

Power Transmission Engineering

Engineering Showcase 2015

One of our goals at *Power Transmission Engineering* is to help you understand, identify and select the best technology for your mechanical power transmission or motion control applications. With every project, you have to decide which components to use, and which suppliers, based on functionality, quality and price. We aim to help you make those decisions *informed* by providing the latest information on current technology, especially when it comes to mechanical components.

With that in mind, we are pleased to present our second annual Engineering Showcase, a celebration of some of the leading products and companies in mechanical power transmission. In the pages that follow, you'll find examples of engineering excellence and technological know-how in the field of gears, drives, couplings, machine parts and other mechanical components.

This guide is meant as a complement to our annual Buyers Guide and our permanent online directory of suppliers at powertransmission.com. In this special section, we have the opportunity to go into more depth in describing the products and capabilities that make each of these suppliers unique.

So please browse through the section and read about the latest these suppliers have to offer. If you have an upcoming project that matches their manufacturing capabilities, we're confident that giving one of them the opportunity to bid will be well worth your efforts.



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Precision Mechanical Components and Complete Engineered Solutions, Quality and Reliability for Over 5 Decades

Designatronics provides complete mechatronic engineered solutions and services. Through our brands, we develop comprehensive mechanical solutions in the markets we serve, such as aerospace and defense, automation, robotics, oil and gas, packaging, and medical. Applications include high-tech surveillance camera systems, satellites, UAVs, 3-D printers, diagnostic and medical devices.

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As a CNC manufacturer, we excel in every aspect of the process: milling, turning, grinding, and drilling. Our facility accommodates short runs to high-volume production runs.

We can machine in many materials including aluminum, brass, bronze, steel alloys, stainless steel, and titanium. An on-site Class 10,000 clean room is used for assembly and testing.

Our Credentials:

ISO-9001:2008 + AS9100C Registered

ITAR Compliant – DDTC Registered

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Boeing Certified

Stock Drive Products - Setting Ideas into Motion. SDP offers both inch and metric small off-the-shelf mechanical components. Thousands of components can be located and purchased in one convenient place. Find gears, timing belts and pulleys, couplings, bearings, shafts, gearheads, speed reducers, clutches, brakes, vibration and shock absorbers and other mechanical drive components.

Sterling Instrument - Your Partner in Innovation. SI continues to build their reputation as a premiere precision gear manufacturer; both standard and custom. Fine to medium pitch gears are manufactured to AGMA 14. Our expertise is not limited to gear making; it also includes the design and production of precision gear assemblies, gearboxes, differentials, speed reducers, and other motion control products.

QTC Metric Gears - Supplying North America with Metric Gears.

Over 20,000 metric dimensioned gears, Module 0.2 through Module 10 are available. Looking for a larger bore or keyway, modifications can be made quickly to meet your requirements.

Quality Bearings & Components - The Bearing Marketplace. Look to QBC for all your bearing requirements and bearing related services. QBC is a distributor of BEGA Special Tools for maintenance of bearings and other transmission components.

Contact us for customized design and technical support. Learn more at our web sites; shop 24/7, download free 3-D CAD models and the latest product information.



Designatronics INC.

