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PLANT

ADVANCING CANADIAN MANUFACTURING

Volume 74, No. 05 July/August 2015

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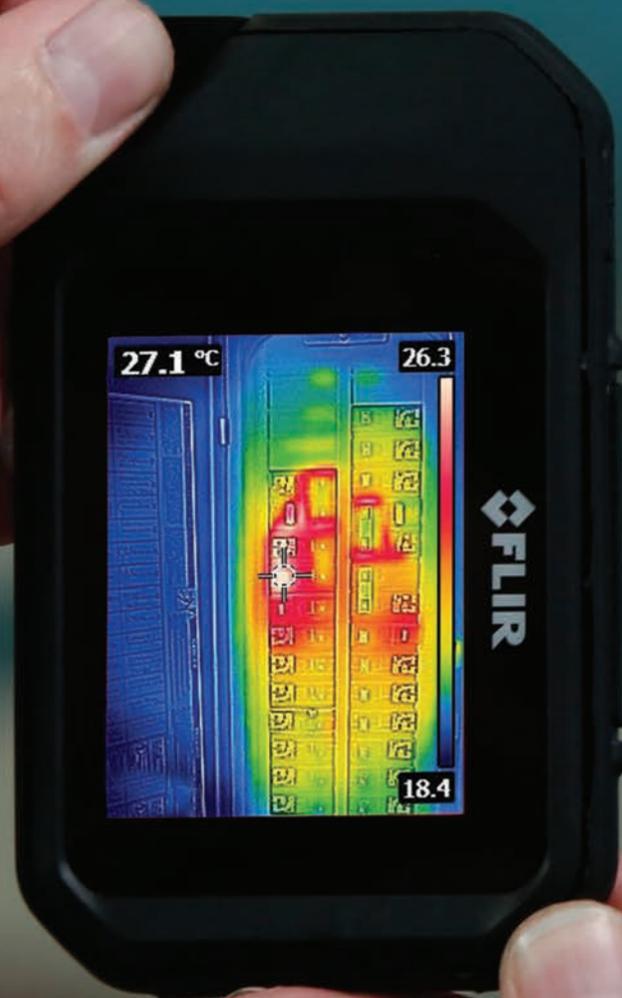
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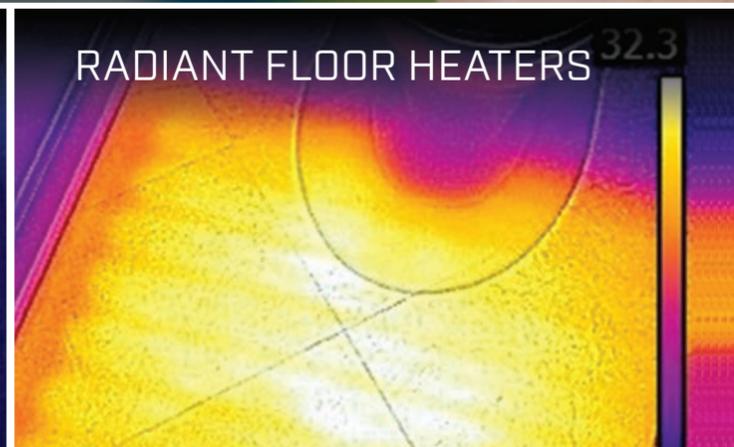
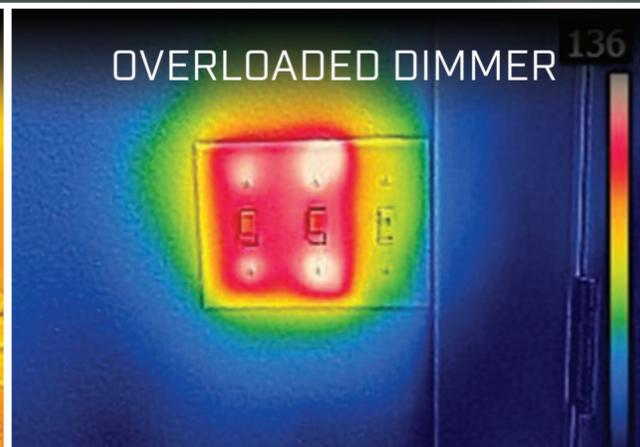
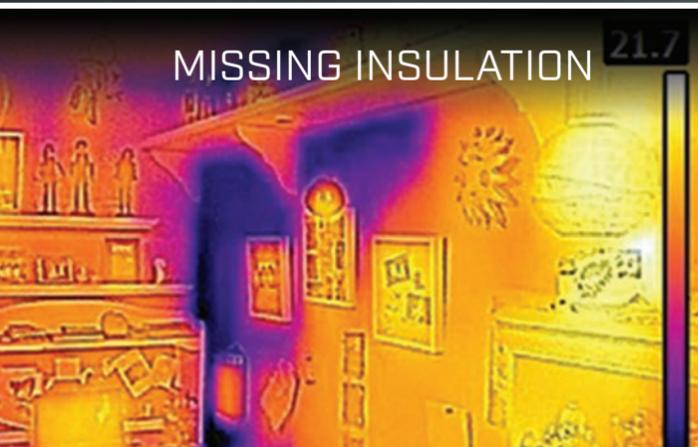
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Wynne's business burdens

When Canada's energy industry was in investment freefall thanks to the plunging global price of oil, Ontario Premier Kathleen Wynne made the rather heroic declaration that the province would save the day with a resurgent manufacturing sector. The loonie was cooling (good for exports), the US manufacturing sector was expected to power up and Canada had a free trade agreement with the European Union in the bag. So how are things going for Ontario manufacturing just past the year's halfway mark?

Not so good.

The latest manufacturing stats show the fourth sales decline of the year. More troubling, though, are the longer-term prospects for manufacturers that must contend with tough competition from the US and Mexico for North American business.

Adding to the cost of doing business doesn't help them, and it will make attracting investment to the province even more difficult. Yet the Wynne government appears to be stumbling in that direction with its high electricity rates, a proposed provincial pension plan and a cap and trade regime to reduce greenhouse gas emissions.

Let's start with electricity. The Ontario Chamber of Commerce issued a report calling on the government to curb the price of power, which has risen 16% for industrial users since 2013. The report says the rates are among the highest in the country. They're projected to rise another 13% over the next five years, and will continue to rise over the next 20 years. Of concern is a poll that revealed one in 20 businesses expect to shut down over the next five years because of soaring rates.

Yes, there are programs to help reduce power use and many manufacturers aren't making use of them, but the report contends more disclosure about peak and off-peak times is needed to reveal how electricity costs are calculated so businesses can better adapt their management efforts.

The automotive industry, responsible for about 3% of Ontario's GDP, is especially sensitive to cost issues. Ontario is an expensive place to make vehicles. There has been no new auto capacity investment in Canada (Ontario) in four of the last five years, while Mexico has scored seven new assembly plants. Ontario has picked up about \$4 billion of investments in existing plants after a couple of fallow years, but missed out on a \$2 billion Ford engine plant destined for Windsor that ended up in Mexico. And GM (iffy about its commitment to the Oshawa complex, pending contract negotiations with Unifor) has moved Camaro production to the US. So when Sergio Marchionne, CEO of Fiat Chrysler Automobiles, advises Wynne that cap and trade and a provincial pension plan reduce the industry's competitive position even more, she should listen.

What those costs will be are not known yet, but the pension scheme in particular is raising a red flag. The Wynne government's plan should be aimed at those who have trouble saving for their golden years on their own or through their employment. But it appears people who already have workplace defined contribution plans, or workplace RRSPs, or TFSAs, will be forced to participate in the Ontario Retirement Pension Plan too. This makes little sense for a company such as Fiat Chrysler, where workers are already participating in a defined plan.

Enviroics Research found 66% of Ontario companies are looking at eliminating existing group retirement plans and 78% are likely to reduce contributions to workplace plans....so mission not accomplished.

The national economy will find little relief from Ontario if Wynne continues with policies - executed in a manner that's reminiscent of her bungler predecessor - that add to manufacturers' costs and their angst.

Joe Terrett, Editor

Comments? E-mail jterrett@plant.ca.



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» Bulletins

IKEA Canada will rollout a network of electric vehicle charging stations at its 12 stores across Canada, to be completed by late August. It is the first national installation of EV charging stations in Canada by a retailer at all of its locations for free. Partner **Sun Country Highway**, an EV infrastructure firm in Saskatoon, will install SCH-60 "Level 2" 60-amp charge stations at each store.

BluMetric Environmental Inc., an Ottawa-based cleantech company, has signed a technology, business and project development agreement with Switzerland's **Aquarion AG**. The companies will address wastewater treatment issues and develop new technologies that meet increasingly stringent government regulations.

Uniboard Canada Inc. is investing \$7 million to install a new wood fibre mat-preheating technology at its Mont-Laurier MDF plant to increase productivity. The company says the process innovation is a first at a North American MDF facility. Uniboard is a manufacturer of engineered wood products, with mills in Val-d'Or, Sayabec, Mont-Laurier and Laval, Que. that employ more than 800 people.

BlackBerry Inc. is acquiring California-based crisis communications firm AtHoc for an undisclosed amount. AtHoc's software platform enables people, devices and organizations to exchange critical information in real time during business and life safety operations. Blackberry will integrate AtHoc's platform into its enterprise portfolio.

Ballard Power Systems will provide a 1-megawatt ClearGen fuel cell distributed generation system for **Hydrogène de France**. The system will be deployed at an AkzoNobel sodium chlorate chemical plant in Bordeaux Métropole, France. Ballard will receive \$4.8 million for the two-phase project that is to be completed by 2017.

The federal government has invested \$3-million to support a proposed 300-megawatt wind farm project on the **Henvey Inlet Indian Reserve**, between Sudbury and Parry Sound, Ont. The project will guarantee financial independence and employment for the First Nation and surrounding communities. The joint venture with **Nigig Power Corp.**, is wholly owned by the Henvey Inlet First Nation and **Pattern Energy Group**.

Safety blitz results in 3,603 stop work orders

Most infractions related to damaged ladders, insufficient fall protection

TORONTO — Ontario Ministry of Labour (MOL) inspectors have issued 65 stop work orders since it began a safety enforcement blitz to prevent slips, trips and falls at workplaces in the industrial sector.

From Feb. 2 to March 15, inspectors visited 946 workplaces from restaurants to metal fabricators located across the province.

They issued 3,603 orders for violations of the Occupational Health and Safety Act and its regulations, including: portable ladders that had bent or damaged legs or rungs, or were missing non-slip footing; fixed position access ladders without side rails to protect workers from falling; and failing to ensure guardrails were provided around openings in floors.

MOL says as of June 9, more than 85% of the



Safety inspectors visited 946 sites from February to mid-March.

PHOTO: THINKSTOCK

orders were complied with.

In 2013, 11 workers died in falls at industrial workplaces.

Hennessy celebrates 250 years with Time Barrel

Will preserve messages in cognac maker's historic cellars for 50 years

TORONTO — Cognac-maker Hennessy has created an interactive time capsule to celebrate its 250th anniversary. It will store video and text messages in a barrel typically reserved for its famous French brandy that will be sealed for 50 years.

The barrel made a week-long stop at La Société restaurant in Toronto's glitzy Yorkville neighbourhood in early July.

"My real mission is to prepare the eaux-de-vie for the generations of master blenders that will follow me...", says Yann Fillieux, Hennessy's master blender.

Visitors to the installation and



The Time Barrel spent a week in Toronto in early July.

PHOTO: HENNESSY

Hennessy's website can send a digital text or video message to the future. From March to October, the Time Barrel will travel to nine cities around the world.

The company, founded in 1765, has also released its Hennessy 250 Collector Blend, a batch of pricey cognac aged in 250 handmade, specially commissioned barrels of Limousin

oak filled with 250 litres of booze aged for more than 10 years.

Hennessy, based in Cognac France, is the world's largest cognac producer, accounting for 40% of global consumption. It's owned by Moët Hennessy, which is jointly owned by liquor titan Diageo and luxury goods conglomerate LVMH.

Cargill opens Camrose canola plant

WINNIPEG — Cargill Inc.'s newest canola processing plant in Camrose, Alta. will process one million tonnes of the seed annually.

Cargill operates eight businesses in Alberta across 22 locations with more than 3,000 employees. The new facility has created 60 permanent jobs in Camrose.

It represents the first major investment in the province's grains and oilseed sector in more than 30 years.

The company said the crush facility will help Alberta's canola sector gain a competitive advantage in the global marketplace as markets become available through the proposed Trans Pacific Partnership.

Cargill's Canadian operations, headquartered in Winnipeg, employ more than 8,000 people across the country.

PLANT Off-Site

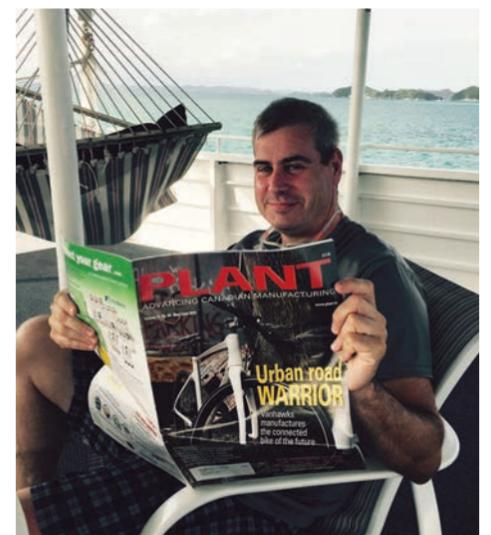
Darren takes a deep dive into PLANT while vacationing in Palau

Darren Graham, a buyer with Alberta Health Services, pauses with PLANT on the Tropic Dancer during his dive vacation in Palau, an archipelago of more than 500 islands, part of the Micronesia region in the western Pacific Ocean.

When you go on a business trip or vacation, be sure to take a copy of **PLANT** with you. If you have a photo taken while reading your favourite manufacturing publication in a remote, interesting or exotic location and we use it, you'll get \$75.

PLANT has travelled all over the world, visiting such exotic locales as China's Great Wall and Rome's Coliseum, it has been underwater and was taken on safari. Get snapping and become a **PLANT** celebrity!

Send photos with name, title, company, address and phone number to Off-Site, **PLANT**, jterrett@plant.ca. Digital photos should be at least 5x7 inches and 300 dpi.



Hydro One Haldimand update complete

TORONTO — Hydro One has completed a \$19.2 million refurbishment of the Dunnville Transmission Station in Haldimand County.

The project for the region that runs from the north shore of Lake Erie, between Norfolk County, Niagara and Hamilton includes a new station plus the installation of new transformers and an additional feeder line.

The station will serve Caledonia, Dunnville, Hagersville, Jarvis, Selkirk and several smaller municipalities

The original Dunnville station, built in 1952, was completely removed.

The refurbishment took approximately 25,000 construction hours to complete.

Johnnie Walker tops global booze brands

NEW YORK CITY — VinePair, a New York City-based blog that writes about the world's best wine, has uncovered the 30 most popular liquor brands, of which global consumers purchased \$45 billion worth in 2014.

Scottish whiskey-maker Johnnie Walker, produced by British booze multinational Diageo, took the crown for most consumed, with sales of more than \$5.3 billion, followed closely by Smirnoff vodka at \$3.4 billion.

Whiskey is also the world's favorite liquor, with brands including Canadian-made Crown Royal, Chivas Regal, Jack Daniels, Jameson and Jim Beam accounting for global sales of \$17.5 billion.

Made-in-Ontario tooling improves nuclear safety

Inspection system will be used during planned shutdowns

CAMBRIDGE, Ont. — Bruce Power says it will enhance its maintenance and inspection activities by installing what it's calling a state-of-the-art tooling system developed by a coalition of Ontario-based companies that would reduce downtime and improve the safety of its inspection activities.

The Bruce Reactor Inspection and Maintenance System (BRIMS) tool, which was unveiled in early July at ATS Automation Tooling Systems Inc.'s Cambridge manufacturing facility, will make its debut during Bruce Power's planned outages throughout the rest of the year.

The \$100-million system will be used to inspect and extend the life of the facility's nuclear reactors, and is the result of



(L-R) Duncan Hawthorne, CEO, Bruce Power; Anthony Caputo, CEO ATS; Charles Sousa, Ontario's Minister of Finance; Kathryn McGarry, MPP for Cambridge; and Doug Craig, Mayor of Cambridge unveil the Bruce Reactor Inspection and Maintenance System (BRIMS) tool at ATS in Cambridge, Ont.

PHOTO: ATS

three years of development through collaborative efforts between MacDonald, Dettwiler and Associates Ltd., ATS, Candu Energy Inc., GE Hitachi Nuclear Energy Canada and BWXT Canada Ltd.

Bruce Power, which provides

30% of Ontario's electricity, was founded in 2001 and is an all-Canadian partnership between Borealis Infrastructure Management, TransCanada Corp, and the Power Workers' Union and the Society of Energy Professionals.

'Mcity' for driverless cars opens in Mich.

Technology could lead to safer roads, environmental benefits

ANN ARBOR, Mich.—The University of Michigan has opened the world's first controlled environment specifically for driverless cars. Dubbed "Mcity," it is designed to test the potential of connected and automated vehicle technologies that will lead to mass-market driverless cars.

The \$10 million, 32-acre mock-urban and suburban environment includes roads with intersections, traffic signs and signals, streetlights, sidewalks and construction obstacles. U-M said it will support rigorous, repeatable testing of new technologies before they're tried out on public streets and highways.

Mcity was designed and developed by U-M's interdisciplinary MTC, in partnership with the Michigan Department of Transportation.

Autonomous vehicles proponents often tout safety and efficiency as key advantages to going driverless, but if approached correctly using clean technologies, environmental benefits also could be significant.



The 32-acre mock city cost \$10-million to construct. PHOTO: U-M

A 2013 Eno Centre for Transportation study found the technology potentially uses more efficient braking, fine speed adjustments and better intersection management to reduce congestion, leading to fuel savings. Going driverless could also speed up the adoption of electric vehicles, which would improve greenhouse gas emissions reduction efforts.

Avcorp buys composites manufacturer

DELTA, BC — Avcorp Industries Inc. will acquire the US-based composite aerostructures division of a subsidiary of SGL Carbon SE to expand its composites capabilities.

Hitco Carbon Composites Inc., which employs 550 people in the Los Angeles suburb of Gardena, Calif., produces composite parts for commercial and military aerostructures.

Avcorp, based in Delta, BC, produces wing assemblies for Lockheed Martin's F-35 fighter jet. It says the acquisition will double its near-term revenues.

The purchase includes all inventories, equipment, tooling and other fixed assets, intel-

lectual property, contractual rights, good will, accounts receivable, and work in progress. Hitco's materials division is not included in the acquisition.

SGL will take an impairment charge against the value of the sale, which hasn't been disclosed, but includes payments to Avcorp totalling \$42 million in cash and in kind supplies or payments of up to \$5 million until the end of December 2016.

Avcorp builds major airframe structures for aircraft companies, including BAE Systems, Boeing and Bombardier. It employs more than 380 workers at production facilities in Delta, BC and Burlington, Ont.

RAPID 3D show returns at CMTS 2015

TORONTO — Canada's additive manufacturing/3D printing tradeshow and conference is returning to Toronto.

SME will bring RAPID Canada's Conference back to Toronto's International Centre in September as part of the Canadian Manufacturing Technology Show (CMTS) 2015.

First introduced in 2014, RAPID is a forum for the exchange of information on developments in additive manufacturing, 3D printing and 3D scanning. It was first introduced by SME in the US market in 1994.

At CMTS, it will address 3D printing/additive and medical/dental device manufacturing. The keynote address will be delivered by former Stratasy's vice-president Jeff Degrang, now CCO of Impossible Objects LLC, a producer of composite-based additive manufacturing technology (CBAM).

There will also be an exhibit of the latest technologies, with a special focus on automotive, aerospace, bio-printing, printed electronics, 3D scanning/imaging and material development.

