IDC Industrial Review

HIGH-PERFORMANCE MANUFACTURERS

What separates THE BEST from THE REST

Honing your safety plan

What you need to know about the new ISO 55000 standard

IDC-USA®

SPRING | SUMMER 2014

TOSHIBA

Leading Innovation

1 CALL SOLUTION

ONE CALL. ONE SOLUTION.

Toshiba International Corporation is proud to be a single-source solution for your application demands, offering a complete product lineup of electric motors, adjustable speed drives, and motor starters. From R&D to after-market service, our full range of in-house services give our customers easy and efficient access to some of the best services in the world. These are just a few reasons why our customers prefer Toshiba. One Call. One Solution.

1-800-231-1412

toshiba.com/tic

SPX®

Power Team

The POWER Behind the Project

Ask your local IDC Distributor about Power Team high force, hydraulic pumps, cylinders, tools and accessories.

LIFT. PUSH. PULL. CRIMP. TORQUE.

Portable power since 1924.

powerteam/idc-usa

CONTENTS

SPRING | SUMMER 2014 | VOLUME 8 NO. 1

FEATURES

DEPARTMENTS

COVER PHOTO: MICHAELJUNG


NACHI
www.nachi.com
Nachi America Inc.
715 Pushville Road,
Greenwood, IN 46143
(888) 340-2747
EX-V
High Capacity Design
Hardened Cage
EX
High Capacity Design
Robust Cage
AEX
High Speed Design
Machined Bronze Cage

High performance. What does it take?

JACK L. BAILEY

If you have an interest outside of your business, I'm willing to bet that you can name the high-performers in that field. If it's golf, you might name Tiger Woods or Bubba Watson. If it's football, maybe Peyton Manning. If you're a finance junkie, how about Warren Buffett? Regardless of what it is, painters, race car drivers, authors or outdoorsmen, you can always find who the high-performers are in that field.

The same is true in industry. Within our own circles, we all know who the players are. They're not always the ones with the most money or the biggest companies. What sets them apart is the passion and skill they bring to the table. The high-performers have a reputation for reliability and always getting the job done. When you are faced with a difficult situation, they are the ones you want in your corner. They are the "go-to" people you rely on.

Within our family of IDC Independent Distributors, we have great high-performers. Many of them have different approaches to being the best. Some are known for 24/7 availability. Some are known as innovative solution providers. Others are known for cutting their customers' costs and improving efficiencies. And in the end, when that line goes down, or you're pressed to find improvements in efficiency and production, you want the IDC Distributor in your corner.

The common denominator of high-performers is they are always looking for ways to take their skill to the next level. Our IDC Independent Distributors make this a way of life. The fact that they are a part of the IDC family is a clear indication that they are not afraid of doing things differently, but in fact thrive on finding new ways to better serve their customers. They attend educational courses and seminars. They network with other distribution professionals to exchange ideas and learn best practices. They work to bring their customers the best value in quality products, all delivered with the highest expertise. They want to make you better.

This issue of *IDC Industrial Review* focuses on high-performance and what it takes to get there. Ask yourself what you need to do to have the reputation as a high-performer. What is it that can set you apart from others doing the same job? How can you come up with that next great idea or suggestion that is such a game-changer it produces a "Wow!" reaction from those around you?

Our IDC Independent Distributors and our IDC Preferred Suppliers are always working to be a high-performer for you, our valued customer. We are very appreciative and proud of the advertisers that support our ability to provide you this publication without charge. They represent suppliers that are high-performers in the industry. Products advertised in *IDC Industrial Review* can be sourced from your IDC Independent Distributor. Now is a great time to contact your IDC Independent Distributor to achieve that next level of high-performance.

IDC Industrial Review is published twice per year by IDC-USA. Editorial, design and production services provided by Direct Business Media, LLC, 401 S Fourth Street W, Fort Atkinson, WI 53538-2106. Program Director: Stephanie Swaim; Editorial Coordinator: Rich Vurva; Graphic Design: Amy Klawitter, Advertising Sales: Patricia Wolf; Production Manager: Deb Pierce. For address changes, e-mail lmccabe@directbusinessmedia.com. For editorial, subscription and advertising inquiries, call (866) 214-3223. For further information on any of the products featured in the magazine, contact your local IDC Distributor.

IDC-USA

Lubriplate®

"It's the Film" ®
PREVENTS WEAR and CORROSION
LUBRIPLATE
SUPER-LUBRICATION

The Lubricants You Need...

From a name you know and trust.

- Full Range Synthetic Fluids & Greases
- Multi-Purpose Gear, Bearing, Chain and Recirculating Fluids & Oils
- Compressor Fluids & Oils
- Hydraulic Fluids & Oils
- Specialty Lubricants
- Multi-Purpose Greases
- Environmentally Responsible Lubricants
- NSF H-1 Registered Food Machinery Lubricants
- Spray Lubricants
- Metalworking Fluids
- Automotive Lubricants Motor Oils
- Perma Automatic Lubricators

Legendary Performance from a Legendary Brand!

Lubriplate® Lubricants

Newark, NJ 07105 / Toledo, OH 43605
1-800-733-4755 / E-Mail: LubeXpert@lubriplate.com
To visit us on Facebook, Twitter or LinkedIn, go to www.lubriplate.com and click on the desired icon.

Available From:

IDC-USA®

1-866-575-2025 • www.IDC-USA.com

Publisher does not assume any liability for errors or omissions.

This copy of

IDC Industrial Review

is provided to you by your local IDC Distributor and the advertisers at left.

IDC-USA®

Industry Knowledge...
Quality Workmanship...
Cost Effective Solutions...

It's in our name . . . It's who we are . . . It's what we do.

- ✓ Screw Conveyors
- ✓ Bucket Elevators
- ✓ Drag Conveyors
- ✓ Hoppers and Silos
- ✓ Belt Conveyors
- ✓ And More

MADE-TO-ORDER COMPONENTS

KWS stocks a full line of **CEMA** standard parts and an extensive inventory of specialized parts and accessories.

For over 40 years, KWS Manufacturing has been dedicated to providing you the highest quality equipment and service available to the bulk material handling industry.

We know your industry. You'll love our workmanship. We have the solutions you need. **That's the KWS difference!**

Design
Engineering
Manufacturing

Conveying...Knowledge Workmanship Solutions

KWS Manufacturing Company
3041 Conveyor Drive • Burleson, Texas 76028
Toll Free: (800) 543-6558
www.kwsmfg.com

ISO 9001:2008 Certified

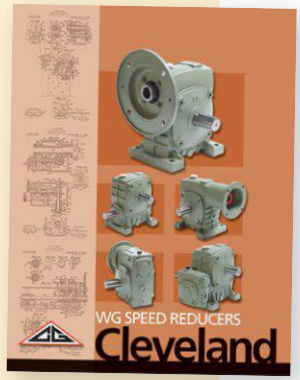
PREFERRED SUPPLIER TO THE IDC-USA

SPX Power Team Pullers

SPX Hydraulic Technologies entered into a global marketing partnership with Posi Lock on Jan. 1. As a result, Posi Lock pullers, accessories and service parts became Power Team by Posi Lock. This new partnership offering includes a wide selection of options in manual and hydraulic pullers, with two or three jaws, and pulling capacities ranging from one ton up to 200 tons. SPX Power Team self-aligning pullers are designed to safely and efficiently remove bearings, gears, sprockets, pulleys and other press fit items as well as allow users to gain access to tight spots. The T-handle and safety cage control the jaw at all times making operation a one-man job. The cage is the key!

New Cleveland Gear catalog available

Cleveland Gear has a new enhanced product Catalog for its "WG Series" Worm Gear Speed Reducers. The catalog provides ratings data, engineering information dimensions and design configurations for 40 mm (1 9/16") to 225 mm (8 27/32") center distance drives. Standard types available include: worm over, worm under and universal style. These WG units come in single reduction (5:1-70:1) and double reduction combinations, ranging from 50:1 to 3,600:1. Units are ready for immediate shipment from extensive inventories. Please contact your local IDC Distributor for a copy of catalog No. 810.




RENOLD
JEFFREY
Advancing Chain Technology™
Over 125 Years
Global Leader
Global Solutions
Renold Jeffrey Engineering Class Chain
The finest most reliable engineered chain in the world.
Renold Roller Chain
The world's leading brand of high-performance, high-quality roller chain.
1-800-251-9012
www.renoldjeffrey.com

Get Smart at IDC University

IDC University provides an intense learning environment where students gain valuable industry knowledge that they can apply immediately to their daily jobs. A low student-instructor ratio insures that students receive one-on-one attention to help them succeed in the classroom. A collaborative learning environment sets the stage for hands-on training and case studies.

Students range from seasoned veterans to the newest in the industry, from sales to purchasing, and from warehouse to marketing. The information provided in these courses improves the performance level at any age and in any area of the business.

Refer to the schedule below for upcoming IDC University courses and visit us online at www.IDCuniversity.com to register.

"IDC University is one of our best tools for training the next generation of industry leaders," says Kristina Pariso, Jason Industrial Inc. A MEGADYNE Group Co., an IDC preferred supplier.

IDC University iPhone app

The free IDC University mobile app for iPhone is a tool for anyone in the power transmission industry to use out in the field or in the IDC University classroom. Instantly calculate common belting, hydraulic, mechanical and electrical formulas with the IDC University app.

Mobile app formulations

Belt Length: Determine the length of belt needed for pulley system in imperial and metric dimensions.

Hydraulics: Formulas for every hydraulic and fluid power conveyance situation.

Electrical: Preparing you for everything from amps to watts.

Mechanical: Quick, concise and reliable information to support your mechanical requirements.

Download the IDC University iPhone app at www.idc-usa.coop/idcuapp.

IDC University

Seats are filling up fast, so sign up soon for the following classes:

BULK MATERIAL HANDLING
Nov. 17-20, 2014

HYDRAULIC PRINCIPLES & APPLICATIONS
Sept. 15-18, 2014

MOTORS & CONTROLS
Dec. 8-11, 2014

POWER TRANSMISSION PRINCIPLES
Aug. 18-20, 2014

It's a new year. Invest in your skills.

