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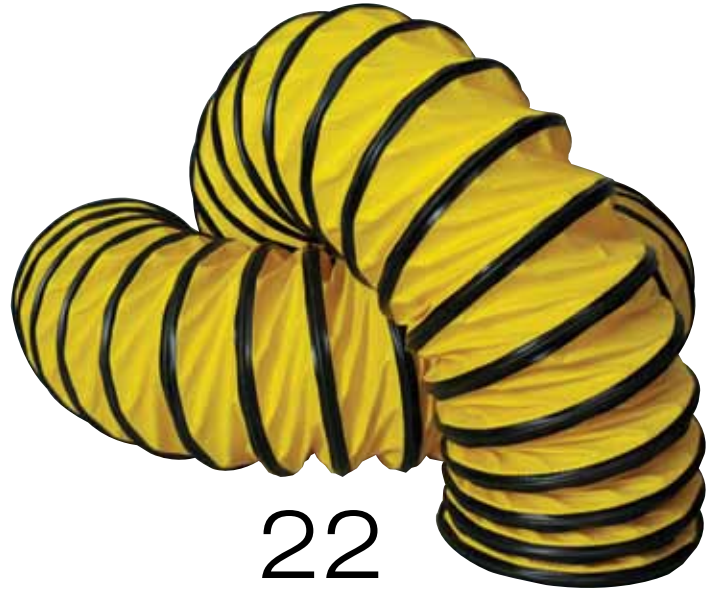
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An interesting year in football

With each issue of this publication I try to tell people why the IDC Distributor-Owner that provided you with this magazine is one of the very best in the industry. If you've read my messages in the past, you know that IDC Distributor-Owners are part of one of the best business models known throughout the world; the cooperative. IDC-USA is a distributor-owned cooperative whose members consist of independent, entrepreneurial distributors from your local community. So what has this got to do with football?

Okay, I'm an Indianapolis Colts fan but I really admire the Green Bay Packers, the current Super Bowl World Champions. Why? Read the article below written by David J. Thompson, who has given us permission to reprint his article. Not only is David a fellow president of an outstanding cooperative, Twin Pines Cooperative Foundation, he is also a 2010 inductee into the Cooperative Hall of Fame. Here is what most people don't know about the Packers that David shared in a recent issue of the *Cooperative Business Journal*:

Packers 31, Steelers 25: Why Co-ops Should Care

This year's Super Bowl-winning Green Bay Packers, who beat the Pittsburgh Steelers 31-25, are one of the most fabled teams in football. They are also the closest thing to be found to a cooperative in American major league sports.

The Packers' structure works so well for the community that owners of other teams passed a rule that forbids any other community-owned club. The Packers are the only National Football League team that has never been sold. The Green Bay Packers began

in 1922 and are the third-oldest team in professional football. The Packers have won 13 NFL championships, more than any other team.

It may seem odd that an Englishman has to explain to Americans the unique history of the Green Bay Packers. But for the past 20 years in speeches to cooperatives around my adoptive country I've been explaining the cooperative-like structure of the Packers, with a British accent. Of course, no American has been able to explain to me why you call this sport "football."

But let's go back to the Packers.

Here is how it works: The Green Bay Packers have 112,015 stockholders who together own 4,750,934 shares. No stockholder can own more than 200,000 shares, which ensures that no one individual is able to assume control of the club.

No dividends are paid, the stock cannot appreciate in value and there are no season ticket privileges associated with stock ownership. No matter how much stock you own you get only one ticket to the annual meeting. Those stockholders elect 44 unpaid directors who then elect a seven-member executive committee. Only the president receives remuneration.

Shares of stock cannot be resold, except back to the team for a fraction of the original price. At the last issuance of shares in the 1990s the price was \$200 each. Green Bay fans bought 120,010 shares during the 17-week sale and provided \$24 million towards revamping Lambeau Field, where the team has played



outdoors for fanatical sold-out crowds for the past fifty years.

The articles of incorporation state that if the Packers' franchise is sold, any remaining funds will go to the Green Bay Packers Foundation. This requirement ensures that the club remains in Green Bay and there is no financial gain if the stockholders vote to sell the team.

So what does all this mean to cooperatives? Consider the following:

- Green Bay has a population of 102,000 and is in a market of 300,000 people in a very rural state. This is the smallest town in America with a professional football team – only one-fortieth the size of the New York City market.

- The team is worth almost \$1 billion and ranks 13th in the NFL in terms of value. However, the Packers have the lowest debt-to-value percentage of all 32 teams, at 5 percent.

- In a recent Sports Illustrated poll, 17,000 fans rated the game day atmosphere for each NFL team. The experience of seeing the Green Bay Packers at Lambeau Field ranked first. It has been described by fans as a “religious experience.”

- Since 1998, the Harris Interactive poll has always shown the Packers as one of the four most popular teams in pro football, even though most Packer fans will never see a live game. Year after year, the NFL reports that sales of Packers' merchandise are among the highest.

- The waiting list to buy season tickets has 74,000 names. That's more than the lucky 72,928 fans who fit in the stadium. The waiting time to get a season ticket is 35 years. Fans often place newborn infants on the waiting list after receiving birth certificates. Rights to season tickets are often a major issue in Green Bay divorces or deaths.

Clearly, shared ownership is no obstacle to success.



There are over 600 co-ops in Wisconsin, many of them making great cheese, hence the “Cheeseheads” nickname for the team's fans. Wisconsin has one of the highest numbers of co-ops per capita in the United States and there are co-ops for almost everything. It is not surprising that in choosing a structure for the Green Bay Packers the founders would choose a non-profit community-owned organization that applies a number of cooperative practices in a state famous for its cooperatives.

To top it all, the Green Bay colors of green and gold are almost the same as the green and yellow of the cooperative Twin Pines logo.

Go Packers, go co-ops!

Jack Bailey

PRESIDENT & CEO, IDC-USA

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Goodyear provides a single source hydraulics hose solution for IDC-USA distributors

Goodyear Engineered Products (Veyance Technologies Inc.) recently joined IDC-USA as an IDC Preferred Supplier. The new partnership provides IDC Distributors with a single-source solution for their customers' hydraulic hose needs.

Goodyear Engineered Products' precision-engineered hydraulic hose products include fittings, adapters and crimp equipment, therefore eliminating the worry of inconsistencies. The single-source solution additionally includes a global distributor network that offers service and support on a local basis.

Veyance is a global manufacturer and marketer of engineered rubber products with

exclusive global rights to the Goodyear Engineered Products brand name. It is a \$2 billion global organization with North American headquarters based in Fairlawn, Ohio.

Its diverse product offerings include conveyor belts; air, water, steam, hydraulic, petroleum, fuel, chemical and materials handling hoses; rubber tracks for agricultural and construction equipment; military tank tracks; power transmission belts; anti-vibration products such as air springs; automotive replacement products; and services for certain products.

"Since our initial meeting with Todd Carroll, vice president of IDC-USA, and their entire staff,



every aspect of our relationship has been first class. This begins with the personnel in Indianapolis and continues with every IDC Distributor-Owner that I personally meet. The combination of an owner's local presence in one's 'back-yard' supported by a long history of value-add from the IDC-USA network makes this a 'perfect formula' to serve the customer," commented Brian S. Milek, sales manager for Goodyear Hydraulics North America (Veyance Technologies Inc.).

IDC-USA expands operations with Reno Distribution Center

IDC-USA is pleased to announce the opening of the IDC-USA Reno Distribution Center. This new location will enable IDC Distributors to better serve their customers in the Western half of the United States.

On March 17, IDC-USA successfully shipped the first orders out of the new distribution center. It is a 31,000 square foot facility that complements the already established distribution center at IDC Headquarters in Indianapolis.

"We are delighted that Reno is home to our second distribution center," announced Jack L. Bailey, president and CEO of IDC-USA. "Plans to open a facility in the West were in the works as far back as 2009. At a time when most companies were cutting back, IDC-USA was strategically planning for growth. With its ideal geographical location and its strong pool of talent, Reno is an ideal setting for this center, enabling us to better serve our IDC Distributor-Owners and their customers in the Western region."



Nachi introduces single-row metric tapered roller bearings

In response to industrial distributors' requests, Nachi America has started importing various sizes of single-row metric tapered roller bearings. These bearings are manufactured in Japan and comply with ISO Standards; this ensures that the cups and cones are internationally interchangeable. The various series of bearings will have bore sizes that range from 17mm to 110mm. Nachi

Metric Tapered Roller Bearings offer you a high quality alternative to other major manufacturers.

"We are excited to partner with IDC-USA and pleased to bring in high-quality metric tapered roller bearings to complement our existing product offerings to IDC Distributors and their customers," said Jay Campbell, national sales manager for Nachi America Inc.



IDC University Online

IDC University Online is an exciting new addition to IDC-USA's educational initiative that provides an online source for all of your industry training — providing a comprehensive educational platform to foster professional and organizational development.



Recognizing that budgets are limited and travel time is hard to schedule, IDC University Online allows students to learn from the ease of their own office or home and at their own pace.

To find out more about IDC University Online, visit www.IDCUniversity.com.

ABC Industries complements IDC-USA product offering with industrial ventilation ducting

Currently based in Winona Lake, Ind., ABC Industries (www.abc-industries.net) was founded in 1926 and was originally known as American Brattice Cloth Corp. At the time, ABC offered one product — jute brattice cloth. The jute fabric was flame proofed, cut to order and sold to coal mines located throughout the Midwestern United States. This material was hung in the mines to direct fresh air to the working areas.

Over the years, the mining industry became more mechanized and this resulted in more attention being directed to the health and safety concerns of its workforce. ABC kept pace with these developments by introducing

many new products. This resulted in the company introducing several products that enabled ABC to expand its product offering to tunneling contractors and shaft sinkers. Today, ABC is a leading supplier of ventilation products to the mining and tunneling industries internationally.



IDC-USA has partnered with ABC Industries on its industrial ventilation ducting products. ABC's ducting products are used in a variety of industries and applications including agriculture, utilities, shipbuilding, temporary shelters, construction and aviation, as well as special events.

New IDC Distributor-Owners

IDC-USA continues to rapidly expand its distributor-ownership and preferred supplier partnerships. The co-op is pleased to announce the addition of six new distributor-owners to the IDC Family that cumulatively bring 50-plus new authorized locations nationwide to better serve IDC Distributor-Owners' customers.

French Gerleman

ST. LOUIS, MISSOURI

French Gerleman (www.frenchgerleman.com) is a leading supplier of profit-boosting electrical, automation, datacom and power transmission products and services to industrial, commercial and construction markets. Based in St. Louis, French Gerleman has locations in Quincy, Ill.; Kansas City, Kansas; Columbia, Mo.; and Washington, Mo.

A fifth-generation family-owned business, French Gerleman is ranked the 70th largest distributor in North America by *Electrical Wholesaling* magazine (June 2010). Additionally, recent accolades include being featured in the *St. Louis Business Journal's* list of Top 150 Privately Held Companies.

APEX Industrial Automation LLC

MONTGOMERY, ILLINOIS

Founded in 1946, APEX Industrial Automation (www.apexindustrialautomation.com) built its legacy as a premier supplier of power transmission products by offering high-quality, well-recognized brands to customers throughout the Chicagoland Area and northwest Indiana markets. The acquisition of Peoria Bearing in March of 2007 allowed APEX to not only expand its extensive line of name brand products but also its partnerships with manufacturers. The

company's unique combination of experience, knowledge, resources and total service commitment enables APEX to provide customized solutions to all of its customers.

In April of 2009, APEX acquired Industrial Motor Service (IMS), allowing APEX to offer customers the finest in motor, gearbox and pump repair. The staff at IMS has 75 years of combined experience in providing top-quality repair services. APEX has truly become a single-source provider to many OEMs, MROs and end-users.

Adam-Hill Company

SOUTH SAN FRANCISCO, CALIF.

Serving northern California since 1919, Adam-Hill Company (www.adam-hill.com) has been the chosen high-tech mechanical distributor for over nine decades. It has partnerships with more than 75 specialized manufacturers, and boasts of being the first distributor for Weatherhead Corporation. Its product range includes mechanical power transmission equipment, bearings and hose, as well as tubing and fittings.

Badger Bearing PTP Inc.

BURLEY, IDAHO

Established in 2007, Badger Bearing PTP Inc. is a family-owned and run independent distributor based in Burley, Idaho. Its core business lies in the distribution of bearings, belts and sheaves, among other power transmission and industrial bearing industry related items. Additionally, one area of expertise is made-to-order sprockets.

