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PLANT

ADVANCING CANADIAN MANUFACTURING

Volume 74, No. 08 November/December 2015

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AMM advances
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Time to shift from survival to excelling

Manufacturers have endured plenty of pain as a result of the recession in 2008-09, not that the period before wasn't challenging. Many are small and assailed by competitive pressures from all directions. Economic conditions haven't been inspiring so little wonder they advance cautiously.

PLANT's 2016 Manufacturers' Outlook survey (download the report at www.plant.ca) shows 57% of senior executives and owners continue to proceed cautiously, as they have done since the surveys began in 2009. There are many positive indicators in the results. Canadian companies have proved themselves resilient despite many challenges, and collectively they have created a national brand that is respected around the world. But they lack boldness.

Canadian companies are criticized for lagging productivity (compared to peers in the US), slowness to invest in new technology, being unenthusiastic in their innovation efforts and they stick too close to home. Looking across the Outlook timeline, manufacturers have made slow progress in all of these areas.

The conclusion of free trade deals with Europe, South Korea and now the countries involved in the Trans-Pacific Partnership will open doors to opportunities beyond North America. Forty-five per cent of respondents see value in these agreements, but of those seeking new markets, 36% of companies intend to look within Canada, 37% in the US, 13% in Mexico. About 17% plan to venture to Central and South American countries, and 10% to Brazil. Currently 2% are doing business in China but as in past surveys, 10% plan to enter that market. These "plans" are consistent with other surveys, but the results demonstrate they have been short on follow-through.

Productivity is described as important to business growth, yet only 38% companies approach it with a formal strategy, almost half still collect and analyze data manually (22% don't measure it at all) and a third declare they are not likely to connect the shop floor to top floor management systems.

The Conference Board of Canada views the nation's innovation story as being more about inaction and poor commercialization. The research firm's annual innovation report card did move Canada up to a C from a D. The improvement is mostly a result of surging entrepreneurial vigour, but investment in R&D is slipping.

Outlook results also tell the tale. Most companies (40%) devote less than 1% of their staff to R&D, 28% intend to invest just 1% to 3% in innovation (although 53% say they will increase investment over the next five years). Forty per cent took advantage of the SR&ED tax credit in the past but far fewer did so this year (30%) and 46% have not taken advantage of the tax credit nor do they intend to do so.

The Conference Board notes Canada is pursuing more patents and trademarks, but so are its competitors, and the survey results don't offer much encouragement: 61% of the companies are not actively pursuing these indicators of innovative boldness.

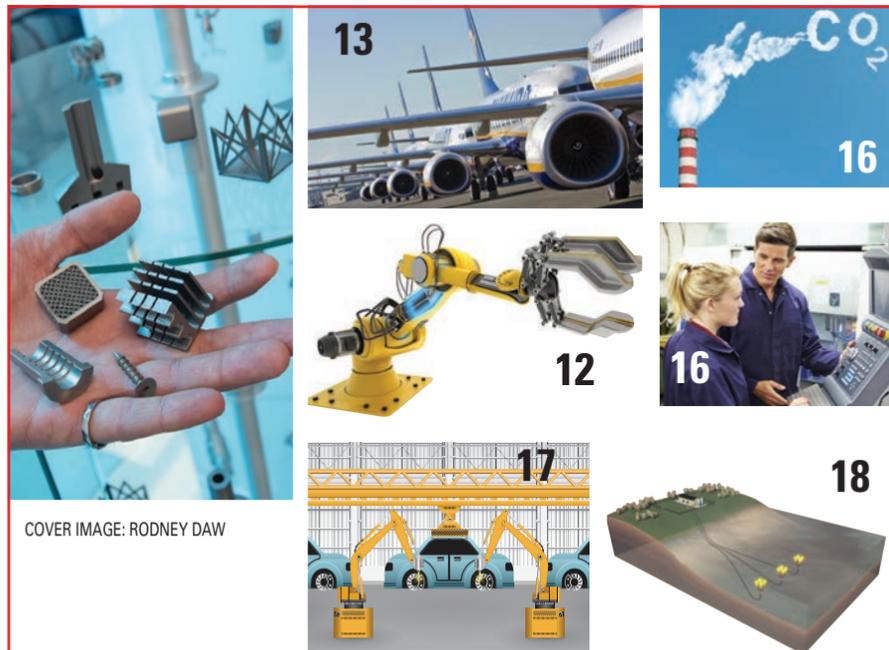
The world is changing for manufacturers. Competitive challenges are plenty but so are the opportunities for companies that choose to venture into new markets, especially the developing economies where there will be significant growth.

The Lawrence Centre at Western University's Ivey Business School has studied success factors and they can be summed up in three points: growing manufacturing is up to the companies with governments playing a supporting role; focus on producing high-value-added goods and related services that take advantage of Canada's excellent technology, skills and reputation for quality; and leverage the highly skilled workforce.

Manufacturers have done a good job of surviving. Now is the time for bolder moves and more aggressive growth (where feasible) beyond the comfort of North America.

Joe Terrett, Editor

Comments? E-mail jterrett@plant.ca.



COVER IMAGE: RODNEY DAW

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» Bulletins

TransCanada Corp., the Calgary-based developer of energy infrastructure, is selling a 49.9% interest in **Portland Natural Gas Limited Partnership** (PNGTS) to its master limited partnership, **TC PipeLines LP**, for US\$223 million. PNGTS is a 474 kilometre natural gas pipeline that connects with the TransQuébec and Maritimes Pipeline at the Canadian border (near East Hereford, Que.), for delivery to the US northeast.

Roxul Inc., a manufacturer of insulation in Milton, Ont., is helping out building industry customers with its Energy Design Centre (EDC) at ROXUL.com. It will provide information, tools, training and advisory services aimed at tapping energy savings. Roxul says the centre is supported by a panel of international building science and energy efficiency experts from top tier industry and educational institutions.

Essar Steel Algoma Inc. in Sault Ste. Marie, Ont., Canada's second largest steel producer, has been granted creditor protection in Canada, with a corresponding filing in the US. It cites plummeting steel markets and supply issues. It also secured US\$200 million in financing from a syndicate of lenders led by **Deutsche Bank AG** to fund operations.

MacDonald, Dettwiler and Associates Ltd., a global communications and information company based in Richmond, BC, has signed a contract for up to \$9.7 million with **Boeing** for a communication antenna subsystem. It will be installed on the Boeing 702MP satellite platform.

Resolute Forest Products Inc., a Montreal-based producer of newsprint, specialty papers, market pulp and wood products, has acquired **Atlas Paper Holdings Inc.** in Miami, Fla., a manufacturer of tissue products. The company employs 360 people and operates three tissue machines, with annual production of 65,000 short tons.

Nanotech Security Corp., a Vancouver-based producer of advanced security products, and **Hueck Folien GmbH** of Baumgartenberg, Austria, which develops advanced security features for banknotes and documents, are looking at collaborating to produce a colour shifting security feature in optical thin film. Initially, the product would be used in banknotes, then expand into other markets.

Honda Canada goes global with 2016 Civic

New models will roll off the Alliston, Ont. line every 63 seconds

ALLISTON, Ont. — Honda of Canada Mfg. (HCM) has launched production of the 2016 Honda Civic sedan at its Alliston, Ont. manufacturing facilities. It's part of an \$875 million investment over three years to install new technologies and processes in Honda's three Canadian production plants.

The Alliston plant is the first in the world to produce the all-new model, but it's also responsible for developing the processes and tooling for all Honda plants globally.

More than 4.5 million Civics have been built in Alliston since 1988. Canada's sales now exceed 1.89 million units.

Honda was the first Japanese automaker to make cars in Can-



Alliston will serve at Honda's global lead plant for the Civic.

PHOTO: HONDA

ada starting in 1986. Since then, the factories have produced the Accord, Odyssey, Pilot and Ridgeline Honda models, as well as Acura EL, CSX, MDX and ZDX vehicles.

HCM employs more than

4,000 people. It has the capacity to produce 400,000 Civics and CR-Vs annually for the North America and export markets. The company also produces 260,000 four-cylinder engines yearly.

ABB inaugurates \$70M Montreal tech centre

The 300,000 square-foot facility will house R&D, assembly and testing

MONTREAL — Swiss-based energy and automation giant, ABB Group is establishing a \$70 million, 300,000 square-foot facility in Technoparc Montréal, adding another major player to one of Canada's most prestigious tech hubs.

The company said the investment, to span 10 years, will consolidate ABB's Quebec energy value chain under one roof and house a corporate headquarters, research and development, manufacturing, assembly and testing facilities. The 700 employees spread across Montreal will move into the new facility in 2017.

"The investment will allow us to continue improving our operational effectiveness and contribute to the development of cutting-edge technology in collaboration with our business



The campus will include spaces for tech demonstrations and client training.

PHOTO: ABB

partners, and with the academic and research sectors with whom we have long collaborated," said Nathalie Pilon, president and CEO of ABB Canada.

The new campus, equipped with ultra-modern equipment,

advanced technologies and manufacturing processes, will have spaces for demonstrations and for training clients on systems developed by ABB.

Construction is to be completed by February 2017.

PLANT Off-Site

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 a description, 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.



Eric Matthews, a purchasing agent with Fruitland Manufacturing, a manufacturer of custom-designed production machinery in Stoney Creek, Ont., pauses with **PLANT** while visiting the Skylon Tower, overlooking Niagara Falls.

Ballard, King Long to collaborate on fuel cell buses

VANCOUVER — Ballard Power Systems has signed a strategic collaboration agreement with Xiamen King Long United Automotive Industry Co. to deploy a fleet of fuel cell-powered buses.

The companies will collaborate on a prototype, with Ballard supplying its proprietary fuel cell engine and a suite of other technology solutions.

King Long, a manufacturer of buses, coaches and minivans based in Xiamen China, has three manufacturing bases in China. They produce 25,000 buses and 30,000 minivans annually.

Ballard, based in Vancouver, is a developer of clean energy products, including fuel cell engines for transportation.

Bruce Power electrifies EV charging stations

TORONTO — Bruce Power is partnering with Plug'n Drive, the University of Waterloo, local communities and the Asthma Society of Canada to promote clean, electrified transportation in Ontario.

Key initiatives include a free iPhone App in partnership with Plug'n Drive, built from Bruce Power's existing platform with social interactive features for people who want to switch to electric vehicles.

These include maps of charging stations, grant information and vehicles available, along with a unique calculator that determines the economic and environmental benefits of going electric.

Bruce Power and Plug'n Drive will install charging stations around Bruce Power sites. Two dual wand stations have been installed at Bruce Power's Visitors' Centre, while additional stations have been installed in Port Elgin, Southampton and Wroxeter. Stations are also planned for Kincardine, Sauble Beach and Owen Sound.

The partners will also undertake a joint study to examine the economic and environmental opportunities with electric transportation.

Transportation accounts for 34% of Ontario's emissions, the largest contributor. The Ontario government has set a goal to reduce emissions from 1990 levels 15% by 2020 and 80% by 2050.

Canada Goose opens second Winnipeg plant

New factory will create over 350 new jobs by 2017

TORONTO — Canada Goose, a manufacturer of Arctic luxury apparel, has opened its second manufacturing operation in Winnipeg, creating more than 350 jobs (by 2017).

The company said the 103,000 square-foot facility will help meet growing global demand for its Made-in-Canada outerwear.

The plant, built in 1982, has been repurposed with state-of-the-art manufacturing technology to produce Canada Goose parkas as well as new lightweight down styles, which will be sold in more than 50 countries.

Canada Goose sees its new factory as part of an effort to rebuild the apparel



Canada Goose president and CEO Dani Reiss (R) and Kevin Chief, Manitoba's minister of jobs and the economy, open Canada Goose's second manufacturing facility in Winnipeg.

PHOTO: LISA WALDNER

manufacturing infrastructure in Canada, which Industry Canada says lost 12,000 jobs between 2010 and 2014.

This is the second facility the

company has opened this year and follows a recent expansion of both factory and office space at its global headquarters in Toronto.

Airbus, Coulson partner on water bomber

Prototype firefighting aircraft has been flying since 2013

OTTAWA — Airbus Defence and Space and the Coulson Group of Canada have signed an MOU covering manufacturing, supply and support of the new water bomber version of the Airbus C295W transport aircraft.

Coulson Group, based in Alberbi, BC, will manufacture a version of its Retardant Dropping System (RDS) through its operating company Coulson Aircrane Ltd. The RDS system is also used by a number of global firefighting outfits.

The C295W's system will consist of two roll-on-roll-off internal tanks, which are easily removed after the fire season. The bomber will then be available as a conventional ramp-equipped, multi-role transport able to carry cargo, troops, paratroops or stretchers.

The RDS has two internal tanks that transport 3,500 litres of water or retardant and are refilled in under seven minutes.

During a drop, the flow-rate is adjusted via the cockpit control panel according to the desired coverage, aircraft speed and height over terrain. A prototype C295W water bomber has



Two internal tanks carry 3,500 litres of water or fire retardant.

PHOTO: BOEING

been flying since 2013.

Airbus Defence and Space, a division of Airbus Group, employs more than 38,000 employees. It was formed by combining the business activities of Cassidian, Astrium and Airbus Military.

Magellan buys Lawrence Ripak companies for \$23.7M

TORONTO — Magellan Aerospace Corp. is building out its US processing capabilities with a US\$23.7 million acquisition of Lawrence Ripak Co. Inc. and Ripak Aerospace Processing LLC through a wholly-owned subsidiary.

"The acquisition of Ripak establishes a North American capability in processing that adds capacity and is complementary to Magellan's existing processing facilities in the UK, Poland and India," said Phillip Underwood, Magellan's president and CEO.

Ripak was founded in 1952 and provides a range of non-destructive test services, anodizing, plating, painting shot peening, as well as other aerospace parts processing services. It operates a 97,500 square-foot facility and employs approximately 150 people.

Magellan said it intends to continue operating the company under the Ripak trade name as an independent division.

West Fraser expands in Alberta

VANCOUVER — West Fraser is acquiring Manning Diversified Forest Products Ltd. in Manning, Alta. and related timber harvesting rights.

No financial details were released.

The sawmill has operated at the site since 1993 and has been producing approximately 100 million board feet of lumber annually.

West Fraser, a forest products manufacturer based in Richmond, BC, plans to adjust current operations and expand annual production capacity to approximately 130 million board feet.

The timber rights allow the harvest of approximately 440,000 cubic metres of coniferous trees.

Christie on a recruitment drive

KITCHENER, Ont. — Christie Digital has started a recruitment drive for skilled technologists, engineers and technicians to meet growing global demand for its visual and audio technologies.

All positions, which require a college diploma, are located at the company's Canadian headquarters for engineering and advanced manufacturing in Kitchener, Ont.

Technologists will be responsible for complex assembly and testing of projection systems in the operations manufacturing department, and distribution roles include a range of logistical responsibilities within the operations team. The company is also hiring mechanical engineers to support laser design and production.

Christie is a manufacturer of laser projectors for 3D visuals. The company is a wholly-owned subsidiary of Ushio Inc. Japan.

Thordon lands container ship deal

Will make lubricated bearings for Matson Navigation

BURLINGTON, Ont. — Thordon Bearings has signed what it describes as "a landmark contract" to supply COMPAC bearings to two containerships under construction at the Aker Philadelphia Shipyard for Matson Navigation Co. Inc.

Thordon Bearings, a manufacturer of seawater lubricated propeller shaft bearing systems based in Burlington, Ont., said the order is significant.

"It represents the first large containership reference and the largest commercial ship propeller shafts to be fitted with COMPAC seawater-lubricated bearings," the company said in a release.

The 3600TEU 'Aloha Class' Jones Act vessels will each use a bearing system for a 930 millimetre diameter shaft driving an 8.1 metre diameter fixed pitch propeller.

Craig Carter, Thordon Bearings' head of marketing and customer services, said the bearings reduce the impact the ships have on marine environments by eliminating potential non-compliance with stern tube oil rules.

The US Environmental Protection Agency ruled in December 2013 that vessels over 24 metres (79 feet) must adopt environmentally acceptable lubricants in all oil-to-sea interfaces and recommended seawater lubricated bearings be used in propeller shaft lines.

Matson is a shipping company based in Honolulu, Hawaii.