FROM HYDRAULICS TO MOTORS & BULK MATERIAL HANDLING

WWW.IDCUNIVERSITY.COM

IDC UNIVERSITY

HIGH-PERFORMANCE MANUFACTURERS

What separates the BEST from the REST

BY DELOITTE UNIVERSITY PRESS

The emergence of China, India, Southeast Asia, Mexico and Brazil as manufacturing powers has dramatically reshaped competition in the manufacturing industry. In turn, that trend has significantly challenged twentieth century manufacturing industry leaders in North America and Europe. Of course, it is the competitiveness of individual companies operating in all of these countries that ultimately helps shape the global competitive landscape.

It is evident that manufacturers everywhere have been improving their competitive capabilities. And as global competition has increased, it has become that much more important for manufacturing firms to clearly understand the competitive

PHOTO: VIOLKA08; MICHAELJUNG

capabilities they need to develop to attain superior performance.

But questions abound. What exactly are high-performing global manufacturers doing today? How are they positioning themselves for future success? In what areas do they differ most from their competitors? What is the secret of their high performance—the competencies and capabilities that have helped separate the very best manufacturing companies from all the rest?

To provide guidance to leaders of manufacturing firms about the critical capabilities they need to competitively distinguish themselves, we draw upon insights from two separate yet related research studies:

- The three rules initiative
- The Global Competitiveness in Manufacturing initiative

The power of both of these studies to inform manufacturing executives' action is enhanced by their integration. Examining the linkages between the two studies can give manufacturing executives a means to identify specific capabilities their companies should seek in the future, organized in a way that rolls up into a few straightforward rules they can use to make decisions about priorities and motivate action throughout their organizations.

The "three rules" perspective

The three rules project encompassed a multi-year analysis of more than 25,000 firms in order to explain the sources of sustained, superior company performance. Its findings are summarized in three simple rules that can help company leaders make choices among the many strategic alternatives they face. These rules are:

1) Better before cheaper: Companies that build competitive positions based on greater differentiation through

CONTINUED ON PAGE 16

brand, style or reliability are more likely to drive exceptional performance than those that choose to compete based on price leadership.

2) Revenue before cost: Companies that seek higher profitability through higher unit prices or volumes (higher prices being the primary route) are more likely to achieve superior performance than those that seek profitability through the development of structural cost advantages.

3) There are no other rules: Every other option is on the table. Companies should seek to achieve sustained, superior performance through market differentiation and profitability through revenue enhancement.

In summary, a preferred approach for achieving sustained, superior performance relative to competitors would be to pursue differentiated, high-return strategies that seek to generate pricing power in the market, even at the expense of cost or asset turnover. Furthermore, companies are more likely to achieve sustained success when they choose to invest in revenue growth through the ability to charge high prices (or, to a lesser extent, through high unit volume), even where such choices lead to relatively higher cost structures.

A key challenge for executives is to discern the specific steps to take within their industries to achieve those outcomes. The Global Competitiveness in Manufacturing initiative sought to find those answers for the manufacturing industry.

Pursue differentiated, high-return strategies that seek to generate pricing power in the market, even at the expense of cost or asset turnover.

What differentiates the best from the rest?

The Global Competitiveness in Manufacturing initiative sought to understand what capabilities were viewed by high-performing manufacturers as essential to achieving superior future performance. We defined 43 such capabilities in our study and asked each participating company to rate its relative competitive position today with respect to each capability. We also asked companies to rate the importance they believed each capability would have five years from now with respect to their ability to compete with their closest global rivals.

In our analysis, we categorized the capabilities into four distinct groups based on the relative differences in ratings offered by CEOs at high-performing companies versus all other companies. These groups are:

- **Qualifiers:** Qualifiers are capabilities on which high performers and the other companies do not significantly differ. Statistically, companies in these two groups approach qualifier capabilities in the same way. They may or may not view themselves as very competitive today in a particular capability; they may or may not be placing significant importance on the capability for the future. Wherever the capability is on the scatterplot, it is effectively in the same place for both groups. Essentially, qualifiers represent table stakes for competitiveness today and in the future.

- **"Being challenged":** "Being challenged" capabilities are those in which high performers currently hold a strong lead, but where they may lose ground as other manufacturers catch up and close the gap. Low performers place as much or more emphasis on "being challenged" capabilities as do the high performers with regard to future competitiveness.

- **"Creating advantage":** "Creating advantage" capabilities are those in which high performers hold no significant advantage over other companies in current performance, but that are viewed as much

more important by high performers than by the other companies with regard to future competitiveness.

Game-changers: Game-changers are capabilities in which high performers stand apart from the pack and in which they likely will continue to lead. On the current competitiveness scale, high performers are significantly better than their counterparts today on game-changing capabilities. And along the future importance scale, high performers place considerably more weight on game-changer capabilities than do the other companies in our sample.

Examples:

Manufacturing prowess is a game-changer that demonstrates the "better before cheaper" rule. Superior overall manufacturing processes and capabilities are a critical competitive asset unique to high-performing manufacturing organizations. Rather than outsourcing and/or hollowing out their manufacturing capabilities, high performers build and leverage their own manufacturing capabilities to the highest levels, which gives them a foundation for product quality, cost and service differentiation that is hard for competitors to match.

Rule No. 2, revenue before cost, attracts a great deal of attention from high performers. We have identified five drivers that high performers emphasize to fuel future growth: improving global sales capabilities, global distribution and logistics capabilities, global marketing capabilities, and the effectiveness of global marketing programs, with a keen eye on penetrating and growing in new markets. This indicates that the high-performing manufacturers in our study give greater weight to growing the top line versus cutting costs to improve profitability, which is consistent with the three rules.

While high performers focus on improving revenue and non-price-based competitiveness, they place relatively less emphasis on cost-focused clusters. Few manufacturing companies have competed successfully over the long term solely on the basis of improved cost efficiencies, particularly if it results in hollowing out their internal capabilities and competencies. Staying ahead of competitors also becomes harder for companies relying on cost-control practices, given the rapid diffusion of these practices.

High-performing companies often accept higher costs as investments that help develop superior capabilities over time to strengthen revenue-generating assets, including human, physical and customer capital. These assets create economies of knowledge that underpin the continuous development of revenue-generating, non-price-based differentiators. The lower positioning of cost-based competitiveness clusters, be it material costs or labor and energy costs, is in line with the "revenue before cost" rule; these clusters of capabilities are not viewed as a sustainable path to superior performance.

High-performing companies consider brand image, delivery speed and perceived quality of customer sales experience to be some of the most important capabilities for competitiveness. All three are game-changers, which indicate their high importance in both maintaining current competitiveness and improving future competitiveness. These three capabilities are non-price differentiators that help a company to compete effectively without cutting prices, thus facilitating adherence to the "better before cheaper" rule. They go hand in hand with each other: Customers are more likely to perceive a product to be high-quality if it is manufactured by a firm with a strong reputation, while consistent delivery of high-value, quality products aids in building a good reputation. Leveraging a strong brand name and reputation built in this manner allows a company to charge a price premium, thereby increasing margins and helping the company adhere to the "revenue before cost" rule.

It is important to note that reputation and service quality are two sides of the same coin. Conveying the message of high quality and value to the customer is just as important as making high-quality products.

This article was excerpted from the report called "High-performance Manufacturers," published by Deloitte University Press. It was authored by Craig A. Giffi, Bharath Gangula, Michelle Drew, Aleda V. Roth and Atanu Chaudhuri. For more information, visit www.dupress.com.

Hanna

Solid past, promising future

One of IDC's newest suppliers can meet manufacturers' toughest and most unique pneumatic or hydraulic cylinder requirements

CA/CH Series Composite Cylinders

DW Series Double-Welded Lift & Steering Cylinders

Series RT Hydraulic Rotating Cylinders

BY CLAIR DAVID URBAIN

Founded in 1901, Hanna is a leading designer, manufacturer and marketer of premium quality, industrial grade tie-rod and mill-type cylinders. It is a complete source for virtually any heavy-duty pneumatic or hydraulic cylinder requirement.

With more than 110 years of experience, Hanna is world renown for providing custom-designed cylinders used for nuclear valve actuation, marine, military, offshore drilling, construction and lift equipment, tire presses, plastic injection molding, steel mill, metal cutting and forming and agricultural equipment.

Today, Hanna's 106 fully trained employees can develop and produce any industrial hydraulic or pneumatic cylinder needed by today's manufacturers. With its long heritage, Hanna Cylinders is a proud founding member of the National Fluid Power Association (NFPA).

Preparing for the future

The past 18 months have been exciting for Hanna employees as well as its customer base. The company invested more than $3.5 million for paint facilities, testing equipment and nine new NC machines, including a Mazak Megaturn 1600, which is only one of three in existence worldwide. This is part of the company's December 2013 move to its new 100,000 sq. ft. facility in Pleasant Prairie, Wisconsin.

High-quality product line

Hanna cylinders are designed for today's higher pressure and faster moving machine

applications. They are ruggedly built and incorporate many field-proven design features that assure trouble-free performance over millions of cycles.

The cylinders feature Hanna's composite bearing and gland design that is complemented by Hanna's high-load piston design. They use polytetrafluoroethylene (PTFE) materials that assure long life and extremely low friction. The bearing, gland and piston design eliminates metal-to-metal contact and offers high compressive load capability. This proven design makes Hanna cylinders the most suitable units available for applications that demand ruggedness, precision, zero leakage and day-to-day performance and reliability.

Standard on all NFPA and mill-type designs, Hanna uses a composite high-strength bearing incorporated into its removable gland design. These types of bearings are made from high-grade polymers and fibers and incorporate a uniquely designed woven structure of PTFE super-filaments that have a tensile strength 20 times greater than PTFE resins alone.

Match your specs

Hanna has unlimited flexibility in cylinder and machinery design and offers a full range of options that include bore size, rod size, mounts and rod-end styles. The cylinders are developed for pressures of up to 250 psi for pneumatic and up to 3,000 psi hydraulic applications. They can also be outfitted with NPT or SAE porting.