Prior to becoming an independent distributor, the Badger family spent many years in the industrial snow blower business. The leap into distribution wasn't too far, as the

company still supplies many products to the new owners of the former business.

Processor's Equipment & Hardware Co. Inc.

MODESTO, CALIFORNIA

Processor's Equipment & Hardware Company brings 60 years of industry experience to IDC-USA. It is a family-owned and run business that mainly deals in the distribution of conveyor belts, conveyor pulleys, screw conveyors, electric motors, roller chain and sprockets. Its focus in the Western states is conveyor belting, and in the California Central Valley, the company focuses on power transmission.

IBT Inc.

MERRIAM, KANSAS

IBT Inc. (www.ibtinc.com) is a leading industrial distributor committed to providing world-class service and quality products from trusted supply partners. Employees are well-known for their breadth and depth of product knowledge and technical expertise across multiple and diverse product lines.

The company was founded by the late Forrest L. and Bonnie Cloud in 1949, and still continues to maintain family ownership. The organization employs 335 people and has 40 locations throughout the Midwest.

Modern Distribution Management (www.mdm.com) named IBT No. 38 on its 2010 Top 40 Industrial Distributors list. The Top 40 list is published annually with top industrial supply companies ranked according to total worldwide sales.

NAE launches a shaft mount reducer line

Due to the enormous success and name recognition that North American Electric and its distribution partners have established with a second-to-none quality product in the aggregate and agricultural markets, the evolution into the line of shaft mount reducers was the obvious next step. The North American Electric Belt and Screw (NBS) Shaft Mount line of reducers and accessories are designed to be drop-in replacements for the major lines that you see in the market today.

The NBS Shaft Mount Reducer Program will start with sizes 2 through 6 in both the 15:1 and 25:1 ratios, drilled and tapped with one box design for both the belted and the screw drive applications helping to minimize inventories. NAE will also



offer all standard components including motor mounts, belt guards, back stops, bushing kits and torque arms. NAE has no plans of stopping at size 6; throughout the remainder of the year, the company plans to launch sizes 7, 8, and 9 with plans for size 10. Additionally, NAE plans to launch a full line of NBS flanges and accessories for the Conveyor Equipment Manufacturers Association (CEMA).

“We sincerely want to thank our distribution partners and their customers for the support and confidence they have put in North American Electric through the years. NAE commits that we will provide highly tested, market proven and feature rich products to you—the people responsible for our success,” said Lance Book, national sales manager.

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U.S. manufacturers are leading
the economic recovery

LEADING

THE



BY THOMAS DUESTERBERG

In 2009 and 2010, the Manufacturers Alliance/MAPI offered 10 talking points on manufacturing to help executives communicate in concise fashion and offer insight into the state of the sector in the United States.

These coincided with the historic recession which has been a challenge to the resilience and ingenuity of manufacturing leaders. According to Kenneth Rogoff and Carmen Reinhart, recoveries from post-war financial crises like the one the world just experienced require nearly four-and-one-half years before a full recovery to previous levels of production. Additionally, competition from new industrial powerhouses like China and India makes the task of rebuilding after a crisis even more difficult. Nonetheless, U.S. manufacturers

PHOTO: © LDF



By contrast, the overall U.S. economy recovered its previous levels at the end of 2010, three years after the start of the recession.

3 In the last year, the United States lost its number one ranking in global manufacturing production statistics to China. When measured in value-added terms, U.S. output at the end of 2010 was narrowly (roughly \$50 billion) behind that of China, but still double that of Japan and triple that of Germany. It is almost 10 times that of India.

4 An important tool in manufacturers' battle to remain globally competitive is sustained attention to productivity improvements. In 2010, manufacturers achieved a 6.7 percent

jump in labor productivity, and productivity is up over 14 percent since 2005. As a result, unit labor costs, perhaps the single most important indication of global competitiveness, were down 4.4 percent in 2010 and are up only 3 percent since 2005. Since 2000, inflation for manufactured goods (excluding food and energy) is down 0.8 percent, compared to inflation growth of 22 percent in the overall economy.

5 The productivity of Chinese manufacturing workers is only 12 percent that of its American counterpart. The 11 million to 12 million American manufacturing workers produce

CONTINUED ON PAGE 16

CHARGE

have shown remarkable strength and are now leading the U.S. recovery.

The 10 talking points that follow help to make this case:

1 Recently revised data from the Federal Reserve Board confirm that the recent "Great Recession" was the most severe by far since the Depression in the 1930s. U.S. manufacturing output fell by 20 percent from the end of 2007 to May of 2009: the peak-to-trough decline in transportation equipment was an astounding 41.2 percent, in industrial equipment 34 percent, and in business equipment a smaller

20 percent. By February of 2011, total manufacturing had clawed back half of those losses, with only information processing equipment among the major subsectors having surpassed the peaks of 2007 and early 2008. Manufacturers Alliance/MAPI forecasts manufacturing growth of 5.5 percent in 2011 and 4.6 percent in 2012, much higher than total GDP growth, which is expected to register 3.2 and 3 percent in 2011 and 2012.

2 MAPI forecasting indicates that a full recovery from the "Great Recession" will not be completed until the fourth quarter of 2012, a full four years after the start of the downturn.



The productivity of Chinese manufacturing workers is only 12 percent that of its American counterpart

nearly the same amount of product as 100 million Chinese workers. Among the more advanced nations, only Finland and Taiwan have shown greater labor productivity growth in manufacturing than the United States since 1979, and only by small margins.

6 Manufacturers also achieve a competitive edge through research and development (R&D) to drive higher rates of innovation than other sectors of the economy. Manufacturing firms accounted for 71 percent of all private sector expenditures for R&D in 2008 and actually performed over two-thirds of the actual R&D. This helped manufacturing firms to have almost triple the rate of product and process innovation as in the nonmanufacturing sector. Over 22 percent of the 127,000 manufacturing firms identified by the National Science Foundation introduced product and process innovations in 2008, compared to only 8 percent in the nonmanufacturing sector.

7 One traditional source of domestic demand for manufactured products, the construction sector, has been abnormally slow to recover and is likely to remain weak for

another few years, as is typical in the slow recoveries from major financial crises in the last century. Total construction spending is down 6.2 percent in the last three months alone and is still below its level of 1999. Housing starts remain mired at levels nearly 75 percent below the peak in 2005-2006 and, even with the recent jump from the federal stimulus program, are about one-half the level of 2007-2008. Construction employment is about 2.2 million less than in 2006. A return to historical construction patterns would give a big boost to manufacturers.

8 One source of relative strength in the recovery is in exports of manufactured goods. Despite the huge and growing trade deficit in this sector, exports are growing at rates faster than imports, thanks to the competitiveness and innovation initiatives of U.S. firms and the slow decline in the trade-weighted value of the U.S. dollar. After falling 12 percent in 2009, exports of goods grew by 14.6 percent last year, and MAPI forecasts growth of 8.9 percent and 10.1 percent in this year and next. Overall imports are forecast to grow by 6.7 percent and 5.2 percent in 2011 and 2012, respectively.

9 In 2010, the United States had a trade surplus in the following subsectors: aerospace; material handling equipment; semiconductors; construction equipment; industrial machinery; mining and oil and gas equipment; basic chemicals; and paper.

10 The United States is falling behind in trade-opening agreements, putting its manufacturers at a disadvantage to some of its main trade competitors. The “Doha Round” of multilateral free trade talks has languished for over a decade, with little hope for near-term progress. To fill the vacuum, many nations are signing bilateral or regional free trade agreements (FTAs), similar to the North American Free Trade Agreement (NAFTA). The European Union now has 30 FTAs in place, including with Turkey and Mexico, and is about to complete one with India. India has 14 FTAs in place and currently is negotiating with Japan and four other nations. Even China has 10 FTAs, most notably with the Southeast Asian nations. Korea has FTAs with Southeast Asia, most of Africa and South America, and is negotiating with the EU, Japan, Canada, and Mexico. By contrast, the U.S. has 11 FTAs in force and three pending. 

Thomas Dueterberg is a senior advisor and former president and chief executive officer of the Manufacturers Alliance/MAPI, a public policy, economic research and executive education organization based in Arlington, Va. For more information, visit www.mapi.net.

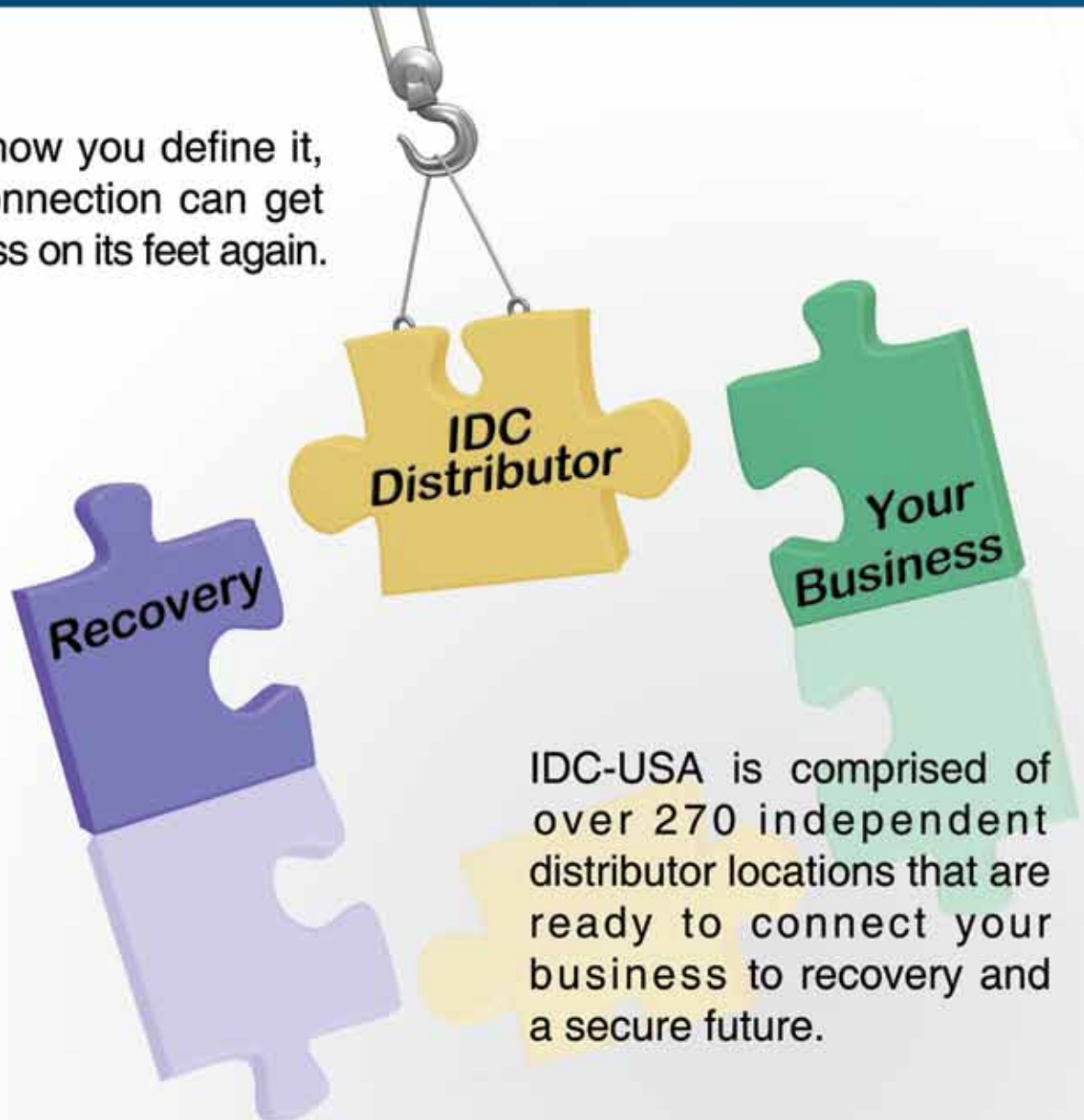
• CONNECT •

[con`nect] verb /kə`nekt/

DEFINITION: to join or fasten together usually by something intervening

SYNONYMS: join, link, associate, couple, unite, combine, bind, relate

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Advances in screw conveyor systems

Here's a look at how this ancient device can solve modern material handling problems

BY BILL MECKE

Screw conveyors are used in many industries today. This article looks at basic concepts, where screw conveyors are typically used and what is required to solve your application problems.