» Careers



David Winestein



Sara Elford

CSA Group, the global standards development organization and provider of testing and certification services based in Toronto, has appointed **David Winestein** as the organization's new president and CEO. He was CEO of ABS Group, a membership-based technical services firm in Houston.

Neil Cawse, CEO of Geotab Inc., a supplier of fleet management, driver safety and vehicle-tracking technology based in Oakville, Ont., is the Ontario EY Entrepreneur of the Year winner. He founded the company in 2000 to improve the way enterprises operate and to make the world safer by focusing on innovative technology.

Richard Aubertin has succeeded **Michael Hardman** as general manager of Sika Canada Inc. Hardman has moved on to the position of senior vice-president of mergers and acquisitions for Sika North America. Aubertin, who joined the company in 1999 and handled a variety of positions, has returned to Canada after a three-year stint in Europe. Sika is a subsidiary of Sika AG, a global specialty chemicals company based in Baar, Switzerland.

Pure Technologies Ltd., an international pipeline inspection company based in Mississauga, Ont., has added **Sara Elford** to its board. Elford retired from Canaccord Genuity after nearly 20 years as a sell-side analyst where her research focused on sustainability and special situations.

Seco Tools LLC has made some changes within its Canadian sales organization. **Branko Hohne**c has been appointed general manager for Seco in Canada, based in Milton, Ont. He joined Seco in 2005 and has worked as managing director of the operations in Slovenia. **Vince Tersigni** is the new sales manager for Canada. He has nine years of experience in the cutting tool industry.

New Flyer to supply with 725 Xcelsiors

Boston deal for diesel-electric buses is valued at \$254 million

WINNIPEG — New Flyer of America Inc. has been awarded a contract by the Massachusetts Bay Transport Authority (MBTA) for up to 725 40-foot Xcelsior heavy-duty transit buses.

The contract includes a firm order for 175 compressed natural gas buses (XN40) and 150 diesel-electric hybrid buses (XDE40), plus options for an additional 200 clean diesel buses (XD40) and 200 diesel-electric hybrid buses (XDE40) over the next



New Flyer's Xcelsior bus.

PHOTO: NEW FLYER

five years.

The bus manufacturer's portion of the contract is valued at approximately \$223 million

with options valued at \$254 million. MBTA currently operates a fleet of 1008 heavy-duty transit buses, 70% of them built by New Flyer.

The company, with more than 3,000 employees at facilities in Winnipeg and Minnesota, has also acquired Motor Coach Industries in a deal worth \$455 million.

Founded in 1933 in Winnipeg, MCI has three manufacturing facilities and nine service and parts distribution centres.

Ontario exports to rise 11% this year

EDC cites growing US demand driven by automotive and manufacturing

LONDON, Ont. — A favourable exchange rate and rising demand caused by a strong recovery in the US economy will drive broad-based gains across all sectors of Ontario's exports both this year and next, according to Export Development Canada (EDC).

The *Global Export Forecast*

Fall 2015 projects exports to grow this year by 11%, led by the automotive and manufacturing sectors, both of which will see double-digit increases. EDC predicts a further 6% increase in 2016.

"The weaker Canadian dollar and much lower oil prices have, not surprisingly, shifted the

centre of growth in Canadian exports to the manufacturing heartland, and Ontario is benefiting greatly from this," said Peter Hall, EDC's chief economist.

Motor vehicles and parts make up more than a third of the province's exports. EDC says they will rise 13% in 2015 and a further 4% in 2016, largely due to strong vehicle sales in the US.

The industrial machinery and equipment sector will grow 16% as a result of increased demand from US customers and a lower Canadian dollar.

Metals, ores and other industrial products, which account for 21.5% of exports, will see shipment values increase by 7% in 2015 and 2016. Steel export growth has been subdued because of lacklustre production volumes and increased competition from Chinese steel.

Honeywell buys Com Dev for \$455M

TORONTO — American aerospace and manufacturing giant Honeywell has purchased space hardware maker Com Dev International in a \$455 million deal that will see the Canadian company spin off its ExactEarth subsidiary.

Com Dev, which is based Cambridge, Ont., manufactures and sells devices such as transponders used in satellites and satellite ground stations.

ExactEarth is a joint venture with Hisdesat Servicios Estrategicos S.A. and provides satellite data services. The company and its subsidiary employ 1,250 people at facilities in Canada, China, India, the UK and the US.

Honeywell will fold Com Dev into its existing satellite and space hardware business.

Avcorp gets camera fairing contract

VANCOUVER — Boeing Co. has awarded Avcorp Industries Inc. production and supply of 767-2C panoramic camera fairings as part of its KC-46 tanker program.

The aircraft component manufacturer with a plant in Delta, BC says each shipset of panoramic camera fairings consist of large and complex composites and metallic components that are made into a fully integrated assembly.

This assembly attaches directly to the 767-2C fuselage and will be delivered to Boeing's assembly line in Everett, Wash.

No financial details were released.

Avcorp., which employs almost 390 skilled workers, operates 340,000 square feet of facilities at its Delta location, which is dedicated to light-weight metal manufacturing and assembly. Its Comtek location in Burlington, Ont. makes composites and does repairs.

P&WC launches 'most powerful' engine

LAS VEGAS — Pratt & Whitney Canada has introduced what it says is the most powerful and fuel efficient engine on the general aviation market.

The company's PT6A-140A turboprop and the PT6A-140AG variant deliver 15% more power with 5% less fuel consumption.

The engine has no mandatory requirements for warm-up or cool-down, which allows operators to maximize productivity and efficiency, the company said.

The Longueuil, Que. aero-



Delivers 15% more power with 5% fewer fuel consumption. PHOTO: P&WC

space manufacturer notes the two engines are optimized for "hot and high" environments, packing 867 mechanical shaft horsepower and 1,075 thermal mechanical shaft horsepower.

Ontario's China trade mission nets \$2.5B in agreements

TORONTO — Ontario businesses secured contracts or memorandums of understanding worth \$2.5 billion that will generate 1,700 jobs across the province following a trade mission to China led by Premier Kathleen Wynne.

Wing On New Group Canada Inc., a Markham, Ont.-based food and consumer products company, signed three export agreements totalling \$230 million.

The Ontario cleantech industry also did well. Fuel cell maker Hydrogenics in Mississauga signed four certified integrator agreements for zero-emission public transport buses. Potential value of the deal is \$100 million over three to five years.

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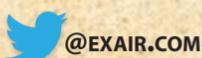
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Unifor proposes changes to the Employment Standards and Labour Relations acts. PHOTO: THINKSTOCK

Union wants big changes to workplace laws

Unifor submits 43 recommendations to Ontario review

Unifor is proposing sweeping changes to Ontario employment standards and labour laws that include giving more workers a chance to form a union.

The union representing more than 310,000 workers nationally released its 156-page submission to the Ontario government's Changing Workplace Review during opening day (Oct. 27) of the annual Ontario Economic Summit in Niagara on the Lake.

Unifor makes a total of 43 specific recommendations that include several proposed changes to the Employment Standards Act.

Among the changes are rules that provide workers with more stability in scheduling and more opportunity for full-time work; making employers jointly responsible for the actions of temp agencies; providing access to prorated employment benefits (such as health and insurance protection) for part-time workers; and providing a more pro-active and independent approach to the enforcement of employment standards (including greater scope for independent third-party investigations of ESA violations).

Proposed changes to the Labour Relations Act include proposals for the use of electronic union voting, holding certi-

fication votes in neutral locations, and expanded arbitration systems to help establish first contracts in newly-unionized workplaces.

Unifor is proposing the maintenance of union security and provisions when contracted services are flipped; and it wants workers in non-union workplaces to be given legal protection to engage in collective action to pursue economic objectives (mirroring similar protections that exist in US law).

The union also wants to establish sector-wide employment standards and contract provisions covering both unionized and non-union workers. The aim is what Unifor describes as "better employment practices" in sectors facing "especially unfavourable or insecure conditions" (such as fast food workers or freelance workers).

The Ontario Chamber of Commerce has also made a submission to the Changing Workplace Review, expressing concern many of the recommendations that have been made would result in significant changes to the Employment Standards and the Labour Relations acts, which would increase the cost of doing business in Ontario.

Download Unifor's submission at www.unifor.org/WorkplaceChanges.

BC study IDs labour shortage

VANCOUVER — A forecast for BC's labour market shows tight conditions for key occupations over the next five to 10 years.

The Asia Pacific Gateway Labour Market Information study looked at 56 occupations in the construction, rail, trucking, marine, managers, logistics and air sectors, plus occupations that support these sectors, plus the province's ability to meet labour demands.

While the forecast focused on five and 10-year horizons (2015-2024), it found tight labour conditions will take hold even sooner across all sectors in the first three years, and remain for most of the next decade.

The number of new workers is not keeping pace with job openings. There will be more than 46,000 new jobs available by 2024 and retiring baby boomers will create almost 160,000 openings over the next 10 years.

People new to the workforce will likely make up about 40% of the new supply of workers, and an additional 25% will be made up of workers new to the country.

The study also identifies regional impacts. For example, Northern BC faces a tighter labour market than the Lower Mainland. And individual reports will be available to employers planning ahead to fill labour requirements for each of the 56 occupations, and seven sectors in Northern BC, the Lower Mainland and the rest of BC.

Canada's Sectoral Initiatives Program funded the project.

Download more information from the Asia Pacific Gateway web page at www.lmionline.ca/projects/apg.



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PLANT PULSE

ECONOMIC DEVELOPMENTS AND TRENDS

R&D FLATTENS

2014 spending dragged down by biggest performers

Canada's largest R&D companies have cut back on their spending, dragging down the 2014 national total, according to a Toronto-based R&D research firm.

Canada's Top 100 Corporate R&D Spenders list shows a 1.6% drop to \$12.3 billion compared to a 4.1% increase (\$12.5 billion) in 2013.

"Economic and financial headwinds have affected the country's leading R&D companies," said Ron Freedman, CEO of Research Infosource Inc. "What's different this year is that spending was down – often substantially – at seven of the 10 largest performers, whereas smaller performers managed strong gains. Overall, 69 companies posted spending increases versus 30 where spending declined (one company was even)."

Aerospace led the industry sectors with five companies accounting for 22.4% of total spending; however, combining all its sub-sectors, ITC accounted for 39.6% of spending.

Montreal-based rail and aerospace giant Bombardier Inc. holds on to the top spot, even with a 7.8% spending drop. BlackBerry Inc., the Waterloo-based developer of smartphones and services, saw R&D spending plummet 40.7%, yet it hangs on to second place. Automotive parts giant Magna International, based in Aurora, Ont., is in third place, clocking in at a modest 1.5% increase.

Some new members were added to the list's \$100 Million Club: Suncor Energy Inc. (\$150 million), Mitel Networks Corp. (\$130.7 million) and Cisco Canada (\$104.2 million).

EDC FORECASTS EXPORT SURGE IN 2016

Canadian exports will benefit from a surging US economy and improving prospects in Europe and China next year, according to a new global export forecast.

Export Development Canada (EDC) is forecasting a 7% increase in the value of exports following a slight 1% decline this year mostly caused by sharply lower oil prices.

"The US economy is being led by increased consumer spending and a rising housing market that can sustain higher growth for at least the next two years," said Peter Hall, EDC's chief economist.

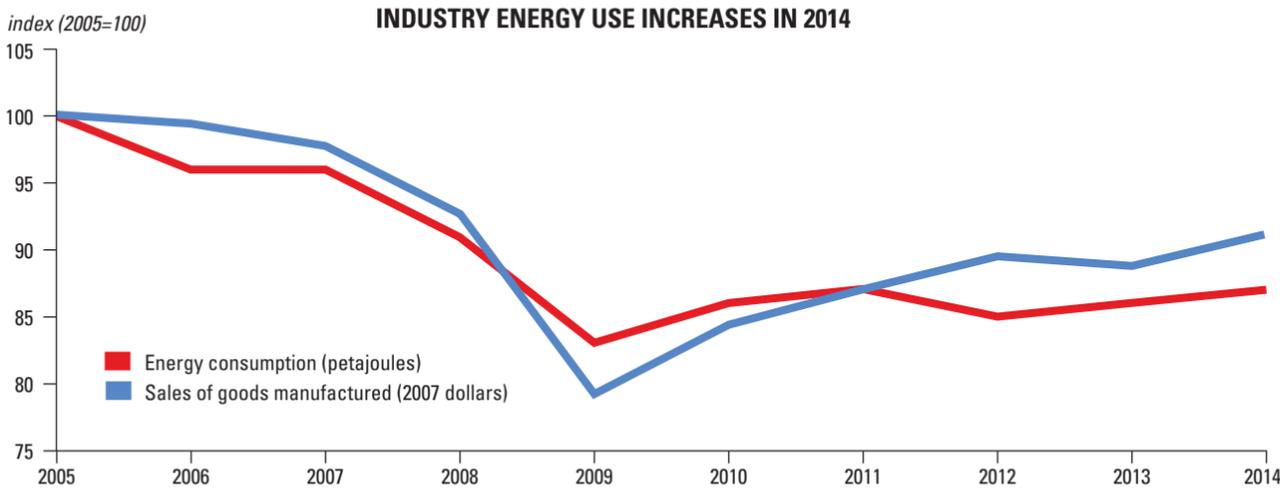
Canadian companies also stand to benefit from the lower value loonie and US companies dealing with tight capacity.

EDC forecasts global growth will be 3% this year and 3.6% in 2016, but there will be "considerable volatility" in equity and currency markets, as well as in commodity prices. The price of oil is expected to remain below \$60 a barrel through 2016.

"Smart companies should consider moves into new markets now while competitors are still sitting on the fence, particularly in the US, and ahead of the new competition that will be coming in a few years' time from free-trade agreements with the European Union and Pacific Rim countries," said Hall.

The EDC notes fertilizers, aerospace, consumer goods, automotive, advanced technology and industrial machinery and equipment sectors are all seeing double-digit increases in exports. Chemicals and plastics, forestry products, and metals and ores are growing by between 4% and 8%.

However, the energy sector, which makes up about 24% of Canada's exports, is in decline this year as a result of much lower prices for oil. But EDC predicts the value of energy exports will rise by 17% in 2016 due to a mix of increased demand and slightly higher prices. All other sectors are expected to see increases as well.



Manufacturing consumed 2,177 petajoules of energy as part of the production process in 2014, up 1.7% from 2013. Natural gas accounted for 33% of consumption, up from 27% in 2009. Electricity accounted for 28%, down from 30% in 2009. The use of heavy fuel oil has declined by more than 80%. Paper, primary metal, chemicals, and petroleum and coal manufacturing used 74% of the energy.

Statistics Canada

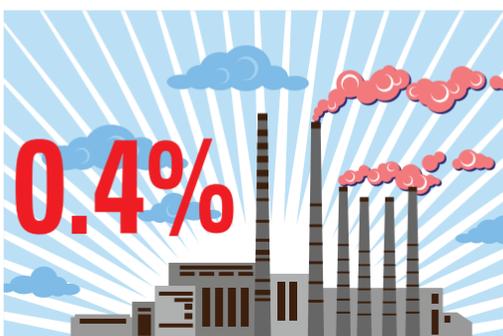
The Bank of Canada's rebooted growth forecast for 2016, down from and earlier projection of 2.3%. The forecast for 2017 is adjusted to 2.5% from 2.6%.

Bank of Canada



The amount of new private sector jobs in the past 12 months created by SMEs.

CIBC



The 12-month decline of the Industrial Product Price Index ending in September, after falling 0.4% in August. Much of the price decline is attributed to energy and petroleum products, and chemicals, offset somewhat by higher prices for vehicles and aircraft.

Statistics Canada



Average weekly earnings of manufacturing employees in August, down 2.7% from July but ahead 1% from August 2014.

Statistics Canada



2.6% The average increase for non-unionized employees in 2016, according to the Conference Board of Canada's Compensation Planning Outlook 2016. The lowest increases will go to workers in BC (2.3%) and Alberta (2.4%). The highest increases are going to Saskatchewan (3.2%) and Manitoba (2.9%). Employees in the hard-pressed oil and gas industry will average 2.1%.

» Additive Manufacturing

3D METAL makers

BRINGING ADDITIVE METAL MANUFACTURING TO THE MAINSTREAM

AMM leverages advanced technologies and innovative minds to enhance Canadian companies' global competitiveness.