Hanna's expert staff of engineers and knowledgeable production professionals can collaborate with customers to develop cylinders to meet exacting specifications and design requirements. Hanna engineers use the latest in 3D engineering technologies to virtual-design parts and models to assure design integrity and fit. Its engineers can also provide preparatory stress calculations and virtual stress analysis (FEA) as needed, which can help

CONTINUED ON PAGE 21

MT Series Heavy Duty Mill Cylinders

Hanna's long product line

With its venerable past and promising future, Hanna is the logical resource for your pneumatic or hydraulic cylinder needs. It can manufacture a wide variety of sizes and types of cylinders to match your specific need:

NFPA Tie Rod Cylinders, Industrial Grade, Heavy Duty Pneumatic and Hydraulic
- 2H/3H Heavy-Duty Hydraulic 3000 psi
- 3L Medium-Duty Hydraulic
- 3A/3AN Heavy-Duty Pneumatic 250 psi
- CA/CH Composite Air and Hydraulic

Alternative Industrial Grade, Heavy Duty Cylinders
- MT Heavy-Duty Mill Type
- RT Heavy-Duty Rotating Cylinders
- Accumulators
- Boosters

DW Industrial Grade Double-Welded Cylinders (Contract manufacturing only) Custom Design Cylinders
- Mobile
- Large Bore
- Offshore

Custom Configurations
- Tandem Cylinders
- Back-to-Back Cylinders
- Multi-stage Cylinders
- Spring-loaded Cylinders
- Electro-servo Cylinders

Services
- Express Delivery Program for Standard NFPA Designs
- Certified Material Coupons
- Material Traceability Certificates
- Engineering Services
- Product Design
- Preparatory Stress Calculations

Association Certification or Collaboration
- ABS, DNV, and Coast Guard
- Military
- ASME Section VIII
- AWWS
- Nuclear 10CFR Appendix B

Capabilites
- Contract Manufacturing – Large Scale Production
- Large Bore Cylinders up to 40"
- Long Stroke Cylinders
- Special Materials
- Special Seals and Fluids
- Custom Primers, Coatings, and Finishes
- Testing Capabilities to 10,000 psi
- Custom Testing – Third-Party Testing
- Nitrogen Testing
- State-of-the-Art Manufacturing

Hanna recently relocated to its new 100,000 sq. ft. facility in Pleasant Prairie, Wisconsin, where it is committed to developing and supplying highly reliable pneumatic and hydraulic cylinder that meet the exacting specifications and long life requirements of manufacturing customers worldwide.

Hanna history reveals quality and innovation commitment

Like so many companies, Hanna was started on the basis of one man's idea to improve a process.

In the beginning

Company founder Elmer E. Hanna arrived in Chicago from Montana to head up the engineering and manufacturing functions of the Gates Iron Works Company. While at Gates, Hanna observed men hand-sifting sand to separate the coarse sand from the fine sand needed to make sharp, clean foundry molds. The sifting was time consuming and was typically done by the more experienced mold makers.

Hanna experimented with using a pneumatic cylinder that shook the screen to separate the sand. He developed a machine dubbed the Screen Shaker, which was used by Gates Iron Works' foundries. Soon other foundries, hearing about the Screen Shaker, asked where it could be purchased. Because Gates Iron Works was doing very well in the mining machinery business, management did not want to set up a facility for a completely new and different product line. As a result, Elmer Hanna requested permission from the president of Gates to set up his own company to manufacture the Screen Shaker.

1900 Hanna opened the E. E. Hanna Company in 1900, and the Screen Shaker was an immediate success. In 1901, the company was incorporated as the Hanna Engineering Works and by 1902, the company moved into a new factory built on a five-acre tract of land at 2059 N. Elston Avenue in Chicago. The company remained at this location until 1917, when it was forced to move to 1765 N. Elston due to a reconfiguration of Ashland Avenue.

1903 Hanna invented and patented the Hanna Riveter. The company also produced special machinery including units that compressed cottonseed to produce cottonseed oil and other equipment for baling loose cotton. Hanna produced all the cylinders and valves used on the machinery it sold.

1914 Hanna began to manufacture air cylinders and valves for sale to other manufacturers.

1945 By the end of World War II, welding replaced riveting for many metal-fastening applications. Company management recognized riveters was not a growth market, so it concentrated on manufacturing and marketing hydraulic and pneumatic cylinders and valves.

1954 Hanna introduced the T750 air cylinder product line, which more than 70 years later, are still in operation. This remarkable cylinder, virtually unchanged since its introduction, was used on high-speed packaging equipment. A testament to its durability, one T750 cylinder sold in 1961 remains in operation, cycling 12,000 times a day, five days a week. It is not unusual for Hanna representatives to get a repair request for a cylinder that is 40 or 50 years old. Users will find this level of durability with all Hanna cylinders, not just the T750 line.

1963 Hanna Engineering Works was purchased by Chain Belt Company of Milwaukee, Wisconsin. Chain Belt soon became Rex Chain Belt, and after a merger with Nordberg, the company was renamed Rexnord Inc. Hanna Engineering Works became the Hanna Cylinder Division of Rexnord.

1980 The Rexnord Cylinder Division was sold to a group of employees and became known as Hanna Corporation. Hanna then became part of The Chatwins Group in 1986.

1990 Hanna purchased Chicago Fluid Power/Roto-Thrust Corporation, further expanding the product lines offered by Hanna. In 1994, Hanna acquired T. J. Brooks Company of Milwaukee, Wisconsin. Brooks added a line of welded and mobile cylinders to Hanna's product offerings.

2001 The Brooks plant was moved to Libertyville, a northern suburb of Chicago, occupying space leased by Chatwins. Hanna remained at 1765 N. Elston until 2004 when it joined Brooks at 828 E. Park Avenue in Libertyville. For the first time since the Brooks acquisition, all of Hanna's manufacturing capabilities were under one roof.

2013 Hanna moves to its new state-of-the-art manufacturing facilities in Pleasant Prairie, Wisconsin and introduced the Live Design web-based cylinder specification and design program.

minimize delays in customer approval and production processes.

Hanna cylinder experts can also provide certifications for material traceability, material testing and a wide range of association certifications, including ASME Section VIII, ABS, DNV, Coast Guard, and Nuclear 10CFR Appendix B.

Hanna offers its Live Design program, which can be accessed at www.hannacylinders.com. This online design and development tool allows customers to create cylinders by selections and obtain specification sheets, 2D drawings and 3D models by email.

Series CA Composite Pneumatic Cylinders

Hanna's cylinders use a bi-directional, glass-filled PTFE piston seal that is energized by an O-ring. This design provides a positive seal that eliminates rollover or extrusion problems typically associated with cup-type piston seals.

Hanna cylinders also incorporate bronze-filled PTFE bearing strips that make a nonmetallic bearing surface between the piston and tube, assuring long life and extremely low-friction piston travel.

Bearing damage related to PWM drives

An excerpt from an IEEE report titled "Practical Guide to Understanding Bearing Damage related to PWM Drives"

BY DON MACDONALD AND WILL GRAY

The performance and reliability of AC Adjustable Speed Drives (ASDs) is continually improving. One of the key reasons for improvement has been the advent, development and use of Pulse Width Modulated (PWM) drives utilizing faster switching devices, primarily Insulated Gate Bipolar Transistors (IGBTs). As with many other developments, improvements in some areas may cause problems in others.

AS1 Low Voltage ASD - The AS1 adjustable speed drive builds on Toshiba's history of supplying powerful, reliable and versatile drives. The modular construction of the AS1 allows the unit to be installed into nearly any application quickly and easily.

EQP Global SD Low Voltage Motor - The EQP Global SD motor series is designed for severe duty applications.

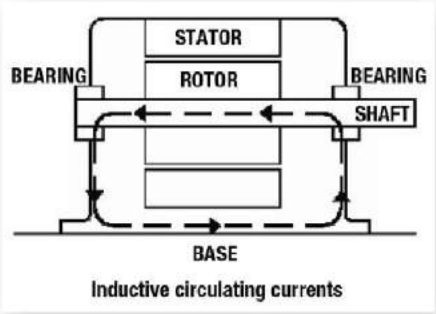
An increased bearing failure rate in motors is one of the negative effects of these types of drives. To mitigate bearing current damage in motors, as well as in loads and other auxiliary equipment attached to the motor shaft, it is important to understand how these currents are generated. In addition to theoretical explanations, actual field cases and solutions will be reviewed.

The phenomenon of motor shaft voltages producing circulating shaft currents has been recognized since the 1920s. When a motor is operated by sinusoidal power, shaft voltages are caused by alternating flux linkages with the shaft. The linkages are associated with flux unbalance caused by:

- motor static or dynamic eccentricity
- rotor and stator slotting
- axial cooling holes in the stator and/or rotor laminations
- shaft keyways
- rotor core support arms
- joints between segmental laminations

- directional properties of magnetic materials
- supply unbalance
- transient conditions

FIGURE 1

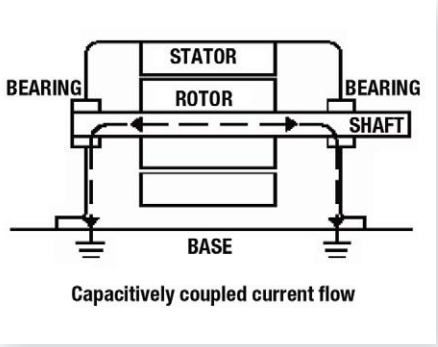


Shaft voltages exceeding 300mV require one bearing of the motor to be insulated to prevent circulating current damage to the bearings (see Fig. 1 above). Typically this phenomenon only occurs on 500 frames and larger machines. Normally the Opposite Drive End (ODE) bearing is chosen. If the Drive End (DE) is insulated, the driven load can provide an electrical path that completes the loop to allow current to flow. PWM drives can cause increased circulating currents to flow due to a high-frequency flux produced by common-mode currents which link the stator, rotor and bearing loop. This is an inductive rather than capacitive effect. Motors become more asymmetrical at high frequencies because the high-frequency capacitively coupled currents depend heavily on the location of the first few turns within the slot. Since placement of the turns in random-wound motors is not well controlled by any manufacturer, even a motor which is symmetrical at low frequencies becomes asymmetrical at high frequencies.

