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PLANT

ADVANCING CANADIAN MANUFACTURING

Volume 73, No. 01 January/February 2014

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ahead of the auto
aftermarket curve

NEW TECHNOLOGY SECTION

CIEN

CANADIAN INDUSTRIAL EQUIPMENT NEWS

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Eco Solutions gives winter ice a good beating
MRFC system tackles renewable power storage
Organic beads clean up oil sands waste
Beware the Russian Bear's hunger for investment

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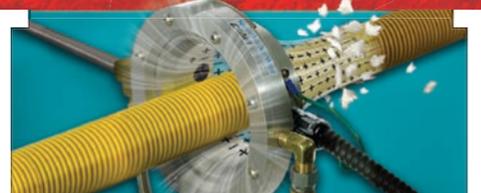


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Off-key on the oil sands

There will be many nodding heads and fingers pointing at climate change to account for some of the extreme weather we have experienced early into our Canadian winter. So how timely was it for rock troubadour and Canadian citizen Neil Young to roll through several of our towns in January to advise us that fossil fuels are dirty, that the oil sands is very dirty indeed, and its development is stepping on First Nations treaties while messing up their lands?

He caught a lot of flack for his off-key slagging of the oil sands, comparing its effect on the natural environment to a nuclear-wasted Hiroshima; and that the bitumen destined to flow through the proposed Keystone XL pipeline to Texas refineries would wind up going to China, which he called one of the dirtiest countries on Earth because of the high levels of pollution. Never mind that he got the destination wrong (the filthy bitumen is destined for North American use). The resulting rhetoric that escalated between pro- and anti-oil sands interests did serve to enliven a discussion that should focus on the world's continuing reliance on fossil fuels rather than from where the stuff comes.

Indeed, fossil fuel consumption will grow from 524 quadrillion btus in 2010 to 630 quadrillion in 2020 and 820 quadrillion by 2040, according to Environment Canada's National Inventory Report, so the main beef folks such as Neil have with the oil sands seems to be its dirt level.

For the record, oil sands developments are intrusive and offer some harm to the environment. Although oil sands production is "dirtier" than conventional fossil fuel extraction, energy companies are pouring massive investments into environmental remediation (some question the effectiveness of their efforts) and lowering the intensity of emissions per barrel (now 26% less than 1990). They are doing so to a point, notes an IHS report, where levels in new developments are only slightly greater than the average barrel produced in the US, and no worse than Venezuela.

But just behind the fossil fuels industry, responsible for 51% of the 111 million tons of Canada's emissions growth between 1990 and 2011, we can blame transport, including our driving more and a preference for light-duty trucks for 49%, along with the automotive sector's slow response to provide alternatives for conventional combustion engines.

This is where Neil puts his money where his mouth is. He converted a 1959 gas-guzzling Lincoln Continental into a plug-in hybrid using E 85 bioethanol fuel, which – incidentally – he drove to the oil sands. So let's thank him for using his rock star money to make the point that technology can wean us off the pump.

In Canada, the move is on to do so. By 2025, passenger vehicles and light trucks will have to expel 50% fewer emissions than 2008 models, which is in line with the US where California emissions laws and President Barack Obama's requirement that vehicles deliver 54.5 mpg by the same date have encouraged automakers to pick up the pace on delivering greater fuel efficiency. They're doing this through light-weighting and other means, while accelerating the R&D of more innovative hybrids and straight-up electric vehicles.

But the assumption is that much of the fuel for the vehicles we drive in the future will be derived from gasoline, so until someone invents a commercially enticing version of a Back to the Future-style DeLorean with a flux capacitor that runs on trash, there will still be a need for Canada's oil sands output.

As for Neil, he'll likely continue to lament our reliance on oil production and the damage done. There's probably a song there.

Joe Terrett, Editor

Comments? E-mail jterrett@plant.ca.



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PLANT

ADVANCING CANADIAN MANUFACTURING

Vol. 73, No. 01, January/February, 2014

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PLANT—established 1941, is published by BIG Magazines LP, a division of Glacier BIG Holdings Company Ltd.
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Printed in Canada
ISSN: 1929-6606 (Print), 1929-6614 (Online)

» Bulletins

Molson – Coors Brewing Co. will be using energy saving technology developed by Sherbrooke, Que.-based Novacab International Inc. at its Montreal plant to store electricity thermally. It will be integrated into the brewing process.

Bombardier Transportation, the Montreal transportation company's rail division based in Berlin, has entered into a US\$4.1 billion consortium deal with the State of Queensland in Australia for its New Generation Rollingstock Project. Bombardier's \$2.7 billion share includes the supply of 75 electrical multiple units, a new depot and maintenance for 30 years.

Great Western Minerals Group Ltd., a Saskatoon-based manufacturer of rare earth element-based metals and metal alloys, is reporting a successful test of its proposed process flow sheet at its mini-pilot plant in South Africa, where it has a rare earth asset. Study continues at the Steenkampskraal project and is on track for completion this year.

Willis Energy Services in Vancouver has changed its name to CLEAResult, after joining the company in 2012. The Austin, Tex.-based CLEAResult companies design and implement energy efficiency programs for utilities and their customers.

Conifex Timber Inc., a Vancouver-based forest products company, has acquired Lignum Forest Products LLP, a private partnership for \$4 million. The company, which operates a lumber marketing and distribution business, is also based in Vancouver and has extensive market reach in North America.

ACT Aurora Control Technologies, a manufacturer of inline measurement systems for the photovoltaic industry based in North Vancouver, is partnering with Hauman Technologies Corp., a supplier to major photovoltaic product manufacturers, to build its presence in the Taiwan market.

Saputo Inc., a Montreal-based producer of dairy products, is acquiring the fluid milk business of Scotsburn Co-Operative Services Ltd. for \$61 million. It operates two fluid-milk processing facilities in Sydney, NS and Mount Pearl, Nfld. that employ 400 people. The Nova Scotia co-operative will continue making its frozen ice cream and frozen novelties products.

Ford's 2015 F-150 truck takes a load off

Aluminum body and high-strength steel frame drop 700 lb.

DETROIT: Ford has lightened its 5,000-pound 2015 F-150 truck by 700 pounds with aluminium alloys and more high-strength steel in the frame to make the vehicle more energy efficient.

The Detroit-based automaker has increased the use of high-strength 70,000-psi steel from 23% to 77% for a weight reduction of up to 60 pounds. But the big innovation is the use of high-strength, military-grade, aluminum alloy for 97% of the body, which combines with the frame for a weight reduction of up to 700-pounds.

The Ford Motor Co. says its four-door F-150 has 660 pounds of aluminum, or nearly double the average use of aluminum per vehicle used now, according to Drive Aluminum, an industry web site.

The reduced weight allows the F-150 to tow and haul more while also improving acceleration, braking and handling. Plus, aluminum alloys don't rust and are resistant to corrosion.



F-150's new 70,000 psi steel frame.

PHOTO: FORD

Despite the higher cost of aluminium compared to steel, Ford truck marketing chief Doug Scott says the F-Series will stay within the current price range, reports The Associated Press. The company expects to make up the premium by reducing its recycling costs because there's less metal, and by slimming down the engine and other components, since they won't have to move so much weight.

The 2015 F-150 goes on sale late this year.

This ice truck is one cool ride

Silverado gets a frozen retrofit for a Canadian Tire ad



A 2005 Silverado gets iced for a winter cruise.

PHOTO: ICECULTURE

HENSALL, Ont.: Have you seen the Canadian tire commercial aired through January that features a pick-up truck that appears to be made out of ice? That's not some sort of TV trick.

It's the work of three Ontario companies, including Icecul-

ture Inc., a manufacturer of ice products that outfitted the 2005 GMC 2500 Silverado with an ice makeover for a TV commercial promoting Motor Master Eliminator Ultra batteries.

The truck was purchased in Texas by Bronson Line Autom-

tive Ltd. in Zurich. The body and cab were removed, modifications were made to lower the overall height and width of the engine compartment, the chassis was repainted and the electronics were adjusted.

The truck chassis then went to St. Catharines where Pick Me Productions, specialists in extreme prop making, fitted it with a steel frame to support the ice. A wood replica of the chassis was also made so ice for a second truck could be built at the same time.

Hensall was the next stop where Iceculture CNC technicians and a crew of designers and ice carvers took over. First step was to encase the engine in ice to test what effect running a warm engine might have in an enclosed, frozen environment. Special fans were incorporated to provide additional airflow to help remove hot air and any exhaust fumes.

After the commercial was shot, a replica was put together to make a four-kilometre run under police escort between Hensall and Zurich in Huron County. The trip may earn the ice truck a spot in Guinness World Records.

Post road trip, the vehicle was taken to Detailers in Zurich where it melted over 40 hours, the whole process was recorded by time-lapse photography.

Visit www.canadiantire.ca to see the coolest ride in Ontario.

Husky Energy proceeds with thermal plants

CALGARY: Husky Energy has green-lighted two heavy oil thermal projects in Saskatchewan, which will deliver a total of 20,000 barrels per day (bbls/d) by 2016.

Construction of the 10,000 bbls/d Edam East and the 10,000 bbls/d Vawn projects will begin this year.

The two new plants will be nearly identical to Husky's Pikes Peak South and Rush Lake projects, both of which realized operating costs under \$10 per barrel in 2013.

They are part of the Calgary-based energy company's plan to produce 55,000 bbls/day from thermal projects by 2016.

Steaming is already underway at the 3,500 bbls/d Sandall thermal project with first production expected this quarter, and construction is advancing at the 10,000 bbls/d Rush Lake project, with first oil to be produced in the second half of 2015.

» Feedback

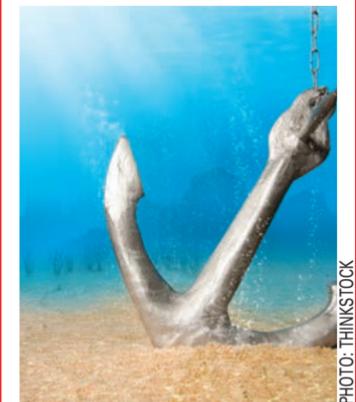


PHOTO: THINKSTOCK

ANCHORS AWAY? BETTER THEY STAY

Re: November/December 2013 Anchors AWAY, "Davie Yards sails into high-tech waters... that make anchors unnecessary!"

Oh, really?

I suppose next these Davie ships will levitate above water and be unsinkable so life rafts will also be unnecessary! An anchor is a vital safety device. Let's see a Davie ship make it through a Canadian Steamship inspection without one.

Also, if you take a cruise, tell your captain you'll feel much safer on board if they left the anchors behind on the dock!

Jean-Guy Audet
Audet Welding Ltd
Charlo, NB

We'd like to hear from you. Send letters to j.terrett@plant.ca with your name, address and phone number. Letters will be edited.

Four manufacturers score funding

OTTAWA: Funding is flowing through federal government programs to boost the competitiveness of four manufacturers.

Automatic Coating Ltd., a Toronto-based manufacturer of pipeline coating equipment, received \$50,000 through the Canadian Manufacturers & Exporters' (CME) SMART Prosperity Now (SPN) program for the re-launch of its Flex Line, which combines the abilities of several locating lines into one. This will provide greater flexibility and opens up space to build automated products.

The company's total investment was \$403,360.

In Thetford Mines, Que., Innotek Inc. received \$160,000 in repayable funding under the Canadian Initiative for the Economic Diversification of Communities Reliant on Chrysotile to boost the productivity and capacity of its biodiesel manufacturing plant.

The contribution will help Innotek make leasehold improvements and acquire new plant equipment.

Box spring manufacturer Rosaire Tessier & Fils Inc. received \$136,450 in repayable funding through the federal Quebec Economic Development Program.

The company, which manufactures wood-frame box springs for Quebec's main mattress companies, renovated a recently acquired building and purchased new equipment, including an automatic strip nailer and compressors, to automate a portion of its production line.

In Sainte-Christine-D'auvergne, Que., Maple Leaf Charcoal Inc. received \$250,000 in repayable funding through the Quebec Economic Development Program to improve the productivity of its charcoal manufacturing operations.

The project will help the company improve productivity and create five new jobs.

Businesses divided on skills gap

TORONTO: A shortage of skilled workers is the single biggest issue facing Canadian executives in 2014 but employers are split on how to address the skills gap, according to a new survey by the Canadian Education and Research Institute for Counselling (CERIC).

The telephone poll of 500 Canadian business leaders conducted by Environics Research Group shows the shortage is a challenge for 68% of businesses.

Most executives (72%) perceive a gap between the skills

they are looking for and what most jobseekers have. More than one in three businesses feel that gap has grown.

There is an even 43% split between those who feel the best way to close the gap is for employers to provide more training, and those who say it is prospective employees who should better prepare themselves for the labour market.

Seventy-per cent of respondents say finding a skilled employee is not easy. For businesses located outside Ontario, that challenge is even greater and as a result, many rely on referrals from current employees and internal promotions to fill positions.

Nearly two-thirds would hire an employee with the right soft skills and provide training on the more technical aspects of the job. Yet 66% have difficulty finding candidates with the soft skills they're looking for – a positive attitude, good communication ability and a strong work ethic.

Although willingness to provide training is high, 64% are concerned about losing employees after investing in training.

Canadian executives were also asked about their organizations' efforts to recruit candidates from under-represented groups, such as visible minorities, aboriginal people, people with disabilities and new Canadians. Half say that it's not something in which they invest a great deal of time or effort.

CAE wins \$110M in defence deals

Three contracts cover US, Denmark and Mexican militaries

MONTREAL: CAE has won three separate defence contracts worth \$110 million to provide aviation training systems for the US and Royal Danish navies and the Mexican Air Force.

The company, a Montreal-based developer of aviation simulation and training systems, will develop aircrew training systems at the US Navy's Naval Air Station Corpus Christi in Texas and will provide classroom and simulator

training to support the navy's T-44C aircraft, which is used for multi-engine intermediate and advanced flight training.

It will also develop an MH-60R mission operational flight trainer (MOFT) for the Royal Danish Navy in a contract completed under the US foreign military sale (FMS) program. CAE USA will design and manufacture the system that will be delivered in 2016 to Karup Air Base in Denmark.

The MH-60R MOFT is a full-motion simulator with crew positions for the pilot, tactics officer and sensor operator. The system will also include an onboard flight instructor station and off-board stations.

The Mexican Air Force has tapped the company to develop a comprehensive T-6C GBTS, which will include a T-6C operational flight trainer (OFT), computer-based classroom training systems, and courseware.

The T-6C OFT will include a high-fidelity replica of the T-6C cockpit with a fully enclosed 270 degree by 70 degree field-of-view display system driven by CAE's Medallion-6000 image generator.



A cockpit view of CAE's MH-60R MOFT full-motion simulator.

PHOTO: CAE

» Careers

Bioniche Life Sciences Inc. has appointed **Donald Olds** COO. He will help position the biopharmaceutical company based in Belleville, Ont. as a top-tier North American biotechnology company with a focus on the development of oncology therapeutics. Olds has held key executive positions in biotechnology, investment banking, biotechnology and information technology.

AirBoss of America Corp. has appointed **Tim Toppen** as president of the rubber-based products manufacturer. He'll have overall responsibility for the company's growing businesses in rubber compounding, engineered products, auto parts and defence. Toppen was chairman and CEO of TruVitals, a private medical device company.

Patrick Bell has been appointed to the newly created role of executive vice-president, Conifex Timber Inc. Bell served three terms in the BC Legislature and held a number of high profile ministerial positions with the provincial government. He'll be based at Conifex's Prince George, BC office and will focus on regional operations, including raw material supply, lumber manufacturing, capital expenditure programs and human resources.

Enbridge Inc. has appointed **Greg Harper** president of the Calgary-based energy company's Gas Pipelines and Processing operation. He comes to Enbridge from Southwestern Energy, an oil and natural gas company based in Houston, where he was senior vice-president, midstream.

OYA Solar lights up huge PV project

WINDSOR-ESSEX, Ont.: OYA Solar Inc., a developer of solar photovoltaic (PV) systems, has commissioned its largest project with Atlas Tube, a manufacturer of steel tube products.

OYA and Atlas have built what they are describing as Canada's largest rooftop PV plant, a 718.08-kilowatt development that spans over nearly 120,000 square feet of roof top space at the steel company's operation in Harrow, Ont. It's the first phase of a planned 3.5 megawatt rooftop project.

The installation now supplies enough power for 60 homes for a year, with an output of 897,128 kilowatt-hours.

OYA says the plant will offset more than 420 tons of greenhouse gas emissions, the equivalent of planting more than 25,000 trees.

The project features 2,244 solar modules and more than 30 tons of steel tubing supplied by Atlas Tube and Polar Racking's rooftop ballasted mounting system.

Polar Racking, one of OYA's sister companies that manufactures racking in Windsor, Ont., has incorporated Atlas's steel tube to manufacture its second generation of ground mount racking systems.

OYA has offices in Toronto, Windsor, Ont. and Montreal.

Bombardier gets \$681M rail car order

BERLIN: The San Francisco Bay Area Rapid Transit District (BART) has ordered an additional 365 rail cars from Bombardier Transportation for its "Fleet of the Future" in a deal worth \$681 million.

Bombardier has received firm orders from BART for 775 cars worth \$1.5 billion.

Bombardier will assemble the cars at its plant in Plattsburgh, NY, which has produced more than 3,300 passenger rail cars and locomotives in use across the US.

The cars will incorporate improvements that include a re-configured interior that maximizes

seating for regular passengers, priority seating for seniors and people with disabilities, and bicycle racks.

The new cars also include interior and exterior digital passenger information displays, public address systems, more doors, energy saving lighting, and energy-efficient propulsion and regenerative braking.

Ten pilot cars are scheduled for delivery in the spring of 2015, which will be followed by testing on the BART system. Delivery of the remaining cars is expected between early 2017 and 2021.

EnWave extends Gay Lea deal

VANCOUVER: EnWave Corp. has extended its agreement with Gay Lea Foods Ltd. by six months to continue the development of dehydrated cheese products using its radiant energy vacuum (REV) technology.

Gay Lea will pay EnWave \$300,000 to extend the agreement and retains an option to license the technology to produce dried dairy products in Canada.

Vancouver-based EnWave's REV technology applies microwave energy under vacuum in a low temperature environment to gently dehydrate food, pharmaceutical and industrial materials. Six REV platforms have been developed so far, three of which are being used commercially. Three others are in the developmental stage.

Gay Lea is a co-operative of more than 1,200 Ontario farmers that produces 30% of the province's milk and other dairy products.

EnWave also has research and collaboration agreements with other food producers including Nestle, Kellogg and Ocean Spray.

TransCanada sells CanCarb for \$190M

Power plant recycles energy for Medicine Hat.

CALGARY: TransCanada Corp. has sold CanCarb Ltd. and its waste heat recovery power plant to Tokai Carbon Co. Ltd. for \$190 million.

CanCarb, which TransCanada acquired in 1981, is the world's largest producer of thermal carbon black, a specialized form of carbon derived from super-heated natural gas used in industrial and automotive products. Its 41-megawatt power plant was commissioned in 2001 and captures waste heat from the manufacturing process to produce electricity that is sold to Medicine Hat, Alta.'s electric grid.

"Low natural gas prices and CanCarb's market share for thermal carbon black have made it an attractive investment for prospective buyers," said TransCanada



CanCarb's waste recovery power plant.