Engineered Solutions for a World in Motion



2015 Engineering Showcase

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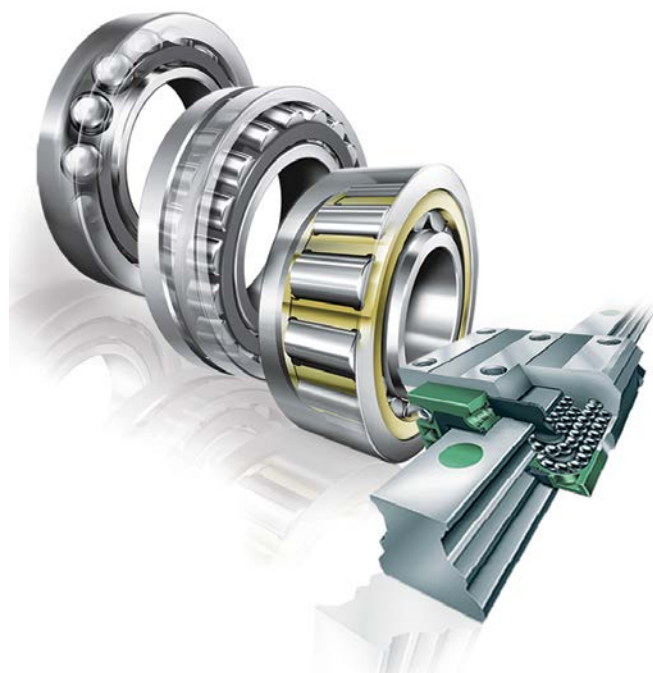
Forged from a History of Innovation and Industry Breakthroughs: The Right Solution for Every Bearing Position

When it comes to bearings, Schaeffler, together with our INA and FAG brands, has always been at the forefront of technological innovation. Industry firsts such as the development of the needle roller & cage assembly or the groundbreaking ball grinding machine that is regarded as the foundation of the entire rolling bearing industry have earned Schaeffler a unique distinction among the world's great bearing companies. With over 80,000 employees working in approximately 170 locations in 49 countries, Schaeffler is one of the world's largest technology companies in family ownership. Our bearing solutions and expert service offerings are designed to improve the reliability and performance of equipment and machinery in virtually every industrial sector, while reducing downtime and overall operating costs.

SCHAEFFLER



FAG



In addition to rolling bearings for practically any application, linear bearings and guidance systems have also been a vital part of Schaeffler's product portfolio. Unrivalled in scope and versatility, Schaeffler's linear product lineup ranges from shafts with linear ball bearings and monorail guidance systems to sophisticated actuators with drives and control systems, plus special coatings and every conceivable accessory. You name it, we've got it.

X-life™ is Schaeffler's seal of quality for ultra-high performance products from INA and FAG. Compared to standard bearings, X-life bearings from Schaeffler offer up to 70% longer service life under identical load conditions – or the same service life with the ability to support much higher loads. In addition, X-life bearings deliver high static reliability while minimizing the strain on the lubricant, thanks to reduced friction and lower bearing temperatures. For our customers, this translates into extremely high machine efficiency and reduced operating costs. Moreover, the ability to downsize means more value for your bearing dollar. X-life - proven to be better.

Of course, while innovative products make up the heart of Schaeffler's offerings to our customers, service represents the soul of what we do. A perfect illustration of this guiding principle is Bearinx®-online Easy Linear System: the latest addition to Schaeffler's comprehensive lineup of calculation programs that lets you design your own multi-axis positioning systems with Schaeffler linear actuators. Using realistic, preconfigured single-, 2- or 3-axis positioning systems and an open layout for the drives, the desired linear system is quickly identified and configured to your required specifications.

**More Value. More Performance. More Reliability. More Durability.
More Solutions. Only from Schaeffler.**



R+W Coupling Technology

1120 Tower Lane, Bensenville, IL 60106

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R+W knows engineering and manufacturing of precision flexible shaft couplings for motion control and power transmission applications, with a wide variety of designs for torsional rigidity, vibration damping, and overload protection. Whether for micro motors or 10 megawatt drives, couplings are customizable for most applications, while many standard models ship from stock. Configurable CAD models are available in a large number of file formats online.

With a philosophy of meeting customer requirements from conception to production, R+W has supplied many thousands of custom coupling designs, creating a wealth of knowledge about the technical requirements associated with a wide variety of industries and applications. Constant new product development takes place in house, in addition to intensive collaboration with universities and technical schools, keeping R+W at the forefront of technical development and product innovation in its field. Over the past 25 years this has resulted in a position of market leadership for metal bellows couplings, with global availability for all of its precision couplings and torque limiters.

