

PLANT

ADVANCING CANADIAN MANUFACTURING

Volume 74, No. 01 January/February 2015

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FREEish TRADE

Canada takes exception to US protectionist measures



NEW TECHNOLOGY SECTION
CIEN
 CANADIAN INDUSTRIAL EQUIPMENT NEWS

HIGHLIGHTS

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- Doing business beyond Canada's borders
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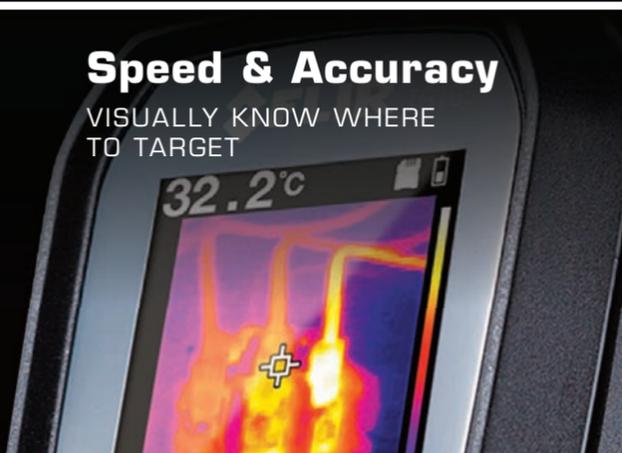
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Message to America: Free trade, fair trade

When Canada and the US entered into a free trade agreement in 1988, then added Mexico with NAFTA in 1994, the idea was to break down protectionist barriers, thus increasing business for all. And creating a more open North American market has been good for business, especially for manufacturers in the partner countries.

But alas, the relationship is now under increasing strain. The US has defaulted to more of a free-ish trade posture with its protectionist Buy America/American measures, which are creating friction among manufacturers on this side of the border.

Both free trade agreements opened up procurement federally but did not include the sub-federal levels of government. Buying American rules have been around for decades, yet Canada and the US, two best friends and each other's number one trade partner, managed to do business mostly in harmony, applying a waiver or special consideration here and there when issues arose.

That harmony began to fray post recession with billions of dollars in US infrastructure investment up for grabs. Buy American got a tune-up to broaden its reach and combined with Buy America, these measures are tuning out Canadian manufacturers who are now viewed no differently than pillaging interlopers from overseas.

This is a troubling turn of events that's generating belligerence between "friends" and costing jobs on both sides of the border.

Alaska's dust-up over a ferry terminal upgrade on leased land in Prince Rupert, BC could have easily been avoided. The \$20 million project was subject to Buy America provisions, but Alaskan Governor Bill Walker arrogantly blew off Canadian diplomatic efforts to waive the problem away.

This over about \$2 million worth of steel.

As a result, Canada invoked the rarely applied Foreign Extraterritorial Measures Act (FEMA) to penalize the firm that wins the contract and implements the Buy America stipulations on Canadian soil. Result: no work for anyone.

And one American company has closed Canadian operations over Buy America she-nigans, while a small town in the US almost had to pay back the federal funding used to build a bridge because a Canadian plant had supplied a small amount of its steel.

But there is a more troubling development. New Jersey has passed a law requiring its municipalities to apply Buy America to all their purchases, begging a Canadian response; and this may be just the beginning of a protectionist plague spreading across the US, which is worrying the CME.

It's all so blatantly unfair. No such restrictions apply in Canada's provinces or municipalities, but that could change. CME is encouraging Canadian municipalities to "buy Canadian" and there are some takers.

Such a response may irritate enough American companies to cause some blowback against the US measures, but reciprocity perversely validates the protectionist behaviour and does nothing to diminish the inevitable cost to taxpayers when open procurement is abandoned.

We should be accustomed to America's bipolar view of trade (you mustn't keep us out but we might not let you in unimpeded). The ongoing US bullying of Canadian soft-wood lumber producers comes to mind.

But with the energy industry in cyclical decline, Canada is looking to manufacturing to pick up the slack.

Ottawa is up against American domestic politics, but it must step up efforts to remind our trade partner that we have common purpose and both benefit from a relationship that must not be taken for granted. Trade should be free, and fair.

Joe Terrett, Editor

Comments? E-mail jterrett@plant.ca.

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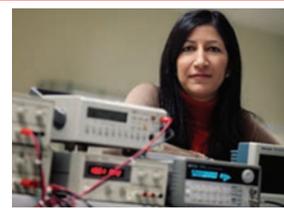
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» Bulletins



Fuelled by compressed natural gas.
PHOTO: WESTPORT

Westport Innovations Inc. has received EPA certification for its compressed-natural gas powered 2015 Ford Transit van. The manufacturer of natural gas engines based in Vancouver expects California Air Resources Board (CARB) certification in early 2015.

Catalyst Paper Corp. has acquired the Biron paper mill in Wisconsin and the Rumford pulp and paper mill in Maine from **NewPage Corp.**, **NewPage Wisconsin System Inc.**, and **Rumford Paper Co.** for US\$62.4 million. The deal is expected to boost Catalyst's annual production to 2.1 million tons of paper and 500,000 tons of pulp.

CANARAIL will overhaul **Rocky Mountaineer's GoldLeaf** fleet, consisting of 16 bi-level domed cars. The work involves engineering and design work of the interior, lighting, plumbing, installation of seating and electrical work. The project is to be completed in 2018.

Atlantic Packaging Products is investing \$40 million and hooking up with **Standfast Packaging** to form the joint venture sheet feeder, **Blackhawk Corrugated**, in Carol Stream, Ill. Up to 100 local jobs are to be created. The business is to be fully operational by late 2015.

RMT Robotics Ltd. has changed its operating name to **Cimcorp Automation Ltd.** The company, a manufacturer of material handling and automation solutions based in Grimsby, Ont., joined the **Cimcorp Group** in 2010, extending Finland-based Cimcorp Oy's reach into North America.

Magellan Aerospace, a manufacturer of aerospace engine and structure assemblies and components, has signed a 10-year, \$250 million deal with Montreal-based aerospace engine maker **Pratt & Whitney Canada** to supply complex magnesium and aluminum castings. Most of the castings will be produced by Magellan's Haley, Ont. division, but several will come from Magellan's Glendale, Ariz. plant.

Patriot Forge gets \$10M for expansion

Manufacturer plans to double the Brantford plant's output capability

BRANTFORD, Ont. — Patriot Forge will expand its Brantford, Ont. facility with the help of an investment of up to \$10 million from FedDev Ontario.

The federal investment will support the construction of a new 320,000-square-foot production plant and the purchase of state-of-the-art metal forging equipment.

The company, a manufacturer of heavy-duty industrial components, expects to create 75 new full-time jobs during the life of the project, plus 86 full-time jobs within five years of its completion.

Patriot says the \$63 million expansion will double its output capability.

Koss Aerospace is also getting \$5 million in federal funding to purchase new equipment, which the company says will strengthen its production capabilities and create up to 25 jobs.

The Mississauga, Ont.-based company manufactures structural aerospace components such as wing ribs, floor and cross beams, bulk heads



(L-R) Phil McColeman, MP for Brantford and Gary Goodyear, Minister of State for FedDev Ontario are guided on a tour of Patriot Forge by Mike Malecki, senior vice-president.

PHOTO: FEDDEV ONTARIO

and seat tracks for OEMs, including Boeing and Bombardier.

It says the new equipment will reduce lead times and production costs.

Wynne among Canada's worst fiscal managers

Fraser Institute analysis ranks former NL premier Dunderdale best



Ontario's Kathleen Wynne runs the largest average deficit of all premiers, says the Fraser Institute.

VANCOUVER— Ontario's Kathleen Wynne ranks as one of the worst Canadian premiers at managing provincial government finances, while Saskatchewan's Brad Wall ranks as one of the best, according to an analysis by the Fraser Institute.

Measuring the Fiscal Performance of Canada's Premiers,

2015 examines the records of 10 Canadian premiers (five current and five former) relative to each other during their time in office up to the 2013/14 fiscal year.

Of the current premiers included in the policy think tank's analysis and expected to table budgets this spring, Wall

ranks first, while Wynne — the premier of Canada's largest province — finishes last.

The study assigns each premier an overall score (out of 100) and rank (out of 10) based on their relative performance on three core components of fiscal policy: government spending, taxes, and deficits and debt. Premiers who managed spending more prudently, balanced their books and paid down debt, and reduced or maintained key tax rates — relative to their counterparts — ranked higher.

Wynne scored 39.5, placing sixth on government spending, fifth on taxes and last on the deficits and debt component, running the largest average deficit of all the premiers at 1.5% of GDP.

At the top of the rankings are Kathy Dunderdale, former Newfoundland and Labrador premier (84.6), Wall (71.5) and Christy Clark, premier of BC (64.8).

Premium to close Toronto meat plant

RICHMOND, BC — Premium Brands Holdings Corp. plans to close its Toronto processed meats plant December 2015, blaming age and location within a residential area as factors that have rendered the facility unfeasible.

The plant, built in 1958, produces branded and private label processed meats for retail and foodservice customers.

The Richmond, BC-based company intends to gradually transition a portion of the business to its other production facilities in Ontario starting in the spring.

The closure will affect approximately 200 employees.

The cost associated with the shutdown is estimated at \$7.3 million.

Premium Brands owns a range of specialty food manufacturing and food distribution businesses with operations in BC, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nevada, Ohio and Washington State.

Bain acquires TI Automotive

AUBURN HILLS — Bain Capital, a global private investment firm, is acquiring TI Automotive.

Headquartered in Auburn Hills, Mich., TI is a producer of fluid storage, carrying and delivery systems for automotive manufacturers.

The existing management team will continue to lead the company.

Maibec acquires Fraser Timber's Masardis mill

LEVIS, Que. — Maibec Inc. and Fraser Timber LLC have concluded Maibec's purchase of the assets of the Masardis, Me. lumber mill.

The mill employs about 135 people and produces yearly over 100 million board feet of softwood lumber sold in the US.

Maibec, a wood processor based in Levis, Que., plans to make strategic investments over the next two years in the mill, which produces lumber primarily for the construction and renovation markets. Its new production will serve customers across Quebec, Ontario and the northeast and southern US.

PLANT Off-Site photo feature RETURNS!

Travel with PLANT Magazine to an exotic locale and win \$75

PLANT is reviving its popular Off-Site photo feature.

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

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

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

Intrepid subscriber pauses with PLANT for a little downtime reading while vacationing on the Moon.

Canada makes paying corporate taxes easy

We're tops in the G7, ninth out of 189 countries: PwC, World Bank

TORONTO — Canada continues to rank in the top 10 countries when it comes to the ease of paying corporate taxes, according to a joint study from global consulting firm PwC and the World Bank Group that reviews tax regimes in 189 economies.

Paying Taxes 2015 shows Canada sits in first place among G7 nations, well ahead of other members, and in the ninth spot overall, with the UK ranked 16th, and the US ranked 47th.

In the G7 after Canada were the UK, US, Germany, France, Japan and Italy.

The study measures the overall ease of paying taxes for a hypothetical medium-sized domestic business by measuring all business taxes paid out as a percentage of business profit; computing the amount of time invested to complete all the necessary tax filing; and adding up the number of annual tax payments.

Global highlights include:

- Nearly half (43%) of the 189 economies measured now have electronic filing and payment systems that are used by the majority of companies.
- Central Asia and Eastern Europe continue to be the fastest reforming regions with a major



Nearly half of the 189 countries measured have electronic filing and payment systems. PHOTO: THINKSTOCK

focus on improving administrative systems. All three sub-indicators have fallen with the number of payments and time to comply both below the world average.

- Bolivia ranks last of 189 countries, largely due to a total tax rate of 83.7% and the second-highest time to comply at 1,025 hours.
- A 7.4% total tax rate is lowest in Macedonia, while the time to comply is lowest in the United Arab Emirates (12 hours).

Eclipse expands Cambridge operations

Will house machining, service and software departments



Eclipse Automation's facility in Cambridge, Ont.

PHOTO: ECLIPSE

CAMBRIDGE, Ont. — Eclipse Automation is now operating its new 15,000 square-foot facility in Cambridge, Ont.

Located between the com-

pany's head offices and fabrication plant, the facility will house machining, service and software departments to increase the company's operational capacity.

"[The new facility] will allow a greater focus into manufacturing capabilities and establish a more refined footprint," said Steve Mai, Eclipse's president.

The Cambridge, Ont.-based company has also recently expanded in the US, with operations in North Carolina and California.

Eclipse is a supplier of custom automated manufacturing equipment for the energy, health sciences, transportation, consumer/industrial and telecommunications/electronic industries.

Wood exports to increase with Mexico deal

OTTAWA — Mexico has agreed to recognize Canada's heat-treated lumber certification program.

Lumber producers accredited under the program overseen by the Canadian Food Inspection Agency (CFIA) is now able to

export wood such as spruce, pine and fir to Mexico without a phytosanitary certificate.

The movement of lumber and wood products can be a pathway for the spread of plant pests. In Canada, lumber is

heat-treated to reduce this risk and to meet the import requirements of foreign countries.

The Canadian Heat-Treated Wood Products Certification Program is also recognized by the US, the EU, Australia and Korea.

The forestry, logging, pulp and paper industries contributed almost \$20 billion to Canada's GDP in 2013, and \$19.1 billion to Canada's balance of trade.

The sector employs 186,500 Canadians.

Lumber exports to Mexico were valued at almost \$6 million in 2013.

Canada and Mexico are each other's third largest trading partner. The value of Canada and Mexico's total bilateral merchandise trade was \$32 billion in 2013.

Medical marijuana venture launched

OWEN SOUND, Ont. — Canadian Biocetual Corp. is expanding its existing life sciences business into the production, processing and distribution of medical marijuana and cannabis-based medicinal products through BioCannabis Products Ltd., a newly incorporated, wholly-owned subsidiary.

The Toronto-based company is in the process of securing a lease at a 155,000 square-foot facility in Owen Sound, Ont. Once fully operational, BioCannabis is touted to be one of the largest medical marijuana facilities in North America.

BioCannabis, which expects the new venture to create up to 100 local jobs, has recently submitted an application to Health Canada to become a licensed producer under the Marijuana for Medical Purposes Regulations.

SRC launches volatile materials project expansion

SASKATOON — The federal and Saskatchewan governments have jointly invested \$1.73 million to the Pipe Flow Technology Centre at the Saskatchewan Research Council (SRC), as part of a \$3.2 million facility expansion.

The centre is now one of Canada's first research facilities equipped to test conditions with volatile materials such as crude oil in a high pressure and high temperature (HPHT) model. SRC is investing the additional \$1.46 million.

The facility has a 100 millimeter diameter pipe flow loop designed to simulate industrial conditions.

The loop will be used to research the flow of complex mixtures in pipes under HPHT conditions.

SRC provides applied research, development and demonstration and technology commercialization services.

Teknion wins green award

TORONTO — Teknion Corp. has been declared a good environmental citizen by the Ontario government – again.

The Toronto-based manufacturer of office furniture and environments received the Minister's Award for Environmental Excellence.

Partnering with Chemetall, a manufacturer of chemical products based in New

Providence, NJ, Teknion introduced a phosphate-free chemical at the cleaning stage of its paint finishing lines.

The new process creates less hazardous waste, consumes about 33% less water and uses less natural gas to heat the water.

Teknion received Ontario Waste Minimization Awards in 2010, 2012 and 2014.

Careers



Kevin Spence



Andreea Dutescu



Adam Frankland

Vortex Aquatic Structures International, a manufacturer of aquatic play products based in Montreal, has two new executives. **Kevin Spence** is vice-president, business development North America. Previously he owned and operated Miracle Playground Sales in California and represented Vortex.

Andreea Dutescu has joined the company as vice-president of strategy and international business development. She comes from Bombardier Business Aircraft where she was director, sales and market insight.

Adam Frankland has been appointed corporate accounts manager at Provincial Partitions, a manufacturer of modular buildings based in Mississauga, Ont. He has been with the company for 34 years.

Andy Thorne, vice-president of mining and operational excellence of Cameco Inc., a uranium producer, is the 2014 winner of the Sergio Guy Memorial Award for his outstanding contribution to the maintenance profession. He is responsible for Cameco's Cigar Lake, Rabbit Lake and US mining operations, and oversees the company's efforts to reach world-class standards in operational excellence. The award is presented annually by the Plant Engineering and Maintenance Association of Canada.