PHOTO: CANCARB

CEO Russ Girling.

Tokai Carbon Co., headquartered in Tokyo, is an international supplier of furnace carbon black and other carbon ceramic-related products. It operates five plants in Japan, China and Thailand that have an annual capacity of more than 500,000 tonnes.



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» Events

Time Management

BCIT/CME-BC

March 12, Burnaby, BC

This Manufacturing Leadership Series event presented BCIT's Corporate & Industry Training Services, School of Business and the Canadian Manufacturers & Exporters (CME) in BC will address personal motivation. Learn how to plan and prioritize daily activities more efficiently, set effective goals, handle crises, organize workflow and manage stress. E-mail Christina Hagberg at Christina_Hagberg@bcit.ca.

FABTECH Canada

SME, FMA, PMA, CCAI

March 18-20, Toronto

Presented by SME, FMA (The Fabricators & Manufacturers Association), AWS (The American Welding Society), PMA (Precision Metal Forming Association) and CCAI (Chemical Coaters Association). This metal forming, fabricating, welding, and finishing event features new products, tools, technologies, top speakers, networking hubs and educational sessions. Visit www.fabtechcanada.com.

Workplace Safety, Health & Wellness Symposium

CME-Ontario

March 19, Mississauga, Ont.

Share best practices and the latest developments in workplace insurance, health and safety. Presented by Canadian Manufacturers & Exporters (CME) Ontario division. Visit <http://on.cme-mec.ca>, Upcoming Events.

Energy Summit 2014

EMC/NRCAN

May 14-15, Niagara Falls, Ont.

This national conference presented by Excellence in Manufacturing Consortium (EMC) in partnership with Natural Resources Canada (NRCAN) and the Canadian Industrial Program for Energy Conservation (CIPEC) will host Canada's leading energy experts, industry leaders and energy efficiency suppliers to share best practices and the latest innovations in industrial energy efficiency. Visit www.emccanada.org/group_spaces/energy_summit/register.

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Let's see the details of the CETA deal

BY JERRY DIAS

The Comprehensive Economic and Trade Agreement (CETA) with Europe will no doubt contain some good and bad things for Canadians worried about the security of their jobs or opportunities for meaningful employment. Any trade deal would. But we won't know how the good and bad balance until we see the entire text of this "in principle" deal.

Some sectors will be happy, but others will have reason to be concerned. Take

"Under CETA, we would end up exporting our barely processed forestry products and buy them back as finished products..."

Canada's forestry industry, touted by the government as a winner with this deal. First of all, there are no European tariffs in the big part of that market – cut lumber and newsprint. CETA would eliminate tariffs on products such as plywood and oriented strand board, which is a limited market. Europe's economic crisis, a shrinking newspaper industry and other structural factors have reduced incoming shipments of wood and

paper products there by two-thirds over the past decade. CETA won't turn that around.

As for furniture, we import 10 times the amount from Europe as we sell there. Under CETA, we would export our barely processed forestry products and buy them back as finished products, cementing our place in world trade as hewers of wood. Indeed, our trade with Europe is mostly in raw (or barely

processed) resources and is similarly out of balance so eliminating the relatively small tariffs won't correct the lopsidedness.

We have a growing list of concerns about the deal's impact on Canadians that need answers.

The Harper government has accepted the demand of European pharmaceutical companies for stronger drug patents and admits prices will skyrocket by billions of dollars. What sort of pressure will CETA put on workplace benefit plans and the health system?

We're told there will be more European cheese allowed into Canada, but in return we can sell them more field crops and beef. Do European consumers even want to buy our genetically modified foods or hormone-raised beef?

Trade deficit drain

We import 20 times the automotive products from Europe as we sell there, creating a trade deficit that drains more than \$5 billion per year from the domestic industry. The government's own numbers show this will get worse under a CETA. Apart from a few niche European customers (who like the novelty of North American-made minivans or muscle cars), there is little demand for our vehicles in Europe. Yet sales of imported luxury brands will grow – squeezing our own products such as the Cadillac XTS, Chrysler 300, Lincoln MKX and MKT, and Lexus RX 350 a bit more in their home market.

Across manufacturing, European firms enjoy a strong branding, technology and marketing advantage over their Canadian counterparts. Any new sales in Europe will be swamped by their imports here, worsening the already existing \$30-billion trade deficit.

CETA is opening up provincial and municipal contracts to trade, which will make it very hard for those governments to use their spending power to create jobs and opportunities for young Canadians. Each province should have a democratic vote on the matter.

Without the text, we can't fully assess CETA's impact. What's more worrisome is the deal isn't actually done: more negotiations are to take place.

CETA is too far-reaching to be left to chance. Assurances are needed that the Harper government is focused on the practical outcomes, not just the theoretical. Canadians need to see the details of the deal so they can decide for themselves whether it's in their best interest.

Jerry Dias is the national president of Unifor, Canada's largest union in the private sector with more than 300,000 members. It represents a merger of the Canadian Auto Workers and the Communications, Energy and Paperworkers unions.

Comments? E-mail jterrett@plant.ca.

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ECONOMIC DEVELOPMENTS AND TRENDS

MANUFACTURING SALES CONTINUE UPWARD TREND

Statistics Canada reports manufacturing sales increased 1% in November to \$50.5 billion, the sixth advance in seven months, which indicates steady momentum for 2014, according to a TD Economics report.

Sales rose in 11 of 21 industries, representing about 58% of manufacturing.

With this advance, sales have shown increased momentum through the final two-thirds of 2013, falling just shy of the recent peak of December 2011, says Jonathan Bendiner, an economist with TD Economics.

Gains in transportation equipment (up 6.1% to \$9.5 billion) and machinery (up 5.4% to \$3 billion) were key to the increase.

Durable goods rose 2.9% to \$25.6 billion, while sales of non-durable goods slipped 0.9%.

Ontario led the seven provinces that posted higher sales, up 2.2% to \$23 billion largely as a result of gains in transportation equipment.

Inventories edged up 0.2% to \$69.3 billion with an increase in the aerospace product and parts industry partly offset by a decline in petroleum and coal product inventories. In constant dollar terms, total inventories rose 0.1%, indicating the volume of inventories held by manufacturers was essentially unchanged.

The inventory-to-sales ratio declined from 1.38 in October to 1.37 and unfilled orders increased 0.4% to \$72.2 billion because of higher levels in the aerospace product and parts industry. Excluding the aerospace industry, Statistics Canada says unfilled orders were down 0.8% with primary metal, electrical equipment, and computer and electronic products posting the largest declines.

TD Economics expects manufacturing to maintain this improved momentum in 2014, says Bendiner.

“The recent six cent slide in the Canadian dollar since mid-September will provide an added boost from a competitiveness standpoint,” he says in a TD bulletin.

What’s more, rising US economic growth – Q4 real GDP growth is tracking around 3.5% quarter to quarter – also points to an increase in demand for Canadian manufactured goods. However, Bendiner notes “capacity constraints will likely act as a headwind to the manufacturing sector which will limit the extent of a bounce back in 2014.”

PROS TO A LOW DOLLAR: BMO

The sudden turnabout in the loonie’s fortunes offers some positives to various sectors in the economy, according to BMO Economics.

Now “decisively” below 92 cents (thanks in large part to a resurging US economy) for the first time since September 2009, it’s good news for manufacturing.

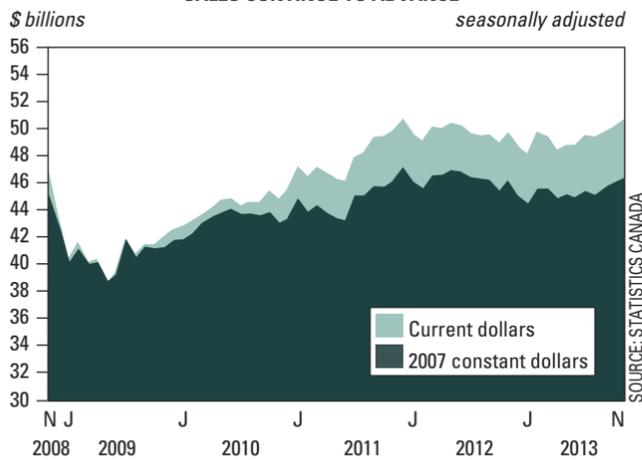
Indeed, it’s just what the policy doctor would order for the Canadian economy, says Doug Porter, chief economist for BMO Capital Markets, which estimates further weakening to 90 cents and possibly lower.

“With a number of emerging markets where Canadian firms can do business, the opportunities to make exports part of a comprehensive and diversified business strategy are growing,” he says.

Of course, a higher value dollar isn’t so good for consumers, travellers, utilities, broadcasters or sports teams, but other beneficiaries include retailers and domestic tourism.

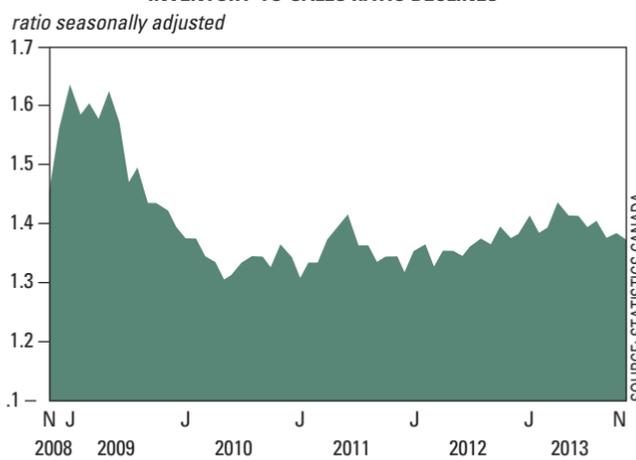
BMO estimates a 10% drop in the currency could add as much as 1.5% to real GDP over two years, or 0.5% to 1% per year.

SALES CONTINUE TO ADVANCE



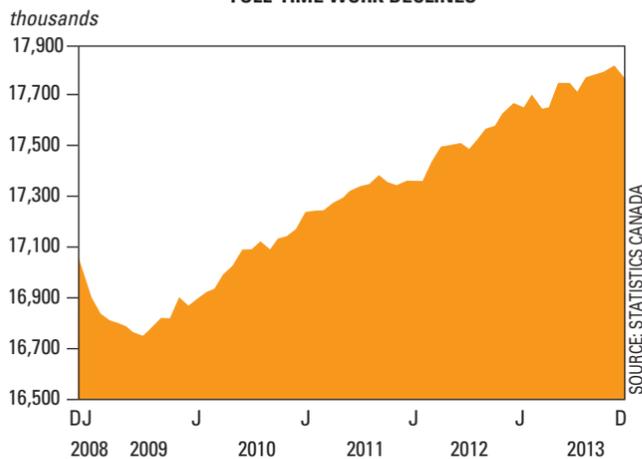
Manufacturing sales increased in 11 of 21 industries to \$50.5 billion for a 1% increase in November, driven by gains in the transportation equipment and machinery industries. This is the sixth advance in seven months.

INVENTORY-TO-SALES RATIO DECLINES



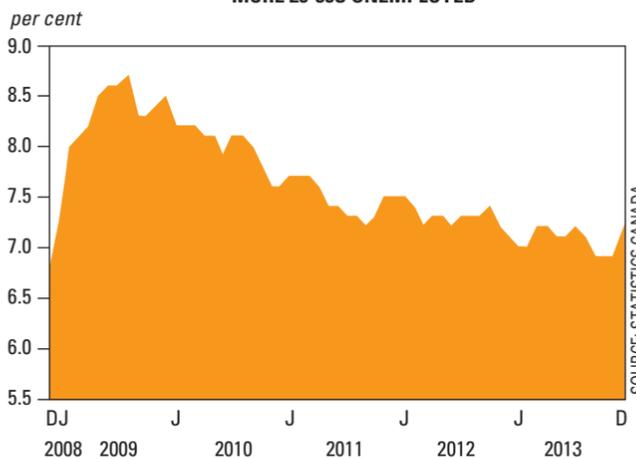
Although inventories were up slightly, the inventory-to-sales ratio declined from 1.38 in October to 1.37 in November reflecting the increase in manufacturing sales being greater than the increase in inventories.

FULL-TIME WORK DECLINES



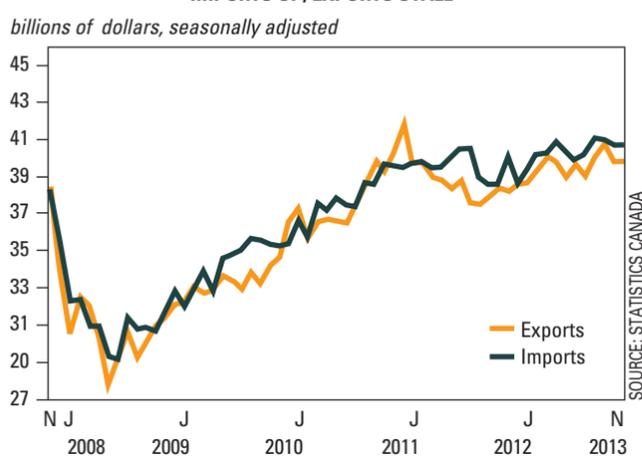
Employment was down 46,000 in December, the result of declines in full-time work. Manufacturing was down 0.2%, but up 0.7% year-over-year. In 2013, it declined 2.3%, although all jobs were up 0.6% to 102,000.

MORE 25-35S UNEMPLOYED



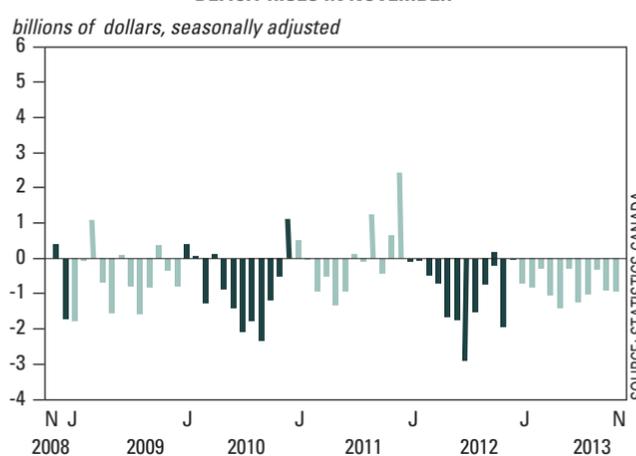
The unemployment rate rose 0.3% to 7.2% as more people searched for work in December. The unemployment rate for men and women aged 25 to 54 increased 0.4% to 6.1% with the loss of 38,000 jobs.

IMPORTS UP, EXPORTS STALL



Merchandise imports rose 0.1% in November to \$40.7 billion. Prices were up 0.1% and volumes remained the same. Exports were unchanged at \$39.8 billion with prices increasing 0.7% while volumes were down 0.7%.

DEFICIT RISES IN NOVEMBER



Canada’s trade deficit with the world went from \$908 million in October to \$940 million in November. The surplus with the US narrowed from \$3.1 billion to \$2.8 billion and the deficit with other countries narrowed from \$4 billion to \$3.7 billion.

MBRP's full metal TACTICS

STAYING AHEAD OF THE CURVE WITH R&D AND DIVERSIFICATION

It's pedal to the metal for this Huntsville fabricator of automotive aftermarket performance exhaust systems.

BY NOELLE STAPINSKY

If it's made out of metal and has anything to do with tubing, cutting, welding or grinding, MBRP Inc. can manufacture it; however, this isn't your typical metal fabrication company. MBRP – which stands for Martin Barkey Racing Products – is known throughout North America for its motorsport and automotive aftermarket performance exhaust systems. This recognition is the result of aggressive growth strategies and investment in R&D that has fuelled its rapid expansion over the years, allowing it to diversify by delving into private label projects, specialty products, new automotive accessory lines and even the manufacturing of HVAC ducts.

Husband and wife team Martin and Ginger Barkey started MBRP in a one-car garage in Burk's Falls, Ont. Martin, a motorsport enthusiast with a knack for sales, saw an opportunity to take his father's several years of expertise and R&D in motorcycle exhaust systems and apply it to a snowmobile exhaust line. He hit the road in 1996, going door-to-door selling to dealers and warehouse distributors.

"I was working during the day, Martin was on the road, and when we got home at night we'd work on finishing the products and getting orders ready to ship," says Ginger, MBRP's CFO.

They burned the midnight oil for two snowmobile seasons before moving to a larger shop in Huntsville, Ont. and adding automotive exhaust systems to the repertoire. By 1999 they had moved into a 1,800-square-foot shop, which was followed by a few more moves to larger facilities as demand grew. "Then we moved into 30,000-square-feet here. We built this [facility] because we were growing faster than we could find space," says Ginger.

Indeed, in 2006 MBRP was listed as one of Canada's

fastest growing companies in *Profit* magazine's top 200 listing. And in 2008, when the economy – particularly the automotive industry – took a serious dive, MBRP invested in tooling, equipment and personnel. "We hit the road harder, while our competition was restructuring internally in a negative manner," says Ginger. "We hired national and regional sales managers and expanded into Jeep accessories. We got into tubular bars and bumpers, roof racks, cargo baskets and a few other items. We developed a whole new market for the company that got us through 2008 and 2009."

Located off Highway 11, just south of Huntsville, the MBRP compound is hard to miss. The main building – where it manufactures gas and diesel exhaust systems for heavy-duty and sports trucks, late model muscle cars and compact sports cars – is perched slightly higher than its secondary facility that turns out ATV and snowmobile systems, and Jeep accessories. Two years ago, the Barkeys opened The Garage, a performance parts and accessories retail store where they sell MBRP products, as well as other renowned brands, in a one-stop format for auto enthusiasts.

"A few years ago, we saw an interest in retail. People wanted to buy some of the products we put on our special-build vehicles that we use for marketing. That's when Martin saw an opportunity to open a store," says Ginger.

"But we support our dealers and don't undersell or undercut. It's very important that we hold the market value and retain the current pricing level of our own brand," says Martin, president and CEO, who handles MBRP's sales and marketing from his office in The Garage. He also manages Garage Racing, a road racing team that races factory built Porsches in the Ultra 94 Porsche Cup Challenge Canada. The Barkey's sons are part of the action, too. Josh, who works at MBRP, races for the team and Jacob is the photographer/videographer.

When asked about adding racing to his company's specialties, Martin laughs. "That's another bad habit. We've been down for a couple races in the US as well.



But we just wrapped up our season in the Canadian series in third place."

The special-build vehicles – which have landed MBRP on 20 magazine covers and have been displayed at top industry events, prompting the sales inquiries – are not just suped-up showpieces, they're test vehicles that are all a part of MBRP's robust R&D program. "We start by finding out which vehicle is going to be the next hot item," says Martin. "Take the Mustang 5.0, for example. When it came out it was obviously going to be a big mover. We will buy the vehicle for big ones like this and



T-409 and T-304 aluminized stainless steel pipes are cut to size using cold saws.



Tubes are fed through manual and CNC benders.



The CNC Horn bender is used for gasoline vehicle exhaust applications due to tighter undercar tolerance.



Martin with a MBRP Ford Focus down pipe and Ginger with a diesel muffler. PHOTOS: NOELLE STAPINSKY

parts built and ready before the vehicle even lands in the dealership,” says Martin. “So when the vehicle arrives, we can get one back here for a test fit.”

