IDC Industrial Review

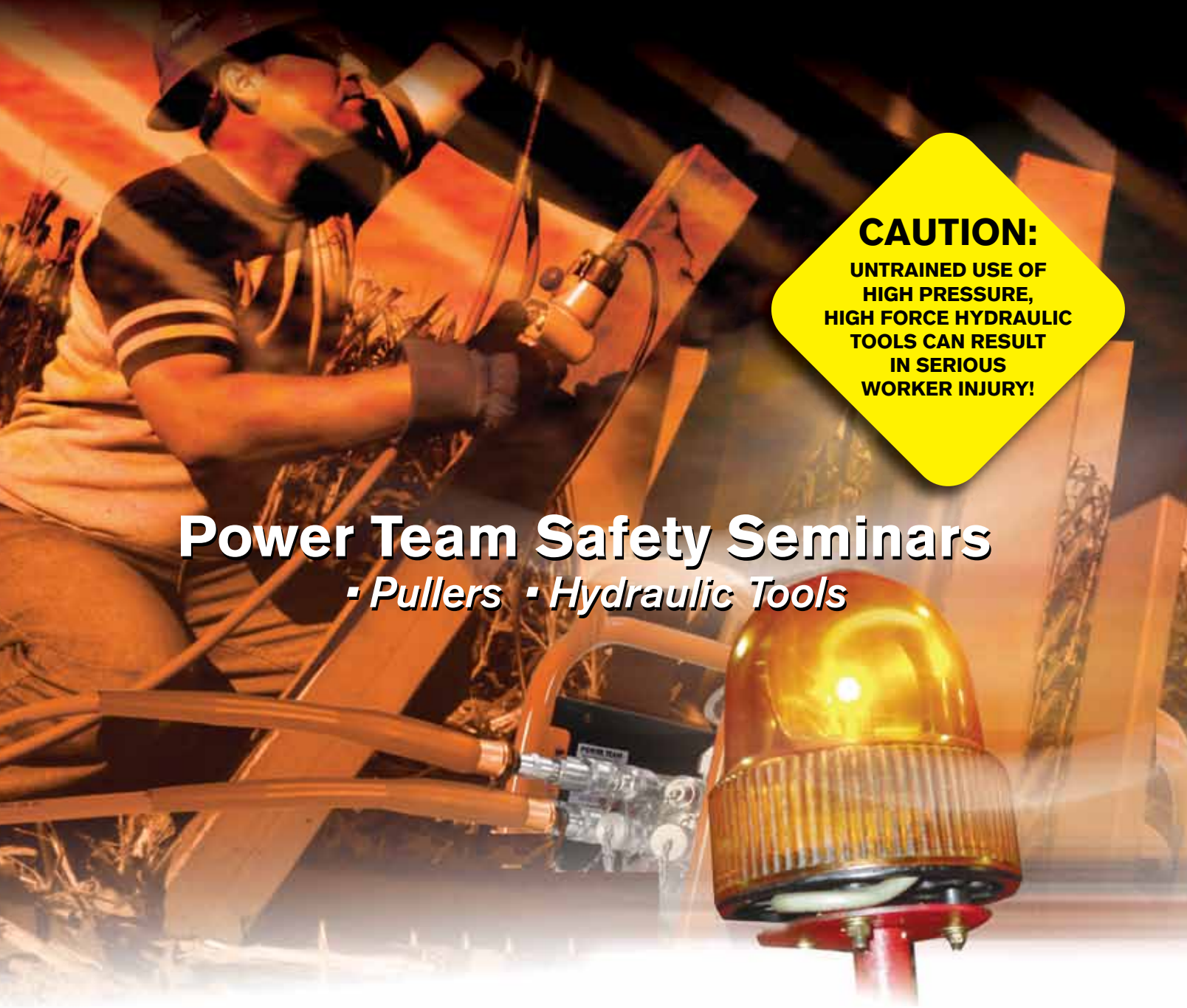
Can U.S. manufacturing be saved?

5 tips for selecting bearings

Roller chain Rx

Countdown to a zero injury workplace

FALL | WINTER 2010



Power Team Safety Seminars

• Pullers • Hydraulic Tools

Through **Proper Use** and **Proper Application** of high force tools

You Will Gain:

- Fewer Workman's Compensation Claims
- Less Worker Fatigue
- Greater Productivity
- More Uptime

IDC-USA®

SPX®
HYDRAULIC TECHNOLOGIES

POWER TEAM®, an Industry leader in high force hydraulic tools, has partnered with **IDC** Distributors. Protect your business investments and resources with an on-site safety seminar. Contact your local IDC Distributor for scheduling details.

Koyo®

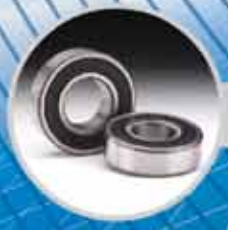
Koyo Corporation of USA

Meeting the challenges of demanding applications since 1958

With over 100,000 variations of Ball and Roller Bearings Koyo has a bearing for just about any application:

Angular Contact Ball Bearings

Cylindrical Roller Bearings



RD Sealed Ball Bearings

Spherical Thrust Bearings

Wind Power · Agriculture · Lift Truck · Machine Tool · Steel Mill · Power Sports · Automotive · Electric Motor

JTEKT Group

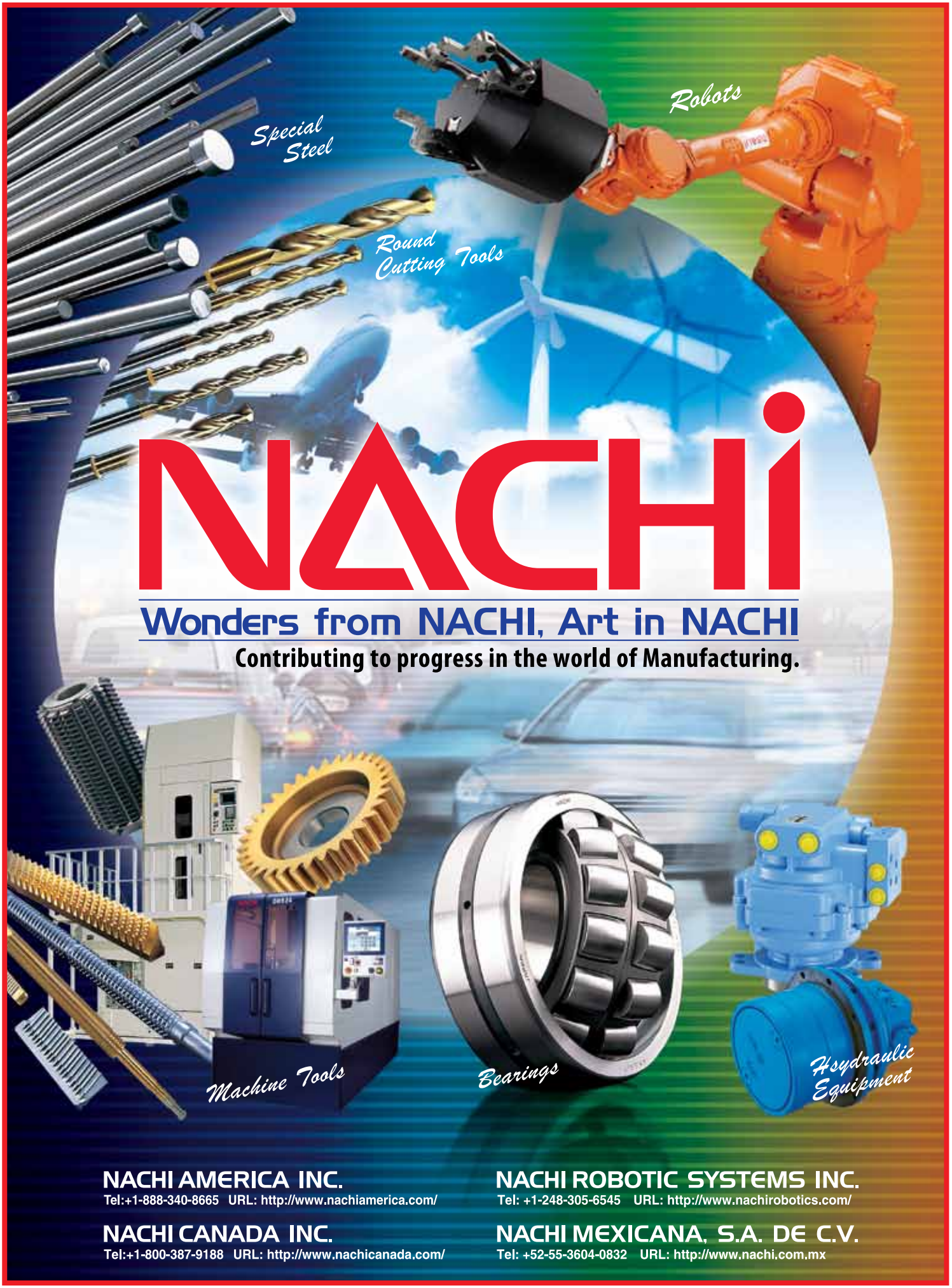
Koyo Corporation of USA • 29570 Clemens Road • Westlake, OH 44145 • (440) 835-1000 • Fax: (440) 835-9347 • www.koyousa.com

CONTENTS

FALL | WINTER 2010 | VOLUME 4 NO. 2

FEATURES

DEPARTMENTS



NACHI AMERICA INC.
Tel:+1-888-340-8665 URL: http://www.nachiamerica.com/

NACHI ROBOTIC SYSTEMS INC.
Tel: +1-248-305-6545 URL: http://www.nachirobotics.com/

NACHI CANADA INC.
Tel:+1-800-387-9188 URL: http://www.nachicanada.com/

NACHI MEXICANA, S.A. DE C.V.
Tel: +52-55-3604-0832 URL: http://www.nachi.com.mx

Keeping it in the community

JACK L. BAILEY

If you're like me, it probably feels like this summer went by at warp speed. It's hard to believe we're wrapping up the third quarter of 2010! Most businesses have spent much of this year "rebuilding" from last year's recession. Happily, our IDC Distributors have lent their service and expertise to those companies on the rebound as well as those still digging out.

There's a lot of focus on the national economy as it continues to be a concern for most businesses. I would also encourage you to think about your local economy as well. Members of my family will tell you I hate to shop or spend money with large national companies. The reason is simple: When I spend money with a national supplier or retailer, I know my money is going out of my local community and straight to the community of that company's particular national headquarters.

Conversely, I know when I spend my money with a locally owned company, that money is going straight to that local business owner so that he can pay his employees, pay local taxes, and provide for his family. In doing that, the locally owned business owner is making the community I live in a better place; with better schools, better local infrastructure, and a better local economy. Call me old-fashioned, but for some reason that just sounds and feels right.

I would ask you to consider the same thing when purchasing your MRO needs. Does the community in which your facility is located benefit more when those MRO needs are filled by a local company or a national chain with headquarters several states away?

Your local IDC Distributor is an independent business and has a vested interest and commitment to the community. That distributor lives in the community, goes to the same churches, and roots at the same school ball games as the people in your facility. The IDC Distributor lives in your community and will be there tomorrow and in the future. As with all locally owned companies, it's not just business; it's where we live and grow.

Aside from the local expertise you receive from an IDC Distributor, when your MRO needs are placed locally, you're doing your part to sustain and grow the local economy, not an economy in another state. The IDC Distributor is paying local employees so that they can live and spend in the local community. This is what we refer to as a "win-win" situation.

So remember, in having your MRO needs fulfilled by your local IDC Distributor, you're not only getting the best service and expertise available, you're supporting your own local economy. Makes sense, doesn't it?