Screw conveyors have proven to be one of the most reliable and cost-effective ways for conveying bulk materials. Since Archimedes invented the screw conveyor back in 267 B.C., it has been a versatile machine that can handle a wide variety of materials, from dry and free flowing, to wet and sluggish. Today, there are well over a million screw conveyors in operation throughout the United States and the rest of the world conveying bulk materials from A to Z (Adipic Acid to Zinc Concentrate).

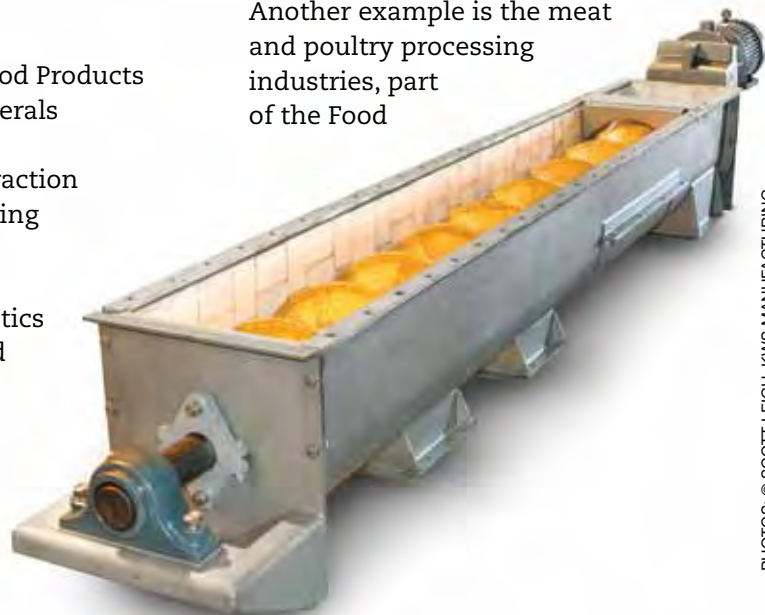
Where Are Screw Conveyors Used?

Screw conveyors are used to convey any type of bulk material and are found in thousands of applications. The major industries that utilize screw conveyors are:

- Agriculture Production
- Chemicals
- Food Processing
- Lumber and Wood Products
- Mining and Minerals Processing
- Oil and Gas Extraction
- Petroleum Refining
- Primary Metals
- Pulp and Paper
- Rubber and Plastics
- Stone, Glass and Concrete
- Wastewater Treatment

These major

industries are defined by the U.S. Department of Labor and every company that produces a product or service is categorized by industry. More specific industries fall within these major industries where you'll find thousands of applications for screw conveyors. For example, portland cement production is part of the Stone, Glass and Concrete Industry. Limestone production falls under the same industry. Each major industry can have as many as 20 more specific industries that use screw conveyors in their processes. Another example is the meat and poultry processing industries, part of the Food



PHOTOS: © SCOTT LEIGH, KWS MANUFACTURING

Processing Industry. Screw conveyors are used throughout the meat and poultry processing industries for conveying by-products or rendered products.

The versatility and cost-effectiveness of the screw conveyor make it a perfect choice for conveying a wide variety of bulk materials.

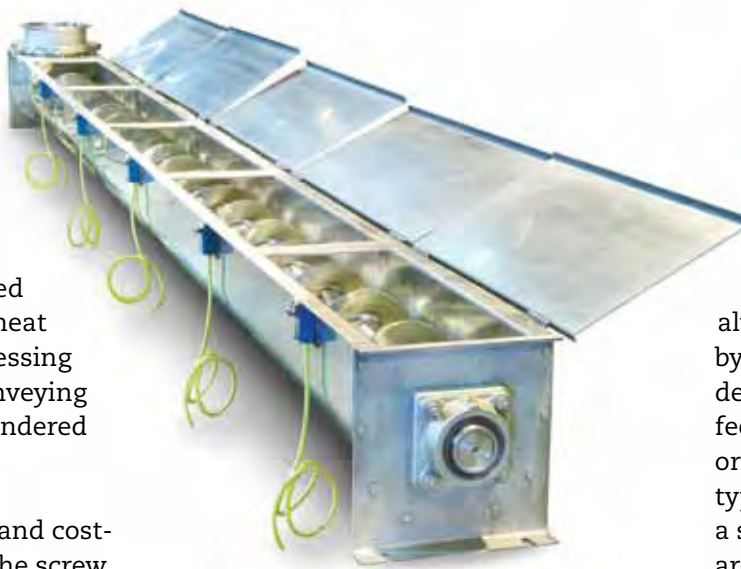
Classifying Bulk Materials

Bulk materials are defined as goods that are handled in large quantities without the benefit of individual packaging. Bulk materials are conveyed, stored and processed to create the things we need to live, such as food products, plastics, building products, paper and thousands of finished goods.

The bulk material handling industry is an engineering field centered around the design of equipment used for transporting bulk materials. The Conveyor Equipment Manufacturers Association (CEMA), comprised of manufacturers of material handling equipment, creates industry standards for the design and safe operation of conveying equipment.

CEMA and the major screw conveyor manufacturers have studied thousands of different bulk materials to determine their characteristics. CEMA classifies bulk materials by:

- Particle Size
- Flowability
- Density
- Abrasiveness



■ Other Characteristics (corrosive, flammable, sticky)

CEMA provides material classification codes for most commonly conveyed bulk materials. This information is readily available to anyone who designs, specifies, manufactures or uses screw conveyors and other bulk material handling equipment. The proper design of screw conveyors is dependent upon knowing and understanding the bulk material being conveyed and the application.

Detailed information about bulk materials is available through CEMA or one of the major screw conveyor manufacturers. Most major screw conveyor manufacturers have in-house experts to help design screw conveyors or other bulk material handling equipment. These in-house experts can provide knowledge of many different applications and help with the right solution.

How Does a Screw Conveyor Work?

Screw conveyors are volumetric conveying devices. Each revolution of the screw discharges a fixed volume of material. The purpose of a screw

conveyor is to transfer product from one point to the next. Screw conveyors are always control fed at the inlet by another conveyor or metering device. Rotary valves, screw feeders, belt conveyors, grinders, or even other screw conveyors typically connect to the inlet of a screw conveyor. Screw feeders are similar to screw conveyors except that screw feeders are always flood loaded or 100 percent full in the inlet area. Screw feeders are designed to volumetrically meter material from a hopper, bin or silo at a controlled rate. Many screw feeders utilize adjustable speed drives to allow for varying the material flowrate.

The flowrate or capacity of a screw conveyor is measured in cubic feet per hour. If the capacity is given in pounds per hour, tons per hour or bushels per hour, it is converted to cubic feet per hour. Since screw conveyors are control fed at the inlet, the cross-sectional trough loading is less than 100 percent. CEMA has developed standards for trough loading based on the material classification codes. For example, portland cement is described as free flowing and moderately abrasive. CEMA recommends a trough loading of no more than 30 percent. CEMA also recommends reducing the speed of the screw conveyor when conveying mildly to extremely abrasive materials. Reducing the trough loading and speed reduces the wear on the screw conveyor. This information is readily available from CEMA or one of the major screw conveyor

CONTINUED ON PAGE 20

Screw conveyor safety

Safety is an important consideration when working around screw conveyors. Since a screw conveyor is a rotating machine, it can be dangerous if the proper safety precautions are not taken. Screw conveyor safety begins with a plan that considers every possible danger and potential hazard. Operations and maintenance personnel must be thoroughly trained in safe operating procedures, recognition of possible hazards and maintenance of a safe work area around screw conveyors.

CEMA has a comprehensive safety program that includes:

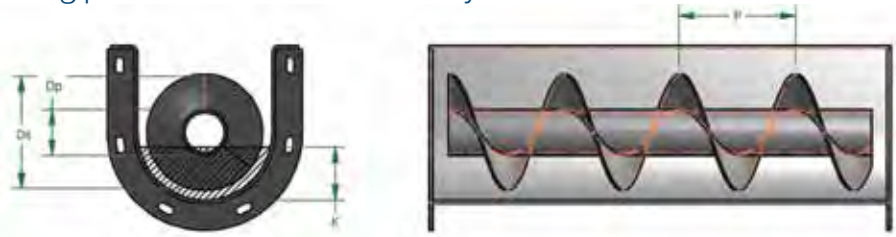
- Warning and Safety Reminders
- Safety Labels
- Safety Label Placement Guidelines
- Safety Posters
- Safety Videos

The CEMA safety program also gives guidance to the end-user on the proper operation and maintenance of screw conveyors, as well as troubleshooting common problems. CEMA has distributed over 20 million safety labels for screw conveyors in the past 10 years and is clearly committed to promoting screw conveyor safety and preventing accidents.

Make sure your screw conveyor provider is an active member of CEMA to ensure your screw conveyors are provided with the proper safety labels and safety guidelines. Quality screw conveyor manufacturers will provide the CEMA Safety Video with every screw conveyor system.

Screw conveyor accidents can be avoided by implementation and enforcement of an in-plant safety program. Remember, accidents are caused by negligence or carelessness.

Figure 1
Sizing parameters for screw conveyors



D_s = Diameter of Screw (inches)
 D_p = Diameter of Pipe (inches)
 K = Trough Loading (percent)
 P = Pitch of Screw (inches)

$$\frac{C}{\text{rpm}} = \frac{0.7854 (D_s^2 - D_p^2) PK 60}{1728}$$

C = Capacity (cubic feet per hour)
 rpm = Speed (revolutions per minute)

manufacturers. The percentage of trough loading is based on the material being conveyed and whether internal hanger bearings are used. Hanger bearings are located inside the conveyor and are used to support the screw. Figure 1 shows the parameters necessary for sizing a screw conveyor.

The capacity calculation takes into account the outside diameter of the screw and the outside diameter of the pipe, as well as the pitch of the screw and the trough loading. The calculation determines the capacity in cubic feet per hour that will be conveyed with each revolution per minute of screw rotation. It is not necessary to memorize this calculation. Most CEMA-approved screw conveyor manufacturers include the capacity calculation and the CEMA guidelines in their screw conveyor design software.

Choosing the right screw conveyor for your application requires basic knowledge of the material being conveyed as well as some basic information, such as conveyor length, degree of incline and product temperature. Figure 2 is a typical screw

conveyor data sheet used to help select the conveyor for an application.

Value Added Solutions

Screw conveyors are typically a cost-effective way to convey bulk materials but can become very expensive if they shut down your operations. The cost of not producing product far exceeds the cost of a screw conveyor. So it's important to have screw conveyors and other bulk material handling equipment designed to meet your needs and applications.



Figure 2

Many common mistakes are made in conveying bulk materials that can be solved with application experience. For example, you may be processing and conveying an abrasive product such as dried biosolids and replacing screws every three months. The cost of continued maintenance and downtime far exceeds the cost to replace screw conveyor components. As an added value, replacement screws can be constructed from abrasion-resistant materials or the screw flights and trough can be lined with ceramic tiles (see photo on page 18). The new replacement components will extend the life of the screw conveyor for up to 10 years.

Another example could occur at a chemical processing plant, as many chemicals give off hazardous or toxic vapors when being processed and conveyed. Containing the toxic vapors is important to the health and safety of the plant personnel because the vapors could ignite and cause an explosion or create health hazards. Screw conveyors can be designed to be completely vapor-tight and also to handle internal pressure. The screw would be completely enclosed in a tubular or pipe housing and special shaft seals would keep the vapors from escaping. Fully welded construction is also important to prevent any leaks. Failure is not an option when handling hazardous bulk materials. The added value of the proper design and construction of screw conveyors for hazardous applications can be calculated in millions of dollars.

How Do I Learn More?

IDC-USA offers a comprehensive training program through IDC University. The Bulk Material Handling course is a four-day program that covers screw conveyors, bucket elevators, drag conveyors and belt conveyors. Participants learn the basics of screw conveyor design and discuss many different applications and industries, while gaining important knowledge to help solve bulk material handling problems.

Past attendees have given an overwhelming positive response to the Bulk Material Handling course. The sessions are interactive and allow for hands-on demonstrations of screw conveyors in assembly and operation. Every attendee can study various bulk materials and learn about their characteristics.

Participants leave the Bulk Material Handling course with confidence and understanding of the basics of screw conveyor design and how to apply and select the right screw conveyor for their application.