BY MATT POWELL, ASSOCIATE EDITOR

A large blue marlin adorns the back wall of the Concord, Ont. office shared by Norman Holesh, David Slimowitz and Nigel Southway. Slimowitz who is the fisherman of the bunch, has added a number of photographs from his numerous fishing expeditions. The marlin represents a bit of a metaphor for the three manufacturing veterans who have more than 100 years of industry experience between them. They're trying to reel in a much bigger fish.

Holesh, Slimowitz and Southway are confident they've uncovered a solution that will make manufacturers more competitive globally. And it lies in the abilities of a machine gently humming away in a small, lab-like room at the Additive Metal Manufacturing (AMM) office in an industrial park barely north of Toronto.

AMM's story began more than two and a half years ago when Holesh attended an information night on 3D printing. While the focus at the time was on plastics, it was the metals that really excited him.

"Canada needs something that assists manufacturing, and there's very little that assists them in terms of getting the parts they need," says AMM's CEO who has 40 years of manufacturing experience under his belt. "Everyone's looking at low costs, and over the years Canada has lost lots of manufacturing jobs. [Additive manufacturing] seemed like an opportunity to stem the tide and help manufacturers get their products going."

The company offers engineering and design consulting, additive metal rapid prototyping and additive production services. It's also in the midst of developing a Centre of Excellence for additive metal manufacturing, part of an effort to make advanced technologies such as 3D printing more accessible and support a perceived repatriation of manufacturing to Canada. 3D printing will reduce costs, increase opportunities and encourage innovation, say the partners.

"Being a service bureau, we can tell clients that in particular situations, they might not need a lot of additive work, but instead machining or casting. We look at the job from an end product point of view, not just a supply chain view," says Holesh. "Toolmakers are only beginning to see the opportunities additive manufacturing brings them. We're not trying to displace traditional machining, we're trying to augment it."

The company's capabilities are



impressive, and they have a little black box of goodies to show off to potential customers. One part cuts weight from traditional machining by more than 50% (118 grams to 54) thanks to an intricate honeycombing construction throughout the middle of the printed tool steel part. Another shows how the company consolidates five parts into one intricate assembly.

"There's no welding fixtures required. No individual parts. Consolidating parts into one results in a massive cost and time savings," says Slimowitz, AMM's vice-president of sales and marketing. He's the founder of Sabito Machinery Inc., a used industrial machinery dealership that shares workspace with AMM. He also brings more than 40 years of industrial experience to the company.

"You can do things you couldn't do before, especially for the tooling market and thermal management concerns those kinds of companies have to deal with. The question is how far are you willing to push the envelope?"

Just as CAD technology was a game changer in the way components are designed, he declares metal additive manufacturing will have the same effect.

The technology is so new, there are no rules. AMM is defining them as they go.

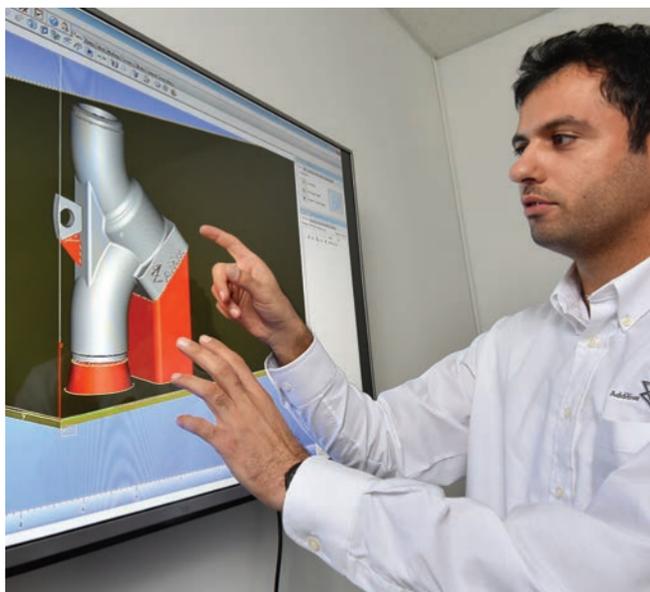
"We need to show manufacturers what's available because a lot of what is available isn't known," adds Holesh. "[Additive] isn't something one thinks of in the normal course of manufacturing. We can rewrite the design for manufacturing rules."

AMM's EOS M280 laser sintering machine is made by German OEM EOS, who Southway describes as the father of laser sintering technology. Founded in 1989, the global company provides high-end solutions applying direct metal laser sintering and polymer printing.

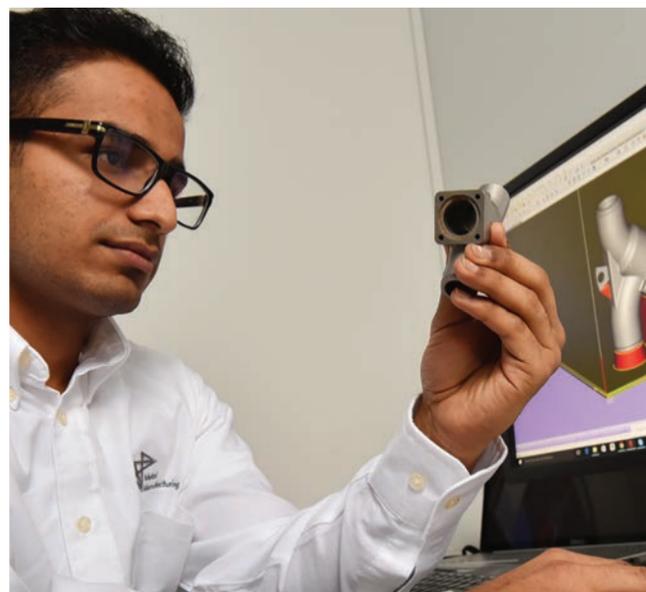
The machine melts and sinters powdered metals, including stainless and tool steel and aluminum, onto a plate at 40 microns – thinner than human hair – building each part swipe by swipe to produce cost-efficient high-quality metal tool inserts, prototypes and end products.

"You literally watch your part growing like a seed," says Slimowitz.

The part comes out of the machine at a hardness of between 32 to 35 rocks (on the Rockwell scale). On instruction by the customer, AMM can get each part hardened to 65 rocks thanks to four post



Senior process engineer Keyvan Hosseinkhani demonstrates how AMM digitally consolidates multiple parts into a single assembly.



Jaskaran Sadheora, technical designer, inspects a newly printed metal part.



Sadheora uses a computer to design parts, but they are validated using old-school measurement tools.



AMM's leadership team (L-R): Norman Holesh, CEO; David Slimowitz, vice-president of sales and marketing; and Nigel Southway, vice-president of engineering.

PHOTOS: RODNEY DAW

processing capabilities including grinding, lathe-work and sand blasting. Each part polishes to a mirror finish.

Super speed

"Everybody talks about speed to market. When you have a product to launch, and the toolmaker tells you it's going to take 12 weeks to produce a soft tool or a prototype, that's going to slow anyone's production cycles down," says Holesh. "We can produce a prototype in four days. That allows customers to test and validate much faster and gets the final tool to their facility much sooner. We're trying to show the toolmakers they can get on with building the final tool a lot sooner, and therefore get the final product to market much more efficiently."

The technology is not push button, explains Southway, AMM's vice-president of engineering. He's an executive member and past chair of the Society of Manufacturing Engineers (SME), a leading advocate for the Take Back Manufacturing Forum and the North American Reshoring initiative in Canada, and he lectures on sustainable supply chain management and lean practices at Sheridan College in Brampton, Ont.

Southway sees plastics 3D printing being ahead of metal additive manufacturing by about four years. But development on the plastics side has pushed demand for metals printing despite a number of tighter barriers to entry, including costs.

"The software is not play and ride. There's quite a learning curve, and most 3D parts are still going to be tooled in injection moulds. ..."

"There's more gymnastics to go through, but metal has more legs, especially as it relates to manufacturing," says Southway, adding that the sintering machine AMM has purchased cost more than \$1 million, compared to high-quality 3D plastics printers, which are as inexpensive as a few thousand dollars.

"Metal has a lot more change in focus as far as manufacturing is concerned," he says. "The software is not play and ride. There's quite a learning curve, and most 3D parts are still going to be tooled in injection moulds. Tool makers are only dipping their toes in. We have to teach them how to design the technology and that's a significant challenge."

But he's confident AMM has found

people with the right skills to make that happen.

"If you're not computer literate, you don't belong in this industry, and that's the advantage our young guys have," says Southway.

New blood

Filling out AMM's six-man team, through work with local post-secondary institutions including McMaster University and Sheridan College, is a team of young and tech-savvy manufacturing minds who Holesh says balance out the "grey hairs around the table."

In a lab-white control room next to AMM's laser sintering machine, Keyvan Hosseinkhani, Jaskaran Sadheora and Manan Gandhi man laptops equipped with high-tech CAD software. This is where the magic happens.

Senior process engineer Hosseinkhani who came to Canada from Iran, is also a

PhD candidate at McMaster University, where his research focuses analysis of mechanical and thermal stresses and tool wear in metal machining processes. He is responsible for analyzing the mechanical and metallurgical properties of 3D printed metal components and he conducts customer benefit analysis for AMM.

Sadheora, an Indian-national who came to Canada to pursue studies in manufacturing technology at Sheridan (where he met Southway), is AMM's technical designer and focuses on bringing custom designs to life from the computer screen to the laser sintering machine in the room next-door.

"This is an emerging technology that's

going to take over more manufacturing production," he says. "And if we stick with it, this is the future – it has so many applications in the realm of manufacturing design."

Holesh sees a major benefit in having the youngsters around because of their tech-savviness and familiarity with computers. But he also believes having an opportunity to work with an up-and-coming high-tech manufacturing firm is critical to developing the next-wave of manufacturing leaders.

"We're trying to give these kids a bit of hope...that when they come out of school, there will be jobs for them," he says. "They bring an incredible level of education and a background in 3D printing, at a research level. Coupling their skills with the experience of us older guys, we think we've created a dynamite team."

Indeed, there's a growing appetite for AMM's capabilities. A 2013 report by Colorado-based research firm Wohlers Associated Inc. forecasts global sales of additive manufacturing (metal and plastic) to reach \$6.5 billion by 2019.

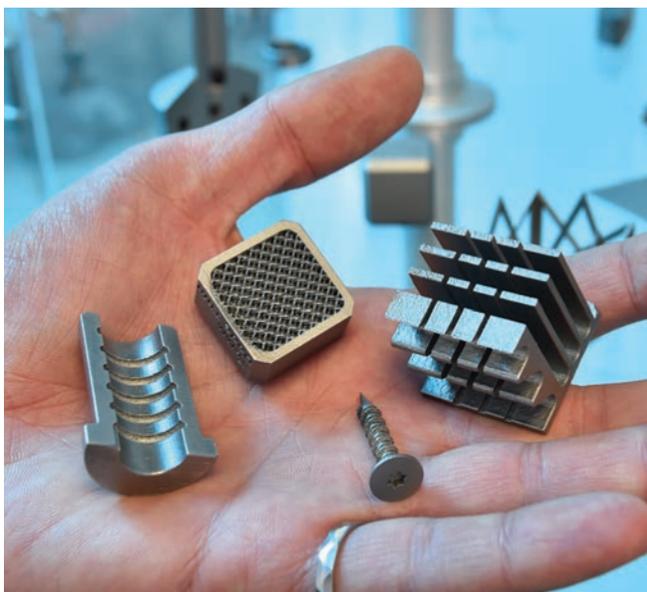
AMM plans to take full advantage of this market trajectory with an aggressive growth plan that within three years will see AMM expand the facility's capabilities to provide 150,000 hours of additive metal processing capacity annually.

Eventually, Southway predicts, the office will house 20 laser sintering machines.

Holesh believes part of AMM's task will be overcoming a general resistance to change among manufacturers; resistance he says is a result of feeling threatened. And as Canada's manufacturing supply chain shifts into more advanced technologies and global markets, additive metal manufacturing has the potential to improve companies' competitiveness and the speed at which products are brought to market.

"This technology is going to happen whether people like it or not," says Holesh. "It's an exciting game changer and I'm surprised that more people haven't adopted it, but they will."

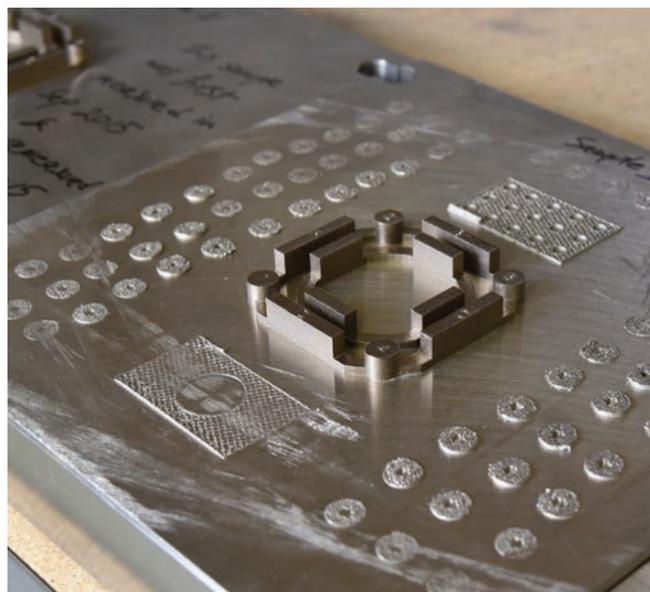
Comments? E-mail mpowell@plant.ca.



Some of AMM's 3D-printed parts and tool assemblies.



A view inside one of the company's more intricate printed pieces.



The parts are printed on, then removed from plates made of steel and aluminum.

» Assembly



Get ready to JUMP

ADVANCED ROBOTICS IS THE NEXT GREAT LEAP

The economies are becoming attractive enough for wider adoption, which will lower labour costs and give Canadian manufacturers a productivity boost.

BY JOE TERRETT

The time of the robot is approaching, something Canadian manufacturers of all sizes, but particularly smaller ones, should be exploring.

Robotics in plants isn't a new idea. The technology – pricey and potentially dangerous for workers who wander into the path of an active unit – has been more widely used in large, volume assembly operations, but that's changing.

But the technology making its way into the industrial marketplace is smarter, more compact, safe to use alongside humans, and capable of assembling diverse components and parts. *The Wall Street Journal* noted in a recent article that as robotics technology becomes less costly, it will replace many manual tasks, which should help smaller manufacturers compete against larger ones. And lower labour costs would help manufacturers reclaim some of the processes ceded to low-wage countries such as China.

Indeed, The Boston Consulting Group (BCG), in a recent research article, predicts a robotics revolution is nigh as manufacturers reach an “inflection point” where the economics are attractive enough to replace many manual activities with machines.

Canada isn't a lightweight in the development of robotics. Yes, we can lay claim to the famous Canadarm, but we also have three very innovative robotics developers (Clearpath Robotics, Robotiq and Kinova Robotics) in the latest *Robotics Business Review* global top 50.

Our adoption of the technology is less glorious. Canada's installed base is hard to track. Because it's small, it tends to be lumped in with North American statistics, but **PLANT's** 2016 Manufacturers' Outlook Survey provides a glimpse of Canadian adoption and it shows only 10% of the mostly smaller companies are using advanced robotics.

The Robotics Industries Association (RIA) reports 22,427 robots valued at \$1.3 billion were ordered from North American companies in the first nine months of 2015, an increase of 6% and Canada's share is almost 2,100 units valued at about \$134,000.

The good news is BCG reports Canada is among a vanguard of nations deploying the technology, alongside Japan, South Korea the UK and the US (while the laggards are Austria, Belgium, France, Italy and Spain).

The Boston-based consulting firm says the application of robotics will be a

game changer. It's projecting growth in the global installed base will accelerate from around 3% annually to 10% over the next decade. And adopters in western economies will see an 18% to 25% improvement in labour cost competitiveness within 10 years.

Labour flexibility

BGC offers the following tips for adopters:

- **Understand the global landscape.**

Get a clear picture of the adoption trends in other countries and in their industries; how the price and performance are likely to change in comparison with the total cost of labour; and how this comparison is likely to change in the years ahead. Factor in the flexibility of labour rules and the future availability of workers that support or hinder wider robotics adoption in these countries.