Mike Whitehead is the new president of Lincoln Electric Canada, a subsidiary of Lincoln Electric Holdings Inc. He replaces the retiring **Joseph Doria**. Whitehead joined Lincoln Electric in 2005 as chief counsel, intellectual property and has served as director, new product development in consumables R&D since 2011. Lincoln, based in Toronto, manufactures welding equipment and products.

David Paterson has rejoined GM Canada in Oshawa, Ont. as vice-president, corporate and environmental affairs. He led corporate affairs at GM Canada between 2003 and 2009 and was most recently global senior vice-president, government relations for BlackBerry. He will also work as part of GM's global public policy and communications organizations. Patterson currently serves as the vice-chair of the Canadian Chamber of Commerce.

General Mills to close Midland plant

MIDLAND, Ont. — General Mills will close its manufacturing facility in Midland, Ont. by mid-2016.

The closure will impact 100 employees.

The plant, operated by General Mills since 1952, produces frozen pizzas, refrigerated dough, cookies and turnovers for the Canadian and US markets.

The company also plans to shutter its New Albany, Ind. facility by 2016. The decision is subject to negotiation with union officials and should it become final, would affect 400 employees.

The New Albany plant makes refrigerated baked goods and has been in operation since 1959.

EDC launches online credit insurance for small business

OTTAWA — Export Development Canada (EDC) is offering a new online version of its credit insurance product that will allow Canadian companies to insure their sales to US or foreign buyers in minutes.

The Crown corporation, a provider of financing and insurance, has designed Trade Protect specifically for small businesses, covering sales to foreign buyers up to a value of \$350,000 with payment terms of 90 or 180 days.

EDC notes insuring a sale

helps banks provide additional financing. The product also allows the Canadian seller to be more competitive by offering more flexible payment terms than their competitors — often an advantage in many industries.

If a foreign buyer doesn't make a payment, EDC will pay the Canadian exporter 90% of the invoice value and then seek payment directly from the foreign buyer. If EDC recovers the payment, it pays the final 10% back to the Canadian company.

Air Liquide to build Hamilton oxygen pipeline

HAMILTON — Air Liquide Canada plans to build a new \$12 million oxygen pipeline at its Hamilton facility, where the company expects to reduce energy consumption by up to 29,000 megawatt hours and save \$2 million annually.

The pipeline will be built, with support from Horizon Utilities and the Ontario Power Authority's saveONenergy program, between Air Liquide's air separation complex and the ArcelorMittal Dofasco plant in Hamilton, Canada's largest flat rolled steelmaking facility.

The supplier of industrial gases and services says a large part of purchased goods and services required to build the pipeline will be sourced from Hamilton area companies.

Commissioning is to begin in March 2015.

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Shutdowns and Turnarounds East 2015 CI Energy Group

March 24-25, Montreal

This two-day session features case studies, presentations, panel debates, and a master class on plant shutdowns and turnarounds. Visit www.shutdownsturn-aroundseast.com.

Partners in Prevention 2015 WSPS

April 28-29, Mississauga, Ont.

Workplace Safety & Prevention Services presents its annual health and safety conference and trade show with more than 60 sessions and 400 exhibits. Keynotes include Chris Hadfield, the first Canadian commander of the International Space Station. Visit <http://wsps.ca>.

STLE 70th Annual Meeting & Exhibition STLE

May 17-21, Dallas

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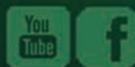
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The Western Manufacturing Technology Show features state-of-the-art machinery and equipment for manufacturers in Western Canada, plus educational sessions, industry keynote, an interactive town hall panel and networking opportunities. Visit www.wmts.ca.

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Canada needs a manufacturing strategy

BY HASSAN YUSSUFF

The plunging price of oil is raising concern that another energy bust is on the horizon. This serves as a harsh reminder about the limitations of Canada's current economic growth strategy, which depends largely on the extraction and export of natural resources, but it also reinforces the vital role of manufacturing in building a balanced, sustainable and prosperous economy.

Unfortunately, the current federal government, with its oil-dominated

“A highly skilled workforce is essential to innovation and productivity in today's knowledge-based economy...”

economic vision, has taken a hands-off approach to manufacturing. It's choice is to blindly follow market forces that pit countries against one another on the basis of cheap products, low wages and disposable jobs.

There is a better choice: developing a national manufacturing strategy that puts Canada in the race to the top, competing on the basis of sophisticated products, fair wages and decent jobs.

The key is to develop innovative products our global competition can't match.

In recent years public policy has focused on boosting investment in research and development and cutting edge technologies, but there's another element that must get more attention from policymakers: investing in human capital. A highly skilled workforce is essential to innovation and productivity in today's knowledge-based economy.

The good news is Canada's formal education system is performing relatively well. Young Canadians (aged 15) are among the world's top performers in reading, math and science skills. Canada sits in first place among OECD countries with the highest rate of people with a post-secondary qualification.

The bad news is that Canada is performing poorly outside the formal education system. Our record on workplace training is abysmal. Only 30% of Canadians receive some form of it.

And Canada ranks near the bottom of the industrialized world when it comes to government expenditures on training. Employer investment has decreased 40% since 1993. Only 19% of employers who employ skilled-trades workers actually train apprentices.

More training investment

The labour movement is doing its part. Union training centres provide an extensive range of apprenticeship programs and unions are responsible for the most skilled trades training in this country. But we also need employers and governments to step up their game and invest more.

Adopting a partnership approach brings together labour, business, government and the education sector.

The Canadian Labour Congress (CLC) and Canadian Manufacturers & Exporters (CME) have had a long-standing working relationship stretching back over 25 years to the formation of the Canadian Labour Market and Productivity Centre.

In 2009, the CLC and CME formed the Centre for Workplace Skills to promote the adoption of best practices in workplace training. In 2012, we held a series of Roundtables on Workforce Skills that brought leaders from business, labour, and colleges together with federal and provincial officials to discuss labour market challenges and potential solutions.

Most recently, the CLC and CME launched a project to develop a new workplace training and certification program in the manufacturing sector called CertWORK Plus (www.certwork.com).

More investment and partnerships in workplace training are needed to ensure the Canadian manufacturing sector out-innovates and out-competes the rest of the world; however, building a thriving manufacturing sector requires more than supply side education and training policies.

We also need policies that will influence the demand side of the labour market by targeting and supporting high-value industries that create good jobs in manufacturing, the focus of my next column.

Hassan Yussuff is the president of the Canadian Labour Congress, which represents 3.3 million workers across the country in every sector of the economy. Visit www.canadianlabour.ca.

Comments? E-mail jterrett@plant.ca.



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Where Discoveries Begin

Just one new idea can spark change

KEYNOTE SPEAKERS



CHRIS HADFIELD
First Canadian Commander of the International Space Station (2013)
The Sky is Not the Limit



DR. JOE MACINNIS
Renowned Explorer | Leadership & Teamwork Expert
Leadership Lessons from the 7-Mile Dive into the Marianas Trench



MICHAEL LANDSBERG
Host of TSN's Off the Record
Darkness & Hope: Depression, Sports, & Me

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PLANT PULSE

ECONOMIC DEVELOPMENTS AND TRENDS

» Economy

AUTO INVESTMENT: It's in decline

Reshoring favours US, Mexico

BY PLANT STAFF

A report from the Canadian Automotive Partnership Council (CAPC) paints a grim picture of Canada's automotive future, suggesting that although automotive manufacturing has rebounded to near pre-recession levels, the sector is withering from capital spending levels not experienced since the 1980s.

The study cites Statistics Canada data showing an average of \$1.5 billion directed to capital spending from 2009 through 2011, dropping by almost half of the approximately \$3 billion the industry invested annually in Canada between 2000 and 2008.

The report factors in a Morgan Stanley forecast that estimates automotive manufacturers in North America will add 3.5 million units of capacity from 2011 to 2015. Of that, the US will receive 63% and Mexico will get 34%, leaving Canada with 3%.

The absence of productivity enhancing capacity upgrades calls the Canadian industry's future into question.

There are several reasons investment has declined. Canada suffers from cost disadvantages related to labour, logistics and outsourced parts.

All automakers employ some form of lean manufacturing and share best practices. As a result, productivity at an automaker's Canadian plant is not meaningfully different from one in the US.

Higher-value loonie

Labour contract provisions have responded to the impact of the higher-value loonie and new US labour provisions; however, the resulting decline in labour costs has not fully offset the loonie's influence, making those costs at current exchange rates somewhat higher than in the US (and much higher than in Mexico).

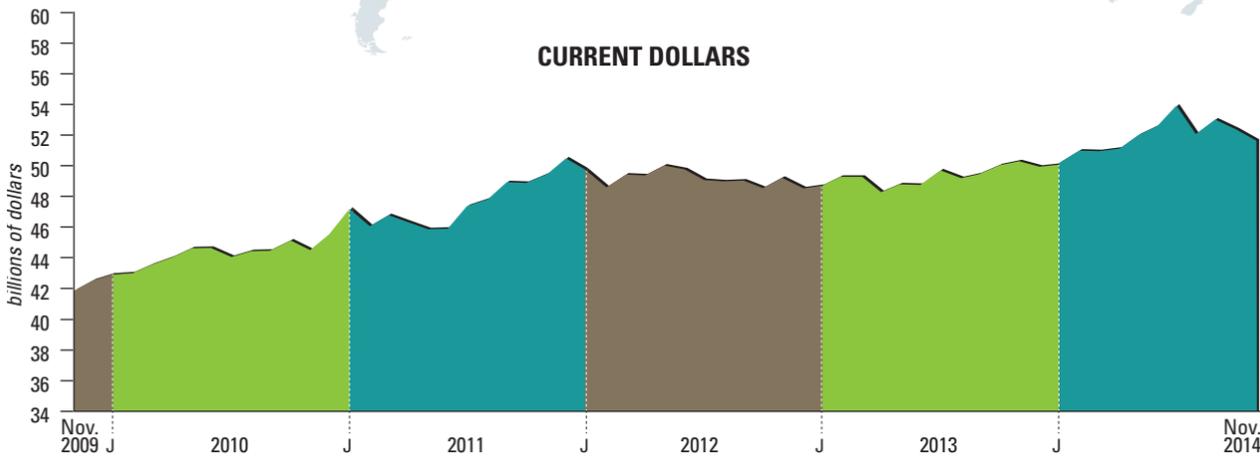
Differences in pension costs and other benefits may also lead to labour cost differences between Canada and US. Canadian plants have typically migrated to various forms of hybrid defined benefit and, defined contribution plans. US plants are almost exclusively defined contribution for new hires, which doesn't always equate with lower cost, but does shift future risk.

Canada's traditional public health care advantage is eroding because assemblers in the US have moved those retiree costs to Voluntary Employee Beneficiary Associations. That shifts risk from the company to the employee.

The report notes Canada still retains an advantage in active health care costs, while Mexico's significant labour cost advantage is only marginally reduced by higher taxes and transportation costs.

CAPC has identified the following actions by government and industry to turn things around:

- competing for investment with globally competitive support from governments;
- reducing the cost of labour by controlling employment insurance costs, employer health tax and workers' compensation premiums;
- coordinating federal, provincial and municipal governments as a one-stop investment window;
- improving transportation and border policy;
- easing the regulatory burden;
- pursuing a free and balanced trade agenda; and
- aligning the number of working days with competing jurisdictions.



THIRD SALES DECLINE

Manufacturing sales fell 1.4% in November to \$51.5 billion, the third drop in four months. Year-to-date sales in 2014 were 5.2% higher than those in the first 11 months of 2013.

Source: Statistics Canada



186,000

The number of people enrolled in more than 400 apprenticeship and skilled trades programs, but only half of apprentices are completing their programs.

Source: Statistics Canada



The average price per barrel (WTI) for crude oil during the first half of this year, before rising to an average of \$53 per barrel in the second half, and \$65 per barrel in 2016.

Source: TD Economics

\$41

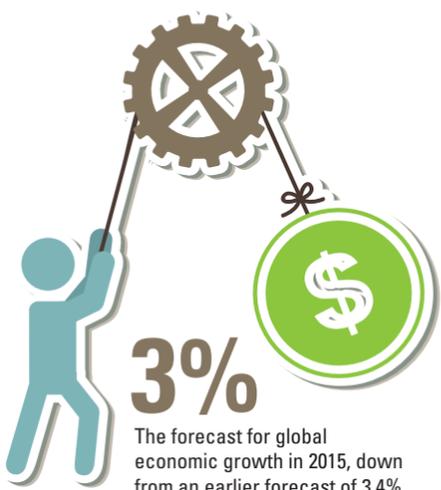


2.3%



The forecast for Canadian growth this year, down 0.1% from an October prediction. Growth in 2016 is pegged at 2.1%, down 0.3%.

Source: International Monetary Fund



A strengthening US economy and falling oil prices won't offset troubles in the eurozone and emerging markets.

Source: World Bank



Employment gains in 2014, an increase of 1%. The total number of hours worked increased by 0.7%.

Source: Statistics Canada

What red tape is costing you

Small Canadian businesses are spending more time and money on regulatory compliance than they were in 2012. The Canadian Federation of Independent Business notes in its *Red Tape Report* that companies spent \$37.1 billion on regulation in 2014, an increase of \$5.4 billion from two years ago, and spent an average of 842 hours a year complying with government rules and paperwork, an increase of 12%.





Not-so-

FREE TRADE

...NOT SO GOOD FOR CANADIAN MANUFACTURERS

Protectionist measures blocking Canadian manufacturers from bidding on government contracts in the US are creating trade friction.

BY KIM LAUDRUM

Recently updated Buy American/America protectionist laws are raising the ire of Canadian manufacturers, who are particularly inflamed over an Alaskan ferry terminal project on leased BC Crown land that was open only to US companies.

But this and other examples of America's conflicted view of trade (pro free trade, pro protectionist measures) represents an issue that has more troubling ramifications.

Protectionist Buy American restrictions in the US are killing jobs in Canada, says Canadian Manufacturers & Exporters (CME). Further, the accelerated expansion of these provisions by Washington and various US states threatens to further erode Canada's manufacturing base.

Case in point: less than a week before Christmas, Mueller Canada announced it was closing its iron and steel facility, laying off 71 people in Saint Jérôme, Que. The plant, owned (ironically) by US-based Mueller Water Products, produced manhole covers used in the construction and modernization of water and wastewater infrastructure projects. Mueller has other plants in the US.

"[Expanded] Buy American legislation, introduced last June by the US Congress, is the main reason for this closure," CME said in a statement.

Buy American restrictions oblige American municipalities to source their water and wastewater products solely from US manufacturers, effectively shutting out Canadian manufacturers from participating in American projects.

"This is another example of the toll that Buy American protectionism is taking away manufacturing jobs in Canada," said CME president and CEO Jayson Myers. "It is grossly unfair that American companies can freely do business in Canada but Canadian manufacturers are locked out of municipal procurement contracts in the United States."

Although Buy American and Buy America policies have been on the books since 1933 and 1982 respectively (see *Buying American defined*), it wasn't until 2009 when the American Recovery and Reinvestment Act (ARRA) was introduced that Canadian manufacturers began to feel the pinch.

The ARRA was intended to stimulate the US economy by injecting \$787 billion in spending and tax cuts. The ARRA includes Section 1605, a Buy American provision that stipulates funded projects requiring the construction, alteration, maintenance or repair of a public building or public work, requires 100% of the iron, steel and manufactured



PHOTO: CME

"It is grossly unfair that American companies can freely do business in Canada but Canadian manufacturers are locked out of municipal procurement contracts in the United States."

—Jayson Myers, president and CEO of Canadian Manufacturers & Exporters

goods used must to be produced in the US, with certain waiver restrictions. In effect, the ARRA expanded the Buy American provision to include all manufactured goods, not just iron and steel.

In 2014, legislation was introduced

affecting the Buy America provisions for US Department of Transportation procurement. This meant all municipal transit, roads and highway projects would be restricted to 100% domestic sourcing.

Canada did not have an exemption to

this clause because it was not negotiated earlier under the North American Free Trade Agreement (NAFTA), according to Martin Lavoie, CME's director of manufacturing policy. "Since then we've had Buy America issues again and again."

In December 2014, the state of New Jersey passed legislation that would apply Buy America policies to all goods that all of its municipalities purchase – a large extension of protectionist policies that would see Canadian companies shut out of millions of dollars in trade.

"We don't know exactly how much of an impact it's going to have on Canadian companies. We'd have to know how much New Jersey buys every year from Canada. But we do know that it's a lot," Lavoie says.

"What worries us at the CME is that a lot of other states will want to do the same."