CMTS 2015 is Canada's largest manufacturing event, attracting more than 10,000 manufacturing professionals.

This year's Manufacture the Future theme will feature advancements in machine tool, tooling, metal forming and fabricating, automation, 3D printing/additive manufacturing, design engineering and plant management.

» Careers

Pacific Insight Electronics has appointed **Ian Scott** COO. Scott will oversee the Nelson, BC-based automotive electronic components manufacturer's worldwide operations. He joins the company from Westport Innovations, where he served from 2001 to 2014, holding senior leadership positions in the automotive and trucking businesses. He succeeds **Jeffrey Hunt**, who has left Pacific to pursue other opportunities.

Robert Mionis has been named CEO of Toronto-based electronics manufacturer Celestica, replacing **Craig Muhlhauser**, who is retiring. Muhlhauser will remain as an advisor to the board until the end of December. Mionis has 25 years of senior leadership experience in the aerospace, industrial and semiconductor sectors. Most recently, he was an operating partner at Pamplona Capital Management, a global private equity firm.

BlackBerry has named **Carl Wiese**, former Cisco senior vice-president of business collaboration and go-to-market strategy, president of global sales. He succeeds **John Sims**, who has left the company. Wiese has also held executive positions at Apple, Avaya, Lucent and Texas Instruments.

Sightline Innovation Inc. has appointed **Mark Alexiuk** as CTO. His tenure at the company began as director of engineering, machine learning. He will lead development of SPE's sensor integration and machine learning capabilities to Sightline's Verify and VuPoint product lines. Winnipeg-based Sightline develops machine and deep learning cloud services.

David Haig has been appointed president and COO of Blu-Metric Environmental Inc., an Ottawa-based clean technology developer. Haig will oversee the company's business development and operations. He has held senior executive positions with Bio-Fertilis, Inc. and AgriMarine Holdings Inc. throughout his 20-year career, and served as a business planning officer and senior international affairs advisor for the Canadian government.

BIOREM Inc. has added **Brian Herner, Robert Nally, Bernardo Llovera** and **Derek Webb** to its board. Biorem, based in Guelph, Ont., is a clean technology manufacturer that produces air emissions control systems.

Spring Loaded tops BDC's entrepreneur awards

HALIFAX — The Business Development Bank of Canada (BDC) has awarded Halifax's Spring Loaded Technology Bionic Boost project the 2015 BDC Young Entrepreneur Award and the \$100,000 grand prize. The project competed against 10 other finalists.

Co-founders Chris Cowper-Smith and Bob Garrish said their project will accelerate Spring Loaded's capacity and commercialize the world's first bionic knee-brace technology.

The compact, lightweight product stores the user's kinetic energy and releases it when it's most needed to enhance strength, reduce fatigue and increase stability. It's used by athletes looking to enhance performance, labourers and military personnel, and people with disabilities.

Cowper-Smith says the company will use the cash award for new rapid carbon-fibre and composites manufacturing equipment to boost production and cut costs.

Created by the Business Development Bank of Canada in 1988, the BDC Young Entrepreneur Award program pays tribute to Canadians between 18 and 35 years of age.

Canadian biz gets access to \$180B US funding market

TORONTO — Canadian businesses with US operations or plans to expand south of the border now have a new tool to search and apply for more than \$180 billion in annual business incentives programs provided by the federal and state governments.

The Funding Portal, an online aggregator of more than 8,500 Canadian and US business incentive programs, has launched The Funding Portal US, and now serves the American and Canadian business markets.

A free search tool and customized data reports are available. Updated daily, the tool boasts more than 4,000 US and 4,500 Canadian programs as well as 2,500 sources of private capital, ranging from angel investors, venture capital financing and bank debt.

The Portal estimates US governments awarded \$180 billion in funding in 2014, while Canadian governments awarded \$14.4 billion in publicly-disclosed funding, from which manufacturers benefitted the most.

Downside to paying more to CPP/ORPP plans

Will reduce voluntary savings, notably among young, middle-career Canadians

TORONTO — Forcing Canadians to contribute more to the CPP or Ontario Retirement Pension Plan will reduce voluntary private savings, says a new study by the Fraser Institute.

The Canadian public policy think-tank said when Canadians were forced to contribute more to the Canada Pension Plan in the 1990s and early 2000s, they ended up saving less voluntarily.

“Calls for an expanded public pension plans often rely on the dubious claim that Canadians aren’t saving enough for retirement. Yet if Canadians are forced to save more in government-run plans, they’ll save less privately,” said Charles Lammam, director of fiscal studies at the Fraser Institute and co-author of *Compulsory Government Pensions vs. Private Savings: The Effect of Previous Expansion to the Canada Pension Plan*.

The study examines the saving patterns of Canadian households from 1986 to 2008 and focuses on



The study says private savings vehicles offer more flexibility. PHOTO: THINKSTOCK

major changes to the CPP between 1996 and 2004, when the total contribution rate rose from 5.6% to 9.9% of insurable earnings. It shows with each percentage point increase in the total CPP contribution rate, the private savings rate of the average Canadian household dropped by 0.895 percentage points (after accounting for interest rate changes and demographics shifts in age, income and home ownership).

The reduction in private savings

was more pronounced among the young (under 30) and mid-career households (30-49) and less evident among those approaching retirement (50-64). In addition, the study finds a larger drop in private savings among lower- and middle-income households and practically no drop for those with higher incomes.

The Fraser Institute contends private retirement savings such as RRSPs, TFSAs and other plans offer more choice and flexibility than CPP savings. With RRSP savings, Canadians can tailor their investments, pull money out for a downpayment on a home or to upgrade their education, transfer the money to a beneficiary in the event of death, and withdraw money in case of emergency.

Lammam says the benefits to a mandatory expansion of the CPP, or a new provincial plan in Ontario, should be weighed against the costs, which will include a reduction in private, voluntary savings.

IBC delivers first EOTS components for F-35 jet

Alloys are three times stiffer than aluminum, weight is 22% less

WILMINGTON, Mass. — IBC Advanced Alloys Corp. has delivered the first Beralcast azimuth gimbal housing components to Lockheed Martin, which will be used in the F-35 Lightning II’s Electro Optical Targeting System (EOTS).

The EOTS adds multi-function targeting to the F-35’s full spectrum of military operations and is the first sensor to combine forward-looking infrared and infrared search and track functionality. It provides pilots with situational awareness and air-to-air and air-to-surface targeting from a safe distance, enabling aircrews to identify areas of interest, perform reconnaissance and precisely deliver laser- and GPS-guided weapons.

IBC, a Vancouver-based manufacturer of rare metals based alloys for the nuclear, automotive, aerospace and industrial sectors with four US production facilities, was awarded the low-rate initial production (LRIP) contract in September.



IBC’s azimuth gimbal housing. PHOTO: LOCKHEED MARTIN

IBC says its Beralcast alloys suit many aerospace applications where lightweight, high modulus and cost are critical. The alloys, three times stiffer than aluminum with 22% less weight, are substituted for aluminum, magnesium, titanium, metal matrix composites and beryllium or powder metallurgy beryllium-aluminum.

Manufacturers lead IoT investments

SINGAPORE — A new study by global consulting company Tata Consultancy Services reveals that more than 80% of companies investing in Internet of Things (IoT) technology saw an increase in revenue, especially manufacturers.

The study surveyed 795 executives from multi-national companies and identified the huge potential for revenue increases from IoT, and highlighted the significant challenges to businesses transitioning to the new model.

Companies investing in IoT reported revenue increases averaging 15.6% in 2014.

Manufacturing executives reported the largest revenue increase,



PHOTO: THINKSTOCK

which averaged 28.5%.

Despite the encouraging data, the report also revealed challenges realizing the promise of IoT across all sectors.

Three of the biggest factors holding companies back were corporate culture, ambivalent leadership and corporate uncertainty around how the technology would benefit businesses.

PyroGenesis ships waste system to US Navy

MONTREAL—PyroGenesis, a clean tech company that designs and manufactures plasma waste-to-energy systems and plasma torch products, has shipped its second commercial Marine Plasma Waste Destruction System for the US Navy.

The system is bound for the US Navy aircraft carrier, John F. Kennedy.

The company said the equipment sold for \$415,000. Proceeds will go towards working capital.

Turning LMI Data ON IT'S END

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This project is funded by the Government of Canada's Sectoral Initiatives Program

The Secret To Keeping Electronics Cool!



NEMA 12 Cabinet Coolers

The NEMA 12 Cabinet Coolers for large heat loads up to 5,600 Btu/hr. are ideal for PLCs, line control cabinets, CCTV cameras, modular control centers, etc.

- Measures 8" (203mm) high
- Mounts top, side or bottom
- Enclosure remains dust-tight and oil-tight



NEMA 4 and 4X Cabinet Coolers

NEMA 4 and 4X Cabinet Coolers for large heat loads up to 5,600 Btu/hr. They are ideal for PLCs and modular controls.

- Enclosure remains dust-tight, oil-tight and splash resistant
- Suitable for wet locations where coolant spray or hose down can occur



Type 316 Stainless Steel Cabinet Coolers

Type 316 Stainless Steel Cabinet Coolers for NEMA 4X applications are available for heat loads up to 5,600 Btu/hr.

- Resists harsh environments not suitable for Type 303/304
- Ideal for food and chemical processing, pharmaceutical, foundries, heat treating and other corrosive environments



Mini NEMA 12, 4, and 4X Cabinet Coolers

The mini NEMA 12, 4 and 4X Cabinet Coolers for small heat loads up to 550 Btu/hr. are ideal for control panels, relay boxes, laser housings, and electronic scales.

- Measures 5" (127mm) high
- Mounts top, side or bottom
- Enclosure remains dust-tight and oil-tight

A bad choice could cost you thousands!



Look Familiar?

When hot weather causes the electronics inside a control cabinet to fail, there is a panic to get the machinery up and running again. The operator might choose to simply open the panel door and aim a fan at the circuit boards. In reality, the fan ends up blowing a lot of hot, humid, dirty air at the electronics and the cooling effect is minimal. If the machinery starts functioning again, the likelihood of repeated failure is great since the environment is still hot (and threatens permanent damage to the circuit boards). Worse yet, that open panel door is an OSHA violation that presents a shock hazard to personnel.

The Real Solution!

Stop electronic downtime with an EXAIR Cabinet Cooler® System! The complete line of low cost Cabinet Cooler Systems are in stock and can ship now. They mount in minutes through an ordinary electrical knockout and have no moving parts to wear out. Thermostat control to minimize compressed air use is available for all models. All Cabinet Coolers are UL Listed to US and Canadian safety standards.



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Jeff Hauck, Lasercraft Inc. Cincinnati OH

"It took us three days to get a replacement computer cabinet and we didn't want to risk another heat failure. Fans weren't an option since they would just blow around a lot of hot air. Freon-type air conditioners like those on some of our other machines were a constant maintenance project of their own. We purchased EXAIR's Model 4330 NEMA 12 Cabinet Cooler System since it was easy to install and requires no maintenance."

High Temperature Cabinet Coolers



High Temperature Cabinet Coolers for NEMA 12, 4 and 4X applications are available for heat loads in many capacities up to 5,600 Btu/hr.

- Suitable for ambients up to 200°F (93°C)
- Ideal for mounting near ovens, furnaces, and other hot locations

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- Uses only 1 SCFM in purge mode
- For heat loads up to 5,600 Btu/hr.
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Crown Metal Packaging strike ends after 22 months

Employees ratify six-year deal that guarantees a return to their jobs.

TORONTO — After 22 months off the job, 130 employees at Crown Metal Packaging's Toronto factory have ratified a new collective agreement.

A tentative agreement was negotiated July 8 after the company withdrew what the United Steelworkers (USW) union described as one of the major impediments to a settlement – its attempt to bar many striking workers from returning to their jobs.

The union says the proposed contract was presented to striking workers and was submitted to a ratification vote during the weekend of July 18.

Details of the agreement – reached

with the assistance of the Ontario Labour Relations Board – were not released prior to the vote.

The new collective agreement guarantees the rights of all striking employees to return to their jobs. It also includes enhanced retirement and severance provisions for employees who decide not to return to the plant.

Marty Warren, USW's Ontario director, accused the Ontario government of sitting idle "as a giant corporation provoked a labour dispute, then brought in replacement workers to try to destroy decent jobs in our province."

The union alleged the near two-year



The Toronto plant makes aluminum cans for 120 beer producers, including Molson and Labatt. PHOTO: THINKSTOCK

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long strike was prolonged by illegal behaviour of the US-based multinational.

Commissioner Morton Mitchnick, appointed by the Ontario government in March to lead the inquiry and seek a resolution to the protracted dispute, released his final report June 18.

The union says Crown provoked the strike at its Toronto factory in September 2013 by demanding massive concessions from its employees, members of USW Local 9176. It contends the company hired replacement workers to operate the plant instead of negotiating a fair settlement over the ensuing 21 months.

In Mitchnick's report, he acknowledged the USW's contention that the major impediment to resolving the strike is whether striking workers would return to their jobs once a collective agreement is negotiated.

He agreed with the union's position.

"The only matter really preventing the parties from moving on to a deal is that of return to work," he wrote in his report. Mitchnick also notes that Crown failed to provide "any clear articulation" of the reasons for the position.

The USW filed an unfair labour practice complaint with the Ontario Labour Relations Board, which was heard July 7.

Unionized workers voted July 19 to accept a six-year collective agreement with Crown. The return to work process begins Aug. 10.

Ovivo completes UPW expansion project

MONTREAL — Ovivo Inc., a developer of engineered water treatment technologies, has delivered a \$6 million state of the art Ultrapure Water (UPW) plant expansion to new cleanroom facilities at SUNY Polytechnic Institute's Colleges of Nanoscale Science and Engineering

The \$20 billion SUNY Poly CNSE Albany NanoTech Complex, in Albany, NY, is home to the world's first Global 450 mm Consortium, a 450 mm wafer and equipment development program.

The Montreal-based company says the UPW plant consists of processes to produce ultrapure water, such as activated carbon filtration, reverse osmosis, ultra-violet irradiation, ion exchange, membrane degasification and micro-filtration.

PLANT PULSE

ECONOMIC DEVELOPMENTS AND TRENDS



TRADE DEFICIT WIDENS TO \$3.3 BILLION

Canada's exports declined 0.6% in May while imports edged up 0.2%. Export volumes decreased 2.5% and prices increased 1.9%, while import volumes were up 0.3% and prices edged down 0.1%, all of which combined to widen Canada's global merchandise trade deficit from \$3 billion in April to \$3.3 billion in May.

Source: Statistics Canada

\$53,500

The median Canadian after-tax income in 2013, which was virtually unchanged from 2012. For two-parent families, median after-tax income was \$85,000. Incomes for lone-parent families averaged \$41,700.

Statistics Canada

16%

The amount global foreign direct investment (FDI) fell in 2014 to \$1.23 trillion, says a United Nations report. The drop was blamed on the fragility of the global economy, policy uncertainty for investors, elevated geopolitical risks and some large divestments. Developed economies recorded a 28% (\$499 billion) decline in FDI.

United Nations Conference on Trade and Development

\$251.8 BILLION

The total amount of capital expenditures in non-residential construction and machinery and equipment expected in 2015, down 4.9% from 2014. Private sector capital expenditure is to slide by 7%, the result of lower spending in mining, quarrying, and oil and gas extraction. Manufacturers will boost spending by 2.7% to \$17.5 billion due to increases in petroleum and coal product manufacturing, and machinery manufacturing in Quebec.

Statistics Canada

1 in 20

The number of Ontario companies that could shut their doors unless the provincial government takes steps to curb electricity prices, according to the Ontario Chamber of Commerce. The organization that represents the province's businesses says hydro costs are a continuing challenge to the economy. They have risen by 16% since 2013 and are forecasted to climb 13% over the next five years.

IS CANADA IN RECESSION? Interest rate cut suggests 'yes'

As the Bank of Canada lowered its overnight interest rate by a quarter percentage point to 0.5% it also slashed the economic outlook for the remainder of the year, reflecting further downgrades of business investment plans in the energy sector and weaker-than-expected non-energy exports.

Real GDP is now projected to improve by just over 1% in 2015, but increase to 2.5% in 2016 and 2017.

The economy should return to full capacity with an inflation rate of 2% in early 2017.

Growth is expected to resume in Q3 and exceed potential again in Q4, led by the non-resource sectors. Outside the energy-producing regions, consumer confidence remains high and labour markets continue to improve. However, rising capacity pressures could impact manufacturers, specifically exporters sensitive to fluctuations in the dollar.

TD Economics' senior economist Randall Bartlett suggests the economy was likely in recession in the first half of the year – typically defined by consecutive quarters of negative real GDP growth.

Unlike the central bank, Bartlett suggests the second half of the year will be weaker than previously expected, marking the weakest pace of growth outside of a recession in over 20 years.

On a positive note, the labour market continued to post advances in recent months despite contractions in GDP, buoyancy that reflects the relatively narrow impact of the decline in oil prices.

Getting labour right

A report from the University of Calgary's School of Public Policy suggests that Canadians have become too obsessed with the outcome of the labour market in terms of distribution and don't pay enough attention to its efficiency by matching the right people and skills with the right employers.

There are concerns that the last 2009 economic crisis accelerated the rise of a precarious, part-time labour force. But the share of those jobs has not increased significantly and the majority of people who work part time do so voluntarily, finds *The Recession's Impact on Canada's Labour Market* by Phillip Cross, a former chief economic analyst at Statistics Canada.

Cross argues the 2009 economic crisis was much less severe for Canada's labour market than recessions in 1981 or 1990 when unemployment rates rose above 11%, compared with 8.3% in 2009. Employers used hours worked (-4.1%) more than employment (-1.5%) to reduce their labour input, which also differs from past economic crises when employment and hours worked fell by the same amount.

RATE CUT WON'T BOOST BORROWING: CIBC

The Bank of Canada's 0.25% interest rate cut won't tempt most Canadians to borrow more money. Thirty-three per cent of respondents to a CIBC poll would rather boost debt repayment.

The poll found that:

- 60% of respondents said lower rates won't impact borrowing intentions;
- 7% would borrow more if the rate was lowered;
- 12% of 18 to 34-year olds would borrow more at lower rates.

A recent report from CIBC deputy chief economist Benjamin Tal said although a central bank rate cut is unlikely to boost the economy by increasing spending, it would cause the loonie to fall farther, potentially making exports more attractive.

SALARIES ARE LOO

The 2015 EMC-PLANT salary survey shows overall compensation growth for manufacturers is well ahead of inflation.

BY JOE TERRETT, EDITOR

There is seldom a dull moment in the world economy. This was to be the year of the turnaround for Canadian manufacturers, when the US economy advances, the loonie is valued low enough to spur exports and conditions elsewhere in the world are somewhat stable.

But a hard winter got 2015 off to a slow start, the US economic resurgence is bit pokey, and the seemingly unstoppable energy sector was brought up short by a steep drop in oil prices. Globally, well there's always something. Last year it was Ukraine, this year it's an insolvent, defaulting Greece. All that to note Canadian manufacturers' customary caution is well founded and reflected somewhat in their approach to compensation this year.

Not that the cash box is closed: senior executives and managers for the most part are getting increases that are in line with other industries. But owners are holding the line on their own pay as they watch the year unfold, according to the results of the fourth national salary benchmark survey conducted by the Excellence in Manufactur-

ing Consortium (EMC), a not-for-profit organization based in Owen Sound, Ont., and **PLANT** magazine, an Annex Business Media publication.

Manufacturers were likely watching economic conditions and noticing the year getting off to a slow start when the survey was conducted in February and March, reinforcing their caution.

"Maybe it's a function of a high percentage of respondents adjusting sales, looking at other markets, their product mix and what would cause a pause in revenue growth," offers Al Diggins, EMC's president and general manager, who noted respondents are nonetheless happy with their employment conditions and compensation.