In addition to the preceding, PWM drives utilizing Bipolar Junction Transistors (BJTs) or IGBTs can cause Electric Discharge Machining (EDM) currents. PWM inverters excite capacitive coupling between the stator windings, the rotor and the stator frame. This common mode current does not circulate but rather travels

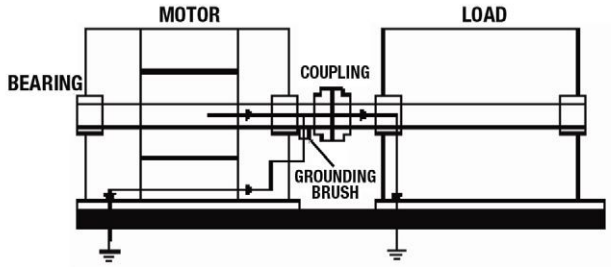
CONTINUED ON PAGE 24

FIGURE 2



Capacitively coupled current flow

FIGURE 3



Paths for common-mode currents to ground

to ground (see Fig. 2). The path to ground can be through both motor bearings and/or load or auxiliary equipment bearings (see Fig 3). The paper written by the authors investigates induced shaft voltages caused by PWM, AC variable-speed drives and discuss' methods of mitigating their harmful effects.

The existence of EDM currents with PWM voltage source inverter drives depends on the presence of all of the following conditions:

1. Excitation, which is provided by the source voltage to ground

2. A capacitive coupling mechanism, between stator and rotor

3. Sufficient rotor voltage build-up which is dependent on the existence of bearing capacitance

Conclusions from the IEEE report

When a bearing fails, especially on a motor being powered by a PWM ASD, the bearing and lubricant should be examined to determine the cause of failure. If the damage is due to EDM, corrective measures should be considered.

There are several possible practical solutions to mitigate bearing currents which include:

1. Selecting a carrier frequency which is between 1500 and 3000Hz if practical. This significantly reduces the energy transferred to the rotor.

2. Adding a common mode filter to mitigate common mode noise. The ratio of common-mode noise caused by a PWM drive compared to a sine wave is in the order of 10:1 or more. The addition of a filter which combines both common-mode and differential-mode filtering can reduce this ratio by as much as 70%. A common-mode filter connects the wye point of the filter to a "neutral" point on the DC bus. This filter arrangement provides a low-impedance path from the output of the ASD back to a neutral point on the DC bus instead of through the motor. (Note that further research has shown that the wye point of the filter can be connected to the negative DC bus with similar results).

3. Insulating both motor bearings to prevent current flow plus isolating all mechanical load and/or auxiliary equipment bearings (such as tachometers).

4. Adding a shaft grounding

S15 Low Voltage Micro ASD - Toshiba's heavy duty S15 adjustable speed drive is a compact and high performance drive designed for controlling a wide range of variable and constant torque applications.

brush or brushes to shunt common mode currents (ideally with the ODE bearing being insulated).

5. Making sure that the motor frame is suitably grounded for high frequency currents. This prevents stator frame currents from flowing through the connected mechanical load or auxiliary equipment bearings via the motor bearings (or grounding brush).

6. Changing the cable to the recommended type to minimize the common mode current. Testing has shown that cables which have a continuous shield or continuous armor provide the lowest common-mode current plus relatively low frame voltage. The recommended cable for PWM ASD application has six symmetrical conductors, 3 phase and 3 ground conductors) with a continuous corrugated-aluminum armor-type sheath

7. As a temporary measure, using conductive grease. When a high-resistivity grease is used and the bearings are "floating" on the oil film, the equivalent-circuit characteristic changes from a resistor to a capacitor. If the rotor voltage exceeds the threshold voltage of the oil film between the balls or rollers and the races of the bearing, the oil film's dielectric strength is exceeded. At this point, destructive EDM currents and arcing occur.

New installations should be designed with the bearing current phenomenon in mind and take into account the issues discussed in this paper. This is particularly important if high carrier frequencies are planned to be used.

This article was excerpted from a white paper published by Toshiba International Corporation, an IDC Preferred Supplier. You may download a PDF of the article at www.idc-usa.coop/toshiba.

Honing your SAFETY PLAN

Whether you're new at safety and health management or a seasoned veteran, here are a few tips to improve your safety program

BY J.J. KELLER

Most of us are familiar with the person who has suddenly been given the complete responsibility for a company's safety and health program. Perhaps this person is you, and you are, quite understandably, intimidated by what to do first. To get started, focus on the primary areas that OSHA targets its inspections which will, in turn, provide insight into some of the more important aspects of safety and health management.

Plan

In order to achieve the goal of reducing workplace risks, you must establish a plan for eliminating employee injuries and illnesses. The plan should not only consider the organization's immediate needs, but should provide for ongoing and long lasting employee protection. Once the plan is designed, it must be properly implemented. As a result, the program will enable you to anticipate, identify and eliminate the conditions or procedures that could result in workplace injuries and illnesses.

Organize

It is difficult to make a lot of changes to a business at one time; improvements are more manageable if they are assigned a level of importance, and completed in a logical order. Priorities for correcting identified safety and health hazards can be established on the basis of severity of the danger, the probability of injury and illness,

PHOTO: TONYLOMAS

the time needed for correction, and the required amount of employee training.

For example, you might think your facility is too small for you to worry about medical treatment, but large or small, every operation should consider how it will deal with minor and major injuries and accidents. The OSHA medical and first aid standard (29 CFR 1910.141) requires that:

- You ensure the ready availability of medical personnel for advice and consultation on matters of employee health;
- At least one person be trained to render first aid if a hospital, clinic or infirmary is not located in near proximity to the workplace;
- First–aid supplies be readily available;
- Suitable facilities for quick drenching or flushing of the eyes and body be provided in the work area when a person is exposed to injurious corrosive materials.

Developing a first aid program is similar to developing any other type of safety program. It requires you to identify and meet OSHA requirements, it calls for brainstorming likely medical scenarios that could occur at your organization, and demands efficient planning to handle these situations if and when they occur.

Take action

An action plan can serve as a road map to get your safety and health program from where it is now, to where it should be. The action plan defines what must be done, the order tasks should be performed, and who is responsible for completing each task. It should be specific, yet flexible enough to respond to changing needs as the development of the program proceeds. In other words, how exactly are you going to develop, implement and maintain a medical and first aid program?

CONTINUED ON PAGE 28

An action plan typically involves two parts. The first part contains a list of the major changes or improvements needed in order to make the safety and health program effective. Assign each element of the list a priority and a target date for completion, and be sure to identify the person who will monitor or direct each element of the list.

The second part of the action plan involves taking each major change or improvement, and developing a quantifiable plan for making the change. This means:

- Specifying what is to be accomplished
- The specific steps required
- Who will be assigned to do what
- When the task is to be completed

Such a plan will help keep track of program improvements so that details are not inadvertently missed. When several improvements are being made at the same time, it is easy to overlook something that may be an important prerequisite for the next area of the plan.

Train

Whether your business has three employees or three thousand, employee training is one of the most crucial aspects of running a business. Workplace training should be considered an important and ongoing part of your company's procedures.

Meeting OSHA's training requirements is only one reason for conducting a thorough training program. Another overriding reason is to reduce the number of worker injuries. As a general rule, trained workers have fewer incidents, and are more productive. As a result, your workers' compensation costs are less, and your insurance rates may also decline.

Record

Employee injuries and illnesses occur on the job every day, and while your company may not be among the most hazardous of industries, it is not immune to workplace accidents that often result in recordable injuries and illnesses. Although recordkeeping presents industry with a heavy burden, it is a very important function of every company.

Records can prove to be very valuable to you because they enable your company to track and trend the injuries and illnesses that occur. Such tracking and trending is key to pinpointing trouble spots in your workplace, and for reducing the hazards that tend to cause your company's injuries and illnesses. The more accurate your statistics, the more helpful they will be to your company in enabling you to reduce lost work time and workers' compensation costs due to workplace injuries and illnesses.

The following are general recordkeeping guidelines (not mandatory requirements) that you may wish to follow:

- Document all elements of your program – Essential records, including those legally required for workers' compensation, insurance audits and government inspections must be maintained as long as the actual need exists.

- Ensure records are legible – If handwritten notes are made in records, it is important to remember that the person making the notes may not be the person reading the notes, and that the notation may become important several years after the original recorder has left the company.

- Records should be complete and up to date – Changes in processes or procedures, additional employee training and other information relative to OSHA compliance should be reflected in company records as soon as possible.

- Records should be comprehensive – Original information should never be removed from a file. This practice often results in incomplete files since records are often lost or misplaced by end–users, or simply never returned to the master file. Establish a procedure that must be followed for obtaining file information in order to prevent lost records.

Remember that recordkeeping violations, reporting violations, or fraud can subject you to the same sanctions as other OSHA violations. Consider the mandatory recordkeeping requirements of OSHA as more than just a burden. Use the information in your self–auditing or self–inspection procedures to identify problems and improve

workplace safety.

Your general duty

The General Duty Clause has become increasingly important to employers as OSHA has begun to use the clause in more of its penalty and enforcement actions. Section 5(a)(1) of the Occupational Safety and Health Act requires that every working man and woman must be provided with a safe and healthful workplace. The section specifically states: "...each employer shall furnish to each of his employees employment and a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

In simple terms, this means that you, as an employer, are obligated to protect your employees from recognized hazards in the workplace even if there is not an OSHA standard that applies to the situation, or if hazards still exist after compliance with a standard. In effect, the General Duty Clause obligates employers to take additional steps toward safety if the well–being of employees is in jeopardy.

Review

And finally, a safety and health management program is a working plan. It is essential to review safety systems on an ongoing basis. This usually involves a survey of the workplace to identify whether workplace safety requirements and corporate policies and procedures are being followed, and evaluate the methods used to achieve compliance.