He notes the law passed the New Jersey legislative assembly but it has to be signed by Governor Christie – who is a Republican. Republican politicians tend not to endorse protectionist policies because restricting the ability to source products drives the price up.

The CME is calling on Governor Christie to "support business and free trade and wisely use his veto powers to stop this growth-killing bill."

Killing jobs

"New Jersey legislators have seemingly made it clear they do not want to do business with Canada," Myers is quoted as saying. "They think they are protecting jobs. In reality, given the integrated nature of manufacturing, they are killing jobs in both the United States and Canada."

Twelve US states and the US Chamber of Commerce support the CME's position. Indeed, rising concerns about impeding trade between the US, Canada and Mexico spurred the formation of a new organization: North Americans Trading Together, or NATT.

Spearheaded by former Secretary of State for Texas, Republican Hope Andretti, NATT is a broad coalition of companies, trade associations, the chambers of commerce in both the US and Canada, and others. Most of the issues NATT seeks to resolve are focused on steel and

Continued on page 12



Buying American defined

Buy America (1982) and Buy American (1933) are separate legislation and regulation requirements. Buy America applies solely to grants issued by the Federal Transit Administration and Federal Highway Administration; Buy American may be applied to all direct US federal procurement.

The Buy American Act applies to all US federal government agency purchases of goods valued over the micropurchase threshold, but does not apply to services. All goods for public use must be produced in, and manufactured items made in the US from American materials.

The Buy America Act was a provision of the Surface Transportation Assistance Act of 1982. Provisions are applied to transit-related procurements valued over US\$100,000, for which funding includes grants administered by the Federal Transit Authority (FTA) or Federal Highway Administration (FHWA). Buy America provisions are a condition of US federal government grants to state, municipal or other organizations including transit authorities. Similar conditions prevail for airport projects that receive funds from the Federal Aviation Administration as authorized by the Airport and Airways Facilities Improvement Act. Such projects require that all steel and manufactured products have 60% US content and that final assembly occur in the US.

Source: Abridged from *Foreign Affairs and International Trade Canada*

How about Buy Canadian?

Continued from page 11

the supply chain for steel and railways, says NATT spokesperson Stan Skocki.

NATT's view of Buy American is that it "needs to be updated to reflect the practical trade relations that Canada, Mexico and the US have enjoyed under NAFTA," he says.

"Right now, Buy American rules supersede NAFTA – even though we've had this agreement in place for years. A domestic preference for products is all good, but the practical applications are pretty onerous. The problem is that it drives up the cost of manufacturing and costs consumers more."

He says NATT is striving to raise awareness of the valuable trade relations the US has with Mexico and Canada.

With the New Year there is a new Congress in power, one that will see the Republicans in control. Congress will be reauthorizing the 1980's Highway Bill at the heart of the Buy America issues.

Skocki says NATT is hopeful there will be changes to the legislation. Why is change needed? He says Buy America (transit-related procurement) is causing job loss in Canada and the US. The consequence of reducing the supply chain is overspending on road projects. Bureaucratic delays are increased because everything has to be certified to Buy America approvals. Politically the whole issue of reciprocity from an international point of view could have a negative impact on trade.

The CME is encouraging Canadian municipalities to promote Buy Canadian procurement policies as a reciprocal strategy to combat Buy America. So far "many municipalities have adopted the anti-American motion and the FCM (Federation of Canadian Municipalities) is now seized by the issue," Lavoie says.

Recent projects affected by Buy America restrictions are infuriating Canadian manufacturers. Construction on the Prince Rupert ferry terminal in BC, for example, was to be built with US iron and steel – despite the fact that it sits on Canadian Crown land.

Because funding for the Prince Rupert ferry to Alaska project, estimated at



The ARRD was intended to simulate the US economy with \$787 billion in spending and tax cuts.

PHOTO: THINKSTOCK

\$20 million, comes from the US Federal Highway Administration, it falls under the Buy America legislation.

"The extraterritorial application of these protectionist restrictions on trade within Canada by a foreign government is unreasonable," said international trade minister Ed Fast in a statement to *Canadian Press*. "Taxpayers on both sides of the border would benefit from dismantling the trade barriers and inefficiencies created by US protectionist policies such as Buy America."

Canada responds

Last October, the small town of Morrison, Colo. narrowly averted having to pay back federal funding for a bridge built with a small amount of steel manufactured in a Canadian plant. Like Mueller Canada, the plant was owned by an American firm.

In January, Canadian Ambassador Gary Doer and Alaska Governor Bill Walker were scheduled to discuss the potential implementation of a little-used Canadian trade law to deter suppliers to the Prince Rupert project from adhering

to Buy America rules at the expense of Canadian suppliers. At press time, the situation was evolving quickly. (See *Taking a bite out of Buy America*).

"Support from Ottawa is moving slowly. They are being careful," Lavoie says. "The Department of International Trade understands the issue, but the Minister of Infrastructure (Denis Lebel) doesn't believe in [protectionist] reciprocity. We asked him to implement some reciprocity on the Champlain Bridge project. The answer we received was 'no'. He wanted the cheapest steel."

"If you look at the steel trade, we used to export twice as much as we imported in 2006. Now it has flipped the other way around. We have lost capacity," Lavoie says.

The National Association of Manufacturers (NAM) notes the US exports more than \$1 trillion of manufactured products to 236 countries, "but this represents just a fraction of the country's export potential." NAM calls for new trade and investment agreements to be signed with the European Union and interested countries in Asia, South America and Africa.

The organization, which represents 11,000 US manufacturing companies, says on its website that it "wants to work with WTO to reduce trade barriers to exports of manufactured goods, including through negotiations on trade facilitation and the expansion of the Information Technology Agreement. NAM also calls for the "President to be provided with Trade Promotion Authority to negotiate and implement new trade and investment agreements that eliminate barriers and enhance manufacturers' competitiveness."

The United Steelworkers union believes that Canadian and American governments should ensure that public investment in infrastructure stimulates the domestic economy, rather than worsening offshore trade deficits, according to Mark Rowlinson, assistant to the national director of United Steelworkers Canada. "Therefore, we support procurement policies that give preference to domestic manufacturing over overseas imports."

Buy North America

But Rowlinson adds, "Because manufacturing is highly integrated across the Canada-US border and trade in manufactured goods is balanced between our two countries, we advocate a "Buy North American" policy. Specifically, Canada and the US should negotiate preferential access to each other's public procurement of manufactured goods. Indeed, we have for many years advocated for the use of North American steel in large projects – such as the new Windsor-Detroit Bridge."

Even if Buy American policies disappeared, Rowlinson says there's no reason to expect that particular procurement contracts would come to Canada rather than going offshore. "In fact," he says, "Buy American has strengthened the broader US economy, which is the largest market for Canadian steel and other manufactured goods."

Therefore, he concludes, Buy American is a net positive for Canadian steelworkers. "However, it would be even more beneficial if it gave equal preference to Canadian steel."

That would be an improvement for Canadian manufacturers. As it stands, the escalation in the adoption of protectionist legislation at the state and municipal levels in the US is threatening fair competition for suppliers north and south of the border. NAM is all for dismantling trade barriers elsewhere in the world that have impeded members' ability to export. But such enthusiasm for fair global trade should be extended to America's number one trading partner, as detailed in previously negotiated trade deals.

Kim Laudrum is a Toronto-based business writer specializing in manufacturing and is a regular contributor to PLANT. E-mail klaudrum@rogers.com.

Comments? E-mail jterrett@plant.ca.



Taking a bite out of Buy America

Canada wins a round over the Prince Rupert ferry terminal

Alaska has cancelled bids for a ferry terminal project on land it leases in Prince Rupert, BC, a project the Canadian government threatened to block because of a dispute over the use of American steel.

Alaska had rejected Ottawa's demand that the state abandon a Buy America rule requiring the project to use only US-made steel. The Harper government threatened to apply its Foreign Extraterritorial Measures Act to impose fines and take legal action against the project's winning bidder if it were to comply with the Buy America provisions.

Alaska, which has a 50-year lease on the property as of 2013, intends to operate the terminal as is until the outstanding issues are resolved.

Source: Associated Press

» Automotive R&D

AUTO21 researchers are working on enhancing the reliability of V2V and V2I communications to prevent accidents.

BY SOUMAYA CHERKAOUI

The US Department of Transportation (USDOT) estimates 90% of crashes are caused by human error and driver distraction is a key. These statistics are fuelling innovations that incorporate new sophisticated active safety applications to prevent accidents involving drivers and passengers, as well as cyclists and pedestrians who share the road.

AUTO21, the national automotive research initiative involving Canadian universities, is leveraging communication and perception technologies to detect when an accident is imminent and avoid it.

But first, some background.

The design of new safety applications is changing with the inclusion of communications capabilities. Wireless vehicle-to-vehicle (V2V) communications will feed information to and from other vehicles and vehicle-to-infrastructure (V2I) communications will be used to exchange information with transportation infrastructure. These types of communication extend a car's perception of the environment beyond the capabilities of its embedded sensors. For instance, cars will warn drivers if there's a chance of a collision with an oncoming vehicle, even if it can't be directly detected.

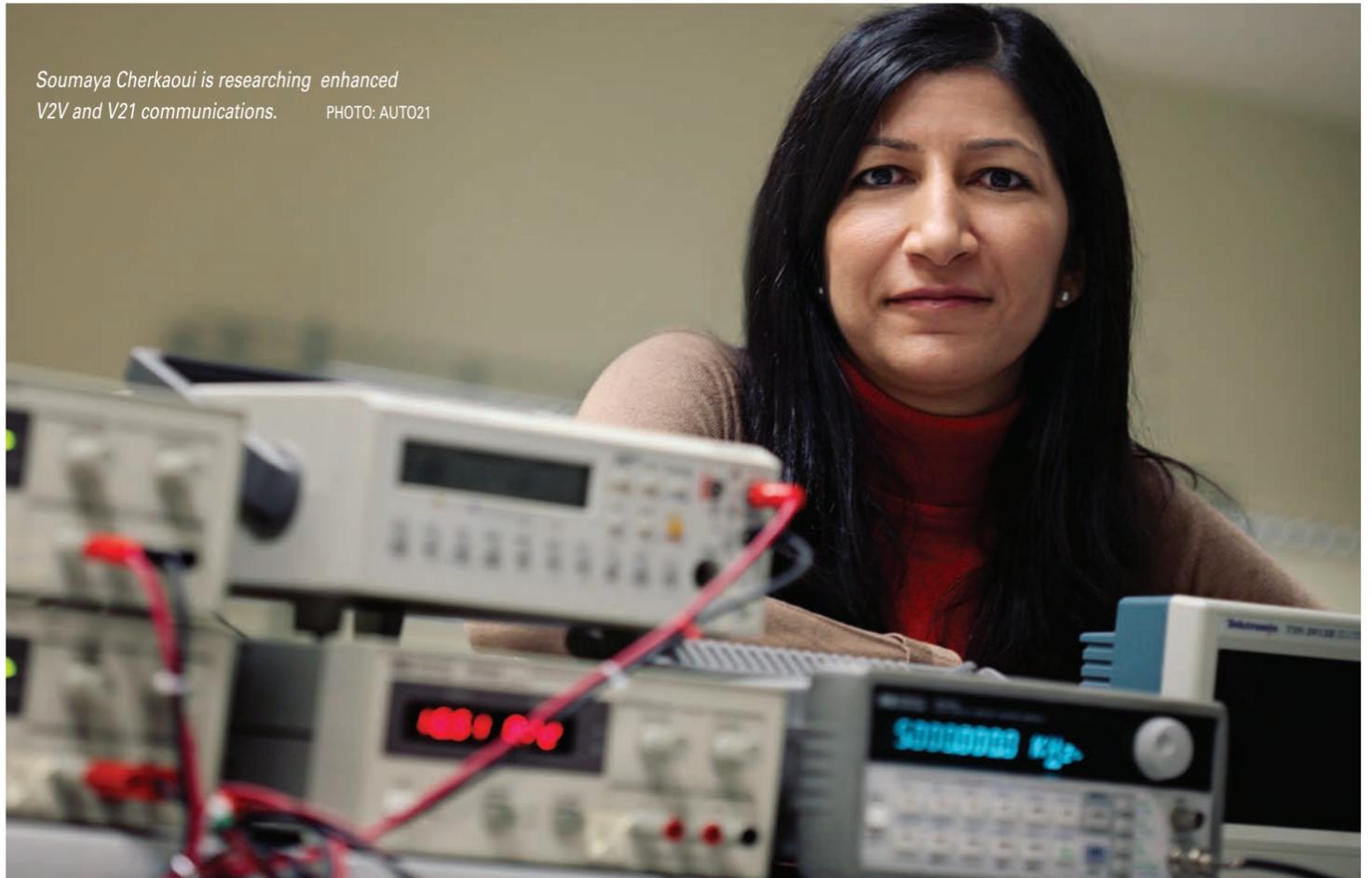
Vehicles communicating with each other and with roadside sensors, traffic signals and remote data centres will smooth traffic flow and make it safer. Cars will have the ability to change a traffic light to green if it's safe to do so. In fact, traffic lights could be eliminated if cars coordinate their manoeuvres through V2V and V2I.

Communication devices are embedded in some new vehicles, but the USDOT's National Highway Traffic Safety Administration (NHTSA) announced last February that it's working on legislation requiring mandatory wireless capability in all vehicles. Since the Canadian and US automotive markets are strongly linked, US legislation would greatly affect Canada.

AUTO21 researchers are particularly interested in enhancing V2V and V2I communications where vehicle density is high. More vehicles in an area makes communication difficult because data is sent by each one at least 10 times a second. This data might collide in the communication channel, so vehicles may not get the information in time.

AUTO21's researchers are developing intelligent telecommunication and information processing tools that use V2V communication to improve the reliability of safety applications. Multiple positioning devices and many sensors are used to collect data and monitor vehicle performance and environmental sens-

Soumaya Cherkaoui is researching enhanced V2V and V2I communications. PHOTO: AUTO21



Connecting CARS

WIRELESS SENSING TECHNOLOGIES TO MAKE DRIVING SAFER

ing. By sharing individual data pieces and exploiting redundancies, vehicles validate and enhance the precision of their readings to optimize the reliability and robustness of safety applications. When a vehicle reacts in a timely manner because it has precise information, a potentially fatal situation is avoided.

Overcoming defaults

The AUTO21 team has had recent success overcoming situations leading to sensor defaults. For example, signals can be lost when a vehicle enters a tunnel or is in the vicinity of tall buildings. Researchers refined and combined math-

ematical, signal processing and analytic tools to achieve a high level of position accuracy even in the presence of faulty situations. This technology determines if a failure is minor (when a GPS signal is temporary lost) or if the failure is major (when a sensor is broken and its information can no longer be trusted).

The kind of technology AUTO21 researchers are developing will take at least five years before it's readily available, but some advancements can be integrated into embedded systems now. For example, a few adaptations of V2V standards would enhance information delivery rates among vehicles, especially

in highly dense road areas.

The AUTO21 research team is working with several industry partners, aiming to embed technology in the next systems to be integrated into cars.

Soumaya Cherkaoui, a professor at the Université de Sherbrooke in Sherbrooke, Que., leads the Multi-Vehicle Communication and Perception for Safety project at AUTO21, a national research initiative supported by the Government of Canada through the Networks of Centres of Excellence Secretariat. Visit auto21.ca.

Comments? E-mail jterrett@plant.ca.

» Fuel cells

Toyota's patent play

Accelerating hydrogen fuel cell development

Toyota wants hydrogen cars on roads as quickly as possible. The world's biggest automaker announced at the Consumer Electronics Show in Las Vegas that it's making available thousands of hydrogen fuel cell patents and expects the initiative to spur the development and introduction of innovative fuel cell technologies.

Toyota will invite royalty-free use of approximately 5,680 fuel cell related patents held globally, including critical technologies developed for the new Mirai hydrogen-powered vehicle. The list includes 1,970 patents related to fuel cell stacks, 290 with high-pressure hydrogen tanks, 3,350 related to fuel cell system software control, and 70 patents related to hydrogen production and supply.

Toyota said the first generation hydrogen fuel cell vehicles, launched between 2015 and 2020, will be critical, requiring a concerted effort and unconventional collaboration between automakers, government regulators, academia and energy providers.

It hopes that by eliminating traditional corporate boundaries, it can improve the speed of new technology development.



Toyota will request other companies also share their fuel cell-related patents.