The survey gathered a total of 1,675 responses from executives and managers who shared personal information about salaries and bonuses, and how their busi-

nesses are faring.

The results show average executive remuneration in a sector dominated by small and medium-sized enterprises (84% with 50 or less to 499 employees) will rise 3.6% to \$107,532 this year compared to a 5.2% increase in 2014 when the inflation rate was 1.9%.

are expecting a 7.4% boost compared to 4.8% last year, while plant managers will get a more modest 2.6% raise compared to the 5% they received in 2014. Directors are expecting 5.4% following an 8.5% increase in 2014.

Technicians/technologists are looking at a 2.1% decrease this year while safety managers are anticipating virtually no increase (0.2%) and purchasing/supply managers are not doing much better (0.6%). Logistics managers expect 7.2%, plant engineers 6.6%, design engineers 5.5%, administrative management 4.1%, production operations managers 3.3%, quality assurance managers 3.2% and materials managers 2.1%.

While most industries show salary increases, albeit mostly very modest,

"The last four years [according to past salary surveys] have been growth-oriented, a mini-trend. It's good to see..."

Executives are less optimistic about earning higher revenues (53% compared to 61% in 2014), but 54% intend to invest in new production equipment and processes over the next five years, 50% say they will hire new employees and 34% expect to add new lines of business.

"The last four years [according to past salary surveys] have been growth-oriented, a mini-trend. It's good to see," says Scott McNeil-Smith, EMC's director of strategic planning and communications, and president of the Canadian Manufacturing Network. "Leading indicators are all related to growth."

Manufacturers do have concerns (that are also consistent with the past salary surveys). Cost control tops the list for 52.7% of respondents, while 39.2% identified skills issues, followed by technology upgrades (29.9%) and capacity utilization (25.9%).

CEOs and presidents will do okay this year. They foresee a 5.5% increase after a 8.1% advance last year. Owners and partners aren't taking much of an increase. They're looking at 0.9% compared to 5.4% last year, which is a much better outcome than a 1.9% decrease the 2013 survey sample predicted. Vice-presidents

several recorded declines, including: beverage and tobacco; environmental; and petroleum/coal products. Plastics/rubber products and textile mills were virtually unchanged while transportation equipment jumped an impressive 18%.

What's driving compensation?

"One of the biggest issues is businesses focusing on production gains and looking to get them without increasing head count," explains Andy Robling, vice-president, client development for Hays Canada in Toronto, a global recruitment specialist.

"There is a focus on compensation, particularly the bonus element, which is based on productivity gains. Specific to manufacturing, you'll see issues such as customer fill rates, inventory on hand and asset costs all being drivers of compensation."

Most survey respondents (63%) report no change in employment status since the last survey, while 20% are working harder for their money. Although they hold the same job and salary, they've taken on more responsibility because of reduced staff. Most put work-life ahead of all other desired work conditions but just ahead of compensation and job security and 82% are satisfied with the

HOW THE YEAR LOOKS

Economic prognosticators have downshifted Canada's growth forecast for 2015. The Organisation for Economic Co-operation and Development (OECD) pegs growth at 1.5% while the Bank of Canada is predicting GDP of just over 1%. TD Economics (which forecasts 1.2% growth) notes corporate profits were down 40% in Q1 and will show additional decline through June.

Not a great start to the year, but the experts have recalibrated their forecasting and the general consensus is a much better second half to the year and a pretty good 2016.

RBC Economics' June outlook said global growth this year will likely be in the 3.5% range, where it has been for the past three years. It also expects US growth to be stable during Q2 and TD Economics says Canada's pace will pick up in Q2. The good news for Canada is growth of between 2.3% and 2.5% next year (depending on who is reading the tea leaves) with an ongoing inflation trend of 1.5% to 1.7%.

The loonie is floating around 81 cents to the US dollar, but RBC Economics says it will likely drop to 77 cents and stay under 80 cents through 2016. A lower dollar is good for exports, which TD Economics says will grow 3% to 5% over the next couple of years. A lower dollar does make investments in machinery and equipment more expensive, but as demand rises there will be a lack of available production capacity for some manufacturers, which should propel higher capital spending on plant expansions and production needs.

KING UP!

YOUR ROI FOR CONTRIBUTING TO BUSINESS GROWTH

balance (although they're averaging 46 hours per week on the job). CEOs and presidents log the most time at 50 hours, followed by owner/partners, vice-presidents and plant managers at 49.

But they're also very happy with their jobs overall (91%), job security (89%), vacation time (84%), benefits (81%) and compensation (78%).

Fifty-eight per cent of the respondents reported a portion of their pay made up of bonuses and incentives with those showing the highest percentage (20% or

more) with average salaries of \$201,832.

Forty-one per cent report perks or extras such as profit sharing (43%), a vehicle of some kind (28%), other enticements (29%), access to private health care (12%), club memberships and stock options (each 11%).

Hays Canada's research shows the following additional benefits have a chance of finding their way into a company's compensation packages: flexible work hours; extended health coverage; professional development; more vacation time;

and working from home.

Companies are coping with gaps in needed skills, and they're going to lose key employees to retirement, emphasizing the need to ensure the right people are engaged with their work and careers – and that they'll want to stick around.

Hays Canada's *What People Want* report identifies salary as always a key motivator, but Robling says benefits, company culture and career progression are elements that add up to more than salary when you look at what matters to people.

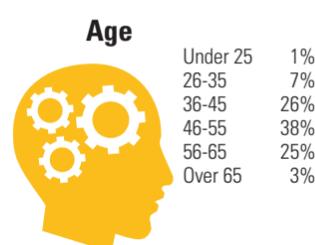
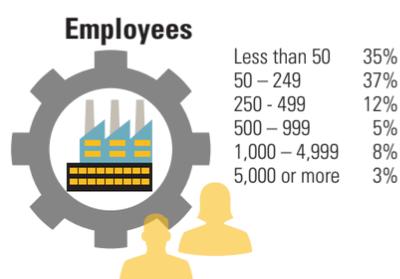
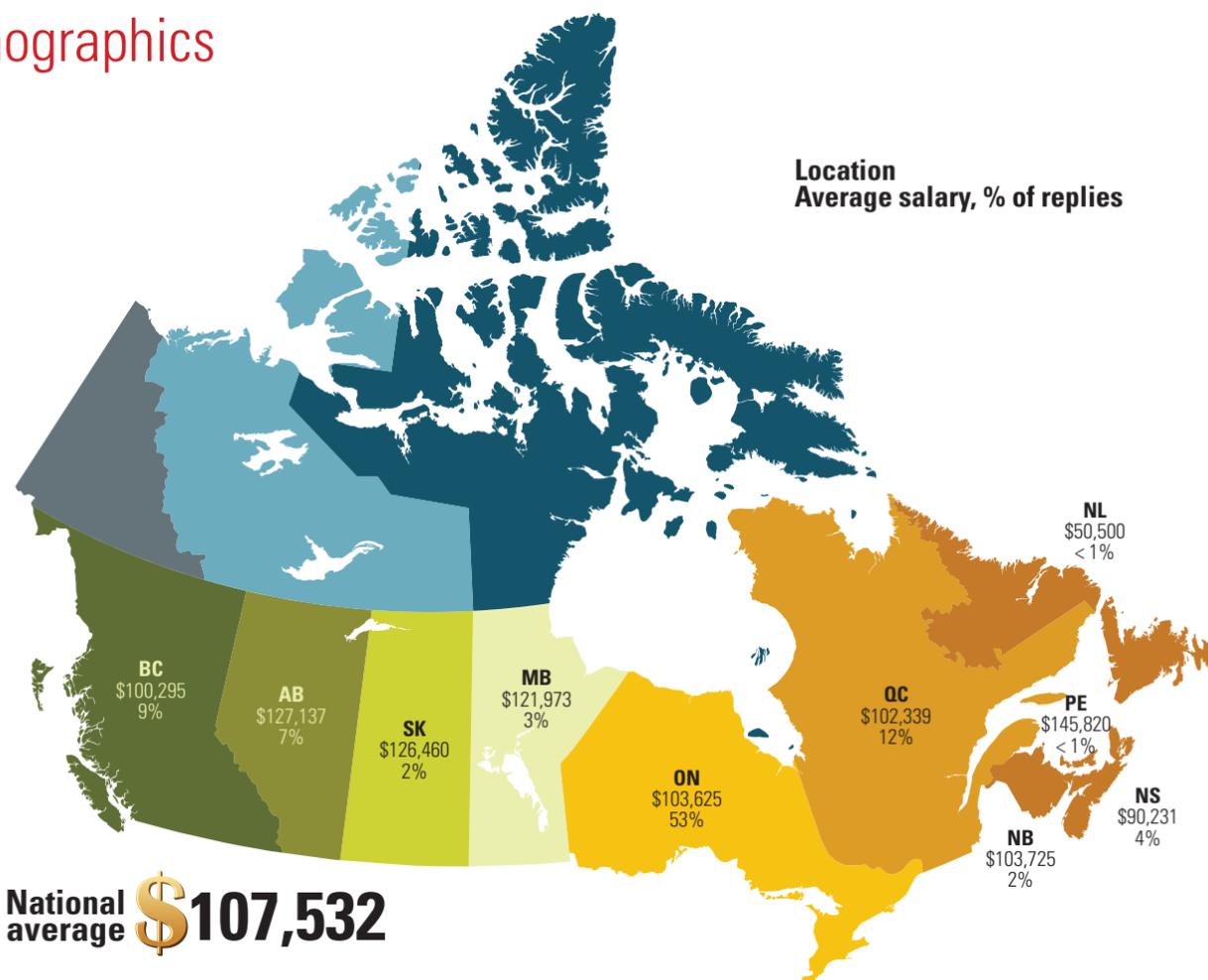
"It's not enough for a company to say, well come and join us just because we're a big name, or you've heard of us in the market. You have to get a message around all of the things you have to offer."

It could be about training, or career progression, green credentials, corporate responsibility, or a focus on health and safety.

Robling says leading companies are putting more time and effort into developing a message to employees that makes their companies attractive.

"Biggest thing we're seeing companies needing to do to attract new people is to get the messaging right about the packets they're offering rather than introducing new elements into the package."

Demographics



84% Respondents who are SMEs

88% Those working full-time in manufacturing

73% Companies that are not unionized

Show me the money!

Salary levels are affected by a variety of factors, such as company revenue, years of experience, education, industries served and gender (only 23% are female – and this year's sample reveals a 31% pay difference between the sexes).

Owners, senior executives, plant managers and materials managers top the \$100,000 a year mark. CEOs and presidents are the highest earners averaging \$204,273, followed by vice-presidents (\$186,383), directors (\$135,330), owners/partners (\$133,821), design engineers (\$121,838) and plant managers (\$116,823).

Plant engineers average \$95,732, production/operations managers \$91,260, maintenance managers \$89,623, while many of the other categories, including administrative management, technicians/technologists, quality managers, safety managers, logistics managers and materials managers earn between \$70,800 and \$82,500.

Most of the respondents (72%) have a management role only in their companies, while 7% have a controlling ownership stake, 6% are minority owners, and 5% are equal partners.

The average Joe has been on the job 22 years, 14 at the same firm and 10 at the same job.

Forty-three per cent have a university degree, 27% have a college diploma, 14% a trade or technical diploma, 13% a high school education or less and 3% a

Continued on page 12

More training needed

Continued from page 11

CEGEP. University grads score the highest wage rate at \$120,935, 11.7% ahead of the next best-paid group, trade/technical school grads who average \$107,602.

Seventy per cent of the companies pay for educational courses, 51% cover memberships in professional associations and

43% pay for professional certification programs. Twenty-one per cent don't pay for any education upgrades or association memberships.

Similar to last year's survey results, investing in the business is the highest priority for respondents over the next five years. Fifty-four per cent will put money

into new production equipment and processes, 50% will hire new employees, 34% are adding lines of business, 27% are expanding their plants and intend to enter new geographic markets, and 23% are entering new lines of business.

Asked about what skills they need most to do their jobs, 54% of senior executives and managers cited people skills, followed by industry specific technical (for 42%) and financial (36%).

Additional training requirements

include productivity/continuous improvement (27%), financial (26%), people skills and project management (both 25%), industry-specific technical skills (24%) and technical skills (23%).

The EMC/PLANT survey results continue to serve as a reminder that manufacturing is short of skilled labour and the workforce is aging, which is exacerbating the problem. Most respondents (66%) are 46 to 65 or older. Of the

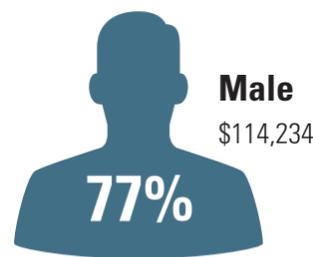
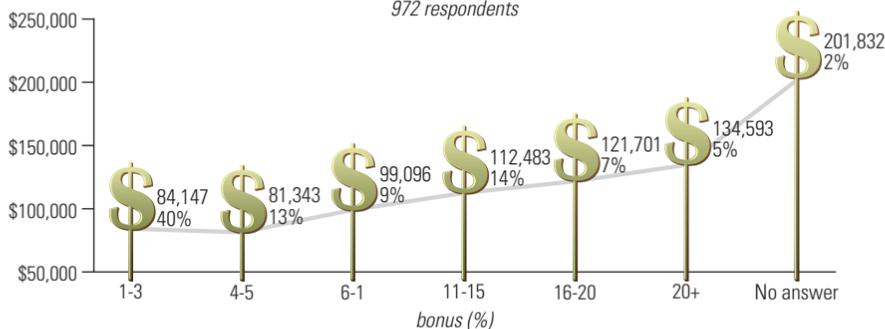
Salary comparisons

Industry 943 respondents	2015	2014	2013	% replies
Aerospace product and parts	\$106,338	\$102,873	\$96,984	4%
Beverage and tobacco products	\$75,016	\$76,833	\$72,500	1%
Chemical	\$111,696	\$106,342	\$99,069	4%
Clothing manufacturing	\$79,000	\$77,000	\$76,000	< 1%
Computer and electronic products	\$94,000	\$93,932	\$88,228	3%
Durable goods industries	\$101,463	\$97,381	\$93,390	1%
Electrical equipment, appliances and components	\$91,303	\$88,678	\$84,584	5%
Environmental	\$96,286	\$98,346	\$107,600	1%
Fabricated metal products	\$111,651	\$107,015	\$102,051	19%
Food manufacturing	\$108,483	\$106,661	\$99,746	7%
Furniture and related products	\$131,950	\$130,263	\$133,300	1%
Leather and allied products	\$72,060	\$69,625	\$65,125	< 1%
Life sciences (such as biopharma/ pharmaceutical, medical devices)	\$108,970	\$99,209	\$97,300	2%
Machinery	\$126,949	\$120,688	\$113,823	7%
Miscellaneous manufacturing	\$92,455	\$90,577	\$84,956	9%
Motor vehicles	\$103,060	\$94,480	\$90,700	1%
Motor vehicle bodies and trailers	\$109,500	\$105,750	\$102,000	< 1%
Motor vehicle parts	\$98,484	\$92,934	\$86,734	4%
Non-durable goods industries	\$101,858	\$99,188	\$96,277	1%
Non-metallic mineral products	\$99,811	\$95,888	\$93,222	1%
Paper manufacturing	\$100,124	\$98,100	\$92,109	3%
Petroleum and coal products	\$116,512	\$128,125	\$119,437	2%
Plastics and rubber products	\$106,029	\$106,090	\$100,453	10%
Primary metal	\$132,370	\$117,429	\$108,170	2%
Printing and related support activities	\$104,710	\$101,858	\$98,593	4%
Railroad rolling stock	\$150,000	\$130,000	\$104,000	< 1%
Ship and boat building	\$112,283	\$116,950	\$111,666	< 1%
Textile mills	\$115,750	\$115,616	\$109,333	1%
Textile product mills	\$126,358	\$119,569	\$114,955	1%
Transportation equipment	\$137,150	\$115,850	\$104,800	2%
Wood products	\$98,706	\$95,548	\$92,669	3%
No answer	—	—	—	1%

Company revenue 900 respondents	2015	2014	2013	% replies
\$1M to < \$5M	\$74,960	\$72,704	\$69,294	18%
\$5M to < \$10M	\$101,661	\$97,205	\$89,680	15%
\$10M to < \$30M	\$115,306	\$111,525	\$106,896	23%
\$30M to < \$50M	\$115,838	\$116,651	\$109,995	11%
\$50M to < \$100M	\$117,885	\$111,496	\$106,346	11%
\$100M to < \$250M	\$114,562	\$113,355	\$111,849	6%
\$250M to < \$500M	\$122,018	\$118,405	\$110,575	4%
\$500M to < \$1B	\$129,739	\$128,959	\$120,132	5%
\$1B plus	\$144,089	\$131,167	\$123,707	6%
Total	\$107,532	\$103,837	\$98,689	100%

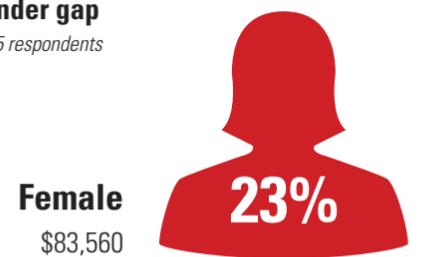
Bonuses and incentives

972 respondents



Gender gap

1,015 respondents



Job title 1,021 respondents	2015	2014	2013	% replies
CEO/President	\$204,273	\$193,707	\$179,181	5%
Vice-President	\$186,383	\$173,491	\$165,528	6%
Director	\$135,330	\$128,386	\$118,345	6%
Owner/Partner	\$133,821	\$132,605	\$125,765	6%
Design Engineering	\$121,838	\$115,534	\$109,176	5%
Plant Manager	\$116,823	\$113,843	\$108,478	10%
Plant Engineering	\$95,732	\$89,820	\$86,428	4%
Production/Operations Manager	\$91,260	\$88,362	\$84,884	14%
Maintenance Manager	\$89,623	\$88,276	\$84,947	5%
Administrative Management	\$82,561	\$79,303	\$75,949	15%
Purchasing/Supply Manager	\$81,429	\$80,942	\$77,805	6%
Quality Assurance Manager	\$79,061	\$76,616	\$74,827	6%
Technician/Technologist	\$77,136	\$78,761	\$74,476	5%
Safety Manager	\$75,331	\$75,481	\$72,383	5%
Logistics Manager	\$74,312	\$69,312	\$68,200	1%
Materials Manager	\$70,857	\$69,378	\$68,121	1%

Experience (years) 942 respondents	2015	2014	2013	% replies
1 to 4	\$82,446	\$79,420	\$76,048	4%
5 to 9	\$86,247	\$83,947	\$78,092	10%
10 to 14	\$97,868	\$93,257	\$84,511	12%
15 to 19	\$107,448	\$102,333	\$98,087	17%
20 to 24	\$110,801	\$111,430	\$106,248	16%
25 to 35	\$116,923	\$111,563	\$107,032	32%
35+	\$121,309	\$115,577	\$108,695	9%

Age 962 respondents	2015	2014	2013	% replies
Under 25	\$57,195	\$52,925	\$48,875	1%
26-35	\$79,160	\$74,172	\$68,059	7%
36-45	\$106,854	\$101,763	\$95,900	25%
46-55	\$103,289	\$100,572	\$96,508	36%
56-65	\$121,274	\$118,492	\$112,002	23%
Over 65	\$117,657	\$114,307	\$110,953	3%
No answer	—	—	—	5%

Type of education 964 respondents	2015	2014	2013	% replies
University degree	\$120,935	\$116,716	\$110,607	41%
Trade/technical diploma	\$107,602	\$105,798	\$100,018	13%
College diploma	\$95,330	\$90,332	\$84,348	25%
CEGEP	\$88,267	\$85,452	\$80,776	3%
High school or less	\$87,335	\$86,955	\$86,795	12%
No answer	—	—	—	6%
Total	\$107,532	\$103,837	\$98,689	100%



Issues

total, 38% are 46 to 55, 25% are 56 to 65 and 3% are older. Just 7% are 26 to 35 and 36% are in the 36 to 45 group. Under 25s account for 0.8% of the total.