Over the past year R+W has also expanded its design and manufacturing operations in the USA, allowing for ever faster turnaround times for both precision couplings as well as the more recently introduced industrial drive coupling and torque limiter product lines. More catalog items are being added to inventory in Illinois all the time. Also new to the program, R+W now offers custom machined accessories, such as pre-mounted sprockets for torque limiters and custom motor / gearbox mounts for coupling applications. Contact R+W today to see what's new, and get the ultimate connection.

R+W®

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2015 Engineering Showcase

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DieQua Corporation is a manufacturer and supplier of the widest range of gearboxes, gearheads and speed reducers, for power transmission and motion control applications, available from a single source. To assist our customer's we strive to be an extension of their engineering team. With years of application experience throughout a broad spectrum of industries, along with expertise in understanding the needs of a machine design, we work closely to identify the machine's design parameters. This allows us to help select the optimal technology to meet the application performance requirements. Big or small, fast or slow, precise or general purpose, we either have the gearbox that fits your needs or know where you can find it.

DIEQUA

Corporation

Motion Control Solutions

There is a reason different gear technologies were developed. It's because each has a benefit for specific applications. That is why we offer so many more alternative solutions than other suppliers of servo gearheads, to provide the best technology to satisfy the need. DieQua has the largest selection of gearhead options and knows where and when to use them. By analyzing up to 36 different application characteristics, we select the appropriate product for the job. Contact us for a better solution to your next motion control challenge.

We offer more gearboxes!



Helical Gearheads



Planetary Gearheads



Servo Worm Gearheads



Robot Gear Units

Power Transmission Solutions

Production, processing and material handling machinery require a variety of drive solutions to achieve the varying power, torque and speed requirements of their application. Having a supply partner that has all the gear types and knows how to apply them saves time and assures proper implementation of the technology. And with a variety of options and customization capabilities, unique solutions designed specifically for our customer's needs are something we provide every day. Whether a standard catalog item or a custom design, we have a gearbox solution for you.



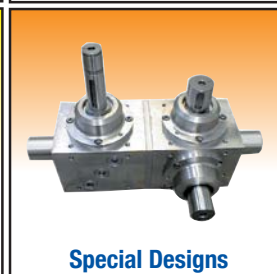
Spiral Bevel Gearboxes



Worm Reducers



Helical Gearmotors



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System Components, Inc. announces new Wedgegard™ shear pin technology for superior torque overload protection.

System Components, Inc. has announced North American availability of innovative new torque overload protection technology—Wedgegard™. Wedgegard™ wedge-shaped shear pins overcome the drawbacks of traditional round shear pins to protect rotating equipment from overload damage.

Eugen Gawreliuk, System Components Inc. president, said, "Gone are the days where spending time and dollars fussing with shear pins is considered acceptable. Not only are round shear pins a drain on productivity, installing them without adequate clearances can result in pin fatigue, fretting, and uncertainty in load sharing. The broken halves of round pins are also difficult to remove."

Wedgegard™ eliminates these problems by replacing the traditional round shear pin with heavy-duty wedges that offer significant performance advantages above and beyond the status quo. These can be finely tuned to the needs of the operator, can be replaced in under five minutes, and have the potential to transform the way users think about torque overload protection.

The Wedgepins, manufactured to close tolerances, act as a 'mechanical fuse' giving reliable and repeatable protection to critical drives. Wedgegard™ products are designed to meet the increasing demands for safety while providing minimum downtime. Wedgegard™ products are also 'fail-safe' under all conditions with their ability to work independently of mechanism lubrication and the release of hydraulic pressure.



SYSTEM

COMPONENTS, INC.

Wedgegard™ products have been proven globally in conveyor drives, sewage and process pumps, oil well pumps, steel and paper mills, marine propulsions and other demanding applications. Wedgegard™ products are now distributed exclusively by System Components, Inc. throughout North America.

For additional information please call 1-800-866-1290.