Summary

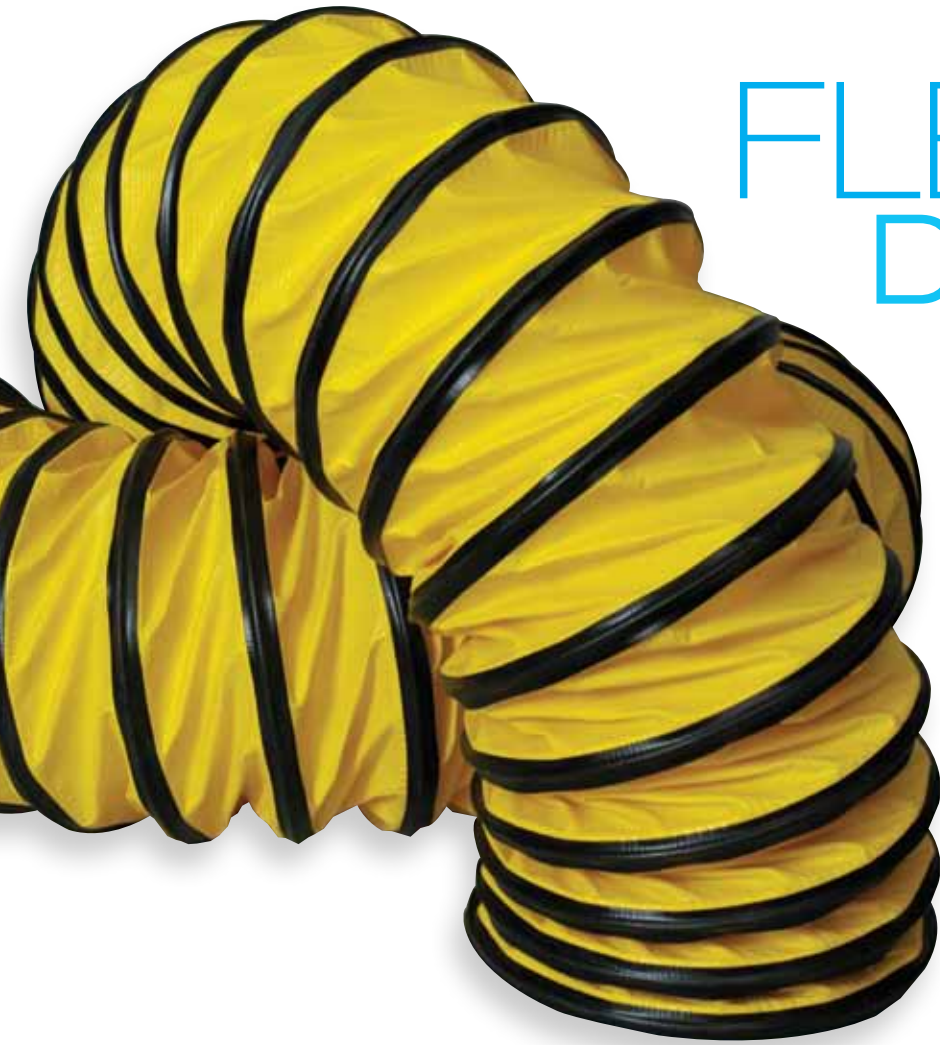
Screw conveyors are a critical part of your operation. If a screw conveyor continually fails or requires excessive maintenance, it is difficult to efficiently produce a quality product. Having a basic knowledge of screw conveyor design and understanding the application will help you solve critical conveying problems. The definition of "insanity" is continuing to



do things the same way and expecting different results. When selecting a manufacturer for screw conveyors, ensure that you choose one with a written quality control program and is ISO 9001-2008 certified so you know you are getting quality equipment. A quality manufacturer will also require that all welders are certified to either AWS or ASME code standards. Also make sure you choose a manufacturer with a continuous improvement program to ensure that the highest standards are met and that your screw conveyors meet or exceed your expectations.

As an added value, KWS Manufacturing has the Knowledge, Workmanship and Solutions to help you solve your conveying problems, and we take our status as a Preferred Supplier to IDC-USA very seriously. 🌀

Bill Mecke is president of KWS Manufacturing in Burleson, Texas. He has over 20 years of experience in the bulk material handling industry and in the design of screw conveyors. Mecke received his B.S. in Mechanical Engineering from Texas A & M University. Contact him at bmecke@kwsfmfg.com or (817) 295-2247.



FLEXIBLE DUCTING

flexes its muscle

Flexible ducting comes in a wide variety of materials, diameters and configurations. While many are available in standard off-the-shelf materials, diameters and lengths, ABC Industries (www.ABC-Industries.net) also offers custom ducting that can be built to meet specific application needs, says Jennifer Kussmaul, ABC Industries' special accounts manager.

Flexible ducting (also called flexible hose) is made of PVC, polyester or other material that's either molecularly bonded by heat or sewn to a steel wire helix that gives the duct its shape and strength. Various helix pitches are available to provide the rigidity needed for specific application requirements.

The duct's durability depends on the material from which it is made. Scuff or wear strips may be bonded or sewn to the wire helix for greater durability. While optional on heat-bonded ducting, it's standard on sewn ducting, which is considered the premium line of ducting due to its increased durability, says Kussmaul. "However, sewn construction requires that air move through the duct in one

Choosing ducting on the application's special needs and the air handling equipment's requirements

BY CLAIR DAVID URBAIN



From temporary ventilation for dehumidifying flooded buildings to permanent air handling systems in plants, office buildings and homes, flexible ducting can be an economical, viable alternative to metal ductwork. It's also used extensively in a variety of portable ventilators used in confined space work.

direction only. There is a tag sewn into the duct that shows the direction of air flow. Heat-bonded duct can be installed so material or air travels in either direction.”

ABC Industries offers more than a dozen types of ducting that can be used in a variety of Air/Fume or HVAC applications (see table, page 24). It also offers a variety of end configurations and types of connectors that can be used to join or install the ducting to air handlers, diffusers, intakes or exhausts.

ABC Industries stocks many standard lengths and diameters, but its two U.S. manufacturing facilities can custom-manufacture ducting for specific needs.

Three duct types

ABC Industries’ product line can be broken into three distinct types: EnviroDuct, ThermoHose and Flovent ducting or tubing, based on their construction and intended use:

EnviroDuct products are premium-quality ducts with standard sewn construction and scuff or wear strips installed along the steel wire helix. “They can compress to as little as 1/7 their fully extended length. Most are made with fire-resistant VentaTex fabric that meets UL94VTM-O flame resistance standards,” says Kussmaul.

ThermoHose ducting has a heat-sealed construction and can compress to as little as 1/6 its fully extended size. TH1 ducting is for standard-duty applications. “TH2 is made with

a slightly heavier PVC/polyester for heavy-duty applications; and THE-SD or THE-HD is for abrasive material, caustic or chemical fume applications,” she says.

FloVent ducting does not have a steel-wire helix incorporated

into its structure and is only for positive-pressure applications with nominal bending. “Perforations in the tube allow it to diffuse the moving air through the facility for temperature control,” she explains.

CONTINUED ON PAGE 25

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PRODUCT PROFILE

Application	Use	ABC Ind. Duct Type/Model	Characteristics	Sizes Available	Specific Applications
Air/Fume	General Purpose	ThermoHose 1099-LD/1399-SD/1899-HD	Yellow or optional black, white, blue, green or red VentaTex fabric is heat-bonded to a steel-wire helix. Operates in -20 F to 200 F. Optional wear strips available. Compresses to as little as 1/6 of its fully extended length.	2" to 30" diameters and 25' or 50' lengths; custom lengths available.	Temporary or permanent positive- or negative-pressure installations such as utility blower hose, ventilation, fumigation, dehumidification, heating, drying/cooling or dust/fume collection.
Air Fume or HVAC	Premium General Purpose	EnviroDuct 1399-SD, 1899-HD or InsulSand	Yellow or custom black, white, blue, red or green with heavy-duty military spec black wear strip. InsulSand is a 20 oz./sq. yd. outer material with a 1/4" closed cell foam insulation and a 14 oz./sq. yd. inner liner. Operates in -20 F to 200 F.	6" through 48" diameters; custom diameters available; 15' or 25' lengths.	Temporary or permanent installations for general-purpose blower hose, ventilation, fumigation, dehumidification, heating, drying and cooling, dust/ fume collection, pre-conditioned air (PCA) handling for airlines.
Air Fume	General Purpose	ThermoHose THP-SD/THP-HD Clear PVC	A clear high-performance, heat-sealed, flexible hose which offers an economical alternative for tough ventilation and exhausting applications. THP material is solvent-free and not subject to common bond failure. Provides good abrasion, chemical and weather resistance. Operates in -20 F to 180 F.	2" through 30" diameters in 25' or 50' lengths; custom lengths available.	Portable or permanent installations for chemical fume exhaust, dust collection, general-purpose ventilation, lightweight material handling, negative or positive pressure applications, industrial venting for air circulation, fabric removal, grinders/sanders, industrial vacuum systems and marine bilge fume ventilation.
Air Fume	Anti-Static	EnviroDuct 1499 VentaStat	A black, high-strength, flame-resistant ducting fabric which, when properly grounded, prevents electrostatic buildup. VentaStat fabric has less than 100 Megohms of surface resistance and an excellent choice when dealing with flammable materials. Sewn construction with wear strips standard. Operates in -20 F to 180 F.	6" through 48" diameters; larger diameters available. 15' and 25' lengths; custom lengths available.	Lightweight material handling or environments where plastic, flour and grain dust, explosive dust, oxygen-laden atmospheres and flammability are a concern.
Air Fume	Anti-Static	ThermoHose 1499 VentaStat	A black, high-strength, flame-resistant heat-sealed ducting fabric which, when properly grounded, prevents electrostatic buildup. VentaStat fabric has less than 100 Megohms of surface resistance and an excellent choice when dealing with flammable materials. Operates in -20 F to 200 F.	2" through 30" standard diameters; 25' or 50' lengths; custom lengths available.	Portable or permanent installations for chemical fume exhaust, dust collection, general-purpose ventilation, lightweight material handling, negative or positive pressure applications, industrial venting for air circulation, fabric removal, grinders/sanders, industrial vacuum systems and marine bilge fume ventilation.
Air Fume	Food and Pharmaceutical	ThermoHose FDA-W	The white with light-duty black wear strips has lightweight, flexible and compressible VentaTex 1399 FDA heat-sealed fabric for use in "clean environments." Retractable, crush resistant and ideal for use in low-abrasion situations. Operates in -20 F to 200 F.	2" through 30" diameters in 25' lengths; custom lengths available.	Ventilation of air, dust and fumes in pharmaceutical operations, hospitals, "clean" rooms, food processing plants and plastic processing facilities.
Air Fume	Negative Pressure	ThermaHose TH-1	A strong, durable, lightweight black or blue standard-duty ducting that is portable, flexible, compressible and retractable. Its heat-sealed encased steel-wire helix construction prevents duct collapse or crushing while remaining resistant to abrasion, fatigue and deterioration from weather and chemical influences. Available with a light-duty wear strip and can operate in -20 F to 200 F.	2" through 24" diameters in 25' or 50' lengths; custom lengths available.	Temporary or permanent installations for ventilation, fumigation, light material handling, dehumidification, heating, drying, cooling and dust and fume collection.
Air Fume	Negative Pressure	ThermaHose TH-2	A strong, durable, lightweight black or blue ducting that is portable, flexible, compressible and retractable down to half its fully extended length. The heat-sealed encased steel-wire helix construction prevents duct collapse and crushing while resisting abrasion, fatigue and deterioration from weather and chemical influences. Operates in -20 F to 200 F.	2" through 24" diameters in 25' or 50' lengths; custom lengths available.	Temporary or permanent installations for ventilation, fumigation, light material handling, dehumidification, heating, drying, cooling and dust and fume collection.
Air Fume	Negative Pressure and Chemical Resistant	ThermaHose THE-SD/THE-HD	An extremely versatile, all-purpose black duct with superior chemical and good abrasion resistance. Can handle many chemical/caustic fumes, oils, hydrocarbons and aqueous-based fluids and has a low compression and tension set. It resists ultraviolet rays, weathering, ozone and flex fatigue. Operates in temperatures from -60 F to 250 F.	2" through 30" diameters in 25' or 50' lengths; custom lengths available.	Portable or permanent installations for fume removal, general-purpose ventilation, negative or positive pressure applications, high-temperature air or air intake for transportation.
Air Fume	Negative Pressure	ThermoHose THU-SD/THU-HD	A clear, frosty clear or black lightweight durable heat-sealed duct with excellent abrasion resistance. It has high-tensile strength and excellent flexibility at low temperatures and superior oil and ozone resistance. The material is solvent- and odor-free and not subject to common bond failure. Operates in -65 F to 200 F.	2" through 30" diameters in 25' or 50' lengths; custom lengths available.	Portable or permanent installations for dust collection, light- to medium-weight material handling such as leaf loading or chip handling, chemical fume exhaust, general-purpose ventilation, conveying, negative- or positive- pressure applications, industrial vacuum systems for carbon dust, plastic pellets, metal shavings, street sweeping, lawn and garden equipment or lavatory waste collection.
HVAC	Positive Pressure	FloVent 1399-SD/ 1899-HD	Available in yellow or optional black, green, red, white or blue VentaTex material, this is an economical alternative for positive-pressure applications where direct access and limited flex action of tubing is required. Resists deterioration, fatigue and abrasion. Operates in -20 F to 200 F.	8" to 48" diameters; larger custom sizes available; 25', 50', 100' lengths; plus custom lengths.	Permanent or temporary installations for positive-pressure ventilation or diffuser tubing.
HVAC	Positive Pressure	Poly Diffusers	Available in white or clear polyester material, this is a low-cost yet highly efficient way of distributing and mixing conditioned air evenly over large areas. Can be designed to mix air without drafts or provide ventilation for a greater cooling effect. Operates in -20 F to 100 F.	12" to 30" diameters with larger custom diameters available in 50' or 100'; plus custom lengths.	Temporary installations for positive-pressure ventilation or diffuser tubing.