With some tweaks, fine-tuning and dyno-testing, MBRP is often first to market with its performance systems. But throughout the entire process of creating new parts, MBRP’s design manager and his team are also carefully documenting each and every attempt – a strategic move that helps the company benefit from R&D programs such as SR&ED tax incentives, says Martin. “I think it’s a great process... knowing that we make a product better each time. If you think you’re making a product right the first time, you’re not likely bringing the best product to the consumer in the end.”

Adding automation

In the manufacturing facility, 72 employees work across three shifts on a 24-hour schedule. Ginger says the process has always been very hands-on and manual, but they are adding automation into the workflow. Most of MBRP’s exhaust systems are made with aluminized, T-409 and T-304 stainless steel. The process starts with cutting 20-foot tubes with cold saws. Deburring is done manually, and the exhaust pipes for diesel applications are formed on a manual bender. Jason Buck, plant manager, explains that diesel applications have more tolerance because they’re used on bigger vehicles, whereas a CNC Horn bender is used for gas applications due to a tighter undercar tolerance. Pipe extensions and adaptors are created using an expanding and slotting forming process. And there are four welding booths where workers weld the mufflers, flares, flanges, hangers, resonators and clamps. MBRP also employs a CNC rod bender, which is next to a newly acquired Lincoln Electric robotic welding system used to fuse hanger clamps that attach to mounting areas under the vehicle.

Since MBRP doesn’t have tool and die or machinist capabilities in-house, it has partnered with local companies to fabricate tooling for its equipment and processes. And to decrease potential downtime it also has pre-cut piping coming from Ohio.

Partnership has been key for MBRP’s latest project – developing a package that will work with diesel particulate filters (DPFs) used in heavy-duty trucks to restore performance attributes. Martin says when the government mandated DPFs be put on trucks in 2008, the diesel industry changed overnight.

Continued on page 12

do some baseline testing. We have an in-house dyno [dynamometer, for measuring force], we’ll drive the car, measure performance gains and decibels, and basically just gather data. After that it becomes a test mule.”

With performance parts, it’s all about what the consumer wants. Adding horsepower, more torque, better sound, increased throttle response, and in many cases, better fuel economy are all key elements enthusiasts look for in aftermarket performance exhaust systems. “But testing is big. The decibels need to meet legal road requirements, while also meeting consumers’ wants

and needs. In a brand new Mustang, we can actually lay down almost 40 extra horsepower at the wheels with MBRP products,” says Martin.

If the R&D team doesn’t get to dissect a vehicle onsite, they’ll get CAD specifications straight from the OEM, or use a scanning tool – which is one of the latest new toys in the department – to collect all the various points needed from a vehicle, and work on developing new parts with SolidWorks 3D CAD program.

“We work closely with some OEMs. Sometimes the CAD will come straight from them and we can have



The Horn CNC interface allows the machinist to control and monitor precision bends.



A Miller/Panasonic robotic welding system fuses hanger clamps that attach to mounting areas under the vehicle.



After the bending process, each pipe is placed on a form to ensure all angles meet exhaust specifications.

Partner power

Continued from page 11

“Just like when catalytic converters were introduced in the late 1960s and early 1970s, everyone threw their arms in the air and said performance was gone. The DPFs took ‘great’ trucks and turned them in to ‘good’ trucks at best,” says Martin.

To regain horsepower and performance, diesel truck owners started removing the DPFs, breaking EPA and carbon laws. To remedy this situation, MBRP has partnered with other companies to pool resources and develop a package product that works with other aspects of the engine to restore 90% of the power, drivability and fuel economy that the illegal removal of the component was netting consumers.

“This is brand new for us. The beta testing has been done and we’ll have it ready by spring,” says Martin. “I believe gaining up to 90% of the performance and fuel economy is well worth it to have your truck deemed legal.”



This Front Stubby Winch Bumper is part of MBRP’s Jeep Accessory. Each one is hand built and jig assembled.

While snowmobile and diesel performance exhaust systems are its largest segments, innovative thinking, strategic partnering and maximizing in-house capabilities have also spawned MBRP’s private label and specialty product business. In recent years, the company has expanded into manufacturing custom exhausts for boats, racks for truck companies and heat duct tubing. “If it has anything to do with tubing, cutting, welding or grinding, we can do it,” says Martin. “The private label opportunities are a growing part of our business.”

When they’re not at the facility overseeing the manufacture of the hundreds of parts they put out, or running The Garage, the Barkeys and the MBRP team attend more than 80 industry events a year. And whether it’s at SEMA, the world’s largest specialty automotive trade event, National Hot Rod Diesel Association races (which MBRP sponsors), a state fair or dealer open house, Ginger and Martin are often found talking to car enthusiasts, promoting the brand and even selling company t-shirts from their event tent.

“It’s still like day one, we need to market, build relationships, see and be seen. It’s 100 miles an hour all day long,” says Martin, who’s known as the “gas” whereas Ginger is the “brakes” in their dynamic working relationship.

With annual sales of just under \$20 million, the Barkeys are again poised for expansion. More production space is needed, but their sights are set on expanding their gas applications, re-releasing the ATV segment and diversifying.

In other words, it’s pedal to the medal.

Noelle Stapinsky is a Toronto and Huntsville, Ont.-based business writer and editor. E-mail noellestapinsky@gmail.com.

Comments? E-mail jterrett@plant.ca.

» Energy Strategy

Methanization cuts dairy’s costs

Cheese byproduct generates renewable energy

Energy savings boost the bottom lines of large companies, but they also yield significant benefits for smaller plants. A case in point is a methanization project for a small cheese-making enterprise in Quebec that reduces energy costs and optimizes hot water use.

Bruno Labbé, co-owner of Laiterie Charlevoix in Baie-St-Paul, Que. and manager of the methanization project, says it allows the dairy to use lactoserum – a by-product of cheese-making – as a renewable energy source to treat its wastewater and to generate process heat more efficiently.

The \$3-million expansion project for the dairy would significantly boost fuel consumption for heating process water, and generate 15,000 to 20,000 litres of lactoserum-laden wastewater for disposal in a septic field with a capacity of only 8,500 litres. The solution was the incorporation of a lactoserum methanization treatment, followed by phytoremediation (use of plants) of the remaining wastewater.

The methanization system, designed by Valbio Canada and Atis Technologies, was installed in 2011 and consists of conditioning lactoserum and “white water” in a 50-cubic-metre holding tank. The fluid is released into a 70,000-litre methanizer where anaerobic bacteria decompose the organic matter, reducing it by around 90%

and transforming it into methane, carbon dioxide and compost.

The biogas is continuously combusted in a biogas furnace and the heat transferred to water circulating in two 25,000-litre reservoirs. One reservoir is kept at 90 degrees C and the other at 75 degrees C. Both store the water that replaces the steam-generated hot water.

Automatic controls managed by a plant-wide energy management system allow for the production of hot water according to the needs of the processes and the buildings. Remaining contaminated water, as well as other wastewater, is treated in the same building using plant matter as biofilters, releasing clean water into the nearby salmon-bearing stream.

The \$903,000 methanization project had a 1.3-year return on investment after a \$750,000 incentive from various Québec government agencies. In addition to the savings in bunker oil, the new heat storage system and the use of hot water instead of steam resulted in savings of 25% to 30% annually.

The company has also diverted 170 tonnes of CO₂ annually and 11 tonnes of pollution associated with the transport of lactoserum for disposal.

Source: *Natural Resources Canada*

» Lubrication

Benefits of online oil sampling

More reliable than lab testing, but expensive

Regularly monitoring the quality of lubricating oil keeps machinery humming. Lubricants reduce friction, minimize wear, control contaminants and dissipate heat, but as they degrade or become contaminated, they lose the ability to perform these functions. The result is damaged rotating equipment.

Keeping track of oil quality can be done by regular offline (laboratory analysis) or on line oil sampling, which is considered to be more reliable. Online technologies deliver real-time monitoring and response to degradation, optimization of fluid draining and sampling intervals, and extend equipment operating life. They also allow better analysis of highly variable contaminants – wear debris and water – and reinforce sample analysis results. The downside is that it tends to be expensive.

Ryan Brewer, vice-president of engineering at Poseidon Systems LLC in Rochester, NY, provided an update on online technologies to the Hamilton section of the Society of Tribologists and Lubrication Engineers (STLE). Poseidon Systems develops and manufactures on-line fluid diagnostic equipment. Brewer is responsible for product development, research and manufacturing, noted the following on-line techniques:

- impedance, dielectric and conductivity sensors (\$100 to \$3,000);
- infrared sensors (\$3,000 to \$10,000);
- viscometers that facilitate real-time monitoring (\$3,000 plus);
- wear debris monitors that provide early warning of imminent component failure, but are insensitive to non-metallic particles (\$1,500 to \$5,000); and
- counters that detect particles via light scattering or imaging and provide ISO/SAE cleanliness code outputs.



Online lubrication analysis of rotating equipment provides real-time data.

PHOTO: THINKSTOCK

They also detect metal, dust and air/water bubbles in oil (\$1,000 to \$10,000).

He said any of these products are well suited for applications in paper mill and wind turbine gearboxes, and for monitoring oil conditions in mining truck fleets.

Nevertheless, there are challenges. Users must select the right test and contamination limits. Sample volume is critical. And the methods must be tested for repeatability and reproducibility. Also important is the technique’s ability to detect anomalies. Most sampling results shows that the oil is healthy. That’s good news for the equipment, but bad news for operations and maintenance budgets.

Brewer suggests the best lubricant health management is often a combination of online and offline monitoring. The strengths of real-time data and laboratory analysis achieve the most benefits and extend the service life of rotating equipment. — *Steve Gahbauer*

You can't afford disengaged employees. They cost companies an average of more than \$2,000 each year and impede productivity.

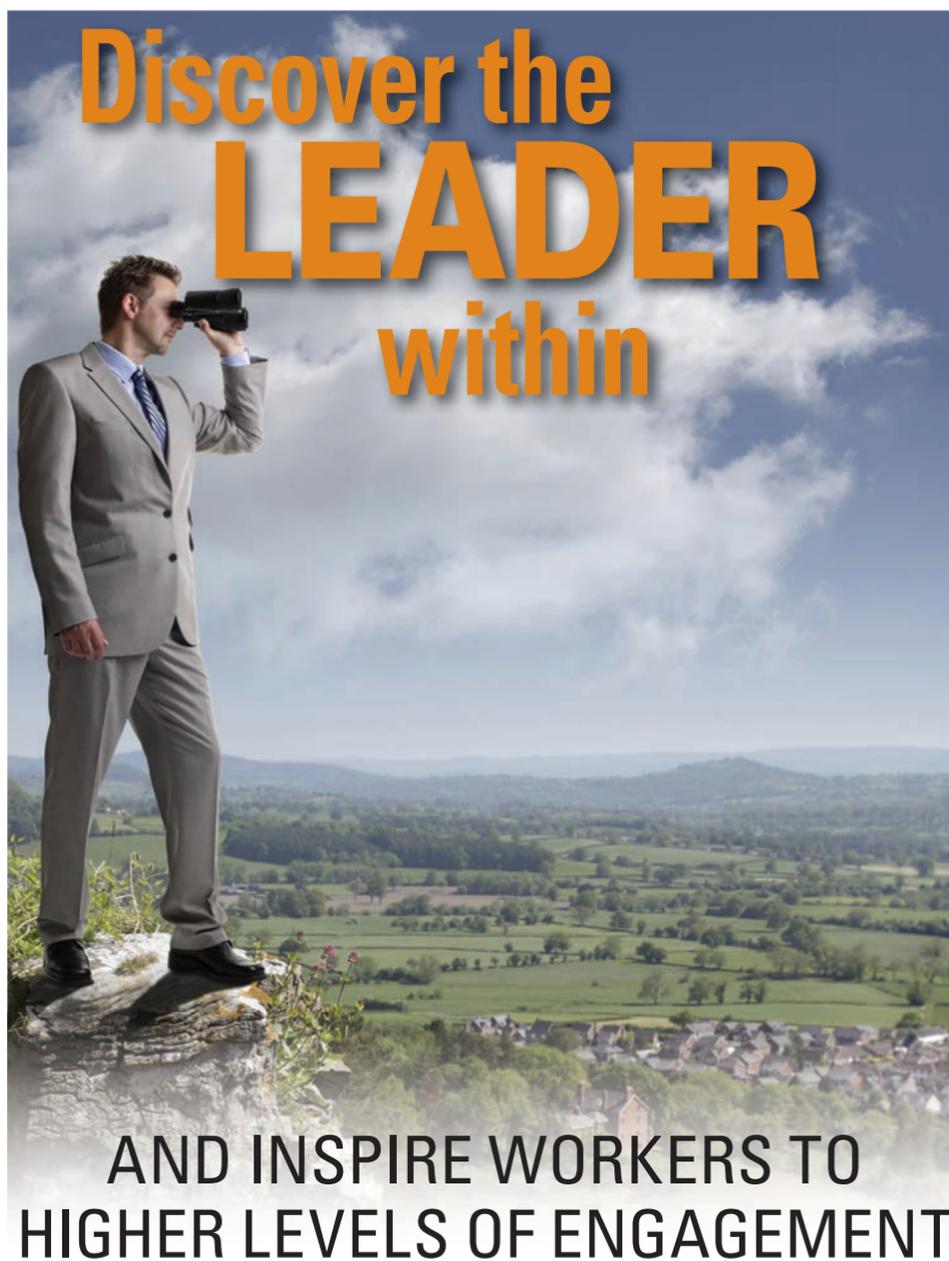
BY RICHARD KUNST

Great leaders know themselves well. They understand their dreams, aspirations and what motivates them to succeed, and this knowledge allows them to lead and inspire others to succeed. They also know themselves well enough to refuse to compromise their values.

"If you look at the career of President Lincoln, you'll notice that such leaders are never willing to sacrifice their values and principles," notes Morgan Hendrix, CEO of Virtual Business Leader. "Lincoln was not surrounded by a naturally cohesive team of followers but rather by a group of enemies and challengers with leadership roles in their own right, yet he stuck to his own values."

Discovering your temperament by taking a test, such as the Myers-Briggs Type Indicator or the Keirsey Temperament Sorter, allows you to get a handle on how you lead best. By embracing your true personality, you make optimum leadership decisions and reach out for assistance in the most effective way. And the quality of your leadership will determine how engaged your employees will be.

Disengaged workers are costing you money and they impede productivity. A recent Gallup Poll disclosed startling statistics about the state of America's employee base. The results in the *State of the American Workplace* survey show that 70% of US workers feel fully disengaged from their workplaces. Drill down to a state or two, and you find similar numbers. For example, 54.7% of workers in Washington are "not engaged" and



another 17.5% are "actively disengaged" with their jobs.

Healing the wounds

The high end of the liabilities amounts to hundreds of billions of dollars per year, according to Brian Braudis, a leadership and management consultant, and a recent ADP study put the cost at \$2,246 per disengaged employee per year.

The "not engaged" employee is simply passionless about a job while the active-

ly disengaged are seeking to act out and undermine the team or company because of their dissatisfaction with work.

When looking for the symptoms of disengagement at either level, common factors include:

- Work is not personally meaningful and purposeful.
- Workers do not have a sense of self-determination and autonomy.
- They believe rules are not applied equally and fairly.

The quality of your leadership impacts employee engagement.

PHOTO: THINKSTOCK

- They're not getting feedback that they consider to be constructive and useful.
- They don't have supportive relationships with superiors and co-workers.
- They don't feel they are experiencing personal growth.

Some root causes of disengagement, as suggested by Joey Price, CEO of Jumpstart HR, include:

- **Lack of training and development opportunities.** If employees don't feel they're growing, the natural opposite is regression or feeling stale.
- **Money.** Salary issues are always going to be a part of the conversation, but it's not always about base pay. It can be the 3% raise cycle rather than the typical 10% bump for a new job, or benefits.
- **Employee-employer friction.** Companies that aren't accountable for problematic bosses often feel the effect of disengagement because people don't perform as readily for people they don't like.

Dealing with disengagement starts with a conversation, something like, "Let's talk about work. What's it like? What gives you energy? What takes it away? What for you is a waste of time and what can we do about that?"

Their experiences and how they energize the workplace will impact the bottom line. Having this kind of dialogue helps to repair any damage done and inspire workers to higher levels of job satisfaction and engagement.

Richard Kunst is president and CEO of Cambridge, Ont.-based Kunst Solutions Corp., which publishes the "Lean Thoughts" e-newsletter. Visit www.kunstsolutions.com. E-mail rkunst@kunststartofsolutions.com.

Comments? E-mail jterrett@plant.ca.

» CCOHS Safety Tips

Too hot to handle

How to work safely with flammable and combustible liquids

Most workplaces use flammable or combustible liquids that are either fuels of other common products such as solvents, thinners, cleaners, adhesives, paints, waxes and polishes. Everyone who works with these materials must be aware of their hazards and how to work safely with them.

The most obvious dangers are fire or explosion.

Flammable liquids ignite at lower temperatures than combustible liquids. The Workplace Hazardous Materials Information System (WHMIS) sets the flashpoint at below 37.8 degrees C (100 degrees F). Combustible liquids have a flashpoint at or above 37.8 degrees C (100 degrees F) and below 93.3 degrees C (200 degrees F).

If sprayed or misted in the air, ignited liquids may burn at any temperature.

Vapours formed by flammable liquids are usually invisible and hard to detect without special instruments. At temperatures above their flashpoints, both kinds of liquids give off enough vapour to form mixtures with air that easily ignite from a spark, a flame, friction, a hot surface or any other source. Hidden sources include static electricity, light switches and other

electrical devices such as power tools.

Even if you clean up a spill, there may be a risk of ignition, especially if the liquids have been absorbed into materials such as wood, cardboard and cloth, which will continue to give off hazardous vapours.

Some of these liquids cause skin and eye irritations or acute toxicity. Many undergo dangerous chemical reactions if they contact incompatible chemicals such as oxidizing materials, or if they're stored improperly.

Here are some basic safe handling tips:

- Read the Material Safety Data Sheet (MSDS) for all the materials you are using.
- Prevent the release of flammable vapours and mists.
- Use these materials only in well-ventilated areas, and for their intended applications.
- Keep containers closed when not in use.
- Be aware of health hazards and follow safe handling procedures.
- Store liquids away from incompatible materials (such as oxidizers).



Once ignited, fires flow under doors, down stairs and to nearby buildings.

PHOTO: THINKSTOCK

- Use the smallest amount of flammable liquid necessary.
- Clean up spills immediately using approved containers for disposal of rags and other materials.
- Use non-sparking ventilation systems and equipment. Eliminate ignition sources.
- Ground all metal drums, transfer vessels, hoses and piping to prevent buildup of static charge. Ground clips must contact bare metal.
- Use only approved containers and dispensing equipment (faucet, pump, drip can).
- Keep areas clear of materials that burn.
- Ensure employees know to report leaks, spills and ventilation failures immediately.
- Practise emergency procedures.
- Do not heat containers or distribution systems.

This article was provided by the Canadian Centre for Occupational Health and Safety (CCOHS), a not-for-profit federal corporation that promotes the physical, psychosocial and mental health of Canadian workers. Visit www.ccohs.ca.