PHOTO: TOYOTA

The patents will go to automakers who will produce and sell fuel cell vehicles, as well as to fuel cell parts suppliers and energy companies that establish and operate fuelling stations. An initial market introduction period is expected to last until 2020.

Companies working to develop and introduce fuel cell buses and industrial equipment such as forklifts are also covered. Requests from parts suppliers and companies looking to adapt fuel cell technology outside of the transportation sector will be evaluated on a case-by-case basis.

The patents related to fuel cell vehicles will be available until the end of 2020. Patents for hydrogen production and supply will remain open.

» Think Lean

The labour shortage is real and likely to worsen in the immediate future, so think about hiring differently and then act.

BY RICHARD KUNST

Companies use contract employees to manage surges in production. They provide flexibility and a way to control labour costs. At one time it was common to see 20% of a workforce made up of contract workers. Now up to 95% is common. This is straining the availability of contract employees, especially good ones.

The variation in their earning potential between companies is extremely narrow, so what will lure a contract employee to your company?

First, recruit them as if you're hiring a full-time employee. This takes time but consider it an investment: you can have the technology and the equipment, but it's your people, including contract employees, that create your culture and capability, and this is what the customer is paying for.

Does your work environment look professional? Look around. Is your cafeteria neat, clean and organized? How about your bathrooms? Signs taped to windows, doors and walls convey a subliminal message the facility isn't respected, which extends to people and processes.

A good visual management program doesn't have to be expensive. The use and type of visuals you deploy is part of your brand image, so don't be cheap.

Assign a buddy to show your new employee the ropes during the first couple of days.

Contract employees can be great auditors, especially on the first day. Debrief them at the end of the day and ask about your organization: what compelling attribute did they experience during the day that would encourage them to return? Employee churn is costly, even if it's with your contract labour pool. Investigate why employees don't stay.

Use a graduated compensation model so the employ-

Broaden your HIRING options

HOW TO RECRUIT CONTRACT EMPLOYEES



Make attracting strong contract employees a recruitment strategy priority.

PHOTO: THINKSTOCK

ee has skin in the game. If a contract leaves in the first week, no compensation, then increase the percent the longer the employee stays.

The following checklist is typically used to assess full-time candidates, but some of the questions fit contract workers. Customize them to meet your company's needs. Answer questions yes/no as indicated or use this scale: 5 = Very Good; 4 = Good; 3 = Ambivalent; 2 = Poor; 1 = Very Poor. Hire the candidates with fours and fives.

1. Pre-Screening/telephone interview.

- Summary of skills, accomplishments

- Clear thought processes in answering the following: What prompted you to answer the ad? What kind of work environment are you looking for? Why are you looking for a new position?

- 2. The interview.** Demonstrates the following effective characteristics: articulate; good eye contact; body language portrays interest; energetic; sense of ease; optimistic; likable; smile; enthusiastic; self-motivated; enjoys a challenge.

3. Clear thought processes in answering the following:

- What skills do you bring that others don't?
- Why do you want to work for our company?
- Why are you leaving your present job?
- What are you looking for in a new job?
- Growth areas identified from a recent evaluation?
- Need for additional training?

4. Major faux pas

- Applicant is late
- Gets lost finding the facility
- Does not know interviewer's name
- Unfamiliar with the company
- Chews gum

Remember: contract employees can make choices and you want them to choose you.

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

Comments? E-mail jterrett@plant.ca.

» Tech Tip

Analyzing electric signatures

Information you need to get the most benefit

Electric signature analysis (ESA) should not require best guesses, but that may be called for when nameplates are missing. There are methods and pattern recognition that, along with experience, can help; however, performing an analysis will take much longer and will be far less accurate as the amount of information decreases.

To get the greatest benefit out of an ESA, you'll need complete nameplate, control and driven equipment information. For instance, if a motor is operat-

ing on a variable frequency drive (VFD) and drives a gearbox attached to a roll, you need information on the VFD, motor nameplate and gearbox nameplate (especially the ratio, or number of teeth of each gear, if available), and anything associated with the roll.

While bearing issues are difficult to detect, knowing the manufacturer, mode and other operating information will improve the chances for an accurate analysis.



Avoid "best guesses."

PHOTO: THINKSTOCK

For more information on ESA and analysis, review the related papers in the MotorDoc.com archives at www.motordoc.org/archives.

Source: Motor Diagnostics and Motor Health News, Success by Design, with permission.

LEAN ALERT



The Toyota Way has two fundamental elements. Most manufacturers focus on continuous improvement. Without focusing equally strong efforts on the "respect for people" element of lean, businesses will not create or sustain any significant business improvements. The real power of lean is to fully engage people's heads and hearts to create habits that result in achievement and fulfilment. Create a people-centric leadership style and approach, and understand the critical importance of lean's cultural component.

Source: Association of Manufacturing Excellence (AME), Canada. Visit <http://ame.org>.

CORRECTION

Apologies to David Landry! *Managing Change — How to handle culture, systems and turnover*, which appeared in the November-December 2014 issue of **PLANT**, identified the wrong person as a workshop speaker. Landry, chief procurement engineer for Cameco Corp. in Port Hope, Ont., addressed turnover and operational risk.

» Managing Assets

The type of maintenance work and how it's done is changing. Maintenance pros have to adapt.

BY STEVE GAHBAUER

When it comes to managing change, many maintenance pros feel they're alone as they deal with pressures from operations (got to keep running) and corporate management (got to stop spending money).

Ben Stevens, founder of DataTrak Systems Inc., an asset management solutions provider based in Godfrey, Ont., says requirements and operating context for assets change as more is demanded from them and the environment and regulations they operate under change. Assets and their operating context are revised over their long lifetimes to meet production volume, variety, quality and regulatory requirements; and they're usually measured in decades rather than years, so these changes accumulate.

How do we best address change? Properly define the problem.

The *Asset Management Solutions Newsletter* by Len Middleton, a Toronto-based physical asset management consultant (visit www.asset-management-solutions.com) suggests answering these questions:

- Is your organization doing the right amount of work?
- Do you experience unplanned and unexpected outages?
- Are you doing proactive maintenance on equipment that doesn't have an impact on safety, the environment or standby equipment? Would the cost of repairs be about the same if it ran to failure?
- What are your current maintenance tactics? Do you get work orders that make no sense because the equipment has changed and the work order is not relevant, or the tasks do not effectively address the probable cause of failure?



Find the right pieces to calm the turbulence caused by change.

PHOTO: THINKSTOCK

technology and are you executing the work effectively and efficiently with few avoidable work delays through good work management practices, including proper planning and scheduling?

- What can you do to change the situation?

Increase value

To successfully manage change, think of maintenance as a business unit that adds to and increases company value. That requires an understanding of your company's rules and objectives and what managers are looking for. Maintenance must learn to speak executive language, which is essentially financial.

To change the way management behaves, show executives your ideas are really their ideas (joint goals); that the results are to their benefit and their credit, and that change is rewarding to them.

Getting help from your friends in accounting should be easy. Do the math. Show how the investment results in higher ROI. Accounting's job is to help maintenance put together sound financial plans for budgets and projects, as well as monitoring progress.

Understand their methods of budget and project evaluation and follow their rules (definitions of costs, project time horizons and threshold ROIs). Get an accounting analyst attached to your team to assist. Help accounting understand the basics of maintenance: show how aging equipment needs more resources; demonstrate that you understand economic annual costs of assets; and don't just send in the numbers, present the budget and explain the rationale to managers.

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

Comments? E-mail jterrett@plant.ca.

What's the PROBLEM?

HOW TO DEFINE AND ADDRESS IT

- Does all the work assigned to the skilled workforce need to be done by them only? Or could others do the work if they received a couple of hours of training and documented instructions?
 - Do you know which assets are critical to meet the organization's objectives? Are they given priority to ensure tactics are effective and executed when required?
- Does your company have a plan to address its ability to execute work properly after many of your maintenance practitioners have retired?
 - Do tactics effectively address the causes and consequences of failures?
 - Is your organization familiar with available technology used for condition monitoring?
 - Are you using the most effective

» OLGs

Mining the benefits of open gear lubes

Tips for their use in challenging operating conditions

Proper gear lubrication is a no-brainer, but when it comes to requirements, not all gears are alike. For example, some need special lubricants because they're exposed to the elements in open pit, or surface mining applications.

Martin Keenan, a product specialist with Petro-Canada Lubricants Inc., a division of Suncor Energy, offered some technical tips about open gear lubricants (OGL) used in surface mining at a Society of Tribologists and Lubrication Engineers (STLE) meeting in Hamilton.

Here are the highlights:

Open gear lubricants are high performance products that must work under high loads and in challenging conditions. They're highly viscous and fortified with EP additives for use on surfaces exposed to rain and snow. The high viscosity is re-

quired because speed of motion is slow. OGLs need to be pumpable and stick to the surface to provide a protective film coating.

In surface mining, OGLs are used for electric and hydraulic shovels, draglines, haul trucks and borehole drills.

These lubricants are applied by spraying or dripping at pre-determined, intermittent times. Avoid too much or too little as equipment downtime in open pit mining is very expensive.

OGLs can be regular or multiservice types. Mining shovels are usually lubricated by multiservice lubes and have two separate reservoirs for different types. Changing ambient tempera-



Petro-Canada Lubricants plant in Mississauga, Ont.

PHOTO: PETRO-CANADA

ture and climate may require a seasonal change of products. Another consideration is solvents: they can be a problem.

Keenan noted each piece of equipment has its own set of specifications. Check with the equipment manufacturer.

» Lubricants

There are many advantages to using single-point automatic lubricators, but they need to be maintained “proactively.”

Many manufacturers have lube programs that were not proactively planned and implemented, but assembled piecemeal over many years with the addition of new equipment, processes and personnel. Not surprisingly, there are problems.

Single-point automatic lubricators (SPALs) are of particular concern because there is less obvious control and observation of whether too little or too much lubricant is applied, or if it’s reaching critical parts.

Single-point lubricators are a niche type but used widely in cement and steel mills, pulp and paper mills, power plants, the mining industry, and in food and beverage plants.

Mike Deckert, vice-president of FLO Components Inc., an automatic greasing systems specialist based in Mississauga, Ont., outlined compelling reasons for using SPALs to members of the Hamilton Section of the Society of Tribologists and Lubrication Engineers (STLE).

Deckert, STLE’s section president, said they provide continuous oil or grease over a set period of time and allow re-lubrication while the machine is running – obvious advantages. In addition, installation costs are much lower than those for central systems, it’s easy to add more lubrication points as the system expands, and SPALs are ideal for hard-to-reach locations for one-point applications.

There are different types of SPALs. Spring-activated units use spring pressure on a piston to dispense lubricant, and rely on back-pressure from the bearing for the dispense rate.

Proactive SPALs

COMPELLING REASONS FOR USING THEM



Single-point lubricators are used in various industrial settings, including steel mills.

PHOTO: THINKSTOCK

Gas-charged dispenser types work like Alka Seltzer. They use gas pressure on a piston to dispense lubricant with settings from one to 12 months. They have large reservoirs – 60 to 500 cc – but there is a drawback: they are very susceptible to ambient temperature.

Gas-electromechanical activated lubricators use a

motor drive on a piston to dispense the lubricant and can be wired into machine electrics. One type is electrochemical-activated SPALs that work with an electrochemical cell and an electrolyte. They have time selector switches, resistors and an electronic circuit board; a bellows gas chamber; piston and lubricant reservoir; a mounting nipple; an O-ring; and an outer plug. They’re battery-operated but have a shelf life of only one year.

Troubleshooting

SPALs have red and green LED lights for troubleshooting. When the green light is blinking every 15 seconds, the operation is okay. A red light blinking every eight seconds indicates malfunction or an error. When both the green and the red light are blinking every three seconds, the unit is empty. A continuous constant red light indicates the VARIO is discharging.

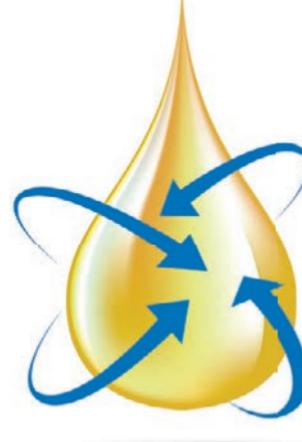
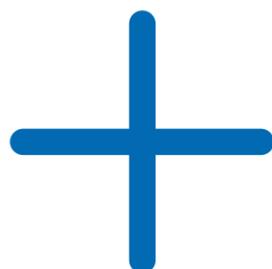
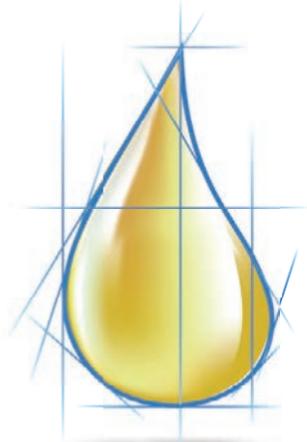
Deckert outlined some options. Grease reservoirs are refillable on some units and remote lines can be used, depending on lubricant viscosity and temperature.

Suppliers have many accessories to meet various requirements. SPALs are great if you use them correctly, use check valves for oil applications, and make sure that excess lubricant doesn’t enter the motor housing because of weak seals inside the bearing cavity.

— Steve Gabbauer

Comments? E-mail jterrett@plant.ca.

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» Renewables

Light-sensitive materials are printed onto a flexible film that coats weirdly shaped surfaces to collect the sun's energy.

BY PLANT STAFF

Ilan Kramer hopes powering your tablet will be as simple as wrapping it in cling wrap.

The post-doctoral fellow, his colleagues at the Edward S. Rogers Sr. Department of Electrical & Computer Engineering at the University of Toronto and IBM Canada's Research and Development Centre have invented a way to spray solar cells onto flexible surfaces, a major step toward making spray-on solar cells easy and cheap to manufacture.

Light-sensitive materials called colloidal quantum dots (CQDs) printed onto a flexible film would coat weirdly shaped surfaces, such as patio furniture or an airplane's wing.

A surface the size of your car's roof wrapped with CQD-coated film would produce enough energy to power three 100-watt light bulbs, or 24 compact fluorescents.

Kramer's sprayLD system – a play on the manufacturing process called ALD (atomic layer deposition) – involves materials that are laid down on a surface one atom-thickness at a time.

Until now, it was only possible to incorporate light-sensitive CQDs onto surfaces through batch processing, which is an inefficient, slow and expensive assembly-line approach to chemical coating.

SprayLD blasts a liquid containing CQDs directly onto flexible surfaces, such as film or plastic, like printing a newspa-



Ilan Kramer shows off his spray-on solar cell kit.

PHOTO: UNIVERSITY OF TORONTO

Spray-on SOLAR POWER

NEW PROCESS MAKES CELLS EASIER TO MANUFACTURE

per by applying ink onto a roll of paper. This roll-to-roll coating method makes incorporating solar cells into existing manufacturing processes much simpler.

No-compromise solution

Kramer built his sprayLD device using parts that are readily available and rather affordable, sourcing a spray nozzle used in steel mills to cool steel with a fine mist of water, and a few regular airbrushes from an art store.

"This is something you can build in a

Junkyard Wars fashion, which is basically how we did it," says Kramer. "We think of this as a no-compromise solution for shifting from batch processing to roll-to-roll."

In two recent research papers in *Advanced Materials* and *Applied Physics Letters*, Kramer showed that the sprayLD method can be used on flexible materials without any major loss in solar-cell efficiency.

A third paper in the journal *ACS Nano* demonstrated how Kramer and

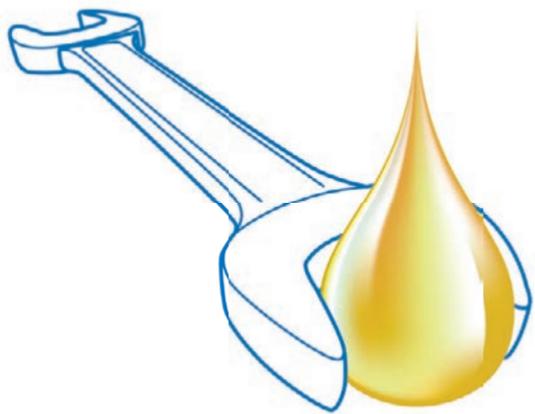
his colleagues used IBM's BlueGeneQ supercomputer to model how and why the sprayed CQDs perform just as well as – and in some cases better than – their batch-processed counterparts.

And he has ambitious plans for his technology.

"My dream is that one day you'll have two technicians with Ghostbusters backpacks come to your house and spray your roof."