J. J. Keller and Associates Inc., is a compliance resource firm headquartered in Neenah, Wis. It provides safety and compliance solutions to manufacturing, environmental, chemical processing, construction, food safety, mining and more. Visit www.jjkeller.com and www.kelleronline.com. J. J. Keller & Associates is not engaged in rendering legal services. If legal counsel is required, seek the services of a competent professional.

Three things to keep in mind when dealing with conflict in the workplace

BY TOMAS GARZA

To successfully navigate workplace conflict, managers must be able to confront team members in a positive, productive manner. Whatever the situation, whether two people are actively quarreling, or whether one person's behavior is impacting the entire work culture, a manager must be able to step in, take charge and do so in a way that does not contribute to the drama.

How, then, do you constructively confront team members? How do you both get your point across and preserve team chemistry?

For any manager, these conversations can be crucial. Ongoing conflict and drama can, of course, have a ripple effect on everyone, and the last thing any organization needs is a dip in morale. Assuming this is not a situation that calls for firing, there is a great deal a manager can do to help resolve the problem, be firm and preserve group harmony.

In having these conversations, here are three things to keep in mind:

1) Use non-accusatory language

For many of us, it is tempting to place blame and pin an entire problem directly on someone else. After all, aren't they the ones causing the disturbance in the first place? A constructive solution, despite our first impressions, involves shelving the urge to blame and taking a step back.

How you phrase things here makes all the difference. You can make the conversation productive by focusing the language on you. For example, you can say, "I notice you missed the last two staff meetings," or "The other day I overheard your comments about the director." The alternative would look like this: "You missed the last two staff meetings," or "You made those comments about the director." One statement talks about your observations, what you saw, noticed, or heard. The other puts everything squarely on them.

This may seem subtle, just a matter of semantics, but in constructive confrontation your word choice matters. When you talk about your observations, people naturally feel less defensive. When people do not have their guard up, you will be able to get more accomplished.

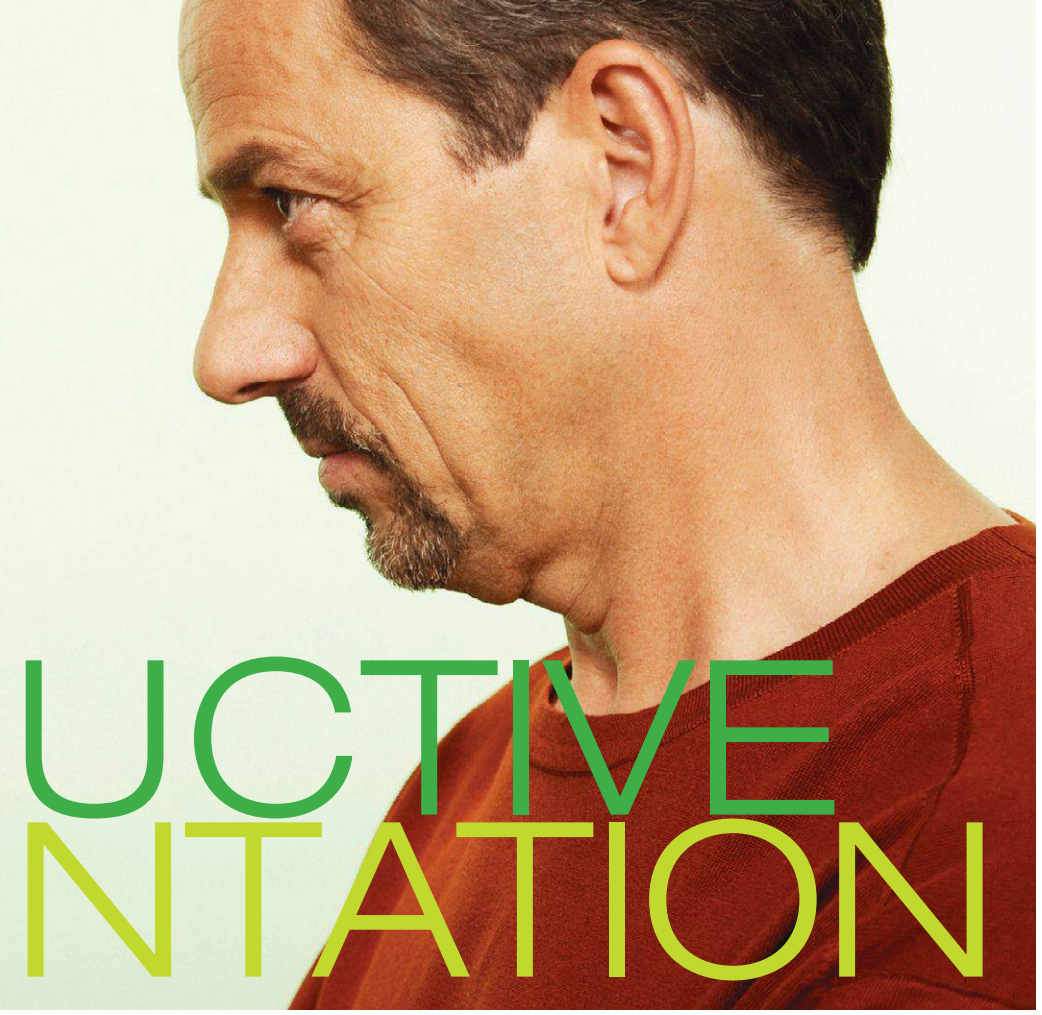
2) Be clear

As a manager attempting to put a stop to harmful behavior, you must be clear in this conversation. Your group cannot afford any mixed messages. Therefore, be as clear as you can about the following:

What you heard or saw.

Make sure there are no ambiguities here. If you didn't

PHOTO: FUSE



UCTIVE NTATION

experience any of the events first-hand, be sure you have gathered sufficient information. The person you are talking to needs to know exactly what it is they are doing that damages your group chemistry.

How this impacts the group.

Be very clear on this. Often, people do not intend any sabotage, but their behavior may, nonetheless, have a detrimental impact. It is perfectly fine to be direct about this impact; often the person really needs to hear it.

Your expectations.

If you don't clearly state your expectations for future behavior, this conversation will be a waste of your time. Unclear expectations create needless confusion and can lead to future problems. As a manager, you must say what you expect. Luckily, this can be done in a non-accusatory manner that strengthens the group rather than pulls it apart.

3) Listen

A conversation—even one you must have with an employee about their behavior—is just that, a conversation. This means it involves two people. Though you will need to come into the dialogue with an agenda and get your point across, the process will be infinitely more productive if you give the other person a chance to speak and, more importantly, to be heard. This means you must take the opportunity to listen.

When the other person speaks and feels you have heard them, their tension level goes down. Defensive posturing that might otherwise stand in your way will disappear. The person may even feel grateful for your hearing them out, and appreciated. This can be crucial to maintaining group harmony. Provided you take the opportunity to clearly state your expectations, there is absolutely nothing to lose in taking a moment and listening.

Also, if you listen attentively enough, the other person may offer suggestions or solutions you hadn't considered. You will never know unless they get an opportunity to speak, too.

Consider these three suggestions the next time you have to confront somebody in the workplace. In most situations, you can preserve group harmony, show respect and appreciation for the other person, and be sure you have clearly stated your expectations. It is indeed possible to become a pro at constructive confrontation. Do it, and your organization will benefit.

Tomás Garza is a conflict resolution and personal development expert with over 12 years of experience helping people erase pain, turmoil and doubt from their lives. He has served on the faculty of Portland State University, and is a former president of the Oregon Mediation Association. For more information, visit www.garzainitiative.com, email tomas@garzainitiative.com, or call 541-230-4477.

GARZA

A history of experience and innovation

BY RENOLD JEFFREY

Renold Jeffrey, located in Morristown, Tenn., represents the pinnacle of history and experience in the two main disciplines of industrial chain design and manufacturing: engineering chain and roller chain.

The Jeffrey Manufacturing Company was founded in Columbus, Ohio, in 1887 by its own first customer, Joseph A. Jeffrey. When this coal equipment manufacturer couldn't find the heavy-duty chain he needed to drive his coal-cutting machinery, he designed and manufactured his own. His patented steel thimble roller (STR) chain quickly became the industry standard and news of its success spread.

The applications seemed limitless, and other inventions soon followed. The first malleable roller chain incorporated a cast link and roller, which reduced friction, required less power, and made production more efficient. It became the forerunner to other Jeffrey innovations, including pintle chain; combination chain; and a flat, round forged chain that provided far greater wear resistance than previous designs could deliver. Many of the innovations introduced in the early years of the Jeffrey business have become industry standards, evolving through innovations in materials and production processes but maintaining the fundamental principles established by this leader in the field.

Renold Jeffrey has made a multi-million dollar investment in its Morristown, Tenn., facility.

Almost a decade before Joseph Jeffrey introduced his first chain products, a Swiss-born manufacturer of textile chain named Hans Renold patented the first solid bush roller chain at his manufacturing site in Manchester, England, which formed the basic concept of transmission chain used throughout the world today. Like Jeffrey, he continued to innovate his product and processes, developing features such as machine-holed link plates and rotary-riveted pins to increase chain strength, reliability and performance.

In 2000, Jeffrey Chain joined the Renold Group and was able to add the broad portfolio of Renold Roller Chains to its product range. Renold Jeffrey today is a major supplier to industry across all parts of the USA, offering the experience and expertise developed from more than 200 years of combined manufacturing history.

Strategic Changes

Renold Group is in the final phase of a strategic reorganization that began several years ago.

The initial phase was driven by the entry of low-cost manufacturers into western markets, and the accelerated development of Asian manufacturing economies, most notably China. While many of the Group's competitors decided to outsource low-specification chains to third-party suppliers, Renold was determined to maintain its policy of controlling all aspects of design and manufacture for all chain products, in particular, rigid standards we have established for material specification and control. This led to the successful acquisition of a quality manufacturing facility in China, followed a year later by acquisition of a premium chain manufacturing facility in India. This has given the Group an ability to compete in these developing markets and to supply quality chain to customers in all sectors of the market.