Beading up BITUMEN waste

RHS TACKLES OIL SANDS LEFTOVERS

Gradek Energy's organic beads offer energy companies a faster, cleaner way to remediate tailings ponds and reclaim some of the waste for more productive use.

BY MATT POWELL, ASSISTANT EDITOR

Although they're smaller than a nickel and weigh less than a kernel of popcorn, Gradek Energy's "beads" are on track to deliver oil sands producers a game changing technology for cleaning up Northern Alberta tailings ponds.

The Montreal-based company's 2,400 square-foot test plant located in the east end of the city is where founder Thomas Gradek and his team of 12 – including chief engineer, Nathan Ashcroft, business development officer Robert Andrews, and Thomas's son and chief operations officer, Stephen – have pioneered and are currently perfecting its re-usable hydrocarbon sorbent (RHS) technology.

"We've analyzed the technology extensively in the total realm of oil sands operations," says Thomas Gradek, who developed the concept for RHS more than 20 years ago. "Now we're at the stage where we're confident we are able to not only assist the oil sands industry, improve its carbon footprint, maximize production yields and do it all economically."

RHS consists of small, oval-shaped beads that resemble those after dinner mints offered at posh restaurants. Because they're organic, the beads are "super-velcro" for hydrocarbons, but they repel water and other organics, which can be recovered and re-used. This presents the energy industry with a simple solution to the challenges associated with complicated and increasingly scrutinized tailings management.

Gradek says the technology will reduce the impact of tailings ponds – the sometimes toxic pools of water, clay, sand and bitumen – but also present an opportunity to recycle water, process it rapidly and send it to an energy operator's processing site for re-use.

"That cuts a huge cost for operators. That process alone would eliminate tailings that contain toxic carbons and acids, which for climate change is a benefit," says Gradek. "We're transforming a wasted byproduct into a resource by dropping its carbon footprint."

Once they're deployed, the bitumen-filled beads, measuring 16 millimetres in circumference, are then removed from the pond, leaving just water and other organics that are split out and recycled. Gradek says the beads are re-usable up to 500 times.

"[They're] completely inert, so there's no releases or leeching. Throw them into a glass of water and you won't see any bacteria or algae growth. The compound is completely harmless. There's zero environmental impact."

Mature fine tailings that make up the middle layers of the water basin can take decades to settle, preventing a timely reclamation of the site. RHS speeds up that process by removing hydrocarbons in the water basin, allowing other organics to settle more quickly.

Tailings remediation

The technology's origin dates back to the aftershocks of the Gulf War in 1991. Hundreds of oil wells burned out of control in Kuwait while engineers tackled a massive offshore spill in the Persian Gulf caused by Iraqi military forces. Gradek, at the time a civil engineer, had experience supplying oil companies with massive pieces of machinery in the Middle East and was invited by Kuwait's royal family to help with clean-up efforts.

"They weren't doing any kind of clean up at all," he says, recalling the three-month gig. "They were just moving waste from one place to another. I was shocked visiting these sites and witnessing how badly crews were handling things. There was no environmental remediation."

He wanted to develop a clean-up solution that minimized the environmental impact of producing oil, but required little energy.

More than 20 years later, Gradek has earned the at-

New RHS beads (L) look more like after-dinner mints than the bitumen-sucking super velcro (R) slated to clean up tailings ponds.

PHOTO: GRADEK ENERGY

tention of Alberta oil producers and has been testing the beads in their tailings ponds, including the completion of a partnership with a major (unnamed) oil sands operator.

More than \$15 million in private and public funding has been pumped into the project over the last two years as it moves towards commercialization. Gradek's pilot plant, which became fully operational in 2013, is now in continuous operation, processing one tonne of materials per hour. A full control room and mini laboratory allows the company to analyze testing in real-time.

The process involves mixing the beads with oil sands tailings streams using a feedstock prepared onsite. Bitumen and fines are absorbed almost immediately.

"A mixer runs a cycle for up to 15 minutes, then the beads are moved into a solvent wash, stripping them of bitumen and releasing fines for filtration purposes," says Nathan Ashcroft, the company's chief engineer.

The beads move to a vacuum dryer to be prepared for re-use, while the stream of bitumen and fines are introduced to an inclined plate separator that isolates clear water from the consolidated solids streams.

"The process allows us to re-use both the oil and the bead, which is a potentially game-changing concept for the management of oil sands tailings," says Ashcroft.

The Montreal facility also handles manufacturing, producing 400 beads per minute, but it has the capacity to increase output to 1,600. The beads, which require a high level of accuracy because of all the organic ingredients, are mixed, metered and suspended individually with special machinery (highly confidential, so there are no details available) developed by Gradek and an unnamed supplier.

"Residence time in the reactor is crucial, which is about six seconds at a temperature range that must be accurate to no more than plus or minus two degrees," says Gradek. "If the chemistry is off by even as little as 0.1%, we're in trouble."

At time of publication, Gradek's leadership team was in Calgary, meeting with a number of companies (their identities under wraps) to finalize a year's worth of testing in various tailings ponds. A report validating the technology is expected by the end of February.

"There are billions of dollars worth of tailings remediation projects developed each year, and if you're able to solve real problems, it could become a multi-billion dollar industry for a technology like ours," says Gradek.

He's counting on those little beads to make 2014 a big year.

Comments? E-mail mpowell@plant.ca.

» Computing

U of W's quantum research gets a boost

\$5 million lab to develop new materials

The University of Waterloo's Institute for Quantum Computing has invested \$5 million to establish a lab and acquire a tool to advance the development of quantum materials.

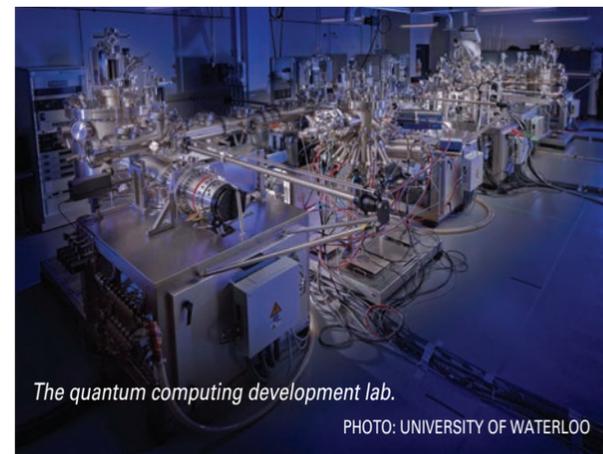
"New materials are not conventional, so we need to take an unconventional approach," said professor David Cory, Canada excellence research chair in Quantum Information Processing.

The Canadian government, the Canada Foundation for Innovation, the Ontario Research Fund and industry partners fund the lab.

Omicron Instruments, a developer of analytics instrumentation for nanotechnology research and development based in Taunusstein, Germany, built the tool with an ultra-high vacuum, multi-chamber design to grow high-quality thin films and layered structures.

It includes molecular beam epitaxy and sputtering capabilities to produce a range of materials, including oxides, metals, superconductors and topological insulators to exhibit unique quantum behaviours.

"Quantum science will shape the future of technology," said Feridun Hamdullahpur, the university's president and vice-chancellor. "The activities happening here will be an important step in building a pathway to the quantum world."



The quantum computing development lab.

PHOTO: UNIVERSITY OF WATERLOO

Fighting FRICTION

ADVANCED COATINGS REDUCE WEAR RESISTANCE



AUTO21 is working with the auto makers to reduce the costs of integrating cast aluminum into manufacturing processes.

PHOTO: THINKSTOCK

Researchers are striving to incorporate diamond-like coatings that protect the stickiness of working with cast aluminum into the manufacturing process.

BY AHMET ALPAS

Aluminum-silicon engine blocks offer significant weight savings over traditional cast iron, but there are challenges. In fact, virtually any automotive engine component composed of a lightweight material will face the same friction, lubrication and wear issues when compared to traditional steel components. Manufacturing processes may require modifications to ensure the tools and dies are appropriately lubricated when, for example, the blocks are machined, shaped and joined to other powertrain components. And everyday operation may present issues later in the engine's lifespan.

Tribology is one way to resolve these concerns. It focuses on understanding and improving the friction and wear behaviour of materials such as aluminum, magnesium and alloys.

Until recently, there have been very few specialized tribology research centres or initiatives. The automakers conduct R&D in this area, some in partnership with American and Canadian academics. Internationally, there are pockets of expertise in Japan and Germany, however many of these focus on technologies for luxury vehicles.

Use of lightweight materials has led to the incorporation of tribological principles

into the design of engines and other parts, and to a certain extent, research is starting from scratch. Just as doctors analyse the symptoms of an illness to determine the correct drug for treatment, automotive researchers are investigating surface properties, heat treatments, the effects of production techniques on both the part and the tools used to create it, casting treatments and alloy compositions.

Researchers with the AUTO21 Network of Centres of Excellence are helping industry partners reduce costs by creating advanced coatings with unique wear resistance and lubrication properties. Although the automotive sector has resolved the challenges of manufacturing cast-iron engines, many of these processes and techniques don't easily transfer to newer, lighter material options such as aluminum-silicon. As these engines are developed, parallel research looks at the need for new technologies for mass production.

For example, many of the tools used in the traditional engine casting process are maximized for wear resistance. These tools react differently with aluminum cast engines; instead of wear, the material sticks to the tool, reducing its lifespan in a new way.

Challenge is overcome

AUTO21 researchers have discovered diamond-like coatings offer protection against the "stickiness" of working with cast aluminum and are looking at ways to incorporate these coatings into the manufacturing process. The team is also applying a tribological system to cutting interface methods. It's possible to use water or "green" lubricants with aluminum casts rather than the traditional flooding techniques used with cast iron.

Much of the savings will come from the elimination of iron liners (sleeves) used to protect the aluminum engine bores, thanks to special surface preparation techniques that expose hard particles on aluminum bore surfaces or by using thermally sprayed coatings.

By overcoming the challenges associated with the use of lighter-weight materials, aluminum engine blocks, manufactured at a reasonable cost, provide the same durability yet weigh 40% less than cast iron, which reduces fuel consumption and will help lower the impact vehicles have on the environment.

Ahmet Alpas is a professor of mechanical automotive and materials engineering at the University of Windsor and a researcher with the AUTO21 Network of Centres of Excellence. Visit www.auto21.ca.

Comments? E-mail jterrett@plant.ca.

» Technology

Innovation spend is too low: PwC

Global 9.64% tops Canada at 7.8% of revenue

Canadian technology companies are not making innovation a priority.

According to PwC's Global Innovation Survey, 88% of Canadian companies expect at least moderate growth over the next five years, but only 27% have an appetite for innovation.

This figure sits slightly above the global average (21%), but competitors worldwide are still spending more. Canadian companies are allocating just 7.8% of their revenue (averaging \$21 million) to innovation, compared to 9.64% (\$200 million) globally.

Half of the Canadian businesses are far more likely to rely on government funding for innovation programs they do initiate. Respondents also lack the structures necessary to manage them effectively.

Products rank at the top of their to do lists, with 35% indicating this as a high priority – well ahead of customer experience (8%) and business models (4%).

Download the survey at www.pwc.com/ca/innovation-survey.

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Russia's resource-dependent economy highlights an area of great opportunity for Canada, particularly for technology and services.

BY MARK DRAKE

Writing recently about Russia in "The Tiger," author John Vaillant summarized the late 1990s business scene thus: "...a whole new frontier has opened up, much of it on the black market. The line between politicians and mafia, and between legitimate business and crime, has blurred almost beyond recognition. This is the Wild East and business is booming."

The descent into what Eric Reguly (*The Globe and Mail*) describes as "crony capitalism, theft, corruption, chicanery, boorish behaviour, violence and gangland hits" began when the Soviet Union broke up in the early 1990s. Reguly wonders why any intelligent investor would put money into such a "pariah state." In more measured tones Deloitte, in its 86-page guide to doing business in Russia (www.deloitte.com/ru/insights/dbir), notes that there's "huge potential for foreign investors...especially in technology and innovation, [the] challenge [being] to determine whether the opportunities are attractive enough to outweigh the well known marketing and political uncertainties."

Export Development Canada (EDC) describes it as having a "challenging environment" (www.edc.gc.ca). So with these caveats let's see what faces the international trader/investor.

Overall the economic situation could be described as "not bad." This huge country, with a population of more than 140 million, has a GDP per capita of close to \$13,000. Growth has slipped a tad from 4.5% to 3.7% (compare Canada at 2.6%), but inflation is set to fall from 8.4% to 7.7%. The economy, like Canada's, is highly resource-dependent, and relies heavily on export income from oil and gas, with overall results that greatly depend much on price levels. However, the importance of this sector highlights an area of great opportunity for Canada – particularly related technology and services.

Russia is one of Canada's 13 priority markets, and International Trade Minister Ed Fast recently headed a trade mission to St. Petersburg and Moscow with 30 Canadian business representatives in tow representing areas of opportunity such as oil, gas and mining services, agriculture and food processing technology, aerospace and timber frame construction. As Russia continues its modernization program (including the privatization of some of the huge state-owned corporations – 62% of major business activity) it urgently needs foreign capital, technology and partnerships in these areas, as well as transport, general infrastructure and ICT.

Canada's and Russia's commercial relationship is nearly 100 years old, and last year bilateral trade was \$2.8 billion, including \$1.5 billion of Canadian exports



Moscow's modern city skyline.

PHOTO: THINKSTOCK

Taming the Russian BEAR

IT'S HUNGRY FOR INVESTMENT, BUT BEWARE

that included machinery, industrial equipment, aerospace products, meat and seafood and of course resource-related services and equipment. Russia's imminent accession to the World Trade Organization (WTO) should increase opportunities as tariffs fall and investor protection improves. A Foreign Investment Protection Agreement (FIPA) is already in place but requires updating to provide "a genuinely transparent, predictable and stable investment climate [and] to inspire greater investor confidence."

Courageous investing

Other Canada-Russia collaborative arrangements exist on agriculture, space, science and technology, and EDC has an agreement with Sberbank, Russia's largest credit institution, to support the purchase of Canadian goods and services. Foreign direct investment (FDI) by Canada remains relatively small at \$725 million, suggesting there's significant opportunities for the courageous investor.

Canada has a strategic marketing plan for Russia pulled together with input from business and industry, plus detailed reports on the construction and building materials sector and on bio-energy. These are available under restricted access conditions via links at www.international.gc.ca. The site also notes the construction and related opportunities around the Olympic Winter Games scheduled for Sochi in 2014.

The press has covered events in Moscow following the job swaps at the top, and the evident dissatisfaction of the average Russian with the seemingly endemic levels of corruption. Prime Minister Dmitry Medvedev has made some

effort to tackle low-level corruption, but much more remains to be done.

In Transparency International's corruption perception index Russia rates number 143 out of 182 countries, with a score of 2.4 (where 10 is good and 1 is highly corrupt). Canada is ninth with a score of 8.7. (www.transparency.org). The World Bank's "Ease of Doing Busi-

ness" gives Russia a 120 out of 183 ranking (www.worldbank.org). The World Economic Forum (www.weforum.org) places Russia at 66 out of 142 countries rated for international competitiveness.

Key improvements they would like to see include: strengthening the rule of law, better protection of property rights and a more efficient judiciary. WEF notes the market is dominated by too few large firms and has inefficient restrictions on trade and foreign ownership.

While Russia may not be fully receptive to incoming foreign investment, it is certainly picking up foreign technology by its own outward investment, such as in Canada's oil sands where Rosneft, its largest oil firm, has teamed up with China in ventures with Exxon Mobil and Imperial Oil. Similar collaborations exist in the Arctic and the Black Sea.

For more information contact EDC for country and market overviews, reports by Deloitte and by KPMG (www.kpmg.com) for tax and legal structures, the Canadian Trade Commissioner Service (www.tradecommissioner.gc.ca) for market reports, and the European Bank for Reconstruction and Development (www.ebrd.com) for background on project finance in Russia, a report on general economic conditions, and areas for special bank focus.

Finally, prepare to tame the Russian Bear with a travel and business advisory www.voyage.gc.ca. And when in Moscow check whether the Cirque du Soleil – one of Canada's most successful exports – is playing at the Kremlin Palace Theatre.

Mark Drake is former president of Electrovert Ltd. and the Canadian Exporters' Association. E-mail corsley@videotron.ca.

Comments? E-mail jterrett@plant.ca.

» Confidence

Bullish on exports

Companies eye improving global economy

Canadian exporters and investors are stoked about their business prospects in 2014, according to a semi-annual survey of companies by Export Development Canada (EDC).

The federal export agency's Trade Confidence Index (TCI) completed in early October and based on responses from 769 companies, went up 2.8 points to 75.4 following a 1.9-point increase in spring. It's the first consecutive gain since 2009.

Most of the respondents believe global economic conditions will improve over the next six months. EDC says this suggests looming reductions or expiring stimulus programs in the US and EU aren't dampening international trade.

"What's compelling about this is a simultaneous echo of optimism around the world, including consumers and businesses in the US and Europe, and broadly across Japanese industry," says Peter Hall EDC's chief economist.

While this global business confidence bodes well for Canadian exporters, he warned that with capacity tightening, there's an acute need for new investment. "We may well be looking at a moment when companies around the world start ramping up production to keep up with demand."

Here are some top line results:

- A growing majority of companies (55%) expect export sales to increase.
- Exporters are more bullish about international business opportunities with 34% expecting better opportunities (up from 27% in the spring).
- 40% reported orders from US customers increased in the past six months, up from 35% in the spring.
- 35% began exporting to new countries during the past two years. Half of the respondents plan to do so over the next two years.
- Almost a third of companies expect to increase hiring over the next six months, but 73% anticipate difficulty hiring skilled labour.

LEAN meets FINANCE

HOW STANDARD COST ACCOUNTING IMPEDES PROGRESS

PHOTO: THINKSTOCK

It gives plant managers few options for lowering costs other than laying off employees.

BY JACOB STOLLER

With many Canadian plants applying lean to their manufacturing processes, it's safe to say its methods are rapidly becoming mainstream. Yet according to Brian Maskell, author and authority on lean accounting, the CFO's office remains one of the top deterrents of lean activity.

Maskell, a presenter at the Association of Manufacturing Excellence's (AME's) Toronto 2013 conference, offered some insight into how finance impacts the success of lean activities.

Accountants are trained to keep score in plants with standard cost accounting. The approach emphasizes absorption of costs, which causes managers to pay close attention to a plant's manufacturing resources, and how fully they are utilized. The assumption is that if machines are running and workers are busy creating product, the plant is making money.

Lean tells us that to the contrary, a plant can be losing money even if all its resources are going flat out. The Achilles heel is inventory. If product is going to a warehouse instead of to customers, it has to be moved, stored, depreciated, and in some cases, liquidated at fire sale prices.

These costs become glaringly obvious when looking at value streams, which are used to create strategic roadmaps for lean improvements. In the typical plant, value streams are defined around product families. For example, if a factory makes snowblowers, tractors and all-terrain vehicles, each of these would be a separate value stream. While these might use common resources, such as a painting department, improvement targets would not pertain to internal resources, but to

each of the respective value streams.

Improvements, therefore, are directly linked to satisfying customer demand faster, with fewer defects, or at lower cost. By eliminating unnecessary steps and outlays, companies fine tune their manufacturing processes to respond quickly to demand, and become less dependent on the buffers of finished goods and parts inventories. Less inventory means less plant space, less labour tied up in the storage and tracking inventory and reduced risk of having a warehouse full of snowblowers at the end of March.