Jack Bailey
PRESIDENT & CEO, IDC-USA

IDC Industrial Review is published twice per year by IDC-USA. Editorial, design and production services provided by Direct Business Media, LLC, 732 Madison Ave., Fort Atkinson, WI 53538. Program Director: Almeda Myers; Editorial Coordinator: Rich Vurva; Graphic Design: Amy Klawitter, Advertising Sales: Patty O'Mera; Production Manager: Deb Pierce. 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

WE DO MORE THAN JUST BUILD CONVEYORS.

DESIGN and ENGINEERING

KWS has extensive experience in the proper design of bulk handling equipment for specialized applications.

- Products that are *corrosive or abrasive*
- Products that must be conveyed at *elevated temperature* or *pressure*
- Products that emit harmful or *combustible vapors*
- Products that are subject to *packing or fluidizing*

PARTS and ACCESSORIES

KWS stocks a full line of CEMA standard parts and an extensive inventory of specialized parts and accessories. Most are available for next-day shipment.

- 4 inch to 18 inch diameter Helicoid Screws & Flighting
- 4 inch to 24 inch diameter Sectional Screws & Flights
  Angle Flanged Troughs
  Formed Flanged Troughs

Screws • Troughs • Trough Ends • Shafts
Seals • Hangers • Bearings • Covers

WE ENGINEER SOLUTIONS.
Design
Engineering
Manufacturing

PREFERRED SUPPLIER to the IDC

Call Toll Free: **800-543-6558** • *Visit us on the web at:* **www.kwsmfg.com**

PTDA

AD INDEX

Advertiser	Page
Accurate Bushing	45
Activant	29
Bando USA	48
CRC Industries	39
Dichtomatik	47
IDC Select	46
IDC-USA	15
IKO International	9
Isostatic Industries	44
Jason Industrial	25
Koyo Corporation	3
KWS Manufacturing Co.	7
Nachi America	5
Reelcraft Industries	39
Renold	23
Renold Jeffrey	27
SPX Power Team	2
System Components	21

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®

IKO

Innovation Know-how Originality

- Crossed Roller Bearings
- Cam Followers & Roller Followers
- Needle Roller Bearings
- Needle Roller Cages
- Spherical Bushings & PILLOBALLs
- Maintenance Free Capilube Bearings

East coast
91 Walsh Drive
Parsippany, NJ 07054
Toll Free: 800-922-0337
E-mail:eco@ikonet.co.jp

Midwest
500 East Thorndale Avenue
Wood Dale, IL 60191
Toll Free: 800-323-6694
E-mail:mwo@ikonet.co.jp

West coast
20170 South Western Avenue
Torrance, CA 90501
Toll Free: 800-252-3665
E-mail:wco@ikonet.co.jp

Southeast
2150 Boggs Road, Suite 100
Duluth, GA 30096
Toll Free: 800-874-6445
E-mail:seo@ikonet.co.jp

Southwest
8105 N. Beltline Road
Suite 130, Irving, TX 75063
Toll Free: 800-295-7886
E-mail:swo@ikonet.co.jp

IKO INTERNATIONAL, INC.

Shaft Repair Sleeves Added to Inventory at IDC Distribution Center

IDC-USA has added shaft repair sleeves (Shaft-EZE) manufactured by Dichtomatik, a gold preferred supply partner to the cooperative, to the products stocked in the IDC Indianapolis-based distribution center.

Shaft-EZE is a thin-wall flange, hard chromed stainless steel sleeve that slides over the worn section of a shaft in minutes, creating a new shaft finish. Shaft-EZE provides customers a more economical solution to repairing worn shafts than replacing the shaft. Shaft-EZE is an ideal application for gearbox repairs or anywhere a seal runs on a shaft.

Silverthin Brings Precision Thin Section Bearings to IDC-USA

Manufactured in the United States, Silverthin bearings cater to the aerospace, industrial, robotics and distributor markets. These thin section bearings are available in standard configurations, sealed and unsealed, and are engineered up to 40 inches in diameter.

Because Silverthin maintains a vast inventory of products, the company can manufacture custom bearings, some made from special materials, to meet the needs of a diverse customer base in a short amount of time.

"We're very excited to partner with IDC-USA and happy to bring our full line of domestic thin section bearings to IDC Distributors and their customers. We look forward to growing our partnership with this elite group," said Scott Eiss, national sales manager of Silverthin.

SILVERTHIN™
BEARING GROUP

"As a part of our strategic plan, one of IDC's goals is to provide an ever-expanding array of new products and services. Silverthin offers a quality domestic product and delivers exceptional service which makes them a perfect fit for this goal," commented Todd Carroll, vice president of IDC-USA.

Lead Times Cut by 50% through Partnership with Miether Bearing Products, Inc.

Following IDC-USA's announcement of its partnership with Miether Bearing Products, IDC Distributors' customers now have access to specialty bearing housings, adapter assemblies and accessories.

Miether domestically manufactures housings that accommodate shaft sizes ranging from 2 ½ inches to 30+ inches in diameter. Miether manufactures solid products for heavy industries using more steel than most competitors, but remains competitively priced. With its "Never Out" program, lead times can be reduced by 50% on more than 200 combinations of split cast iron and steel housings.

"We are pleased to partner with Miether Bearing. Their quality driven mentality, dedication to strong customer service and well-trained staff echoes IDC-USA's commitment to our distributors and their customers to provide the best quality products and services at the lowest possible price," said Jack L. Bailey, president and CEO of IDC-USA.

Larry Cozzo, vice president of sales and marketing of Miether Bearing, added, "Miether Bearing Products is excited about becoming a supply partner to IDC-USA. We look forward to a long and successful partnership with the cooperative, its distributors and their customers."

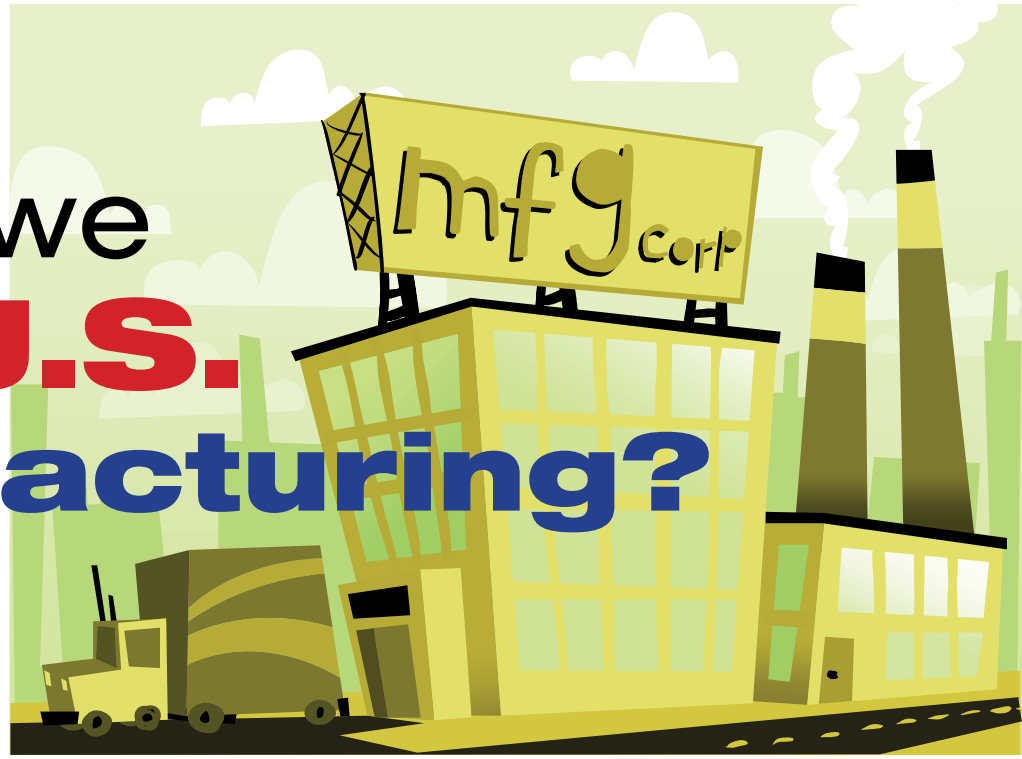
Cooper Bearings Introduces 100 Series

Responding to customers' requests for increased speed and reduced size, IDC-USA, in partnership with Cooper Bearings, announces the addition of the 100 Series bearing to its product offering.

With a lower base to center height, the 100 Series is a small compact bearing that packs a punch! Boasting a high speed and compact design, the 100 Series is ideal for a range of applications where both of these elements are important, from fans and blowers to material handling systems.

"Cooper Bearings strives for continuous innovation to provide customers with productivity improvements and high value, and we are pleased to partner with them to bring the new 100 Series bearing to our distributors' customers, keeping their machines running longer for less," said Almeda Myers, marketing manager of IDC-USA.

Why should we save U.S. manufacturing?



An excerpt from the book *Can American Manufacturing Be Saved? Why We Should and How We Can*

BY MICHELE NASH-HOFF

When the average American thinks about manufacturing, he or she thinks it is "dying." Many people may wonder why we should expend any effort to save American manufacturing. What difference would it make to the United States if we lost virtually all of our domestic manufacturing?

Americans may be surprised to learn that the U.S. is still the world's No. 1 manufacturer, accounting for about a quarter of global manufacturing output. The U.S. manufacturing sector accounts for $1.5 trillion or 12 percent of the country's Gross Domestic Product (GDP), which if it were a country, would make it the eighth largest economy in the world. Manufacturing output of the nation's factories in the United States today is at the highest level in history and continues to rise.

From 2001 to 2005, manufacturing contributed more to real GDP, adjusted for inflation, than any other single sector. Manufacturing GDP growth averaged 4 percent a year compared to 3.5 percent growth for the overall economy.

While manufacturing's share of the economy, measured by GDP, declined from more than 25 percent in 1950 to 11.9 percent in 2007, 80 percent of the drop in manufacturing's share of GDP has been from declines during recession years.

GDP is a measure of the dollars spent for products and services. More of the country's resources today are spent on business services, health care and education in regions where prices have risen significantly. Prices of manufactured products have increased at a much slower rate than the overall inflation rate. Overall inflation has risen more than two-and-a-half times faster than manufacturing prices. The huge difference in pricing power explains much of the reason why manufacturing has become a smaller part of the economy over the last decade.

PHOTO: © DOODLEMACHINE

The three largest manufacturing industries today are (in order): food products, computers and electronic products, and chemicals. Automobiles and auto parts dropped from third to fourth between 2002 and 2007, and fabricated metal products slipped from fourth to fifth in the same time period.

Manufacturing is the engine that drives American prosperity. It is central to our economic security and our national security. Federal Reserve Chair Ben Bernanke stated on Feb. 28, 2007, "I would say that our economy needs machines and new factories and new buildings and so forth in order for us to have a strong and growing economy."

However, Franklin Vargo, vice president for international economic affairs of the National Association of Manufacturers, said, "If manufacturing production declines in the United States, at some point we will go below critical mass and then the center of innovation will shift outside the country and that will really begin a decline in our living standards."

While manufacturing is not likely to fall below critical mass in this generation, it may in the next generation. Mark Zandi, chief economist at Moody's Economy.com, calculates that 20.5 percent of the manufactured goods bought in America in 2005 were imported. This was up from 11.7 percent in 1992 and 20 percent in 2004.

Manufacturing Supplies Millions of Jobs

Many may not realize that while the U.S. has lost millions of jobs in manufacturing in the last 20 years, manufacturing jobs are still the foundation of the U.S. economy and the basis for its middle class. Manufacturing provides high-paying jobs for more than 14 million Americans and creates an additional eight million jobs in related industrial sectors. The five states with the largest manufacturing workforces are: California, Texas, Ohio, Illinois and Pennsylvania.

California's manufacturing workforce of more than 1.5 million is almost the size of the Texas and Illinois manufacturing workforce combined.

