres was further developed for the eMotionButterflies with regard to the image rate of the cameras.

In close cooperation with the University of Oslo, Festo is now presenting the FlexShapeGripper with a working principle derived from the chameleon's tongue.

The FlexShapeGripper can grip, collect and release several objects of different shapes in one process without the need for manual conversion. This is made possible by its water-filled silicone cap, which wraps itself around the items being gripped in a flexible, form-fitting manner. This ability to adapt to different shapes gives the FlexShapeGripper its name. The holding and release mechanisms both operate pneumatically. No additional energy is required for the holding process. The yielding nature of compressible air facilitates the coordination of the handling and the gripper during the grasping process.

The FlexShapeGripper is designed for situations where differently shaped objects are to be handled simultaneously; for example, in service robotics, in assembly tasks, or in the handling of small components. The bionic model demonstrates approaches for new solutions in gripping technology with the help of pack-and-place processes and makes manufacturing units more flexible and adaptable.

For more information:
Festo Corporation
www.festo.us



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JVL Hollow Core Rotary Actuators

AVAILABLE WITH MIS231 INTEGRATED STEPPER OR SERVO MOTOR

JVL recently introduced six hollow core rotary actuators. These integrated rotary actuators are available in two table sizes: the HDCT-100 and the HDCT-130, and each with a choice of three motors. An optional sensor kit, and control modules such as Profibus, Devicenet and Ethernet, and point-and-click programming are designed

to allow for easy integration into new and existing applications.

Each of the hollow core rotary actuators is available either with the MIS231 integrated stepper or with an integrated servo motor, the MAC140 or MAC400. The table diameter and hollow core of the HDCT-100 is 95 mm (3.74 in.) and 29 mm (1.14 in.) and the table diam-



eter and hollow core of the HDCT-130 are 120 mm (4.72 in.) and 35 mm (1.38 in.). Mounted in any position, these rotary actuators are designed for manufacturing, inspection, positioning, research, tracking, medical, and other applications.

The HDCT-100 has a nominal output torque of 6.8 Nm (963 oz-in.), max speed of 167 or 200 RPM (motor dependent), and axial load of 150 N (33.7 lbs.). The HDCT-130 has a nominal output torque of 12 Nm (1699 oz-in.), max speed of 167 or 200 RPM (motor dependent), and axial load of 200 N (45 lbs.). Each of these low cost, precision hollow rotary actuators has repetitive positioning accuracy of ± 15 arcsec, runout of table surface ± 0.015 mm (.00059 in.), and parallelism of platform ± 0.03 mm (.001 in.).

For more information:

Phone: +45 4582-4440
www.jvlusa.com



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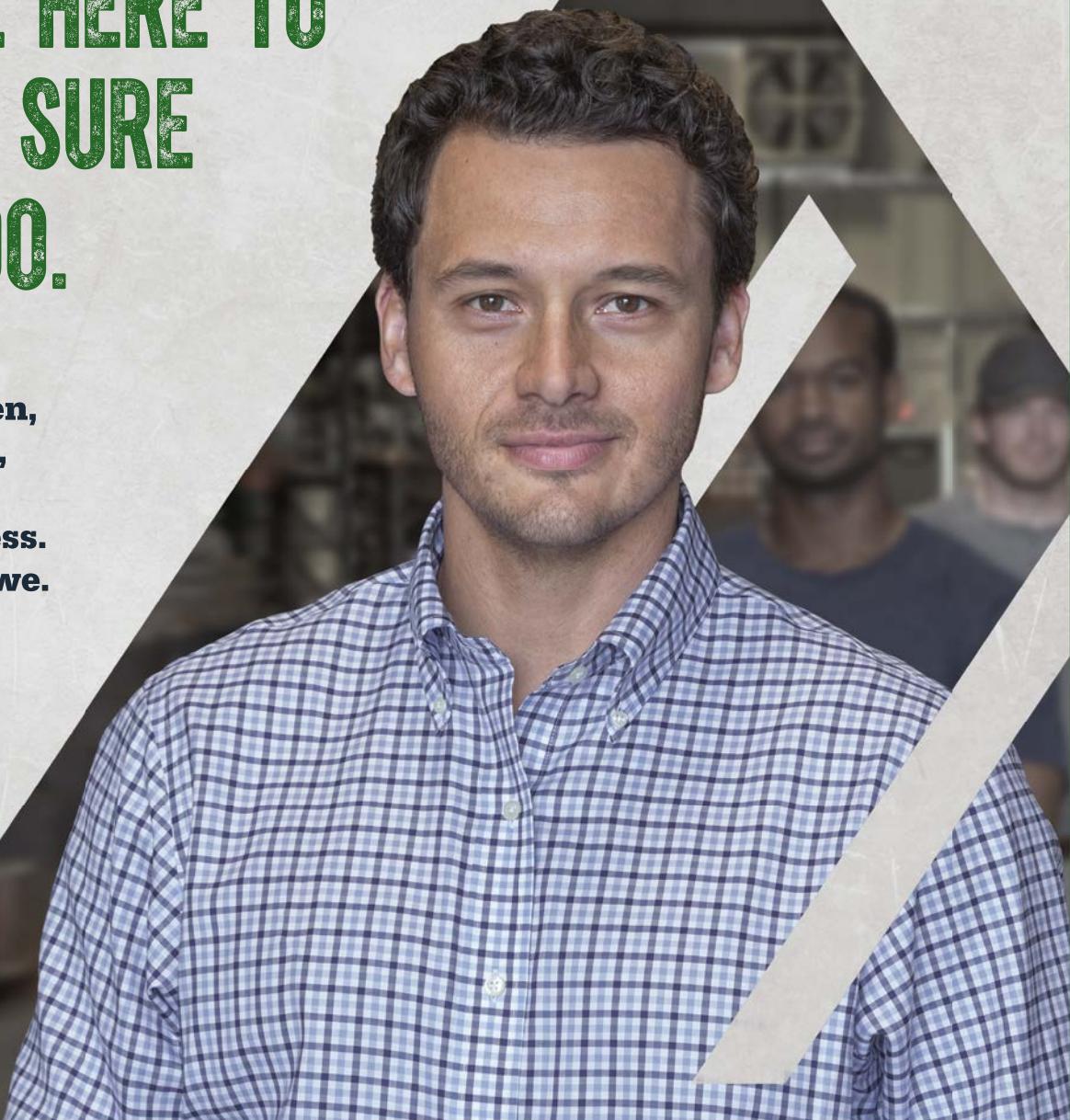
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SKF Spindle Assessment Kit

DETECTS SPINDLE UNBALANCE CONDITIONS

The SKF Spindle Assessment Kit provides an easy way to measure and interpret key spindle operating data to help users detect developing problems before they can escalate. Designed for use after a spindle is assembled and installed in a machine tool, the kit can help OEMs or quality control staff to validate performance indicators, including vibration, thermal behavior, running accuracy, and natural frequency, among others. The kit also can detect spindle unbalance conditions and assist in understanding resonance frequency, which is essential to cutting quality. The kit delivers cost-effective condition monitoring technology to help avoid spindle downtime and increase machine tool uptime.

The SKF Spindle Assessment Kit includes three programs: spindle test module, balancing module (for fine tuning) and RUCD (Run Up Coast Down) module (to test resonance frequency). The spindle test module provides nine condition tests: imbalance and balancing (vibration), bearing condition (vibration), mechanical condition (vibration), resonance frequency, speed accuracy, belt tension, tool nose run out, EM distance and clamp force.

The complete kit consists of a portable SKF Microlog Analyzer, acceleration sensor, laser tachometer, dial gauge with gauge stand, belt tension gauge, and a spindle-specific software package preconfigured to convert measured data into intuitive green-amber-red ("traffic light") color-coded results.

The kit provides step-by-step instructions and features lightweight ergonomic design, extended battery life, easy operation function keys, and rugged and water-resistant design. Automatic analysis of spindle condition will indicate possible faults, imbalance, and bearing defects, among other operating problems.

For more information:

Phone: (267) 436-6723
www.skfusa.com



Rexroth EMC HD Electromechanical Cylinders

OFFER SUPERIOR HEAVY LOAD CONTROL

Rexroth recently introduced the EMC Heavy Duty (HD) electromechanical cylinders, designed to make the benefits of advanced control technology available, even at high forces. The ready-to-install units are suitable for machinery and equipment as well as for outdoor use. Users can integrate them for intelligent energy management, thus reducing power consumption and CO₂ emissions.

Force, position and speed are designed to be parameterized by the

user and adapted at all times to new tasks via the drive system. Without an additional position sensor, the EMC-HD achieves a repeatability accuracy of up to ± 0.01 mm, and they do so for any number of selectable positions within the travel range of up to 1,200 mm. The electromechanical cylinders for heavy loads are driven either by ball or planetary screw assemblies, depending on the



Boston Gear 700 Series Speed Reducers

DESIGNED FOR CORROSION RESISTANCE

Catalogued models of Boston Gear's stainless steel 700 Series speed reducers are now available with standard two-day delivery.