Comments? E-mail mpowell@plant.ca.

reliability



=



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» Waste

Fuel from (WOOD) FIBRE

LEWIS MOULDINGS' SUSTAINABLE ALTERNATIVE TO FIREWOOD

The popularity of Fiber Fuel has resulted in the Nova Scotia specialty wood producer adding capacity with a second briquetting machine.

BY MATT POWELL, ASSOCIATE EDITOR

Lewis Mouldings and Wood Specialties is putting a new spin on “treasure from trash,” and providing Nova Scotia residents with an environmentally friendly and safer way to heat their homes than with firewood this winter.

The Weymouth, NS pine moulding manufacturer is eliminating wood waste and meeting growing local demand for its Fiber Fuel bricks by adding a second wood waste briquetting machine to its 60,000 square-foot facility, which processes up to 6 million feet of pine annually.

“We needed to recapture some of the cost and value that goes into our dry waste,” says Jamie Lewis, the plant’s general manager.

What started as a waste diversion project in 2008 when the company realized it could no longer depend on pulp and paper producers to take away growing piles of wood byproduct. He says the company considered getting into the pellet business, but opted out because it’s a commodity product that has a tendency to fluctuate wildly. “The bricks were a niche we were confident we could capture.”

Fiber Fuel production is currently about the equivalent

of 1,200 cords of firewood, a business that’s worth up to 3% of the company’s revenues.

It also helps that Lewis Mouldings is a producer of eastern white pine, which is kiln dried to remove most of its moisture (briquettes need to have a moisture content of less than 14%.)

“We’re drying it down below that to begin with,” says Lewis, adding that other materials, such as spruce, are usually processed with a moisture level around 18%.

Fiber Fuel is a direct alternative to firewood, and is sold to Nova Scotia locals through a network of hardware stores across the province. He hopes the second machine will double Fiber Fuel revenues in the next two years.

It will also help keep jobs at the plant in a region where the forestry and pulp and paper sector has struggled. Lewis Mouldings, founded in 1990, is one of the region’s largest employers with more than 75 employees.

“We were too dependent on a lot of other customers for our waste, and they eventually shut down as the downward trend in the pulp and paper business continued. We knew we couldn’t be dependent on them forever,” says Lewis.

The second machine was purchased thanks to a repayable contribution of \$307,500 from the Atlantic



Fiber Fuel bricks are expelled from a RUF briquetting system at Lewis Mouldings’ plant.

PHOTO: LEWIS MOULDINGS

Canada Opportunities Agency (ACOA). He describes the process of making the briquettes as simple. Dry wood waste is transferred by collection systems mounted over cutting areas around the plant into a hopper that’s fed into a briquetter made by RUF Briquetting Systems in Germany.

That’s where the magic happens.

How it’s made

Once in the briquetter, the material is transported into the pre-charging chamber by a conveying screw. A pre-charger presses the material to a controlled density to ensure consistent briquette size.

Then a main pressing ram transfers the material into the mould and forms the briquette into its final shape and density. The reciprocating mould moves sideways and parallel ejectors expel the briquettes as a second briquette is formed.

With the addition of the second machine, Lewis says production of 400 bricks an hour will be automated except for final packaging in plastic bags to keep out dampness and make storage easy.

The two-pound Fiber Fuel-branded bricks have benefits over traditional firewood. They’re ready to use immediately (firewood needs to be dried first) and this reduces the risk of mould, insects and dirt inside a customer’s home.

Because they’re 100% kiln dried, there’s less moisture to cause improper combustion, lessening the risk of the creosote build-up that causes chimney fires. There’s also less ash than hard wood and emissions are reduced.

Two or three bricks every 80 to 100 minutes will keep a house at a comfortable temperature.

Lewis says the company is also installing a bio-mass dryer. It will be used to convert green waste, such as wood and bark residues, into briquettes.

“That’s the next evolution of this business.”

In the meantime, Fiber Fuel will continue to provide Nova Scotians with an innovative and environmentally friendly way to heat their homes that doesn’t involve trekking into the forest with an axe.

Comments? Email mpowell@plant.ca.

LOCATE YOUR ADVANTAGE

Through our Canadian Manufacturing Network, EMC has launched a national labour market initiative - ManufacturingGPS - an advanced new tool aimed at placing Canadian industry on the global productivity map.

Through an in-depth LMI study with 5,000 manufacturers coast-to-coast, ManufacturingGPS will host a fully searchable resource, to help industry track key workforce trends and occupational intelligence, including critical information needed to grow productivity:

- Compensation Rates
- Skills Needs/Shortages
- Productivity Cluster Info
- HR Surveys and LMI Data
- Capabilities Resources
- Benchmarking by Sector, Region etc.

All in one unique online portal... the first of its kind in Canada! All participating manufacturers/stakeholders will have access to ManufacturingGPS and its many tools and resources at no cost.



ManufacturingGPS

CONTACT US TO GET INVOLVED

To participate, please email us at: GPS@CanadianManufacturingNetwork.ca



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Canadian Manufacturing Network



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

» Exporting

Twelve categories to cover when researching trade opportunities and strategy on the internet.

BY MARK DRAKE

My three-year-old grandson can pull up his favourite program on Netflix. Like most of us he goes primarily to this one site. Many of us have the same tendency to pull up our favourites, ignoring the other valuable information out there. True, it's often difficult to see the proverbial wood for the trees, and we're all subject to information overload, so here are some useful websites.

1. Export readiness. A self-assessment is an important first step for the would-be exporter, answering the basic question: are you ready to take the plunge? There are several good sites to check out: www.export.gov/begin (US site), www.tradestart.ca (BC-based, includes a SWOT analysis), www.sse.on.ca (68 pages from the Ontario government on exporting, including 20 steps to export success), www.austrade.gov.au (the take from down under), and try the UK's Institute of Exports questionnaire, "Are you ready to export?" at www.export.org.uk. An assessment is done for you based on answers given!

2. The export plan. This is the vital next step, and some of the above sites lead into examples. The Marketing Donut has a good summary at www.marketingdonut.co.uk.

3. Training. It's important to have someone on board who is knowledgeable and experienced in international trade. For focused training: The Forum for International Trade Training (www.fitt.ca) has on-line courses covering the A-Z of the subject, leading to the Certified International Trade Professional Designation (CITP). Many local community colleges run FITT or their own special IT courses. Also check out www.export.org.uk for online courses at all levels.

4. Which market? Most market research has always been desk (and now computer) based. Depending on the competitive situation, a selection of one to three potential markets should be made based on the product/service on offer, the opportunity to carve out a niche position, and the specific challenges of language, culture and business practices. This leads to more focused research, for which a wide range of tools is available, including: www.doingbusinessin.org (world bank); www.globalconnections.hsbc.com (bank report); and www.pwc.com, www.deloitte.com, and www.kpmg.com (major accounting firms).

5. Associations. Check out groups with a special country focus such as www.canada-indiabusiness.ca, or Canada-China Business Council (www.ccbc.com) and Canada-Europe roundtable for business (www.canada-europe.com).



Move beyond your favourite sites for useful trade information.

PHOTO: THINKSTOCK

Surf's UP!

USEFUL WEBSITES FOR INTERNATIONAL TRADERS

org). Members of these groups with non-competitive activities may be willing to share their experience. General associations such as Canadian Manufacturers & Exporters (www.cme-mec.com) and Importers and Exporters Canada (www.iecanada.com) are also helpful.

6. Government sites. Canada's export credit agency (www.edc.ca) publishes market reports, as does the trade commissioner service (www.tradecommissioner.gc.ca). Their local representatives in 174 offices around the world will help search for potential local partners

7. Trade shows. Visiting or participating helps you understand a market and what competitors are up to, plus it's also a good place to find local partners. Choose shows with a particular industry focus. These are usually better value than general ones like the famous Hannover Fair. For a list go to directory.balluun.com, www.tradefairs.com (German focus), and for Canadian government-supported fairs and trade missions subscribe to CanadExport, Foreign Affairs and International Trade Canada's online magazine (www.international.gc.ca). Use Google too.

8. Culture and business practice. Smooth the way and avoid potential gaffes with FITT's "Going Global" workshop, "An introduction to the Cultural Aspects of International Trade" (www.fitt.ca). For a European focus try www.businessculture.org, or the "magazine for clean capitalism" at www.corporateknights.com.

9. Finance and the nuts and bolts. Most training courses have a module on the nitty-gritty of the export function, such as finance, credit, guarantees, insurance, export and import controls and

Inco terms. The bank sites and Export Development Canada (www.edc.ca) are particularly helpful. FITT has modules on trade finance, and trade compliance. Freight forwarders and their brokers can help (www.cargosolution.com) or try CIFFA, the Canadian International Freight Forwarders Association at www.ciffa.com.

10. Intellectual property protection. Check out www.csoonline.com for a list of the basics for an excellent (if rather outdated) general introduction. Industry Canada www.ic.gc.ca has IP protection guidelines (as well as much else about running a business).

11. Corporate social responsibility. Many companies have codes of conduct dealing with personnel matters, their operating environment and related issues such as bribery. Penalties await those who break the law. Industry Canada has details under CSR. See also the United Nations at www.unglobalcompact.org, Canadian Business for Social Responsibility at www.cbsr.ca, or www.international.gc.ca/csr-rse for specific guidelines.

12. Web site. Your web site is an important marketing tool. Make it attractive, compelling and easy to navigate. Aim for top visibility in Google searches! Potential clients should easily find and do business with the best organizations, which also use social media (with discretion) to their advantage, and keep their sites up-to-date.

Don't be like my grandson and stick to one site – unless it's Google of course, which will lead to all the others.

Happy surfing!

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

Comments? E-mail jterrett@plant.ca.

» Training

Target a business need Connect problems with action

BY HUGH ALLEY

A friend of mine has a reputation in his plant for being unwilling to spend money, yet he has invested significantly in the past three years. His team remembers all the times he said "no," yet they don't remember the questions he asked: How will the proposed expenditure help meet business goals? How will the expenditure solve a problem that will improve performance? What will change, and how does that affect one of the key issues preventing the business from delivering faster, cheaper, safer and with more consistent quality?

He needs his staff to make the connection between action and the business goal. Then he's happy to proceed.

Training needs to meet the same rigorous standard, but proposed training rarely sets out a hypothesis: "we will train 10 people in this task and we expect behaviour to change in a particular way, which will change an important aspect of the operation so customers get more of what they want."

There is a better way.

List the objectives you have for the year ahead. Ask if training would help some of your staff achieve those objectives; and whether the methods and the human elements are key to reaching the objectives. If so, you have a basis for training.



List objects and focus training.

PHOTO: THINKSTOCK

Set the context for the training. Tell trainees they're getting this investment because you need them to help resolve the issue.

For example, a client is struggling with delivery times. Key staff will get some training. From the outset, they will be told that the expectation is lead-time in the plant will be reduced from 12 weeks to six weeks. This will let the company handle a sharp increase in demand, and will add a lot to the profitability of the business.

Building your training programs around specific business problems will result in an enormous return on your investment.

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 or call (604) 866-1502. Visit <http://firstlinetraining.ca>.

» Trade

Beyond CANADA'S BORDERS

NAVIGATING THE CHALLENGES OF NEW GLOBAL MARKETS

Pay special attention to cultures, lifestyles, business models, and supply chain and distribution channels.

BY JIM MENZIES

Manufacturers have never been less constrained by geographical boundaries than they are today. The sector has transformed from a collection of regional and national industries into a global engine of economic growth, evolving rapidly from local factory and distribution operations to shipping massive amounts of goods around the world. As manufacturers contemplate navigating this new terrain and venturing beyond Canada's borders, a number of key factors come into play.

Changing global dynamics. Global growth is fed by continuously changing demographics, offering exciting opportunities for manufacturers to enter new and emerging markets. Middle classes are growing throughout the world, even in countries where disposable income was once considered a luxury.

China's newly-affluent population now consumes everything from Starbucks lattes to iPhones. Yet China's economic ascent is becoming old news. The global population will expand to 9.6 billion in 2050, up from 6.9 billion in 2010. India will replace China as the most populous country with 1.6 billion people. Africa will reach 2.4 billion by 2050, with Nigeria becoming the fifth most populous country in the world, outgrowing the US and Canada combined.

Even some developed nations are growing. The UK population is expected to rise from 63 million to 73 million by 2037, although other countries such as Japan and Germany will see their populations decline by more than 10%.

Facing the transition. Even when all signals point to going global, manufacturing executives face an array

of challenges, such as: geopolitical uncertainty; distribution and logistics limitations for perishable goods; product regulations that vary by country, region, state or province; and a tireless battle for the global consumer.

As a result, capitalizing on global opportunities is no easy task. It requires innovation and adaptation of processes, products and strategies. Successful manufacturers transitioning into the global market do the following:

- tailor their products, packaging and messaging to the customs and tastes of their destination markets;
- explore local market dynamics, competitors and suppliers in those areas before entering;
- identify the most profitable product opportunities;
- build an informed picture of potential pitfalls;
- have a clear understanding of regulatory requirements in every jurisdiction in which they operate; and
- understand the mindsets of their partners, making it possible to build long-lasting, profitable relationships with them.

As your company goes through these transitions, pay special attention to the cultures, lifestyles, business models, and supply chain and distribution channels in new markets.

Know the business culture

Cultures and lifestyles. Even as cross-cultural exchanges increase and geographic barriers break down, national and ethnic traditions remain strong – both in how consumers view products and how businesses and executives interact. Knowing the nuances of the business culture in each country will help you choose appropriate business partners, build trust with suppliers and retailers, and reach mutually beneficial agreements faster. Consider whether you can access people in-country who understand and will help you navigate



Global growth offers new markets for Canadian manufacturers. PHOTO: THINKSTOCK

cultural barriers, identify which customs and practices may help or hinder potential business relationships, and identify cultural sensitivities or taboos.

Structuring your business model. Find out the relative success of various models such as joint ventures, acquisitions, distribution into the region, business alliances and transactions through third parties. Corporate entities may not be the best choice from either a business or tax perspective, and changing structures may lead to adverse tax implications or be seen as tax avoidance.

Some jurisdictions have structures for foreign investment that help to minimize tax consequences. In other countries, such as India, ownership requirements differ from state to state. Understand your business model options and that a different business model may be deployed cost effectively. Also ensure your model includes an efficient repatriation and exit strategy.

Supply chain and distribution channels. Develop detailed maps of how your goods will move throughout a region from suppliers to distributors to customers. Selective in-country sourcing, especially of non-core components and materials such as packaging, can slash transportation and distribution costs.

Efficient distribution and supply chains may already exist. Understand what's required to get your products into ideal markets and the robust supply chains necessary to get you there. Be comfortable with your distribution channels and confident you can transport your products without risk of tampering or theft.

Global opportunities abound and realizing doing business in new markets can be quite different from doing business in Canada is half the battle. By taking a sophisticated approach and adapting to challenges as they arise, your business will flourish beyond Canada's borders.

Jim Menzies is National Leader – Manufacturing Industry for Grant Thornton LLP, a Canadian accounting, tax and advisory firm that provides services to private and public organizations. Visit www.GrantThornton.ca/manufacturing. E-mail jim.menzies@ca.gt.com or call (416) 360-5008.

Comments? E-mail jterrett@plant.ca.

» Markets

No place like home Manufacturers focus on North America

Most Canadian manufacturers like to conduct business close to home. **PLANT's** *Manufacturers' Outlook 2015* survey sponsored by Grant Thornton shows most of their revenue comes from North America.

Breaking it down, 63.1% comes from Canada, 26.2% from the US, 2.4% from the EU, 2% from China and less than 2% from each of the other markets.

Looking ahead three years, North America is still the preferred region for market expansion (37% to the US and 31% to new markets in Canada), followed by Mexico (15%), other Central and South American countries (15%), Brazil (12%), other western European countries (11%), China (10%) and the UK (9%).

Visit www.plant.ca for survey results.



C I E N

CANADIAN INDUSTRIAL EQUIPMENT NEWS

» Safety Standards



Rite-Hite's Guardian Defender automated barrier door protects workers from robotic machine movement zones.

PHOTO: RITE-HITE

New TECH, STANDARDS

UPDATE YOUR WORKPLACE TO REFLECT CHANGES

When adding new automated processes, a thorough risk assessment ensures safety measures are in line with current standards.

BY ERIC ESSON

Significant changes to industrial safety standards have taken place across North America in the last two years. While most plant managers recognize these regulatory shifts, those who haven't might find they're no longer up to code, risking costly fines and injuries to employees.