Options for reducing costs

The typical report plant managers receive from accounting, however, doesn't recognize many of these improvements, even though they can dramatically slash costs. "When the controller comes to me once a month and tells me about my absorption and overheads, it doesn't help me do anything at all," says Maskell.

One of the unfortunate byproducts of standard cost accounting is that it gives plant managers very few options for reducing costs. "If they say the cost of the product is too high, what am I supposed to do about that?" says Maskell. "The only thing I could do to bring costs down according to accounting is lay off some people or reduce the amount of labour that goes into the product."

Dennis Mighton, division lean manager at Parker Canada, a division of Parker Hannifin (a manufacturer of motion control technology), offers a unique perspective. Trained as an accountant, Mighton made the unusual move from plant controller to plant manager. It was a huge shock when he really began to understand the gap between traditional

accounting and how plants operate.

"I knew the numbers inside out," says Mighton, "but some time after I'd made the transition to the plant floor, it struck me how little I understood the manufacturing process, and what happens on the plant floor to make money."

He says standard cost accounting actually encourages the wrong kinds of activity. "If I generate absorption by keeping the machines running and productivity going, I'm offsetting my costs, but that's not necessarily driving the right behaviour because you're not getting the cash flow from it. Lean accounting is close to a cash flow type scenario."

Plant managers need real time data. "If you really want to control something, you don't measure it 12 times a year," says Maskell. "You measure it much more often than that. Don't ask 'what is the cost of materials in this product?' Ask 'what did I buy this week?'"

Bottom line, lean accounting is all about bringing financial people out of their offices and into the operation. "The closer you can get to the operation, and the more time you can spend out there and understand what's going on, it's nothing but a benefit to anybody in the accounting positions," says Mighton.

He finds the work more rewarding as well. "You're hands on. You're making customers happy. You're not sheltered, as you tend to be in accounting."

And it makes the finance department more of an ally than a deterrent to lean endeavours.

Jacob Stoller is a journalist and author based in Toronto. His book "Lean CEOs," which presents the strategic aspects of lean through CEO narratives, will be published in the fall of 2014.

Comments? E-mail jterrett@plant.ca.

» Training

Evaluating skills

TOWES assessments set the level of performance

BY HUGH ALLEY

"How can I run a quality program when operators can't average three measurements?" asked the head of the quality assurance program in a plant with 450 employees. Good question!

If you have been challenged finding skilled people, you're not alone. While there is some debate about whether there's a real shortage or just a mismatch, there's no doubt some skills are in short supply.

A common complaint is, "They don't have the essential skills." But what does "essential" mean? After all, every plant is unique. Canada's Human Resources and Skills Development Canada has created a definition of "nine essential skills" that is now widely used, and it's a useful start that includes: reading text; document use; numeracy; writing; oral communication; working with others; thinking skills; computer use; and continuous learning.

Raw academic ability isn't enough. Reading and writing skills include dealing with shop orders. You need to be able to measure length, weight and volume in both imperial and metric systems, plus do conversions and calculations. Graphing skills are needed for quality management, people must be able to use the ERP system and communication skills need to include how to ask a clarifying question.

One useful starting point is TOWES – Test of Workplace Essential Skills. This product from Bow Valley College in Calgary lets you set the needed level of performance in each skill area and standards for the people you hire.

It assesses three essential skills: reading text, document use and numeracy, and requires candidates to extract information from real workplace documents, then decide on the appropriate action.

The TOWES people say its assessments are psychometrically valid and unbiased, good things when you're trying to show non-discriminatory due diligence. Even better, they identify the skill level associated with success, an immediate indicator of how likely a candidate is to master the skills of the job. But you still need to assess motivation and social skills.

Bow Valley College and its partners provide a range of resources to help you, including training to build the skills. Its partners include colleges and employment centres in every province and territory, and it's available on-line at www.towes.com.

Hugh Alley is president of First Line Training Inc. in Burnaby, BC, which focuses on increasing productivity by improving the skills of front line managers and supervisors. E-mail halley@firstlinetraining.ca. Visit <http://firstlinetraining.ca>.

Comments? E-mail jterrett@plant.ca.

Battling BUY AMERICAN

CME CALLS FOR INFRASTRUCTURE RECIPROCITY

Manufacturers want the federal government to restrict access to Canadian projects.

The latest edition of US Buy American legislation is sparking considerable ire from Canadian manufacturers who are calling on the federal government to institute retaliatory measures that could include blocking US companies from bidding on Canadian infrastructure projects.

Legislation before US Congress would reimpose Buy American restrictions on state-side infrastructure projects, and prevent Canadian companies from bidding on lucrative water and wastewater infrastructure contracts.

The US leaned on Buy American during the recession as a requirement of its stimulus funding. Existing provisions applied to transit, highway and airport projects, and required spending to be di-

rected towards companies in the US, or those with manufacturing facilities there.

Canada was granted relief from the restrictions by President Barack Obama, but that deal expired at the end of September and new talks have yet to take place.



Since the stimulus money ran out the situation has worsened, with Congress applying Buy American provisions to more funding appropriation bills and infrastructure programs.

Frustrated Canadian manufacturers have had enough and are seeking action from their federal government to make

sure measures are negotiated that would open the US infrastructure market. If the US won't cooperate, they want to restrict access to Canadian projects.

Canada's federal government has committed \$53 billion to infrastructure spending over the next 10 years, which US companies are free to bid on.

"This isn't about creating a Buy Canadian type of situation," says Martin Lavoie, director of manufacturing policy at Canadian Manufacturers & Exporters (CME). "This is about reciprocity."

CME, along with the Canadian Steel Producers Association, has called on government ministers in infrastructure, public works, industry and transportation to apply reciprocal measures.

"This is creating huge problems for smaller Canadian manufacturers that aren't big enough to set up plants south of the border," says Lavoie, adding that CME has compiled a list of 341 Canadian companies encountering roadblocks because of the protectionist US legislation. "We haven't fixed this problem and it's only getting worse."

Lavoie thinks the federal government should leverage its mammoth infrastructure spending to coax the US into making a deal and level the playing field.

"We need to send a message."

The recently completed CETA deal with the European Union may also hold part of the solution. Canada's newest free-trade deal is the first to include reciprocity on procurement, Lavoie says.

"The EU made it very clear that they wanted more access to our procurement market, and they were willing to give something back in exchange."

The Trans-Pacific Partnership (TPP) could also be a way to resolve Buy American by including issues that aren't covered by NAFTA, such as state and municipal procurements.

"If Canada can address the issue of sub-national procurements through TPP to address buy local agreements attached to funding that national governments provide to state and municipal agreements, we can put our finger on Buy American," says Lavoie.

CME, led by president and CEO Jayson Myers, met with the federal government in early December, but Lavoie says a solution has yet to be reached and time is running out.

"The infrastructure money will be spent in the spring and President Obama wants TPP wrapped up by next spring," he says. "If we don't find a solution, the only answer I will have for manufacturers is to pack up shop and drive south to set up there." — Matt Powell

Comments? E-mail mpowell@plant.ca.



A de-icer made by Eco Solutions from sugar beet molasses is cutting municipal salting costs and making roads safer during the winter months.

BY MATT POWELL, ASSISTANT EDITOR

Beets are an acquired taste. Those who do enjoy the earth-bound vegetable nibble at them in pickled or roasted form (add a little balsamic vinegar and salt n' pepper for a great side dish by the way). But a company in Milton, Ont. has put an entirely new industrial spin on the humble *beta vulgaris*.

During a recent cold-snap that unleashed the disastrous late December ice-storm, Toronto deployed trucks filled with road salt covered in beet juice to help the city's roads melt in the frigid temperatures. The method is only used when temperatures drop below -20 degrees C and is good to -32 degrees C.

Beet juice is actually the main ingredient in Fusion Liquid De-Icer, which was launched in 2007 by Milton's Eco Solutions, a developer of environmentally friendly de-icing, dust control, fertilizer and pesticide products.

"If you're going out before the storm, you're basically applying a Teflon coating that doesn't allow any snow or ice bond to the roadway," says Tony Vaccari, one of the company's founders.

While the Fusion De-Icer has higher upfront costs (up to four times that of traditional road salt), Vaccari says costs are mitigated by using less of it.

"That's one less truck on the road, but that truck goes double the distance."

Toronto uses about 130,000 tonnes of road salt during an average winter at a cost of about \$10 million. It also uses a salt-water brine carried in containers on-board trucks to coat the rocks of salt as they're spread.

In early January, double-digit below

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Eco Solutions' beet de-icer is deployed by city salt trucks when temperatures dip below -20 degrees C. PHOTO: ECO SOLUTIONS

Beating the COLD

ROOT VEG TAKES THE SPIN OFF OF ICY ROADS

freezing temperatures called for the beet juice.

Toronto has been using the beet de-icer for about eight years, deploying it in extremely harsh conditions and its usually only sprayed on areas where ice will cause the most problems, such as hills bridges.

Good enough to drink

"The beet juice has a synergy with chloride and acts as an additive that produces ice corrosion and increases melting capabilities, but requires less material to do so," says Vaccari. "The city will use up to 40% less material doing the same if not better job."

Niagara Region claims a \$2 per highway kilometer savings after introducing beet juice into its de-icing activities in 2011, and it cut road salt use by 30%.

Other Ontario municipal customers include Guelph, Kitchener and Oshawa and those as far north as the Bruce and Grey counties. The organic, eco-friendly material is a novel contrast to road salt that contains high levels of chloride that are damaging to water and soil, and causes corrosion issues with city trucks.

While the company is currently focusing on appeasing demand for municipal clients, Vaccari says the beet de-icer is becoming popular with private sector clients such as property management at condominiums and even homeowners.

Demand for the product has grown steadily, a figure Vaccari expects to

settle between the 5% to 10% range. But that's enough growth to validate production at the company's Quebec facility by next year.

The de-icer is manufactured at the company's Milton and Notre Dame de Lourdes, Man. facilities in quantities exceeding 6 million litres per year. Depending on the blend, the beet mixture handles temperatures as low as -45 degrees C.

The de-icer actually uses a sugar beet, which resembles a mammoth white carrot that's generally grown commercially for sugar production. When it's processed for the food industry, a thick molasses is left over.

Eco Solutions takes the molasses, which it buys from a processing facility in Michigan, and sends it through an alkaline degradation process that thins it out.

The Milton plant employs five full-time, seasonal workers that make the de-icer between the end of August and February.

"During the degradation process, we provide a melt value to our liquid sugar beet and that material is used in conjunction with salt brine or granular rock salt to de-ice," says Vaccari.

The finished product is safe enough to drink, he adds, although the taste isn't too appetizing.

"It's pretty bitter."

But it's a great way to beet the dangers of winter driving.

Comments? E-mail mpowell@plant.ca.

» Fuels Cells

New energy Mantra

MRFC tackles renewable power storage

Technology would supply power producers with a low-cost system for high-volume power density applications.

Ontario's energy minister Bob Chiarelli announced in December that the province would extend the phasing-in of wind, solar and bioenergy to an estimated 10,700 megawatts by 2021 and continue diversifying its energy mix to lower its reliance on nuclear power. By 2025, the government expects half of Ontario's installed generating capacity to come from renewable sources.

But there's a problem with adding renewable capacity: storing energy when the wind isn't blowing or the sun isn't shining.

"Energy storage is needed badly. When the wind isn't blowing, you can't rely on wind power. When the sun isn't shining, you can't depend on solar," says Larry Kristoff, president of Mantra Venture Group Ltd. "We're not just wasting energy, we're compromising power grids and costing conventional power producers a lot of money because they have to slow down or shut down their operations."

Mantra is confident it has a solution to the energy storage shortfall: a relatively low-cost swiss-roll fuel cell system, originally developed by UBC professor, Colin Oloman.

"Talk to anyone in the renewable energy world and they'd agree that energy storage in the next big thing in that industry. It's at a point where you can't add capacity without enough energy storage," says Patrick Dodd, Mantra's chief technology officer.

Mantra Energy Alternatives Ltd., a Vancouver-based clean technology incubator and subsidiary of Mantra Venture Group, has developed its mixed-reactant fuel cell (MRFC) with the University of British Columbia (UBC) and with funding from the Clean Energy Research Centre and the Natural Science and Engineering Research Council of Canada (NSERC).



ERC converts harmful CO2 into saleable chemicals and clean energy. PHOTO: MANTRA ENERGY ALTERNATIVES

The company says the technology has the potential to reduce the complexity and costs of fuel cells because MRFC is platinum- and membrane-free, and doesn't require any platinum-based electro catalysts. This eliminates the need for expensive and failure-prone electrolyte membranes and bulky bipolar plates.

Because there's no membrane, Mantra says cost reductions of up to 68% over conventional fuel-cells are achievable. Another cost reduction of 25% is achieved because there aren't any heavy flow plates.

In conventional fuel cells, the fuel and oxidant flow in separate streams and are kept apart by an ion-conducting membrane that divides the cell into anode and cathode chambers.

Mantra's MRFC employs a mixture of fuel and oxidant flows through the cell as a single stream, allowing for a variety of conventional cell stack designs. This simplification is possible because the fuel cells operate without the gastight structures within the stack that are required for sealing, manifolding and separating reactant delivery in conventional cells.

It also integrates with another Mantra technology developed by Oloman and acquired by Mantra in 2008. Electro reduction of carbon dioxide (ERC) would fuel the MRFC by converting CO2 emissions into saleable chemicals (and clean energy), such as formic acid.

"We're trying to convert CO2 from high emissions industries into a fuel source that produces electricity," says Amin Aziznia, the company's process engineer. "There's not enough platinum on earth to do that."

Aziznia says MRFC will also work for traditional fuel cell applications, such as small electronics and electric cars.

If successful, the deployment of Mantra's technology would be timely in Ontario where wind energy production has doubled over the last four years to 5.2 terawatt hours, according to the province's Independent Electricity System Operator (IESO). And 3,300 megawatts of renewable energy has been committed to Ontario's electricity grid by the spring of 2015, making the need for storage capabilities increasingly imminent. — Matt Powell

Enterprise Resource Planning Software Helps Comtek Advanced Structures Keep Pace With Expansion

Aerospace Designer and Manufacturer Capitalizes on SYSPRO's Scalability and Efficiency During Time of Rapid Growth



Comtek Advanced Structures Ltd. was founded in 1994, and in 2007 became a wholly-owned subsidiary of Avcorp Industries Inc. In a nutshell, says Brett Richardson, Comtek's Director of Finance, the company designs, manufactures and supports advanced assemblies for aerospace and defense applications. Those include "honeycomb sandwich" panel solutions, infusion and out-of-autoclave technology solutions, and high-end repairs for regional aircraft. Headquartered in a 54,000-sq.ft. facility in Burlington, Ontario, Comtek employs sixty workers to service more than 100 customers worldwide, and enjoys annual sales in the range of \$12- to \$15-million.

In 2000, Comtek realized that its reliance on manual accounting procedures was not up to the task of controlling every aspect of the company's accelerating growth. With expansion into US markets imminent, Comtek went shopping for an enterprise resource planning (ERP) business solution. "Ultimately, one of the biggest reasons that SYSPRO ERP was chosen was customer referral. The company right next door to Comtek at the time was running on SYSPRO, and they were very pleased with it. That and SYSPRO's affordability were the two most important factors in its selection." Comtek moved quickly. In six months, working on the implementation with a VAR, the company was up and running with SYSPRO ERP.

background, I know the benefits that a fully leveraged ERP can bring, as well as the dangers of not being fully committed."

In line with Comtek's new philosophy is its decision to purchase a key piece of software that will integrate with SYSPRO. "One of our core activities," says Richardson, "is to manufacture aerospace floor boards from large sheets of raw composite panel. For that particular job we offer just-in-time service - we're shipping in three to seven days. The downside is that the sheets have to be cut to shape quickly, and that results in significant waste. For the last three years, we've been thinking of creating homegrown nesting software, but now we've finally found a package that will review the orders as they exist in SYSPRO, and optimally nest the shapes on the material. This will cut out the middle man, reduce time and wastage, and should drive down our just-in-time lead time."

With any ERP implementation, says Richardson, you have to spend some time adapting your business processes to the system. "What you must have is discipline, which is why I believe that every company should have an ERP champion. The beauty of SYSPRO is that it's not so regimented that it forces you to be exact, but it does put thresholds on deviation. One thing I like about SYSPRO is that rogue employees get identified pretty quickly. Sometimes we're running so fast we don't have time to think, but SYSPRO lets us know when something isn't going the way it's supposed to. It usually means that the employee doesn't understand something, or isn't familiar with the process."

Finding precise figures to demonstrate SYSPRO's return on investment isn't always possible, but as Comtek's Director of Finance, Richardson keeps his eye on the effect of SYSPRO on the company's bottom line. "Our annual spend rate for SYSPRO is less than \$40,000," says Richardson, "including all the hardware. Because of

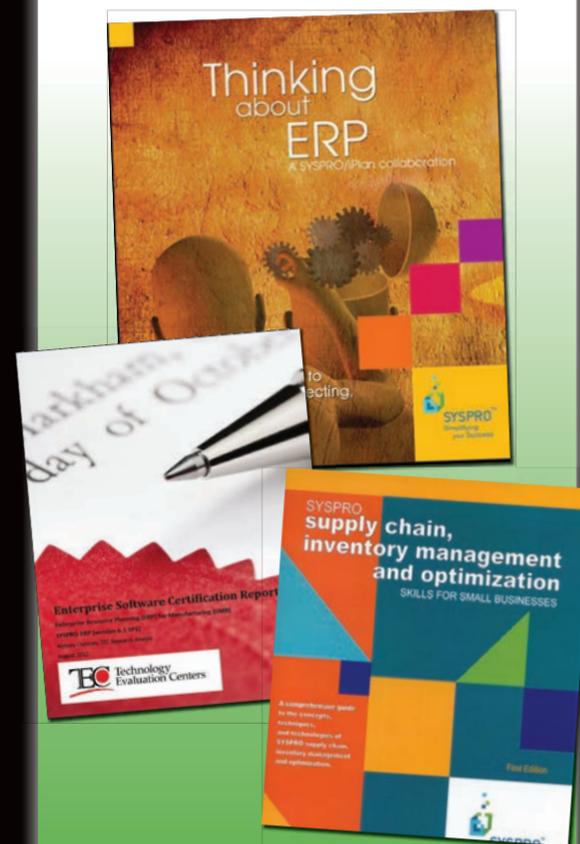
SYSPRO, we easily save on one accountant position and one planner position. Those two positions alone account for \$80,000 to \$100,000 in savings, without including ancillary costs. In addition, if we get busier, SYSPRO scales easily, which saves time from an accounting and inventory perspective. When we added an additional business unit onto the system the work required was minimal."

There are also monetary and operational advantages to having an ERP that has carved out its territory by serving the needs of small to medium-sized enterprises. "Our VAR does not run a typical corporate help desk," says Richardson. "When we call for help, we connect to experienced users who really get involved. The support we receive from our VAR helps us solve issues promptly, enables us to keep a smaller number of staff, and keeps us from having to hire consultants. That's definitely a SYSPRO advantage."

Overall, says Richardson, SYSPRO ERP is having a positive impact at every level of Comtek's operations. "We are absolutely happy with our ERP," he adds, "and I'm very impressed with its level of functionality. For the money, I keep coming back to SYSPRO."