NOTES: Steel wire helix pitch can vary with duct diameter and pressure requirements. VentaTex®, VentaSta®, VentaTex-FDA®, and THE materials meet the requirements of applicable UL94VTM flame resistance test methods. Fabric weights: LD = light duty 10 oz./sq. yd. weight; SD= standard duty 13 oz. sq. yd. weight; HD = heavy duty 18 oz./sq. yd. weight.

Answer these questions for best duct type selection

Many types of ducting are available, and ABC Industries' Jennifer Kussmaul suggests asking the following questions to identify the correct ducting for your application:

1. What is the temperature range of the ambient air and the air being handled?
2. Is the material or air moving through the duct caustic or abrasive?
3. Does the ducting need to meet any specific standards, such as FDA, or clean room or fire resistance requirements?
4. Is the application for intake or exhaust air (positive or negative pressure)?
5. Will the ducting be dragged, moved repeatedly, or be used in an abrasive or rough environment?
6. What type of end configuration is needed? Will more than one length (typically 25' or 50' lengths) need to be coupled together to complete the run?
7. What is the air handler's capacity and what volume of air must be moved at what pressure? Longer runs and excessive bends in the ductwork path increase static pressure that can decrease air handler performance. 



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EPACT, EISA, NEMA . . .

The alphabet soup of motor energy efficiency

BY CLAIR DAVID URBAIN

Industrial motor users raised their eyebrows a bit when the Energy Independence Security Act (EISA) of 2007 went fully into effect Dec. 19, 2010, says David Hackman, president of North American Electric Inc.

Actually, some did more than raise their eyebrows. Some panicked, thinking that every motor in their operation would have to be replaced with a new, higher-efficiency unit. "That's not the case," Hackman says.

A bit of history

The march to greater motor energy efficiency started in 1992 with the passage of the Energy Policy Act (EPAct). "Before then, motors weren't required to meet any energy efficiency standards. EPAct required motors to meet minimum efficiency levels

outlined in the NEMA MG-1 standard's Table 12-11," he says.

Depending on the horsepower rating of the motor and its pole configuration, Table 12-11 established that full load efficiency of Design A and Design B motors must be between 74 and 95.8 percent. "Design C and Design D motors aren't included in the standard. EISA 2007, which went into effect late last year, tightens energy efficiency standards slightly – between 0.4 and 1.5 percent. The new efficiency standards are identified in NEMA MG-1 Table 12-12," says Hackman.

The new energy efficiency standard has created some confusion, but Hackman counsels that it gets much simpler when you first realize that any EPAct motor that was manufactured or imported prior to Dec. 19, 2010, can legally be sold and used in the United States under

the new law.

The new law separates motors into two types:

1) EISA-compliant motors that meet NEMA MG-1 Table 12-11 requirements. These motors include:

- U-frame
- NEMA Design C
- Close-coupled pump
- Footless
- Vertical solid-shaft normal thrust (as tested in a horizontal configuration)
- Eight-pole (900 rpm)
- Poly-phase (maximum 600 volts but other than 230 or 460 volts)
- 201 to 500 hp motors not previously covered by EPAct

2) Premium efficiency motors that meet NEMA MG-1 Table 12-11. These are also commonly referred to as NEMA Premium Efficiency motors and include:

- Designs A and B general-purpose motors from one to 200 hp
- 1,200 rpm six-pole motors
- NEMA Designs A and B general-purpose motors from one to 200 hp
- 1,800 rpm four-pole motors
- NEMA Designs A and B general-purpose two-pole motors from one to 200 hp 3,600 rpm

While the EISA legislation was



adopted in 2007, the industry had until Dec. 19, 2010, to develop and stock the EISA-compliant and NEMA Premium motors. It's important to note that fractional horsepower motors are not covered by the new law. Only one to 500 hp motors with three-digit frame NEMA numbers (143T and up) are included in the EISA legislation. "This also includes the equivalent IEC frame designations," says Hackman.

Motor construction

The NEMA Premium Efficiency motors are built slightly different from EISA-compliant motors. "A motor is really a big magnet. To create more magnetism and less resistance that leads to greater efficiency, manufacturers use higher quality steel and copper than what's found in less energy-efficient motors. Some energy-efficient motors also have different fan configurations that use a conical intake design and a smaller fan. This design creates a more efficient vacuum effect to pull cooling air over the motor. Small changes in the design of the fan cover and the fan can help to improve a motor's efficiency," Hackman says.

Selection strategies

EISA 2007 does not mandate motor replacement with NEMA Premium motors. In applications where the motor is off more than it runs, the additional cost of the NEMA Premium motor far outweighs any energy savings. "Design A and B NEMA Premium motors typically cost as much as 30 percent more than less efficient Design C or D motors that aren't EISA 2007-compliant," says Hackman.

Motor energy efficiency standards tighten, but selection still depends upon run time and dependability

In applications that run 24/7, Hackman recommends selecting NEMA Premium Efficiency motors. "In heavy-use applications, the higher quality motors will offer longer life, greater energy efficiency and lower likelihood of downtime. They are built with higher quality steel and copper. In seasonal or sporadic use applications, the less expensive motors may be a better choice because the energy savings will never justify the additional cost because they won't run enough," he says.


When it comes time to replace a motor, Hackman suggests discussing the application with your motor supplier who can help you select the motor that makes the most economic sense.

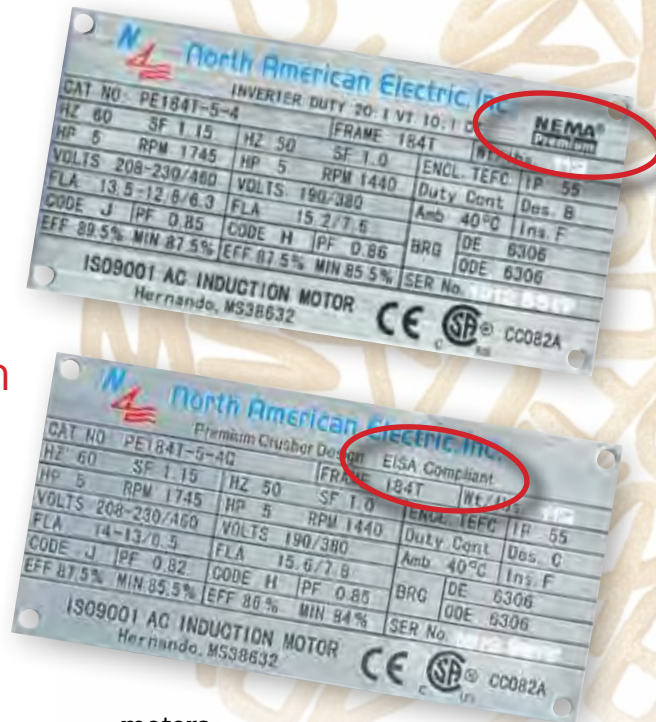
If your facility has several motors operating in critical 24/7 applications, Hackman advises working with your motor supplier to develop a preventive maintenance program. "Your motor supplier can help you set up a plan to regularly check

motors for proper cooling and vibration levels and repair components before they fail. This can be very cost-effective for facilities with several motors in high-use applications," he says.

Look at the nameplate

To identify whether a motor meets the EISA 2007 levels of energy efficiency, look at the motor's nameplate. Motors that meet the new standard will have "NEMA Premium" on the nameplate; those meeting the old requirements will be identified as "EISA compliant."

These motors are checked by Underwriters Laboratories to assure they meet the NEMA MG-1 standard requirements. "We also randomly select motors from our warehouse and send them to a testing facility in North Carolina to assure the motors we sell meet or exceed the minimum energy efficiency requirements," Hackman concludes. 





Watch your step!

Here's practical advice for avoiding slips, trips and falls in the workplace

BY JOHN MICHAEL

Slips, trips and falls are probably the most common causes of accidents in the world. In the United States alone, these account for nearly 20% of all accident claims. If you injure yourself at work because of these reasons, then you are entitled to claim slip compensation. However, if you are an employer or an employee, then it should be your primary responsibility to ensure that your working environment is absolutely safe, as this will help prevent workplace accidents like slips from occurring. Here are a few ways to prevent slips and trips from occurring at work:

1) Never run at work: Avoid running in your workplace, as this

is one of the main causes for slips and other work-related accidents. Ask your work staff to walk instead of run if they want to avoid hurting themselves.

2) Be careful around mats and rugs: As silly as it may sound, mats and rugs pose serious health and safety hazards, especially if they have worn or frayed edges. Uneven edges, stray threads and lumps or bumps in your mats or rugs can lead to workplace accidents like slips, trips or falls. Try to get rid of these to provide a safer and more even walking surface.

3) Remove and mark the changes in floor: Unexpected changes in floor pose a health hazard, but there are many ways to reduce these risks at your workplace. Put in hand rails, better lighting, tread marked ramps and bright floor marking to make your workplace safer and prevent accidents.

4) Check for bad lighting: Bad

lighting can greatly increase the chances of accidents from happening in the workplace. Lighting on the stairs and across floor levels should be corrected as well.

5) Make sure you choose sensible shoes to wear: If you are planning on wearing high heels or ill-fitting shoes to work, then you can expect to meet with accidents frequently. Always make sure you wear well-fitting shoes that are sensible to work.

6) Keep slippery surfaces safe: Some surfaces can be slippery and should be treated to prevent workplace accidents. Naturally slippery surfaces can

be chemically treated as well to remove hazards.

7) Clear up spilled substances: If you notice any spillage, make sure you clean it up immediately to prevent slips and falls. Or, you could put up signs to alert people that there are spilled substances present. Call in the cleaning services to dry and clean the area.

8) Secure loose cables and wires: Loose cables and wires that are trailing along the floor can cause workplace accidents. You can use cable guards to reduce these hazards, and use signposts to make people aware of the risk of tripping.

9) Put up signposts: If your workplace has sizeable changes in flooring or frequent wet surfaces, putting up signposts can be very effective in preventing accidents from occurring.

Follow the above mentioned steps carefully, and you can avoid all workplace accidents related to trips, slips and falls. ☺

John Michael represents OSHA 10 Hour Safety Course, an online 10 hour OSHA training solutions provider for workers on construction safety, work site safety and risk management issues. For further information, visit: www.osha10hoursafetycourse.com.

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HIGH-FORCE HYDRAULICS

How to safely choose and use high-pressure hydraulics

SPX HYDRAULIC TECHNOLOGIES

BY RICK SWANSBRO

In hydraulic systems, power is transmitted and controlled through a liquid (hydraulic oil), under pressure within an enclosed circuit. Further, hydraulic fluid under pressure to stationary industrial equipment requires an understanding of pressure, force and area in order to safely benefit from the power amplification of hydraulic technology.