One of the best ways to ensure a safe work environment is by conducting a thorough risk assessment, especially if

your plant has added new automated processes, which – thanks to the new CAN/CSA Z434 standard (adopted in 2013) – is now mandatory.

This new standard references ISO 10218-1 & 2, which addresses robots, robot systems and integration. The revised CSA Z434 was written alongside the Robotics Industrial Association (RIA) in the US to be compliant with international standards already in place in Europe, making life easier for manufacturers and end users.

Because every robot system is different, risk assessment is an important step to protect employees. The standard requires superior hazard identification accounting for not only robot motion, but also the task being performed. Additionally, it requires validation and verification of the safety systems employed, and

of the designs that incorporate protective measures for the robot cell and the operator.

Some of the biggest changes have to do with safety-rated motion and allowing for advanced programmable safety devices to be used. This means software is allowed "safety-rated" control of various aspects of the robot's function, limiting the area in which it operates and the speed of motion.

Thanks to technological advances in safety controls, these long overdue applications can be implemented safely. In the past, engineers designed guarding for the maximum space, speed and load of the robot. Significant floor space savings with proper point-of-interaction safety devices should shrink the physical footprint of new robot cells.

Continued on page 22

» Supply Lines



SATIR's PK160 thermal imaging camera.

PHOTO: SATIR

NEW SATIR DISTRIBUTOR

techniCAL is now distributing SATIR infrared imaging products.

SATIR, its European headquarters in Ireland, makes cameras used in a variety of sectors, including manufacturing, for predictive and preventive maintenance, condition monitoring, non-destructive testing, research and development, temperature measurement and thermal testing.

techniCAL, a supplier of test and measurement instruments, is based in Millgrove, Ont.

HOW BIG IS YOUR TOOLBOX?

KBC Tools and Machinery is celebrating its 50th anniversary this year as a supplier to the metalworking industry with a contest: it wants to know who has the biggest toolbox.

Send in a shot of your tool collection for one of three KBC Cash prizes of \$1,000, \$500 and \$250.

The company, based in Mississauga, Ont., is adding to the celebration with a new website. It features expanded product information (diagrams, manuals and parts list, plus enhanced accounts lists); current and sale prices; a spotlight on new products; improved search and navigation; larger images; a quick order pad; and real-time inventory status at local branches.

IMPROVE YOUR RELIABILITY PRACTICES

Would your maintenance team benefit from some help reducing mechanical failures and streamlining maintenance practices?

Henkel Corp. is offering a customizable, in-plant training program applying Loctite maintenance solutions for reliability and maintenance engineers, managers, supervisors and technicians that covers new ways to lower costs and increase the reliability of equipment.

After a plant survey, the maintenance team reconvenes with Henkel reps in an MRO Workshop that will identify specific ways to realize time savings, energy cost reductions, and safety and reliability improvements.

Henkel, with Canadian operations based in Mississauga, Ont., makes consumer and industrial products, including adhesives.

Matching safety with technology

Continued from page 21

One of the biggest regulatory paradigm shifts occurred in 2012 with the move from EN 954-1 to ISO 13849-1 and EN 62061.

At its core, ISO 13849-1 provides a clearly defined set of rules to follow when designing the safety system applied to industrial machine control systems. This regulatory shift became necessary because of increasingly complex manufacturing processes using robotic and automated technology that's forcing safety control systems and methodology to keep pace.

The ISO 13849-1 standard is more quantitative than EN 954-1, applying common sense and forcing facility managers to validate their safety systems. Conversely, EN 954-1 was conceptual and only required facilities to apply safety controls properly specifying non-programmable, out-of-date technology.

Safety devices

As manufacturing processes become more complex, so too will the systems needed to monitor their operation and keep machine operators safe.

EN ISO 13849-1 accounts for the regulatory gaps that were starting to show in the older standards, which is what CSA Z434 is expected to do.



Safe-guarding for robotic welding.

PHOTO: RITE-HITE

Automated barrier doors are becoming popular safety devices for points-of-interaction. While the main purpose of these doors is to contain fumes, sparks, smoke, mist, flying debris, excess noise and other common manufacturing process by-products, they minimize the physical footprint of the robotic cell by eliminating the safety zone that's required for light scanners and curtains. The most advanced roll-up automated barrier doors apply high-speed, high-cycle technology with PLe hold-down mechanisms, and safety rated non-contact interlock switches and controls.

Most automated doors function from the top down, but some are designed to operate from the ground up. This allows machine operators to easily interact with the process using overhead cranes to load and unload large, heavy parts. They're also an option for interaction points that have a very limited space.

Matching safety measures to state-of-the-art technology will help keep workers safe and improve efficiencies, making manufacturing operations more competitive.

Eric Esson is the national sales and marketing manager for Rite-Hite Machine Guarding, a Milwaukee manufacturer of safety equipment for welding, robotics and other industrial processes. E-mail eesson@ritehite.com. Visit www.ritehite.com. Arbon Equipment Corp. in Calgary distributes Rite-Hite products in Canada.

Comment? E-mail jterrett@plant.ca.

Test & Measurement

TEST WVTR FOR BARRIER STRUCTURES

MOCON Inc.'s fully automated PERMA-TRAN-W Model 3/34 G tests the water vapour transmission rate (WVTR) for packaging and other barrier structures.

In automatic mode, the operator mounts a test film, sets the temperature/relative humidity conditions and begins the test. TotalCal improves accuracy and eliminates significant set-up time while improving accuracy in the "advanced testing mode" where the operator sets all testing parameters.

Four NIST calibration films are stored and a calibration curve is generated across the system's entire range.

TruSeal technology prevents ambient air *Measures only water vapour.*



from the test cell to ensure only water vapour is measured.

Additional throughput/time savings include an easy-to-use touch screen to enter testing parameters; automatic maintenance of temperature, relative humidity, flow and pressure; running of 10 sequential tests with one set up; a GO button that eliminates entering the same conditions when repeating a test; larger water reservoirs that allow tests to be conducted overnight/weekends without an operator present; and a high purge mode to reduce testing preparation time.

MOCON is a Minneapolis-based provider of instrumentation.

www.mocon.com

LIGHT TESTER ELIMINATES THE LADDER

Maintaining fluorescent lamps tends to be a trial-and-error process. Bulbs not lit? Climb the ladder and replace them. Still not lit? Go back up the ladder and replace the ballast. Still not lit? Climb the ladder one more time.

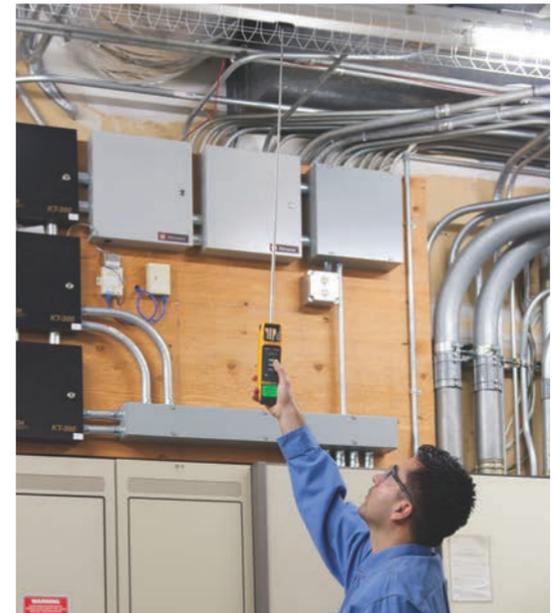
Fluke's 1000FLT Fluorescent Light Tester performs lamp, ballast, non-contact voltage detector, pin continuity and ballast discriminator tests in less than 30 seconds.

The tester comes with a rugged, metal test rod that extends up to 31 in. (79 cm) mostly eliminating the need for a ladder, and a belt-style holster so the tester is always within easy reach.

The point-and-shoot ballast discriminator identifies what type of ballast is in the fixture before the technician climbs the ladder. There is no need to remove the bulbs or to make contact with live circuitry.

Fluke is a manufacturer of test instruments. Fluke Electronics Canada LP is based in Mississauga, Ont.

www.fluke.com/1000flt



Performs tests in under 30 seconds.

SCANNER GOES THE DISTANCE

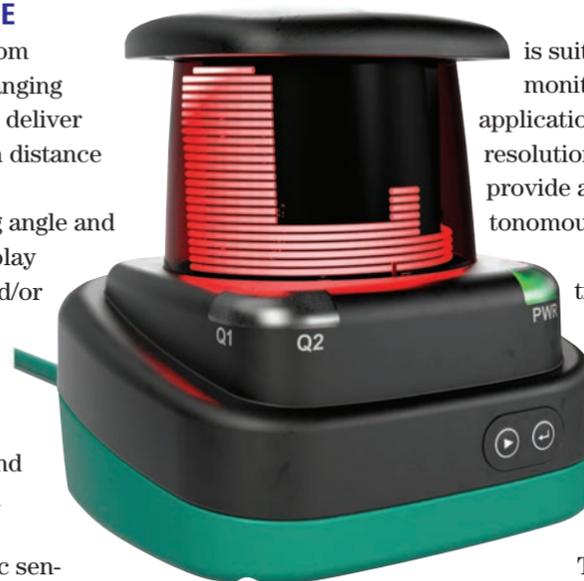
The R2000 UHD Laser Scanner from Pepperl+Fuchs leverages pulse ranging technology and a rotating head to deliver quick, precise and high-resolution distance measurement.

A gapless 360-degree measuring angle and interactive wrap-around LED display detects objects to 10 m (33 ft.) and/or reflectors to 60 m (197 ft.), with quick visual status indication and access to extensive measurement data.

Set-up and alignment is quick and easy with the eye-safe, class 1 red laser light.

This IP65-rated 2D photoelectric sensor's interactive, 360-degree LED display is capable of both text-based and graphical information that covers basic status and an image of the scanned environment.

With a high 50Hz scan rate (3,000 rpm), the R2000 detects protrusions or obstacles over a large area and at high speeds. The gapless 360-degree scanning angle



Detects objects to 10 m.

is suited for positioning, area monitoring or collision avoidance applications. Extremely high angular resolution and precise measurement provide accurate navigation for autonomous vehicles or mobile robots.

A fast ethernet interface transmits data at speeds up to 100 Mbit/s. Distance data is received as packets using a separate TCP/IP or UDP/IP channel, and a simple HTTP command protocol is provided to configure the device.

The scanner is rated for use in temperatures ranging from -10 to 50 degrees C (14 to 122 degrees F) and has an anticipated operating life,

dependent on operating conditions, of up to 20 years.

Pepperl+Fuchs is a manufacturer of sensors with US operations based in Twinsburg, Ohio.

www.pepperl-fuchs.us

CATCH PRODUCT DEFECTS WITH LEAK TESTER

Sciometric's 3520 Series leak testing system incorporates a dual-stage, high-flow precision electronic regulator designed from the ground up that dramatically increases the speed of the fill, regardless of the volume, with repeatability to within millionths of a psi.

Sciometric, a developer of test and measurement instrumentation based in Ottawa, says the 3520 is easy to use and calibrate, with built-in self-checks and diagnostics.

A combination of the latest precision electronics, signal conditioning and A/D converters, attains high levels of repeatability and accuracy in pressure and flow signal measurements.

The system is not affected by changes in atmospheric pressure and compensates for thermal effects.

The 3520 supports multiple test types and pressures with programmable electronic pressure and flow control. It comes in low volume and high-flow manifold versions, for test volumes ranging from a few cubic centimetres to hundreds of litres.

www.sciometric.com



Supports multiple test types.

WAVE RADAR MEASURES TANK LEVELS

The SmartLine Guided Wave Radar Level transmitter measures the level and volume of liquids inside processing tanks up to 49 m high.

The online Application Validation Tool ensures the correct level transmitter application is delivered to the process tank site ready to install out of the box.

Choose either the basic alphanumeric display or an advanced graphics display that shows process data in graphical formats and communicates messages from the control room. It integrates with Honeywell's flagship Experion process control system. SmartLine instruments include temperature and pressure transmitters and they integrate with all control systems.

Honeywell Process Solutions, based in Morris Township, NJ, makes industrial automation controls and instrumentation. www.honeywellprocess.com/smartline



Includes temperature and pressure transmitters.

MONITORS IMPORTANT DATA

Saelig Co. Inc.'s KDMON system monitoring device checks various industrial equipment's electrical signals of industrial equipment. This includes data such as analogue voltages between -30 to +30 V, analogue currents from 4 to 20 mA, the presence or absence of data on an RS485 bus, the contents of registers in an RS485 MODBUS Slave device, or a relay contact closure. The device then relays signals by SMS text message, e-mail or fax.

It also acts as a protocol-independent communications monitor to trigger an alarm upon a specific byte sequence, or a lack of bus activity. This function works on two-wire RS485 or a 4-wire RS485 or RS422 system.

Users are able to configure a range of alarm conditions and notification via a serial configuration port (RS232 or USB via converter cable) using the supplied Windows-based configuration program and an external modem. Modem type depends on the notification required. SMS transmission requires an external GSM modem (industrial or data-capable GSM, or a satellite phone) that supports the GSM/Hayes command set.

SMS features triggering of simulated alarms, resetting alarms, and setting KDMON real time clock or SMS to an e-mail gateway for system testing.



Get alerts via text message.

Transducer current is passed through a 47 ohm resistor and the voltage drop across it is measured using a 12-bit A-D converter. KDMON provides an unregulated -20 V output and relay output is a normally-open isolated contact that closes when an alarm occurs, opening after a programmed time or when the alarm is cleared.

The monitoring devices require a 7-35 VDC, 300 mA power supply and operate in temperatures between -20 to 50 degrees C. It clips to a standard 35-mm DIN rail and is housed in a 1.2 x 4.5 x 3.8-in. case.

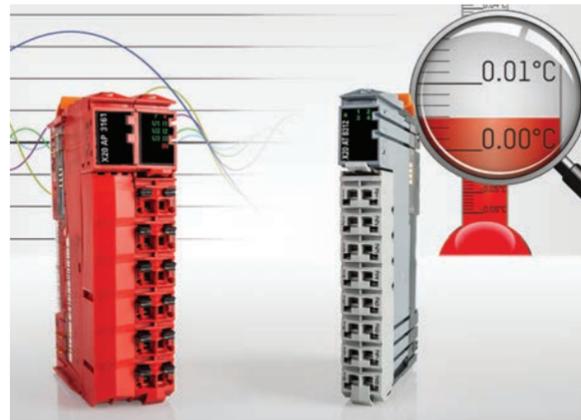
Saelig is a supplier of test and measurement and control products based in Fairport, NY.

www.saelig.com

X20 ADDS TWO MODULES

B&R has added two measurement modules to its X20 I/O system: temperature with 4-wire resistance and energy with four current inputs for connecting external transformers with a 333 mV output.

Up to four platinum IEC 60751-compliant PT100 temperature sensors connect to the X20ATB312



Allows direct resistance measurement.

temperature measurement module. The 12.4 mm wide, 4-channel X20 module is wired using a X20TB1F 16-pin terminal block.

The X20AP3161 is equipped with three voltage inputs for a maximum of 3x 480 VAC and four current inputs for connecting external current transformers with a 333 mV output. The module measures effective, reactive and apparent power individually for each of the three phases and for all of them collectively. The power consumption of each phase and the total sum is also recorded.

Current and voltage is measured up to the 31st harmonic. Due to its high sensitivity and having a fourth channel, the unit is suited for measuring leakage current on neutral lines. The signals are pre-processed before being passed on as digital variables, which reduces the load on the controller.

B&R Industrial Automation Inc. North America, based in Atlanta, makes industrial automation products.

www.br-automation.com

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TEST & MEASUREMENT

MEASURE HIGH-VELOCITY LIQUIDS WITHOUT PLUGGING

GP:50's Model 188/288/388 miniature flush diaphragm pressure transducers accurately measure high-viscosity fluids, even within high shock and vibration environments, without port plugging and clogging.

The transducers, which support applications such as aerospace and automotive test stands; chemical and pharmaceutical processing; plastics extrusion; and adhesive, sealant and paint systems, are made of all-welded stainless steel with a 7/16-20 UNF pressure port that eliminates any zero installation effect.

Standard wetted parts are made from stainless steel, with optional substitution of Inconel or Hastelloy. The standard operating temperature range is -65 to 250 degrees F (-54 to 121 degrees C), with an optional high-temperature version to 350 degrees F (177 degrees C).