- **Benchmark the competition.** If robotics adoption is expected to rapidly

increase in your industry, assume the total cost of systems will fall. This will help you accurately estimate the cost and timing of investments, then make decisions about where to locate new capacity.

- **Stay technologically current.** Have a clear view of how quickly innovation is resolving technical barriers that so far have inhibited the use of robots, such as the ability

to manipulate flexible or oddly shaped materials, or to operate safely alongside workers. Is it better to wait for an improved technology to emerge or to implement a new process and upgrade without duplicating what has already been done? Timing is crucial.

- **Prepare the workforce.** As more factories convert to robotics, the availability of skilled labour will become a more important factor in the decision about where to locate production. Tasks that still require manual labour will become more complex, and the ability of local workforces to master new skills will become more critical. Work with schools and governments to expand training in mechanical engineering and computer programming.

- **Prepare the organization.** Make sure networks are flexible enough to realize the benefits of robotics as installations become economically justified in different economies, and as suppliers automate. Consider how new advanced-manufacturing technologies will transform production processes. For many manufacturers, adapting to the age of robotics will require a transformation of their operations.

Canada's lagging productivity is a key reason for manufacturers to get ahead of the robotics revolution, but keep in mind that Industry 4.0 will play an important role in global manufacturing, which is why it's so important to continually modernize. Advancements in robotics technology and declining costs open up much potential for companies that do so.

Comments? E-mail jterrett@plant.ca.

» Tech Tip

Finding your balance

Retrofit leverages PdM technology

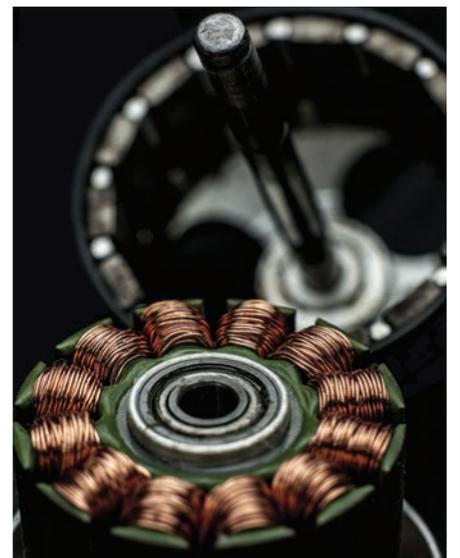
MotorDoc LLC, an industrial consulting firm based in Lombard, Ill., is leveraging innovative technology for its balancing machine retrofits.

It uses VibePro vibration analysis software from GT Predictive Technologies, a special two-channel system with a tachometer, and an iPad-based single and two-plane balancing system.

The iPad has a special docking system that can be removed from the machine and used to apply other GTI technologies. Reports are completed, generated and uploaded and/or e-mailed directly from the balancing machine.

GTI, a predictive maintenance (PdM) services provider based in Manchester, NH, covers most predictive and specialty technologies, including vibration, balancing, alignment, ultrasound and infrared that can be wired to Bluetooth, computers and cloud-based advices. MotorDoc LLC is a distributor of GTI products.

- Visit <http://www.motordoc.org/?s=GTI+Predictive>, for more information.



Cutaway view of an electric motor.

PHOTO: THINKSTOCK

» Energy Management

Boeing fixes its air condition

Winnipeg facility saves energy with redesigned compressed air system

A redesigned compressed air system installed at Boeing Canada Winnipeg in 2014 has improved efficiency and delivered significant energy and air storage savings.

The aerospace composite manufacturer, which employs more than 1,600 people in three locations totalling 730,000 square feet, produces nearly 1,000 composite parts and assemblies such as wing to body fairings, engine strut forward fairings, engine strut aft fairings and landing gear doors, for Boeing Commercial Airplanes. All its products are exported and in 2013 the operation had sales of \$511 million.

Parts are baked in large autoclaves pressurized with compressed air. An audit found the centrifugal compressors supplied only 3,000 cubic feet per minute (cfm), despite two additional autoclaves having increased the demand to 5,500 cfm, and there were high peaks and low valleys during normal production.

When not in production mode, the two compressors entered a very inefficient blow-off mode. The additional autoclaves would have required the use of a third compressor and the purchase of a fourth.

The capacity issues presented an opportunity to install a new system with four rotary screw compressors (two 225-hp VSD and two 100-hp base), plus two booster compressors (50-hp high pressure).

Consumes less electricity

Rather than running the compressors continuously to supply the autoclave, air is now stored (up to 280 psi) in two large 25,000-US gallon receivers outside of the compressor room. When air is needed, receivers deliver up to 5,500 cfm, or the equivalent of 1,375 hp of capacity.

The demand management system designed by Manitoba Hydro monitors power peaks and turns off the booster compressors when they lead to increased peak demand charges, which reduces the cost of the stored air by about 25%. And oversized compressor piping is reducing piping pressure losses across the system.

An innovative sequencing system and accurate regulation of the VSDs controls the compressors. Usually, only one of the four main compressors is running while another one supplies fill air for the autoclave, which is supplemented by stored air as needed. Staff also dealt with compressed air leaks and inappropriate end-use levels to reduce average air flow from 750 to 425 cfm.

The new system consumes about 669,000 kWh of electricity with a peak of 285 kVA, it's much less maintenance- and energy-intensive, and it allows the

autoclaves to be pressurized about three times faster than with the old system, which reduces run time. Compressed air is also used to operate other pneumatic equipment without a loss in pressure.

Source: Natural Resources Canada

Comments? E-mail jterrett@plant.ca.



Boeing Winnipeg manufactures the engine inlet inner barrel of the new 737 MAX.

PHOTO: BOEING

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Account Manager

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“There's always a way to fix something.
It may not be the conventional route,
but there's always a solution.”

There are plenty of reasons why businesses adopt eCommerce solutions like time savings, cost savings, and enhanced order management. Even though some businesses may be slow to adopt new technologies, today's eCommerce solutions can adapt to even the most complex purchasing processes.

Account Manager Nicole Pelletier knows this firsthand and recognized that her customer would save huge amounts of time with an eCommerce solution. But for many reasons, the customer was reluctant. A natural-born consultant, Nicole enabled the customer to see for himself that eCommerce was right for his company. It was a matter of *showing* the customer the benefits, not *telling* the benefits.

Get the full story of how Nicole solved this problem, as well as other examples of Acklands-Grainger team members finding solutions, by visiting:

AcklandsGrainger.com/ProblemSolved/Nicole

» Think Lean

Tear down your OFFICES

OPEN SPACES BUILD COLLABORATION AND TEAMWORK



Eliminate office silos and organize people into teams.

PHOTO: THINKSTOCK

Your plant may be lean but the rest of the operation likely harbours functional silos in administrative areas.

BY RICHARD KUNST

There are many lean plants where the rest of the organization still operates in functional silos. Why do they allow this to happen? Perhaps they voice the mantra that “change is good anywhere, except in my backyard.”

In operations where ugly is quickly visible, great things have been accomplished. In many cases cells created by adopting single-piece-flow are delivering dramatic results, which can also be accomplished in administrative areas. Instead of having a sales department, engineering group or groups, production control, accounting, marketing, human resources operating as functional silos, create cells based on value streams.

A common complaint voiced by organizations is that communication is horrible. Well, of course it is if you have walls acting as barriers to prevent collaboration and teamwork. People will say they need an office for quiet thinking to focus on the required tasks, but they can learn to work in hectic environments without offices and walls, and be very effective at completing tasks. You also tend not to collect a lot of clutter or personal items.

Open concept

Here’s a challenge for you: tear down your office walls and organize people into teams, then experience the power of collaboration. You’ll also see an immediate improvement in the flow of work through the administrative processes, likely at twice the speed of your former format.

For the unconvinced, here are some points to consider:

- Cadence will improve since people can immediately hand off information instead of waiting until break, lunch or end of day to deliver the paperwork.
 - Concerned about private discussions? Teams don’t have secrets, but if you need to share some confidential information, go to a meeting room. Have several small ones.
 - With all the technology now available, there should be less physical confidential information but if you have the need, invest in lockable fireproof filing cabinets.
 - Need to concentrate? These days you can work from home, or head to the library if the kids are home.
- What’s nice about totally open work areas is the work environment can be quickly reconfigured to a specific task or project. Teams work in a community and if a specific task is not required in one community, move it to another community that specifically needs the skill.
- Hiding places should be eliminated in a lean workplace. What are offices? The ultimate hiding places. Best to get rid of them.

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

Comments? E-mail jterrett@plant.ca.



LEAN ALERT

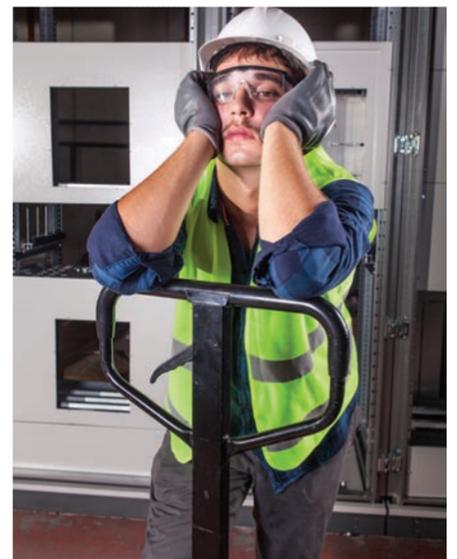
» CCOHS Safety Tips Stressful workplace? Avoid making workers sick

When the demands and pressures of a job are too much for some workers to handle, they may experience work-related stress. If left unchecked for a prolonged periods, stress can make them sick.

Studies show stressful working conditions are associated with increased absenteeism, tardiness, high staff turnover, reduced productivity and product/service quality, and increased compensation costs. How workers react to stress may include tobacco, alcohol or drug abuse; violent/bullying behaviour; sleep problems; anxiety; depression; inability to concentrate; and irritability. Chronic stress can also cause health issues such as back problems, heart problems, stomach ulcers, hypertension and a weakened immune system.

Everyone has different thresholds for stress and its triggers. Employers can do the following to reduce stressors in the workplace:

- Treat all employees in a fair and respectful manner.
- Look for pressures at work that could cause high and prolonged levels of stress.
- Prevent the pressures from becoming negative stressors.
- Match the workload to workers’ skills and abilities.
- Design meaningful jobs that are stimulating and provide opportunities for employees to use their skills.
- Allow employees to have as much control as possible over their tasks.
- Clearly define roles and responsibilities.
- Provide employees with the training, skills and resources they need to do their jobs.
- Establish work schedules that are compatible



Poor shift design leads to stress.

PHOTO: THINKSTOCK

with demands and responsibilities outside the job.

- Involve employees in decision-making and seek their input on issues affecting their jobs.
- Improve communications and reduce uncertainty about career development and future employment prospects.
- Value and recognize individuals’ results and skills.
- Provide opportunities for social interaction among employees.
- Provide access to employee assistance programs.

Workplaces with healthy work systems are more likely to have productive workers who can effectively handle the demands of the workplace.

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

LNS Research and Mesa International’s research study identifies the metrics that drive the most value for manufacturers across key business functions. They include customer responsiveness, quality, efficiency, profitability, inventory, maintenance and innovation. The Association for Manufacturing Excellence’s Target Online says the free eBook report is available at <http://blog.lnsresearch.com/smart-connected-operations-metrics-that-matter>.

Source: AME

dyson airblade V

**Small.
Fast.
Most hygienic.
Now \$799.**

Dyson engineers have developed one of the world's smallest 1400W motors. They've used it to build an ADA compliant hand dryer that protrudes just four inches from the wall. There's even room for two HEPA filters, so it dries hands hygienically – in just 12 seconds.¹



For more information or to set up a demo call 1-877-397-6622 or visit dysonairblade.ca

¹ Dry time measured using Dyson test method 769 based on NSF P335 using a measurement of 0.1g residual moisture.

» Climate Strategy

Most companies have a long way to go to prepare for a carbon-constrained world, but doing so will help sharpen their competitive edge.

BY MIKE KENNEDY

Regulations to manage carbon emissions have been described as a competitive threat to manufacturers; however, they represent an opportunity for companies that take the right steps to gain advantage.

For several years facilities emitting greenhouse gases (GHG) above certain regulatory thresholds in Alberta, BC, Quebec and Ontario have been required to provide reports. Many companies have already gathered several years of baseline data on their carbon impacts, but most still have some work to do preparing for a carbon-constrained world.

Carbon cap and trade, an idea now common in many European countries, as well as in Quebec and California, involves comparing a facility's GHG emissions to a government-imposed "cap" or upper limit. A facility that emits above its cap must purchase allowances or offset credits to cover the gap. Reducing emissions could result in extra allowances that can be banked for future use or sold on the open market.

Many firms are already compliant with GHG reporting rules; however, regulations are likely to change if cap and trade is implemented. For example, requirements to report certain production information may be introduced, or third party verification may become mandatory. In Ontario, where cap and trade is imminent, additional source types are being added to the scope of the regulation and the reporting threshold is being lowered from 25 to 10 kilotons.

As more facilities are subject to carbon trading legislation, manufacturers must improve the reliability and credibility of the information used in GHG reports.

Two areas for improvement are:

- **Data gathering and analysis reliability.** It needs to be done correctly and by current standards. Assess the required level of effort and make plans to ensure the availability of sufficient resources well ahead of reporting deadlines.

- **Information reliability.** It must be acceptable to regulatory authorities and investors who will rely on the information to make important policy and investment decisions. Regulators will require reporters engage a credible third-party to provide independent assurance that reported information meets required standards. In Quebec, Ontario and BC assurance providers must be accredited to ISO 14065.

Calculating GHG emissions is relatively straightforward – perhaps based on natural gas consumption, using bills from a natural gas provider.

In other cases, the emissions inventory may be more complex than identifying all the sources, calculating their emis-



Calculating greenhouse gas emissions to meet cap and trade requirements can be complex.

PHOTO:THINKSTOCK

sions and finding a way to monitor any changes.

Some companies will find that opportunities to reduce their emissions are plentiful. This can be through a combination of capital expenditures such as replacing a simple-cycle with a combined-cycle boiler, and operating changes, such as making sure bay doors are kept closed in very hot or very cold weather.

Other companies that have worked hard to squeeze out unnecessary expenditures should consider turning to the open market. This means looking for allowances from other regulated facilities that have found ways to reduce emissions below their caps. Another option

is finding offset credits from third-party validated and verified offset projects related to activities outside the regulatory scope of the cap and trade program, such as waste, forestry or destruction of ozone depleting substances.

Setting a price

There may also be benefit to planning for potential cap and trade costs by using "shadow" prices for carbon. Proposed cap and trade rules will likely include a price collar on carbon to restrict prices from falling too low or climbing too high. This price collar can be used to estimate future carbon liabilities for discussion with those responsible for planning oper-

ating and capital expenditures.

There is wisdom in dealing with these issues sooner rather than later. Good planning allows companies to use dollar cost averaging of investment confidently and conservatively purchase allowances over time. Planning also helps budgeting for allowances in a way that matches the company's revenue stream.

Mike Kennedy is administrator of the GHG Validation and Verification Program for consulting firm RWDI, based in Guelph, Ont. Call (519) 823-1311 or e-mail mike.kennedy@rwdi.com.

Comments? E-mail jterrett@plant.ca.

» Training

Why bother with training?

Five reasons not to and why they're wrong

BY HUGH ALLEY

When manufacturers trim costs, training is often on the list. But here are five reasons management may think training isn't worth the investment or effort, and why they should think again.

1. You'll train them and they'll leave. Yup. They will. A survey of millennials showed they expected to change jobs every three years. But there's also the cost of mistakes. Each person making one \$400 mistake every two weeks adds up.

2. You train them but they forget it all in a day or two. You sent them off to learn a tough technical skill like setting up a machine, but the orders weren't there, so they didn't do that set-up for a month, and the plant was too busy to give them any practice time. Of course that makes it hard to remember.

3. Behaviour doesn't change. Why do people go off to training, then come back and behave the same? There's a study that shows it takes more than 60 days to develop a new habit. It helps to have people around who provide encouragement, reminders and support.

4. That's common sense; why train? When my daughter was in grade four she recounted how one of her classmates was using a saw like a hatchet. How could anyone not know that you draw a saw back and forth to cut wood? Common sense! Then we realized two things: she'd never seen one used; and her only point of reference, given her Asian background, was her mother's use of a cleaver in the kitchen.