Part of the loss of manufacturing jobs is due to increased productivity of American workers and automation. American workers achieve a high productivity rate year in and year out, increasing by more than 50 percent in the past decade. In the decade ahead, productivity growth will be the major source of economic growth, as more and more Baby Boomers leave the workforce to retire.

The growing trend of training in "lean manufacturing" is accelerating the increase in the productivity of American workers. For example, the metal stamping company that we represent went through lean manufacturing training in 2001 and, as a result, the productivity per employee doubled and the time it takes for a part to go through the shop from the first work station to the last part went down from an average of four weeks to one day. In other words, a part goes from one stage of the manufacturing process to another (or one machine to another) without any delay.

Another trend is the domestic outsourcing of service jobs within a manufacturer, such as janitorial services, cafeteria/food services, accounting and payroll services, and legal departments. Thus, jobs that may have been classified as manufacturing are now classified as service jobs.

As companies get rid of business units and people that used to work for them, they get smaller. But as companies get smaller and more efficient, revenues go down but profits go up.

Manufacturing Creates Secondary Jobs

There is a multiplier effect of manufacturing jobs that reflects linkages that run deep into the economy. For example, every 100 steel or automotive jobs create between 400 and 500 new jobs in the rest of the economy. This contrasts with the retail sector, where every 100 jobs generate 94 new jobs elsewhere, and the personal and service sectors, where 100 jobs create 147 new jobs. In addition, each manufacturing dollar generates an additional $1.37 in economic activity.

Manufacturers hire services such as banking, finance, legal and information technology.

CONTINUED ON PAGE 14

Thus, this economic data indicates that each manufacturing job creates three to four other jobs, while service jobs only create one to two other jobs. Therefore, the loss of 3.2 million manufacturing jobs nationwide since the year 2000 may have caused more than ten million other jobs to vanish. The U.S. Department of Labor estimates that another 1.5 million manufacturing jobs will be lost between 2006 and 2016. The University of California-Berkeley estimates that 14 million jobs are vulnerable to moving overseas in the next few years.

Automation has helped keep American manufacturers not only competitive but the most productive in the world. Manufacturing has long led U.S. industries in productivity growth.

Gains in productivity raise a country's standard of living. In the past 20 years, productivity – output per hour – has more than doubled (actually 2.5 times) that of other economic sectors.

Manufacturing Drives Innovation

American manufacturers are responsible for more than two-thirds of all private sector R&D, which ultimately benefits other manufacturing and non-manufacturing activities. More than 90 percent of new patents derive from the manufacturing sector and the closely integrated engineering and technology-intensive services.

Manufacturing R&D is conducted in a wide array of industries and businesses of all sizes.

The heaviest R&D expenditures take place in computers and electronics, transportation equipment, and chemicals (primarily pharmaceuticals.)

According to the 2008 annual survey conducted by the Industrial Research Institute (IRI), 38 percent of the companies responding said they plan to increase R&D spending by at least five percent this year. In addition, the largest industrial companies are planning to increase funding for basic research for the first time in a decade. "They also expect to increase spending on outside resources – through outsourcing R&D, licensing technology from others, funding university research, entering contracts with federal laboratories and increasing participation in alliances and joint R&D ventures."

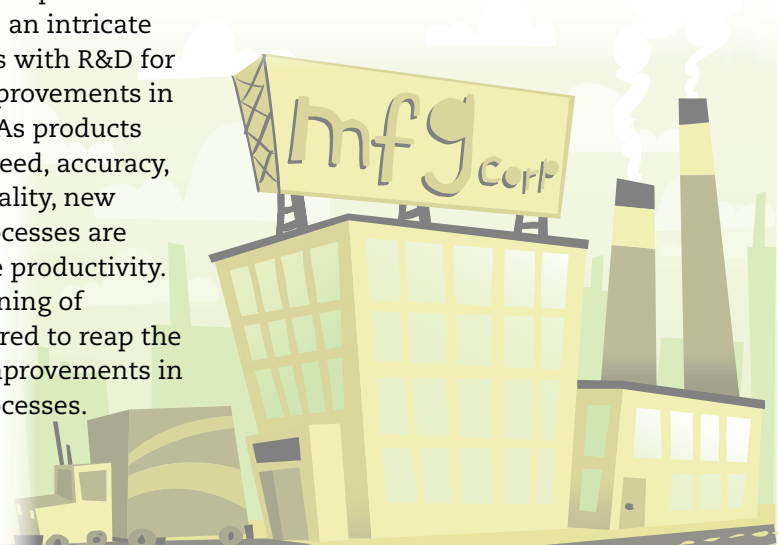
America's manufacturing innovation process leads to investments in equipment and people, to productivity gains, the spreading of beneficial technology to other sectors, and to new and improved products and processes. It is an intricate process that begins with R&D for new goods and improvements in existing products. As products are improved in speed, accuracy, ease of use and quality, new manufacturing processes are utilized to increase productivity. Education and training of employees is required to reap the benefits of such improvements in manufacturing processes.

In summary, manufacturing is the foundation of the U.S. national economy and the foundation of the country's large middle class. Losing the critical mass of the manufacturing base will result in larger state and federal budget deficits and a decline in U.S. living standards.

This, in turn, will result in the loss of a large portion of our middle class, which depends on manufacturing jobs. America's national defense will be in danger, and it will be difficult, if not impossible, to maintain the country's position as the world's super power.

It will take cooperative efforts on the part of industry, government and individual Americans to ensure that American manufacturing survives and grows in the global economy.

Michele Nash-Hoff is president of ElectroFab Sales, an independent manufacturers' representative agency, which she founded in 1985. She is the author of "Can American Manufacturing be Saved? Why we should and how we can." You may order her book at www.savingusmanufacturing.com.



When you need responsive service, premier products and trained support staff, your local **IDC Distributor** is here to help.

WE'RE HERE TO SERVE YOU

Large national chains simply can't match the support provided by your locally owned and operated **IDC Distributor**. When you need a critical replacement part because a production line is down, you need it now. **IDC Distributors** can get you the part you need when you need it, eliminating expensive downtime.

Your local **IDC Distributor** is a cut above the rest because of their ownership of IDC-USA. Because IDC-USA is a nationally owned cooperative of independent distributors with more than 200 locations, you receive the benefits of doing business at a national level while still getting that same hometown service of a small business owner.

Employees at your local **IDC Distributor** receive factory training through our vast network of Preferred Suppliers and participate in additional educational offerings from IDC University, our very own educational program where distributor salespeople learn all about the world of bearings, power transmission, material handling and more.

To learn more about how doing business with an IDC Distributor can benefit you, contact your local IDC Distributor today.

IDC-USA®

5 tips for selecting the proper bearing

Here are five tips to help you determine what type of bearing you need for your application

BY KEVIN PHELPS

Bearings come in all shapes and sizes. Every bearing type has advantages and disadvantages and can be supplied with a variety of special features. For this reason, it is imperative to fully understand the application prior to selecting a bearing.

The criteria for selecting a bearing can be broken down into five simple topics to consider. Most of these topics require basic common sense, while a few are more in depth. This article discusses each topic in detail.

What is the shaft diameter at the bearing location?

Before selecting a bearing, first determine the diameter of the shaft at the bearing location. Also, check to ensure that the shaft dimensions are within the recommended tolerances specified by the bearing manufacturer for the given application. This can be achieved using a calibrated outside diameter micrometer. If the application contains multiple bearings, check each bearing location, as the shaft diameter may change at some point along the shaft.

As a general rule of thumb, when mounting a Cooper split cylindrical roller bearing, the recommended tolerance on shaft diameter should be +.000-inch, -.002-inch. For slow-speed applications, this can be increased up to +.000-inch, -.005-inch. Roundness and parallelism of the shaft should be within .001-inch for optimum performance.

What is the shaft speed at the bearing location?

The maximum shaft speed at which a bearing will be operating is a key piece of information when evaluating an application. The shaft speed not only affects bearing life, but also the seal selection and grease recommendation. If the application is variable speed, then the maximum speed should be used for the bearing selection.

If the application is directly coupled to a motor, then the shaft speed can be obtained from the data plate on the motor. If the application is belt driven, then the motor speed and belt sheave diameters must be

known in order to determine the shaft speed at the bearings. If the shaft passes through a gear box or reducer, then the output speed of the gear box or reducer determines the shaft speed at the bearings. This output speed can usually be obtained from the data plate on the gear box or reducer.

All bearing manufacturers have a maximum speed limitation for their bearings depending on the type of bearing used and the design of the components. The Cooper Split Roller Bearing Corp. uses a split cylindrical roller bearing design which can take a considerable amount of radial load and operate at higher speeds than a double row spherical bearing or tapered roller bearing.

For example, Cooper's 01EBCP215EXAT (2 15/16-inch expansion type pillow block) can operate at speeds up to 4,138 rpm using synthetic grease. This makes Cooper split cylindrical roller bearings an excellent choice for fan applications and other high-speed equipment. A photo of this style pillow block is shown on page 16.

How much load (radial and axial) is the bearing required to support?

The required bearing capacity is determined by the amount of load (radial and axial) the bearing will support. Typically, for a given shaft size, a variety of bearing sizes or series are available to accommodate loads ranging from light-duty to extra heavy-duty. The load capacity of a bearing is a function of the amount of contact area being used to support the load; therefore, as the size and quantity of rollers increase, the capacity of the bearing also increases. Light-duty bearings are typically smaller in size and contain smaller rolling elements. Heavier duty bearings are much larger in size with thicker inner/outer race sections and larger rollers.

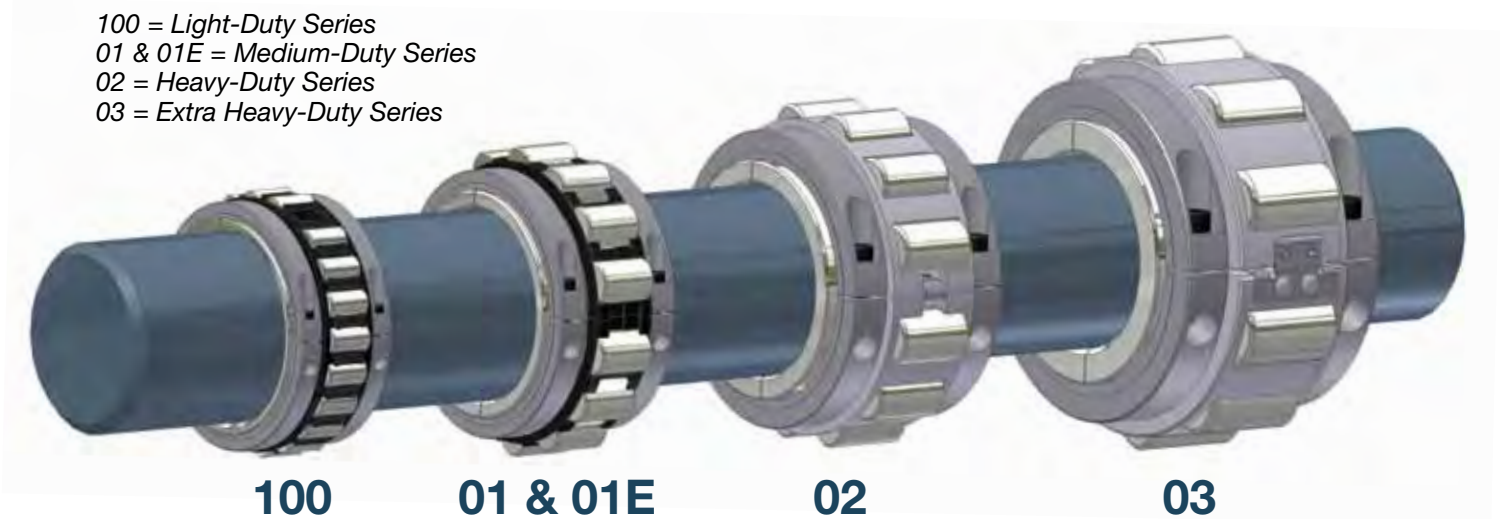
An example of the standard series range offered by The Cooper Split Roller Bearing Corp. is shown below.