2015 Engineering Showcase

Smalley Steel Ring Company

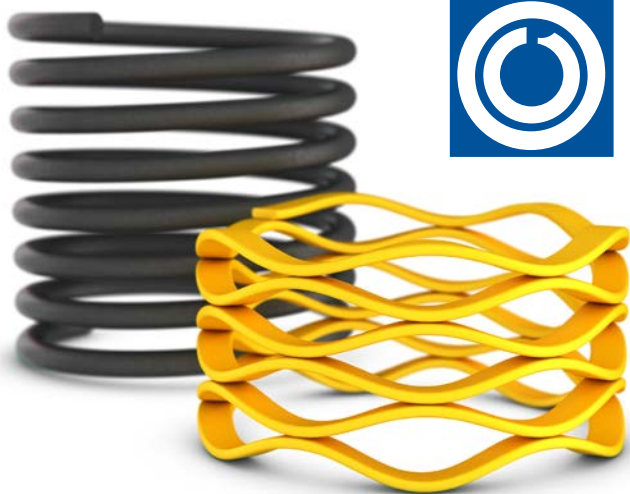
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Smalley®

Steel Ring Company

Founded over 50 years ago, Smalley Steel Ring Company has evolved to become the world leader in the manufacturing and development of Spirolox® Retaining Rings, Constant Section Rings and Wave Springs. Smalley has led the way in introducing state of the art products and continues to lead the way in innovations for the future.

The Smalley product line consists of 10,000 standard parts stocked in carbon and stainless steel. When time is of the essence, Smalley's No-Tooling-Cost™ edgewinding manufacturing process allows for fast prototyping and economical production of specialty wave spring and retaining ring designs. The scrapless process is ideal for exotic alloys including Inconel, Elgiloy, and Titanium.

Smalley is the exclusive manufacturer of Spirolox Retaining Rings. Spirolox Rings have no ears to interfere with mating components in assemblies. The unique Spirolox design simplifies your assembly process by making it easy to both insert and remove the ring without any tooling. Spiral rings offer a 360° retaining surface and are interchangeable with ordinary snap ring grooves.

As the originator of the Crest-to-Crest Wave Spring, Smalley has a state of the art offering of wave springs that allow for a space savings of up to 50% compared to conventional coil springs. By reducing spring operating height, wave springs also produce a decrease in the spring cavity. With a smaller assembly size and less material used in the manufacturing process, a cost savings is realized.

Free CAD downloads and a staff of engineers available for design consultations provides our customers with a full range of resources to ensure their application contains the most cost-effective solution possible. With offices throughout the globe, Smalley is able to offer customers worldwide unprecedented service and quality.

Smalley is certified to ISO 9001, ISO/TS 16949, AS 9100C and ISO 14001.



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Getting Hydraulic-type Power from Compressed Air - Combining an Air-Oil Tank with a pressure booster provides a convenient, low cost way of adding the control, rigidity, and power of hydraulics to an air powered application. Fabco-Air Multi-Power® Boosters use basic shop air to raise the pressure of another gas or liquid. They are compact and versatile finding use in numerous manufacturing operations such as **clamping, shearing, pressing, crimping, bending, testing**, and many more.

Two considerations - (1) When relatively small volumes of high-pressure fluid are called for intermittently, boosters show obvious advantages over continuously running hydraulic systems. (2) For applications where high pressure must be maintained for prolonged times, boosters are ideal. After the booster strokes, there is no further energy input required and no heat build up. A booster can be mounted in almost any convenient location, and most of its control valves are installed in the low-pressure circuit where lower cost components save costs over hydraulics.

How they work - The input is shop air, or any compatible gas, up to 150 psi; the output can be oil, liquid, air, or gas pressurized to 500 psi maximum. Multiple pistons compress the oil or fluid in the output end of the booster. Check valves insure the direction of fluid flow. The photo shows a booster with only two (2) pistons. But Fabco-Air boosters can have as many as five (5) pistons driving the output with a power factor of 4.8 times line pressure!

Sizing boosters - By selecting the proper combination of bore size, stroke, power factor (determined by number of pistons) and regulating the input air pressure, the exact output pressure and required volume can be achieved and maintained.