New recruits

Manufacturers looking to fill gaps would be wise to recalibrate the way they engage with potential employees. Another Hays Canada report shows 90% of candidates use LinkedIn, but only 55% of manufacturers are using the networking website to recruit. Predictably, almost 60% engage more with their potential customers.

Most of the people companies want to employ are passive job seekers (doing a good job, well looked after, well paid) and they're not applying on websites, says Robling. "Companies need to get to them, but it's quite involved and can be expensive."

He says unless an organization is involved in training and development, it needs to invest in a content strategy that delivers a strong message to the marketplace, making sure everything is in the mix such as values, culture and career prospects.

"A company's internal profile becomes the external profile," says Robling, noting online sites such as Glassdoor, which has a growing database of company reviews, CEO approval ratings, salary reports, interview reviews and questions, benefits reviews, office photos and more.

Difficulty filling employee gaps is driving companies to take action.

"We're seeing industry taking back responsibility for hiring, training and developing employees," says Diggins.

EMC is helping them do so. There's greater interest in its e-learning supervisor certificate program, a collaboration with Harvard Business Publishing. The course includes a performance project, which can result in bottom line savings for a company.

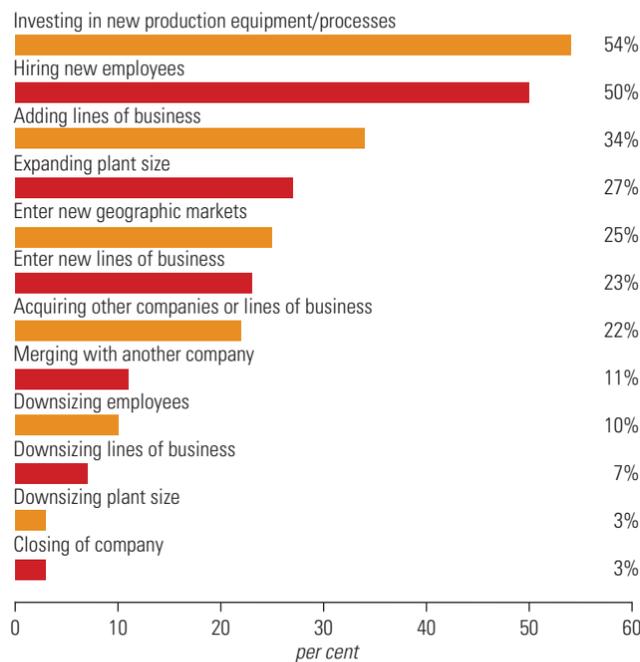
"If you have a \$50,000 impact while training, that more than pays for the training," says McNeil-Smith.

He sees the skills issue as a matter of supply and demand being out of alignment. Colleges and universities are relying on historical data to develop their curricula, putting their response about two years behind current industry needs.

To bring supply and demand into better alignment, EMC used its Workplace Literacy and Essential Skills research to develop 10 case studies involving a diverse group of Canadian companies

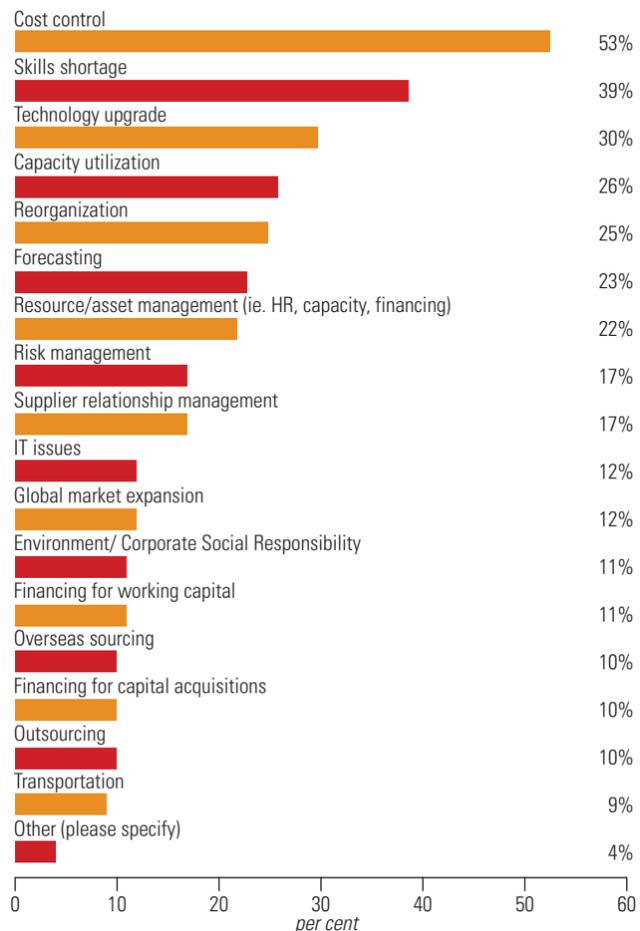
Changes in the next 5 years

1,325 respondents



Most significant issues

1,305 respondents



that demonstrated to management the positive impact training has on productivity and bottom lines.

MW Canada, a textile manufacturer in Cambridge, Ont. was one of the case studies. The company, which has 65 employees, initiated a technical skills certification program to improve technical communication and problem solving in production. Key measurements were reduction of downtime and improved product quality. And the research showed there was a payoff. Total annual savings were more than \$20,000, ROI was 117% and productivity benefits will continue to accrue.

EMC's next phase is MFG GPS. It's 18 months into a three-year project that aims to develop a database that combines industry market capabilities

and needs with data from colleges and universities to provide ongoing, real-time labour market information.

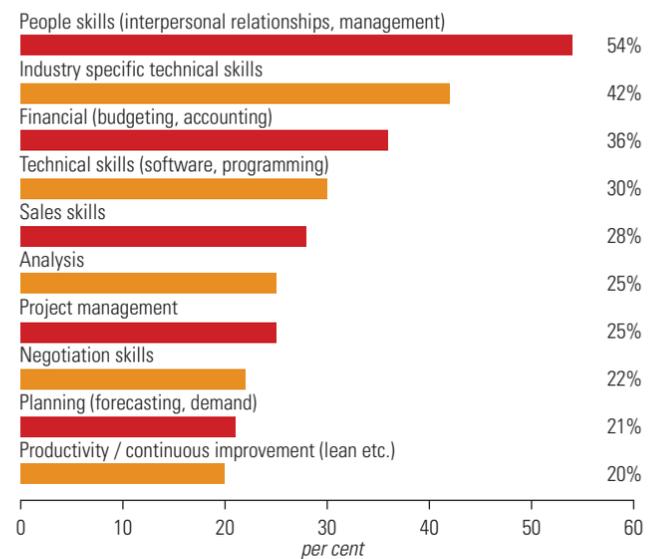
The third component, potentially, is certification. EMC has graduated more than 200 certified supervisors, who are now set up for higher-level management. "There's a real need at the production level to provide certification-based learning that will make employees more productive. That's an option we're looking at."

It's difficult to predict how shortening the gap between supply and demand for skilled people will impact compensation, but as McNeil-Smith concludes, the shorter the distance between the two, the easier it will be for industry to grow and be more competitive.

Comments? E-mail jterrett@plant.ca.

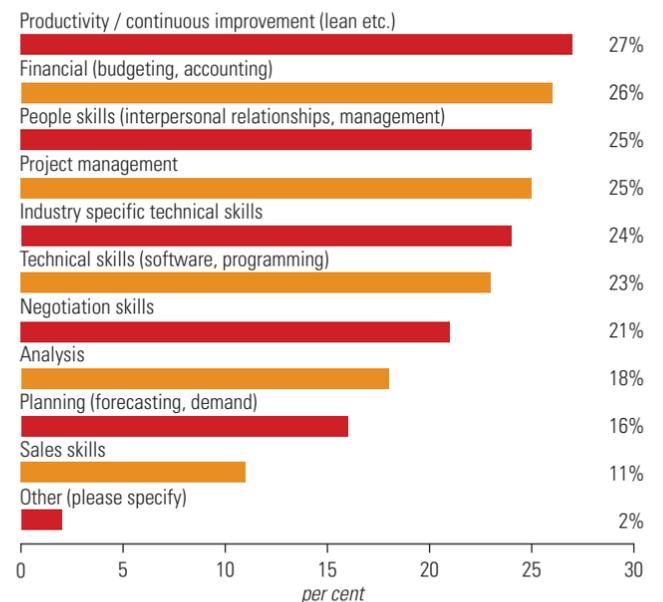
Most important skills

1,025 respondents



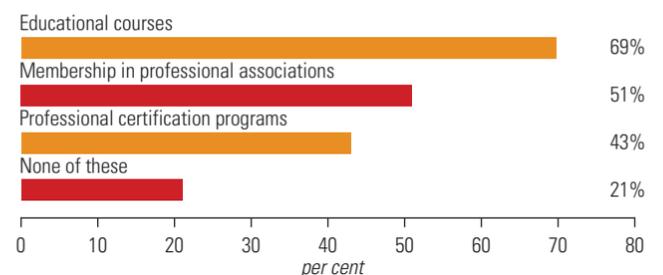
More training needed

981 respondents



What companies pay for

1,003 respondents



OTHER SALARY STATS

- About 27% of the EMC-PLANT survey respondents are at least partly unionized. The average increase for unionized labour (generally) is forecast to be 2%, according to Statistics Canada.
- Statistics Canada shows the average hourly wage for manufacturing May 2014 to May 2015 as \$20.80 per hour, a 1.3% increase. Management salaries overall at \$40.55 represent a 2.1% increase. The average weekly wage for all manufacturing titles so far this year is \$1,007.40, or an annual \$53,385 (March to March), which is a 0.4 percentage point increase over 2014.
- As of February, Workopolis (the online job site) places the average manufacturing salary at \$54,256.

» Digital Marketing

Putting CONTENT to WORK

HOW TO SUPPORT EVERY STEP OF THE SALES CYCLE



Create fresh content you can post or tweet for effective discovery of your brand.

BY MARTIN WONG

Canadian manufacturers, especially those selling high-end industrial equipment, face lengthy and often highly technical buying cycles. Traditionally, they've relied on personal relationships to acquire new business, but business-to-business buying behaviours are changing in the following ways:

- 46% of business buyers use online search as their first information source (DemandGen);
- only 17% deal directly with peers and colleagues as their first source (DemandGen);
- 72% use social media to research their purchases (DemandGen);
- today's buyers might be anywhere from 60% to 90% of the way through the buying cycle before reaching out to the vendor (Forrester).

If you can't get face-to-face with a prospect until two-thirds of the way through a buying cycle, your marketing has to deliver the desired information and support relationship building. Content marketing is not a substitute for personalized selling, but it creates a comfort level with prospects who will be more willing to reach out to you.

The most effective content strategy guides the visitor through the various stages of the sales cycle. Make your web pages easy to navigate for access to the most relevant information, and think of the information you publish via social media based on the following:

Discovery. Your prospect may not be sure a problem exists and is looking for validation, usually via social media, blogs and forums.

Solution research. Your prospect begins gathering requirements with a more purposeful online search for solutions via webinars, white papers, industry portals and vendor websites. Case studies and testimonials are critical at this stage.

Shortlisting. The list of suitable vendors is shortened. Look for detailed product and service information and some ballpark costs. Content should feature a call-to-action for personal interaction.

Procurement. Vendor selection and a

process for a final decision begins. Offer live events or phone consultations.

Advocacy. Marketing should make your best customers your best advocates.

Don't forget SEO

You don't need to create original content for every interaction. Plan your social media outreach to include a mix of the following:

Original. Re-purpose and re-use blogs, white papers and tutorials for maximum mileage. Take a good case study and use it across multiple channels, promoting it on social media. Offer it as a contributed article to an online publication or incorporate it in a webinar or as an example in a training workshop. Summarize and use it in a sidebar for a white paper, an eBook or on your website. Do a video interview with a customer and use snippets for testimonials.

Community-oriented. Participate in forums, comment on other people's blogs/posts and offer advice. Community interaction may be higher value than original content if your industry is going through a transition.

Curated content. Link to other content – people value savvy curation. Whenever you share a URL, use a tool such as Sniply that lets you add a call-to-action to drive traffic to your website and track conversions.

Promotional. Events, offers and

product launches should not exceed 20%. People expect you to promote your business, but not all the time. Keep it soft.

Search ranking is very important to discovery. If you rank at the top of the search engine results page (SERP) for a term such as cnc router, you'll see close to 32% of all traffic for that term. A second place ranking gets 17%, and traffic volume drops fast the lower you rank. Backlinks still rule, but search engines have evolved to reward relevant content that others want to share.

Your page rankings will improve as you accumulate quality content and social interactions, but this kind of organic traffic takes time to build. Paid search campaigns (adwords, pay-per-click) give your rankings a boost, but before you invest, make sure your website is SEO-friendly. A technical web audit will reveal any issues that may need fixing.

The good news is that content marketing, social media and SEO are mutually beneficial. Use social media as the distribution channel to maximize the content's value, support the sales cycle and improve SEO results.

Martin Wong is chief marketing officer at Smartt, a digital consulting agency based in Vancouver. Visit www.smartt.com.

Comments? E-mail jterrett@plant.ca.

» Training

Break down tasks

Get people up to speed and avoid mistakes

BY HUGH ALLEY

I need a new engineer in my plant. She'll know the core engineering stuff but odds are, even if she has worked in this industry, she won't know the details of how things get done here. How do I get her up to speed quickly, without her making lots of expensive mistakes?

By breaking the tasks down to small, manageable bites.

Preparing a quote that involves reverse engineering a part might have several smaller tasks such as: measure as-is item; record critical measures; correct any identified flaws in the sample; validate measurements against a knowledge-base; create a solid model; apply standard tolerances... and so on.

With a more detailed view, you will easily determine whether someone already has the skills to do a sub-task. This has three direct advantages:

- Training time is more efficient.

- As sub-tasks are learned, the new employee is handed productive work without having to know the whole procedure.
- Once the trainee can do some of the sub-tasks, the most skilled person is freed.

In a recent case, the manager broke a job down into more than 50 discrete tasks ranging from specifics using the ERP system to handling a customer's inquiry. At first blush it all seemed overwhelming, but since a new person would have to learn all these tasks one way or another, the value of listing them was clear. The manager could choose which tasks to teach first. Other tasks could build on established skills. And in each case, the manager knew the new employee would do the job correctly.

When someone moves into a new job, ask yourself a few questions:

- What tasks must be learned?
- Which ones do I expect the new person to do on arrival, and which ones require instruction?
- Which ones should be taught first so the person can become productive quickly?
- Which ones are consistent sources of error that need more attention?
- Are there tasks that rely more on experience?



Sub-tasks teach employees faster and make them more efficient.

PHOTO: THICKSTOCK

The answers will help shape a training plan that prepares new employees to become productive faster.

Hugh Alley is operations manager of Westcan Industries, an industrial pump services provider in Port Coquitlam, BC. Previously he was president of First Line Training Inc. Call (604) 866-1502 or e-mail halley@westcan.com. View his blog is at <http://firstlinetraining.ca/blog>.

» Connected Technology

Why your plant needs WEARABLES

HOKEY? MAYBE. AN OPPORTUNITY FOR MANUFACTURERS? DEFINITELY

Workers fitted with wearable technologies provide manufacturers with ways to easily integrate the Internet of Things into their operations.

BY MATT POWELL, ASSOCIATE EDITOR

It's a high-tech world we live in. We're glued to smartphones, tablets and the like, in a sharing economy that keep us connected in a digital world that is, believe it or not, only in its infancy.

The internet has changed the way people communicate and the way businesses communicate with their customers. And the so-called Internet of Things (IoT) will usher in the next generation of connectivity, a shift to which manufacturers should be playing close attention.

As IoT continues to evolve, it promises to connect more people, data and "things" and deliver more valuable information to both consumers and enterprises, while closing the gap between the two.

For manufacturers, that means having the ability to better control networks and improve equipment assets, situation management and process control. IoT intelligent systems will speed up the deployment of new products, provide dynamic response to demand, and enable real-time supply chain optimization by bringing together networking machinery, sensors and control systems.

Much has been made of the phenomenon. Global networking giant Cisco estimates IoT will drive net profits of \$3.9 trillion to the global manufacturing sector over the next decade (\$100 billion in Canada).

Research firm IDC, based in Toronto, says Canadian companies will spend \$21 billion on such projects in 2018, up from \$5.6 billion in 2014 – a 375% increase. And General Electric says internet-connected machines could add \$15 trillion to global GDP by boosting annual productivity growth up to 1.5% in the US.

Like most disruptive digital technologies that take hold in the consumer world before making inroads into industry, wearables will provide manufacturers with an unlikely tool to harness IoT's power through of the massive amounts of data these systems will collect. Shop floor workers will connect with machinery in more personal, job-specific ways to acquire relevant, real-time data when they need it most.

Research firm Strategy Analytics predicts an incredible surge in the wearables sector, with global revenues to reach \$37 billion in 2020, up from \$1 billion in 2014. Juniper Research predicts shipments of wearable devices will reach 130 million units by 2018.

The factory floor is an ideal and safer application for wearables, keeping a worker's eyes and hands on the machine and off a phone or tablet display.

Recon Instruments, based in Vancouver and founded in 2008, has developed the Recon Jet, a sleek yet heavy-duty smartglass that pushes and pulls data, tasks and instructions from various points across an operation to specific users. The devices allow voice and touch con-

trol, and are equipped with a camera that reads labels and barcodes.

And Nashville-based XOEye Technologies' stripped down, industrialized XOne smartglasses are designed for harsh manufacturing environments.

They aren't slick looking, but they are lightweight and certified for everyday factory hazards and provide users with high-tech features including barcode scanning, video and audio telepresence with cloud-based servers, and biometrics tracking, which can discover and resolve workflow issues.

Big possibilities

Exact Online, based in Waltham, Mass., a developer of cloud software for small manufacturers and wholesale distributors that automates workflows, suggests manufacturers will use wearables in:

Video applications. Companies that use cameras to monitor the shop floor or employees could apply a hands-free, first person point-of-view wearable that includes a camera. Users would stream video in real-time and save the content for later reference.

Employee monitoring. Shop floor safety would be enhanced by keeping track of what's going on with employees. Smartbands or smartwatches would allow supervisors to see that somewhere along a production line, productivity is being affected by fatigued workers. Monitoring their work rate or body for fatigue could help manufacturers improve productivity by changing break schedules to reduce shop floor injuries.

Digital strategy and product-design tool and services provider Solstice Mobile, based in Chicago, believes

wearables will impact manufacturers by:

Enhancing field service. Functions such as maintenance that require workers to work at heights or underground could use wearables to collaborate with managers and speed up decision making. There is also access to online support to resolve problems faster.

Remote line monitoring. Wearables reduce the need for workers to be tied to their machines for hours. Plants would gather line speed or machine component failure data remotely.

Warehouse monitoring. Sensors, smartwatches and smartglasses would enable anyone working in a warehouse to easily locate stored goods and maintain inventory at the tap of a finger, saving time and reducing misplacement and downtime.

Employee training. Improve training by encouraging workers to learn on the shop floor. There's also a case for workers accessing learning material on the move anytime, anywhere.

Integrating wearables into the workplace will also play a critical role in attracting your future workforce, says Cisco. The tech giant, which is leading the global IoT charge, suggests more Millennials believe a wearable device will be an important part of the workplace by 2020. Millennials now make up 75% of the US workforce and will continue to supplant retiring Baby Boomers and Gen-Xers.

Don't get too caught up in the high-tech chatter. Wearables aren't a fad, they're going to be a major disruptor that will simplify their integration and help manufacturers harness IoT's power.

Comments? E-mail mpowell@plant.ca.