Model 188, the smallest of the series at 1.35 in. (34 mm), measures fast events due to its high-frequency response, typically less than 3 kHz. It operates over a standard range of 300 psi to 20,000 psi (21 to 1,379 BAR), with total accuracy to $\pm 0.25\%$ RSS. Output signal is 2 mV/V, with a bridge impedance of 5,000 Ω (350 Ω optional). Typical thermal shift is $\pm 2\%/100$ degrees F, both zero and span.

Models 288 and 388 at 2.67 in. (68 mm) are available with a choice of either voltage or current output. Model 288 has a DC output, proportional to pressure, of 0-5 VDC and 0-10 VDC. Model 388 is a loop-powered device (4-20 mA) with a current output proportional to pressure. Both models operate over a standard range of 100 psi to 20,000 psi (7 to 1,379 BAR) with $\pm 0.25\%$ FSO (RSS) accuracy, or optional $\pm 0.5\%$ FSO. Typical thermal



Made of all-welded stainless steel.

shift is $\pm 0.5\%/100$ degrees F (zero and span), with optional improvement to $\pm 0.25\%/100$ degrees F.

GP:50 Corp. Ltd. is a manufacturer of static pressure sensing instrumentation based in Grand Island, NY. www.gp50.com

INSULATION RESISTANCE TESTING MADE SAFER

Megger's BM5200 5 kV insulation resistance tester amplifies the safety of technicians working on three-phase equipment in high-voltage environments.

It's rated to CAT III 600 V with a high-voltage warning indicator, an external voltage display after IR test, automatic discharge of reactive loads and high quality test leads.

The digital IR tester's five preset test voltages range from 250 to 5,000 V with a maximum resistance range of 1 teraohm.



Multiple operating modes.

The fully automatic tester features multiple operating modes including insulation (InS), polarization index (PI) as well as varied timed test (t). A single rotary switch makes operation easy.

A user-settable insulation resistance test timer ranges to 20 minutes. Selectable DC or AC voltmeter functions range from 25 to 600 V and a guard terminal minimizes surface leakage current.

The BM5200, rated at IP40, has a backlit LCD display for easy viewing under all lighting conditions.

Megger, based in Norristown, Pa., makes test and measurement equipment. www.megger.com



High-resolution gauge.

MEASURE WITH PRECISION

The Taylor Hobson Talyrond 500H precision surface measurement tool with its high-speed column drive, precision positioning and 4-mm roundness and contour gauge, handles a wide range of high-accuracy measuring applications. These include precision bearings, fuel injectors, crankshafts and turbocharger parts.

The tool's low-noise metrology frame, an accurate axis alignment and a patented data collection method with straightness and roundness measurement capabilities exactly reproduce the shape and contour of a precision-machined component.

A high-resolution gauge measures linear or circumferential surface roughness; its frictionless air-bearing spindle and precision column measure roundness, cylindricity and straightness, while a patented calibration technique performs radius, angle, height, length and distance measurements.

Taylor Hobson, based in Leicester, UK, is a manufacturer of ultra-precision measurement instruments.

www.taylor-hobson.com



AC or DC acceleration.

ACCELEROMETER CHECKS VIBRATION LEVELS

The SDI 1510 from Silicon Designs Inc. delivers reliable, general purpose vibration measurements at OEM volumes with long-term stability. It's used across a variety of aerospace, automotive, energy, industrial, oil and gas, test and measurement applications.

This MEMS variable capacitive accelerometer incorporates a micro-machined variable capacitive sensing element and custom integrated circuit. It produces two analogue voltages that vary proportionately according to measured acceleration levels.

Series units respond to either AC or DC acceleration, with choice of either +4 V differential or 0.5 to 4.5 V single-ended output. Both outputs read nominally at +2.5 V (at zero acceleration).

The accelerometer is both nitrogen damped and hermetically sealed. Two reference voltages, +5.0 and +2.5 V (nominal) are required. The output scale factor is ratiometric to the +5 VDC 6 mA (typical) reference voltage. A sensitive axis is perpendicular to the bottom of the LCC package.

Units are RoHS-compliant and operate over a standard temperature range of -40 to 85 degrees C. As a MEMS-based device, the 1510 is also insensitive to temperature changes and gradients, with a signal output that's unaffected by electromagnetic interference, and requires no warm-up period.

Standard measurement ranges from ± 5 to ± 100 g, with corresponding nominal frequency response from 0 to 600 Hz (± 5 g) to 0 to 2,500 Hz (± 100 g).

Silicon Designs, located just outside Seattle, Wash., manufactures industrial-grade capacitive MEMS accelerometers. www.silicondesigns.com

INSPECTION

BOROSCOPES ADDED TO DIGI-SENSE LINE

Digi-Sense has enhanced its line of meters and scopes to include borescopes for inspecting duct work, wiring locations, piping, vehicles and other uses.

Flexible camera-tipped probes provide easy viewing in hard-to-reach areas.

A bright LCD monitor allows instant viewing of the area being inspected. An adjustable LED light on camera tip provides the needed light in dimly lit areas or adjusts down when viewing reflective objects to eliminate washout.

The unit with 8 GB of flash memory captures both still and video images for playback on LCD, TV, or a computer monitor; transfers video and images to your PC with an SD card or USB cable; and captures images with date/time stamp.

It has a 3.2-in. colour LCD monitor for real-time viewing, a TV-Out hookup for real-time or recorded viewing on external video devices, and four adjustable LED lights for operation in dark environments.

Davis Instruments, based in Vernon Hills, Ill., makes test, measurement, control, and calibration instruments.

www.Davis.com



Captures still and video images.

DUST COLLECTION

GET IN TOUCH WITH DUST COLLECTION

A touch screen controller from Camfil Air Pollution Control provides full monitoring and control of industrial dust collectors and associated equipment functions.

It's used with Farr Gold Series dust collectors, or other types if integrated with a motor starter or variable frequency drive (VFD) package.

A built-in differential pressure sensor monitors the primary filter pressure drop. Four analogue inputs monitor the secondary filter as well as other devices such as leak detectors, flow meters and compressed air pressure monitors. Six digital inputs are also included to monitor hopper level, smoke detection, remote cleaning and other functions.

Four relay outputs/signal faults from any of the digital or analogue inputs or from internal device faults.

The 4-20 mA output remotely monitors air flow or pass through any analogue input to a remote location. The controller also monitors fan power consumption and provides data logging of system performance with multi-language capability.

Camfil APC is a manufacturer of dust collectors with Canadian offices in Concord, Ont.

www.camfilapc.com



Used with Farr Gold units.

Measure vibration, no contact

SKF's MSL-7000 expands condition monitoring

The introduction of a non-contact method of measuring vibration by the SKF Laser Vibrometer MSL-7000 has significant implications for both condition monitoring and production quality testing.

Developed in cooperation with Polytec GmbH in Germany, this small, compact and easy-to-install unit extends the assortment of sensors used for condition monitoring.

The MSL-7000 connects with SKF noise-testing technology for advanced end-of-the-line testing installations for other types of equipment, such as electric motors, pumps and compressors.

The unit is a digitally integrated single-box vibrometer developed specifically for non-contact vibration measurements. The new sensor combines with the SKF Microlog. Measurements include:

- ranges of 20, 50 and 100 mm/sec;

- a velocity proportional signal on digital or analogue output connectors;
- acoustic from 0.2 Hz to 22 kHz;
- over large distances, up to 3 m;
- on hot surfaces;
- vibration on rotating parts;
- hazardous zones or difficult to reach areas; and
- through glass.

The Swedish bearing manufacturer also launched a sensor bearing with improved protection against power surges. It has an in-line electromagnetic compatibility filter to shield its sensitive electronics from high electric stresses.

And the SKF Wireless Machine Condition Sensor takes equipment condition monitoring. It combines a sensor, data collector and radio into one compact, battery-operated unit. The system collects overall and dynamic data and uses the



Master of multi-measurement.

WirelessHART protocol, forming a mesh network that provides access to locations traditional WiFi doesn't reach.

The unit operates at low power and has a multi-year battery life.

www.skf.com/ca/en

Moxa, a developer of industrial computing and networking products based in Brea, Calif., says the system is built around an ARMv7 Cortex-A8 processor and equipped with two RS-422/485 serial ports and dual auto-sensing 10/100 Mbps ethernet LAN ports. A Mini PCIe socket supports a cellular interface and other modules.



Use it in-field.

Programmable LEDs define unique event signalling for debugging or for building troubleshooting tools. A compact, space-saving form factor with a standard DIN rail mount makes installation easy.

The trusted platform module (TPM) protects against network attacks and a patented secure boot algorithm defends kernel corruption.

Native support for Modbus makes sensor installation convenient, and there's ample room for memory expansion with SD or mini SD cards.

www.moxa.com

CABLES

AIRSTREAM INSTALLS CABLE AT HIGH SPEED

General Machine Products Co. Inc.'s (GMP) AirStream cable blowing machine safely installs micro-fibre cable into pre-installed 5 to 18 mm OD micro ducts, placing 2.5 to 11 mm cables at speeds up to 80 m per minute.



Double belt drive.

A double belt drive concept and servo control technology securely grips with precise torque and speed control in indoor and outdoor environments.

Pushing force, up to 20 kg (44 lb.), is adjustable to suit cable stiffness.

An electronic monitoring system provides read-outs of speed and distance, and includes an emergency stop capability.

GMP is a supplier of specialty machine tools and equipment based in Trevoise, Pa.

www.gmptools.com

FINISHING TOOLS

FINISHING APPLICATIONS MADE EASY

Ransburg's RMA 500 rotary atomizers enhance reliability, reduce maintenance and provide high quality finishes for solvent or waterborne applications.



In-field reparability.

They're forgiving in unbalanced conditions thanks to a turbine design, and have a longer life as they're equipped with titanium bell cups. Colour changes are fast and they're fitted with a quick disconnect and true dual purge technology.

The atomizers come with direct or indirect charge technology for added flexibility under dynamic loads. A choice of diameters with multiple coatings and part configurations are available.

Time saving field repair ability allows turbines to be field stripped, cleaned and reassembled for a quick return to service.

A quick disconnect changes the atomizer in less than two minutes for off-line maintenance.

Ransburg is a manufacturer of electrostatic equipment based in Toledo, Ohio.

www.ransburg.com

ENCLOSURES

HOUSINGS PROVIDE FRONT AND REAR ACCESS

Rittal's IP55-rated operating housings are available in 10 sizes and fitted with handle strips based on the CP 60/120/180 support arm system that replaces the company's existing sheet steel housings.

Rear and front access makes servicing easy, and an aluminum front panel dismantles and locks easily with integral door runners.

Rittal Systems Ltd., the Canadian subsidiary of Rittal GmbH & Co. KG, is an enclosure manufacturer based in Mississauga, Ont.

www.rittal.ca



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TOOLS

MU TECH HANDLES MULTI-MILLING APPLICATIONS

Huron's MU TECH 6 entry-level 3-axis milling machine with a 600-mm table is equipped with an electrospindle as standard and operates in 3+2 axis mode.

It delivers high power at low speed for rough cutting of large parts at service class S1 (starting at 3,000 rpm) and at service class S6 for 40% of the time at 2,200 rpm, with finishing operations in 5-axis mode at high speed.

The high-speed electrospindle with a rotary head (B-axis) provides 23 kW of power with 75 Nm of torque and a maximum speed of 12,000 rpm. The +30 degree/-120 degree rotation allows general mechanical components to be machined vertically and horizontally. Continuous head rotation is achieved by a play-free system that also allows all possible 5-axis shaping applications.

Each axis is driven by large-diameter high-performance ball screws and all movements are controlled by encoders to ensure accuracy to within one one-hundredth of a millimetre along the three axes.

The maximum linear speed is 30 m/min. Like the other machines in the Huron range, the MU TECH's structural components are made of heavily ribbed cast iron to substantially dampen vibrations and

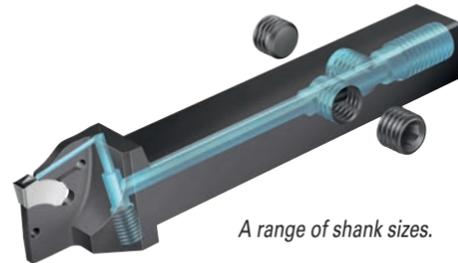


High power, low speed.

ensure a high level of machining stability.

MU TECH can be equipped with an optional rotary table integrated in the stationary table, other spindles, a 40- or 60-station tool changer, through-tool coolant and workpiece and tool touch probes.

Huron Graffenstaden SAS is a French manufacturer of machining centres with Canadian offices in St. Laurent, Que. www.huron.fr



A range of shank sizes.

CUT-SX GROOVING SYSTEM KNOWS NO LIMITS

Walter has added additional sizes to its Cut-SX single-edged grooving system that don't limit groove cutting depth to the length of the insert.

A positive locking insert shape with form fit underside and a sturdy top clamp improves process reliability. This is particularly important with parting, where there's a risk an insert is pulled from the holder by the action of the workpiece and the bar separating.

The toolholder has an internal coolant delivered directly to the cutting edge, both with and without high pressure.

Shank sizes are 1/2-, 5/8-, 3/4- and 1-in. with metric shank sizes of 12 and 16 mm for smaller diameters.

Walter is a manufacturer of precision cutting tools based in Waukesha, Wis. www.walter.com

TUBING

NON-WETTING TUBING RESISTS CHEMICALS

Parker's FEP tubing resists more chemicals than thermoplastic tubing in high temperature applications.

Chemically inert and translucent, it's



Sizes up to 4 in.

weldable and non-wetting, and won't crack, degrade or discolour in temperatures up to 204 degrees C.

It's resistant to highly corrosive chemicals such as aqua regia, hydrofluoric acid and hydrogen peroxide. Only molten alkali metals, such as sodium or potassium, chlorine trifluoride and gaseous fluorine will attack it chemically.

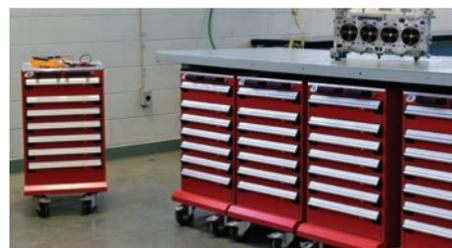
A low refractive index allows visual inspection for contaminants, flow interruptions and leak detection.

Tubing sizes range from .010 to 4 in. in diameter, and it's available in smooth-bore or an extra flexible convoluted or corrugated style.

Parflex is a manufacturer of thermoplastic hoses and tubes based in Ravenna, Ohio.

www.parker.com

STORAGE



Drawers have 100-lb. capacity.

L CABINETS ARE VERSATILE

Rousseau Metal's "L" line of cabinets work for a variety of applications.

Drawers have a 100-lb. capacity with 100% extension. The lock-in mechanism prevents them from accidentally opening and the central locking ensures maximum security.

Adding casters makes the cabinet mobile. Six-inch models have a 900-lb.

capacity per caster.

Rousseau Metal Inc. is a manufacturer of industrial cabinets based in St-Jean-Port-Joli, Que.

www.rousseau-metal.com

ROBOTICS



Robot is IP67-rated.

DELTA ROBOT SIMPLIFIES DESIGN

Yaskawa Motoman's MPP3H delta-style robot for packaging, cartoning and kitting has a parallel link arm configuration with a direct-driven rotary axis that simplifies design. Although it occupies a minimum installation area with zero footprint, it provides a large working envelope.

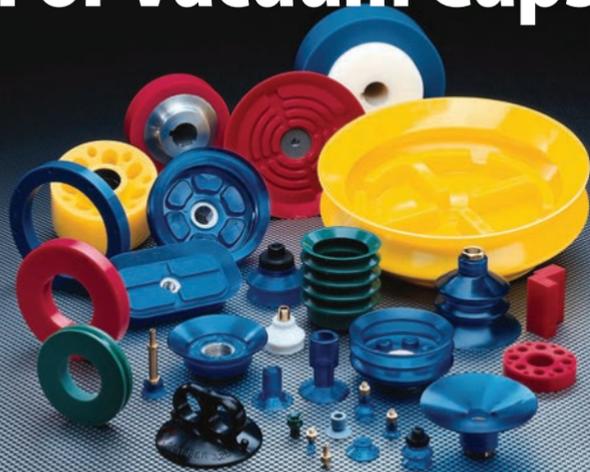
The MPP3H has several key features that promote easy integration. A large 80 mm through-hole at the base allows end-of-arm tool cables to be routed through the centre of the robot, permitting less complex cabling and reduced cable lengths. The through-hole also mounts the valve pack at the base of the robot, reducing the payload. In addition, maintenance is simplified due to a single entry point at the base for applying lubricant.