Boston Gear's SS700 Series, the original "domed crown" stainless steel reducers, are designed for corrosion resistance and high-pressure food processing and packaging washdown applications.

All SS700 models are NSF Certified and have maintenance features including electropolished exterior finish, sealed motor flange, and covered hardware. To prevent minuscule niches that can host microbial contamination, the nameplate has been laser marked to provide a smooth uninterrupted surface. An internal oil reservoir, filled with H1 food-grade lubricant (Klubersynth UH 1 6-460) and sealed for life, allows for use under a range of operating temperatures and extended service life.

For more information:

Phone: (704) 588-5610
www.bostongearss700.com



dynamic and power requirements.

The high-precision, backlash-free preloaded Rexroth screw assemblies are offered in various sizes and leads economically cover a wide range of application demands. Rexroth offers the EMC-HD both as finished, purely mechanical axes as well as a complete system with precisely matched gears, servo motors and controllers from the IndraDrive product line.

For the installation of the heavy-duty cylinders, the user can choose from

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numerous mounting options reducing the construction and assembly work involved. The electromechanical solution does not require any additional components and incorporates space-saving machine designs.

Rexroth IndraDrive electromechanical servo drives offer numerous opportunities for intelligent energy management. The drives can regain and store braking energy.

The EMC-HD with IP65 protection

class is also suitable for outdoor use and operates reliably over a wide temperature range. The construction is designed to ensure a long lifespan, even under harsh environmental conditions. The sealing system protects the cylinder from wear resulting from exterior contamination.

For more information:

Phone: (717) 393-3831
www.boschrexroth.com

Nexen Group Versa Rack

AN ALTERNATIVE TO TRADITIONAL METAL RACKS

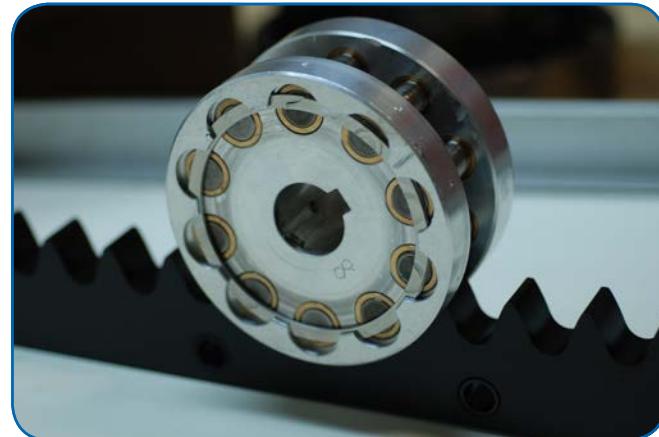
Nexen Group, Inc. recently introduced the Versa thermoplastic rack — an alternative to traditional metal racks that are designed to deliver high-corrosion resistance and durability, low maintenance requirements and medium accuracy and load-carrying capacity at a relatively low cost point. The Versa Rack is made for applications such as CNC routers and conveyors, as well as many picking, part-marking and gantry-based automation systems.

Made of self-lubricating polymer, the Versa Rack is able to run at full speed without additional lubrication. It can withstand washdown, outdoors operation (even in coastal climates with salty air) and other challenges, making it an option for usage in dirty environments, clean rooms and food/pharmaceutical production.

The Versa Rack features backlash less than 3.2 um and positional accuracy of ± 580 um, depending on the pinion selected. It can be used with any of Nexen's pinions — either its value pinion or its higher performance premium pinions. The Versa Rack withstands loads of 500 to 1200 Newtons depending on pinion size. The speed rating of value pinions and thermoplastic racks is 480 to 750 RPM and 2 m/s.

For more information:

Phone: (800) 843-7445
www.nexengroup.com



RSF Elektronik MSA 37x Feedback Encoder System

DESIGNED FOR MOTION APPLICATIONS

RSF Elektronik now offers a linear motion feedback encoder system that is designed for machines with loose mechanical motion during operation. Called the MSA 37x series, these encoders are designed for motion applications such as press brake and metal forming/bending machines, or any other type of machine that have significant flexure near the area requiring motion feedback.