» Computing

D-Wave breaks quantum barrier

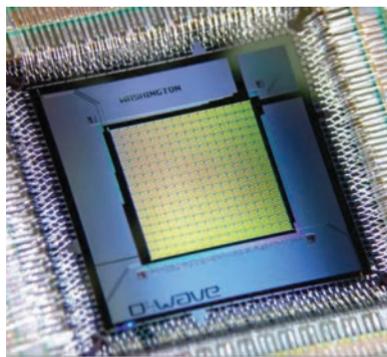
Milestone enables system to address larger, more complex problems.

The world's first quantum computing company has reached another milestone that will allow it to solve more complex computational problems.

D-Wave Systems Inc., based in Vancouver, has broken the 1,000 qubit barrier, a processor that is roughly double the size of its previous quantum chip.

The company's computer runs a quantum annealing algorithm to find the lowest points, corresponding to optimal or near optimal solutions in a virtual "energy landscape." Quantum annealing is a mathematical operation where the extreme points of a function are determined from a given set of discrete candidate solutions.

Each additional qubit doubles the search space of the processor, and at 1,000 qubits the new processor considers more than 21,000 possibilities simultaneously, dwarfing the company's previous 512-Qubit D-Wave Two at 2,512 possibilities.



Chip considers 21,000 possibilities.

PHOTO: D-WAVE

The new processors, comprised of more than 128,000 Josephson tunnel junctions in a 6-metal layer planar process with 0.25µm features, are believed to be the most complex superconductor integrated circuits ever produced. The chips are fabricated at D-Wave's facility in Palo Alto, Calif. and at Cypress Semiconductor's wafer foundry in Bloomington, Minn.

Beyond the much larger number of qubits, D-Wave has lowered the processors operating temperature by 40%.

Through a combination of improved design, architectural enhancements and

materials changes, noise levels have been reduced by 50%.

In testing, increased precision and noise reduction has improved precision by up to 40%.

The new technology also expands the boundaries of quantum resources. Firmware and software upgrades will make it easier to use the system for sampling applications.

» APMA Conference

Emerging market pressures and CAFE requirements are creating opportunities for auto manufacturers, but they need a jumpstart to keep pace globally.

BY MATT POWELL, ASSOCIATE EDITOR

The North American automotive sector is undergoing a profound change, and it's happening quick. Strict changes to US fuel emissions standards are coming, more investment is headed to Mexico, there are emerging markets in the southern US and elsewhere, and there's a need for new manufacturing processes to integrate new materials affordably.

There are opportunities for Canadian auto parts suppliers to play a critical role in an increasingly diverse global market, but they will need to shift into a higher gear to keep pace.

That was the message from the 2015 Automotive Parts Manufacturers' Association (APMA) conference in Windsor, Ont.

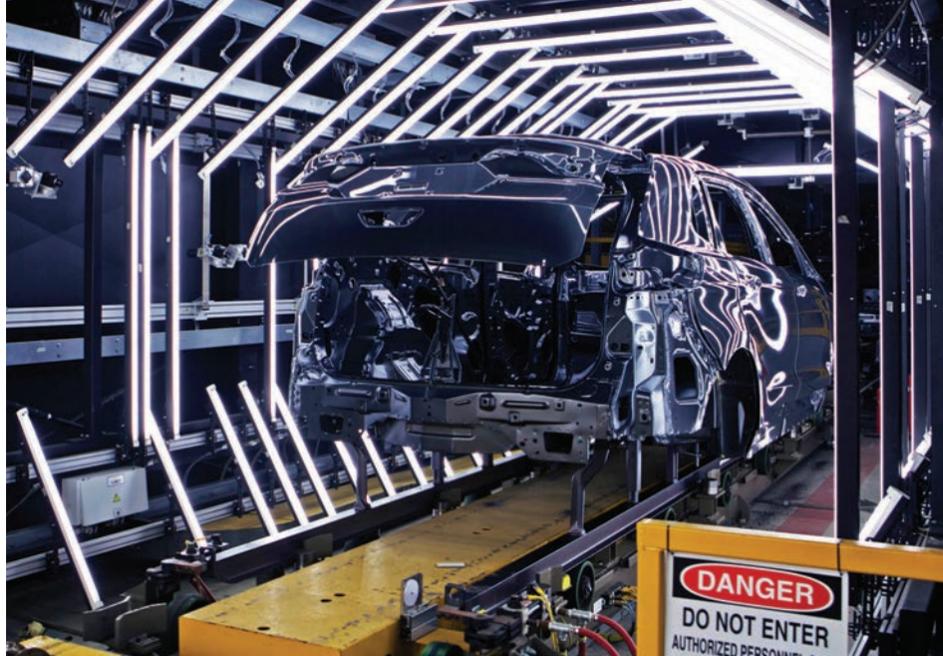
The sector is in pretty good shape after all, coming from a record month in May with sales up 1.1%, but conference participants learned this is no time to relax.

Despite calls to explore export markets outside of the US, Export Development Canada's (EDC) chief economist Peter Hall said Canada's largest trade partner will be critical to driving near-term global growth thanks to pent-up consumer demand.

"Macro-economic conditions that we didn't see are driving growth in the US," he said. "There's a crisis there, but it's a crisis of growth."

Low oil prices, he added, will benefit net energy importers such as the European Union, where consumers could save \$122 billion this year at the gas pumps. If that's the case, opportunities exist for Canadian firms if they're willing to navigate European markets and leverage the Comprehensive Economic and Trade Agreement (CETA).

EDC predicts CETA could increase auto parts exports



The Ford Edge, produced in Oakville, Ont., will be exported to 140 countries. PHOTO: FORD

GLOBAL opportunities in AUTOMOTIVE

IT'S NO TIME TO RELAX DESPITE RECORD SECTOR GROWTH

to the EU by 28.8%. Auto parts represent 11.6% of Canada's total exports, a market worth \$67.9 billion. But just 5% are shipped to emerging markets. Hall expects the sector to grow by 13% this year before flatlining in 2016, the result of increased capital investments and the impact from skills shortages.

Geographic shift

Michael Robinet, managing director at Douglas County, Co.-based IHS Automotive, believes the shift is being led by geographic factors. More OEMs and suppliers are moving to the southern US and Mexico, which are both ripe with government incentives.

"Everything has moved about 350 miles south in the US," said Robinet.

By the end of this year, he estimates more than 50% of North American automotive production will take place south of Ohio. Mexico's share increases to 4.8 million units by 2020 (from 2.2 million in 2010), while Canada's slides to 1.8 million in 2020 (from 2 million in 2010).

Production from the Detroit Three (Chrysler, Ford, General Motors) will also slip from a high of 77% in 2000 to less than 50% of the NAFTA pool by 2020.

While Mexico has taken a big bite out of Canada's NAFTA auto production, it wants Canadian expertise and suppliers to meet growth demands.

Oscar Albin, executive president of the National Industry of Auto Parts Mexico, said the nation needs to pad its engineering and R&D expertise, which amounts to just 0.4% of GDP. Mexico wants to double that figure. He said the availability of good technicians and engineers is a challenge.

The country currently exports 79% of its auto production and the sector represents 17% of its manufacturing GDP, he said. It has also worked to diversify export markets. In 2002, the US imported 85% of Mexico's total exports, but that number decreased to 71% by 2014.

Lightweighting is also a driving force, the result of the fuel emissions reduction requirements from the Obama administration, which rises to 54.5 miles per gallon in 2025 from the industry's current commitment of 35.5 mpg by model year 2016.

Marcello Grassi, head of composites for the UK's McLaren Automotive Ltd., said there's opportunities in carbon fibre and other advanced composites, but costs remain an impediment to mass industry adoption. The price of carbon fibre per kilogram will need to drop from \$30 to \$10 for OEMs to integrate the material affordably.

New manufacturing processes, recycling abilities and repairability are factors that must be ironed out before automakers can realistically consider composites, which he said likely won't happen before 2025.

Progress so far in the drive to uncover new materials and processes is a concern for Mark Stevens, project manager at the Centre for Automotive Research (CAR) based in Ann Arbor, Mich.

"If we change nothing, just 30% of the vehicles produced in North America would meet CAFE requirements for 2016," he said, adding it gets worse by 2020 when not a single automaker in Canada or the US would meet the requirements.

A 10% reduction in vehicle mass enhances fuel savings by up to 7%, but he said eliminating 163 grams of CO2 per mile is the greatest challenge.

Ford's 2015 F150 aluminum-bodied pickup truck is a bright spot, said Jeff Bladow, director of engineering at Kaiser Aluminum in Foothill Ranch, Calif. The truck's five-star NHTSA safety rating also proves the material's viability in body and chassis applications.

The federal government's \$100 million Automotive Supplier Innovation program, announced in April's manufacturing-heavy federal budget, puts some public skin in the automotive innovation game and should help companies enhance technology offerings that address challenges the industry is facing.

Minister of State Gary Goodyear, who launched the five-year program during his lunchtime keynote speech, said the funding will help manufacturers accelerate research and development, prototype development, engineering and product testing activities.

Despite challenging trends in the global auto industry, Canadian suppliers have an opportunity to be part of the growth in new markets – they just have to be willing to drive unfamiliar roads.

Comments? E-mail mpowell@plant.ca.

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» Inside Maintenance

Troubleshooting helps you to understand how a pump works, spot problems and identify probable causes and suggest possible solutions.

Looking for TROUBLE

STAYING AHEAD OF PUMP PROBLEMS

BY STEVE GAHBAUER

Pumps are critical to plant operations. A breakdown could halt production and result in costly downtime, repair and/or replacement. Trouble will come at the most inconvenient time, which is why it's important to stay ahead of potential problems.

Each pump has its own sound and vibration patterns. Once "normal" is established, pay attention to day-to-day changes in these patterns – they could mean trouble. Increased or erratic vibration of the driver is often the first symptom of an impending breakdown. Other changes include reduced speed, decreased flow rate, excessive leakage and strange noises.

Failure causes such as unevenly worn parts, bent shafts, loose impellers and signs of corrosion or abrasion become evident when a pump is pulled and disassembled.

Michael Dufresne, customer support services at Sulzer Pumps (Canada) Inc. in Toronto, provided six troubleshooting guidelines at a recent Education Day of the Hamilton Section of the Society of Tribologists and Lubrication Engineers (STLE).

1. Selection. Review the ISO 13709 (API 610) standard for hydraulic selection criteria, which states: the rated duty flow should be within 80% to 110% of best efficiency flow; pumps should have a preferred operating region of 70% to 120% of best efficiency flow; pumps should be capable of at least 5% head increase at rated condition; and head rise to closed valve (shutoff) should be at least 110% of rated head.

2. System curves. There's always friction loss in a system from length of piping, valves, strainers and reducers. An increase in flow results in more friction loss, which is proportional to the square of flow.

The net positive suction head (NPSH) available at site (measured in feet of liquid and defined as the total head available in absolute terms above vapour pressure) must always be greater than the NPSH for the pump. Every liquid has a unique vapour pressure, which varies with temperature. The required NPSH can't be calculated but can be estimated with values determined by testing. Impellers designed for low NPSH applications usually have high suction-specific speeds and are prone to operational problems at low flows.

Pumps have "comfort zone" within characteristic curves where the pump is good for continuous operation. Comfort zone is related to API 610 preferred flow bands.

3. Cavitation. It occurs when the pressure of a liquid falls below its own vapour pressure, causing noise and

vibration when bubbles move into the higher pressure side of the impeller.

Suction-specific speed is a rating number indicating the relative ability of centrifugal pumps to operate under conditions of low available NPSH. Industry standards recommend pumps be in the 10,000 to 11,000 range.

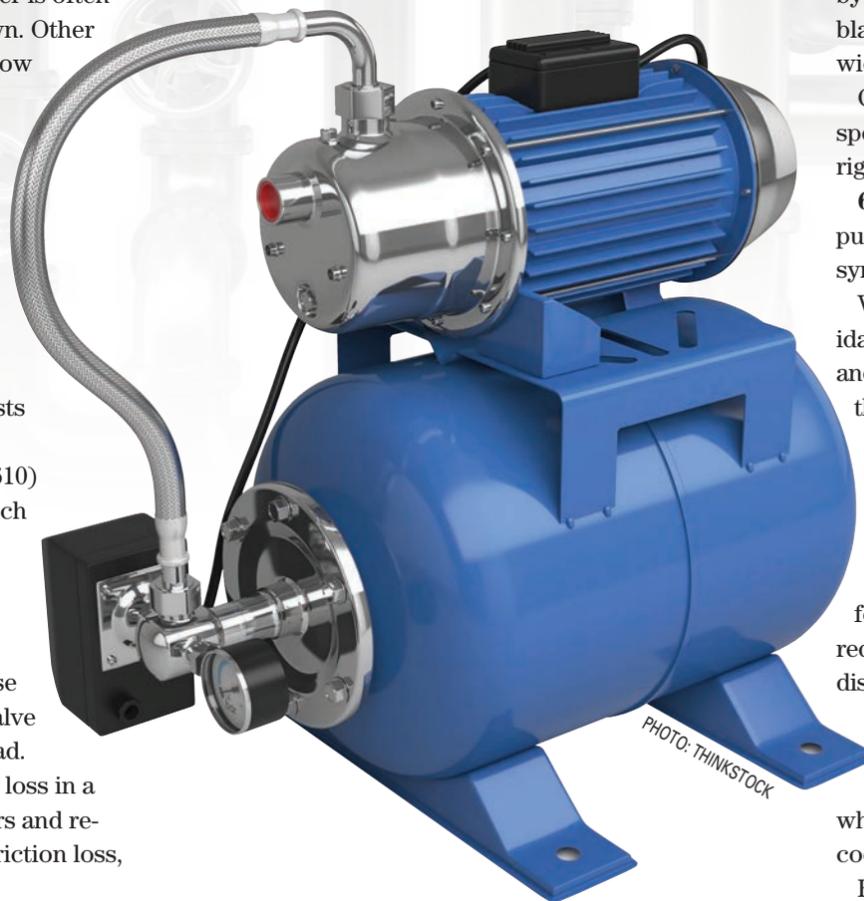


PHOTO: THINKSTOCK

4. Backflow and vibration. Flow spikes from the impeller may impact adjacent stationary elements, such as anti-swirl ribs or flow straighteners, producing vibration at vane pass frequency.

The swirling liquid ring slows down with increasing distance from the pump inlet. When the ring has an impact on stationary elements farther from the pump inlet, it produces vibration at a lower frequency. So-called vane pass occurs when the interaction between the impeller vane and volute lip generates pressure pulsations or waves at vane passing frequency. Staggered discharge vanes reduce pass pulsation.

Pump vibration has many causes, the most common being unbalance. Others include shafts, misalignment,

oil whip or foundation failures.

5. Pump performance modifications. Underfiling the impeller discharge vanes increases pump performance by increasing the impeller outlet area.

Overfiling suction vanes or cutting them back lowers the required NPSH. Overfiling impeller discharge vanes by removing material from the pressure side thins the blade at the outlet to roughly one-third of its original width, which doesn't impact discharge performance.

Cutting back volute lips on low- and medium-specific speed pumps moves the peak efficiency and head to the right by a factor of the volute area change.

6. Lubrication. The two most popular oils used for pump bearings are pure and refined mineral oils; and synthetic oils for high temperatures.

Various additives increase lube performance. Anti-oxidants improve oxidation stability to decrease corrosion and prevent the oil from becoming more viscous and there are additives that prevent foaming, which reduces the load-carrying capability of the lubricant. Film stiffeners reduce wear from metallic contact by forming a surface layer with a tension greater than the lubricant. Organic zinc compounds prevent direct contact between the ball and the races. Active EP additives form a chemical combination with the bearing metal to reduce friction. And solid additives, such as molybdenum disulfide, improve lubrication qualities.

The oil level should be halfway through the bottom ball when the pump is at rest.

Most pumps have a facility for cooling the oil when it gets too hot. Never attempt to cool a bearing by cooling the housing – steel will expand or contract.

Heat decreases oil's velocity, creating even more heat as the lubricant loses its ability to support the load. The interference fit conducts heat away from the bearing and onto the shaft. Ensure there are no knurled surfaces or polymers used to build up the shaft to the proper dimension.

Effective troubleshooting is about knowing your pump. Become familiar with its proper performance, closely monitor operation and correct problems quickly to avoid costly interruptions to production.

Steve Gahbauer is an engineer, a Toronto-based business writer and a regular contributing editor to PLANT. E-mail gahbauer@rogers.com.

Comments? E-mail jterrett@plant.ca.

» CCOHS Safety Tips

Selecting the right PPE

How to protect workers from specific hazards

Hazards exist in all workplaces. They should be eliminated, controlled at the source or reduced through administrative measures. But when such measures haven't covered all potential hazards, personal protective equipment (PPE) offers a last level of safety.

PPE includes respirators, gloves, aprons, fall protection and full body suits, plus head, eye

and foot protection.

PPE does not reduce the hazard itself nor does it guarantee permanent or total protection, but it should be used when: no other control method is possible; while other controls are being installed or implemented; in emergencies and maintenance activities; and situations where other control methods don't provide enough



Ensure PPE is comfortable.

PHOTO: THICKSTOCK

protection.

Use these guidelines to select the best gear:

- Match the PPE to the hazard following a complete hazard assessment.
- Get expert advice and shop around. Discuss your needs with an occupational health and safety specialist and trained sales representatives. Ask for alternatives, check

into product claims and test data.

- Involve workers in evaluations. Bring approved models into the workplace for trials.
- Consider the physical comfort. It's unlikely a PPE device that's heavy or poorly fitted will be worn. Offer flexibility as long as it meets required legislation and standards.
- Evaluate cost. Disposable options are not always cheaper over the long term.
- Review regulatory requirements and standards. In Canada, two of the more common standards include the Canadian Standards Association (CSA) and the Bureau de normalisation du Quebec (BNQ).



Slowing the lean process down improves employee uptake over the long term. PHOTO: THICKSTOCK

but as the initial checklist is developed, compare the checks against your brand image to ensure it will not become tarnished.

Quickly deploy a report-out methodology to improve communication and eliminate disturbances to flow. Many companies that use dashboards wonder why they're not improving performance. It's simple: the graphs and charts are computer generated, which takes time and motion (a waste) and they typically deliver information only. A good report-out methodology harvests information and displays it for all to see. Back to basics is key. An employee gets no greater reward than being able to update a chart at the end of the day to acknowledge great performance.

Slow things down

Adopting these methodologies evolves the culture slowly as people learn to see flow and identify waste. They may not know how to fix it but they'll be more open to suggestions for change.

As their lives become easier and your organization is willingly accepting change, you can finally step on the accelerator of change.

In a culture focused on continuous improvement (CI) all roads lead to leaders who drive the process in the natural course of running the business. Envision an organization where most of them have the ability to facilitate various improvement efforts so lean and CI will withstand budget cuts during difficult financial times when many organizations gut or disband lean or CI groups.

It will take time to achieve, even years, but if this is the necessary and true destination, start down the path at the beginning of a lean transformation.

Richard Kunst is president and CEO of Cambridge, Ont.-based Kunst Solutions Corp., which publishes the "Lean Thoughts" e-newsletter and helps companies become more agile, develop evolutionary management and implement lean solutions. Visit www.kunstsolutions.com. E-mail rkunst@kunstartofsolutions.com.

Comments? E-mail jterrett@plant.ca.

» Think Lean

What's the RUSH?

YOU COULD BE COMMITTING KAMIKAZE KAIZEN

Take the right amount of time to improve processes by matching methodologies to your plant's speed of absorption.

BY RICHARD KUNST

Many manufacturers try to accelerate lean deployment through kaizen event-based workshops. They identify an area of improvement, round up team members, provide some training and focus on making the improvement in a few days. In essence, they're committing Kamikaze Kaizen.

Implementing lean tools and methodologies is easy; matching implementation to the absorption rate of your organization can be much less so.

Before the journey begins, have a clear vision of your brand image to which everyone can conform.