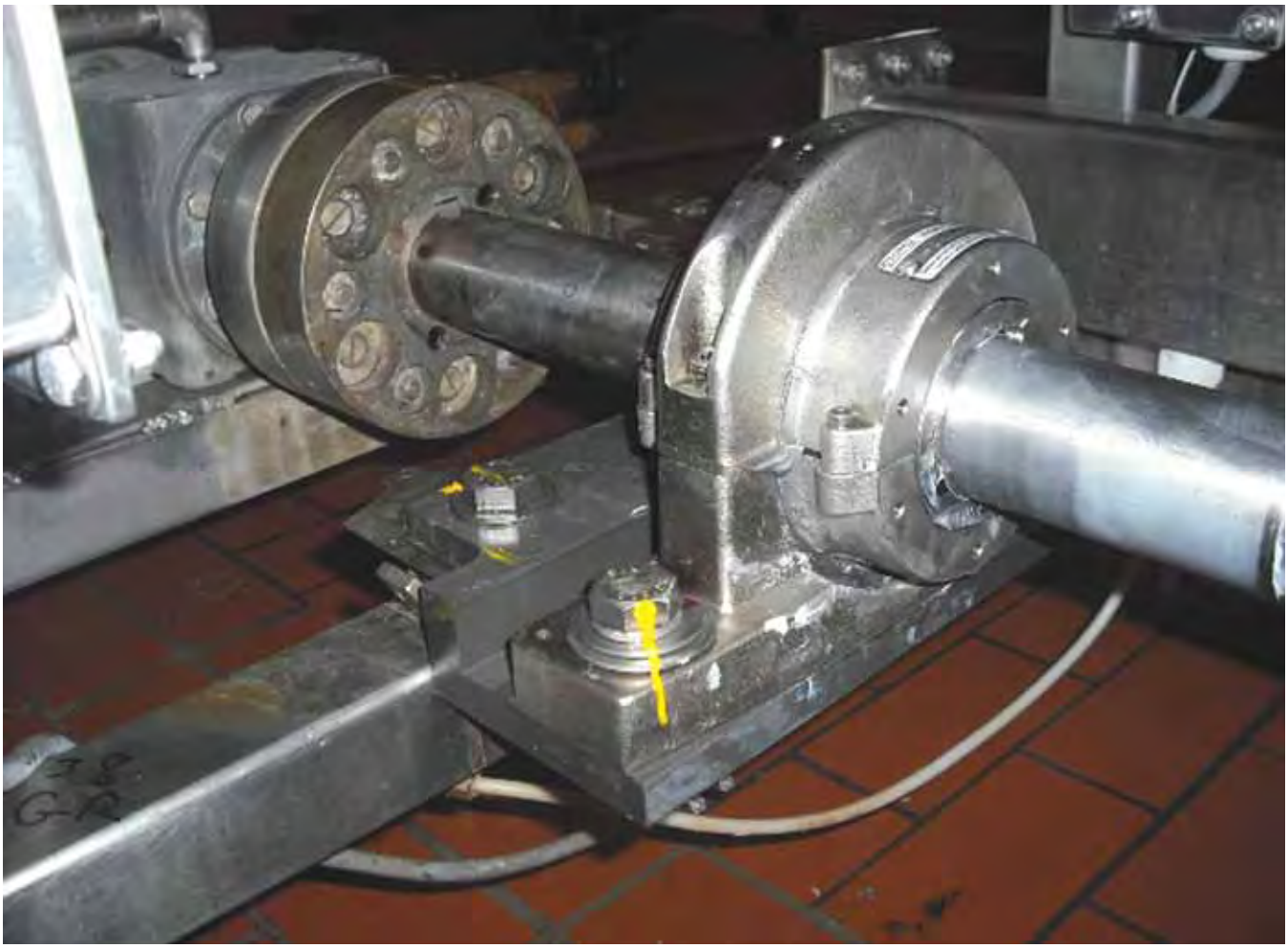
It is important to consider the application loads when selecting a bearing. If the selected bearing does not have enough capacity, it could lead to a bearing failure. In this case the calculated L10 life of the bearing is extremely low, causing the running surfaces to fatigue in a short period of time.

If the selected bearing has too much capacity (too lightly loaded), it could cause roller skidding and also lead to a premature bearing failure. Roller skidding occurs when there is not enough load on the rolling elements, and they begin to slide on the raceways instead of roll. This generates a considerable amount of heat which can lead to a premature bearing failure. Depending on the type of rolling element (ball, spherical roller, cylindrical roller, tapered roller, etc.), the amount of radial load required to prevent skidding will vary. In the case of a Cooper split cylindrical roller bearing, it requires less radial load to prevent roller skidding than a

CONTINUED ON PAGE 18

100 = Light-Duty Series
01 & 01E = Medium-Duty Series
02 = Heavy-Duty Series
03 = Extra Heavy-Duty Series





The above 01E series 2-inch pillow block unit was supplied by the Cooper Split Roller Bearing Corp. and is mounted on a lineshaft in the food industry where the equipment is constantly sprayed with a caustic cleaning solution. The housings were coated with electroless nickel plating to protect the outer surfaces from rust and corrosion.

double row spherical or a tapered roller bearing. This makes it a good choice for both heavy and lightly loaded applications. When making a bearing selection, a bearing that can support the load without skidding and provide an adequate L10 life would be the ideal solution.

What is the operating environment?

At this point in the bearing selection, the shaft size and series should already be determined. The topic of environment primarily determines what special features, seal type, clearances, etc., may be required for the operating conditions. Some common questions which fall under this topic are as follows:

- What is the shaft temperature at the bearing?
- What is the ambient temperature around the bearing?
- Is the bearing subjected to a dirty or dusty environment? If so, what types of contaminants come in contact with the bearing?
- Is the bearing in a dry or wet (splashed, submerged, etc.) environment?
- Is the bearing subjected to any harmful chemicals such as a caustic washdown solution?
- Is the bearing subjected to reciprocating loads or heavy shock loads and vibration?

Answers to these questions

will help determine the required features such as bearing and housing clearances, seal type, housing and roller cage materials, special coatings or surface treatments, grease selection and frequency of re-lubrication. Knowing and understanding the environment will allow the correct features to be supplied in order to maximize bearing life. Two examples where special features have been used are shown on pages 18 and 19.

What are the minimum life requirements?

Bearing life expectancy and cost tend to go hand in hand. Typically, a bearing that has a higher life expectancy in an application will be more expensive than a similar bearing with a lower life expectancy. This relates to topic No. 3, where bearing capacity is discussed. A bearing with a higher capacity will typically be more expensive than a bearing with a lower capacity. For this reason, it is best to choose a bearing that will meet the life requirements in the application rather than just purchasing the largest bearing available. For example, you wouldn't walk into a hardware store and purchase a sledge hammer to drive in a finishing nail. You would select the appropriate size hammer for the job. Selecting a bearing is very similar.

Something else to consider is that bearing life can be relative. For example, for one manufacturing facility, the normal cycle may be to change out the same bearing on an application once a month. If this facility were to switch to a different style of bearing, such as a Cooper split cylindrical roller bearing, and improve the life from one month to one year, the facility would be extremely happy. Someone who is unaware of the performance of the previous bearings may think that one year is not adequate; however, those involved from the beginning realize that the life has been increased by 12 times. From their standpoint, the newly achieved life of one year is fantastic. Since bearing life can be relative, it is up to the end-user to determine what life is reasonably acceptable. For this reason, the minimum life requirements are important for the bearing selection.

In summary, selecting a bearing for an application can become quite complicated. Breaking down the selection and reviewing the five topics mentioned above should help simplify this process. There can be other things to consider in special cases, but reviewing these five topics should lead to an adequate bearing selection in at least 90 percent of the applications in the field.

If you need assistance in selecting a bearing for a given application, please contact your IDC Distributor.

Kevin Phelps is technical sales manager for the Cooper Split Roller Bearing Corp. For more information, visit www.cooperbearings.com or kphelps@kaydon.com.

The above 01 series 12-inch Cooper split roller bearing is mounted on a rotating drum that passes steam through a hollow shaft. Due to the intense heat, a C5 clearance bearing along with a bronze roller cage and a special race design allow for 1 3/16-inch of shaft expansion.

Roller Chain RX

Roller chain that meets specific application requirements and is installed and maintained correctly will run reliably and efficiently for a long time

BY CLAIR DAVID URBAIN

Roller chain literally drives automation in much of the production and transport equipment in today's plants and facilities. It transmits power in a myriad of applications, many of which are not the best operating environments. It must work dependably in hot or cold, wet or dry, extremely dusty or corrosive conditions.

Each application requires specific chain qualities that will produce excellent wear and fatigue resistance for a long, reliable working life, says Ray Hensley, engineering manager at Renold Jeffrey, a world-leading chain manufacturer. But he also reports that many times, poor attention to maintenance can cut chain service life in half.

"Nine out of 10 chain failures are caused by improper maintenance and insufficient lubrication," Hensley says. "Chain maintenance and lubrication is so easy and simple. It's like checking air pressure in car tires. It's easy to do but very often overlooked."

Maintenance matters

A poorly maintained chain will not work correctly, which can result in secondary conditions that will lead to short service life or even chain failure, Hensley says. "Poorly maintained chain can become tight and stiff, and will not interact with the sprockets correctly. If the chain will not flex freely, then proper chain and sprocket interaction is not occurring. In severe cases, poorly maintained chain can result in unusual load conditions that can exceed the maximum designed working load of the chain," he says.

Proper maintenance starts when the chain is installed. Take time to assure all things are as they should be. "An old system is not the same as it was when it was new. Take the time to assure everything is aligned properly before installing new chain, and remember new chain requires new sprockets," Hensley advises.

PHOTO: © MATTEO NATALE

Once new chain is installed, it must be lubricated. Most manufacturers only use a lubricant on new chain that prevents light rust from forming. The chain must be lubricated before operation according to the OEM, chain or sprocket manufacturer's guidelines.

Lubrication takes more than just going through the motions of applying grease. Lubricant selection depends on the application and operating conditions. "Operating temperature affects lubrication selection. High operating

temperatures require a high-temp lubricant; but if it's a cold-temperature application, a low-temp lubricant may be needed," he says.

Although less of a problem than in the past, Hensley cautions against using lubricants with detergent additives. "It sounds like a good idea, but the detergent actually removes the protective coating on the chain and causes chain corrosion. Use non-detergent lubricants that match the application. There are some good ones available that offer cleaning properties without the corrosive qualities," he says.

In extreme applications, Hensley recommends building a team of people from your sprocket, chain and lubricant suppliers who are knowledgeable about the specific operating requirements of your equipment. "They can work together to select the correct lubricant and identify the lubrication schedule to get the longest component life," he says.

Monitor alignment and tightness

Over time, chain will wear and elongate. Even minute changes in alignment and chain tightness will affect chain and sprocket life.

For example, a chain that is 10 feet long and wears just .003-inch or .004-inch at each pin and bushing can increase chain length by as much as 2 inches, depending on the chain

CONTINUED ON PAGE 22

Lubrication takes more than just going through the motions of applying grease

pitch. “It’s common to think that chain stretches over time, but that’s not the case. The links don’t stretch, but pins and bushings wear, making the chain appear that it has stretched,” Hensley says.

Similarly, the sprockets wear along with the chain, and Hensley recommends that they should also be replaced when the chain is replaced. “Otherwise, the new chain won’t mesh with the old sprocket, causing additional wear to the chain and the sprocket, which also shortens the chain’s life,” he says.