Versatility - Since it is a basic booster without controls built-in, it can be adapted and controlled to perform a wide variety of applications. Fabco-Air boosters are not limited to cylinder applications. They may be used wherever a small volume of high-pressure media is required.

The BA Series considered here is built for use on systems in which the input to the booster will be gravity fed (no pressure) fluid or atmospheric pressure gas. It requires a 4-way air valve for operation. Porting is provided on the booster for the multiple piston power stroke and single piston reset stroke.

One-shot Holding Cycle - The air circuit schematic in Figure 1 shows a single tank air-to-oil booster feeding two (2) clamping cylinders. The clamp-off position of the 4-way pneumatic control releases the clamp cylinders and simultaneously opens the pilot-operated check valve allowing oil to flow back into the tank.

Booster becomes a Pump - In Figure 2 we see how adding a magnet piston to the booster enables position sensing. Electronic sensors can then control a 4-way solenoid valve causing the booster pistons to reciprocate and pump high pressure liquid. Exhaust liquid is returned to the tank's top port from the driven device.



Fabco-Air 2-stage Pressure Booster

FABCO-AIR



Double and single air/oil tanks are available

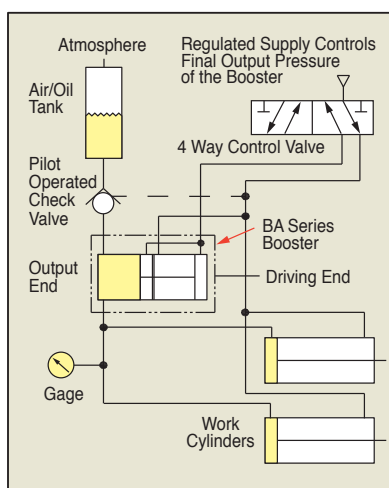


Figure 1. Booster one-shot holding circuit

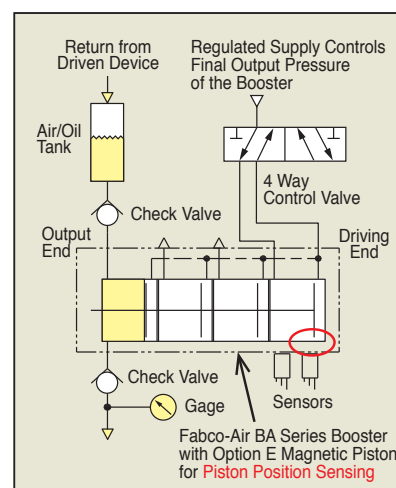


Figure 2. Booster used as pump

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QA1

QA1 is the #1 name in rod ends and spherical bearings, with over 1,500,000 units sold annually. Founded in 1993, QA1 built its foundation on quality and affordability being the number one priority. QA1 has the largest selection in the industry, economical prices, unmatched quality and a huge inventory; with over 6,500 SKUs on the shelf and 99% same-day shipping, you are sure to find exactly what you need and get it quickly.

QA1's quality system is ISO 9001 certified. With a wealth of engineering and manufacturing expertise on staff, QA1's products are designed, built and tested to ensure consistent quality, ultimate reliability and unbeatable performance. If you need custom linkage products, QA1's complete in-house design and engineering team and state-of-the-art manufacturing facility are dedicated to making it happen. QA1 is also a global provider of shock absorbers, suspension components, ball joints, clevises, rod eyes, jam nuts, spacers, custom linkage assemblies and more!