Quite often we hear the terms “low-pressure hydraulics” versus “high-pressure hydraulics.” Low-pressure hydraulics typically indicates less than 3,480 psi (240 bar). High-pressure hydraulics indicates greater than 3,480 psi (240 bar). This article focuses on high-pressure applications up to 10,150 psi (700 bar).



Major markets served by high-pressure hydraulics such as Power Team pumps, cylinders, tools and accessories include non-residential construction, foundation repair, concrete post tensioning, bridge maintenance, oil and gas, refinery, mining, wind towers, as well as industrial in-plant (MRO) applications. Recent high-profile applications of Power Team products include the US-191 Colorado River bridge project, a commuter rail project in Dubai, and repairing the foundation of a historical museum in the United Kingdom. All applications called for substantial hydraulic might in order to complete the job.

Whether lifting a museum in the United Kingdom or pulling a bearing off a shaft, safety is a “mission critical” aspect of the proper use and application of high-pressure, high-force hydraulic pumps, cylinders, tools and accessories. Let’s consider three of the most common application mistakes of high-pressure, high-force products. We will also consider the proper application of these same products.



PHOTOS: SPX HYDRAULIC TECHNOLOGIES

Pullers

Pullers are used for a number of applications including pulling bearings, sheaves, sprockets, etc., from a shaft. Pullers range in capacity from 1-ton pulling force up to and including 200-ton pulling force. A good rule of thumb is 10 tons pulling force for every inch of shaft diameter; therefore, a 20-ton puller should be used with a 2-inch diameter shaft.

Conversely, striking an undersized puller with a heavy object is not an option. While the force of a blunt object may deliver a shock to the item being extracted from the shaft, it will also run the risk of creating shards of metallic shrapnel and/or cause the puller to fall to the floor. Either consequence is dangerous and ill-advised in order to minimize injury to the operator(s). The proper way to use mechanical and/or hydraulic pullers is to leverage the pulling load without employing external and potentially dangerous means of transmitting force.

Mechanical Cribbing Blocks

Cribbing blocks are used to achieve incremental gains in extended cylinder height. Rather than purchase a longer stroke cylinder, which may not be possible, cribbing blocks are used as a mechanical means of cylinder extension. Cribbing blocks should be applied as a set per the manufacturer’s recommendation. Do not combine additional cribbing blocks greater than recommended, as this poses a stacking safety risk to the operator(s). Also, do not use unapproved cribbing materials such as square drive sockets, which may impart an unsafe compressive load on the socket, leading to mechanical failure and potential operator injury.

Fluid Conveyance

Proper selection and application of hydraulic hose for purpose of fluid conveyance is paramount to achieving a safe and productive working environment. Let’s consider the many application and environmental issues related to hose safety.

1) Damaged Hose: Any physical damage or alteration of hydraulic hose should be dealt with immediately. Physical hose damage can result from exposure to chemicals, being run over by equipment, and contact with extreme temperatures including, but not limited to, fire and/or welding byproducts and contact with sharp objects.

Attempts to repair damaged hydraulic hose are absolutely prohibited!

2) Non-Conductive Applications: The need for electrical isolation requires the application of non-conductive hose. These types of hose products are designed with a polyurethane outer coating and orange color for easy identification. The covering is not perforated, preventing moisture ingress and benefiting overall conductivity.

3) Proper Selection of High-Pressure Hose Products: You should purchase high-pressure hose products only from authorized fluid conveyance suppliers that sell and service Power Team products. Design specification for high-pressure hose is very specific and requires burst pressures up to 40,000 psi (2,700 bar).





Lastly, the application and specification of high-pressure, high-force hydraulic pumps and cylinders
CONTINUED ON PAGE 33

The advertisement features a central image of several cylindrical bronze bearings of various sizes. To the left of the image is the Isostatic logo, which consists of the Roman numeral 'III' inside a square frame, with the word 'ISOSTATIC' below it. Below the logo is the text 'IDC-USA DISTRIBUTORS'. To the right of the image, there are three stacked boxes with the following text: 'Powdered Metal Bronze Bearings', 'Cast Bronze Bearings', and 'TU Self-Lubricating Bearings'. At the bottom right of the image area, it says 'Isostatic Industries, Inc. ISOSTATIC'. Below the image area, there is a paragraph of text: 'Isostatic® stocks thousands of items in *inch* and *metric* sizes. Economical made-to-order sizes are also available with quick turn-around. Contact your local IDC-USA Distributor for further information.' At the very bottom of the advertisement is the 'IDC-USA DISTRIBUTORS' logo.

PUMP CAPACITY Selection Chart

The following guidelines are for general lifting and construction applications. Hydraulic tools, pullers and presses may fall outside these recommendations. Always check to see that the pump's "usable reservoir capacity" exceeds the cylinder(s) oil capacity.

Generally Recommended	Marginal Check Requirements	Not Recommended for most applications

		10,000 psi Maximum Working Pressure															
		Pressure Stage	Cylinder Capacity (Tons)														
			5	10	15	20	25	30	55	75	100	150	200	300	400	500	
	46	P12‡	Single	14	32	44	65	72	93								
	46	P55‡	Single	6	14	19	28	31	40	71							
	47	P19/ P19L	Low	4	8	10	15	17	21								
			High	13	30	42	59	68	86								
	47	P59F	Low	1.8	4.1	5.7	8	9	12	20	29						
			High	8	17	24	34	48	50	85	122						
	47	P59(L)‡ P157‡	Low	1.5	3.2	4.7	7	7.7	9.7	16.7	23.9						
			High	6	14	19	28	31	40	71	101						
	48	P159‡ P300‡	Low	0.5	1	1.3	1.9	2.2	2.8	5	7	9	13	18			
			High	7	15	21	30	34	43	77	110	143	200	250			
48	P460‡	Low	0.1	0.3	0.6	0.6	0.7	0.9	1.5	2.2	2.8	4.2	5.6	8.4	11.2		
		High	3.3	7.7	9	14	17.5	22	37	55	71	105	143	213	284		
	68	PE10	Low	0.5	1.2	1.6	2.2	2.6	3.2	5.5							
			High	6	13.4	18.9	27	31	39	66.2							
	70	PE17‡	Low	0.2	0.5	0.7	0.9	1.1	1.4	2.3	3.3	4.3	6.5	8.7			
			High	3.5	7.9	10.9	16	18	23	39	56.3	73	109	146			
	72-73	PE18	Low	0.4	0.8	1.2	1.6	1.8	2.3	3.9	5.7	7.3	10.8	14.6	21.9	29.2	
			High	3.3	7.5	10.3	15	17	21	37	53	69	102	136	207	276	
	74-75	PE21‡	Low	0.2	0.5	0.7	1.0	1.1	1.4	2.5	3.6	4.6	6.8	9.2	13.8	18.4	
			High	2.8	6.4	9	13	15	19	32	45.5	59	88	118	177	236	
	76-77	PED25	Low	0.2	0.4	0.6	0.9	1.0	1.3	2.2	3.2	4.1	6.1	8.3	12.0	15.7	19.9
			High	2.4	5.4	7.5	10.6	12.4	15.6	26.5	38.2	49.5	73.6	99.1	144.3	188.5	238.6
78-79	PE30‡	Low	0.2	0.45	0.6	0.9	1	1.3	2.2	3.2	4.1	6					
		High	2	4.5	6	9	10	13	22	32	41	60					
80-81	PE46‡	Low	0.1	0.3	0.4	0.5	0.6	0.7	1.3	1.8	2.4	3.5	4.7	7.2	9.6		
		High	1.3	2.9	4.1	5.9	6.8	8.6	14	22	28	42	56	84	112		
82-83	PE55‡	Low	0.1	0.2	0.3	0.4	0.4	0.6	0.9	1.4	1.8	2.6	3.5	5.4	7.2		
		High	1.1	2.4	3.4	4.8	5.6	7.1	12	17.8	23	34	45	69	92		
84-85	PE60‡	Low	0.1	0.2	0.3	0.4	0.4	0.5	0.9	1.3	1.7	2.5	3.4	5.1	6.8	8.5	
		High	1	2.2	3.3	4.4	5.2	6.5	11	16.2	21	31	41	63	84	105	
88-89	PQ120	Low	0.1	0.2	0.3	0.4	0.4	0.5	0.9	1.3	1.7	2.5	3.4	5.1	6.8	8.5	
		High	0.5	1.1	1.6	2.2	2.6	3.2	5.5	7.7	10	15	21	30	40	50	
90-91	PE400	Low	0.1	0.1	0.2	0.2	0.3	0.3	0.6	8	1	1.5	2.1	3	4	5	
		High	0.1	0.3	0.4	0.6	0.7	0.9	1.6	2.2	2.9	4.4	5.9	8.7	11.6	14.5	
	50-51	PA6‡	Single	10	22.4	31	44.4	51.3	65.2								
	54-55	PA9‡	Single	10	22.4	31	44.4	51.3	65.2								
	60-61	PA17‡	Low	0.2	0.5	0.7	0.9	1.1	1.4	2.3	3.3	4.3	6.5	8.7			
			High	3.5	7.9	10.9	16	18	23	39	56	73	109	146			
	62-63	PA46‡	Low	0.1	0.3	0.4	0.5	0.6	0.7	1.3	2	2.4	3.5	4.7	7.2	9.6	
			High	1.3	2.9	4.1	5.9	6.8	8.6	14	22	28	42	56	84	112	
62-63	PA55‡	Low	0.1	0.3	0.4	0.6	0.7	0.9	1.5	2.2	2.8	4.1	5.5	8.4	11.2		
		High	1.1	2.4	3.4	4.8	5.6	7.1	12	18	23	34	45	69	92		
	94-95	PG30	Low	0.3	0.7	1	1.3	1.6	2	3.3	4.8	6.2	9.3	12.4	18.1		
			High	2	4.5	6.3	8.9	10.3	13	22	31.8	41.3	61.4	83	121		
	94	PG55‡	Low	0.1	0.3	0.4	0.6	0.7	0.8	1.4	2	2.6	3.9	5.2	7.6	9.9	12.5
			High	1.1	2.5	3.5	4.9	5.6	7.1	12.1	17.3	22.5	33.5	45	66	86	109
	96-97	PG120‡	Low	0.1	0.3	0.4	0.6	0.7	0.8	1.4	2	2.6	3.9	5.2	7.6	9.9	12.5
			High	0.5	1.0	1.5	2.0	2.4	3.0	5.1	7.3	9.5	14.2	19.1	27.8	36.3	46.0
96-97	PG400	Low	0.1	0.1	0.2	0.2	0.3	0.3	0.6	0.8	1.0	1.5	2.0	3.0	3.8	4.9	
		High	0.2	0.3	0.5	0.7	0.8	1.0	1.7	2.4	3.1	4.6	6.2	9.0	11.8	15.0	

‡ Some Power Team pumps are available in special configurations not listed in this catalog. Power Team can "Assemble to order" pumps with special seals, voltages, valves, relief valve settings, etc. For your special requirements please consult your local distributor or the Power Team factory.
 * Hand Pumps = Number of strokes required to move piston 1". † Air, Electric and Gasoline Engine/Hydraulic pumps = Number of seconds required to move piston 1".

is dependent on the selection of component products. High-force hydraulic products and systems are used for lifting, pulling, pushing and bolt torquing applications. The chart at left offers a guideline for general lifting applications.

The Power Team pump capacity chart enables the application of pump vs. cylinder in order to minimize the work required. The horizontal axis at the top of the chart lists hydraulic cylinders from five to 500 tons. The vertical axis lists various types and capacity of hydraulic pumps, including hand pumps, electric pumps, air pumps and gas-operated pumps.

To read the chart, intersect the cylinder tonnage shown at the top horizontal axis with the pump shown on the left vertical axis that offers the most efficient operation. Then target a cylinder/pump intersection point that falls in the more efficient green shaded areas. Avoid the less efficient red shaded areas. The yellow shaded areas should only be considered when there is no other option. For further information, contact your local authorized IDC-USA distributor. Also, be sure to inquire about Power Team safety seminars featuring high-force hydraulic products or pullers. Seminars are conducted by SPX Hydraulic Technologies District Managers at customer facilities. ☉

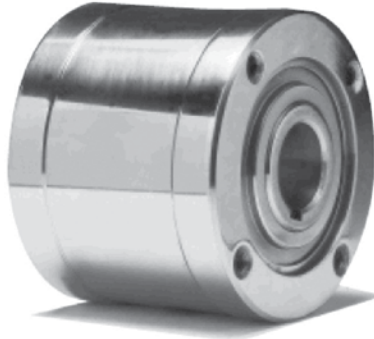
Rick Swansbro is national accounts manager for SPX Hydraulic Technologies, Rockford, Ill. Contact him at (815) 873-3868 or via e-mail at rick.swansbro@spx.com.