The second phase of the reorganization has seen the consolidation of four European factories, plus the Renold Jeffrey Engineering plant in Morristown, into two specialized manufacturing sites. The majority of Renold Roller Chains are now manufactured at our highly-automated facility in Einbeck, Germany, which has expanded significantly as a result of this restructure. This accommodates many decades of experience and expertise, and is the sole source of our small-pitch and medium-pitch Tier 1 Roller Chain and Solution Chain product ranges.

In addition, the Group has implemented a major investment at our Morristown, Tenn., facility. A multitude of new machinery is now installed and commissioned, including additional presses, substantial increases in CNC machining capability, and a number of new heat treatment furnaces, the largest of which has more than double the production capacity of existing equipment. This multi-million dollar investment project, the largest in the company's history, is scheduled to be complete by the summer of 2014, and has increased the Renold Jeffrey workforce by more than 20% and expanded manufacturing capacity by around 35%.

This facility is now the global "center of excellence" for the Group's comprehensive range of Engineering Chain products. The design, manufacturing, development and testing capabilities concentrated at the Morristown facility are increasingly being used to generate high-quality export sales, complementing the company's substantial and growing share of the U.S. chain market.

This investment also introduces manufacture of large-pitch Roller Chain into our U.S. facility for the first time in its history. This represents a significant vote of confidence in the capabilities of the Jeffrey management team and the skills of the local workforce. It will further enhance service levels for supply of large volumes of standard product and reduce the lead time for design and production of special chains.

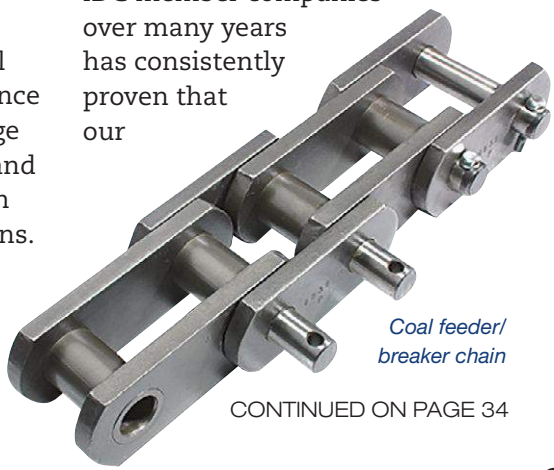
Ongoing Development

For several years Renold Jeffrey focused on continuous improvement in the capabilities of the business, with emphasis on customer service and product performance. One benefit of this work is that Engineering Chain average lead times are now four weeks shorter than just two years ago. This is a valuable time savings that can help customers reduce cost and manage the time pressures in their own business. Investment in training and equipment in specialist areas, such as metallurgy, allow us to produce more consistent components made to tighter specifications, improving product service life and reliability in even the most demanding applications.

We have also strengthened our design and applications engineering team, enabling us to find increasingly sophisticated solutions to customers' real-life operating problems, and permitting more site visits that help us and our customers to tailor these solutions to the specific needs of the application.

Enhanced Product Capabilities

Many Roller Chain applications can be served with standard products, usually available off-the-shelf. Our partnership with IDC member companies over many years has consistently proven that our



Coal feeder/ breaker chain

CONTINUED ON PAGE 34

combined knowledge of customers' needs, product capabilities and application requirements results in excellent service and customer satisfaction.

However, there are many difficult applications that require something extra in order to give our customers reliability, reduced operating costs or downtime, increased productivity or enhanced safety. We have teams of experts in a range of fields located across the Group who are working every day on developing and enhancing our range of Solutions Products, and we work with some of the largest machinery manufacturers and engineering companies in the world on new technologies that ultimately filter down into our standard production processes.

Readily-available Solutions chains include:

- Synergy – extended service life for the most demanding applications
- Syno – lubrication-free operation
- Sovereign – designed for highly abrasive environments
- Hydro-Service – ideal for food industry applications
- Alternative materials and coatings such as stainless steel, nickel and zinc plating.

All Renold Jeffrey Roller Chains incorporate the highest grades of materials and processes – solid bushings and rollers, case-hardened wear-components, all manufactured from high-grade alloy steels. The increased strength, fatigue resistance and higher breaking loads translate to less production downtime, fewer chain replacements and, ultimately, lower total cost of ownership.

Engineered To Perform

Many of today's production needs require higher performance from equipment and machinery of all kinds, and Engineering Chain is no exception. Proven solutions have been developed to optimize

chain performance in a wide range of hostile environmental conditions, including high shock loads, abrasive dust and debris, extreme temperatures, immersion in water or exposure to other corrosive elements. There are specialized needs such as food contact, sterile environments, space constraints, or applications that are inaccessible for regular lubrication.

The extensive range of capabilities developed by Renold Jeffrey engineers to find solutions to these and other application needs include:

- Close cooperation between our metallurgists and steel suppliers to develop material specifications
- Refinement of heat treatment processes and controls to consistently meet exacting specification for hardness, strength and ductility
- A range of solutions that permit lubricant-free running of chains
- New surface coatings, and sealed joint chains, for use in abrasive environments
- Corrosion-resistant surface treatments to give chains excellent service life even with direct and constant exposure to salt water
- Collaboration with a number of highly respected engineering universities to capture leading-edge developments in materials and manufacturing process technologies.

We are equally adept at meeting challenges where reductions in size, cost or weight are the primary customer objectives.

Renold Jeffrey has been listening to customers for over 125 years and continuously developing advanced industrial chains to meet their needs. In partnership with the knowledge and experience of IDC member companies, we remain committed to providing customer service, product quality and innovative solutions.

A fresh look at TRAINING

Training is an investment, not a cost

BY MICHAEL V. BROWN

Training is often perceived as a cost, not an investment. It's a cost that many companies feel they can defer when money is tight, but the consequences of this decision often come back to haunt the business. What are the consequences of poorly trained maintenance personnel?

Increased maintenance costs, which begin to rise the moment an untrained employee goes to a job site. Inaction and missteps will accumulate extra labor costs, not to mention costs from broken tools or wasted parts. Mistakes made in repairs usually means that someone will be back on the same job in a few days,

PHOTO: MICHAELJUNG

hopefully to do the job right this time.

- Extended downtime, which can lead to inventory shortages, lost sales and even permanently lost customers.

- Unsafe acts, which jeopardize the safety of the employee, fellow workers, and can even imperil the surrounding community. Lack of proper training is cited as the most common contributing cause of industrial accidents.

The costs associated with these consequences can be astronomical. National Board of Boiler and Pressure Vessel Inspectors - Incident Report for 2000 determined that poor maintenance was the cause of 42% of power boiler incidents and 76% of pressure vessel incidents.

In a specific case, North American regulators discovered that carbonated water produced by a bottled water company was contaminated with benzene. Benzene is a poisonous liquid shown to cause cancer in laboratory animals. The source of the problem was traced to a worker who didn't know to change a filter during routine maintenance. The product's market share was cut in half after the event, and has never truly recovered.

Employees with technical college and other formal training may be equipped with the basic requirements of a job. However, the specific requirements of a facility have to be learned on the job.

"Practice Makes Perfect," or Does It?

Your employees may learn from their mistakes, but can you afford to pay for this type of education? "Trial and error" during normal facility operation is possibly the most expensive form of training. As a matter of fact, the employee most likely learns to do just enough to get through the shift, leaving the real repair for someone else. This is not to say that on-the-job training has no place. A trainee paired with a qualified employee or a manufacturer's representative is bound to gain some important knowledge.

There is an on-the-job component to all training, but more formal training should provide the basis for "practice." Once something is learned and even tried in the classroom, it must be used in the real world. The opportunities to perform the task don't necessarily come up right after the classroom training is complete. Facility management must be patient when an opportunity to perform the task does arise. For example, take shaft alignment. Employees can learn proper alignment methods in a classroom setting; they can train on equipment models in the classroom.

However, not until they have to perform an alignment in the field do the obstacles to good alignment appear, such as pipe strain, bolt-bound condition, or inadequate base.

What are the largest obstacles to training?

- **Lack of Funding** – Some companies simply have a low or nonexistent budget for training. This is less and less true for larger companies, but sometimes

CONTINUED ON PAGE 38

A good skill checklist is one way of assessing the basic need for a skill.

funding of technical training loses out to soft skills (diversity, teamwork), or computer system training (when a new system is installed). Some companies put heavy emphasis on management training but miss the mark when it comes to the rank and file.

- **Lack of Management Support/Commitment** – Aside from funding, some companies have little knowledge of the needs of a maintenance organization. It's the job of the manager of maintenance to make the needs known.

- **Language Barriers** – Some managers are faced with a workforce that doesn't read or speak the predominant language in the region. Training materials in this language may be hard to find. Also, some employees may not know how to read at all. Remedial language training may have to be performed alongside technical training.

- **High Employee Turnover** – Truly skilled employees are always in demand, but this should not deter anyone from investing in training. A manager should be aware of the local skill market and must be able to counter the urge to move on with a better work environment, benefits and, yes, money.

- **Lack of Time for Training** – Many facility managers feel they cannot afford to send employees away to training when they have problems they need to deal with on the line, right now. This is just short-sighted thinking. For one, they have to do without these people when they are absent or on vacation, and somehow they manage. Secondly, the benefits of training will reduce or even eliminate the problems they seem to have now.

Training Pays – Big

A study conducted under the auspices of the American Society for Training and Development in the year 2000 determined that a training investment of $680 yields a 6% return (on average) in total shareholder return the following year. For most companies, the question is not "Should I train?" but rather, "What is the most cost-effective training I should perform now?"

Using a good skill checklist is one way of assessing the basic need for a skill. This list is best derived from a review of the equipment that has to be maintained at the site. Supervisors or advanced maintenance workers should look at a representative sample of the equipment at your site. The lists of skills should then be combined to provide a master list of all skills required at the site.

Gather together all key maintenance personnel and have them make a list of tasks that are needed from day to day. A review of completed work history provides some insight into the types of skills currently used in the facility.

Review that list and write down how often the skill will be required. Review completed work history to determine how often a skill may have been used in the past so you can determine where best to focus your training efforts.