For more information on Comtek Advanced Structures, please visit: www.comtekadvanced.com.

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"Ultimately, one of the biggest reasons that SYSPRO ERP was chosen was customer referral. The company right next door to Comtek at the time was running on SYSPRO, and they were very pleased with it. That and SYSPRO's affordability were the two most important factors in its selection."

Brett Richardson, Director of Finance, Comtek Advanced Structures

Brett Richardson was hired as Comtek's Director of Finance in 2008. Having implemented and upgraded SAP ERP in a former position, Richardson has an intimate understanding of the road map that leads to optimal ERP adoption and leverage. "One of the reasons I was hired," says Richardson, "was to drive the use of the ERP. I suppose you could call me the 'ERP champion.'" Moving from SAP to SYSPRO, he claims, was comparatively simple. "Because I had a strong ERP background, I was able to pick up SYSPRO in a matter of days."

Since taking on the job, Richardson has been active in promoting the development of SYSPRO power users. "We encourage our workers to develop their expertise, and engage them to spread their knowledge throughout the company, instead of folding that information into their individual silos. We even bought a one-year license for the SYSPRO learning channel [a web-based, collaborative learning environment]."

Richardson's passion for ERP was also important in fostering management commitment. "We now promote a simple philosophy: Whatever the challenge, we will address it in SYSPRO, and we discourage the use of anything else. There was always an excuse before, because of the unknown. But because of my

C I E N

CANADIAN INDUSTRIAL EQUIPMENT NEWS



Roll-up doors, capable of opening at 100 inches per second, don't hold up traffic.

PHOTO: RYTEC

Plant DOORS are on a ROLL

PROTECTING THE INS AND OUTS OF PRODUCTION

Industrial doors are keeping pace with the rapid movement of material handling systems.

SPECIAL REPORT

It's simple. The plant door has only two functions: close tightly to maintain the room environment and...get out the way. Life, however, is complicated and so it is with doors.

Follow the production path in any manufacturing or processing plant and there

will be a number of steps between the minute raw material and subassemblies hitting the receiving dock to when the finished product loads onto the truck. Many of these steps involve product going from room to room, and all of these rooms have their own environments based on the demands of the process, which must be protected by doors.

As with all manufacturers seeking ways to minimize the time it takes for any process, cutting down the time it takes for material handling traffic to pass through the doorways along the route is

a key consideration.

The different functions performed along the way dictate the kinds of doors needed to protect the environment within the room. An area where dust is generated from sanding, or another where heat is necessary for curing ovens, may need to be separate from a room where precision parts are being assembled.

What kinds of doors are available? Ideally, doors encountered by material handling traffic should not operate on hinges or rollers, but open and close by

Continued on page 22

» Supply Lines



FLIR ONE will come in grey, white, or gold.

PHOTO: FLIR

SMARTPHONES GO THERMAL

Detecting thermal issues arising from common electrical and mechanical problems just got a lot easier thanks to FLIR Systems Inc.

All you need is an iPhone 5 or 5s. The FLIR ONE from the Wilsonville, Ore. thermography expert attaches to your smartphone and displays a live image on the screen. Consumers can use it to look for cooling leaks, studs, water damage, to detect smoke or even find a lost hamster. But it's also handy on industrial sites for pinpointing issues such as loose connections, failing breakers, overloaded wiring, overheating motors, bearings and compressors, or misaligned shafts.

It's powered by FLIR's new Lepton camera core, which incorporates the company's thermal imaging technology. And it's easy to use. FLIR says the average user can attach it and create images in less than 30 seconds.

The device will be rolled out worldwide in the spring.

CHINA OFFICES FOR CRS

LED lighting manufacturer CRS Electronics Inc. has opened two new offices in China.

One will serve as the Toronto company's international headquarters in Chongqing.

The second office will be located in Zhuhai, Guangdong Province, near several key strategic manufacturing partners.

ICRON EXPANDS DISTRIBUTION

Icron Technologies Corp. has added two new distributors for its USB and video extensions.

The Burnaby, BC manufacturer welcomes AVB Technology Ltd., an Israeli distributor of systems and multimedia components, and Industrial IT Systems Ltd., a UK-based distributor of industrial networking, computing, automation and extension products.

They'll sell Icron's ExtremeUSB portfolio, which includes USB 1.1, 2.0, 3.0 and KVM (USB + Video) systems used in a range of applications including pro AV, industrial automation, machine vision, medical imaging, aerospace, interactive whiteboards, digital signage, remote desktop extension, security, enterprise computing and isolated USB.

Guarding against energy loss

Continued from page 21

rolling up and down. Here are some examples:

Fabric roll-up doors. Flexible, high strength plastic panels confine debris and differential air pressures. Goods move off of the receiving dock or warehouse shelves and right into production, but the doors ensure unconditioned air does not come along. Thicker panels separate rooms with wider temperature differentials.

Clean room roll-up. Most are made of USDA-, FDA-, NSF- and ISO-compliant materials. Metal parts are stainless steel. Surfaces shed contamination and clean easily.

Exterior roll-up. Dock doors stay open for loading, and because the doorway perimeter is protected by dock seals, speed is not important.

Many plants have massive openings to accommodate large parts coming in, product rolling out and forklifts heading out to the yard to pick up sub-assemblies. In addition to providing access, these doors deny access to unauthorized people. Depending on the level of security needed, panels are either hinged aluminum slats or rubber with the toughness of a truck tire.

They also stand guard against HVAC energy loss. And they all have features that maintain the environment of the room while allowing rapid traffic for efficient material handling.

When the roll-up door debuted several decades ago, rolling up at 20 inches a second was impressive. Now they are capable of 100 inches per second. Even the large exterior doors attain speeds of 60 inches per second.

Sealing a room

These doors do not get in the way of traffic, putting vehicle and driver time to good use. Extra seconds spent waiting for a door to open can translate into hours going nowhere in a year, diminishing the return on investment in the material handling vehicle and limiting the amount of product that flows through the system.

A door is doing its job when it performs the same function as a wall by tightly sealing a room. The roll-up style door design stops dead air infiltration and airborne debris, contamination and moisture.

They're tightly sealed on all four sides from the brush seal at the header to the flexible bottom edge that conforms to the floor contours. In between, the door guides enclose the edge of the panel. Room pressures help out by pressing the panel edge against the door guides.

One of the biggest threats to the seal comes from material or vehicles colliding into the panel and damaging it or causing misalignment. Once damaged, the doorway may not be effectively sealed for hours or days. The panels on most roll-up door designs, with the exception of rigid slat doors, separate undamaged from their side guides when the doors are hit, but quickly set back in place.

Many roll-up doors are controlled electronically to expand their scope of operation and improve reliability. These sophisticated drives eliminate the mechanical parts and the need to find the man-lift or the ladder to make adjustments.

This advancement in door control also delivers precise performance records for more effective maintenance. Electronics in the control box enable the door to make the handshake with production or material handling operating systems and coordinate its operation with the process.

Woody Allen once said that 80% of the job is just showing up. When it comes to a speedier material handling path for more efficient production, the job of the plant's doors are just getting out of the way.

This feature was provided by Rytec High Performance Doors, a manufacturer of high-speed, high-performance doors for industrial environments based in Jackson, Wis. Visit www.rytecdoors.com.

Comments? E-mail jterrett@plant.ca.

Pumps

OPTIMIZED FOR HARSH CONDITIONS

KSB's heavy-duty KWPK pumps are built for harsh conditions in mining, mineral processing or wastewater applications, handling slurries and aggressive fluids with highly wear- and corrosion-resistant hydraulic components. But they also work in pulp and paper as well as food and beverage processing where abrasive and/or highly corrosive materials are encountered.

This family of pumps with the non-clogging K-type impeller is based on a modular design so individual units are customizable to meet specific application requirements. Five standard material combinations



Modular design.

are available, each with different characteristics related to corrosion and wear resistance. A back pull-out layout simplifies on-site maintenance.

They come in a range of sizes, with inlet diameters as small as 40 mm or as large as 900 m. Maximum flow rate is 15,000 m³/hr., while the discharge head is up to 100 m.

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

www.ksb.com/ksb-ca-en

SOFTWARE CONTROLS COORDINATED PUMPS

WEG's Pump Genius for its CFW-11 variable speed drive manages and monitors up to six pumps in a coordinated system.

The software operates motors from 5 to 150 hp in the 208 and 230/240 VAC range and motors from 5 to 600 hp in the 480 VAC range. It provides control and protection, manages cycle hours and handles master and slave designations. It also monitors and controls system pressure or flow referencing low and high set points.



Manages cycle hours.

Pump Genius monitors the operating hours of all the pumps in the system, adding and subtracting them as demand changes, all without a cycle timer. This feature ensures equal pump run times without supervision.

A floating master and slave automatically senses if the master is not responding due to sensor loss or other fault condition. Another pump is then assigned to be the master, maintaining operational continuity. The transition between master drives is done in a totally bumpless manner without disturbing the process.

The CFW-11 VSD also monitors and provides an alarms system for motor and drive faults that will alert the operator to a potential problem.

The drives come in 2 to 600 hp units.

WEG Electric Motors Corp. is a manufacturer of industrial motors based in Atlanta.

www.weg.net



Magnetic drives.

MAG DRIVE HANDLES HARMFUL FLUIDS

The magnetic drives on Moyno's Mag Drive progressing cavity wobble stator pumps ensure zero leakage during critical applications.

The pumps handle toxic, aggressive, caustic or even flammable and explosive fluids.

There are no mechanical seals, eliminating costly repairs. The pulsation-free, low shear pumping action maintains product integrity while the coupling establishes a static seal aligning an outer drive magnet with an inner driven magnet within a stationary containment shell. And there's no vapour locking when handling gaseous, volatile liquids.

There are four models with PVC housings and flow rates from 0.1 to 900 gph.

Stator materials include nitrile or EPDM with optional FPM stators and titanium rotors.

Typical applications include sodium hypochlorite, ammonia, hydrogen peroxide, ferric chloride, aluminum chloride and many other caustic fluids.

Moyno Inc. is a Springfield, Ohio-based manufacturer of progressing cavity pumps, positive displacement pumps and sludge pumps.

www.moyno.com

SKIMMER REMOVES FLOATING HYDROCARBONS

Abanaki Corp.'s PetroXtractor active membrane skimmer pump recovers light non-aqueous phase liquids (LNAPL) from groundwater at depths of up to 130 ft.

Abanaki, a manufacturer of skimmer products based in Chagrin Falls, Ohio, says the combo pump and skimmer, which fits inside a monitoring well, has an advanced patented membrane that skims light hydrocarbons such as gasoline, diesel fuel, aviation fuel, and kerosene and keeps water out of the recovered liquid.

When full, the pump's internal float kicks the compressed air on and discharges the product. Once the hydrocarbon is flushed out, the pump cycles again. The pumps automatically shut off when there's no recovered liquid present.

The skimmer is made of durable stainless steel, there are no moving parts, it's ATEX certified for high explosive environments, and it's easy to install.

www.abanaki.com



Capacity up to 1,135 l/h.

IMPROVED FLOW CHARACTERISTICS

Neptune Chemical Pump Co.'s 7000 pumps for water and wastewater applications have no contour plates on the liquid side of the diaphragm but a simple, straight-through valve and head design improves flow characteristics.

The self-priming pumps have a capacity of 300 gph (1,135 l/h) at 150 psi.

The manufacturer of chemical metering and peristaltic pumps, portable mixers and chemical feed systems based in North Wales, Pa. also has a 500 series of PZ hydraulically actuated metering pumps with flow rates from 0.01 to 20 gph.

PZ pumps operate on a manual control that produces speeds from 15 to 300 strokes per minute.

EZE-CLEAN valve cartridges are removable for cleaning without disturbing the piping to the pump.

The 500 pumps handle up to 100 gph (302 l/h) simplex and 160 gph (605 l/h) duplex at pressures up to 3,000 psi (210 kg/cm).

www.neptune1.com

UPGRADES MEET OIL AND GAS CHALLENGES

Mouvex's A Series Eccentric Disc Pumps have been upgraded to meet the integration of ductile iron systems into oil and gas processes.

ISO PN16/ANSI 150 flanges have been added and Mouvex or standardized mechanical seals are offered, which expedites installations regardless of location.

Maximum differential pressure is doubled from 5 bar (72 psi) to 10 bar (145 psi) for the safe transfer of viscous, non-lubricating, volatile or delicate fluids in a

CUP-BB5 COVERS HYDRAULICS

SPX Corp.'s ClydeUnion CUP-BB5 multi-stage, radially split barrel pumps provide comprehensive hydraulic coverage.

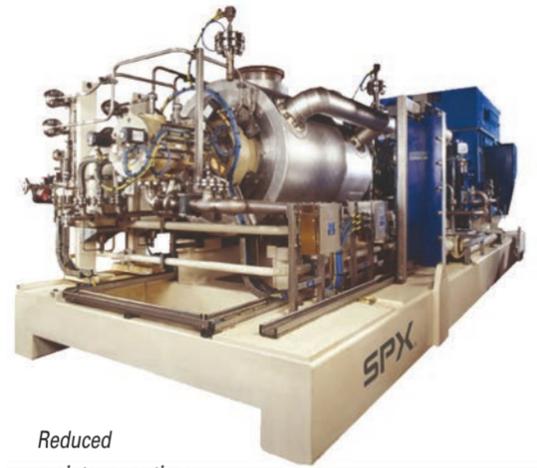
They feature opposed or inline impeller arrangements, volute or diffuser based hydraulics, foot or centreline mounting and material options from carbon steel to super duplex.

A shear ring cartridge locking system allows rapid withdrawal of all the pump internals as a cartridge without disturbing connecting pipe work, which reduces maintenance time.

Sophisticated sealing options that meet the API 682 standard include a patented double mechanical system for safe operation when pumping aggressive or toxic fluids.

SPX, based in Charlotte, NC, manufactures specialized, engineered products for flow technology and energy infrastructure.

www.spx.com



Reduced maintenance time.

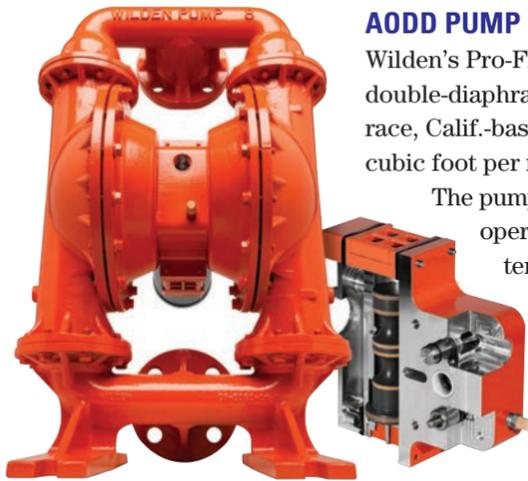
AODD PUMP SAVES ENERGY

Wilden's Pro-Flo SHIFT uses up to 60% less air compared to other air-operated double-diaphragm (AODD) pumps for greater energy savings. But the Grand Terrace, Calif.-based pump manufacturer also claims more product yield per standard cubic foot per minute.

The pump is submersible and features plug-and-play operation for use in harsh operating environments. ATEX compliance makes it suitable for use in potentially explosive atmospheres, while fewer operating parts means less downtime and simple maintenance.

Pro-Flo SHIFT comes in 38 mm (1-1/2 in.), 51 mm (2 in.), and 76 mm (3 in.) versions with maximum discharge pressures to 8.6 bar (125 psig), maximum flows to 1,056 lpm (279 gpm) and a maximum solid-handling size to 13 mm (1/2 in.). Maximum suction lifts are to 7.2 m (23.8 ft.) dry and 9 m (29.5 ft.) wet.

www.profloshift.com



More product yield.

variety of oil and gas applications.

Maximum speed is 600 rpm with maximum flow rates to 55 m³/h (242 gpm). Suction and discharge ports are from 1 1/2 to 4 in.

The pumps transfer product up to 80 degrees C (176 degrees F), and have self-priming and run-dry capabilities (up to 6 min.) while maintaining constant flow rates regardless of changes in viscosity and pressure.

Mouvex, based in Auxerre, France is a manufacturer of positive displacement pumps, vane compressors,



Differential pressure doubled.

screw compressors and hydraulic coolers. It's part of Dover Corp.'s Pump Solutions Group.

www.psgdover.com

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LIGHTING

LEDS LIGHT UP CALIBRATION ACTIVITIES

Saelig Co. Inc.'s GL OptiLight LED 127 controls the properties of its LEDs using a multilevel calibration procedure that characterizes each light source and stores the spectral properties in the unit's electronic controls.

Use the light as a reference luminance standard for display and monitor calibration systems, or as a reference for calibrating cameras and other optical instruments. The system combines a set of LEDs with an integrated sphere to enhance light source homogeneity.



Self-controls operating conditions.

When controlled by a PC via USB connection or set with the LED control panel, it creates almost any colour source. Supplied "adJUST" software allows users to set a range of light coordinates. Several light source standards are also featured, including D50, D65, D75, A, and TL84.

An active multilevel calibration system consists of basic factory and permanent on-line operational so an external metrological device isn't needed. The LED self-controls its operating conditions and adjusts resultant lighting with a high frequency drive (>100 Hz), which is both permanent and invisible to the eye.

The unit is made by GL Optic, a supplier of lighting solutions and is distributed by Saelig, a supplier of electronic control and instrumentation products based in Fairport, NY.

www.saelig.com

POWER



No detaring or heat sinking.

MINIATURIZE POWER CONVERSION

MicroPower Direct's ME100S DC/DC converters provide 1 W of output in a miniature 4-pin SIP package for a range of space critical board level applications.

Thirty-five models operate from 3.3, 5, 12, 24, and 48 VDC inputs and single outputs of 3.3, 5, 9, 12, 15, 18 or 24 VDC. Efficiency is as high as 83%, up to 1,000 VDC input/output isolation, and they're quiet.

All case materials meet UL94-V0 requirements and each model operates in temperatures between -40 to 85 degrees C without detaring or heat sinking. The converters are cooled by free-air convection.

MicroPower Direct is a supplier of power conversion products based in Stoughton, Mass.

www.micropowerelectronics.com

CUSTOMIZE POWER DENSITY, SWITCHING SUPPLIES

Standex-Meder Electronics's planar inductors provide power density and power switching supplies for applications in the electronics, telecommunications and aerospace industries in three standard or customized configurations.



Delivers 70 A.

Applications include switching power supplies, DC/DC converters in distributed power systems, FIGA and low-profile, high current POL converters, feedback control, overload sensing, load drop and shut-down detection. The inductors are also customizable to fit specific applications over a wide power range.

The PQ20, PQ26, and PQ32 inductors come with inductance of 0.4-6.0µH and a maximum voltage of 70 A.

Standex-Meder is a manufacturer of electronic and magnetic components based in Cincinnati.

www.standexmeder.com



Accommodates all cord sizes.

ENHANCE YOUR SECURE CONNECTIVITY

Power management company Eaton has redesigned its Arrow Hart locking devices and straight blade plugs to maximize security and connection strength. An updated ergonomic grip, reversible inserts and a universal cord clamping system accommodates all cord sizes.