Train and follow up with practice time.

PHOTO:THINKSTOCK

That was her common sense.

5. There is no payback. Yes, if you send the person for training, don't follow up and don't do any practice or coaching. Indeed, a Motorola study in the 1980s showed training without follow-up had a negative payback. Time away. Lost production. Course fees. And so on. It also showed more than 10 times the return with follow-up by the manager.

If you're wondering whether training pays off, ask yourself how many mistakes could be prevented. That will give you a sense of whether it's really worth it.

Hugh Alley is a consultant based in Port Coquitlam, BC who helps companies quickly achieve significant performance gains. Contact (604) 866-1502 or e-mail hughralley@gmail.com.

Comments? E-mail jterrett@plant.ca.

» Trade

The massive trade deal has auto parts players concerned that less than anticipated regional content requirements will cut the bottom out of Canada's automotive industry.

BY MATT POWELL, ASSOCIATE EDITOR

The Trans-Pacific Partnership's full text was revealed Nov. 5, a day after newly elected Prime Minister Justin Trudeau took office, and it contains what some of Canada's key auto sector players are calling an unpleasant surprise.

Now, they say, it will depend on Trudeau's federal Liberal government to decide whether it will sign or seek changes to the massive trade agreement, which covers more than 40% of global GDP and makes major cuts to regional content requirements for the auto sector. Many believe current provisions will be detrimental to an industry crucial to the Canadian economy.

The agreement reveals that many key auto parts product clusters will require just 35% regional content, down from what was initially thought to be 40% when news of the deal broke in early October. And despite a renewed and friendly dialogue between Canada's new prime minister and the US president, Barack Obama is pushing Canada to approve the deal.

But auto parts manufacturers and related industry associations are now encouraging Trudeau to revisit the deal agreed to by the preceding Conservative government.

Within NAFTA, a car had to contain at least 62.5% local content to be sold tariff free in Canada, Mexico and the US.

It was originally believed the TPP's local-content requirements for vehicle components would be between 40% and 45%. But Flavio Volpe, president of the Auto Parts Manufacturers' Association (APMA) in Toronto, says this isn't about a 5% drop in regional value requirements, but further spreads in the gap from NAFTA requirements. Volpe is particularly concerned about the viability of small manufacturers.

"The most important thing for volume parts manufacturers is access to customers, and the trade agreement provides those larger companies with more global potential, but small and medium-sized businesses don't have those capabilities," he says. If the deal proceeds as is, it will be critical for Canada to pad its automotive OEM base if it's going to compete under TPP rules, he added.

Engine parts and body stampings such as truck frames and metal roof panels will only require 35% TPP content. Volpe said there are 26 Canadian parts companies that manufacture stamped metal components and 18 that make engine parts.

Unlike his predecessor, Trudeau has promised the new Liberal government will consult with the public on the 6,000-



Another BUMP in the ROAD

TPP AUTO PARTS CONCESSIONS CUT DEEPER THAN ADVERTISED

page deal.

"The fact that the new government is open to a formal public consultation is refreshing," said Volpe. "The Conservatives brought industry groups into the conversation later in the process, and that obviously limited the impact we were able to have on the final result."

Not only are auto and auto parts makers concerned about regional content requirements, the Canadian Vehicle Manufacturers' Association told the *Globe and Mail* that it's displeased with Canada's willingness to eliminate a tariff on imported Japanese vehicles more rapidly than what was agreed to by the US. Canada has agreed to eliminate its 6.1% tariff over five years, while the US will do so over as much as 30 years.

Dennis DesRosiers, president of

DesRosiers Automotive Consultants in Richmond Hill, Ont., isn't particularly optimistic about the looser local content requirements.

"We are in a long phase of the slow wil-
lowing out of the automotive and parts manufacturing sector in Canada, and [TPP] is just another initiative that reaffirms that point of view," he said.

Something has to change

Unifor, Canada's largest private sector union, is among those urging the Trudeau government to revisit provisions in the agreement that it says will cause major damage to key Canadian industries, including automotive, and eliminate thousands of jobs.

"The new government needs to commit to fixing whatever mistakes lurk in the

TPP text because the former Conservative government was in such a rush," said Jerry Dias, president of Unifor.

The union's chief economist Jim Stanford estimates Canada's automotive concessions would result in the loss of up to 20,000 manufacturing jobs.

"It is outrageous that the [Harper Conservatives] have signed a deal that would allow the majority of a car to be made in China, yet still come into Canada tariff-free," said Dias.

After the tentative deal was released Harper promised a \$1 billion package for the auto sector spread over 10 years, to protect jobs and boost innovation.

While the TPP provides Canadian companies with access to Japan's massive consumer markets, it also makes it easier for manufacturers to use offshore parts, a windfall for low-wage Asian parts suppliers. This is an impediment for Canadian firms already dealing with fast-growing production in places like Mexico, where automakers are taking advantage of lower labour costs and bloated government investment incentives.

"At some point, you reach a tipping point on content that doesn't make it financially viable to manufacture in Canada," said Volpe.

The auto sector doesn't want a handout. Volpe would rather see that compensation go towards investment opportunities. He told the *Windstar Star* he has not asked the federal government to re-open negotiations, but is instead seeking cooperation on how to address vulnerabilities he thinks will impact the sector.

"We're not looking for a compensation package. I don't need to send a cheque to each manufacturer we represent," he says. "That money would be put to much better use in a macro fund that would be tapped for the investment opportunities the Canadian sector needs to grow and compete on a global scale."

DesRosiers agrees.

"Our auto policy in Canada comes down to three words: cut a cheque. And sure they're very large cheques, but there has to be a better way of maintaining Canada's automotive landscape."

Comments? E-mail mpowell@plant.ca.

» Skills

Work perceptions shift

Report finds trades are no longer considered 'dead-end'

Though parents and youth say they believe career opportunities in the skilled trades are limited, a Canadian Apprenticeship Forum (CAF) national report finds the opposite to be true.

With observations from 754 certified journeypersons across Canada, *The Benefits of a Skilled Trades Career: Journeyperson Perspectives and Experiences* sheds new light on career progression in the trades.

Benefits include good pay, interesting work, full-time employment and the job satisfaction that comes with building or creating something. Based on a national survey with tradespeople at various stages of their careers, 50%

of respondents reported making more than \$80,000 annually.

"In recent surveys to gauge parent and youth understanding of the skilled trades, we were disappointed with the perception that skilled trades careers are 'dead end jobs,'" said Sarah Watts-Rynard, the forum's executive director.

"This study reflects a much different reality, one of broad opportunity both in the trades and in related occupations. We need to share that story with young people."

The survey found that the majority of respondents valued their Red Seal endorsement



Red Seal endorsements make the skilled more employable.

PHOTO: THINKSTOCK

because it made them more employable and enhanced their labour mobility.

Many had also become mentors themselves, expressing satisfaction in becoming leaders who promote a positive work environment, model good safety practices and facilitate team collaboration.

» Compressed Air

A Hydrostor and Toronto Hydro pilot project stores power in balloons deep below the Great Lake's surface.

BY PLANT STAFF

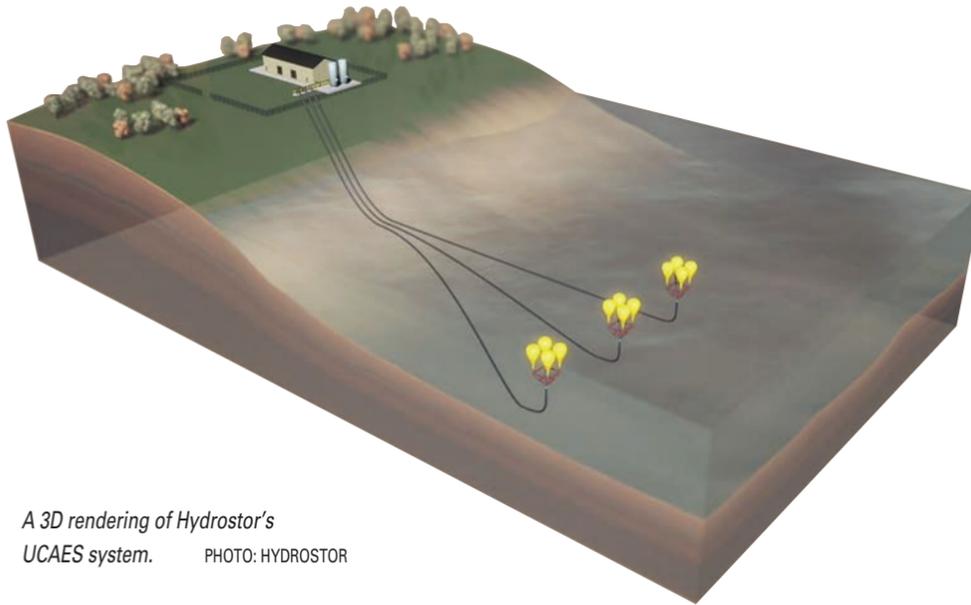
In the frigid depths of Lake Ontario, three kilometres off the south shore of Toronto Island and below 55 metres of water, a series of balloon-like bags near-bursting with compressed air, are pumping clean electricity into Toronto's energy grid.

Toronto cleantech startup Hydrostor Inc. has partnered with Toronto Hydro to launch this – the world's first underwater compressed air energy storage system, and it will remain there until a two-year pilot study is complete.

Hydrostor's Underwater Compressed Air Energy Storage (UCAES) system accumulates energy during off-peak hours when demand is low and power is cheapest, then pumps energy back into the grid during peak times. Paired with renewables such as wind or solar, it can store energy on days with high winds or clear skies to offset potential production lulls.

Underwater ENERGY storage

HARNESSING THE POWER OF LAKE ONTARIO TO BOOST TORONTO'S ELECTRICITY GRID



A 3D rendering of Hydrostor's UCAES system. PHOTO: HYDROSTOR

Hydrostor was founded in 2010 by president Cameron Lewis, formerly a specialist in oil field equipment. CEO Curt VanWalleghem joined shortly after and the company started testing balloons off Toronto's Leslie Street spit in 2012.

The demonstration project, launched Nov. 18, produces 660 kilowatt hours of electricity, which is enough to power 330 homes. It's emissions-free and readily scalable to allow for a significantly larger version to be produced. And unlike many traditional large-scale battery storage options, the balloon system doesn't use any toxic substances.

The company is also seeking global opportunities, and has a contract with a utility company in Aruba to build an even larger facility. The deal is contingent on the success of the demonstration project.

Hydrostor said it will initially focus on developing projects in coastal environments, such as island nations and micro-grid applications, which can be stand-alone or combined with a renewable generation option. It estimates the cost of UCAES will be about half that of a similar-sized lithium ion-based system and would hold power for much longer.

The tests will determine whether or not the system really works and is efficient enough to make financial sense. The company boasts UCAES is more than 60% efficient, so less than 40% of the energy is lost in the transfer to the compressed air balloons and back.

Comments? E-mail mpowell@plant.ca.

Under development for about five years, it builds on a range of technologies already in use, including Hydrostor's trademark balloons, known as accumulators, made of the same material long-used to raise shipwrecks from the bottom of lakes and oceans.

Global potential

An advanced compression system sends the air through a three kilometre pipe to six three-storey-tall balloons anchored at the bottom of Lake Ontario. Hydrostor reduces energy loss using a series of heat exchangers to store as much of the hot air as possible.

When the grid needs more electricity, the charged balloons come alive, using the natural pressure of the lake water to push the air back through the pipe to power a turbine at the end of the line.

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» Renewables

Strong fuel cell growth into 2020

Four companies hold 70% of global market share

Expansion in the fuel cell market is expected to kick into a higher gear over the next five years, with worldwide capacity reaching 664.5 megawatts by 2020.

A favourable regulatory climate and the continued push toward renewable technology will fuel growth in the hydrogen industry, along with government support that will see countries develop hydrogen fuel infrastructure, according to Grand View Research, based in San Francisco. "The eco friendly nature of fuel cells among other advantages has resulted in governments of various countries pushing for its development and technological advancement," the research firm said.

But it also noted high infrastructure costs could hinder the hydrogen fuel cell shift in developing countries.

The report identifies Fuel Cell Energy, Vancouver's Ballard Power Systems, Clearedge and Toshiba as dominant players, accounting for more than 70% of the global market.

When he reduced costs by 13% with a new RTU, he wasn't just saving money. He was setting a precedent.

Once you start seeing the benefits of our incentives for upgrading to high efficiency RTUs, you will want to look into making other parts of your facility like lighting, ventilation and motors more efficient too. When you do, you'll be joining thousands of organizations across Ontario who are already enjoying the savings that our programs deliver.

Take a look at their stories and our incentives at saveonenergy.ca/business



Dyson Airblade™ hand dryers work differently

In 1907, paper towels were introduced to washrooms. More than 40 years later the electric hand dryer was introduced, changing the way people washed their hands. However, since then hand dryer technology has changed very little. Machines use hot air to evaporate water from hands, some taking as long as 43 seconds to dry hands.

As a company of problem-solvers, Dyson engineers sought to solve the issue of ineffective hand dryers. Over the course of three years, a team of 125 engineers designed an entirely new type of hand dryer that dry hands effectively, hygienically and at a low cost to the environment. Dyson engineers created over 3,300 prototypes for the new Airblade™ hand dryers and subjected the machines to hundreds of tests, including simulated washing hands 213 million times.

Dyson Airblade™ hand dryers dry use three key technologies:

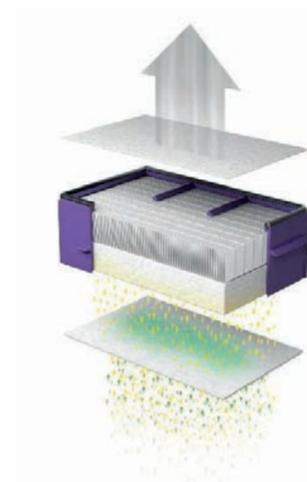


Dyson digital motor V4: Conventional motors are bulky, slow and can be inefficient. They also rely on carbon brushes, which wear out over time. The Dyson digital motor V4 sits at the heart of Airblade technology. One of the world's smallest fully integrated 1400W motors, it uses digital pulse technology to spin up to three times faster than a conventional motor.

HEPA filtration: Other hand dryers are unhygienic, drawing in dirty air and blowing it back onto hands. Dyson hand dryers use HEPA filters to remove 99.97 per cent of particles the size of bacteria and viruses, which are filtered out, so hands are dried with clean air.



Airblade™ technology: Dyson Airblade technology releases sheets of high velocity unheated air. Every second the Dyson digital motor draws in up to 9.25 gallons of air through the HEPA filter and travels out through apertures 0.8mm wide. The result is 675 kph sheets of air effectively scraping water from hands like a windshield wiper, leaving them completely dry in 12-14 seconds*.



Dyson offers a range of hand drying solutions, engineered for different restroom environments:

Dyson Airblade dB hand dryer: The Dyson Airblade dB hand dryer is 50 per cent quieter than the original Dyson Airblade™ hand dryer. Dyson acoustically re-engineered the hands-in dryer by reducing the sound of turbulence. Scallop-shaped apertures reduce air rush noise and Helmholtz silencers alter the level and quality of the sound produced by the digital motor. The hand dryer is approved by HACCP International for the use in the food and beverage industry.

Dyson Airblade V hand dryer : Dyson engineers have concentrated Airblade™ technology without compromising drying performance, hands are dry in 12 seconds*. The Airblade V hand dryer is 60 per cent smaller than the original Dyson Airblade™ hand dryer, protruding just four inches from the wall; it complies with the Americans with Disabilities Act without any additional recessing. With its innovative backplate, it can be mounted or removed from the wall quickly for low maintenance.

Dyson Airblade Tap hand dryer: The Dyson Airblade Tap hand dryer washes and dries hands at the sink. Sensors pinpoint hand positions and release water from the tap stem. Integrated circuitry computes the information and activates the Dyson digital motor, creating two high velocity sheets of air on the tap's branches. No waste water ends up on the floor and saves valuable wall and floor space.



C I E N

CANADIAN INDUSTRIAL EQUIPMENT NEWS

» Facilities



HVLS fans gently move warm air from the ceiling toward the floor.