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An effective maintenance program doesn't happen by accident



The PLANNED MAINTENANCE system

BY JOHN W. RUSHTON

Planned maintenance is a maintenance concept developed over a span of time, and is made up of numerous functions, all designed to complement each other. Planned maintenance, then, is a maintenance program designed to improve the effectiveness of maintenance through the use of systematic methods and plans. The primary objective of the maintenance effort is to keep equipment functioning in a safe

and efficient manner. This allows production to meet production targets with minimum operating cost.

All portions of a planned maintenance program interrelate and are necessary for total system effectiveness. Planned maintenance is not just a planning and scheduling function stuck on the side of a general “firefighting” type maintenance organization. It must be complete

to be effective, and leaving one feature out will seriously hamper the program. Leaving two or three features out will leave you without a planned maintenance program. Companies that buy a computer software program and keep repair history files do not have a system.

The most critical components of a planned maintenance system are the following:

- Work Orders
- Daily Work Schedules (DWS)
- Daily Planning Meetings
- PM Task Lists
- Equipment History File
- Backlog Control Boards

These tools can be done manually or partially on a computer.

The system is more important than what tool you use to control it or monitor progress. The best software in the world is not a system, and software will not necessarily reduce costs. Complex and labor intensive software will frequently increase costs. You can install a good system with any software, but good software can be a valuable tool and can be used as part of a system.

IMPLEMENTING A PLANNED MAINTENANCE SYSTEM

Production involvement is extremely important. Without this, any maintenance program will be jeopardized. Commitment to the success of a maintenance program must extend from top production management through the front-line supervisors. If production management is not committed

to a maintenance program, then unrealistically high or low requirements may be made of the maintenance forces. Either situation can cause poor performance and low morale.

The system will go in easily at facilities where the production and maintenance managers work as a team in an effort to achieve common goals. In these cases, the production manager will want to see what he will receive in service from the maintenance department if such a program is started. A basic outline of the systems must be developed prior to selling the concept to upper management. An overall maintenance philosophy will be developed by the production and maintenance team leaders. A system to fit this philosophy will then be developed by the maintenance group.

MAINTENANCE RESPONSIBILITIES

Basic to the philosophy of planned maintenance is the concept that maintenance will continually attempt to increase online time and decrease internal costs.

- 1) Maintenance will be actively involved in optimizing production on a daily, weekly and monthly basis.
- 2) Maintenance will actively upgrade supervision by training and, if necessary, replacement.
- 3) Maintenance will actively upgrade hourly employees by training and, if necessary,

discipline and replacement.

- 4) Lowest manning levels will be sought.
- 5) Maintenance will use a daily work schedule.
- 6) Major shutdowns or overhauls will be totally planned.

PRODUCTION RESPONSIBILITIES

Basic to the philosophy of planned maintenance is the concept that production is an equal partner with maintenance in the achievement of established goals. Production has certain obligations to maintenance:

- 1) Production must accept maintenance as an equal partner.
- 2) Production must continually attempt to optimize production.
- 3) Production equipment must not be abused. Higher than designed output is not necessarily abuse.
- 4) Lines of communication between production and maintenance must remain open. ☺

Excerpted from John W. Rushton's book, Effective Maintenance Management Using Planned and Preventive Maintenance. Rushton International provides maintenance consulting and maintenance management software. Phone (888) 218-4466, e-mail admin@rushtonintl.com or visit www.rushtonintl.com.



your workplace

Powerful prescriptions to prevent hardening of the attitudes among employees

BY JACK SINGER, PHD.

We live in a 24/7 stressful society, filled with uncertainty in the job market and the economy. A large percentage of employees admit to being unhappy with and psychologically disengaged from their jobs. Recent research shows that

among the least happy and least engaged employees, the annual per-person cost of lost productivity due to sick days is more than \$28,000, versus only \$840 among the happiest and most engaged employees! Furthermore, job stress alone is estimated to cost U.S. industry

at least \$300 billion a year in absenteeism, diminished productivity, employee turnover and direct medical, legal and insurance fees.

Matt has been a manager for 16 years. Although his employees seem satisfied with their compensation, surveys conducted with them consistently show that their job satisfaction and morale are low and their stress levels are high. Matt has been well trained, but seems at a loss regarding helping his employees to feel more engaged or happy with their jobs.

Because he feels helpless to change the job situation for his employees, Matt is stressed at work and unhappy in his supervisor role. Can Matt regain his passion for his profession? Are there techniques he can use which will immediately enhance his employees' satisfaction and morale? Absolutely!

Following are five powerful prescriptions for enhancing employee morale and job performance as well as minimizing job stress.

Rx #1 Provide your employees with empowering goal setting strategies. People are 11 times more likely to reach a goal when they write it down, as opposed to simply thinking about the goal. Have regular meetings with your work team where, in addition to encouraging them to discuss their areas of discontentment, join with them in writing down short and long-term goals that are specific and action-oriented.

For example, "For this month, we will have four meetings where we will design and implement our new plan for developing a psychologically healthy workplace. Your goal is to bring an idea with you to each meeting."

Next, ask your people to visualize themselves feeling wonderful once they have accomplished that goal. Ask them to imagine it as if they have already accomplished the goal.

Finally, perhaps most importantly, have them write down ways in which they can sabotage themselves so that they will not accomplish those goals. Encourage them to be honest with themselves about the kinds of self-talk or self-defeating behaviors they have unfortunately engaged in before, which contribute to not accomplishing their goals.

Rx #2 Provide your employees with a sense of control over their jobs. Psychological studies of jobs are filled with examples of how important it is to give employees a genuine "say" in how to conduct their jobs. Not only does the perception that management truly cares about their feelings have a powerful impact on their morale and degree of job engagement, but giving workers some control over their own work-hour schedule (such as "flex time") and how to approach their work tasks, dramatically reduces job burnout, absenteeism and turnover.

Allowing talent and creativity to flourish will keep employees motivated and happy

Have frequent meetings with your employees directed at genuinely listening to their issues and allow them to suggest resolutions. Finally, encourage workers to determine their own specific strengths and put them to use on their jobs. When this is done, employees are six times as likely to be engaged in their jobs and more than three times as likely to report excellent quality of life at their workplace.

Other examples of providing employees involvement in their work are:

- Self-managed work teams
- Employee committees or task forces
- Continuous improvement teams
- Team-centered hiring process, where employees select their peers
- Participative decision making projects

Rx #3 Provide growth and development programs for your employees, such as brownbag learning programs.

CONTINUED ON PAGE 38

Most employees desire the opportunity to gain new skills and knowledge, so they don't feel stagnant in their jobs. Information provided by outside experts, which will help them on their jobs and in their lives, can serve these needs. Providing lunchtime seminars and workshops on such topics as stress mastery, anger mastery, enhanced wellness, communications skills, as well as cross-training them with other job skills, enhances organizational effectiveness and improves work quality. Providing free college credit courses after work in your company is a wonderful benefit to provide employees.

Rx #4 Provide a variety of planned and spontaneous recognition events for your employees. It's a no-brainer for companies to provide world-class service for their customers and clients, but they often forget that their most important assets — their employees — need the same. Why not make your employees feel as valued as your customers? By acknowledging their efforts — not just their productivity — you can increase employee satisfaction, morale and self-esteem.

Examples of providing recognition:

- Give unpredictable rewards,

such as movie tickets, gift certificates, etc., for a job well done

- Create a volunteer committee from across different departments to plan special events to show appreciation for your employees
- Provide free, healthy lunch options for employees (this also benefits by having them stay in the building to discuss work-related issues during every lunchtime)
- List the births, birthdays and other news of interest about employees in the monthly newsletter. Have the CEO or president send out personalized cards to

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the families listed in the newsletter each month.

- Encourage work team-friendly competition off the job, such as bowling leagues, or softball games, and post pictures and results around the work sites.

Rx #5 Provide a warm, accepting and fun workplace atmosphere, “jest” for the health of it! If you want your employees to look forward to Monday mornings, provide an atmosphere that includes fun, teamwork and camaraderie. Acknowledging employee needs and allowing talent and creativity to flourish will keep employees motivated

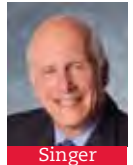
and happy. Examples of providing an accepting workplace:

- Have a “Whine and Geeze” area where employees can go to melt away stress
- Inject funny quotes and cartoons into company memos
- Have positive parties funded by negative people (every time a colleague is overheard making a negative comment, he/she puts 50 cents into a kitty)
- Have monthly theme contests where goofy prizes are awarded
- Have a surprise treat day once a month, such as having the

manager serve the employees bags of popcorn, ice cream bars or some other treat.

If you begin to employ these five potent strategies into your workplace today, you will see amazing results quickly! 🌀

Dr. Jack Singer is a licensed Industrial/Organizational and Clinical/Sport Psychologist, professional speaker, management coach and trainer. To learn more about Dr. Singer’s professional speaking and consulting services, visit www.drjacksinger.com. E-mail him at drjack@funspeaker.com or phone (800) 497-9880.



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For the best hose for the job, ASK questions

Completely understand
the application before
specifying replacement
hose

BY CLAIR DAVID URBAIN

Ordering a replacement hose takes more than reading the item number off the old hose's spine. Whether you are the maintenance pro or the salesperson taking the hose order, fully understanding the application will help you hone in on the correct hose for the job. It will also help you avoid disastrous failures, reports John Flanders, hose and coupling marketing manager at Jason Industrial, a leading hose and coupling supplier.

“Compatibility of the hose and fittings with the material flowing through it is the biggest issue. Ask what goes through the hose, at what temperature and at what pressure. The information off the spine of the hose isn't enough because the failed hose could have been spec'd incorrectly,” he says. “You may need to consult chemical resistance tables for





hose types to assure it won't react with the material being handled."

These factors affect any type of hose; however, more critical applications require even greater diligence. "For example, bio-diesel fuels can attack some hoses rated to handle petroleum products," he says.

Simple mistakes, sad results

Flanders has seen the consequences of improper hose selection. "The user must be sure that he or she knows the application and share that information with the hose supplier. Improper selection can lead to catastrophic property damage or injuries." He's seen water hose spec'd for chemicals or solvents and low-pressure hose used in high-pressure applications. "Only steam-rated hose should be used in steam service. Using 212 F-rated petroleum hose cannot withstand the 400 F heat and

pressure of a steam application," he says.

A hose that's rated for handling mild or diluted chemicals should not be used to move acids or concentrated chemicals. "These applications require special hoses," he says.

Temperature extremes can also affect hose life, so know the ambient temperature extremes and the temperature of the material flowing through the hose. "Temperature ranges should not exceed the hose's specifications," Flanders says.

Oil resistance

Rubber hose that handles oil must be able to withstand its degrading effects, and the Rubber Manufacturer's Association (RMA) has developed a classification system that identifies a hose's ability to resist the effects of oil. It's based on completely immersing the hose in oil at 212 F for 70 hours. From

test results, it's given one of three classifications:

■ Class A (high oil resistance):

CONTINUED ON PAGE 42

Factors that could affect hose selection

- Abrasion
- Electrical conductivity
- Environment
- Flammability
- Flow rate
- Fluid velocity
- Movement (type, distance, frequency)
- Ozone exposure
- Sub-zero temperature exposure
- Permeation
- Pressure drop
- Routing
- Salt water exposure
- Static electricity
- Ultraviolet light
- Vibration (share the frequency rate in Hz, its amplitude and "G" load, if available)

PRODUCT PROFILE

Maximum 25 percent volume change and retains 80 percent of its tensile strength.

- **Class B (Medium-high oil resistance):** Maximum 65 percent volume change and retains 50 percent of its tensile strength.
- **Class C (Medium oil resistance):** Maximum 100 percent volume change and retains 40 percent of its tensile strength.

Design ratios

Hoses are designed to have a minimum burst and maximum working pressure, which is known as its design ratio. “Minimum burst values are used to establish a reasonable and safe maximum working pressure,” Flanders says.

“Maximum working pressure is one of the most important operating characteristics that a hose user must know and respect to assure satisfactory performance and optimum hose life,” he adds.