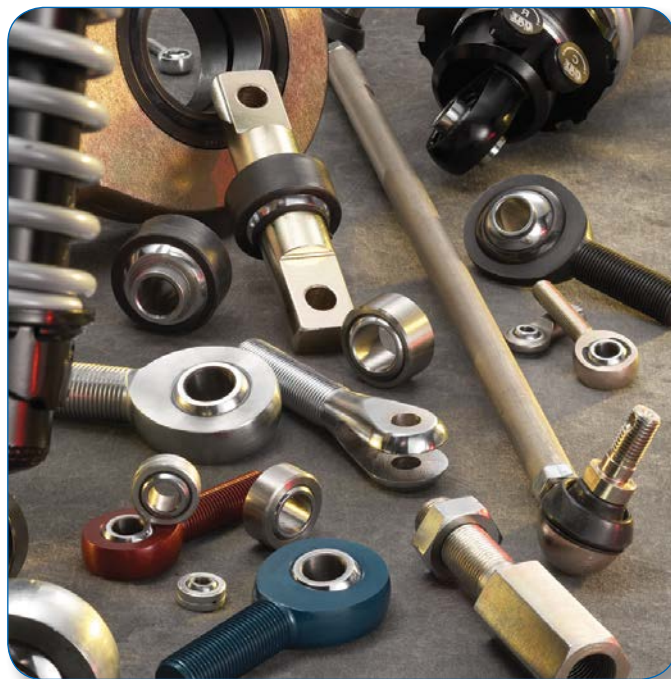
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PRECIPART®

ISO 9001:2008, ISO 13485:2003,
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Precipart designs and manufactures custom solutions for the most recognized names in the Medical, Aerospace and Industrial markets. From precision gears to electro-mechanical assemblies, Precipart supports its customers from prototype through high volume production and from feasibility study through product optimization. With integrated Design Engineering and Manufacturing teams under one roof, we are able to provide optimal solutions designed for manufacturability. Precipart's high precision gears, ranging from AGMA Q8 – Q12, include: miniature precision gear heads, speed reducers and increasers, complex electro-mechanical assemblies, custom designed gear trains, motor gearboxes and actuator assemblies.

Precipart has increased its manufacturing footprint by 40% by adding a 4th building to their campus, where they employ more than 215 team members over 3 shifts.



Nordex, Inc.

Nordex is an Engineering driven company!



We exist to assist fellow engineers design and bring to life new and innovative ideas that will impact the way we live each day of our lives today and in the future.

Our goal is to make a difference in the world by offering innovative ideas and fostering the philosophy of anything is possible.

Our vision is expanding the minds of engineers to dream big, believe in themselves and know the idea of flying cars and vacation trips to the moon will one day be a reality.

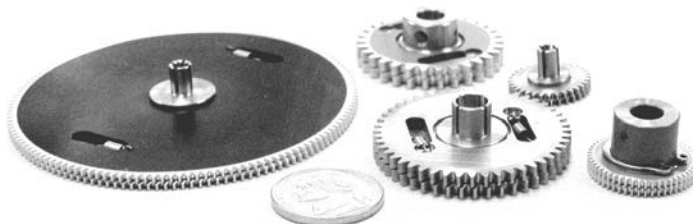
Nordex has made custom components for applications that have gone to outer space and to the bottom of the ocean. Look around you ~ everything was created from an idea from someone like you and I.

Contact Nordex Engineering Department today (eng@nordex.com).

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Over 30,000 standard components with 3-D CAD models are available at our online store www.nordex.com. Gears, pulleys, racks, bearings, shafting, couplings, fasteners, etc...

Nordex Engineering Department is available to assist you with modified standard parts or made to print parts for medical, robotic, military, prosthetic, semiconductor, and automation OEM industries contact eng@nordex.com



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"Strive for perfection in everything you do. Take the best that exists and make it better. When it does not exist, design it."

-Sir (Frederick) Henry Royce
British Engineer, 1863-1933

Gear Technology

Gear Technology is where the world turns for information about gears and gear manufacturing. We reach a broad-based audience of gear industry professionals involved with every phase in the life of gears and geared products, from conception to design, from design to manufacturing, from manufacturing to inspection, from inspection to purchase and from purchase to end use.

Our magazine, website and e-mail newsletters are read in more than 60 countries around the world, at huge multinational corporation and small job shops, in high-tech engineering offices and on the factory floor.

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