Training is essential to an effective maintenance program. An organized and structured approach can meet your facility's current requirements and build a strong foundation for the future.

Michael V. Brown is president of New Standard Institute, a Milford, Conn.-based training and consulting firm specializing in industrial maintenance. Visit www.newstandardinstitute.com to learn more.

IDC-USA®

YOUR IDC DISTRIBUTOR IS ON-CALL WITH
THE PRODUCTS AND EXPERTISE YOU NEED.

Introducing leak-free SmartSeal clamps

Ideal Clamp Products' new clamp takes the pressure off of OEM and repair professionals

BY CLAIR DAVID URBAIN

Air and coolant connections can be the weakest link in the reliability of any piece of equipment. Extreme temperature changes under the hood of a vehicle or on a piece of equipment, when combined with normal engine or equipment vibration, can lead to a leaky situation that could develop into a production stoppage or safety hazard.

With the Ideal Clamp Products' new Ideal-Tridon SmartSeal clamp, system leaks can be a thing of the past.

How it works

The SmartSeal clamp is a self-adjusting, constant-pressure clamp. Ideal-Tridon engineers have developed an exclusive trough design that puts the sealing "magic" on the inside of the clamp.

The new clamp's design forms a unique 360-degree seal around joints. Its design prevents fluid and air leaks, even under extreme temperatures and vibrations.

Each SmartSeal clamp is made up of an assembly and a patent-pending SmartLiner inner ring, which has an engineered profile that applies 360 degrees of pressure.

It produces a higher grip force applied over a narrower footprint, so it penetrates deeper into the hose wall, fostering resistance against potential leaks.

The SmartSeal clamp also features a compact design and lower profile without the bulk of other types of clamps. It can handle non-uniform hoses, which are especially prone to leaks.

The SmartSeal clamps are light in weight – as much as 30 percent lighter than traditional constant-tension clamps. One would think that one clamp alone doesn't weigh much, but in a bus, for example, the total weight of all of the clamps used in its assembly weighs as much as 50 pounds! A 15-pound weight reduction on a bus – or any piece of equipment – can translate into greater fuel efficiency.

Construction

SmartSeal clamps are all stainless steel construction, which provides superior corrosion resistance and durability in harsh environments. Outfitted with a 5/16" hex head, the captured screw tightens and loosens the clamp for trouble-free tensioning.

The SmartLiner inner ring is made up of a precision gauge, high-quality, specially coated 300 series stainless-steel that applies pressure more evenly around the hose. The patent-pending SmartLiner follows the hose diameter, applying uniform radial pressure as the engine or equipment cycles from cold to hot running temperatures.

SmartSeal clamps are engineered to perform better and last longer than traditional clamps

Proof of performance

The SmartSeal clamps are engineered to last longer and perform better than traditional clamps in the most demanding environments. Leak pressure tests commissioned by Ideal Clamp Products show that SmartSeal clamps perform even better in thermal cycling than typical constant-tension clamps and perform better over time when compared with other leading brands in the same category.

That proven design is backed up by literally millions of installations in the field around the world where equipment is operating in very hostile environments, leak- and worry-free.

The SmartSeal was first developed because of a difficult-to-seal application in Caterpillar equipment that was in a very tight space. It's worked so well that Ideal-Tridon now ships hundreds of thousands of SmartSeal clamps to Caterpillar annually. Its success has attracted many heavy-duty OEMs to use it to solve difficult-to-seal air and water connections.

The SmartSeal clamp has also proven to be a preferred product for turbo air management applications. These applications have higher heat and vibration levels than a standard connection; any air leakage in these systems cause the engine to lose power.

In the past five years, turbo-assisted engines have increased from 3 percent to 20 percent of North American-produced vehicles and turbo-assisted engines are expected to continue to grow to 42 percent of all global vehicles by 2018. The SmartSeal

CONTINUED ON PAGE 42

Product line

WORM-GEAR AND GENERAL-PURPOSE CLAMPS
Worm-drive and general-purpose hose clamps for sealing and connecting components. Available in multiple sizes and configurations.

SPRING CLAMPS
Self-adjusting, thermal-compensating spring- and constant-tension clamps are good for thermal cycling and temperature or tension fluctuation.

HEAVY-DUTY CLAMPS
Extra-strength clamps designed for the rigors of heavy-duty truck, off-road and industrial applications. They are available in T-bolt, V-Band, spring-loaded, flanges and specs.

SPECIALTY CLAMPS
Have a special application? Ideal has a wide variety of quick-release, quick-install and no-tools-required styles, as well as, two-part clamps, pinch/crimp clamps, P-clips and more.

NO-HUB COUPLINGS
Used for a variety of applications including sanitary drain, storm drain, waste pipe, vent piping and more.

Ideal Clamp Products regional markets

- USA / Canada
- Mexico
- Intra-America
- Brazil
- Europe
- Africa
- South Asia
- East Asia
- Australia / New Zealand
- South Pacific

Industries/channels

- **Replacement:** Distribution, warehouse and retail
- **OEM:** For original equipment manufacturing
- **Automotive:** Original equipment, parts distributors and retailers
- **Heavy-duty:** Original equipment, distributors, repair and dealers
- **Industrial parts:** Original equipment, distributors and retailers
- **Commercial/Ocean-going marine:** Parts distributors
- **Ship builders:** Original equipment, parts distributors
- **Hardware:** Distributors and retailers
- **Hardware and plumbing:** DIY retailers
- **Plumbing professionals:** Distributors
- **Government and military:** Original equipment, Parts repair
- **Truck and engine:** Original equipment, parts distributors and dealers
- **Heavy equipment parts:** Distributors and dealers
- **Telecommunications:** Original equipment
- **Recreational/pleasure craft:** Original equipment, marine retailers and distributors
- **Recreational vehicles:** Original equipment, parts distributors and retailers
- **Convenience stores and truck stops:** Parts
- **Irrigation:** Original equipment, parts distributors and retailers
- **Agriculture:** Original equipment, parts distributors and retailers
- **Mining:** Parts distributors and retailers
- **Oil and gas:** Original equipment, petrochemical parts distributors
- **Railway power engines:** Original equipment

will add an extra measure of protection in these key applications. Ford Motor Company was the first global passenger car company to embrace the SmartSeal concept and has specified it on a large number of global models with engines greater than 1.0 liter displacement. Today, Ideal-Tridon is testing, validating and implementing and becoming a part of the production process with car companies in North America, Europe, Japan, China and India.

Clamps produced by Ideal Clamp Products are used in a variety of applications, including automotive, heavy-duty and industrial fastening applications.

Sized right

SmartSeal clamps are available in sizes ranging from 26mm to 148mm. Need a custom option? It's highly likely that Ideal engineers will be able to design a custom clamp to meet your specific needs for sizing, clips and materials.

If you're not entirely sure what type of clamping system would be best for your application, Ideal engineers will, in effect, become your engineers, delving into your application and develop a custom clamping system that will meet your specific need.

As manufacturers strive to automate more production processes, Ideal engineers will work with production teams to design custom assembly clips that will allow the clamps to be used in automated assembly processes.

A manufacturer's manufacturer

Ideal Clamp Products Inc. is a leading global engineering solutions designer and manufacturer of stainless steel worm gear and specialty hose clamps for a broad range of automotive, heavy duty and industrial fastening and sealing applications.

Headquartered in Smyrna Tennessee, its Ideal-Tridon brand products are made in North America, Europe and Asia. They are sold to OEM operations and replacement market warehouses, distributors and retail businesses.

"Our products are highly engineered and top-line quality. We work with our customers to develop and supply stainless-steel clamps, worm-drive hose clamps, high-torque clamps, constant-tension clamps, T-Bolts, V-Inserts, no-hub couplings and a host of specialty and custom clamping products," says Michelle Arceneaux, marketing manager.

Like other manufacturers, Ideal Clamp Products practices continuous process improvement techniques. It understands the challenges its customers face in establishing efficient processes and building reliable products that are competitive in the world market.

"You can take advantage of our automated assembly processes, advanced screw manufacturing technology, high-speed stamping expertise, automatic sensors and visual control systems, testing, analysis and inventory control options," says Arceneaux. "Our manufacturing experts understand the challenges you face and look forward to helping you solve them."

Ideal Clamp Products is a lean manufacturing company rooted in QS practices

As a lean manufacturing company rooted in QS practices, Ideal Clamp Products facilities have earned QS 9000, ISO 9001, ISO 14001, and most recently, TS16949 at all manufacturing facilities, the standard for just-in-time manufacturing processes. It supplies clamping and sealing products as well as dimensional shipping specs, materials analysis and performance guarantees for OEM customers.

"Whether you want a standardized product or specialized attention, ask us how we can help you. We have helped design, produce and supply clamp products in the Americas, Europe, Asia, Australia and Africa," Arceneaux says.

Have it your way

Ideal Clamp Products Inc. is your manufacturing source for on-time, quality hose clamps and specialty clamps. Its experts stand ready to help you select the best clamps for your application or customer base.

"In addition to our Ideal-Tridon branded products, we offer private labels, custom design, merchandisers, special packaging configurations for retail and barcodes in multiple formats," Arceneaux adds.

The Ideal philosophy promotes engineering ingenuity, progressive thinking and a commitment to product and service excellence.

"We recognize that many of our customers resell our products to their own customers and we specialize in communicating your needs to our many production sites around the world. Many of our employees speak multiple languages or can identify someone who can communicate with you or your customers. In addition, we have sales and service persons around the globe who can help you bring your production requests to life," Arceneaux concludes.

What you need to know about the new ISO 55000 standard

BY MIKE POLAND

With the introduction of the first edition of the ISO 55000 standard released in January, many organizations are questioning the value of obtaining compliance. Why do we need a new standard for asset management?

This article, based on a white paper from Life Cycle Engineering, explains why so many organizations struggle with their asset management strategy.

One source of frustration is the "solution" that most software vendors position as the system supporting asset management. These solutions are very IT and finance-centric.