Apply methodologies that build organizational infrastructure to sustain change and don't deploy too many at once. Pick

no more than three that will deliver the greatest impact and focus on them for the next year.

One of the best methodologies for sustaining change or creating that distributed accountability is the use of TPM. Initially it was known as total predictive maintenance. Operators conducted self checks on equipment to detect issues that could become bigger problems. It then morphed into total productive maintenance, adding some minor maintenance such as changing filters and lubri-

cation. But the checklist is so powerful and using the TPM stations so effective it just seems right to incorporate as many checklists into one methodology as possible. So these days we call it total productive management. You still do the regular area checks and minor maintenance, but add paperwork completion, kanban checks and replenishments along with the requisite 5S daily requirements. If you witness something you don't like, it goes on the TPM checklist. Culture is adjusted one check mark at a time,



LEAN ALERT

Need to reduce downtime? Sweat the little things. Vorne Industries in Itasca, Ill., which specializes in making manufacturers more productive, suggests getting each of your line teams to identify and fix one problem each day. Follow these three simple steps to make it happen:

- Use plant floor information to identify the losses.
- Review them and focus on the biggest or easiest wins.
- Agree on one fix that can be completed during the shift.

Vorne reports in many cases overall equipment effectiveness improved by 10% or more when managers consistently applied the strategy over a period of at least three months.

Source: Vorne Industries Inc. Visit www.leanproduction.com.

» Renewable Power

Natcore eliminates silver from silicon solar cells to simplify the manufacturing process and lower costs.

BY PLANT STAFF

Scientists working at Natcore Technology Inc.'s Rochester, NY R&D Centre have come up with a new solar cell structure that the company says will simplify the production process, lower costs and speed the development of ultra high-efficiency cells.

The structure also has the potential to eliminate high-cost silver from mass-manufactured silicon solar cells, which has been a long-time goal in the solar science field. Silver currently contributes to about 30% of the cost of a single cell.

The silicon heterojunction cell structure, which other researchers have used to achieve world-record silicon



COULD REDUCE PRODUCTION COSTS BY 30%

solar cell efficiencies, has been adapted by Natcore using the company's proprietary laser processing technology to eliminate silver from the finished cell.

"All of our tests to date demonstrate we're on the optimum path toward very high efficiencies with manufacturing solutions that are low cost and do not require complex process equipment," says David Levy, Natcore's director of research and technology.

Novel packaging

The cell uses thin amorphous silicon layers in combination with a standard crystalline silicon solar wafer. Applying a novel packaging approach would involve bonding a flex circuit to multiple, small contact pads with high-speed laser fusion.

Natcore says the integrated approach using low-cost alignment bonding provides major advantages over cur-

rent production cells, including the elimination of the front surface contact, which blocks some of the incoming light. "Practical photovoltaic solar cells have been around for 60 years," says Charlie Gay, former director of the National Renewable Energy Lab (NREL) and a member of Natcore's Science Advisory Board. "Natcore scientists have taken a lot of known pieces and assembled them in new and different ways. They've taken basic concepts and made them manufacturable by using low-cost materials and simplifying production methods."

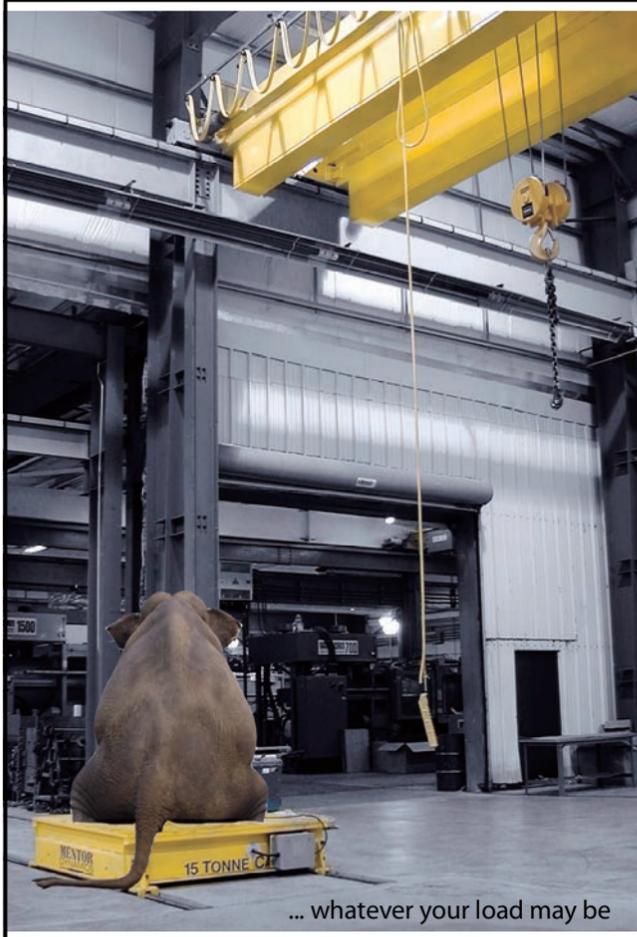
Natcore, based in Rochester, NY and listed on the Canadian TSXV, researches and licenses technology that controls the growth of thin and thick silicon dioxide film and mixed silicon oxides on silicon and other substrates.

Comments? E-mail mpowell@plant.ca.

TRANSFER CARTS



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Transfer carts are **moveable platforms** used for the horizontal movement of materials, assemblies and other items.

Compact in design, **transfer carts** can handle upwards of 100 ton and work well in areas with limited floor space. On-rail, towed, steerable and **100% custom-made** to your specifications.

Transfer carts can reduce labor costs, optimize manufacturing processes and reduce capital costs associated with forklift systems.

» Cap and Trade

\$3 BILLION



Total revenues the Ontario government could collect by 2020 if it decides to auction off 70% of its greenhouse gas emissions "allowances" under the new cap and trade carbon reduction system, slated to start in 2017.

Source: The Ecofiscal Commission

» Alternative Energy

Powering up with biomass

Cement plant looks to set new standard for industry sustainability

McInnis Cement and the Forestry Cooperative Association – St. Elzear (ACF – St. Elzear) have signed a cooperative agreement to study the feasibility of using forest biomass as an auxiliary fuel for McInnis's new cement plant in Port-Daniel-Gascons, Que. to reduce greenhouse gas emissions.

The plant and its marine terminal are currently under construction with production scheduled to start by the fall of 2016. It will have the capacity to produce 2.2 million tonnes of product per year.

Power will come from biomass such as forest residues, wood chips, sawdust, shavings and bark, which is abundant in Gaspésie.

McInnis was created following the Beaudier Group's acquisition of Cimbec in December 2011, which is part of the Beaudoin family's investment arm, the majority shareholder of Bombardier and BRP.



A 3D-rendering of the McInnis Cement plant in Port-Daniel-Gascons, Que. PHOTO: MCINNIS

The company says the \$1.1 billion facility will be the only cement plant in Canada to conform with the most restrictive air emission standards in North America, specifically the 2015 National Emission Standards for Hazardous Air Pollutants (NE-SHAP) for new plants as established by the US Environmental Protection Agency (EPA).

C I E N

CANADIAN INDUSTRIAL EQUIPMENT NEWS

» Material Handling

Improve your TRAFFIC control

IMAGE-BASED READERS BOOST CONVEYOR EFFICIENCY

A manufacturer of fibreglass sheeting dramatically improved its ID tag read rates and reduced conveyor traffic by switching from laser scanners to image-based readers.

BY RON PULICARI

A Canadian manufacturer of composite materials used in construction materials, tires and other products that moves its work in process on a power and free conveyor system was having issues with the frequent shutdowns needed to clean ID tags and clear collisions.

The company (not identified by request) makes fibreglass fabric sheeting other manufacturers form into anything from automotive components to cafeteria trays.

Working with Shelley Automation, a distributor of high technology automation and control products and services based in Toronto, the company switched to image-based ID readers with a new algorithm that improves signal quality and increases the speed of signal acquisition, leaving more time for decoding. The new devices provide 99.9% read rates.

Overall traffic on the conveyor has been reduced by 80% because carriers now move directly to the next station rather than looping around. The conveyor stops about once per shift, saving operators up to 190 minutes.

Each carrier has a tag with a 1D barcode used to track operations performed on the contents and direct it to the next station. But carriers go through ovens where they pick up soot, get sprayed with water and are dented in collisions. The laser scanners had read rates averaging 86%. Operators had to stop the system about 20 times per shift (for an average of 10 minutes) to clean tags or clear collisions.



Image-based readers use algorithms that search for the position and orientation of the barcode.

PHOTO: COGNEX

The carriers pick up composite filament called balls of yarn in the forming department and move to a washing station where the filament is sprayed with water. Then the carrier goes through a drying oven.

The next stop is the fabrication area where the filament is unloaded by operators for further processing. Finally, the carriers are directed back to the fabrication area to pick up more filament.

During operation, the carriers are directed to each of these stations through spurs off the main conveyor loop. The barcode tags are read at the entrance to each spur to determine whether the carrier should be directed there or continue on the main line. If the read fails, the carriers continue on the main line until an operator cleans the tags or manually directs them to the correct station.

Misreads for the system averaged about 60,000 per month, and this contributed to a maintenance issue. The

conveyor system has many chains that needed to be replaced every two years at a cost of about \$25,000 each.

Instead of relying on a photocell monitoring the reflections of a single laser beam passing across the barcode to generate an electrical signal, image-based readers capture an image, then use a series of algorithms to make it easier to read. A typical algorithm searches the entire image for the code and identifies its position and orientation for easy reading. Other algorithms handle degradations in code quality such as damage, quiet zone violations and reflections.

Image-based readers are solid state and don't wear out over time, so they provide two to three times the life of motor-driven laser scanners.

They also make it possible to save "no-read" images for later review to determine if the problem resides within the reader setup or the process.

Continued on page 22

» Supply Lines

NEW CLOUD CONNECTION

Big Bang ERP has partnered with Plex Systems to deploy the Plex Manufacturing Cloud for Canadian manufacturers.

The system connects the shop floor by gathering data on suppliers, machines, people, systems and customers to drive innovation and reduce IT costs.

The Montreal-based boutique consulting firm that specializes in cloud ERP systems says it's already working with 400 companies in the process and discrete industries.

The firm's Big Bang Experience defines the goals for the system and guides companies through deployment and optimization.

IGUS EXPEDITES TO CANADA

Canadian customers can look forward to expedited shipping from Igus, a manufacturer of plastic cable management systems and self-lubricating plastic bearings.

Orders will be processed and shipped direct from Igus's Providence, RI location to avoid international shipping rates and duty fees.

The new system is faster (two to five days) and less expensive because customers will only get one invoice. A 1 lb. box, shipped from Rhode Island to Toronto would have cost \$55, excluding duty fees. With the new system, the cost would be \$16.81.

MERLIN ADDS CNC

Memex Automation has acquired the intellectual property and other related assets of Dostek Inc., a producer of computer numeric control (CNC) communication products based in Kitchener, Ont.

It also develops distributed numerical control (DNC) software, which is a method for loading parts programs onto manufacturing machines, and Behind-the-Tape Reader (BTR) interfaces.

Memex will use the Dostek's IP to enhance the DNC capabilities of its MERLIN shop floor communications platform.

Memex is a Burlington, Ont.-based Industrial Internet of Things (IIoT) technology platform provider.

25 YEARS FOR E+H

Endress+Hauser Canada Ltd. joins the Canadian quarter century club this year.

The company, part of the family-run German firm that provides measurement instrumentation, services and solutions for industrial process engineering globally, set up shop in Burlington, Ont. and Montreal in 1990.

The Canadian operation now employs more than 150 people, with offices in Calgary and Edmonton. It also services the oil and gas, and power sectors.

Easy reader

Continued from page 21

Visualization makes setup easier. The operator views live images of what the reader is pointing to on a monitor. The operator ensures the barcode is visible in the camera's field of view, sees how crisp the image is and knows immediately how well the reader is performing.

Image-based readers also read two-dimensional codes like Data Matrix (used by manufacturers to improve traceability) because they can hold a much larger volume of data.

Cognex DataMan 300s use 1DMax code algorithms with Hotbars technology to read even damaged linear bar codes at a high rate of speed. 1DMax uses omnidirectional texture analysis to identify areas in the image that may contain the barcode regardless of its orientation. Once neighbourhoods are evaluated for the likelihood of a barcode, a clustering algorithm joins likely neighbourhoods into more complete regions. These regions are further analyzed and filtered to produce the final set to be subjected to decode attempts.

High-tech simplified

The time budget for texture analysis is just a few nanoseconds per source image pixel on a relatively inexpensive digital signal processor (DSP). Meticulous hand-coding of instructions and sophisticated control of memory makes it possible to execute the finder in a mere handful of processor clocks per source pixel.

Once regions likely to contain barcodes are identified, decode attempts can be made. The fundamental image analysis operation is the extraction of a 1D digital signal from the 2D source image along a line of given orientation, often called a projection line. To provide high geometric accuracy, good noise reduction and acceptable resolution, contemporary state-of-the-art methods effectively rotate a portion of the image so the projection line becomes horizontal. Rotating a digital image typically involves the use of some form of interpolation to estimate pixel values at points in between squares of the pixel grid.

Interpolation methods are based on a model of rotation in the continuous plane, but a discrete pixel grid can't accurately represent rotation at the small scales characteristic of fine features, which results in some signal blurring. Hotbars' fast signal extraction speed comes from using an algorithm that's well-matched to contemporary DSP architecture.

The DataMan 300 readers are configured with a continuous trigger that capture about 50 images per second. The carriers move at two inches per second so the vision systems have approximately 30 chances to read each tag as it moves past.

The cameras are configured with LED array lighting and a liquid lens that automatically focuses on the moving tags and are mounted on brackets that aim the reader. The vision systems connect to the plant network through ethernet and communicate with the PLC using the PLC5 protocol.

Since changing over to the new readers, the payoff for the composite materials manufacturer has been a reduction in the average number of shutdowns per shift from 20 to one and the resulting conveyor system downtime has been cut from about 200 minutes to 10 minutes. Now operators spend much less time on clearing shutdown issues and can focus more on the higher value aspects of their jobs.

This is an edited version of an article provided by Cognex Corp., a Natick, Mass.-based provider of vision systems, software, sensors and surface inspection systems. Ron Pulicari is a senior marketing manager, Americas. Visit www.cognex.com.

Comments? E-mail jterrett@plant.ca.

Pumps & valves

VZQA CONTROLS MEDIA FLOW

Festo's VZQA pinch valve is an alternative to diaphragm and ball valves in many process automation applications for controlling and shutting off a wide range of media flows, such as liquid, fibrous, particulate or granular.

Full bore passage minimizes flow resistance, preventing the valve from becoming blocked or clogged, so media flows freely. This also supports hygienic process sequences and cleaning cycles.

They're simple mounting, compact space-savers and operate via direct air supply. *Individually configurable components.*

There are two versions: normally open (N/O) for media pressures from 0 to 4 bar and a normally closed (N/C) for 0 to 6 bar media pressures.



The N/C version is the first pinch valve on the market with an integrated actuator, and the aluminum variant is the first to offer ring positioning via a ring magnet in the piston.

The components of the VZQA are individually configurable, whether it's connection types, materials or pinch valve sleeves.

The sealing cartridge is replaced without special tools, but this might only become necessary after approximately one million switching cycles.

Festo is a global supplier of automation technology and industrial training and development. Festo Canada is based in Mississauga, Ont. www.festo.ca



Maximum pressure is 60,000 psi.

LESS MAINTENANCE WITH HYPLEX

Flow International Corp.'s HyPlex Prime direct-drive waterjet pump reduces downtime.

Combining ultra high-pressure pump technology with direct-drive efficiency increases the maintenance intervals over prior models and delivers customized performance.

The pump has a maximum developed pressure of 60,000 psi and comes standard with Flow's Pac-V patented control valve, which enables cutting at any pressure.

Flow International is a manufacturer of waterjet products based in Kent, Wash.

www.FlowWaterjet.com

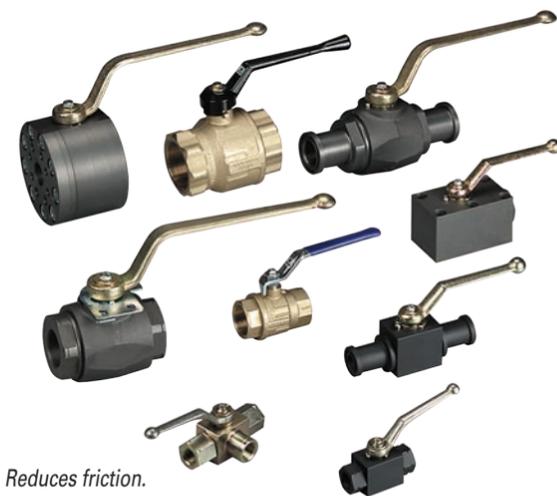
BALL VALVE SEALS THE DEAL

STAUFF's "floating ball" ensures a positive, leak-free seal and automatically compensates for seat wear or misalignment in its valves.

The carbon steel or stainless steel ball valves cover pressures ranging from 3,000 to 12,000 psi. The hard-chrome plated micro-smooth ball reduces friction and seat wear. All valves feature 1/4 turn positive operation.

The Waldwick, NJ-based manufacturer also offers its Fast Track Stainless Steel Ball Valve Program to industries where corrosive environments cause costly contamination and breakdowns.

www.stauffusa.com

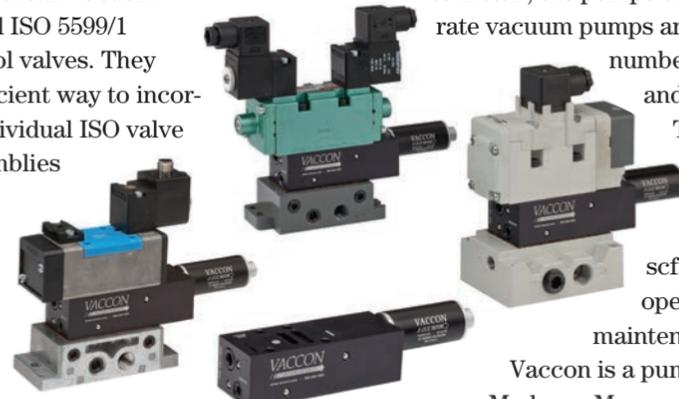


Reduces friction.

ADD VACUUM TO ANY ISO VALVE BASE

Vaccon Co.'s Vac-Stack venturi vacuum pumps integrate with all ISO 5599/1 Size-1 directional control valves. They provide a quick and efficient way to incorporate vacuum with individual ISO valve bases or manifold assemblies for automation applications. These include pick and place and material handling operations in packaging, automotive and food processing.

Modular, lightweight and easy *Eleven different performance levels*



to install, the pumps eliminate the need for separate vacuum pumps and air lines to minimize the number of pneumatic components and fittings.

They cover 11 different performance levels up to a 28 in. Hg [948 mbar] vacuum level and 3.2 scfm [90.6 lpm] flow. And they operate continuously without maintenance or filters.

Vaccon is a pump manufacturer based in Medway, Ma.

www.vaccon.com

PULSE-FREE PUMPING

Scientific Systems Inc.'s LD Class Pump delivers virtually pulse-free operation thanks to a low dead-volume dampener, advanced cam technology and dual piston mechanism for analytical, flash and small-scale preparative chromatography applications.

Standard fluid path materials are stainless steel and PEEK, or optional titanium and there are jacketed heads for temperature-controlled processes. The 12 ml/min., 36 ml/min. and 100 ml/min. versions reach pressures up to 6,000 psi.

High performance linear cams and automatic pressure compensation provide precise flow rates for accurate high-pressure and low-pressure gradients.



Precise flow rates.

Standard features include an integrated prime-purge valve, pulse dampener, interactive keypad control, plus complete PC control and status through RS-232 and Micro USB 2.0 ports.

Internal components, including mechanisms and fluid path components, are also available in Kit Form for OEM applications.