The inserts are adjustable or removable based on incoming cable sizes to reduce connection gaps. A double dovetail design keeps cords aligned with the centre to reduce stress on terminal connections. All locking devices are NEMA certified.

Electrical ratings and part numbers are placed directly on the unit, clearly visible even when in use. Supplemental labeling enhances efficiency and allows end users to reference product specifications without disconnecting the devices.

Eaton is a manufacturer of power distribution products with North American operations in Cleveland.

www.arrowhart.com

TUBING AND HOSES

GREASE HOSE PERFORMS PREVENTIVE MAINTENANCE

Parker Hannifin's HLB remote grease hose makes it easy to quickly perform preventive maintenance on industrial, mobile and transportation equipment, while eliminating costly in-line greases.

The lines connect the port location to a service panel where grease is manually



Reduce lube issues by up to 80%.

distributed throughout the machine. The lubrication hose uses a panel mounted fitting with an internal zerk fitting port. Locknuts, zerk nipples and caps can be sub-assembled.

The hose operates in temperatures from -40 to 100 degrees C and are available in sizes ranging from 1/8 to 1 in.

Parker, a manufacturer of motion and control products based in Cleveland, says the grease hose is 60% lighter than other 1/4 in. rubber hose and reduces the potential of 50% to 80% of lubrication issues on inaccessible bearings.

www.parker.com

MATERIAL HANDLING

SUPER-STRONG CLAMPING POWER

DE-STA-CO's 82M-3E enclosed pneumatic power clamps for automotive producers and sheet metal processors deliver super-strong holding power.

The lightweight aluminum clamps come in 40-, 50-, 63-, and 80-mm sizes for manual and automated fixture welding, positioning and locating.



Infinite arm opening adjustments.

The infinite arm opening adjustment with an opening angle range 0 to 135 degrees is easily adjustable from behind the clamp. Additional time savings come from sensors that don't require adjustment, even when the opening angle is changed.

An enclosed body, sealed needle bearings and an enclosed sensor prevent intrusion of dust or debris and lengthen the unit's lifetime. Repairs are simplified by the sensor cartridge's two-part design, making it possible to replace only the damaged component.

DE-STA-CO develops automation technologies in Auburn Hills, Mich.

www.destaco.com

MAXIMIZE SHOP-FLOOR STORAGE

Akro-Mils has expanded its line of 8 in. ShelfMax plastic storage bins for shelving systems and many vertical automated storage retrieval systems.

Capacity of the bins, available in red, blue, yellow and clear, is 95% greater than traditional 4-in. shelf bins and 65% greater than 6-in. bins. A wider hopper eases access and a built-in rear hanglock provides full access to contents when tilted out on shelving.

The oversized label area accommodates a 2-in.-high adhesive label, or multiple labels for divided bins holding multiple SKUs. An innovative divider

SWITCHES



1.25 million operations.

SWITCHES HANDLE HARSH ENVIRONMENTS

EAO Corp.'s 04 illuminated selector switches are made to handle harsh environments and meet IP76 environmental protection requirements.

Optional LED illumination is available, and an ergonomic actuator meets DIN5566-1 standards. They fit into design-in or retrofit projects and come in standard 22.5 mm panel mount or 30.5 mm flush style configurations in round or square versions.

The selectors are fitted with single colour white, red, green, yellow or blue LEDs. Bi-colour illumination is also available in red/green, red/yellow and green/yellow combinations.

A high-reliability switching element has been tested to achieve at least 1.25 million operations at each position. A variety of contact configurations include silver, gold over silver and palladium materials fitted with screw, plug-in, or push-in terminals.

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

www.eao.com



Built-in rear hanglock.

allows for more secure bin partitions, and easier installation and removal of optional width and length dividers.

Akro-Mils is a manufacturer of plastic and metal storage products based in Akron, Ohio.

www.akro-mils.com

MAINTENANCE



Handles up to 124 oz.

DRAIN PAN HANDLES OIL SPILLAGE

Ken-Tool's 30600 super single axle drain pans solve the problem of gear oil and grease drips and spills on wheels, tires and shop floors during truck and trailer axle servicing.

They're made from lightweight, high-density, heat and warp resistant polyethylene that attach using two three-lug studs with finger-tightened nuts. The pan is contoured to rest flat with the sides gripping the wheel's drop-centre and fits most 22.5- and 24.5-in., 10-hole hub or stud-piloted wheels.

A pair of self-draining shelves keep hub covers, bearings, retainers, seals and hub or axle nuts out of the way. The 124 oz. pan has two drop-proof drain spouts to make waste disposal easy.

Ken-Tool is a manufacturer of tire service hand tools based in Akron, Ohio.

www.kentool.com

PREVENT DOORWAY ENERGY LOSSES

Berner International Corp.'s HL Series air curtains restrict energy losses and the infiltration of fumes and airborne contaminants in petroleum refineries, food processing, chemical facilities and compressed natural gas bus garages.

Standard construction complies with Class I, Division 1 and 2, Groups C and D for gases; and Class II, Division 1 and 2, Groups F and G for dust. Optional construction is available for Groups A and B.

Factory-assembled in single length



Blocks airborne contaminants.

www.plant.ca

units, the air curtains are available in 3 to 16-ft.-long cabinets that don't require intermediate installation supports. They also include explosion-proof motors ranging from 1/2 to 15 hp and heavy-duty blowers that protect doorway heights of 6 to 20 ft.

Optional steam or hot water coils with a 50 to 80 degree C temperature range are available with a custom-constructed ANSI/NFPA-70-compliant aluminum chassis.

Internal components are easily accessible to streamline service activities, while epoxy-coated, aluminized steel cabinets and base frames are standard with optional all stainless steel construction. All on-board electrical enclosures, conduit and terminal fittings are NEMA-7 compliant.

Berner is a manufacturer of air door/air curtain equipment based in New Castle, Pa.

www.berner.com

DUST CONTROL

DISCHARGER HOOD CONTAINS SPILLAGE

Flexicon's bulk bag discharger dust hoods contain spillage and dust that escapes through seams in the bag and folds in the spout.

The six-sided, stainless steel enclosure that seats against the rim of the hopper or flange of downstream equipment is equipped with an exhaust port for dust collection and a hinged door with inspection window.



Enhances material flow.

The top of the enclosure is fitted with a circular opening for passage of the bag spout to the equipment connection point. The flat bottom supports a telescoping tube that pneumatically raises a clamp ring that connects the clean side of the spout to the clean side of the equipment.

Allowing the telescoping tube to descend under its own weight maintains constant downward tension on the spout as the bag empties and elongates. Activators raise and lower opposite bottom edges of the bag at timed intervals to loosen compacted materials and complete discharge.

The enclosure contains incidental leakage of fine powders from seams in the bag, as well as material released from bag spout folds during connection and disconnection. Dust is then vented through the sidewall-mounted port to an optional collector or plant bag house.

Flexicon is a manufacturer of bulk handling systems based in Bethlehem, Pa.

www.flexicon.com

SAFETY

PROTECTION FOR ROLL CAGE WELDING AND RIGGING

Roll Cage welding and rigging gloves from Lincoln Electric (also suitable for cutting and grinding applications) provide complete hand protection so you won't need a separate pair for each task.

They're made of fire-resistant cowhide, sewn with Kevlar thread, and segmented with high-temperature resistant silicon pads for knuckle protection. The finger-structure design enhances grip and durability.

A protective overlay on the palms reinforces high-wear areas, an inside lining that protects against cuts, and a longer-length cuff that guards wrists and forearms against heat and sparks. Fire-resistant Velcro wrist guards secure the glove and allow quick removal.

Lincoln Electric, a manufacturer of arc welding products, is based in Cleveland.

www.lincolnelectric.com



Protective overlay.

MOTION CONTROL

CONTROL VALVES SIMPLIFY SET UP

Bimba Manufacturing's SPCS-2 provides electric-like loop motion control when used with direct feedback pneumatic actuators, eliminating the need to change manual switches or adjust rotary potentiometers during system setup.

System configuration and setup of the high-flow servo pneumatic control valve is completed using a standard USB connection and accompanying software. The valves are IP65 compatible, handle payloads up to 450 lb. and velocities up



IP65 compatible.

to 15 in. per second.

Bimba Manufacturing is a developer of actuation technologies based in University Park, Ill.

www.bimba.com

Need to do More with Less?

VAC-U-MAX Model 1020. The Most Powerful Continuous Duty Electric Vacuum Cleaner.



Model 1020 15 HP with 2 cubic yard self dump hopper.



- * POWER! 50% more vacuum.
- * Speed: Vacuum piles of material at rates up to 5 TONS PER HOUR!
- * Material Handling: Collect Material in a 55 Gallon steel drum or a 2 cubic yard self dumping hopper.
- * Versatile: Easy-Rolling Portable Vacuum or Power-full Central Vac for remote tubing networks.
- * User-Friendly: Quiet, Quick Disconnect Hoses, Ergonomic Cleaning Tools, Rolls through a 34" doorway.
- * Reliable Equipment that is proudly made in America.

VAC-U-MAX is a premier manufacturer of industrial vacuum cleaning systems for production lines and other dust-intensive areas. Put our field-proven industrial vacuum cleaning systems to work for you, and watch dust and other particulate contamination disappear.

www.vac-u-max.com/vacuum
800-VAC-U-MAX

VAC-U-MAX
Industrial Vacuum Cleaners
Belleville, New Jersey

DRIVES FIX SINGLE-DIRECTION LINEAR TRAVEL

A linear speed control option on Amacoil/Uhing's RG rolling ring linear drives fix a specific speed in one or both directions of travel for applications that don't require variable speed.

A set-screw that's inserted into the drive housing eliminates adjustments to motor speed and controls. When the set-screw option is used, hex-head screws are inserted into one end of the drive unit, the end contacts the rolling ring bearing assembly and holds it at a specific angle relative to the shaft, giving the drive its fixed linear speed in one direction.



Dirt and debris free.

If one set-screw is used, the adjustable speed function via control lever may still be used for the other travel direction. If a fixed speed in each direction of travel is needed, two set screws are inserted into the drive housing. In this case, the pitch control lever and dial are removed and the specific pitch/speed of the drive unit is fixed in each direction of travel.

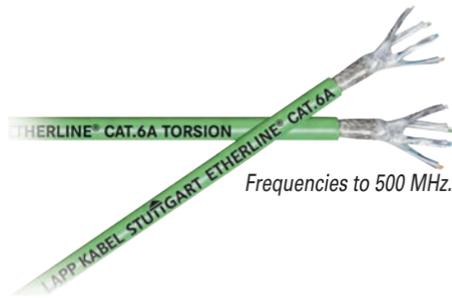
The drive unit runs on a smooth shaft and there are no threads to collect dirt and debris.

Amacoil is a manufacturer of linear drive assemblies based in Aston, Pa. www.amacoil.com

CABLES

CABLES HANDLE CONTINUOUS FLEX AND TORSION APPS

CAT.6A cables already provide fast data transmission rates in industrial ethernet systems, but they don't withstand the continuous flex or torsion requirements associated with moving machine applications and are limited by transfer rates as



low as 1 Gbit/sec.

Lapp Group's ETHERLINE cables remove this limitation, combining 10 Gbit/sec data transfer rates with continuous flex and torsion performance suitable for robotics, machine vision systems, wind turbines and other industrial machines with motion systems.

These CAT.6A cables operate at frequencies up to 500 MHz, which predisposes them to electromagnetic noise and interference. Copper braid reinforced with a foil-laminated fleece ensures reliable data transfer and they're available in two versions: one optimized for continuous flex in cable tracks and the other for torsion.

Both are compliant to PROFINET standards, UV and flame resistant, and operate in damp or dry operating environments. RJ45 and M12 x-coded connectors are also available.

Lapp Group is a manufacturer of custom cable products based in Florham Park, NJ.

www.lappusa.com

SENSORS

AEROSPACE LVDTs SERVE CRITICAL COMPONENTS

Macro Sensors' CD subminiature LVDT position sensors deliver the low weight, compact size and accuracy required for tight space and weight restrictions in aerospace applications.

With a lightweight, low mass core and a compact 3/8 in. diameter, they're suitable for high response dynamic measurements such as valve position. The LVDTs are used in various pneumatic butterfly valve applications, such as shut-off, fan air, and wing anti-ice valves. They also provide reliable displacement measurement for monitoring fuel/oil level and flight surfaces of airplanes as well as load leveling of artillery platforms and rudder positions.

Ratiometrics and digital signal processing have improved temperature stability, accuracy, repeatability (error of <0.01% of FSO) and delivering of high resolution. They operate in temperature extremes of -55 to 105 degrees C, and handle high pressure and temperature configurations that operate up to 200 degrees C under pressures up to 20 kpsi.

The sensors, housed in stainless steel and epoxy encapsulation, are customizable with teflon bore liners and metric threaded cores as well as different lead wire exit points and connectors.



Customizable with teflon bore liners.

Units are available from 0.025 in. to 1 in. measure with a core-to-bore radial clearance of 0.012 in.

Macro Sensors is a manufacturer of linear and rotary sensors based in Pennsauken, NJ.

www.macrosensors.com

FASTENERS



Threads as small as M1.

INSERTS MAKE ASSEMBLY EASY

MicroPEM through-threaded brass inserts from Penn Engineering simplifies the fastening compact, plastic electronic assemblies.

Installation is easy and permanent, with plastics such as ABS and polycarbonate and threads as small as M1. A single-mating screw completes the joining process.

Available in thread sizes up to M1.6 and in several lengths, they install in either straight or tapered mounting-holes and are symmetrical to save time during production by eliminating insert orientation prior to installation.

Penn Engineering is a manufacturer of fasteners based in Danboro, Pa.

www.pemnet.com

INSPECTION

X-RAY SYSTEM MAXIMIZES THROUGHPUT

Thermo Scientific's Xpert C600 X-ray system specifically detects metal, glass and dense plastics in large food packaging.

A 22 x 10-in. aperture, 50% larger than previous models, examines large food products through standard inspection machines for contaminants or inspects them for missing or damaged pieces. The unit includes a 160 W X-ray source for



Dust and washdown rated.

better penetration of large objects.

Its highly sensitive detectors are available in 0.8 mm resolution, and a suite of algorithms finds small contaminants in complex images.

Software allows up to eight lanes to be simultaneously fed through the aperture to maximize throughput.

It operates within a temperature range of 5 to 40 degrees C. Technicians are able to troubleshoot and service the system quickly to minimize downtime thanks to a module design and built-in remote support capability.

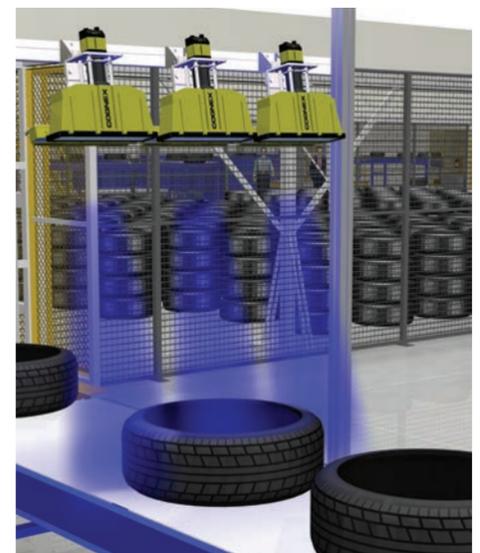
Thermo Fisher Scientific Inc. is a manufacturer of analytical instruments and equipment based in Waltham, Mass. www.thermofisher.com

VISION

READS HARD-TO-READ BARCODES EASILY

Cognex Corp.'s Tire Solution suite solves barcode and low-contrast embossed character reading challenges for tire manufacturers. It integrates proprietary machine vision knowledge, identification and barcode reading technology into preconfigured systems.

IDMax+ with Hotbars algorithms provide high barcode read rates and image-based readers let you see what they see for troubleshooting and continuous improvement.



Catches low-contrast embossed characters.

Xpand technology increases field of view with less equipment and a DS1000 3D sensor reads embossed characters on curved, dark surfaces at speeds up to one tire revolution per second.

Cognex Corp. is a manufacturer of machine vision technologies based Natick, Mass.

www.cognex.com

CHEMISTRY

REACTOR HANDLES HIGH-TECH CHEMISTRY

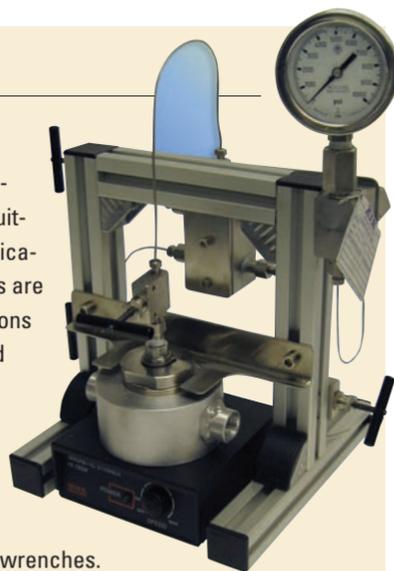
A high-pressure reactor from Supercritical Fluid Technologies handles small batch reaction chemistry and is well-suited for research, process development and screening applications when reagents, catalysts or other essential materials are expensive or in limited supply. It's also useful for applications in green solvents such as supercritical carbon dioxide and traditional organic solvents.

The HPR-micro reactor comes standard with a 10 mm Iconel 625 stainless steel vessel for operation up to 10,000 psi, inlet and outlet valves and a pressure gauge. The vessel, which operates between temperatures of -40 to 150 degrees C, is "hand tight," so it doesn't require any wrenches.

Magnetically coupled stirring ensures optimal mixing and all high-pressure components are ASME compliant. Overall assembly is protected by a rupture disc assembly for safe operation.

Supercritical Fluid Technologies is a developer of material processing technologies based in Newark, Del.

www.supercriticalfluids.com



"Hand tight" closure.

AUTOMATION



10-measurement memory capacity.

RECORD ROTATIONAL AND LINEAR SPEEDS

SHIMPO DT-100A battery-powered handheld tachometers from Automation Direct enhance users' capabilities to measure and record rotational and linear speed, and are made of die-cast aluminum for applications in harsh conditions.

A selection of units in both instantaneous rate and totalized lengths satisfies a number of user requirements. A compact, ergonomic design allows easy grip and rear threaded inserts (1/4 – 20 x 5/16 in.) provide additional mounting options.

The units include large five-digit displays and a 10-measurement memory capacity to retrieve stored data quickly. Continuous-use battery life is up to 40 hours while displays are available in either LCD or red LED.

Automation Direct is a supplier of automation products based in Cumming, Ga. www.automationdirect.com



Reduces operating risks.

MORE INSIGHT WITH FOXBORO EVO

Invensys next generation Foxboro Evo process automation system improves the operational insight of plant operations.

The system, which evolved from the Foxboro I/A Series and Triconex technology, extends the layered architecture approach through a component object-based platform, which will undergo major upgrades without halting operations.

Foxboro Evo includes a new high-speed controller, field device management tools, a maintenance response centre, an enterprise historian, 1-n redundancy and cyber security hardening.

Users have high visibility into historical, real-time and predictive operating information to help drive production efficiency.

Control and safety are coupled, which enables sharing of operational information while keeping the safety system functionally isolated, plus the system features state-of-the-art cyber security.

