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in challenging markets

Kicking off the Smart Parka
How to tame variability issues
Campbell powers up co-generation
iLobby keeps track of plant visitors

Manufacturing News Daily www.plant.ca



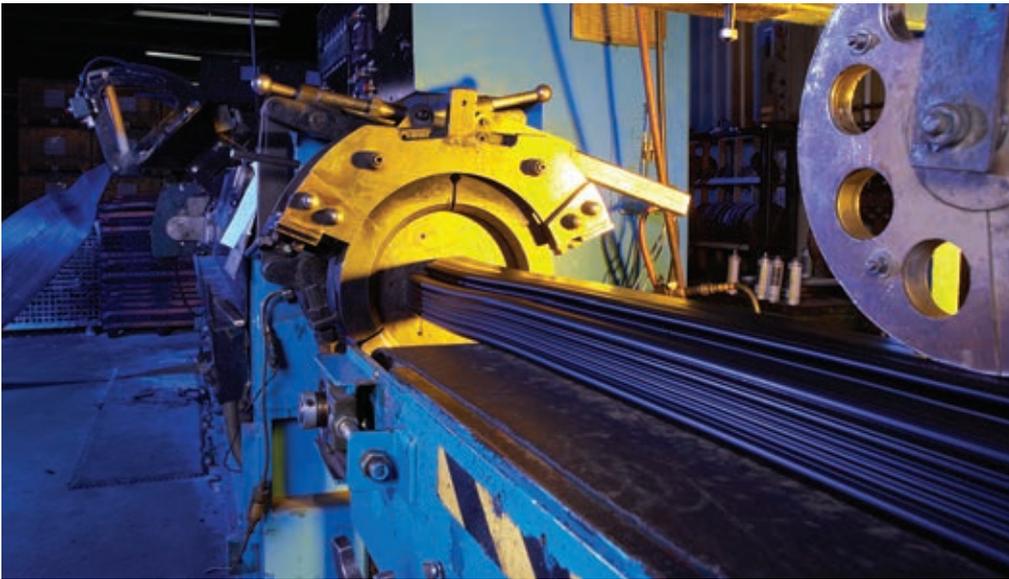
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COVER IMAGE: POLYCORP

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Prepare to be disrupted

Developed economies are taking climate change a lot more seriously, which is certainly the case in Canada where a change of government at the federal level combined with provincial efforts are altering the international perception that we are climate change laggards.

Not that this zeal is a good thing in Ontario's whacky world of policy making and action planning. Take the automotive industry: it can't catch a break. As it struggles to maintain a viable level of production, and against all odds, attract investment to the province, what does the Wynne government have in mind? A climate change action plan with an electric vehicle-shaped torpedo targeting 12% of all sales by 2025.

So far electrics comprise a meagre 0.16% of vehicles on the province's roads. Where all these hoped for new vehicles will come from has industry analysts scratching their heads, but never mind. There will be grants, rebates and incentives aplenty, and nine years to work the magic!

The plan, leaked to the *Globe and Mail*, also takes aim at natural gas. Everyone will retrofit their homes for solar, geothermal or electric heat. Ditto every building. Cover your ears lest you be deafened by the unprecedented economic boom that environment minister Glen Murray predicts will roll across the province.

Begs the question, though: Where is all this electricity going to come from?

The experts predict massive amounts of new generation will be needed to cover the added burden to the power grid, even as Murray dreams of eventually phasing out nuclear (currently covering 58% of our needs) as more diverse sources come to the fore. That's being a bit euphoric considering costly wind power accounts for just 4% of generation, while solar and bioenergy cover a meagre 1% each.

But there are interesting developments afoot that would enhance the viability of renewables, one in particular courtesy of a young Canadian scientist and the company she co-founded that aims to generate useful energy from compressed air.

Danielle Fong, chief scientist of LightSail Energy, a keynote speaker at Energy Summit 2016 in Niagara Falls, Ont. (presented by the Excellence in Manufacturing Consortium, NRCan and CIPEC) offered some interesting insights.

First some background: she was born in Halifax, went to Dalhousie University at 12, then to Princeton at 17 to conduct nuclear fusion research, but quit when she foresaw commercial application was a long way off (2050). That led her to a simpler solution: energy storage and the founding of LightSail in Berkeley, Calif.

She told attendees the generation of electricity has reached a critical point. For the first time production and lifetime operating costs of renewables are competitive with conventional power production (see Lazard, www.lazard.com).