Replace all the used chain with new. Replacing only a portion of the used, worn chain with new chain will result in uneven chain loading and shorter service life. “Replacing a single failed link with a new one sets up the original links that follow it in the chain for added stress and wear. If you replace a failed link, that new link has a different pitch from the others and will not carry its load,” he says. “Instead, the following links will have an increased load which can lead to a secondary chain failure.”

Identify the root cause of chain failures

This wear can be best managed by checking chain/sprocket alignment and tightness on a scheduled basis.

Fixing failures

When a chain fails, it’s important to identify the root cause. Look at all aspects of the failure, such as past maintenance procedures, previous equipment repairs, changes in lubricants or changes in loads or run times. “Your power transmission team made up of your sprocket, chain and lubricant suppliers can help identify root causes and help you get longer, more efficient chain life,” Hensley concludes.

SmartLink collects chain data connection-free

Renold Jeffrey offers SmartLink, a wireless device that can be attached to chains to gather operating information in real time to better understand loads placed on chains in operation.

The wireless device connects onto a chain link, and through infrared technology, transmits chain stress data back to a remote control unit where it can be downloaded to a Windows-based personal computer for further analysis.

SmartLink offers three levels of diagnostics:

1) Overload detection. As the device rides on the chain, it can identify areas where the chain load exceeds a preset level. It can sound an alarm on the remote control so operators or maintenance professionals can determine whether it is safe to continue to operate the equipment safely and efficiently.

2) Detailed load profile. The unit can sense, locate and transmit data as the chain progresses through its circuit to identify peak load issues. The data can be downloaded to a Windows-based personal computer for further analysis.

3) Remote monitoring to improve safety. If the load in question is extreme or monitoring the chain travel and load presents a safety hazard, SmartLink can safely and remotely capture data to better understand the dynamic force loads in specific applications. It’s been used to identify ongoing problems in skid steers, agricultural machinery, material handling equipment at ports and even leisure rides at theme parks.

Chain wear troubleshooter

Renold Jeffrey engineers have identified common types of chain wear and offer solutions. You can download Renold Jeffrey's extremely helpful 52-page chain wear guide at www.renoldjeffrey.com under the heading "Chain Troubleshooter."

Abrasion

Application: Simple transmission chain drive.

Failure mode: Rubbing that caused wear on the side plate faces, ends and pins.

Diagnosis: The chain has been rubbing against some fixed point on the circuit, and it has likely worn a groove in the fixture, probably initiated by the harder pin ends.

Solution: Realign the chain drive before chain is damaged to the point it has to be scrapped.

Corrosion

Application: Chain drive on a barreling machine.

Failure mode: Corrosion.

Diagnosis: This chain has been used in an environment with water contamination without regular lubrication. External parts have gradually corroded until the rollers seized to cause heavy wear on rollers.

Solution: Protect from water if possible; increase degree of maintenance lubrication.

Fatigue

Application: Special 2 1/2-inch ANSI simple chain on a mine conveyor.

Failure mode: Fatigue failure in a No. 58 pin.

Diagnosis: The joint was dry with no signs of lubrication. It had heavy galling and shows signs of surface corrosion

CONTINUED ON PAGE 24

products. The chain had been running in water, and the installer reamed out the joint's holes to ease assembly.

Solution: Provide a better pin lead for easier assembly; reconsider lubrication regime.

Fracture

Application: 1.25-inch BS zinc-plated chain used in a water environment.

Failure mode: Bushes fractured on assembly.

Diagnosis: Customer-supplied zinc-plated bushes for assembly that broke into several fragments due to hydrogen embrittlement. The bushes should have been de-embrittled after plating.

Solution: Ensure correct de-embrittlement treatment is carried out immediately after plating.

Fretting

Application: Tilt tray sorter chain on airport baggage handling equipment.

Failure mode: Chain pins and bi-planar block show scoring and heavy red deposits that indicate fretting corrosion.

Diagnosis: Marginal lubrication caused roughness from components rubbing against each other.

Solution: Every pin should be removed and all traces of the abrasive red oxide removed, then a better lubrication plan developed and followed.

Galling

Application: Hollow (step) pin in a high-rise escalator.

Failure mode: The pin pressure faces have severe wear to the point where surfaces have articulated and fused together.

Diagnosis: The very high pressures experienced in high-rise escalators cause lubricant to be squeezed out of pins and bushings and fail.

Solution: Use high-quality, high-pressure lubricants and follow a diligent lubrication schedule that constantly maintains a film of lubricant between the surfaces.

Lubrication and alignment

Application: 1-inch Pitch BS duplex chain on a flywheel driving a 400 Tonne press.

Failure mode: Excessive wear – chain jumps teeth and causes tooth rounding.

Diagnosis: The chain was never lubricated in its six months service life; the loads required at least oil sump lubrication. Also, the center distance was greater than recommended and the sprockets were misaligned.

Solution: Improve/implement ongoing lubrication plan. Consider hardening the driver teeth and correct drive alignment.

Material cracking

Application: 0.5-inch Pitch BS 20 tooth sprocket.

Failure mode: Material cracking below teeth.

Diagnosis: Sprocket teeth were incorrectly flame-hardened by customer, causing cracking to occur.

Solution: Use sprockets already flame-hardened by Renold Jeffrey.

Overloading

Application: Extended pin fitted to chain to carry an outboard roller.

Failure mode: Sudden shock overload has caused pin failure.

Diagnosis: The extended pin failed due to overload or shock loading. The failure started at the corner of the flat on the pin; the "river markings" flowing away from the crack initial point can be seen.

Solution: Determine the reason for the shock/overload and remove the cause or re-design the pin so it can carry the load.

Wear

Application: 1.5-inch Pitch BS duplex chain.

Failure mode: Pin bearing areas worn. Position of intermediate plates is clearly visible.

Diagnosis: Over a long period of time, the pins gradually wore, resulting in chain elongation of two percent.

Solution: Monitor chain extension regularly and adjust drive as needed to assure proper tension and alignment.

Sprocket tooth wear

Application: Sprockets on a conveyor.

Failure mode: Severe hooking wear of the sprocket teeth compounded with a second phase of hooked wear.

Diagnosis: The original chain and sprockets have followed normal wear patterns with hooked wear of the sprocket teeth and pitch elongation of the chain. When the chain was replaced, the old sprockets with worn teeth are incompatible with the pitch of the new chain, resulting in severe secondary sprocket tooth wear and likely rapid chain pitch extension.

Solution: Always check the condition of the existing sprocket teeth before fitting a new chain to any system.

Adhesives, sealants and more

ND Industries answers the call for cost-effective products with superior performance in production and MRO applications

BY CLAIR DAVID URBAIN

Facility engineers, buyers and other production professionals must constantly dig through a myriad of products to find the ONE that fits hand-in-glove with the application, yet doesn't cost an arm and a leg.

"This is particularly true with adhesives and sealants," says John Hamaty, vice president of new business development at ND Industries. In the high-tech world of manufacturing, tolerances are tight and specifications are rigid. Locking, sealing, bonding and assembly-related products and processes are generally costly and often require long lead times to get test samples. That's where ND Industries has made a world of difference.

Unlike other adhesive and sealant manufacturers, ND works closely with customers to identify or develop the precise product for the application at a cost and quantity that makes sense. "We commonly formulate material for a specific application in a fast turn-around timeframe. Other manufacturers have more of a one-size-fits-all product approach to their customers' needs," says Hamaty.

Low cost, flexible and responsive

ND Industries is a vertically integrated manufacturer that provides a cost-effective, highly responsive alternative to products and services from companies such as Loctite, 3M, Nylok and Long-Lok. "We exceed our customers' expectations by providing personalized engineering consultation and customer-driven product research and development. Our specialized team of chemists and laboratory facilities are second to none," Hamaty says.

ND Industries has a 50-year history as a pioneer in fastening and sealing technologies. It owns and operates the largest group of pre-applied processing facilities in the United States and has state-of-the-art facilities in China and Taiwan. Its sealants, threadlockers, anaerobics, lubricants, adhesives and other products can be found in automotive, electronics, aerospace, marine, construction and appliance manufacturing plants around the world.

Several approaches to your fastening challenges

ND Industries' fastening solutions can be supplied in a variety of ways to suit your specific needs. For instance, many of ND's products can be pre-applied to customer-supplied fasteners in low or high volumes in their regional production facilities. Or, most can be supplied in packaged or bulk containers if customers prefer to self-apply the product.

With more than 100 different products and services directly related to fastener locking, sealing, bonding, coating and thread masking, ND Industries provides customer-driven solutions for unique fastening needs. ND has a growing line of assembly-related products that seal, cushion, insulate, temporarily retain and control noise and vibration in the

CONTINUED ON PAGE 28

manufacturing process.

ND Industries also offers part sorting, color coding and partial assembly services that can make final product assembly simpler, more accurate and faster, which saves money. "These services help reduce assembly errors, cut downtime and eliminate waste in the assembly process, which increases productivity by speeding up the entire assembly process," Hamaty says.

Building your own brand

ND industries works with customers to develop proprietary formulations. "Our ability to custom-formulate products in a cost-effective and time-sensitive way and then produce them in quantities that meet the demand of customers sets us apart from other adhesive and sealant manufacturers," says Hamaty.

He continues, "We are willing to complete the research and development process and take a product through production for customers. Our extensive research and development resources allow us to be more efficient and responsive to customers' needs than our competitors. Our partnership with IDC-USA puts us in touch with customers looking for our types of products that meet their specific performance requirements at the very best cost."

Look to ND Industries for the following technologies:

- Anaerobic threadlockers
- Anaerobic threadsealants
- Anaerobic retaining compounds
- Structural adhesives
- Cyanoacrylates
- Epoxies
- Urethanes
- UV acrylics
- Liquid gasketing
- Anti-seize lubricants

Users of these ND Industry products typically experience substantial cost savings and superior performance over competitors' products.

Product Focus: Vibra-TITE VC-3 Original

Anaerobic threadlock compounds are commonly used to prevent loosening fasteners from vibration. However, these compounds tend to provide one-time-only vibration protection. If the fastener is ever removed, the threadlocking properties are almost always sacrificed.

Unlike other manufacturers that use an anaerobic-based chemistry for threadlocking compounds, ND Industries' Vibra-TITE VC-3 compound uses a solvent-based formulation which provides a permanently tacky residue on the fastener. Its soft, pliable nature allows it to cold-flow into all spaces in the threaded assembly. Even after repeated loosening and tightening sequences, it maintains its threadlocking properties.

Because of its resilience, Vibra-TITE VC-3 Original is widely specified in demanding and critical military and aviation applications. In fact, it's the preferred threadlocking compound on the turret mounting fasteners in the U.S. Army's M1 Abram tank because it can withstand the shock loads of repeated gun recoil. It's also used to maintain tight connections between cable connections in the instrument panels of F-16 fighters and Apache helicopters and is specified for assemblies used in NASA spacecraft.

ND Industries' Vibra-TITE VC-3 Original product offers the following benefits:

Excellent shelf life. Parts treated with Vibra-TITE can be stored indefinitely before use.

Versatility. Adheres to ferrous, non-ferrous metals and most screw types including wood, plastic and plating.

Reliability. Withstands even the most severe vibrations.

Reusable. With common hand tools and steady pressure, fasteners treated with Vibra-TITE can be easily adjusted many times without affecting its holding properties.

Minimizes stripping and galling. Its cold-flow properties actually minimize soft-thread stripping when fasteners are reused.

Low Cost. Typically a fraction of the cost of anaerobic threadlocking compounds.

Common Applications for Vibra-TITE VC-3 Original:

- Power tool assembly and adjustment screws
- Orthotic knee joint assembly fasteners
- Radiographic exposure device (X-ray) assembly fasteners
- Drive belt joint-clamping plate screws
- Trigger and sight adjustment screws in guns and archery
- Various motorcycle fasteners
- Golf shoe cleats
- Carburetor adjustment screws
- Eyeglass screws
- Sheet metal screws for holding glass windows in metal frames
- Turbocharger bearing housing bolts
- Aerospace, military and automotive

DEATH of the maintenance department

(and what you can do about it)

BY JOEL LEVITT

Sometime in the 1990s, the maintenance department as we knew it died. The people who carried out good maintenance practices such as PM got laid off. We lost the planners, maintenance engineers and support people who made the systems work.