PHOTO: RITE-HITE

Fans for WINTER

HVLS FANS CONTROL TEMPERATURE AND SAVE ENERGY

Facilities equipped with HVLS fans lower the burden on the heating system, reduce energy consumption and save money.

Winter is almost here, so get ready to turn up the HVAC system and fans. That's right: fans. As counter-intuitive as it may seem, high-volume, low-speed (HVLS) fans are even more important for temperature management during the cold weather months than in summer.

HVAC systems do an efficient job of providing heated or cooled air to specified areas of a building, but they don't optimize airflow – and, as every grade schooler knows, warm air rises. Thus,

there may be a significant temperature difference between floor-level and the ceiling in large, cavernous spaces. HVLS fans mitigate this problem by continuously mixing air through a process called destratification to provide more comfortable working environments while reducing energy use by as much as 30%.

During the heating season, there's often a difference of more than 11 degrees C between the floor and ceiling in most plants and warehouses. Typically, the air temperature will be 0.6 degrees C warm-

er for every 0.3 metres in height. A heating system must work hard for extended periods to maintain the temperature near the floor or at the thermostat set point, wasting precious energy and dollars.

HVLS ceiling fans mitigate the rising heat effect by gently moving the warm air near the ceiling toward the floor where it's needed. The air then moves horizontally a few feet above the floor and eventually rises to the ceiling where it's cycled downward again. This mixing effect, known as destratification, creates a more uniform air temperature with perhaps a single 0.6 degree C difference from floor to ceiling. Conventional high-

Continued on page 22

» Supply Lines



The Canadian Weidmuller team.

PHOTO: WEIDMULLER

40 YEARS IN MARKHAM

Weidmuller, a global manufacturer of industrial productivity products, celebrates 40 years in North America this year, which includes its Canadian headquarters in Markham, Ont.

Over four decades the Canadian office has grown from two employees to 45, plus 25 field reps. This year Weidmuller's growth continued with an expansion of the warehouse and assembly workstation areas.

UPS DISTRIBUTION EXTENDED

Riello UPS, a global manufacturer of uninterruptible power supplies (UPS) based in Dayton, Ohio, has extended its distribution partnership in Canada with Enviro-Energy, a division of Liaison Can/US Logistics Inc.

The provider of transport and logistics services for batteries and a critical power system integrator based in Lachine, Que. will assume responsibility for marketing and sales of three-phase UL-listed Riello UPS products. It will also help with all aspects of pre-sale and after-sale service, including commissioning and maintenance.

ASI GOES EXCLUSIVE

Wajax Industrial Components has been named the exclusive national distributor of Apparel Solutions International (ASI) safety clothing.

The FR and AR products, distributed under the Sirius Specialized Workwear brand, are produced at the ASI facility in Edmonton.

Wajax, based in Montreal, is an operating division of Wajax Corp.

FORKLIFT PLANT EXPANDS

Toyota Industrial Equipment Mfg. Inc., which manufactures forklifts in Columbus, Ind., is expanding its facility.

The \$16 million project includes a 50,600-square-foot addition, increasing the total facility to 1.1 million square feet of manufacturing and support space. The project also adds a two-story office building, a new cafeteria, a new storm shelter and locker room, plus expansion space for Toyota's on-site medical centre.

The new building will serve as headquarters for Toyota Material Handling North America.

Air movement

Continued from page 21

speed ceiling fans do not have this effect. By quickly spreading airflow away from the fan, little – if any – of that air reaches people working at the ground level.

Because HVLS fans are efficient, their return on initial investment often ranges from six months to two years. Payback varies according to a number of application variables, but winter energy savings are substantial. Users can reduce their heating bills by 20% to 30%.

Based on 22,000 square-foot building with 30-foot ceilings a 12 degree C set point and natural gas at \$0.11 per cubic foot, winter energy savings in Edmonton are \$3,620 and \$2,485 in Toronto.

There are a number of factors to consider when deciding how and when to use HVLS fans. They include obstructions such as pallet racks, machinery and product staging; personnel work areas; and overall building layout. Larger diameter fans will move air further down rack aisles and over obstructions. Smaller diameter fans are most effective in specific work areas, or where installation space is limited.

Performance factors

Suppliers can help configure an array of fans and determine the number, size and locations that provide the maximum benefit for the investment. They also offer turnkey installation where on-site resources are not available. Fan design and performance are key considerations. There are significant differences between manufacturers, including the shape and number of blades, blade tilt, hub construction, blade-to-hub connection and safety features. The performance of different designs will vary in the uniformity of air movement directly below the fan, as well as the height and reach of air movement outward from the fan's diameter.



Rite-Hite's Fan Commander touch-screen control station.

PHOTO: RITE-HITE

Other important considerations include ease of installation, fan controls, local representative support, trial program availability and warranties.

HVLS fans are getting more attention as a practical way to improve air movement and enhance environmental control. Additionally, recent technical advancements make them more attractive. Some fans more than 7 metres in diameter provide maximum air circulation in expansive areas, while touchscreen control stations operate up to 18 fans at once. These types of fans are now recognized as a valuable supplement to help facility designers and engineers control energy costs, and improve employee comfort and productivity. But capitalizing on the advantages of these fans requires careful analysis of each application, and the most suitable fan design.

This is an edited version of an article provided by Rite-Hite, a manufacturer of industrial fans, dock equipment, industrial doors and safety barriers based in Milwaukee, Wis.

Comments? E-mail jterrett@plant.ca.

TRENDING...

Cool gadgets, gear and the latest industry apps

THIS PC IS TOUGH

The IP65-rated XSLATE B10 10-.1-in. tablet from Xplore Technologies Corp. (www.xploretech.com), a manufacturer of rugged PCs based in Austin, Tex., will take some rough handling on the plant floor or in the field. It has plenty of connectivity options with eight ports, four of them sealed from behind, including Power, True Serial, (2) USB 3.0, microSD, micro-HDMI, microSIM, Audio and RJ-45 gigabit ethernet.

It has an IntelCore i5 CPU (or upgrade to a i7 vPro) for top processing speeds; an 8-megapixel rear and 2-megapixel front camera; Wacom pen digitizer and active pen; an xCapture Pro camera application; an optional integrated barcode scanner; and the battery is good for about 20 hours.

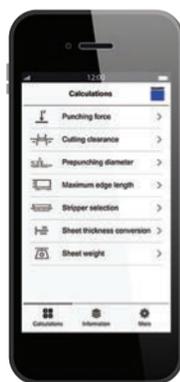


ZERO IN ON COMPRESSED AIR WASTE

Compressed air can be a major energy waster. Festo's MS6-E2M energy efficiency service module seeks out and reports anomalies that suggest leaks in the machine or piping. The automation provider (with Canadian offices in Mississauga, Ont.) says leaks detected between production runs can be fixed before too much air and energy are wasted. And measured values for flow rate, air consumption and pressure are called up any time to determine past performance; production batch requirements; whether the pressure is correctly adjusted; and pressure/flow rate status when a machine breaks down.

RUGGED INVENTORY SCANNING

The HC1 2D from Wasp Barcode Technologies (www.waspbarcode.com/mobile-computers) tracks inventory in tough manufacturing settings. It scans 1D or 2D barcodes using the integrated laser scan engine and provides instant data downloads to PCs. The Plano, Tex. tech company has provided a QWERTY keypad as a productivity enhancer with a 3.8-in. colour LCD screen that handles dual applications. The wireless-enabled unit is powered by a 1 Ghz T1 processor with a Windows Embedded Handheld 6.5 operating system.



APP EASES PUNCHING PARAMETER CALCULATIONS

PunchGuide from Trumpf, a global manufacturer of metal processing equipment (www.trumpf.com) makes it easier to calculate punching parameters. The free app for smartphones and tablet PCs supports a variety of calculations including punching force, cutting clearance, pre-punching diameters, maximum edge length, stripper selection, and calculations for sheet metal thickness conversion and sheet weight. Operators specify metric or inches and store data for their own machines for future use.

ADD DIMENSION TO YOUR TOOLING

GF Machining Solutions, based in Lincolnshire, Ill. (www.gfms.com/us), has collaborated with EOS to create an additive manufacturing tooling system for moulders and die manufacturers. The AgieCharmilles AM S 290, based on the EOS M 290 metal laser sintering system, moves thermal exchange closer to the surface of a mould, improving temperature homogeneity to reduce throughput times and increase part quality. There are also energy savings and the system opens the door for programmers to improve part designs through conformal cooling and heating channels.



Automation

CR-35IA HANDLES THE HEAVY LIFTING

FANUC America Corp.'s 35 kg, six-axis CR-35iA robot works safely alongside humans so there's no need for fences. A soft foam green cover, a contrast to FANUC's standard yellow, protects workers who are in direct contact with the robot.

It handles heavy lifting or repetitive manual tasks to prevent workers from sustaining strain injuries. It's certified to meet ISO 10218-1:2011 requirements and handles a variety of applications such as machine tending, heavy payloads that require lift assist devices or custom equipment, higher payload mechanical assembly, palletizing or packing, and tote or carton handling.

FANUC America, a manufacturer of robotics, is based in Rochester Hills, Mich.

<http://robot.fanucamerica.com>



Green cover protects workers.



Two grit sizes.

PREP SURFACES WITH PRECISION

Guyson Corp.'s robotic blast system has an extended lance nozzle for precision grit blasting and surface prep of industrial gas turbine components.

A Fanuc M-710iC robot is the lance manipulator operating in an expanded process chamber with a servomotor-driven rotary table that's controlled as an auxiliary axis of robotic motion.

The blasting enclosure has an added rear vestibule to accommodate full movement of the pressure-blast lance as the robot follows the tool path required for coverage of complex-shaped internal surfaces, constantly maintaining the correct nozzle angle, offset and surface speed.

An enhanced media reclamation and delivery system for two grit sizes includes a separate cyclone separator, classifier and pressure pot for each.

Change-over takes less than five minutes, and the selected media, as well as the status of all valves and elements of the delivery system, is automatically detected and displayed at the touch screen human-machine interface.

A 500-pound-capacity jib hoist is mounted over the crane slot in the roof of the blast cabinet for the safe and convenient loading of heavy work pieces. Interchangeable fixtures with locator pins and quick-change hardware secure the work in the correct position for repeatable robotic blasting.

Guyson, based in Saratoga Springs, NY, is a manufacturer of surface finishing, parts-washing and advanced robotic machines.

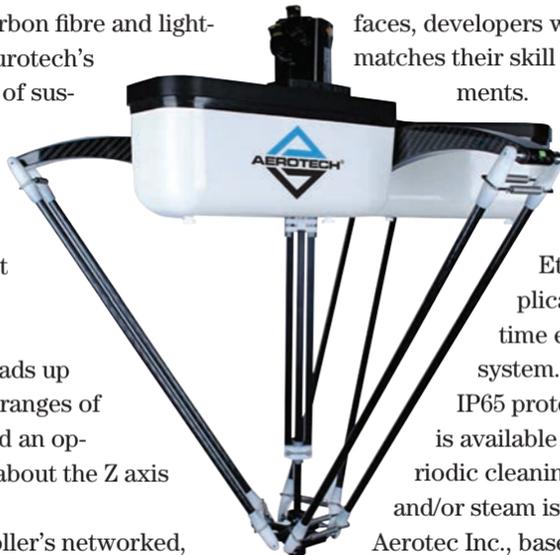
www.guyson.com

SUPER FAST PICK AND PLACE

Making extensive use of carbon fibre and light-weight aluminum makes Aerotech's RCP-DELTA robot capable of sustaining 200 pick-and-place operations per minute with peak acceleration at 15 g. With absolute encoders on each motor the robot never has to be referenced, even after a loss of power.

Four models support payloads up to 3 kg, with X/Y operating ranges of 500/800/1,100/1,300 mm, and an optional continuous rotation about the Z axis (yaw).

Its A3200 machine controller's networked, distributed architecture provides a scalable platform to integrate additional robots, I/O and positioning devices. Thanks to multiple programming inter-



Supports payloads up to 3 kg.

faces, developers work in the environment that matches their skill sets or application requirements.

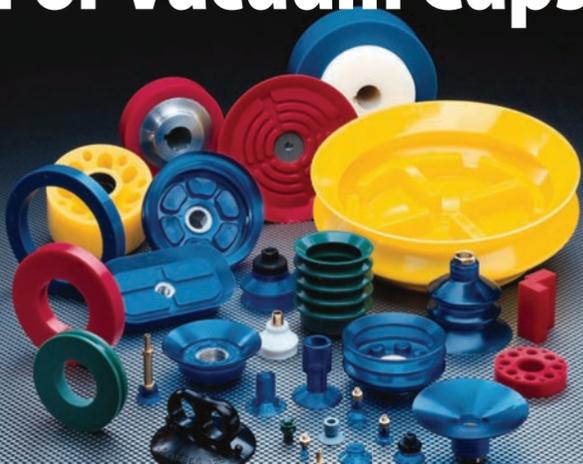
External sensors are supported with industry standard fieldbuses (EtherCAT, Modbus TCP, Ethernet/IP and others) or applications operating in the real-time enabled Windows operating system.

IP65 protection is standard and IP69K is available for applications where periodic cleaning with high-pressure water and/or steam is required.

Aerotec Inc., based in Pittsburgh, manufactures motion control, positioning tables/stages and positioning systems for industry.

www.aerotech.com

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AUTOMATION



Quick access to components.

AUTOMATED PALLETIZERS GET AN UPGRADE

Intelligrated's 890i and 891i palletizer models have been upgraded to include technological advancements that make the machines easier to operate and maintain, improve safety and provide options for increased capacity.

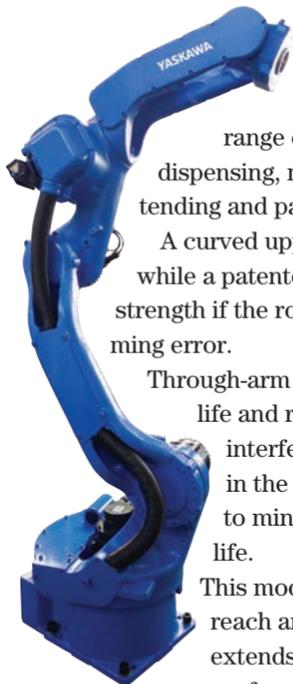
Operators can create new load configurations through a 10-in. colour touch-screen interface while capitalizing on standard features such as automatic layer-centring compression dams and package stops that relocate or install in minutes.

The primary difference between the models is capacity. The 891i features a level, non-pitched layer accumulation table as a buffering mechanism for a throughput rate of more than 60 cases per minute, while the 890i achieves a nominal rate of up to 45 cases per minute. Servo technology is available to further increase capacity or facilitate automatic changeover.

Covers and guards are easy to handle and remove for quick access to components that may require adjustment or replacement through the system lifecycle. The updated design also prioritizes safety with an automatic air dump to avoid trapped energy, standard high-voltage arc flash protection, remote power disconnect, interlocked access gates, taller safety fences and a muted light curtain system for pallet discharge.

Intelligrated is a manufacturer of automated material handling machinery and systems based in Mason, Ohio. www.intelligrated.com

VERSATILE ROBOTIC HANDLING



The MH24 six-axis robot from Yaskawa Motoman performs a range of duties, including assembly, dispensing, material handling, machine tending and packaging.

A curved upper arm enhances its reach, while a patented double yoke provides added strength if the robot crashes due to a programming error.

Through-arm routing ensures longer cable life and reduces the risk of snagging or interference. A 50-mm through-hole in the upper arm creates ample space to minimize wear and maximize cable life.

This model has a 1,730-mm horizontal reach and a large work envelope that extends behind the robot, permitting space for robot tool storage or maintenance. The payload has been increased to 24 kg, with higher moment

of inertia ratings than previous payload class models.

There are brakes on all axes and the robot installs on the floor or wall.

There's also a smaller (12 kg) model (MH12).

Motoman Robotics is a division of Yaskawa America Inc. in Dayton, Ohio. www.motoman.com

TURN UP THE MACHINING VOLUME

Absolute Machine Tools FV vertical, single- and twin-spindle machining centres by Tongtai provide fast automation in high-volume production.

The fixed twin-spindle type processes two individual

machining tasks simultaneously. With the addition of an A-axis trunnion table, the FV series instantly becomes a horizontal machining centre, offering two machines in one to reduce floor space and additional machinery costs.