Most asset managers, and the personnel operating and maintaining the assets, know very little of the full capabilities of their software solution. As a result, they cannot leverage the invaluable information contained within it to manage their assets more effectively throughout their life cycle. It is typical for vendors to show the value proposition of asset management solutions by using a maturity model such as that depicted in Figure 1.

These maturity models tend to focus on maintenance and shift the perception of it from being a cost to being a source of value. Influencing design during the early phases is critical because of the impact maintenance decisions will have on total cost of ownership. If we look at the typical asset life cycle, as depicted in Figure 2, the Maintain phase occurs very late in the asset's life, after many decisions have been made that determine the total cost of ownership. Asset management, maintenance and other considerations must be taken seriously early on or the asset is doomed to suffer chronic reliability problems and higher costs during the Maintain phase.

As a matter of fact, analysis has revealed that by the time Commissioning is complete, as much as 95 percent of the asset's life cycle costs are already pre-determined. This is despite spending only a relatively small percentage of

FIGURE 1

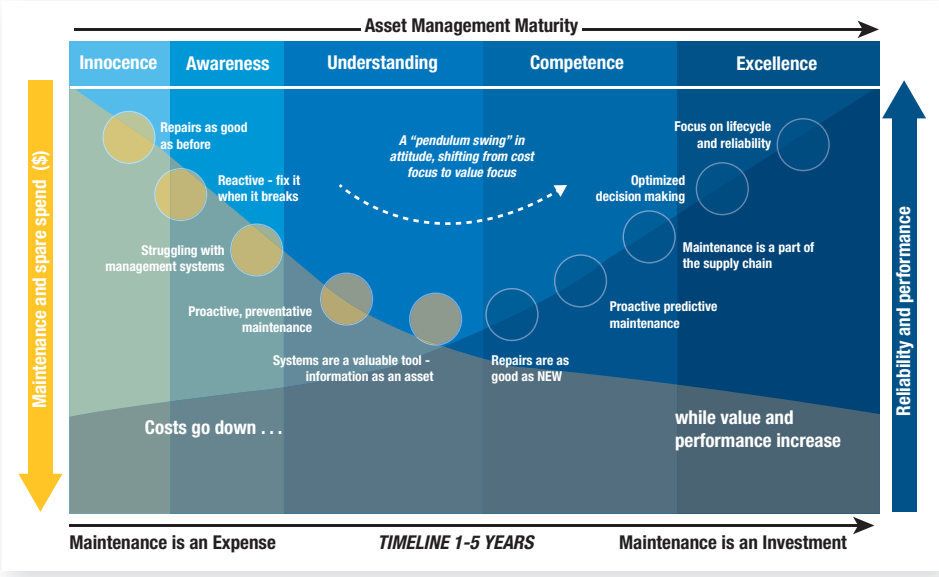


PHOTO: FLYING COLOURS LTD

FIGURE 2

the asset's actual cumulative Total Cost of Ownership (TCO). It is also important to remember that a significant amount of an organization's funds are expended on information management software purchase, implementation and upgrades. The earlier phases are when an asset has the most opportunity to impact these changes and establish the organizational framework for future life cycle cost savings.

Because of the high associated cost of change after an asset has become fully operational, a very small percentage of the total cost of ownership can be impacted once the asset enters the Maintain phase of its life cycle. Fundamentally, this is why so many organizations struggle with optimizing their asset management strategy. Without a focus on asset management – providing value to an organization through assets that the organization has a responsibility for – from the Concept through the Commission phases, the overall return on net assets throughout the life cycle will be significantly sub-optimized.

Compounding the problem of having a limited ability to impact Total Cost of Ownership (TCO) during the Maintain phase is the significant investment that organizations often make in software packages that cannot solve the inherent problems. Without addressing the root cause of the problem – the lack of a comprehensive asset management strategy – software cannot achieve the promised return on investment (ROI). The end result is a negative impact on the bottom line.

During the development of ISO 55000, a new ISO structure for management system elements was created. This model builds upon the traditional Shewhart cycle (Plan – Do – Check – Act or PDCA for short) that is the basis for continuous improvement in management systems. Organizational structure and the leadership that ties value creation as revenue and profit generation to the physical asset portfolio are key additions to the improvement of the previous ISO 72:2001 model.

So the new standard describes the management system for asset management; it does not describe the implementation strategy for the management of assets. Much like BSI PAS 55, it gives you the "what" relating to the requirements and guidelines, but not the "how."

For an organization that does not currently have one in place, implementing an asset management system is a holistic business transformation. It includes a technology component due to the various information technology = software packages used in the day-to-day management of assets and the interfaces to the general business ledger and balance sheets. The project plan must structure an implementation that links the organization's strategic plan and business objectives to the physical asset portfolio by creating an asset management policy.

Most organizations would struggle with an answer if asked to explain how their management of assets supports their strategic plan.

The business objectives must be reasonable, achievable and concrete. This means that each objective must be quantitative, use time constraints, and be understood throughout the organization.

It is important to understand that an organization's optimal value creation depends on the ability of the asset owners, operators and maintainers to provide the greatest asset utilization at the lowest total cost of ownership. This will yield the greatest return on net assets and return to shareholders.

Mike Poland, CRMP, is the director of Life Cycle Engineering's Asset Management Services group. He can be reached at mpoland@LCE.com. To download a copy of LCE's white paper on ISO 55000, visit www.LDE.com.


POLAND

Mounting hole type, high rigidity crossed roller bearing

Both the inner ring and the outer ring have integrated structure (inseparable), and attachment holes are made to the inner ring and outer ring so attachment can be made easily. Furthermore, it is not easily affected by surrounding structures such as housing and presser plate, therefore, a high rigidity and high accuracy rotation are realized. Contact your local IDC Distributor or visit IKO at www.ikont.co.jp/eg/.

Stainless steel coating

CRC Steel Re-Nu Stainless Steel Coating provides corrosion resistance and protection against weather, sunlight, oil & water. Containing 100 percent #316L Stainless Steel pigment, this coating provides a high shine stainless steel finish that inhibits rust in a variety of environments, including food manufacturing, chemical processing and general maintenance repair. Visit www.crcindustries.com/ei or contact your local IDC Distributor.

Flat bottom drill

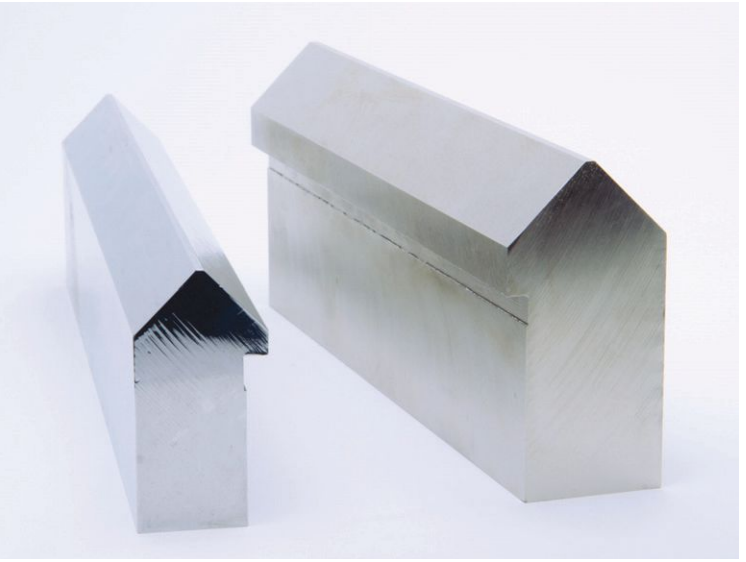
The Aqua Ex Flat is the No. 1 selling flat bottom drill and is ideally suited for flat bottom applications in the oil and gas, automotive and general industries. The drill is specially designed for drilling of inclined surfaces and curved surfaces. Available in lengths 3D, 5D and extended length drills. Visit www.nachi.com or contact your local IDC Distributor.

VC-3 Threadmate holds fasteners tight

VC-3 Threadmate, one of Vibra-Tite's most popular, unique products is 30 years old this year. VC-3 is a material that prevents fastener assemblies from loosening due to shock and vibration. Different from anaerobic threadlockers, VC-3 is a solvent solution of acrylic polymers that dries to the touch within minutes of being applied to fastener threads and is then ready for use. The material properties of VC-3 act as a shock absorber, dampening vibration to prevent fastener assembly thread slippage. VC-3's unique formulation stays pliable, allowing fasteners to be adjusted with standard hand tools, while maintaining thread locking abilities. Visit www.vibra-tite.com for more information or contact your local IDC Distributor.

Hardened steel rails for heavy-duty applications

Use with SMITH-TRAX bearings to quickly design and fabricate precision material handling systems. Precision manufactured SMITH-RAILS drastically reduce system design time and the cost to source guidance systems for material handling equipment supported by heavy-duty SMITH-TRAX track rollers. Visit www.smithbearing.com or contact your local IDC Distributor.



Antimicrobial additive

Lubriplate has introduced Lubri-Armour, an EPA-registered antimicrobial additive for NSF/H-1 food machinery lubricants. Lubri-Armour will prevent the decomposition of lubricants caused by microorganisms. Lubriplate NSF/H-1 food machinery greases treated with Lubri-Armour remain fresh and last longer in harsh food processing environments. The Lubriplate NSF/H-1 food machinery greases formulated with Lubri-Armour are the SFL Series, the FGL Series, Pure Tac, Pur Tac Light and the Clearplex series. They are all available from your IDC Distributor.

BANDO

IDC-USA Platinum Preferred Supplier

The Right Belt For All Applications

Power King®

Power Ace®

Power King® Power Ace® Combo

Rib Ace®

Power Max®

Power King® Cog

Power Ace® Cog

Double V

Duraflex GL®

Synchro-Link® Rubber

Synchro-Link® Polyurethane

Synchro-Link® High Torque

Synchro-Link® Double Sided Rubber

Synchro-Link® Double Sided Polyurethane

Metric V-Belts

KPS High Torque Polyurethane

WORLD CLASS QUALITY BANDO SINCE 1906

No matter what your drive requirements, your IDC distributor has a BANDO belt to satisfy your design criteria.

BANDO USA, INC. **www.BandoUSA.com**