The old paradigms and strategies don't apply in the new corporate order. We must ask fundamental structural questions about what types of tasks maintenance personnel should do and who should do maintenance tasks. The first question concerns the mission of maintenance.

What is the mission?

There used to be as many answers to this question as there were companies. When a company even had a mission statement, it ranged from ensuring quick reaction times for fixing breakdowns to serving the customer. Some companies are intent on reducing downtime, and others focus on cost control or quality. A few focus on safety or environmental security.

All these missions are useful and important. And all ignore the deep issue: the organization has changed and something very simple transcends these missions or values.

Old and new collide

The old mission statement contradicts the new core corporate philosophy of being a lean, mean, fast, in-your-face competitor. The old vision of maintenance is as obsolete as a relay rack. Here is the new vision:

The mission of the maintenance department is to provide excellent support for customers by reducing and eventually eliminating the need for maintenance services.

That calls for retooling traditional roles. On one side, maintenance must merge with machine and tooling design to integrate maintainability improvements into design. The accumulated knowledge and lessons of maintenance will be immediately merged into the design profession. Designers and maintainers will have a revolving door.

On the other side, routine maintenance activity should be merged into operations. The TPM (total productive maintenance) model shows that operators can handle the task and that the whole maintenance effort will benefit from operator involvement.

What happened to our organizations? What is the best structure to produce cars, to generate electricity or to provide a college education? Increasingly, the answer is not a traditional structure. The optimum structure is increasingly a matrix, a network, a wheel or something people never thought of before.

In some notable cases (such as film making), the best organization is virtual. It is assembled ad hoc – with

PHOTO: © MARCO MACCARINI

independent contractors who are experts in their fields – and dissolved when the need changes or ends. The lean and mean virtual corporation depends far less on bricks and mortar than the old one did.

The creed of the new organization is that everyone must add value to the product. Everyone is expendable, outsourceable. Think of the current corporate hero, who is no longer a lone product-development genius but now a tough cost-cutter (who just engineered a 1,000-person right-sizing). Imagine how she would react when you tell her you need additional people to carry out PM and other sound maintenance practices.

Breakdowns are not OK!

Traditionally, maintenance people have believed that breakdowns are OK. After all, that's what we're paid for. The same attitude supports designs that demand constant investment in PM and routine maintenance.

This acceptance of the status quo is unacceptable. Breakdowns should be viewed as failures of the maintenance system. Any equipment that needs periodic attention to avoid breakdowns is likewise a failure of design engineering.

Where do PM and predictive maintenance fit in the new structure? Organizations spend millions of dollars on preventive maintenance, which includes all predictive technologies, such as infrared inspection and vibration analysis. Do we scrap the hard-won improvements in uptime and reliability gained through the judicious use of PM?

The fatal flaw of PM is that it requires a constant investment of labor and materials to maintain the uptime. PM itself never improves the underlying engineering situation. No improvement will ever flow from a traditional PM orientation, because it never addresses the flaws in the design, use or operation of the equipment.

What's more, when your company downsizes and your PM crew is laid off and not replaced, reliability and uptime will return to their old frequency.

PM does, for a price, increase the life of equipment and decreases the size and scope of failures. The new organization has a place for PM. View it as a station or resting place on the way to maintenance elimination.

When you don't have the time, resources or technology to figure out the underlying problem, use a PM approach to reduce your exposure to breakdowns. Also continue PM, along with other methods, where the implications of breakdown are deadly or terribly expensive.

Here's an example of the new approach I'm talking about.

A manufacturer had excessive problems with air cylinders:

1) His calculations showed he was getting only one year between rebuilds in his adverse environment. A seal kit cost $30 plus labor and downtime.

2) He instituted a PM system with weekly cleaning and inspections. The PM approach worked, and the time between rebuilds increased to two years. The problem was that he needed people to make all the checks and cleaning.

3) At a local trade show, he saw a new type of seal kit that promised a long life in adverse environments. It cost $85. His tests revealed that the new seal lasted more than five years without a PM program! As the new seals were phased in, his maintenance requirement dropped, reliability increased, and the production line was well served by the reduction and eventual elimination of maintenance services.

Every maintenance improvement reduces the need for maintenance labor and increases the service level to the maintenance user. The same asset can be successfully maintained by a smaller and smaller crew. Maintenance departments that take this approach will be doing their part to ensure that their organization survives and thrives.

Joel Levitt is a leading trainer of maintenance professionals. He has trained over 10,000 maintenance leaders from 3,000 organizations in 20 countries. He is president of Springfield Resources, a management consulting firm. Contact him at JDL@maintrainer.com.

Countdown to a zero injury workplace

Many people think zero injuries is an unattainable goal

BY CARL POTTER, CSP, CMC AND DEB POTTER, PHD

Imagine for a moment that one of your children has secured his or her first job with a company in your industry. Your child calls you after the first day at work and says, "At the orientation today, they said there is a likelihood that I will either be injured or die on the job while working for this company."

What would your reaction be? If you're like most parents, you'd tell your child not to work for that company. After all, who would want any family member to work in a company where the assumption was that people will be injured or even killed?

However, when you say, "Zero injuries are not possible in our workplace," you tell employees they are likely to be hurt or die at work, just like the previous scenario.

The solution? To attain zero injuries in the workplace, you must have a goal of zero injuries. Even more than that, you must *believe* zero injuries is possible and have that belief become the entire company's philosophy. While the solution may seem simple, it works. After all, most Americans are goal-oriented people. And, if you aim for something, you are likely to get it.

PHOTO: © MARGO HARRISON

The current state of workplace safety

Today, we live in an increasingly demanding and complex business environment. Managers and employees must make tough choices daily when it comes to production, quality, safety and health. We often feel like we're being barraged with regulations, rules, laws and bureaucracies. And in the midst of all this and despite our best efforts, workers are getting injured and dying on the job.

According to OSHA, over 5,214 workers died as a result of workplace injury and illness in 2008. And according to the Bureau of Labor Statistic, 3.6 million workers were injured or became ill in 2008 as a result of incidents and hazards at work. Consequently, companies spend over $50 billion a year on injuries and illnesses, making the United States less competitive in the world market. This figure doesn't include the financial and emotional burden of the impacted families.

With all this money going towards safety-related issues, why are workers still becoming injured, ill or dying on the job? Because many organizations do not have an overarching safety philosophy. As such, the demands of competition, globalization, mergers and acquisitions often take priority in the minds of managers and executives, leaving safety issues to rest on the back burner.

When asked, many executives, managers, and supervisors state they do not have a safety philosophy because they don't understand the concepts of safety and health management. Nor do they understand how to approach safety in the context of the work that they manage or supervise. While many executives, managers and supervisors are highly educated in management and leadership concepts, most of them have had shamefully little training in integrating health and safety management principles into their everyday work.

No matter the problem, no matter the question, no matter the issue, managers and executives can create sustainable, positive change when it comes to safety and health. They do this when they develop a philosophy that promotes safety and health throughout their organizations that de-emphasizes the current focus on compliance. Instead, the philosophy must give equal weight to five areas: management commitment, employee involvement, worksite analysis, hazard prevention and control, and health and safety training.

Too often, organizations temporarily focus on only one or two of these areas. This is a great disservice to the employees, because the lack of balance and absence of an overall philosophy causes chaos and faulty behaviors that directly or indirectly lead to employee injury or death.

While the answer is to develop a philosophy that embodies a standard for safety and health excellence, some executives and managers are reluctant to adopt existing standards, such as OSHA's Voluntary Protection Program (VPP), for various reasons. Some think it is too expensive. Others believe that using certain standards requires them to have a partnership with OSHA that they do not want. Still others think it is too time consuming.

These executives fail to recognize that the standards are in reality meta-standards, or a set of conceptual guidelines for the development of detailed specific standards.

A new approach to workplace safety

After listening to and considering the objections to standards, we suggest that you stop and reconsider. Find and adopt an external standard of excellence for safety management and measure your current processes against it. This standard should address the technical concerns of safety and health professionals, yet give executives, managers and supervisors who are not health and safety experts meaningful standards they can put to work immediately to positively impact their workplaces.

A company that uses and meets this adopted standard is likely to be on target for zero injuries. Additionally, if a company uses the standard as the core of its safety philosophy, they have, in effect, a safety management system that managers and employees are

CONTINUED ON PAGE 34

likely to embrace.

The good news is that by using a systematic approach for sustainable improvement in safety and health management, managers, employees and contractors can begin to reap the rewards of a safe and healthy workplace.

Higher safety standards

Adopting high safety standards is easier than you may think. All it takes is four simple steps:

1) The first task is to understand the five areas that must be covered by the standard:

Management commitment
Provision of outstanding protection to their employees through effective systems and personal actions by executives, managers and supervisors.

Employee involvement
Employee interest and involvement in the safety and health processes at work including participation in audits, accident and incident investigations, suggestion programs, and safety committees.

Worksite analysis
A systematic approach to assessing and managing worksite hazards.

Hazard prevention and control
A commitment to workplace health and safety through preventative equipment maintenance, workplace health processes, hazard tracking methods and emergency preparations.

Safety and health training
Ensures workers know how to perform all aspects of their job to prevent work-related injury or illness.

2) Next, develop a safety philosophy in the organization. Ask yourself:

- What does my organization really believe about worker safety and health?
- Do the executives, managers and supervisors understand their moral and legal obligations about safety and health?
- Do we really believe the company can have zero injuries?

The answers to these questions will tell you what your company's safety philosophy is. Realize that you may have to work to educate leaders and get their thinking aligned with the importance of creating a workplace where safety and worker health are paramount concerns, but the effort is worth it.

3) Then, through careful assessment, determine the current state of the company's health and safety management program. After analysis of where your company is, you can develop a future vision of safety and health management excellence for the organization.

4) Finally, reveal the gap between the current state and the future state of health and safety for your organization. Only then can you begin to take purposeful actions to fill the gaps and create an environment where everyone can go home every day without injury.

A safer, more profitable future

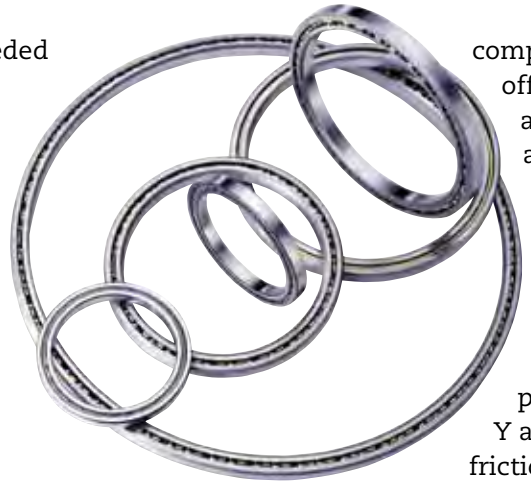
Having a zero injury workplace is possible. If you can lead your team to go one hour without an injury, then you can lead them through many hours that turn into days, weeks, months, and years. Remember, the greatest legacy leaders can leave is that they ran a profitable business where everyone got to go home every day without injury.

Carl Potter, CSP, CMC and Deb Potter, PhD, CMC work with organizations that target a zero-injury workplace so everyone can go home to their families every day without injury. As advocates of a zero-injury workplace, they are speakers, authors and consultants to industry. For information about their Simply Seamless Safety Services, contact them at Potter and Associates International, Inc. 800-259-6209 or www.SimplySeamlessSafety.com.