Current Foxboro I/A Series DCS users migrate to the Foxboro Evo system with little or no downtime, depending on

which version they're running. Users of competing process automation systems, whose wiring terminations are still functional, migrate to the system without ripping out or replacing infrastructure.

Invensys is a Houston-based supplier of industrial software and systems. www.foxboro.com/foxboroevo

POWER TRANSMISSION

TOUGHER BEARINGS FOR STEEL MILL APPLICATIONS

SKF's Explorer spherical roller bearings have been upgraded with a unique heat treatment that makes the bearing steel harder for use in steel mill applications where bearing wear and/or surface damage occurs from contaminated or poor lubrication.



Self-aligning.

Typical applications include large electric motors, gearboxes, fans and blowers, and others where there are contaminants, high temperatures and high levels of combined loads.

The bearings also self-align to compensate for misalignment between shaft and

housing or shaft deflection without increasing friction or reducing bearing life. An optimized internal geometry further accommodates heavy radial loads and moderate axial loads in both directions.

Two rows of self-guiding symmetrical rollers share a common sphered raceway in the outer ring to reduce friction and minimize heat generation. High-strength and dimensionally stable bearing rings minimize the risk of cracking and perform at high temperatures up to 199 degrees C.

The bearings come with cylindrical or tapered bores in a wide range of diameter sizes. Variations include sealed and factory-greased versions and custom solutions.

SKF is a bearings manufacturer with Canadian offices in Toronto. www.skf.com



SPEC IN RELIABILITY

Specify Loctite® Anaerobic Threadlockers

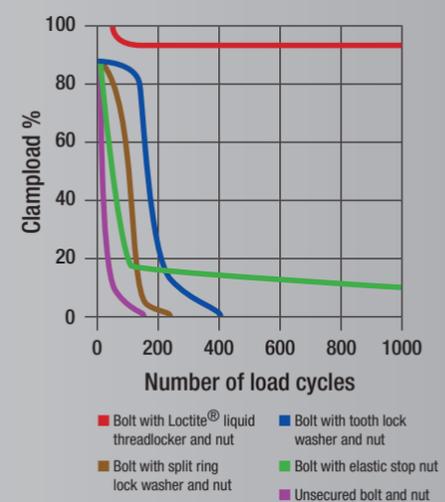
By filling the thread roots and preventing side-to-side movement, Loctite® threadlockers have dramatically increased the reliability of threaded assemblies for over 50 years. New advancements provide higher temperature resistance, improved oil tolerance and primerless performance. Don't let your designs fall apart. Specify Loctite®.

When it comes to:

- resisting vibration
- preventing corrosion and leakage
- improving quality
- reducing weight, size and cost,

mechanical locking devices just don't hold up.

CLAMPLOAD RETENTION COMPARISON

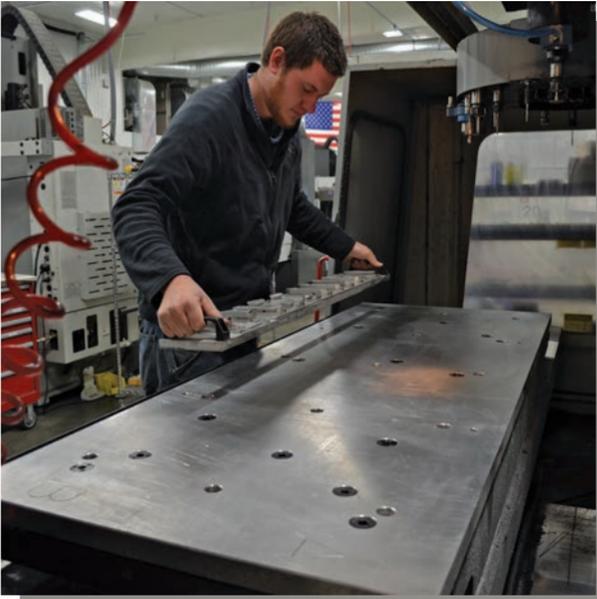


For technical assistance, call 1.800.263.5043



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New Carr Lock™ System Provides Fast Fixturing



The new Carr Lock™ System from Carr Lane Mfg. allows accurately locating and clamping at the same time, with just the twist of a hex wrench, for mounting quick-change tooling on a subplate.

The new system, which consists of a clamp, a liner bushing and a receiver bushing, is exclusively made in the USA. Carr Lock offers complete interchangeability with all components of the similar mounting system previously offered by Carr Lane, but at a lower price. Carr Lock can be ordered alone or in kits combined with mounting plates. Visit the Featured Product section at CarrLane.com for videos of the parts in action.

Machine Operator Tyler Vaughn, of the Flying S, places a carbon trim fixture. The Carr Lock™ receiver bushings allow for fixtures in various configurations.



This standard style has one serrated and one smooth side. Force is applied by the turn of a hex wrench.

CL⁵

5-AXIS +
QUICK CHANGE
=
MAXIMUM
UTILIZATION

- Use Carr Lane's Quintus quick-change riser to mount vises, fixture plates, or your custom clamping device
- By design, the CL5 system accepts our German-built, extremely accurate vises on precision plates made in the USA
- Achieve 5-side part access and quick-change flexibility
- Numerous jaw types and sizes available

MANUFACTURING CO.
314-647-6200
www.carrlane.com/featured

PROBLEM:

“We are an aerospace prototype shop making the transition from prototype to production on an important UAV project. We’ve developed elaborate fixturing of all shapes and sizes. We found ourselves leaving our trim fixtures set up on a large gantry style table and then having to tear everything down when a large part came along to make way for it.

This tied up one of our most valuable spindles, and dust collection was nearly impossible. Change over and setup times were totally out of control.”

SOLUTION:

“I discovered that I could combine 80% of our trim fixtures into just one fixture plate using just two Carr Lock pins, with excellent locating ability and much better clamping than before.

Our setup times have gone from an average of about 25 minutes to literally 30 seconds, thus saving us hundreds of hours.”

*Peter Bowman
Production Manager/Mfg Engineer
Flying S Inc.*

carrlane.com/carrlock



TOGGLE CLAMPS WITH SAFETY LOCKS

Carr Lane provides a variety of new toggle clamps with optional safety locks, including latch-action, vertical-handle, horizontal-handle, and push/pull types. Carr Lane toggle clamps have a comfortable handle grip, and are made of durable high-grade steel (many also available in stainless steel).

Carr Lane Mfg. Co., www.carrlane.com

» Plantware



Measures and maintains heat input.

INTERFACE WITH E-DIGITAL POWER SOURCES

Yaskawa Motoman's digital interface for Miller Electric's Auto-Access now includes E digital series power sources.

Thousands of Motoman robots have Auto-Access and DI power sources with an analogue or DeviceNet digital interface. The analogue interface is easy to retrofit to older robots and the DI's robot-teach pendant changes power source program data normally limited to Miller's File Manager application.

An ethernet interface controls weld data by monitoring parameters through Miller's Insight Centerpoint application, which tracks and verifies within limits. The system also tracks weld quality and overall equipment effectiveness.

The robot's actual travel speed is monitored to measure and maintain heat input. Process control has been improved with the ability to change pulse slope and arc control in real time. The ethernet interface networks up to four robots to operate from a single connection and computers can be added to the network to manage data.

E digital is available in 300, 450 and 675 A capacities.

Yaskawa America Inc. is a robotics manufacturer based in Waukegan Ill.

www.motoman.com



Control it from anywhere.

GATEWAY CONNECTS MODBUS DEVICES

B&B Electronics has expanded its family of Vlinx Modbus Communications Gateways with the MESP211, a compact version that converts Modbus ASCII or RTU serial signals into TCP Ethernet for monitoring and controlling devices anywhere on the LAN or WAN.

Made for harsh environments and cramped spaces, the compact (7.9 x 2.3 x 5.1 cm) gateway features a wide (-40 to 80 degree C) operating temperature range; heavy industrial specifications (61000-6-2 EMC level 3 for harsh environments and IEC60068-2-27 for shock, -6 for vibration and -32 for free fall); and a rugged IP30 metal case.

Applications include temperature control equipment, HVAC systems, industrial PLCs, power sub-metering and communications to solar trackers and inverters.

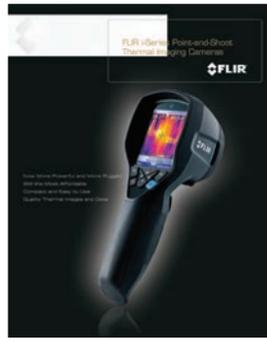
Vlinx Manager Software installs on a PC for remote management of the MESP211 over a LAN or WAN via the built-in web server. Take advantage of Modbus messaging priority control and view messaging status in real time via the built-in traffic monitor.

The one-port gateway works with RS-232/422/485 serial signals and is available in two models: the MESP211D with a DB9 Male connector and the MESP211T with a Terminal Block connector.

B&B Electronics Manufacturing Co. Inc. makes mission-critical network connectivity products in Ottawa, Ill.

www.bb-elec.com

AFFORDABLE THERMAL IMAGING



The FLIR i-Series Point-and-Shoot Thermal Imaging Cameras brochure introduces the newly redesigned i3, i5, and i7. The brochure covers affordable entry-level infrared cameras ideal for equipping front-line plant technicians.

www.flir.ca
Flir

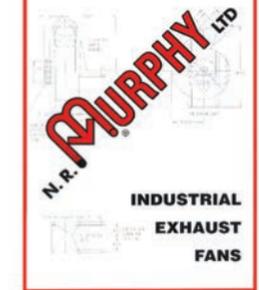
INDUSTRIAL VACUUM CLEANING SYSTEMS FROM VAC-U-MAX



VAC-U-MAX is a premier manufacturer of industrial vacuum cleaning systems for production lines and other dust-intensive areas. With a VAC-U-MAX heavy-duty industrial vacuum cleaning system on site, both your capital equipment and your employees will be safer and cleaner. www.vac-u-max.com

VAC-U-MAX

INDUSTRIAL EXHAUST FANS, IMMEDIATE DELIVERY



N.R. Murphy carries a large inventory of industrial Exhaust Fans in a vast range of sizes. The most popular versions are fully built and ready to ship. When an unusual requirement turns up, they have the experience and manufacturing capacity to quickly modify or build a new fan. Free catalogue, includes N.R. Murphy's line of fans, specifications and guidelines. www.nrmurphy.com

N.R. Murphy

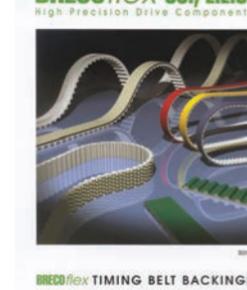
MOST POPULAR VACUUM CUPE



Vi-Cas Manufacturing's new 16-page, full colour brochure details the company's most popular vacuum cups. In addition to dimensional information (including lip diameter, height and mounting holes), the new literature shows photos of each cup to guarantee accuracy. Vacuum cups and accessories are used extensively in all types of packaging and labeling operations. www.vi-cas.com

Vi-Cas Manufacturing

HIGH PRECISION TIMING BELTS WITH BACK COVERS



BRECOflex offers high precision polyurethane timing belts with a wide variety of backings. A heated chemical bonding process assures a strong seal. All backings provide excellent wear resistance and resilience. They come with a full range of accessories including pulleys, clamps, tensioners and slider beds. Visit www.brecoflex.com for your FREE copy, samples and technical support or call (732) 460-9500.

BRECOflex

REFERENCE FOR ROTATING UNIONS



An updated catalogue for designers and users of coolant unions for machine tool, machining center, and transfer line applications. This comprehensive reference guide offers detailed information for rotating union selection, installation, and maintenance, along with expanded product information. www.deublin.com/catrequest

Deublin

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executive decision-makers

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Over 12 million North American business contacts available. Great for direct mail, fax, telesales and email campaigns.

EMAIL MARKETING SERVICE
From simple to complex, we'll handle your campaign from start to finish; from targeting your audience and designing your emails to measuring results and capturing responsive leads.

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Maximize your marketing database for improved ROI with our full suite of data cleansing and enhancement services.

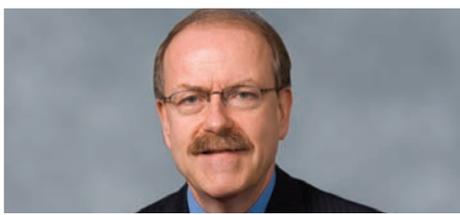
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Thank exports for improved performance

BY JOCK FINLAYSON

After a lacklustre 2013, the prospects for Canada's economy in the coming year are mixed.

In the plus column are accelerating US economic growth, continued low interest rates, and the positive impact of the weaker loonie on Canada's net trade position and competitiveness. On the negative side are sluggish global commodity markets, record high household debt, federal and provincial government

“Overall, economic conditions should strengthen in 2014, with inflation-adjusted GDP advancing in the vicinity of 2.4%...”

fiscal austerity, and a slowdown in residential investment spending.

Overall, economic conditions should strengthen in 2014, with inflation-adjusted GDP advancing in the vicinity of 2.4%, up from 2013's estimated 1.8% gain. The job market is expected to gather steam by the second half of 2014, although the unemployment rate will remain above 6.5% throughout the year. Inflation should edge higher from today's rock

bottom reading, but the Consumer Price Index (CPI) will continue to track below the mid-point of the Bank of Canada's 1% to 3% target range.

Consumer outlays, which account for about two-thirds of economic activity, were more buoyant than anticipated at the beginning of 2013, particularly given a long stretch of fast-paced household credit growth over the preceding five years. With the all-items CPI running at

around 1%, even limited gains in disposable incomes have been sufficient to support higher consumer spending, while persistent low borrowing costs work to the advantage of indebted households.

Low inflation coupled with low interest rates has also proven to be a useful tonic for the housing market, which exhibited surprising resilience in 2013. Home sales and prices moved higher, contrary to the expectations of many market analysts.

But looking ahead, virtually all leading Canadian forecasters expect housing starts to cool over the course of 2014-15. Absent a sudden spike in interest rates, the most probable scenario is a period of broadly flat housing prices in most regions of the country. A few notably frothy urban markets may experience price declines.

Positive export conditions

For the past two years, forecasters and Canadian policymakers have been calling for a “rotation” of economic growth, away from a disproportionate reliance on consumer spending and housing expenditures to stronger gains in business investment and exports. This will finally happen in 2014.

Faster US economic growth, combined with the end of outright recession in the Eurozone, modest growth in Japan and the UK, and a stabilization of economic conditions in key emerging markets offer a more positive backdrop for exports – the only sector that failed to return to its pre-2008 level of economic activity.

US growth is key. America's real GDP increased at a solid 4.1% annual rate in the third quarter of last year. US housing starts are on track to exceed one million per year, up from 400,000 to 500,000 during the worst phase of the epic 2007-2011 meltdown. Most forecasters now predict US growth of 3% for 2014, appreciably better than the 2% average expansion of the previous three years. As the US economy enters a period of hoped-for sustained growth, numerous Canadian industries stand to benefit, from lumber and other building materials to auto parts and assembly, machinery and equipment, and various segments of the advanced technology sector.

Still, any recovery in exports is apt to be fairly muted given the prevailing soft outlook for many globally traded commodities and Canada's loss of competitiveness vis-à-vis the US across much of the manufacturing sector during the past decade. But even a modest jump in the value of export shipments in 2014 should be enough to underpin an improvement in Canada's overall economic performance.

Jock Finlayson is executive vice-president of the Business Council of British Columbia. This column is distributed by Troy Media, based in Calgary. Visit www.troymedia.com.

TWO GREAT SHOWS UNDER ONE ROOF!

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Wednesday, April 23, 2014
Mississauga Convention Centre

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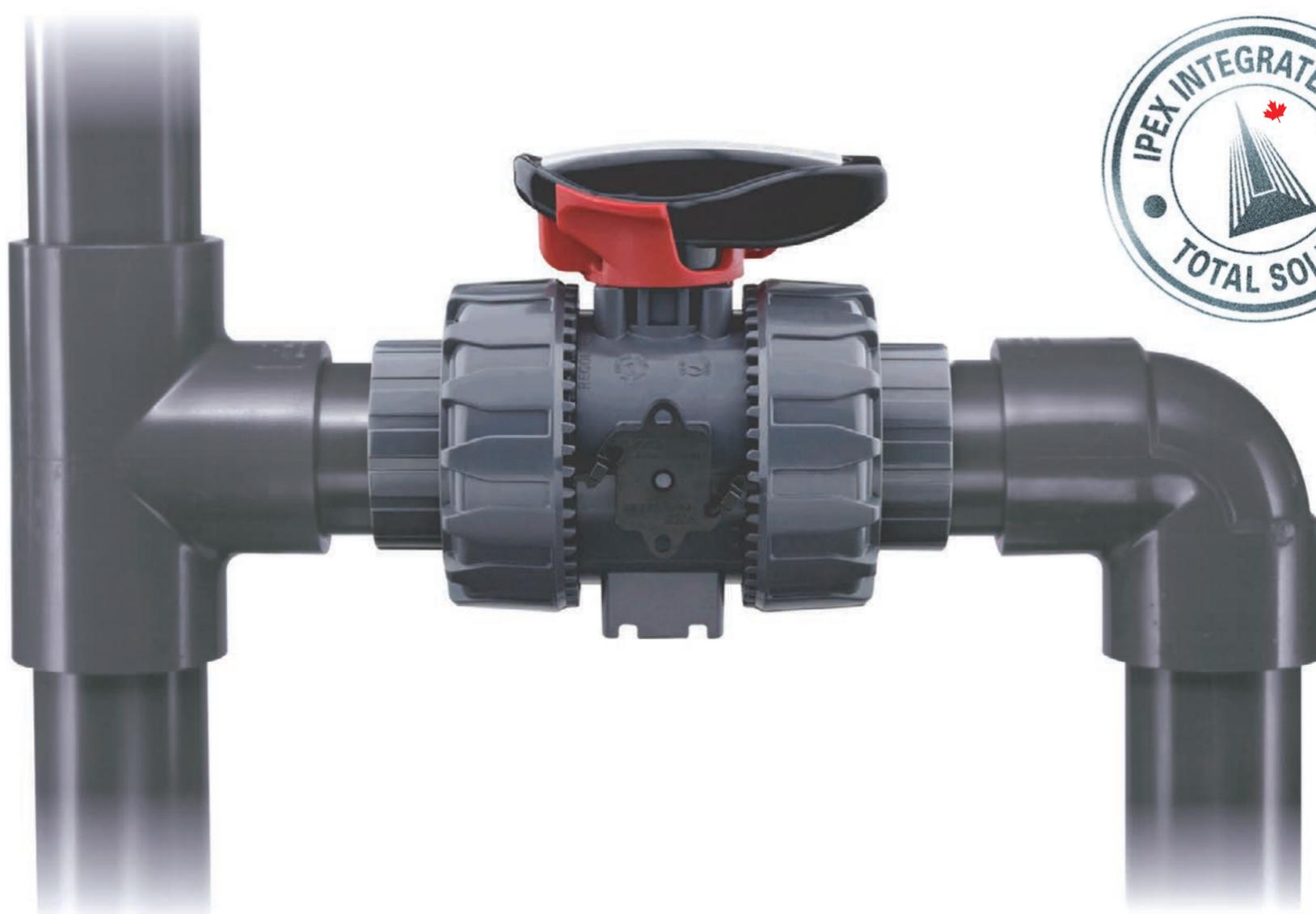
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