The RMA recognizes design ratios for general types of applications. For example, water hose that will handle up to 150 psi should have a design ratio of 3:1. Hose for all other liquids, solid materials suspended in liquids or air and water greater than 150 psi working pressure, such as petroleum tank truck hose, should have a design ratio of 4:1. Hose for compressed air or other gases should have a design ratio of 4:1 and hose for liquid media that immediately changes into a gas under standard atmospheric conditions

(sublimation), such as Liquid Propane (LP), requires a design ratio of 5:1. Hose used for steam applications should have a design ratio of 10:1.

One of the best ways to assure the hose will fit your application: purchase preassembled hose. “Dollar for dollar, when you consider all of the costs, off-the-shelf preassembled hose is a great value,” Flanders says.

Other factors that affect service life

No hose will last forever. “All hose has a given life for a given application, even if the proper hose was selected for the application,” says Flanders. Elastomers and reinforcing materials in the hose will break down over time and with use – or non-use.

Stamp out hose selection mistakes with S-T-A-M-P-E-D

The hose industry has developed an acronym that makes it easier to remember the information needed to select the correct hose and fitting for the application:

S

Size

What is the inside (I.D.) and outside (O.D.) diameters and length? Specify if the length is overall length or length without couplings, and specify any tolerance limitations if Rubber Manufacturers Association (RMA) tolerances can't be used.

T

Temperature

What are the internal, external, minimum and maximum temperatures? Consider extreme and average temperatures.

A

Application

How will the hose be used? What is the flow rate? Is it for use indoors or outdoors? Intermittent or continuous use?

M

Material

What material will be moved through the hose? Identify the materials used in the tube, cover and reinforcement and make sure they are not affected by the material being moved through the hose. What is the anticipated or desired service life of the hose?

P

Pressure

What are the suction or vacuum requirements? What is the pressure range (low and high) and normal pressure range? Does the design ratio need to be 3:1, 4:1, 5:1 or 10:1?

E

Ends

What end styles are needed? Are they banded, crimped, swaged or pushed-on types of couplings?

D

Delivery

When will this be needed and where? Specify any special handling or packaging requirements.

“Dollar for dollar, when you consider all of the costs, off-the-shelf preassembled hose is a great value.”

– JOHN FLANDERS, JASON INDUSTRIAL HOSE EXPERT

But even with the proper hose, several factors can shorten its use life. Flanders lists the most common hose killers:

External abuse: Kinking, bending, crushing, abrasion, exceeding the hose’s bend radius and exposure to chemicals can cause damage that can’t be seen. Hose that is stretched, run over by equipment, used to hoist material or pull or carry objects can be damaged and fail. “Larger diameter hoses are especially vulnerable to kinking, stretching and external abuse and may need additional support for protection and best service life,” Flanders says.

System pressures: “Never use a hose at pressures that exceed its rating. This can cause damage or catastrophic hose damage or failure,” he says.

High temperatures: High temperatures can degrade a hose quickly. “If fluid or environmental temperatures are high, yet still within the hose’s working range, expect a shorter service life from the hose,” he says.

Low temperatures: Hose in an application outside its lower working temperature may

break or crack.

Misapplication: this is simply the wrong hose for the job. Contact your IDC Distributor’s hose expert or Jason Industrial hose specialists to assure the hose fits the application.

Internal abrasion: If the material being handled is an abrasive fluid or solid, and if the hose makes one or more bends, hose service life will be reduced.

Flexing and vibration: If the hose must flex or twist or is subject to vibration or other movement, its use life will be less.

Hose modification: If the hose is repaired with improper couplings or inappropriate fittings and has been modified in any other way, there’s a good chance its life will be shortened and may fail immediately.

Improper installation: If a hose is installed so that it has a twisted layline, it means the hose is under a torque condition that could significantly reduce its life.

Call the experts

Improper hose selection and installation can cost much more than the purchase price of the hose. Property or product may be damaged and downtime will quickly eat into production quotas. Worse, the wrong hose in an application could lead to injury or death of maintenance or production workers.

“If you aren’t sure about the proper hose to use, call your hose experts at Jason Industrial,” Flanders concludes. ☺



Chain of command



SYNERGY



60 HEAVY

Why lowest price isn't always the cheapest

RENOLD JEFFREY

BY RICH VURVA

Paying the lowest price sometimes results in a higher total cost. That's what two different companies recently discovered when they tried to save money on drive chains used in two demanding applications.

California Redwood Co.

As massive sections of lumber pass through saws at the California Redwood Company in Korbel, Calif., it causes a great deal of stress on the chains that power those saws. The chains run at a high rate of speed and start and stop abruptly when lumber snags as it passes over the cutting edge of the saw. Eight 20-foot strands of chain are attached to saws that operate in

tandem to assure even cuts.

The lumber mill needed to replace the chains every two months because the challenging application caused them to stretch out of shape. As the chains become elongated, the timing between the eight drive units falls out of sync.

Dennis DeMello of IDC Distributor-Owner Munnell & Sherrill suggested that the mill switch to a Renold Synergy chain to improve wear life and reduce downtime.

After making the switch, the chains have been in place for nearly a full year without a breakdown, which is more than six times the life of the chain previously used. Although the price of the Synergy chain is higher than the chain it replaced, eliminating downtime and labor costs required to replace the chain every two months resulted in a total annual savings of more than \$55,700.

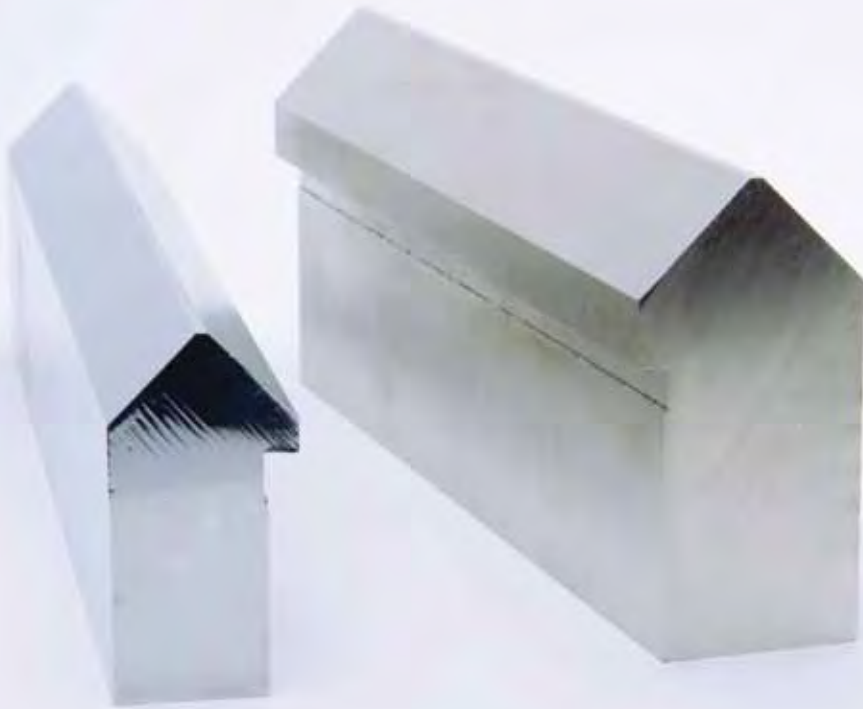
hydrants, includes iron and brass foundries, a machine shop, assembly area and finished goods warehousing. The roller chain powering the conveyors that carry fire hydrant castings into an oven are exposed to high heat and must support heavy loads. As a result, the chain tended to break frequently.

Ed Hubble of IDC Distributor-Owner Van Meter Industrial recommended a switch to the Renold #60 Heavy chain, which offers a higher load rating but could run on the existing sprockets. Although the heavier chain is priced 60 percent higher than the chain it replaced, the chains last up to two months, compared to only two weeks for the standard chain. When the foundry added up the cost to purchase and install replacement chains twice a month using the old chain compared to just six times a year with the new chain, it resulted in an annual savings of \$1,220.

These two examples demonstrate that paying a higher initial price can sometimes save money in the long run. Contact your local IDC Distributor-Owner to learn how you might benefit from similar savings. ☺



Eight 20-foot strands of chain are attached to saws that operate in tandem to assure even cuts.



Hardened steel rails for heavy-duty applications

Use with SMITH-TRAX Bearings to quickly design and fabricate precision material handling systems. Precision manufactured SMITH-RAILS drastically reduce system design time and sourcing cost of guidance systems for material handling equipment supports by heavy-duty SMITH-TRAX track rollers.

Hydraulic hand pump

Power Team's two-stage, hydraulic hand pump automatically shifts into high-pressure stage upon sensing load resistance. Two-speed design reduces handle effort by 40% over other hand pumps, thus improving operator efficiency and productivity. Lightweight, all metal construction will not burn through in welding environments. Pump may be operated in a horizontal or vertical position. Inboard relief valve helps prevent loads from drifting down. Large flow control knob offers added control for precise metering speed. Designed for all applications requiring lifting, turning, pulling and pushing motions.



High-pressure wash reels

Reelcraft's new Series CT hose reels conveniently store longer lengths of high-pressure wash hose.

These reels feature a balanced brass swivel and brake assembly attached to the main shaft, eliminating de-spooling when the reel is not in use. The inlet hose connects to the swivel through the tubular base. The reel is powder coated at the component level for maximum corrosion resistance. Available for up to 100-feet of 5000 psi hose.

NEW PRODUCTS

Get a grip on nuisance leaks and drips

SpillTech's DuraSorb line comes in four different configurations to cover a multitude of problem areas by incorporating an absorbent pad to catch liquids, an impermeable tarpaulin and adjustable straps to keep everything in its place.

Anyone working with liquid transportation knows that connections drip, leak and leave puddles that can lead to accidents and contamination. The DuraSorb line is designed to wrap around these connections, absorbing dripping liquids while the tarpaulin backing keeps liquids from leaking out. This line can be used in applications such as: fuel hoses, oil hoses, hydraulic hoses, piping ends with cam caps, fuel delivery transport hoses, bulk liquid transporters, utility boat fueling hoses and connections, fuel dispenser filters, large truck fuel pump filters, and hydraulic filters.



All plastic modular belt

M0873 Micropitch Non Slip is the only all-plastic modular belt utilizing a conventional bricklay design assembled with high-strength, single-piece abrasion-resistant rods. Available from Habasit, the M0873 Micropitch Non Slip is specifically designed for products requiring a tight transfer combined with surface texture for product positioning and easy release properties. The Micropitch Non Slip, in conjunction with nose bar diameters of 7mm (0.28-inch), allows for spacing between transfers to be reduced to 14mm (0.55-inch).



Unparalleled lubricating performance

CRC introduced Syntha-Tech Lubricant w/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. This food grade synthetic lubricant is NSF H1 Registered for use in meat and poultry facilities. Additionally, its long-lasting film minimizes surface contact, thereby extending lubricating intervals. CRC Syntha-Tech Lubricant w/PTFE penetrates deeply into cracks, crevices and joints to lubricate and protect all exposed metals. The PTFE additive minimizes surface contact and friction to reduce wear, extend equipment life and maintain peak operating conditions. Syntha-Tech Lubricant withstands extreme temperature ranges from -40 to 450 F.

IKO



Innovation **K**now-how **O**riginality

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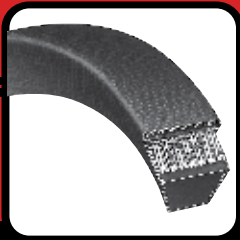
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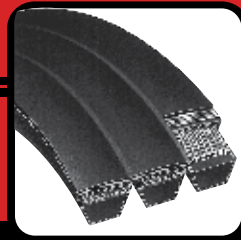
The Right Belt For All Applications



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Power Ace® Cog



Double V



Duraflex GL®



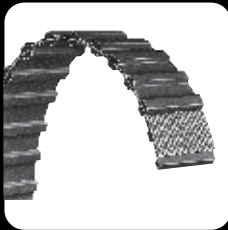
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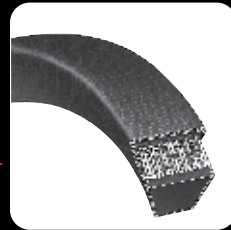
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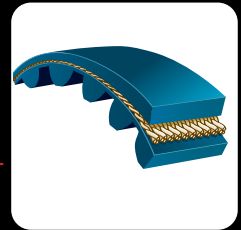
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