The robot is IP67-rated with NSF-H1 certified food grade lubricants and features a 3 kg payload capacity. The work envelope is up to 600 mm with repeatability of ±0.1 mm.

The Motoman Robotics Division of Yaskawa America Inc. based in Dayton, Ohio is a manufacturer of robotic technology.

www.motoman.com

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Thicker end discs.

MDX PULLEYS HANDLE TOUGH CONDITIONS

Baldor Electric Co. has added MDX conveyor pulleys with XT hubs and bushings to its Dodge conveyor component line.

XT drum and wing pulleys are constructed in Heavy Duty, Mine Duty and Mine Duty Extra configurations. They have thicker end discs, which means they power through the toughest operating conditions.

The complete conveyor pulley also includes: engineered class XT conveyor pulleys designed to meet or exceed specific operational criteria; elevator drum and single disc XT conveyor pulleys for grain handling applications; a variety of vulcanized rubber lagging options; and complete conveyor pulley assemblies with shafting and Dodge bearings.

Baldor, a member of the ABB group, is a manufacturer of industrial electric motors, drives and mechanical power transmission products based in Fort Smith, Ark.

www.baldor.com

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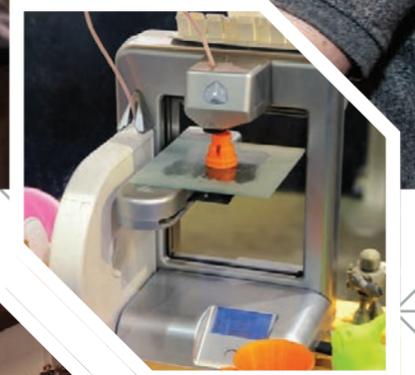


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POWER TRANSMISSION

COMPACT MOTORS SAVE SPACE

The ACOPOSmotor from B&R Automation combines a servo motor and drive in one compact module that provides developers with more freedom in machine design and saves space in control cabinets.

It's connected to the drive network using a hybrid cable, which includes all necessary power and signal lines and connects to the POWERLINK network.

Available in three sizes, the modules handle torques from 1.8 to 12 Nm. An optional fan assembly boosts performance up to 100%.

They're fully compatible with the ACOPOS multi drive system, allowing users to select the best-suited servo drive for each machine without any additional engineering work.

B&R is a manufacturer of industrial automation equipment based in Atlanta.

www.br-automation.com



Three sizes of modules.

WORKHOLDING



Repeat accuracy of <math><0.005\text{ mm}</math>.

CHUCKS CHANGE-OVER QUICKLY

Schunk's MAGNOS magnetic chucks enhance efficiency when combined with the company's VERO-S quick-change pallet system for high flexibility in production.

They're available in 480 V and standard 16 x 16 in. and 16 x 24 in. sizes with more than 200 lb. of clamping force per square inch, and they're quickly exchangeable

at a repeat accuracy of <math><0.005\text{ mm}</math>. A separate unit provides control.

Schunk is German developer of clamping and gripping systems with Canadian sales operations in Mississauga, Ont.

www.schunk.com

SENSORS

SENSORS MEASURE LIQUID LEVELS ACCURATELY

AutomationDirect's ProSense line has added SLT submersible level transmitters for lift station monitoring, construction by-pass pumping, tank liquid level, wastewater, and slurry tank liquid level control applications.

Two styles provide liquid level measurement by continually sensing hydrostatic pressure produced by the height of liquid above the sensor with a 4-20 mA output signal that's compatible with PLCs, panel meters and data loggers.



4-20 mA output signal.

A slim 1-in. diameter housing and a ported bullet nose cap protect the diaphragm. A large 2.75-in. diameter PTFE flexible diaphragm surrounded by a 316 stainless steel non-fouling protective cage boosts reliability.

They're fitted with a shielded cable containing an atmospheric vent tube and a tough polyurethane jacket with an exclusive "water block" liner beneath the jacket. The cable is attached to the sensor using an over-moulding process that prevents moisture intrusion.

Automation Direct is a supplier of industrial automation equipment based in Cumming, Ga.

www.automationdirect.com

VACUUM

VACUUM REDUCES DUST EXPOSURE

VAC-U-MAX's continuous-duty industrial vacuums are equipped with a bagging system that eliminates dumping the drum.



50 square-foot PTFE-coated primary filter.

They're rated for unclassified and Class II, Div 2 rated environments.

A filter cleaning system that doesn't need compressed air and solenoid controls allows the filters to collect the finest powders anywhere in the plant. Closed bags prevent dust clouds and avoid a potential cause of back injuries.

The vacuums are also equipped with a 50 square-foot, PTFE-coated primary filter, and a standard HEPA secondary filter.

VAC-U-MAX is a manufacturer of vacuum technologies based in Belleville, N.J.

www.vac-u-max.com



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MORE OPTIONS FOR PANELVIEW PLUS 7

Rockwell Automation's Allen Bradley PanelView Plus 7 Standard graphic terminal provides machine builders with new options in the size, functionality and connectivity of graphic terminals. They come in five screen sizes from 4 to 10 in. and widescreen formats are available for the 4- and 9-in. screen options.



Monitor data from anywhere.

Monitor data from anywhere on the plant floor using a tablet, smartphone or other mobile device. Virtual network computing connectivity also supports secure monitoring. To configure multiple machines, machine builders save projects, operating system, network configuration, data logs, recipes and other files to the SD card to quickly restore operations in the event a terminal needs to be replaced. There is also access to saved diagnostics. Terminals connect to one controller and up to 25 screens as well as 200 alarms.

The Milwaukee, Wis.-based industrial automation company says its software library of code now includes faceplates and add-on instructions for the PanelView Plus 7 Standard terminal that reduces complex screen-development time by as much as 90%.

www.rockwellautomation.com

CLOUDLINK MONITORS VISION LIVE

The CloudLink web HMI machine vision visualization tool from Mirroscan monitors live machine vision inspections performed by AutoVISION software and smart cameras in an interface that's accessible via web browser on any web-enabled device.

It displays values from the inspection job that have been linked to a shared data service over industrial protocols by AutoVISION's one-click connectivity tool, Microscan Link. These values include images taken by the machine vision camera and the results of tools applied to the image by the software, such as Measure, Count, Decode, Verify and others. As values are received, they're displayed in CloudLink in image, text, or graphical format.

The customizable dashboard provides default widgets for the easiest way to create a tailored window of inspection results within a single view in a browser. Added widgets display values in different formats, from images to data to charts and graphs. Historical data and images are logged by Filmstrip, Chart, and Log widgets.

Alternatively, CloudLink API allows the CloudLink technology to be added to any custom software for visualizing inspection results on the user's preferred platform.

Microscan, based in Renton, Wa., provides technology for precision data acquisition and control solutions.

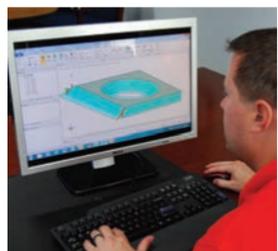
www.microscan.com

FLOWXPRT GETS AN UPDATE

Flow International Corp. has upgraded its FlowXpert software suite, which allows waterjet users to work more effectively in 3D with less complexity.

The FlowXpert 2015 3D CAD/CAM software platform expands on the 2D FlowMaster intelligent software suite.

New capabilities include integration of CAD Design powered by Spaceclaim with CAM Flow Sequencer modules; waterjet-specific geometry analysis so the part is ready faster; 3D CAM offset capabilities; custom lead in/out or choose from an expanded lead in/out catalogue; fast, versatile sheet metal processing from Spaceclaim; advanced clean up tools customized to your waterjet; greater automation from smart pathing; and saving 3D models as 2D programmed parts.



Includes CAD design.

Flow International, based in Kent, Wash., makes ultra high-pressure waterjet technology and robotics equipment.

www.flowwaterjet.com

FLIR TG165 IMAGING IR THERMOMETER

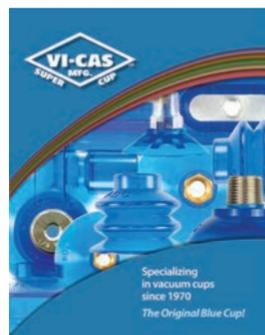


FLIR TG165

The FLIR TG165 Imaging IR Thermometer bridges the gap between single spot infrared thermometers and FLIR's legendary thermal cameras. Equipped with FLIR's exclusive Lepton micro thermal sensor, the TG165 lets you see the heat so you know where to reliably measure it. Easily find unseen hot and cold spots for instant troubleshooting. Store images and data to show customers and include in reports. www.flir.com/tg165

FLIR

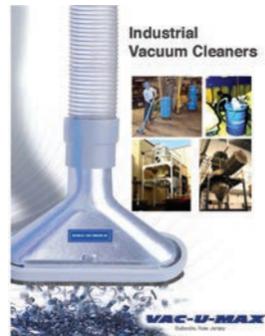
MOST POPULAR VACUUM CUPE



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

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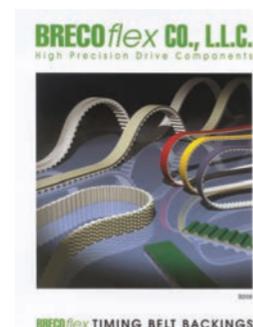
www.vac-u-max.com

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HIGH PRECISION TIMING BELTS WITH BACK COVERS



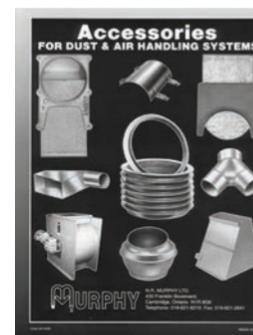
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www.nrmurphy.com

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Another year of modest growth

BY JOCK FINLAYSON

The early weeks of 2015 were a reminder that we live in a turbulent and risk-prone world. From plummeting oil prices to terrorist attacks in France, jittery stock markets, slowing growth in China, and renewed political uncertainty in Greece, there has been much to capture the attention of those inclined to fret about the future. But the underlying economic picture is more favourable than a glance at the newspaper headlines may suggest.

“The steadily improving US economy is the most important external factor affecting Canada’s prospects in 2015...”

Begin with developments in energy markets. The stunning 60% drop in oil prices since last June is reshaping the international economic and geopolitical landscape. Among other things, it heralds economic and fiscal pain for jurisdictions – like Canada – that are significant net exporters of hydrocarbons. But for most people, what transpires in energy markets mainly affects us as consumers.

And here the news is positive. In aggregate, the global economy should get a lift from cheaper oil, with all of Canada’s major trading partners – the US, China, Japan and Europe – positioned to gain. If current oil prices are sustained over the year, Canadian households can look forward to a \$10 billion to \$12 billion boost in spending power.

The benefits for consumers will

partially offset the damage that sagging oil markets are sure to do to business investment – energy recently has accounted for more than one third of non-residential capital spending – and to Canada’s balance of trade.

The steadily improving US economy is the most important external factor affecting Canada’s prospects. From 2010 to 2013, America’s economy grew at an average annual rate of 2.2%, barely half the pace recorded in previous post-Second World War recovery cycles. But the economic engine finally kicked into gear in 2014. Real gross domestic product (GDP) advanced by more than 4% over the second half of the year, accompanied by a visible pick up in job creation.

Indeed, the US has added more than 200,000 net new jobs in each of the past 11 months, making 2014 the best year for job creation since 1999. Forecasters anticipate US real GDP will expand about 3% in 2015, with continued solid job growth and rising housing starts.

Back to health

True, the country still has some distance to travel to get back to a healthy overall economy. Labour force participation remains substantially lower than it was in 2007. And median household income, which fell sharply over 2008-11, has still not returned to its 1996 level (measured on an after-inflation basis).

Hopefully, stronger economic growth will lead to tighter labour markets and higher wages for more American households over the course of 2015-16. In this environment, more Canadian industries should reap dividends as our largest export market continues to revive.

Trends in interest rates and borrowing costs will also bear close scrutiny. Mortgage and prime lending rates remain near all-time lows. The US Federal Reserve has ended quantitative easing and is expected to start nudging its short-term policy interest rate higher in the second half of the year. Rising US rates may be felt in Canadian financial markets, even though the Bank of Canada is likely to lag the US central bank in hiking its own policy rate.

But it’s important to keep a sense of perspective. Adjusted for inflation, interest rates in Canada will stay very low over 2015-16, and any increases in borrowing costs are likely to be gradual and measured.

Add it all up, and Canada looks set for another year of modest growth, with real GDP expected to increase by 2% to 2.5% on the back of a rebounding US and a more competitive exchange rate.

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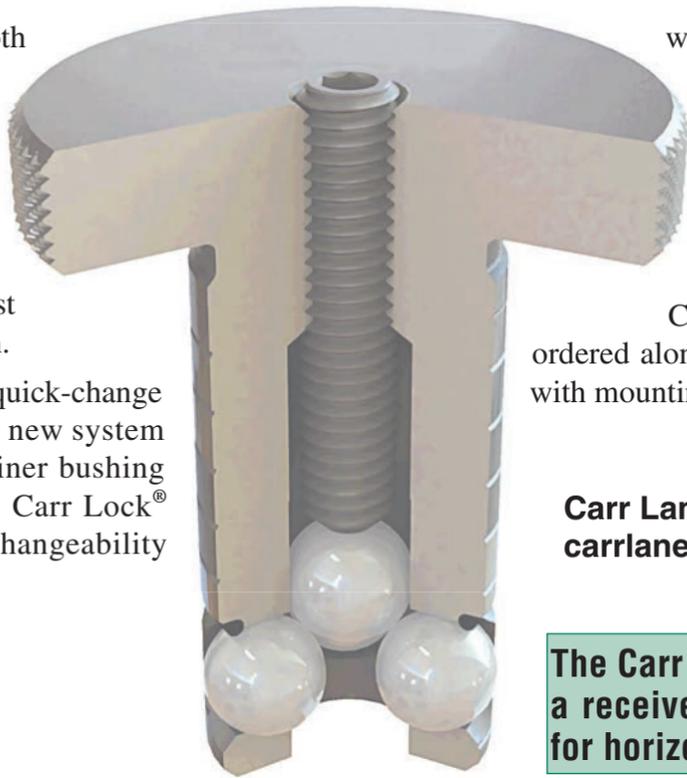
Jock Finlayson is executive vice-president of the Business Council of British Columbia. This column is distributed by Troy Media in Calgary. Visit www.troymedia.com.

Comments? E-mail jterrett@plant.ca.

Carr Lock® System Provides Fast Fixturing

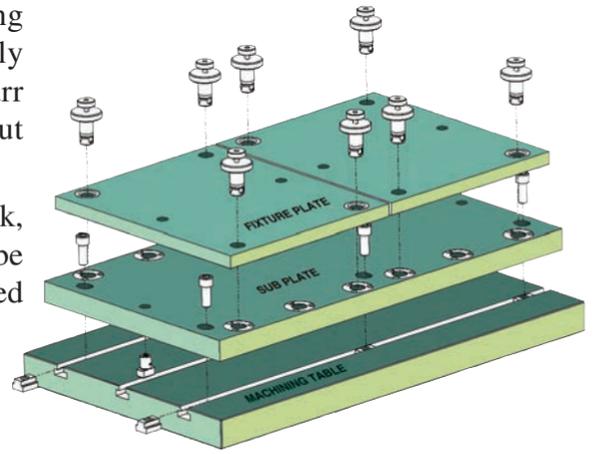
Now available for both horizontal and vertical machining centers, Carr Lock® System from Carr Lane Mfg. Co. allows accurate locating and clamping at the same time, with just the twist of a hex wrench.

For mounting quick-change tooling on a subplate, the new system consists of a clamp, a liner bushing and a receiver bushing. Carr Lock® offers complete interchangeability



with all components of the mounting system previously offered by Carr Lane Mfg. Co., but at a lower price.

Available from stock, Carr Lock® can be ordered alone or in kits combined with mounting plates.



Carr Lane Mfg. Co.
carrlane.com/carrlock

The Carr Lock® system consists of a clamp, a liner bushing and a receiver bushing, and is available from Carr Lane Mfg. Co. for horizontal or vertical machining centers.



CL5® QUICK CHANGE FIXTURING

CL5® consists of three components: a subplate, a riser, and top tooling made up of a vise or a fixture plate. This allows flexible and easy clamping, and 5-side part access.

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



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



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

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