Scientific Systems, based in State College, Pa., specializes in precision machining and high-pressure fluid technology.

www.ssihplc.com



Rapid, tool-free maintenance.

QDOS 60 BOOSTS PRODUCTIVITY

Watson-Marlow says its Qdos 60 peristaltic metering pump reduces chemical metering costs compared to conventional solenoid or stepper-driven diaphragm pumps.

The new model follows the Qdos 30, expanding the line's range to incorporate flow rates from 0.001 to 15 gph at 100 psi. The pumps eliminate ancillaries, boost productivity and cut chemical waste as a result of highly accurate, linear and repeatable metering.

ReNu pumphead technology provides a single, safely contained component for rapid, tool-free maintenance.

The Wilmington, Ma.-based pump manufacturer recommends the pumps for disinfection, pH adjustment and flocculation of drinking water, wastewater and industrial process water, as well as reagent dosing and metering in mineral processing tasks. The Qdos 60 is especially suited to chemical metering applications found in larger water treatment plants where flow demand is greater.

www.wmpg.com

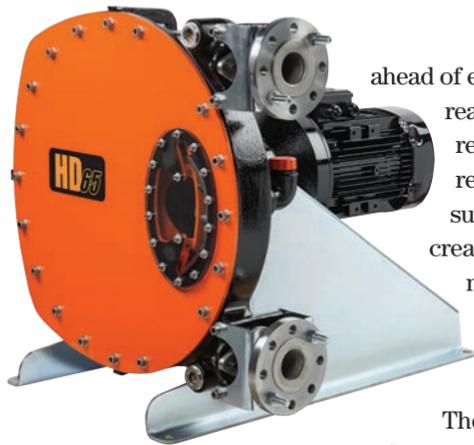
MODELS ADDED TO ABAQUE LINE

Mouvex, a manufacturer of positive displacement pumps, has added models to its Abaque peristaltic line for the chemicals industry that feature a stronger, durable rotor and an innovative hose holding system.

These self-priming pumps run in forward or reverse with suction-lift capabilities to 25.5 ft. (9 m), and can run dry without adversely affecting performance, pressure and accuracy.

They're made of ductile iron and stainless steel, and deliver discharge pressure up to 217 psi (15 bar).

Pumping action is achieved with the compression of a circular loop of elastomeric hose and two diametrically opposed rotating shoes that forces the fluid to move



Rotational motion pumping action.

ahead of each shoe. When each shoe reaches the end of the loop, the reinforced hose immediately returns to its original shape, ensuring suction and priming, and creating a strong vacuum pulling more fluid inside.

Hoses are made of natural rubber, Buna-N, EPDM and Hypalon.

The pumps come in 13 sizes with flow rates ranging from 15 to 77,000 l/hr (.07 to 339 gpm).

Mouvex is part of PSG, a Dover company, based in Auxerre, France. Dover Corp. is based in Downers Grove, Ill.

www.psgdover.com/en/mouvex/home



Heads up to 100 m.

NEXT-GEN PUMP FOR WASHING, DEGREASING

KSB's Etanorm V is a new generation of space-saving vertical-mount pumps for industrial applications such as washing or degreasing systems.

They install in tanks with the components submerged in the medium and the motor mounted in a dry location above the tank.

Wet models use hardwearing silicon-carbide shaft bearings lubricated by the medium. Dry models with what KSB describes as "generously" sized sealed ball bearings supporting the drive shaft are used where the product does not provide adequate lubrication.

Both types are intended for use with non-corrosive fluids that don't contain abrasive solid materials.

The hydraulic components have been optimized for energy efficiency while the mechanical layout simplifies maintenance and overhaul operations.

Etanorm V pumps have developed heads of up to 100 m and capacities as high as 740 m³/hr.

Material choices include cast iron or stainless steel for the volute casings and cast iron, stainless steel or bronze for the impellers.

KSB Pumps Inc., based in Mississauga, Ont., is a member of the KSB Group, a manufacturer of pumps, valves and systems.

www.ksb.ca

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LIGHTING

LED CANOPIES CUT COSTS

LEDtronics Inc.'s DLC, ETL-listed LED canopy lights with flat or prismatic drop lens cover both indoor and outdoor applications.

The manufacturer of LED lighting based in Torrance, Calif., cites energy savings of up to 75%. The wide-beam lamps come in 49 W for replacing up to 250 W old-technology HID or 89 W for replacing up to 400 W HID.

The lights create much less heat to reduce air conditioning requirements in plants or warehouses.

The luminaires provide 5,000 to 5,700 K pure white lighting ranging from 4,925 to 9,950 lumens. They operate from 100 to 277 VAC, and a temperature range of -40 to 50 degrees C.

The lights are equipped with input power surge protection and electronic instant-on light with no delay in re-strike.

They're housed in a die-cast aluminum enclosure and polycarbonate prismatic or clear lens and install easily with four attached, quick-mounting brackets. Solid state construction protects against shock, vibration, frequent switching and environmental extremes.

www.ledtronics.com



5,000 to 5,700 K
pure white light.

BACK-UP POWER

DC/UPS MODULE REPLACES BATTERY-BASED BACK-UP

Altech Corp.'s Ultra Capacitor Modules DC/UPS have five times the lifespan of traditional battery systems to provide reliable back-up power in industrial environments.

They're Din Rail mountable, maintenance free and carry none of the hazards



12 V and 24 VDC options.

of a battery. Standard units include 12 V and 24 VDC from 1,000 to 10,000 W of energy.

Extension modules are available to provide more energy if needed.

The modules are environmentally safe and withstand a temperature range from -40 to 65 degrees C without derating.

Double-layer construction adds an extra measure of strength and security.

Altech Corp. is a supplier of electronic and control components based in Flemington, NJ.

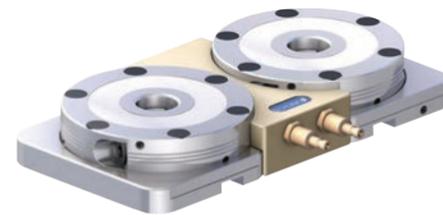
www.altechcorp.com

WORKHOLDING

VERO-S AN EASY RETROFIT

Schunk's VERO-S NSE pneumatic pallet mini-module at 20 mm (high) retrofits to existing machines, making full use of the engine room and direct clamping of small workpieces.

A fast stroke and a clamping stroke ensure a highly compact performance. The unit (90 mm in diameter with a clamping diameter of 200 mm) also has an integrated turbo function and pull-in forces up to 1,500 N.



Clamping diameter of 200 mm.

Large contact surfaces between clamping slide and pin minimize surface pressure in the unclamped condition, and prevents module wear. Locking is done mechanically via spring force.

Components are quickly exchanged in the machine, positioned, fixed and clamped at a repeat accuracy of less than 0.005 mm. Clamping height is adjustable with extensions, so the machine spindle reaches all five sides of the workpiece without special tools.

Functional components, base body, clamping pin, and clamping slide are made of hardened stainless steel and sealed to protect against chips, dust and coolant. The base plate has a bore hole for an air feed connection to blow off chips.

Schunk is a manufacturer of workholding and clamping tools based in Lauffen am Neckar, Germany, with Canadian operations in Mississauga, Ont.

www.schunk.com

MACHINING

BORING TOOL INCHES TO ENHANCED PERFORMANCE

Walter Tools' B3230 Walter Capto fine boring tool comes in inch sizes for enhanced machining performance.

The flexible, single edge precision tool comes in diameter ranges from 0.078 to 7.992 in. with an adjustment accuracy of 0.0001 in.

It features an internal coolant supply up to the cutting edge and indexable inserts adapted for precision boring.

The B3230 comes with the Capto modular toolholding interface, as well as NCT and ScrewFit, allowing all machin-

Have You Heard?

TRAINING & COACHING

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& **EACH OTHER**

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www.emccanada.org/connect

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MANUFACTURERS.
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Accuracy of 0.0001 in.

ing operations to be performed on lathes, machining centres and turnmill centres.

Walter is a manufacturer of metalworking tools based in Waukesha, Wis.

www.walter-tools.com

CONNECTORS

CONNECTORS PREVENT CROSSTALK

Harting's Ha-VIS preLink ethernet cabling system is wired to a termination block separately, then snaps securely into seven mating profiles (RJ45, PushPull RJ45, M12 D-coded, M12 X-coded, RJ45 Harting Industrial Form Factor, RJ45 Keystone and a preLink extender) for solid-stranded cable extensions and transitions.

Cabling is restricted to a single operation, whatever the intended mating profile. Wires are inserted into the preLink termination block according to colour codes. A crimping tool keeps the wires assembled precisely.

The system suits cramped spaces or junction boxes. Pre-assembled cable segments are swapped out quickly during maintenance and upgrades. It also provides future-proofing, such as installing an eight-



Multiple mating profiles.

wire cable into a four-wire format.

Re-terminations aren't necessary when upgrades are required, such as switching from fast to gigabit ethernet. The wired termination block is moved from a 4-pole D-coded M12 to an 8-pole X-coded M12 housing quickly. Unused pairs are shielded to prevent cross-talk.

The Harting Technology Group is a connector manufacturer based in Espelkamp, Germany. Harting Canada has a sales office in Montreal.

www.harting.com

MOTION CONTROL

CUSTOMIZABLE ACTUATORS DELIVER 7.7 KG OF THRUST

Haydon Kerk Motion Solutions' 21000 double-stack linear actuators take up just 0.8 sq. in. of space and deliver high performance and endurance for semiconductor handling, valve control, X-Y tables and handheld instrument applications.

They're compact and come in cap-



Resolutions from 0.025 to 0.4 mm.

tive, non-captive and external linear versions. A variety of resolutions ranging from 0.0025 to 0.04 mm per step to deliver thrust up to 7.7 kg. They can also be micro-stepped for even finer resolutions.

The actuators, which are customizable, have engineered thermoplastics in the rotor drive nut and are fitted with a stainless-steel acme leadscrew to improve motor efficiency.

Haydon Kerk Motion Solutions is a manufacturer of electronic instruments and electromechanical devices based in Waterbury, Conn.

www.haydonkerk.com

DUST COLLECTION

COLLECTOR CATCHES HEAVY DUST LOADS

The HemiPleat synthetic dust collector filter from Camfil Air Pollution Control (APC) combines a high efficiency synthetic media with a proprietary open-pleat technology to make easy work of harsh and humid environments.

The media resists moisture and handles heavy dust loading conditions and/or hygroscopic or sticky dusts in food, pharmaceutical and other industrial processes.

A lightweight, 100% spun bond polyester pleated media maximizes surface area while maintaining open pleat spacing. Wider spacing exposes more media to the air stream to lower pressure drop and improve dust release in pulse cleaning.

The media is washable, reusable and handles temperatures up to 70 degrees C.

There's a standard media version or a nano fibre version that uses Camfil APC's "eXtreme" technology. The nano fibre layer enhances surface loading of dust to keep most particles from embedding in the base media.

Standard media is rated at MERV 11 and the nano fibre version at MERV 15 based on the ASHRAE 52.2 test standard.

They're available for Farr Gold Series dust collectors or retrofitting.

Camfil APC is a manufacturer of dust and fume collectors based in Jonesboro, Ark.

www.camfilapc.com



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POWER SUPPLY

IMPROVED FEATURES POWER TOUGH WELDING JOBS

Miyachi America's IS-800CR/IS-1400CR mid-frequency inverter power supplies are equipped with an improved feature set to keep aerospace, electronic automotive, battery and appliance applications running.

The 800 A IS-800CR outputs power from 0.050-40k A in four ranges, and is used as a standalone, large scale welding station. It's also used in applications that require welding different sized parts on the same station, especially those that require closed-loop feedback control and fast response times.

The 1400 A IS-1400CR version provides

050-80 kA of power in five ranges for the same applications as the CR model, as well as those requiring higher currents, such as aluminum, copper and projection welding.

There are six control modes (primary limit, primary and secondary root mean square, secondary constant power, secondary voltage control, and fixed pulse), two valve outputs and a controlled repeatable waveform, which is adjustable from 600 to 3,000 Hz in 100 Hz steps.

The power supplies, housed in a NEMA-rated enclosure, are equipped with circuit breaker and primary short circuit protection.

Amada Miyachi America Corp. is a manufacturer of welding equipment and systems based in Monrovia, Calif.

www.miyachiamerica.com



Closed-loop feedback control.



Approved to EN 60950.

POWER SUPPLIES PROVIDE OVER-VOLTAGE PROTECTION

MicroPower Direct's 250 W AC/DC MPU-250S power supplies come in four models that operate from auto-ranging inputs of 90 to 132 VAC or 180 to 264 VAC for tightly regulated single outputs. They're factory set to 12, 15, 24, or 36 VDC.

The supplies measure 5 x 3.2 in. in a U-Channel configuration for high power density and the safety approvals required for operation in tight spaces.

FCC class B emissions, power factor correction to EN 61000-3-2 A, I/O isolation of 3,000 VAC, and 20 mS hold-up time are standard. All versions are approved to EN 60950 and are protected for over temperature, over load, over voltage and short circuit faults.

Interface signals for "Power On" and "Power Good" are provided, as well as a driver output for an external fan.

With only 16 cfm airflow, the power supplies provide 250 W of output power and operate in temperatures between 0 to 70 degrees C.

MicroPower Direct is a distributor of power conversion and supply products based in Stoughton, Mass.

www.micropowerelectronics.com

CAMERAS



Full HD 1080p.

3D CAMERAS OVERCOME POOR LIGHTING

Moxa's VPort 56-2MP, full-HD, 1080p IP zoom camera for indoor and outdoor mission critical applications withstands a -40 to 75 degrees C temperature range

without a cooling fan.

An optional IP68 and/or ATEX Zone 1/Class 1, Division 1 compliant housing meets rigorous international code requirements.

The camera also works as an IP positioning system with PTZ capability and two-way audio using an optional built-in fibre interface and PT scanner accessory.

The fibre port extends network distances up to 140 km.

Built-in 3D digital-noise reduction and 10 x optical zoom/16 x digital zoom enhances clarity and precision to unique applications. A Sense Up ICR and image stabilizer overcome poor lighting conditions.

The camera supports ready-to-use NVR and VMS software for video surveillance systems, and provides a variety of software development kits for use with third-party VMS and SCADA software. Industry standard ONVIF specifications are also supported for faster integration.

Moxa is a developer of industrial networking and vision tools based Brea, Calif.

www.moxa.com

BEARINGS

BIMETAL BEARINGS ARE LEAD-FREE

GGB Bearing Technology (formerly Glacier Garlock Bearings) has expanded its lead-free, bimetal line with its GGB-SZ bearings.

This alternative to the SY lead-bronze bimetal bearing has a tin-bismuth-bronze sliding layer sintered onto a steel backing. It provides high-load capacity, particularly high specific loads with low frequency and oscillating motion.

The new bearings have a broad temperature range with what the company describes as "very good" fatigue resistance at higher temperatures, plus good corrosion resistance. Applications include agricultural and construction equipment, textile machinery, pneumatic equipment, king pins, brake callipers, oil pumps and small end bearings.

The GGB-CBM series is based on a range of bronze alloys, with a choice of stainless, carbon, seawater-resistant steel and bronze backings.

The bearings are manufactured using a powder metallurgy process to produce a metallic matrix with homogeneously

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METALWORKING

HOLE PUNCH IN 4 SECONDS

Hougen Manufacturing Inc.'s Hougen-Ogura 75006PR punches holes in steel in as little as four seconds.

The lightweight, electric hydraulic puncher has a power retractable system that reverses out of holes punched in harder, more elastic materials that tend to grip after the hole is made.

Only electrical power operates the motor and the self-contained hydraulic system. No additional hydraulic pumps or hoses are needed.

The 75006PR provides 26.9 tons of punching pressure for round holes up to 15/16 in. (23.8 mm) in diameter and oblong holes up to 11/16 x 13/16 in. (18 x 21 mm). Maximum material thickness is 1/2 in. (12.7 mm).

The unit, which weighs 62.9 lb. (28.5 kg), punches holes in flat bar, H-steel, angle iron and channel. It comes in 120 and 230 V with a work stand for placement on a worktable and a foot switch for hands free operation.

Hougen Manufacturing, based in Swartz, Mich., is a manufacturer of portable magnetic drills and annular cutters.

www.hougen.com



Reverses if needed.

TEST AND MEASUREMENT



Scans 400 mm per second.

**ZIPLINE GIVES
CWS APPLICATIONS ZIP**

Honeywell Process Solutions' next-generation ZipLine scanning measurement device handles continuous web applications such as plastics, films, non-wovens and other flat-sheet work, scanning up to 400 mm/sec. for

high-res basis weight profiles.

The industrial automation company says the self-contained unit measures flat sheets without the cost, size and complexity of traditional scanners at high speeds.

It's small and has flexible mounting options, but uses the same sensors as Honeywell's traditional flat sheet scanners.

ZipLine replaces the rigid O-frame structure of traditional scanners with tensioned stainless steel cables that support intelligent, self-driven measurement modules. Tensioned cables are also used to supply power and secondary support.

A secure Wi-Fi network communicates between the modules and support system and an onboard compressor provides air to the sensor to eliminate the need for a moving power track to manage cables and hoses.

Honeywell Process Solutions develops

industrial automation control and instrumentation technologies in Morristown, NJ.

www.honeywellprocess.com

**METER COMPENSATES
FOR ANOMOLIES**

Precision Digital Corp.'s PD6100 and PD8-6100 strain gauge meters handle weight, millivolt, and force measurement applications.

The meters compensate for anomalies, such as sludge buildup at the bottom of an empty tank, thanks to a tare/reset tare function.

They power up to 12 (350-ohm) load cells and their dual-scale function displays two units of measurement.

The company, a manufacturer of display and instrumentation products based in Holliston, Mass., says the PD6100 is best-suited for weighing applications in large bins, tanks or scales because it allows load cells to be aver-

Up to 12 load cells.



aged to determine weight, volume or level.

The explosion-proof PD8-6100 version is NEMA 4X and IP68-rated for hazardous or harsh environments.

Both perform automatic unit conversions when switching between pre-defined units, such as pounds, kilograms and tons, without additional scaling.

Both models also accept mV input signals up to 300 mV (unipolar) and ±250 mV (bipolar), and are rated for a current of 350 mA at 10 V.

www.predig.com



Tin-bismuth-bronze sliding layer

distributed solid graphite lubricant, forming a film during motion.

Applications include steel works and civil engineering, turbines (water, steam and gas), pumps and compressors, food and beverage equipment, packaging and handling equipment, and general mechanical engineering.

GGB, based Annecy, France, manufactures high-performance, self-lubricating and prelubricated bearings.

www.ggbearings.com

FASTENERS

FASTENERS EASE SHEET-TO-SHEET ATTACHMENT

PennEngineering's microPEM TackPin Type T4 self-clinching fasteners handle hardware stainless steel or higher-strength aluminum alloy sheets for sheet-to-sheet attachment in compact electronic assemblies wherever disassembly will not be required.

They eliminate typical screw-related issues, including costly tapping, cross threading, torque control, and vibration back-out, and give designers practical alternatives to welds or adhesives.

The RoHS-compliant fastener's head will then hold the top sheet (as



RoHS-compliant.

www.plant.ca

thin as 0.2 mm) permanently. The base panel can be as hard as HRB 88 or less on the Rockwell "B" scale and at least 0.89 mm in thickness.

Manufactured from 400 Series stainless steel, the fasteners install easily by preparing properly sized mounting holes in the sheet to be attached and the base panel. After inserting the fastener into these holes, squeezing force is applied to complete installation.

PennEngineering is a fastener manufacturer based in Danboro, Pa.

www.pemnet.com

TRANSMITTERS



Pressure ranges up to 20,000 psi.

GENERATE PRESSURE AND TEMPERATURE READINGS

American Sensor Technologies' AST46PT explosion-proof pressure/temperature transmitter provides outputs from a single process point to reduce the number of components during installation, trim inventory stock and build times.