AIRBORNE ANSWERS

How a bearings supplier helped an antenna manufacturer select the right bearing for a mission-critical airplane application

An antenna manufacturer needed to design a directional antenna pedestal to support an airplane-mounted antenna for relaying critical data. The manufacturer contacted its local distributor, who in turn approached the Silverthin Bearing Group, an IDC Preferred Supplier that manufactures large diameter thin section ball bearings for the aerospace, industrial, robotics and distributor markets.



Since the antenna would be airborne, the pedestal required a bearing configuration that's lightweight, has low torque and is corrosion resistant. The antenna had to maintain a high level of pointing accuracy, which also required that the bearings have a high level of stiffness. The antenna manufacturer needed something that would be cost-competitive and available with a lead time of one month or less.

In most applications where the finished product is exposed to the elements, the solution would be to incorporate stainless steel bearings for their corrosion resistance. But stainless steel bearings typically take 10 to 13 weeks to be delivered because most manufacturers don't keep large quantities in stock.

The antenna maker chose Silverthin over the competition because Silverthin offered a solution that met all of the requirements – in a timely and cost-efficient fashion.

For example, to address the issue of stiffness, Silverthin specified angular contact matched pair bearings for the X, Y and Z axis. To minimize friction and keep torque as low as possible, Silverthin applied a very light and precise amount of low-torque grease in the bearings. And, to address the issue of corrosion resistance, Silverthin's thin dense chrome (TDC) plating served two important purposes – it offered corrosion resistance on par with stainless steel, and the plating could be applied to standard stock rings. Applying the plating to standard rings meant that both the cost and lead time were lower than for an all-stainless steel bearing.

- Directional Antenna Pedestal is a lightweight communication antenna pedestal
- Application required a very small, lightweight yet robust bearing
- Pedestal must withstand rough airborne environment, including corrosion protection
- Quick delivery required

Dealing with difficult people

BY RHONDA SAVAGE

Every time you tolerate rude workplace behavior, it's an invitation to continue those actions

People today have a short fuse – everyone is stressed. And when people are stressed, they can become difficult to be around. Chances are, you've worked with at least one difficult person in your organization. You recognize the behaviors of a difficult person, such as: a bad attitude, apathy, difficulty handling change and terrible customer service. Difficult people give you the silent treatment or worse – they can be verbally aggressive.

Unfortunately, if you don't address this kind of behavior, one of two things will happen:

1) Employees will become resentful and think less of you as a leader.
2) Employees will start modeling the behavior of the person who is not being corrected.

It's important to understand, there's only one reason anyone behaves in an unacceptable manner: Because they get away with it! So, who's responsible for difficult people? The answer is anyone who tolerates them. Every time you give in to a difficult person, every time you choose not to confront him or her, you allow a difficult person to continue this rude behavior.

What does a difficult person in your workplace look like? Often, he is the one who gets the better schedule. He may come in late or depart early, leaving his work for others to finish. He might take a longer lunch, talk on his cell phone or pay his personal bills during work hours. No one asks him to work on a project because people don't like working with him.

So, how can you change this situation? Confrontation is one answer. Unfortunately, it can be hard for anyone to address this issue. However, it's important to understand that dealing with the issue will facilitate a more harmonious atmosphere in the workplace, leading to increased productivity, improved morale and a healthier bottom line.

You'll need to set boundaries, expectations and guidelines, and then hold the person accountable

PHOTO: © PAREMA

for his or her behaviors. Here are some tips, whether you are an employee dealing with a difficult supervisor, a worker dealing with a co-worker, or a manager dealing with a challenging employee.

Owner or Manager to Employee: Have you ever had an employee who was demanding, condescending, abrupt, tearful, insecure, and high maintenance – and yet she did an excellent job? Were you worried about losing her because she produced great work? Just because someone does great work doesn't make her a good employee. If you have a person whose behavior is affecting the morale and productivity in the workplace, and you've already coached the employee on the issue, this person needs a formal corrective review.

The employee should be given a copy of the corrective review; a signed copy is placed in his employee file. Let the employee know the specific behavior you need to have changed, your clearly defined expectations, and a time frame he has to work within. Have a follow up meeting within a designated time period to give the employee the feedback he needs. Be sure to provide clear oversight.

Employee to Manager: What if the difficult person is your boss or manager? Approach your employer or supervisor first by asking: "I need to talk with you about something. Is now a good time?" If not, schedule a time to talk. Begin by expressing your intention and your motives. Explain your concern about a loss of business and unhappy clients, and that your intentions are to help make the workplace not only productive, but one that exceeds the clients' expectations.

Another approach is to talk about how certain behaviors in the workplace are decreasing efficiency. Explain that you'd like to talk about ways to improve the systems. By first addressing the issues as though you're tackling a problem or a system issue, your supervisor or employer will not be defensive. Always be tactful, professional, calm and polite. Ask your employer or manager for their goals and offer to give suggestions to help meet those goals.

Use the "feel, felt, found" method: "Many of our customers feel uncomfortable when you speak to the other employees; they've expressed how they've felt when you left the room. I've found if I convey customer concerns to my supervisor that our sales have increased."

Employee to Employee: If you have a problem with a co-worker, the best course of action is to go to that person directly. Do not talk about the issues with your fellow co-workers behind the other person's back! Go to the person privately and tell them about it.

There are three steps to this.

1) Let the person know you'd like to talk about something that's been bothering you. Ask him or her, "Is this a good time?"
2) Describe the behavior with dates, names and times. Be specific. Begin by saying: "I'd like to talk with you about this. This is how I felt when…." Speak only for yourself and how the behavior affects you.
3) Describe what you would like to see changed. Try to resolve the issue first personally and privately. If the situation does not change, request a meeting between yourself, the other person and your employer.

The person who is calm and asks the questions is the one in control

Everyone can choose his or her attitude. Each day, when someone walks out the front door to go to work, that person has a choice in how his or her day will play out. You can't always choose the people who surround you but you can try to make them aware of their behaviors. If you have a difficult person in your life, set the boundaries, explain your expectations, and then hold that person accountable. Be calm when you're doing this! The person who is calm and asks the questions is the one in control.

Dr. Rhonda Savage is an internationally acclaimed speaker and CEO for a well-known practice management and consulting business. Dr. Savage is a noted motivational speaker on leadership. For more information, e-mail rhonda@milesandassociates.net.

Workers say 'safety first'

8 out of 10 workers rate workplace safety first in importance in labor standards

More than eight of 10 workers — 85 percent — rate workplace safety first in importance among labor standards, even ahead of family and maternity leave, minimum wage, paid sick days, overtime pay and the right to join a union, according to a new study from the National Opinion Research Center at the University of Chicago.

The study, "Public Attitudes Towards and Experiences with Workplace Safety," draws on dozens of surveys and polls conducted from 2001 to 2010 by NORC. This meta-analysis sought to gain a picture of Americans' experiences with workplace safety issues. The study was done for the Public Welfare Foundation, based in Washington, D.C., which includes a workers' rights program.

Despite widespread public concern about workplace safety, the study also found that the media and the public tend to pay closest attention to safety issues when disastrous workplace accidents occur. Even during those tragedies, the fate of workers is often overlooked, such as during the recent oil well disaster in the Gulf of Mexico.

"Workplace safety is too often ignored or accidents taken for granted," said Tom W. Smith, director of NORC's General Social Survey (GSS). "It is striking that coverage in the media and public opinion polls have virtually ignored the 11 workers killed by the blowout and destruction of the drilling platform."

Questions instead focused on the environmental impact of the disaster and overlooked worker safety, Smith pointed out. But he noted that "if optimal safety had been maintained, not only would the lives of the 11 workers been saved, but the whole environmental disaster would have been averted."

Robert Shull, program officer for workers' rights at the Public Welfare Foundation, said, "Workplace safety should

PHOTO: © TIMOTHY GOODWIN

be a constant concern. Given the importance that workers themselves place on this issue, we should not have to mourn the loss of people on the job before government and employers take more effective measures to ensure that employees can go home safely after work."

On August 19, the Department of Labor reported in a preliminary count that the number of workers who died on the job in 2009 fell 17 percent from the previous year, as workers clocked in for fewer hours because of the recession. While Labor Secretary Hilda L. Solis called the results "encouraging," she also noted that "no job is a good job unless it is also safe."

Despite a decrease in workplace fatalities, the study found that reports of workplace injuries remained high.

Although most workers say they are satisfied with safety conditions at work, they also report job-related stress, a contributing factor to injury. The most recent GSS study on job-related stress, done in 2006, reported that 13 percent of workers find their jobs "always" stressful, while 21 percent find their jobs "often" stressful.

"Exhaustion, dangerous working conditions and other negative experiences at work are reported by many workers," Smith said. "Such conditions mean that workplace accidents are far from rare."

The study done for the Public Welfare Foundation found that about 12 percent of workers reported an on-the-job injury during the past year, and 37 percent said they have required medical treatment at one time for a workplace injury.

"Unsafe working conditions end up costing the public dearly," added Shull. "But no matter what the cost to the general public, the workers and their families pay the highest price."

Can you afford not to?

Use the right project management method to accomplish your goals

BY MARTIN VANDERSCHOUW

When it comes to business, there are just a few inescapable truths. One such truth is found in the nature of work. In any organization, no matter what the industry, there are only two types of activities: projects or new initiatives, and operations. Everything falls into one of those two categories. To succeed, an organization must do both very well, and both therefore need to have strong leadership, discipline and visibility at the most senior level of every organization.

For each activity type, there are many different ways to get work done. Unfortunately, not every methodology aligns with every organization or a particular effort. Looking at the new initiatives, half of the equation offers significant opportunities for performance gains.

Often, the quickest and easiest organizational gains can be found by examining the methodology or methodologies used by an organization to execute projects. In more than 76 percent of organizations, a single methodology provides the actionable framework of the project. The most common of these is a "waterfall" model, where activities are done in a four or five-phase sequence: analysis, design, development, testing and deployment. This highly linear approach to project execution has its origins in the engineering world.

Another common family of methodologies is called "agile" development. Agile development makes extensive use of short iterations with significant stakeholder feedback to deliver project results. A good example of this in manufacturing would be a "kaizen" event or short-term project to improve a process.

Each of these methodologies has its fans and detractors, and they represent only the two extremes of the methodology world. With only limited research, one can quickly discover more than 30 major methodologies. However, there is no such thing as a perfect methodology. Each methodology has advantages and disadvantages. Each is appropriate in certain situations, and will spell disaster when applied to other situations. Unfortunately, most organizations choose simplicity over common sense.

For many manufacturing leaders, it makes more sense to select a single methodology for executing all initiatives rather than risk diversity. Yet, this choice ensures that one out of every three projects will fail before any work has begun. The desire for consistency in performance and reporting is only valuable if the performance is good and reporting is accurate.

Where to begin

The first major test should be an open willingness to ask some simple questions:

- Do you know how often your initiatives are late and/or over budget?

PHOTO: © RAUL RODRIGUEZ

In any organization, no matter what the industry, there are only two types of activities: projects or new initiatives, and operations.

- Do you know what your average schedule and/or cost over or under run is?
- How often do you end up with fantastic technical solutions in search of a business problem?
- Do you often find things are right on track until the last minute, when suddenly they are not?
- Do your people often complain about the amount of process or paperwork they must complete?

The answers to these questions are often indicative of a process or methodology problem. The easy answer is to keep doing things the same way, but that is the definition of insanity. There has to be a better way, and fortunately there is. The better way begins with a few simple assumptions. So long as these assumptions hold true, you can achieve dramatic improvements in short order.

- Your initiatives are not clones where one initiative is largely identical to the next.
- Your people are trainable and capable of making basic business decisions.
- You sometimes face diverse customer needs and timelines.
- It is impossible to know all the requirements at the beginning of the effort.
- Change, sometimes even significant change, is a normal part of the process.