The automatic pallet changer (APC), standard on all machines, changes pallets in as fast as four seconds. The APC is built with triple-point clamping and supporting stability and high quality part surface finishes.

The planetary gear is preferred over a worm-gear type because it provides better position accuracy, zero backlash, long-term durability, and noticeable reduction in overall shop noise.



Pallet changes in four seconds.

The APC is driven by servo motors rather than by the traditional hydraulics to save on energy and maintenance costs. Optional built-in tilt rotary tables or built-in tilt fixtures turn this machine into a 5-sided or 5-axis machining centre. The C-axis rotary table option has a table size of 350 mm for single-spindle or 220 mm for twin-spindle models, both with a 360-degree stroke. The A-axis trunnion rotary table design has a stroke of -30 to 180 degrees for both single and twin models.

The automatic tool changer has a built-in carousel. Based on the tool's position, the FV determines whether to move the spindle or the tool magazine to shorten change time.

Tool capacity is 24 single-spindle or 48 for twin-type with an optional 84-tool magazine. Tool to tool change time, whether retrieved by the spindle or the magazine, is 1.2 seconds.

Absolute Machine Tools is based in Lorain, Ohio. [http://absolutemachine.com](http://www.absolutemachine.com)



20 cycles per minute.

CASE PACKER OPERATES 24/7

Standard-Knapp's 949 Tandem Pic-N-Place handles speed up to 20 cycles per minute for both partitioned and partition-less RSC case packing and operates 24/7.

A two-axis, servo-controlled delta robot enhances precision control of two cases of product through the entire pick and place motion. The machine packs to the last case without operator intervention.

The speed and distance that the product travels into the case is precisely controlled.

A user-friendly HMI touch-screen panel and adjustable lowering heads easily change over multiple product types and sizes.

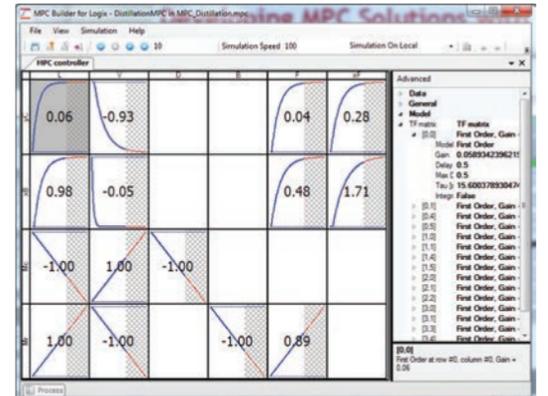
Standard-Knapp is a manufacturer of packing machinery based in Portland, Conn.

www.standard-knapp.com

MAX PERFORMANCE WITH PLANTPAX

Rockwell Automation's PlantPAX predictive control (MPC) software now embeds fully functional MPC technology into Logix controllers to help maximize equipment performance.

When used in process applications, it improves overall control in a single machine or an entire line to help



Control in a single machine.

maximize throughput, increase yield, reduce quality variability and improve energy usage.

PlantPAX MPC is included in the latest release of the PlantPAX modern distributed control system. It simplifies integration and delivers several performance advantages over single-loop PID controllers. These include better multivariable coordination, predictable handling of outside disturbances, improved management of long or complex processes and predictive response to process constraints.

Rockwell Automation Inc., based in Milwaukee, Wis., is a provider of automation systems.

www.rockwellautomation.com

SAFE ROBOTIC CABLE RETRACTION WITHOUT LOOPING



Mounts close to the robot.

Igus has developed a lightweight, automatic retraction system for cables and hoses.

Triflex RSE prevents looping of the cable carrier, ensuring the safe supply of power, data and media to the end of a robotic arm.

The lightweight system is based around self-lubricating, maintenance-free DryLin linear bearings.

A moving carriage guides the cable carrier, allowing for a retraction stroke of up to 23.6 in., while a durable elastic cord automatically retracts any excess slack, preventing loop formation within the system.

The low profile RSE has integrated adjustable attachment plates for mounting close to the robot.

Igus, based in East Providence, RI, is a supplier of cable carriers, motion cables, linear bearings and linear guides, plastic bushings and spherical bearings.

www.igus.com

INPUT MODULES DIGITIZE STRAIN GAUGE SIGNALS



Precise measurement.

B&R Automation has added two analogue input modules to its X20 I/O series that digitize signals from strain gauges to cut equipment costs and control cabinet space.

The X20AIA744 and X20AIB744 work with 4-wire strain gauge load cells, and compensation in the measurement system eliminates absolute uncertainty in the measurement circuit, such as component tolerances, effective bridge voltage or zero offset.

Both modules have 24-bit converter resolution.

B&R is a developer of automation and motion control technologies based in Atlanta.

www.br-automation.com

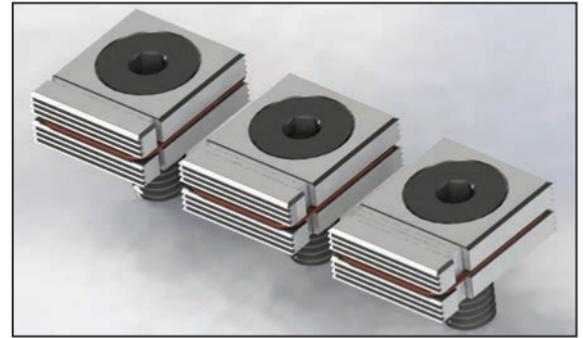
Expand Your Clamping Action With The All-New Modular Series From Tiny Vise®

Patented Tiny Vise® edge clamps from Carr Lane Manufacturing offer strong clamping action in a mini size. Ideal for fixturing small parts, the unique clamps grip the side of a workpiece to keep the top clear for machining.

This latest version incorporates a modular jaw design for greater adjustability. The new modular system allows adjusting your workpiece engagement point by adding or removing spacers. This is useful when using the same fixture for machining a family of parts, or when workpiece size can vary somewhat between batches.

Up to three spacers can be inserted to provide adjustment of up to 3/16 of an inch. The modular jaw assembly is held together securely by a tough, durable O-ring, recessed in a protective groove.

Other variations of the Tiny Vise® include a standard version; double edge version, for clamping two workpieces at the same time; a v jaw version for clamping round workpieces; and a double v jaw style.



Tiny Vise® edge clamps are ideal for fixturing small parts, gripping the side of your workpiece to keep the top clear for machining. The new M-series allows adjustment by adding spacers, which is perfect when workpiece sizes vary.

Carr Lane Mfg. Co.

See "New Items" in the online catalogue at carrlane.com



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.



ID CLAMPS FOR 5-SIDE ACCESS

Self-Centering ID Clamps locate and clamp at once from inside a slot in the part, leaving outer surface clear for machining. In seven sizes, ID Clamps allow multiple-part machining on vertical and horizontal machining centers.

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



CARR LOCK® FOR FAST FIXTURING

Accurately locate and clamp at the same time, with just the twist of a hex wrench, when mounting quick-change tooling on a subplate. Entirely made in the USA, the Carr Lock® System consists of a clamp, a liner bushing and a receiver bushing.

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

New Corrosion-Resistant Swivel Hoist Rings

New swivel hoist rings from Carr Lane Manufacturing have an electroless nickel plating that is ideal for many corrosive and outdoor environments.



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CERTIFIED

Carr Lane Manufacturing offers over 20 different types of pivoting, swivel, and side-pull hoist rings, from economical, low profile versions to load capacities up to 250,000 lbs.

Get more information by clicking on "hoist rings" in the online catalogue at CarrLane.com.

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POWER CONVERSION



1,500 VDC input/output isolation.

CONVERTERS FIT IN TIGHT SPACES

MicroPower Direct's ML100SE 1 W DC/DC converters handle board level power distribution applications that require small size, automated assembly and low cost.

Eighteen models operate with 3.3, 5, 12, 15 and 24 VDC inputs and single outputs. Standard features include input/output isolation of 1,500 VDC, high efficiency and continuous short circuit protection.

All models are RoHS compliant and packaged in a miniature SMT case with an industry standard pin out. They are available on tape/reel for use with automated production equipment.

Operating temperatures range from -40

to 105 degrees C without heat sinking. Cooling is by free-air convection.

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

www.micropowerdirect.com

HEATERS

ECO-HEAT MAXIMIZES DIESEL ENGINE PERFORMANCE

Watlow's ECO-HEAT exhaust gas heating system eliminates problems under low generator load conditions, including increased engine back pressure due to excessive soot loading, poor NOx conversion and fouled EGR valves.

The system works as an internal load bank in medium stationary and mobile diesel generator applications. It installs in the exhaust pipe and provides heat directly where it's needed within the after-treatment system.

Using electricity from the generator, it



Eliminates low generator load problems.

raises the engine load and heats the exhaust directly to save space and energy.

If generator load demand increases, the system gradually reduces its load and thermal output, and shuts off as soon as exhaust gas temperatures reach acceptable levels.

Watlow is a manufacturer of industrial heaters and temperature sensors based in St. Louis.

www.watlow.com

CONNECTORS

CONNECTORS HANDLE HIGH VIBRATIONS, SHOCK LOADS

Binder-USA has added a crimp style cable connector to its M12 product line. It withstands vibration more effectively than screw and solder terminated connectors for acute working conditions and high motion applications.

Crimping guarantees a secure connection with high vibration and shock loads. Contact resistance is low with the gas-tight pin connection, even under extreme loads.

Male and female gold-turned contacts are available separately and accept wires between 22 and 20 AWG. A synthetic slider is included in the female cable connector to help hold the contacts during assembly.

The connectors are available in A- and B-coding and shielded with an iris spring. A-coded units are also available in a non-shielded version.

When fully mated, all connections are rated IP67 to protect against fluid and degree ingress. Rated at 4 A per contact and 250 V, the connectors handle cable diameters ranging from 4 to 6 mm and 5 to 8 mm.

Binder is a subsidiary of Franz Binder GmbH & Co., a German-based designer



Accepts wires between 22 and 20 AWG.

and manufacturer of circular connectors and cordsets, based in Camarillo, Calif.

www.binder-usa.com

VISION



Robot and camera relay data.

3D INSPECTION FOR LARGE COMPONENTS

Microscan's UR5 robotic arm and Vision HAWK Smart Camera solve complicated inline inspection applications simply and safely.

This turnkey system provides final quality inspection of large components such as automotive engines or large electronic sub-assemblies where multi-point inspection of the part is required in three dimensions.

The UR5 system uses one machine vision camera communicating with the robot and navigating to the inspection points on all sides of the component.

Inspection locations are communicated by SKU read from a component on the manufacturing line. This SKU initiates a machine vision job on the Vision HAWK containing all of the prescribed steps for that component.

As the UR5 robotic arm moves to the correct position, a command is sent to the camera for the correct sub-inspection to perform. The system keeps track of the results and this collective pass/fail data is combined into an overall quality report.

The system performs new sets of inspections as components come down the line based on their unique SKUs. This modular process ensures automated quality control is incorporated without downtime on the line.

Microscan is a provider of barcode, machine vision and lighting solutions based in Renton, Wash.

www.microscan.com



IT'S OUR FIRST DV SYSTEMS AIR COMPRESSOR, BUT IT WON'T BE OUR LAST!

ALBERT HOOGENDOORN, PRESIDENT, TRIPLE H CONCRETE PRODUCTS

When we asked **Albert Hoogendoorn, President of Triple H Concrete Products**, a 30,000 Sq. Ft. State-of-the-Art Facility just outside of London, Ontario what he thought about his DV Systems air compressor, he was happy to say that it delivers all the air they need to power their plant efficiently & reliably 24/7.

DVCOMPRESSORS.COM



BUILT BETTER



WORKHOLDING

LATHE CHUCK KEEPS WORKPIECES CENTRED

Schunk's ROTA NCS power lathe chuck is equipped with an active pull-down action on the jaws to enhance external and internal clamping applications.

The unit is available as a three- or six-jaw chuck. The six-jaw version has a pendulum mechanism that keeps the workpiece centered between six contact points and adjusted in pairs for high-volume horizontal and vertical casting applications.

Changing the master jaws is easy, and the top jaw interface is standard for flexibility. The unit is maintenance-free thanks to a hermetically sealed body that protects against dirt and chips.

Schunk is a manufacturer of clamping and machining technologies based in Lauffen am Neckar, Germany. It has Canadian operations in Mississauga, Ont.



Six clamping points.

www.schunk.com

IMAGER CAPTURES THERMAL ANOMOLIES

Saelig Co. Inc.'s THT45 thermal imager is equipped with a bright 2.8 in. colour LCD display and a measurement update frequency of 50 Hz for infrared non-contact temperature measurement from -20 to 350 degrees C.

The imagers detect thermal issues caused by problems in electrical, mechanical and hydraulic systems; air conditioning; automotive manufacturing; and predictive maintenance.

Each IR pixel in the 80 x 80 array collects temperature information to create a two-dimensional thermal image. The unit also contains a perfectly-aligned 1.3 megapixel video camera that accurately focuses picture-in-picture fusion of visible and infrared images to simplify the detection and analysis of temperature-related issues.

There's a 32-times electronic zoom, and the still or video images are stored via microSD or USB2.0. The USB or HDMI connector are used to simultaneously display images externally. A built-in laser pointer locates temperature faults.

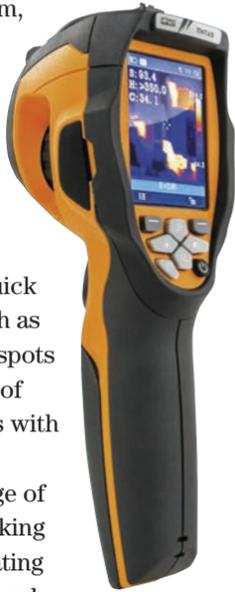
Pushbutton controls access an easy-to-use drop-down menu for quick access to all camera functions, such as automatic detection of hot or cold spots in the image. Analysis and printing of images using the PC software helps with writing reports.

The THT45 provides a video image of the target and its surroundings, making it easier for users to locate overheating components on a printed circuit board.

The lightweight unit's thermal sensitivity at 30 degrees C is 0.1 degrees C, and it has a minimum focal distance of 20 in.

Saelig is a distributor of test and measurement equipment based in Rochester, NY.

www.saelig.com



Minimum focal distance of 20 in.

PUMPS

PUMPS HANDLE NON-CORROSIVE WATER CONDITIONS

KSB's Etaline R pumps combine the reliable, low-maintenance features of the company's Eta family of single-stage centrifugal pumps with an inline design ideal for pressure boosting duties in HVAC systems, cooling circuits, water supply and industrial heat recovery systems.

They come in five sizes for diameters from 150 to 350 mm. A variety of casing and impeller materials and seal types adapt the pumps to a range of non-corrosive water conditions or other pumped media at temperatures as high as 140 degrees C.

Maximum flow rate is 1,900 cbm, with heads of up to 97 m. The inline layout takes up less space than equivalent baseplate-mounted pumps.

KSB Pumps Inc., based in Mississauga, Ont., is a member of the KSB Group, a global pump and valve manufacturer.

www.ksb.ca

PUMPS PASS LARGE SOLIDS EASILY

Wilden Pump and Engineering's Brahma advanced metal AODD pump powered by the energy-efficient Pro-Flo SHIFT Air Distribution System (ADS) handle the passage of large solids in tough applications.

The bolted metal pumps incorporate flap valves and a unique top inlet with bottom discharge orientation capable of passing solids up to 76 mm in diameter, while preventing damage from product entrapment and settling of solids in intermittent-duty applications.



Flap valves prevent damage.

Brahma pumps are also equipped with Wilden's Pro-Flo SHIFT ADS, which incorporates an air control spool. It automatically restricts the amount of air going into the pump during the latter part of each stroke to eliminate over-filling in the air chamber, and it reduces air consumption, which cuts energy use and operating costs.

The pump manufacturer based in Grand Terrace, Calif., claims AODDs achieve up to 60% savings over competitive technologies and handle harsh operating environments.

The AODDs, made from aluminum or ductile iron, are available in two sizes (PS810-51 mm and PS1510-76 mm). They're submersible, self-priming and shear-sensitive. Pressure handling capabilities are up to 125 psig.