The dual output transmitters generate pressure and temperature reading with the power consumption of one sensor for low power systems.

A dual output configuration reduces process penetration points and leaks, which must be considered in critical systems involving hydrogen, oxygen, heavy oil processing, hydraulics, analyzers, offshore, pipelines and ammonia systems.

A microprocessor-controlled design and one-piece body construction provides high accuracy pressure and temperature measurements of +/-0.1% and 1.0% BFS. Units are available in various temperature ranges from -40 to 125 degrees C and pressure ranges up

to up to 20,000 psi (1,400 Bar).

They're CSA-approved for hazardous areas including Class 1 Div 1 Explosion-proof Groups A, B, C and D, and Class 2 Div 1 Groups E, F and G for mining applications.

The transmitters are constructed in a range of wetted materials, including stainless steels and super alloys such as 17-4PH SS, 316L SS, Inconel 718, Waspalloy, and Hastelloy C-276.

American Sensor Technologies is a manufacturer of sensors, transducers and transmitters based in Mount Olive, NJ.

www.astensors.com

3D PRINTING

EXTEND YOUR 3D PRODUCTION

Stratasys Ltd.'s Xtend 500 Fortus Plus material streamlines 3D production with fewer material changeovers.

Each Xtend 500 box contains 500 cu.-in. of FDM thermoplastic for more than five times the output of standard canisters. Two material boxes loaded into a Fortus 3D Production System provide up to 400 hours of unattended run time and up to 1,000 cu. in. of material use.



Increase output.

The boxes are available in ABS-M30 (ivory or black) and PC with support materials for the Fortus 450mc 3D Production System.

Xtend 500 can also be used with Fortus 360mc, 400mc and 900mc 3D Production Systems with a Fortus Plus system upgrade.

Stratasys, based in Minneapolis, is a global provider of 3D printing and additive manufacturing solutions.

www.stratasys.com

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PARTICLE SEPARATION



One-person operation.

SIMPLIFY LIFT IN SEPARATION SYSTEMS

SWECO's QuickChange PT turns screen changes into a one-person operation with a pneumatically powered system operated by simply turning a switch.

Two air cylinders, self-contained within towers, are mounted independently on each side of the unit. The end of the cylinder rods raise up from the towers to engage a bracket on the cover or frame and lift the frame stack.

Features include motor start up interlock, slow raising and lowering of cylinders and an internally adjustable pressure regulator.

The QuickChange PT has a smaller footprint than previous systems and is available in both carbon and stainless steel 48- and 60-in. units.

SWECO is a manufacturer of particle separation and size reduction products based in Florence, Ky.

www.sweco.com

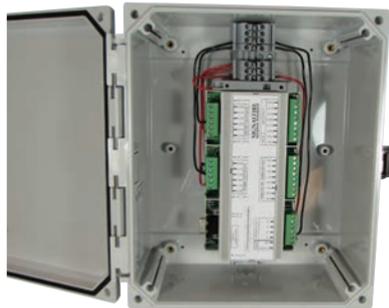
CHEMICALS

SIGNALFIRE OPTIMIZES CHEMICAL INJECTION PROCESS

Chemical injection is critical to the oil field production process and the second highest operational expense, where chemicals are pumped at high pressure into a well to mitigate issues such as paraffin or scale reduction, H₂S mitigation and corrosion inhibitors.

SignalFire Wireless Telemetry's Chemical Injection System monitors and controls the process to provide a known and measured dosing rate, plus diagnostic information for pump performance and operating status.

The system automatically calibrates and monitors pump operation to maintain a specified injection rate that may be slaved to production rates. The control and diagnostic systems also provide visibility into monitoring conditions at the injection site, and verifying and recording that the process is working to specifications.



Wired or wireless monitoring.

Tank level is also monitored to alert when a refill is needed and that it was accurate.

Monitored remotely, control parameters are set from either a local RTU/SCADA system or a central service, such as Wonderware or CygNet. The system is also integrated into SignalFire's Remote Monitoring and Control System for wireless pad automation.

SignalFire Wireless is a manufacturer of wireless telemetry products based in Hudson, Mass.

www.signal-fire.com

VISION

HMIs PROVIDE COMPLETE PANEL CUSTOMIZATION

EAO Corp.'s Series 82 pushbutton Human Machine Interface (HMI) is engineered from the inside out to resist harsh industrial environments.

Made with RoHS-compliant materials, the Series 82 is approved to UL, cUL and CE requirements.

An all-metal front provides IK10 shock protection with an IP67-rated enclosure, and HMI handles temperature fluctuations from -30 to 70 degrees C, with humidity up to 85%.

Control panel designers are able to customize aesthetics through a range of sizes, lens profiles, illumination styles and finishes, such as 16-, 19- and 22.5-mm diameter industry standard mounting hole sizes, and momentary or maintained switch action.

The HMI handles up to 5 A/250 VAC



IK10 shock protection.

and provides Sunlight readable LED illumination in dot or ring style versions.

EAO Corp. is a manufacturer of HMI systems based in Olten, Switzerland.

www.eao.com

WELDING

MASK ACCESSES CONFINED SPACES

The low-profile Weld-Mask with its auto-darkening goggles from Miller Electric Mfg. Co. allows welders to access spaces where a traditional helmet wouldn't fit.

Use it for gas welding and cutting, as well as light-duty MIG, TIG and Stick welding.

The lightweight WeldMask, usable under hard hats without an adapter, reduces neck strain and a tight-fitting eye covering blocks out light



Auto-darkened goggles.

from the welding or cutting arc. A flame-retardant head cover protects against UV/IR rays and light spatter, while the replaceable silicon skirt ensures a comfortable fit for a variety of face profiles.

Shade numbers include 5, 7, 9, 11 and 13, and a light state shade number 3 for clear vision between welding or cutting. A lens frame is included for the easy addition of a prescription or magnifying lens.

Two sensors and a switching speed of 1/15,000 seconds ensure consistent protection.

Battery life is 1,000 hours.

The Weld-Mask meets ANSI, CSA, CE and AS NZ standards.

Miller Electric, headquartered in Appleton, Wis., is a manufacturer of arc welding products.

www.millerwelds.com

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» Events

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Sept. 21-24, Vancouver

Hosted by the Plant Engineering and Maintenance Association of Canada (PEMAC). Join leading experts, practitioners and professionals for knowledge transfer, technical training and networking. Visit www.maintrain.ca.

CMTS 2015

SME

Sept. 28-Oct. 1, Mississauga, Ont.

The Canadian Manufacturing Technology Show (CMTS) presented by SME features the latest in machine tool, tooling, metal forming and fabricating, automation, 3D printing/additive manufacturing, design engineering and plant management segments from more than 700 suppliers. Visit www.cmts.ca.

Industry Summit

PTDA

Oct. 21-24, Chicago

The Power Transmission Distributors Association hosts this event, which features networking and business solutions. Visit <https://www.ptda.org>.

CESCF 2015

JuneWarren-Nickle's Energy Group

Oct. 27-29, Calgary

The Canadian Energy Supply Chain Forum (CESCF) brings together buyers and sellers along Canada's energy supply chain. Visit www.supplychainforum.ca.

Advanced Manufacturing Canada

SME

Nov. 18-19, Montréal

The conference focuses on advanced manufacturing technologies, including automation and robotics, additive manufacturing/3D printing, materials and software. Visit www.advancedmfg.ca.

ISCEA Supply Chain Technology

Conference and Expo

ISCEA

July 16-19, Chicago

ISCEA's annual gathering of supply chain, operations, engineering, and financial professionals will come together to share cutting edge technologies and best practices focusing on efficiency and profitability. Visit www.sctechshow.com.

STRUCTURED WORK WITHIN A TEAM

The integration of the Team Foundation Server platform into B&R's Automation Studio software development environment makes it easier to versionize individual software components and ensure adherence to defined sequences.

Essential for structured development within a team, a source control system guarantees clearly defined development versions while preventing errors such as unintended overwriting or the use of out-dated modules.

Manually saving different versions and writing up change logs for each is time-consuming and error-prone. The TFS adapter for Automation Studio provides software developers a way of leaving tedious version management tasks up to the system, making synchronization easy thanks to the software's integrated comparison mechanisms.



Version 6.0 of configuration software.

Uniform, user-defined workflows also ensure real-time information is available and prevent the distribution of unreleased versions. The development process itself is traceable through history logs, helping developers retain an overview of their current tasks.

Along with the integration of version management software, it also supports continuous integration, which compiles the application, performs unit testing and creates reports each time a check-in procedure takes place to identify potential errors and correct them quickly.

B&R is a developer of automation products based in Atlanta.

www.br-automation.com

C-MORE HMI ADDS FUNCTIONALITY

Version 6.0 of the C-more HMI configuration software from AutomationDirect adds functionality and usability with more alarm and recipe features, additional math and tag logic, plus improved Windows compatibility.

New tag combinations added to the event manager allow for simple logic with multiple events. Combine up to four different tags to trigger actions based on logical results, going beyond simple alarm and message functions. Actions can be taken on a screen change, a set date or time, a single tag status or value, and now on a combination of tag status or values.

New math functions add more computing power to the project. Create custom formulas with constants or tag values, or use the math keypad for access to simple and complex operations including log, sine and square root.



Version 6.0 of configuration software.

An enhanced alarm list provides more options for customization and with new alarm filters you get dedicated summaries. Operators interact with alarms that have occurred and view, confirm or clear them. Alarms include specific messages with embedded PLC tag data, as well as date and time information for the alarm status.

Added accessibility includes a new object layer list window that shows objects on the active screen. They can be locked/unlocked, hidden/unhidden and quickly selected for editing.

It also allows access to individual objects in a group without ungrouping and contains additional lists for hidden, locked or overlapping objects. New recipe functions access databases containing 99 recipe sheets, each with 1,000 recipes of 256 possible tags or values are modified and saved on-the-fly while the machine is running.

AutomationDirect is a distributor of industrial automation products based in Cumming, Ga.

www.automationdirect.com

NEW CATALOG OFFERS INTELLIGENT COMPRESSED AIR SOLUTIONS



Catalogue 28 offers solutions to common industrial cooling, drying, blowoff and static problems, and includes many products that conserve compressed air and eliminate harmful dead-end pressures. Featured products include 1/2

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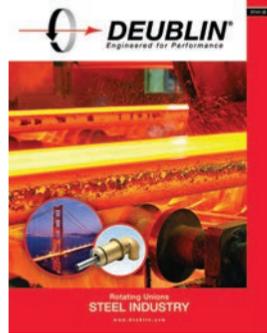
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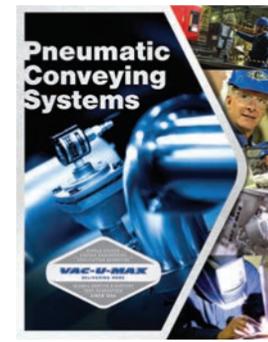
STEEL MANUFACTURING ROTATING UNION CATALOGUE AVAILABLE



A new catalogue of rotating unions for steel manufacturing applications is now available from Deublin Company, in both print and electronic versions (see below). The catalogue provides detailed operating information and specifications for several

model numbers and sizes, along with installation instructions. www.deublin.com/product-support/request-a-catalog/
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AUTOMATED SYSTEMS FOR CONVEYING



This brochure offers a detailed overview of the VAC-U-MAX range of pneumatic conveying components and automated systems for conveying, weighing and batching of powders and bulk materials in food, pharmaceutical, chemical and petrochemical processes. <http://www.vac-u-max.com/landingPneumatic.cfm>

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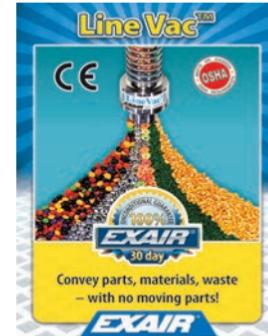
NEW IN THE RITTAL TECHNOLOGY LIBRARY



As Industrial infrastructure changes, the basic "Enclosures" do as well. The aim becomes to modernize the "Old Grey Box" into a scalable, modular and efficient industrial enclosure solution. Rittal's "Technical Aspects of Enclosures" guide aims to help you develop your industrial enclosure solution to ideally match your application requirement. www.rittal.ca

Rittal

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Line Vac air operated conveyors are the low cost way to transport complex shapes, bulk solids and waste – with no moving parts or electricity. Units eject a small amount of compressed air to produce a vacuum on one end and high output flows on the other with instantaneous response. Construction is aluminum, Type 303 or Type 316 stainless steel. New wear resistant models with high conveying rates are also available. www.exair.com/18/164.htm

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Ont. spending itself into economic crisis

BY NIELS VELDHUIS

Ontario Premier Kathleen Wynne has a new advisor: former TD Bank CEO Ed Clark, according to *The Globe and Mail*. Clark will apparently advise the government on a host of issues, including finding new revenue sources to balance the provincial budget.

We hope Clark, a well-respected business leader, does not believe the popular myth that Ontario policymakers are blameless for the massive debt accumulated by the province. As the myth

“Had spending increases been held to the rate of economic growth... Ontario would have a \$4 billion surplus today...”

goes, the province’s annual deficits and mushrooming debt are driven by forces outside of anyone’s control. Rectifying the problem is simple: the government needs to find more revenue.

In 2010, Clark favoured hiking the GST to combat the federal deficit, a recommendation that showed a surprising lack of understanding about the real source of the federal deficit.

The recession depleted federal rev-

enues significantly in 2009/10, but the decline was short-lived and revenues rebounded within two years.

Despite the rebound, the federal government will only balance the budget this coming fiscal year.

The real problem was the massive ramp-up in spending that was supposed to be “temporary” but wasn’t.

Ontario is currently running a \$10.9 billion deficit. Many think it’s the result of

a lack of revenue. That’s why the Ontario Liberals have been desperately seeking new revenues and recruited Clark to help.

But the current deficit is not driven by a lack of revenue. Ontario has a spending problem.

Over the past 10 years, the Ontario government has increased spending at an average rate of 4.6% a year, well beyond what was needed to compensate for population growth and cost increases, and well beyond the rate of economic growth.

Had spending increases been held to the rate of economic growth (averaging 3.1% annually), Ontario would currently be spending \$104 billion a year instead of the nearly \$119 billion it plans to spend this year.

That’s a difference of \$15 billion, more than the current \$10.9 billion provincial deficit. Had spending increased more prudently, Ontario would have a \$4 billion surplus today.

Spending into crisis

Ontario’s coffers remain in the red because it has not managed its spending.

Of course, the narrative at Queen’s Park is completely different. Policymakers say they have been hamstrung by the global restructuring in manufacturing and other external factors, implying that the government is not to blame for its ballooning debt.

If that were true, other jurisdictions such as the Rust Belt states of Pennsylvania, Ohio, Indiana, Michigan and Illinois would be in similar situations. But they’re not.

In fact, many Rust Belt states are more reliant on manufacturing than Ontario, and they’re more sensitive to the global restructuring.

Ontario’s economy has actually grown faster than its Rust Belt counterparts and yet these states have been much more fiscally responsible. From 2000/01 to 2012/13 (a period of both good and bad economic times), Ontario’s annual deficit averaged 4.2% of its annual budget. Ohio and Indiana ran surpluses while Michigan and Illinois ran small deficits.

As a result, Ontario’s net debt was 36% of GDP in 2011/12, the last year of comparable provincial-state data. Every Rust Belt state had government debt of 5% of GDP or less.

Ontario’s red ink stems from poor fiscal policy, not external forces. To solve the problem, the government needs to strike at its root, which is irresponsible spending. This is the message Clark, a man who no doubt understands the need for families, businesses and governments to be prudent, should bring to the premier.

Niels Veldhuis is president at the Fraser Institute. Co-author Ben Eisen is a senior policy analyst. Visit www.fraserinstitute.org. This column is distributed by Troy Media.

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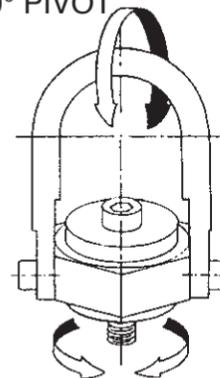


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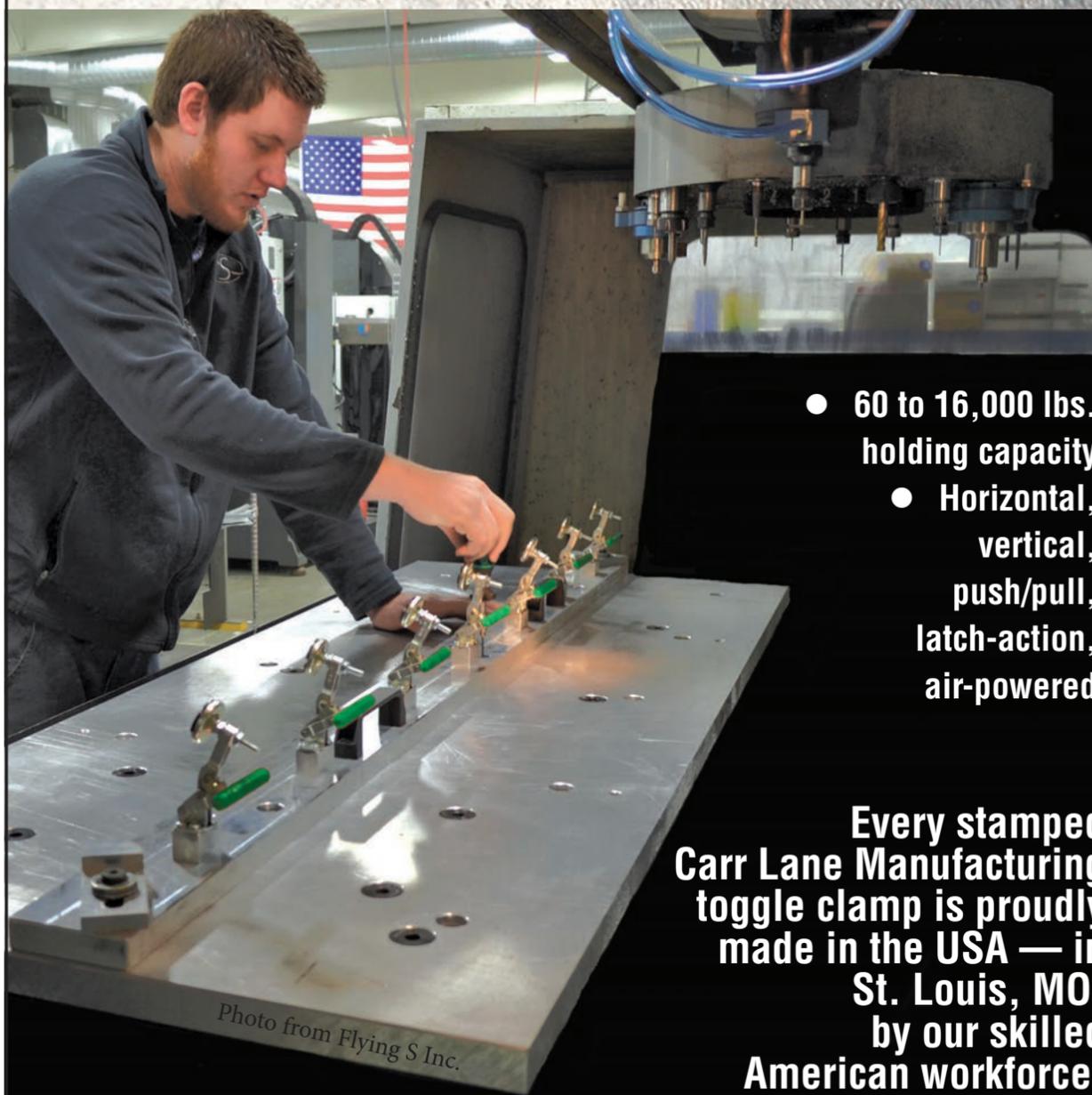


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