CONTINUED ON PAGE 42

If these assumptions are true, then the process that follows will add great value.

Generating ideas

The first step in the process is idea generation. This is the step where someone in the organization says, "It would be a good idea to do _____." Ideas can originate on the plant floor, in the maintenance department or in the executive suite. All that is needed here is a simple capture method for the idea. This can be as simple as a half-sheet of paper or a single-page Web screen. Remember, no one really knows anything yet, so keep it simple with no more than five or six questions.

Once the idea is in the system, someone needs to prioritize it against all the other ideas in the queue. It is best if the senior leadership team prioritizes the initiative against the strategy. A common mistake is to not begin tracking until the idea reaches the execution stage. When this happens, you have no idea how much time or money is being spent to plan your initiatives, and that is dangerous.

The next step is to hold a kick-off meeting. Keep this simple. It should be about an hour and never longer than 90 minutes. All the major stakeholders should attend the meeting, and the sponsor should always start the meeting. However, the sponsor only needs to be there for the first 10 minutes. If the sponsor is not willing to be there, don't do the project. At some point, the project will run into trouble and, if the sponsor won't give 10 minutes to start the initiative, how much support can that person provide later on? The major objective of this meeting is to determine the best way to get the work done, not find the technical solution. This means having the technical team at the kick-off is fine, but only if they can listen.

A common mistake is to not begin tracking until the idea reaches the execution stage. When this happens, you have no idea how much time or money is being spent to plan your initiatives.

Here are some questions that can help you select the best methodology once the kick-off is complete. Remember, it is as much about observing behaviors as it is capturing what people say.

- How well understood are the project requirements by the business and project stakeholders?
- Does the project require the use of new technology?
- Does the project involve a high-volume transaction system or process?
- Will the project require the use of external consultants?
- Will the project team have constant access to business stakeholders?
- What is the experience level of the project team?
- How large is the project team?

The less comfortable the team is with the project and the less well understood the requirements, the more an iterative process is required. Implementing a multi-methodology process can be confusing, but if one out of three efforts are failing today because of misaligned methodologies, can you really afford not to change?

Martin VanDerSchouw, PMP currently serves as president and CEO of Looking Glass Development LLC., and is the author of the book "Flavor of the Month." He regularly makes more than 50 presentations per year to groups in the areas of leadership, performance management, and program / project management. He has lectured at the Daniels School, the Kellogg School, the Krannert School, the Price School and many other colleges and universities throughout the United States. For more information, please visit www.lookingglassdev.com.

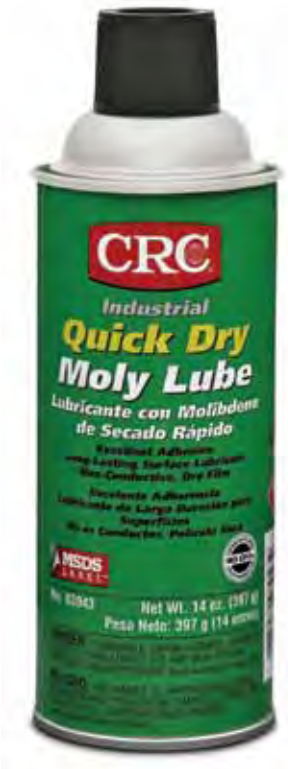

VanDerSchouw

Attachment chains for any application

Renold Jeffrey provides an extensive offering of attachment chains suitable for virtually all applications. Whether your application needs standard carbon steel chain, corrosion-resistant Hydro-Service, stainless steel or a self-lubricating Syno chain, the chain is the quality Renold product you have come to know and trust. Combine that with the speed and reliability of delivery from the Renold Jeffrey attachment assembly department in Morristown, Tenn., and you have the best package available in the industry today.

Synthetic lubricant

CRC introduced Syntha-Tech Lubricant with PTFE, a non-flammable, zero VOC, unique blend of synthetic lubricants that utilizes PTFE, anti-wear and extreme pressure additives to provide unparalleled lubricating performance. It is NSF H1 Registered for use in meat and poultry facilities, and its long-lasting film minimizes surface contact, thereby extending lubricating intervals.



Agricultural spray hose

This new addition to the Jason Industrial product line comes in two colors; orange (series 4199) and yellow (series 4299). This PVC spray hose can be used for most insecticides and pesticides in both agricultural and residential applications. It can also be used for spraying liquid fertilizers. Both series will be able to handle to a 10% concentration of Xylene.

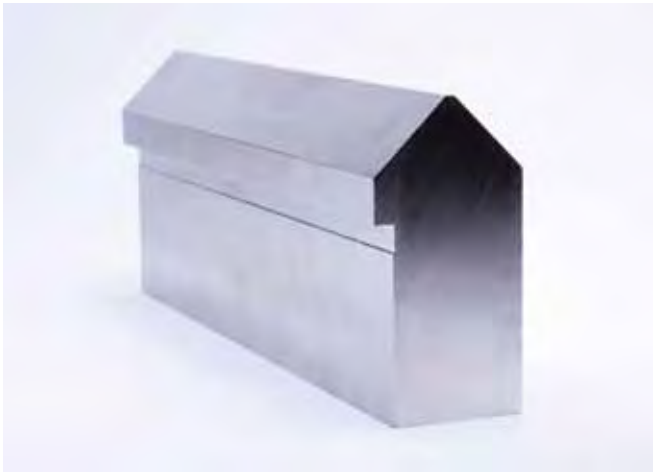
The tube is RMA Grade B (medium-high oil resistance). The cover is ribbed for better grip and to reduce friction from dragging. The non-marking covers will mark patios, walkways, pavement or buildings. This spray hose comes in 3/8-inch and 1/2-inch I.D.s and a working pressure of 750 PSI regardless of I.D. Temperature range is 0 F to 158 F (-17.8 F to 70.0 C).

Bearing mounting tools

Koyo Induction Heaters and Bearing Mounting Tool Kits aid in the proper mounting and installation of bearings. Koyo offers two different models of induction heaters. The BH240P is a portable unit that can handle bearings with O.D.s of up to 240 mm. The BH520SXT unit is for bearings with O.D.s as large as 520 mm. Koyo's BMT39 mounting tool kit inclues an impact fitting tool along with 39 impact-resistant plastic collet rings (for bore diameters of 10-60 mm).

Dual pedestal reels

The latest offering in dual pedestal design from Reelcraft, the Series DP5000 is smaller and more compact than its Series DP7000 counterpart for hose up to 12-inch I.D. These reels feature a patent-pending, interlocking steel-formed and stamped base design that provides excellent rigidity in truck mount service applications. This unique design also makes the base assembly especially strong, compact and resistant to vibration.



Hardened steel rails for heavy-duty applications

Precision manufactured Smith-Rails drastically reduce system design time and sourcing cost of guidance systems for material handling equipment supported by heavy-duty Smith-Trax track rollers. Smith-Rails are fabricated from 180,000 psi tensile strength steel in three profiles to maximum lengths of 12 ft. Rail/bearing contact surfaces are hardened to 60-65 Rc to match Smith-Trax V-Groove, Plain and Flanged bearings. Maximum (point contact) rail loadings up to 71,500 lbs. per roller are allowed. Hardened rails are straight and twist-free. Accurate Bushing Company will cut standard 12 ft. lengths to your specification. ABC will also drill counter bore and tap mounting holes if desired.

Synchronous timing belts

Bando's Super Torque synchronous (STS) timing belts incorporate a modified curvilinear tooth profile with the best material compounds available. With high power transmission capabilities, quiet, smooth-running tooth meshing qualities, energy efficiency and reliability, the STS tooth profile is widely recognized by automotive design engineers as the preferred belt for overhead cam applications in most late model cars and trucks. It is these same qualities that make this generation of synchronous belts ideal for today's high-performance industrial applications.

Precision thin section bearings

Precision thin section bearings from Silverthin Bearing Group are made in the United States in industry standard sizes. Standard bearings are available in 1-inch to 40-inch bore sizes to meet customer short lead time requirements and application engineering services are available to serve the needs of a diverse customer base.

Reduce cam follower lubrication costs

IKO has launched the C-Lube Unit to reduce cam follower maintenance time and costs, which represents a significant expense over the lifetime of the bearing in a typical plant environment. Unlike anything available in the industry today, IKO's C-Lube Unit contains a solid lubricant which is automatically distributed onto the cam follower's outer ring and then onto the mating track surface to provide abrasion protection and increase corrosion resistance. This negates the need for periodic oil supplying, which can be labor intensive, especially across multiple cam followers.

IKO's C-Lube Unit can be used with any standard cam follower, but IKO highly recommends combining it with the company's "C-Lube Cam Follower" for a long-term, maintenance-free bearing system. The C-Lube Unit simply attaches to the head of the cam follower and no additional work to the bearing system is required. IKO's C-Lube Cam Followers contain solid lubrication inside the head of the cam follower which distributes the lubricant onto the raceway when the bearing rotates.

DICHTOMATIK
AMERICAS

Dichto—Who?

Dichtomatik.

(Dish-toe-ma'-tic)

Not exactly a household name, but you know our brands and the products they represent. For over 33 years, you've used our seals and custom rubber shapes in all types of equipment in most every market.

TCM®
Rotary Shaft Seals
Fluid Power Seals

American Seal
O-Rings
Spliced Rings

Nu-Seals
Fitting & Fastener Seals
Custom Molded Rubber




- Global Sourcing and Logistics
- Over 38,000 Inch and Metric Part Numbers in Stock
- Over 100,000 Additional Part Numbers Available
- Experienced Application and Technical Support
- Dedicated Customer Service Teams
- Next Day Delivery

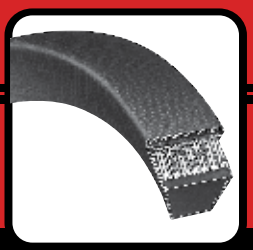
Any Seal ... Any Time

USA	**Canada**	**Mexico**	**Brazil**
800-328-2840	905-470-2266	52-442-221-6303	55-11-4072-8025
www.dichtomatik.us	www.dichtomatik.ca	www.dichtomatikmex.com	www.dichtomatik.us

BANDO

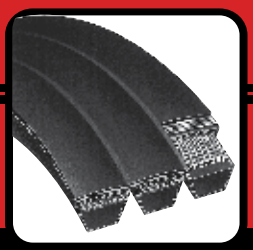
IDC-USA Platinum Preferred Supplier

The Right Belt For All Applications



Power King®

Power Ace®



Power King® Power Ace® Combo

Rib Ace®

Power Max®

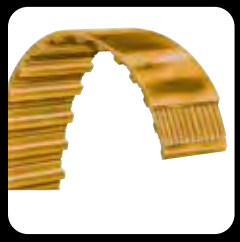
Power King® Cog

Power Ace® Cog

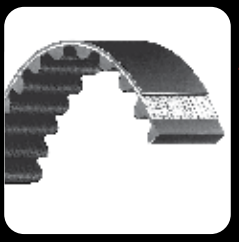
Double V

Duraflex GL®

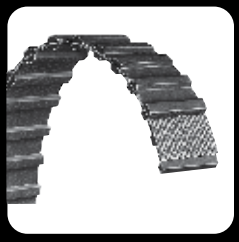
Synchro-Link® Rubber



Synchro-Link® Polyurethane

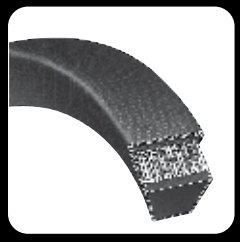


Synchro-Link® High Torque

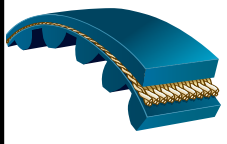


Synchro-Link® Double Sided Rubber

Synchro-Link® Double Sided Polyurethane



Metric V-Belts



KPS High Torque Polyurethane

NEW

Now Available IDC-USA Co-logoed Industrial Belt Catalog

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