Available in North America through Heidenhain Corporation, the MSA 37x series has a design that includes a bearing set internally for guiding the scanning optics, and a bearing set externally for the attachment of a cou-

pling rod that affixes to the machine, thereby allowing for measurement of the moving elements of the machine.

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Maxon EC 4 Brushless DC Motor

MEASURES JUST 4 MM IN DIAMETER

The EC 4 brushless DC motor is Maxon Motor's ultra-compact motor. As the smallest micromotor to come from them, the EC 4 is only 4 mm in diameter. It is available in two lengths, with power ratings of 0.5 and 1 W. Equipped with an ironless Maxon winding, the EC 4 has a robust design and high power density.

Combined with the matching GP 4 planetary gearbox, the EC 4 becomes a compact drive for use in micropumps, analytic and diagnostic devices, and laboratory robots. It can adjust lenses, dispense fluids, or position sensing devices. All units meet the ISO 13485 medical standard.

For more information:

Phone: (508) 677-0520
www.maxonmotorusa.com

Ringfeder Tschan TNR Elastic Couplings

OPTIMIZE TORSIONAL VIBRATION DURING OPERATION

Ringfeder Power Transmission recently introduced the Tschan TNR, a new model for highly elastic couplings. Unlike commonly used torsionally elastic shaft couplings, the TNR is adjustable and therefore allows for a smoother start-up of power transmissions. It also optimizes torsional vibration during operation. If it is mounted between the combustion engine and the trans-

fer box, for example, this novel, non-shiftable coupling is not just suited for mobile construction machines such as excavators, cranes and wheel loaders, but also for power generation wherever combustion engines such as emergency power units or mobile generators are used.

When internal combustion engines are employed, as is frequently the case

with Diesel engines, the power train is subject to dynamic stimuli. These manifest in torsional-vibration behavior and are caused periodically as gas and mass forces are excited. The actual dynamic behavior of the power train can be plotted mathematically by joining mass moments of inertia, damping and rigidity. It is, however, the stiffness and the mass moments of inertia of the entire power train that determine at which frequencies, i.e. rotations, the disruptions occur. The position of the lowest natural frequency is defined by the distribution of the mass moments of inertia of the rotating components and the smallest rigidity. When the excitation frequency and the natural frequency coincide, resonance is inevitable. By adjusting the mass moments of inertia and the rigidity of the coupling, both can be moved from service speed into the non-critical range.

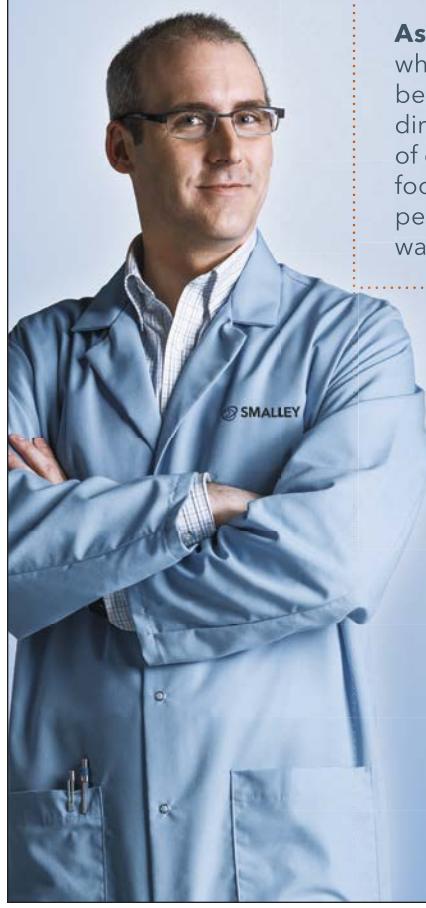
An example of the aforementioned behavior is the flywheel in diesel engines. Since the dimensions of flywheels are made with the fuel consumption and operating characteristics in mind, i.e. they are designed for the combustion process, it would be unwise to try to do anything at the vibration points on the drive side by using an additional mass moment of inertia. In practice, elastic couplings with a relatively low stiffness have stood their ground as the "problem solvers".

This is where the new Tschan TNR comes in. Due to its low stiffness, the shaft coupling influences the above-mentioned vibration points the most. The key figures of the coupling can now be adjusted on a larger scale and with little effort, while the outer dimensions remain the same. The coupling becomes "adjustable" because the elastic buffers are separated one from another and, as a result, are ordered in series. This requires a smart combination of available elastomers on one inner and one outer buffer plane.

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