Maximum flow rates are 640 lpm (169 gpm) for the PS810 and 882 lpm (233 gpm) for the PS1510. Diaphragms are available in Buna-N and Neoprene.

www.psgdover.com/en/wilden

TEST AND MEASUREMENT

MACHINE VERIFICATION IN REAL TIME

4B Components Ltd.'s SpeedMaster diagnostic tool with Pulse Pilot provides independent and real time verification of an entire speed monitoring system that keeps alarms and shutdowns working as expected.

Input mode provides the device with the machine's actual running speed, and an output mode tests the speed switch at set underspeed trip points for real time verification.

There's no need to remove the sensor from the machine shaft or change any system connections. Maintenance and safety personnel quickly test speed switches during periodic inspections.

The unit also complies with insurance audits and OSHA 29 CFR 1910.272 requirements.

An ergonomic housing makes the unit easier to handle, even with bulky work gloves. And an OLED display uses less battery power, providing a brighter display to ease viewing in sunny conditions.

4B is a manufacturer of material handling components based in Leeds, UK.

www.go4b.com



Two operating modes.

BOA2 DETECTS SMALLER DEFECTS

Teledyne DALSA's next generation BOA2 smart camera captures defects that are difficult to resolve or are lost with lower resolution imagers. It delivers more pixels, power and greater integration flexibility for automating parts and assembly inspection with higher resolution imaging (2, 3 or 5 megapixels), dual-core processing and embedded iNspec Express application software.

For very high-speed applications, the CMOS sensor format can be changed to achieve inspection rates of up to 80 parts per second.

The sensor supports standard C-mount lenses, which, together with the optional LED light, enclose within a protective cover to safeguard against accidental damage or tampering.

The BOA2 is rated for use in harsh industrial environments and provides several mounting options on the front, back and side surfaces.

A high performance, 1.5 GHz dual core processing engine executes user configured solutions.

System memory includes 2 GB of solution storage and 1 GB of program memory.

The embedded iNspec Express application software supports standard factory protocols, such as EthernetIP, Profinet and Modbus. The physical interfaces include Gigabit Ethernet, RS-232 serial, opto-isolated inputs and outputs.

Teledyne DALSA is a manufacturer of high performance digital imaging and semiconductors based in Waterloo, Ont.

www.teledynedalsa.com



Autonomous inspection.

New e-chains[®]
Moving Energy
Even Easier

Lightweight, highly dynamic and cost effective:
E4-1 light and R4-1 light tube

igus Energy Chains[®]
www.igus.com/echains

FLUID TECHNOLOGY



Accepts 1/2 in. NPT electrical connectors.

CIRCULATORS WIRE QUICKLY AND EASILY

Armstrong Fluid Technology has enhanced its Astro wet-rotor circulators, including a larger wiring box for easier access and faster wiring on the 220, 225, 230 and 250 Series units.

A larger 3 x 4.25-in. box includes a threaded connection to accept 1/2 in. NPT electrical connectors directly. The identical wiring box is also used on larger capacity Astro models.

The circulators use Noryl impellers, which the company says are field-proven in a variety of applications.

Armstrong is a manufacturer of fluid technologies based in Toronto.

www.armstrongfluidtechnology.com

SHAFT COVERS

Made of T304 stainless steel.



COLLARS COVER WASHDOWN APPLICATIONS

ReliaMark has expanded its washdown product line with stainless steel shaft collars.

Distributed by Kaman Industrial Technologies Corp., collars come off-the-shelf in more than 100 of the most common sizes, ranging from 1/8- to 3-in. Manufactured in T304 using stainless steel, the line includes solid set-screw collars, one-piece (single-split) and two-piece (double-split) collars with socket head cap screws.

Use them in a wide range of washdown applications on hard and soft shafts.

Bore tolerances range from +.004/+ .000 up to 3 in.

ReliaMark is a manufacturer of power transmission products. Kaman is based in Bloomfield, Conn.

www.kaman.com

WELDING

WELDER KEEPS UP BEAD APPEARANCES

The Square Wave TIG 200 welding machine from Lincoln Electric performs AC TIG and stick welding on aluminum and DC TIG welding on steel, stainless and chrome-moly where precision and bead appearance are critical.

Users can switch to stick welding for thicker materials or working outdoors. The unit combines an easy-to-use interface for fast set up with built-in advanced features.

A pulsed TIG feature provides a drum-beat-like rhythm for filler metal deposition. AC frequency control adjusts the machine for a wider or more narrow arc profile when TIG welding on aluminum.

Adjustable AC balance provides more cleaning action on aged aluminum and maximizes penetration on thicker aluminum materials.

The portable machine plugs into standard 120 or 230 V input circuits and weighs only 46 lb. TIG output range is 10-200 A when operating on a 230 V input, and 10-125 A when operating on the 120 V input.

Stick output range is 10-170 A when operating at 230 V, and 10-90 A when



Stick output range is 10-170 A.

operating on 120 V input.

Accessories include a foot amptrol, regulator/flowmeter with gas hose, stick electrode holder, ground clamp and power input cables.

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

www.lincolnelectric.com

POWER INDUCTION



Enhanced energy storage.

INDUCTORS ELIMINATE FLUX LEAKAGE

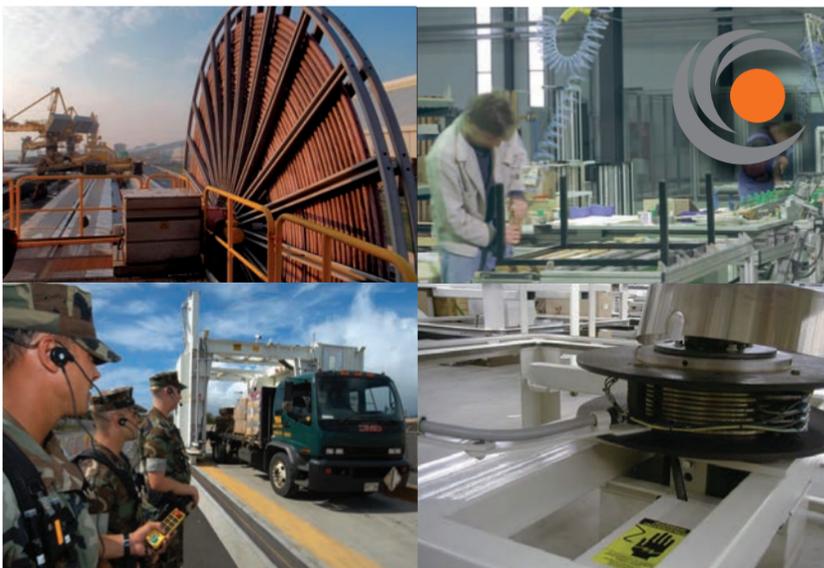
Pulse Electronics Corp.'s ultra low profile SMT shielded inductors for compact point-of-load and mobile devices have core geometries and construction for high currents that won't allow radiated magnetic fields to interfere with associated components.

There's no flux leakage and the ultra-low-profile design has a metalized core termination that boosts shock resistance without impacting the height of the part.

The inductors come in EIA standardized tape-and-reel packaging.

Pulse Electronics is a manufacturer of industrial electronics in San Diego, Calif.

www.pulseelectronics.com



High-Performance Energy and Data Transmission Systems

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Events

2016 AHR EXPO International Exposition Jan. 25-27, Orlando, Fla.

The international heating, ventilation, air conditioning and refrigeration gathering featuring more than 2,000 exhibitors, plus education sessions. Visit www.ahrexpo.com.

CCOHS Forum 2016 CCOHS Feb. 29-March 1, Vancouver

A two-day national event that brings together subject experts, workers, employer and governments to share their knowledge and experience around current and emerging health and safety issues. Visit www.ccohs.ca.

FABTECH Canada SME March 22-24, Toronto

For businesses that specialize in fabricating, metal forming, welding, and/or finishing. Visit <http://fabtechcanada.com>.

Reliability 2.0 Reliabilityweb.com April 11-15, Las Vegas

RELIABILITY and Solutions educational and networking conference for maintenance reliability and asset management professionals features innovative strategies for plant reliability practices. Visit www.reliabilityconference.com.

Energy Summit 2016 EMC/NRCAN May 17-18, Niagara Falls, Ont.

This two-day event brings together Canada's leading energy subject matter experts, industry leaders and energy efficiency suppliers, to share best practices and the latest innovations in industrial energy efficiency. Visit www.emccanada.org.

RAPID SME May 16-19, Orlando, Fla.

Presented by SME, the RAPID conference and exhibition covers 3D printing, scanning, and additive manufacturing. Visit www.rapid3devent.com.

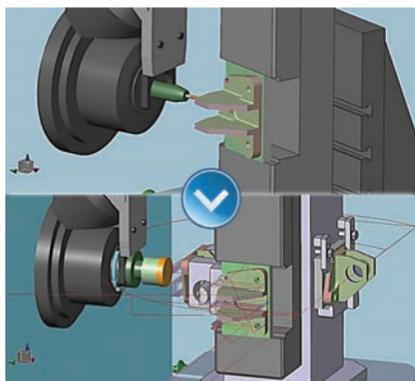
EASA 2016 Convention and Exhibition ESA June 12-14, Toronto

This event provides educational sessions that cover technical, sales, marketing and management in the business services, environment and waste management industries. Visit www.easa.com/convention.

ISCEA Supply Chain Technology Conference and Expo ISCEA July 19-21, Chicago

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

» Plantware



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SOFTWARE STREAMLINES CNC PROGRAMMING

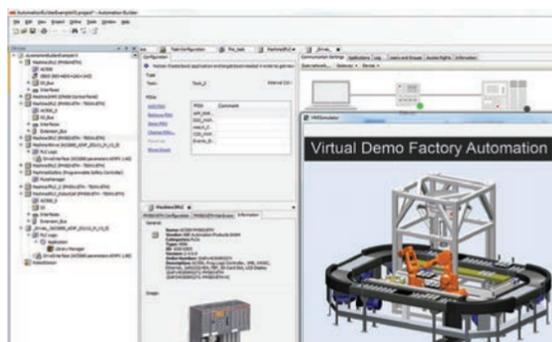
SPRING Technologies' NCSIMUL CAM software delivers agile and native CNC programming to streamline the serial and iterative CAM process and provides flexibility on the shop floor.

It eliminates errors while reducing programming time but enables the generation of programs made for the part rather than programming the part for the machine.

NCSIMUL CAM works on existing G-Code based programs as well as CAM data inputs and for redesigning new manufacturing processes in a few clicks. Coupled with "on-the-fly" native CNC code generation capability, self-verifying and self-optimizing, users reprogram new target CNC machines in one click.

SPRING Technologies is a CNC software developer based in Boston.

www.springplm.com



Extends data exchange capabilities.

SOFTWARE DELIVERS NEXT-LEVEL PRODUCTIVITY

ABB's Automation Builder 1.1 integrated development toolsuite enhances the speed and efficiency of industrial control and machinery automation projects by providing an environment that leverages a full spectrum of components.

The software, which combines information from PLCs, motion controllers, drives, robots and HMIs, extends data exchange capabilities with electrical planning and engineering software and a bi-directional interface to the EPLAN Electric P8. Electrical automation and PLC design data is imported, modified and transferred back to the electrical CAD environment to eliminate manual data entry. The system also ensures signal identification synchronization.

A comparison function allows engineers to see what might have changed since they last looked at a project and use profiles of previous development tool versions for compatibility.

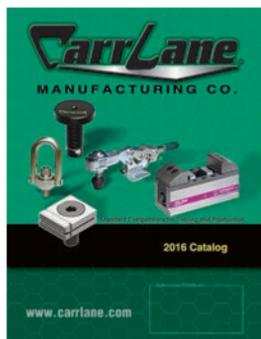
A premium version incorporates C/C+ programming tools and E-CAD interfaces for optimal productivity, easy collaboration and simpler data management on large-scale projects involving thousands of I/O points.

The software provides powerful PLC development resources in the standards-compliant IEC 61131-3 environment, and ABB's Panel Builder tool for creating HMIs. It also includes tools for configuring and programming the latest generation of ABB's safety PLCs, the RobotStudio tool for simulating and programming ABB robot applications, and the Mint WorkBench tool for servo drives.

ABB is a developer of power and automation technologies based in Zurich, with Canadian operations in Lachine, Que.

www.abb.com/plc

TOOLING AND FIXTURING



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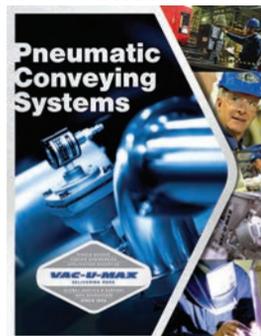
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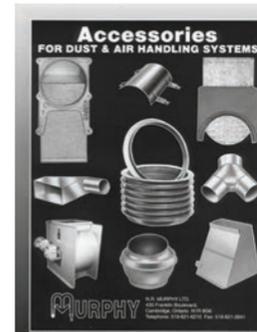
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Vi-Cas Manufacturing

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Counting on US consumers for growth

BY JOCK FINLAYSON

Prime Minister Justin Trudeau and his Liberal colleagues have reason to worry about the macroeconomic picture, but good news south of the border could have a ripple effect in Canada.

Several forecasters, including the Bank of Canada, have (again) downgraded their growth projections for the Canadian economy as the international outlook continues to disappoint.

The world oil price collapse, in tandem with the downturn in many other com-

“With improvements in labour and housing markets, the conditions are set for US household formation to rebound...”

modity markets, has hammered Canada’s resource-centric economy. That triggered a sharp fall in trade, and brought on job and capital spending cuts in the energy and mining industries, as well as many of the service sectors that supply them. It’s hard for commodity producers to see much light at the end of the tunnel. For Canada, mustering an annual growth rate of even 2% (after inflation) may prove to be a formidable challenge, particularly

given that apart from low commodity prices our economy will also be held back by record levels of household indebtedness and stretched housing valuations.

How Canada fares through 2016-17 will hinge, in large part, on developments in the US. Although America has also lost a step at a time of choppy world growth, there is an underlying momentum that should keep its economy on a solid, if unspectacular, expansion trajectory.

Armed with a more competitive exchange rate and a host of domestic industries hungrily looking beyond our own somnolent market for new business, Canada stands to benefit as the giant US\$18-trillion economy chugs along.

The role of American consumers in driving global demand should not be underestimated. The US still accounts for 22% of all global economic activity, most coming from consumption spending, plus investment in residential construction, both of which remain strong.

Low inflation and falling energy prices are boosting the real incomes of many households. Unlike Canada, the US is a net beneficiary of slumping commodity prices. The labour market looks poised to add a net 1.6 million jobs in 2015, on the heels of 2.1 million last year. Housing markets are normalizing.

Steady recovery

One of the most notable trends in the US since 2007 has been the subdued pace of household formation. New households help determine demand for housing, and other goods and services – everything from mortgages, real estate services and home renovation, cleaning and landscaping services, to cable and internet subscriptions.

During the 2007-09 recession and the sub-par economic recovery that followed, household formation in the US plummeted, residential investment was unusually weak and homeowners’ equity dropped significantly. This painful adjustment process weighed on economic growth for several years.

With improvements in labour and housing markets, the conditions are set for US household formation to rebound. Researchers estimate an underlying demand to form new US households in the vicinity of 1.3 million per year. This compares to average annual growth of just over one million per year over 2008-14. In the next five years, household growth could very well rise above trend due to pent-up demand. Some studies suggest there are perhaps 3.5 million “missing” households, some of which can be expected to enter the housing market between now and 2020. These households will be in addition to those stemming from ongoing population growth and demographic change.

Add it all up and there is reason to hope for a sustained lift in both US residential investment, and consumer outlays on goods and services. From a Canadian perspective, the prospect of a revival in American households, homebuilding and consumer spending is perhaps the only bright light on the economic horizon.

Jock Finlayson is executive vice-president of the Business Council of British Columbia. This column is distributed by Troy Media © 2015. Visit www.troymedia.com.

Comments? E-mail jterrett@plant.ca.

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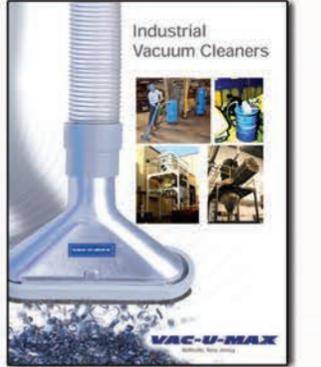
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