That's where her thermodynamic innovation adds an important new element to the renewable energy challenge. LightSail's technology creates heat that can be stored and converted to energy – a handy feature for intermittent power sources such as solar and wind. Here's how it works (see www.lightsail.com): mechanical energy used for compression generates heat that's captured by water spray; compressed air is stored in a tank; heat captured by the water is stored for later use; and during expansion, the stored heat is sprayed into the air and converted back into mechanical energy.

LightSail is banking on almost \$14 billion in infrastructure upgrades over the next 20 years, 30% of which could be served by storage technology. It's easy to see the possibilities, and several high-profile financial backers (such as Bill Gates) have done so.

It's a new world out there that's all about disruption and change, which will be driven by brilliant people like Fong and her associates.

Ontario "officially" unveils its plan for disruption and change this month. Here's hoping Murray's gallant efforts to save the planet don't plunge the energy sector into chaos and mortally wound the automotive industry.

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- 30, 55 and 110 gallon models
- Heavy duty tools
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- Eliminates painful shock hazard
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▶ www.exair.com/18/4170.htm



Chip Vacuum Has No Moving Parts

Chip Vac™ is powered by compressed air and vacuums chips directly into a 5, 30, 55, or 110 gallon drum. It is easy to move from drum to drum to keep materials separate for recycling. Clean chips from floors, fixtures, work surfaces and machines.

- 5, 30, 55 and 110 gallon models
- No moving parts - maintenance free
- Removes industrial contaminants
- Mold and allergen removal
- Reduces exposure to airborne irritants
- Eliminate exhaust debris

▶ **Video demo on web site**

▶ www.exair.com/18/465.htm



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The compressed air powered **Reversible Drum Vac™** will quickly fill or empty a 55 gallon drum in 90 seconds. Coolant sumps can be easily refilled, floor spills vacuumed or contaminated liquids transferred to filtration tanks in minutes.

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- 5, 30, 55 and 110 gallon models
- Built-in pressure / vacuum relief
- Installs quickly
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- Spill free - auto safety shutoff

▶ **Video demo on web site**

▶ www.exair.com/18/462.htm



Chip Trapper™ Extends Coolant Life

The **Chip Trapper™** offers a fast, easy way to clean chips, swarf and shavings out of used coolants and other liquids. The Chip Trapper vacuums in the coolant that is filled with debris, traps the solids in a reusable filter bag and pumps out clean coolant.

- CNC's, Lathes, Saws, Mills, Drills
- Parts washers, Pits, Tanks, etc.
- 30, 55 and 110 gallon models
- Removes unwanted solids from liquid
- No motors to clog or wear out
- Safe - no electricity

▶ **Video demo on web site**

▶ www.exair.com/18/4171.htm



Maximum Lift 2-Way Drum Vac

The **High Lift Reversible Drum Vac™** will quickly fill or empty a 55 gallon drum from up to 15 feet in 85 seconds. This high powered Drum Vac has the strength to move liquids from below grade work areas, sumps or tanks! Uses no electricity nor moving parts.

- Below grade coolant sumps
- Deep well bulk storage tanks
- Deep hole broaching
- Fits standard closed head drums
- 30, 55 and 110 gallon models
- For liquids up to 1400 centipoise
- Cisterns
- Maintenance free
- Safety shutoff

▶ **Pump 55 Gallons in 85 Seconds**

▶ www.exair.com/18/4173.htm



Pump Faster, Higher & Thicker Liquids

EXAIR's **High Lift Chip Trapper™** offers a fast, easy way to clean chips, swarf and shavings out of used coolants and other liquids. It vacuums the coolant or liquid that is filled with debris and traps all the solids in a reusable filter bag. Only the liquid pumps back out.

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- Underground storage tanks
- Recycles coolant
- Deep hole broaching
- Bulk storage tank
- Removes unwanted solids from liquid

▶ **15 feet of lift!**

▶ www.exair.com/18/4174.htm



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- Removes industrial contaminants
- Mold and allergen removal
- Reduces exposure to airborne irritants
- Eliminate exhaust debris

▶ **Rugged Quality Vacuum!**

▶ www.exair.com/18/4172.htm



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BULLETINS

EHC Global (EHC), an Oshawa, Ont. manufacturer of escalator and elevator components has broadened its footprint in the Russian market with the appointment of **MyZiP** as its distributor and service provider. It will handle the sale and installation of new and replacement escalator and moving walk handrails in transportation, retail, commercial and other key market segments.

Husky Energy, an integrated energy company based in Calgary, has sold its Southwest Saskatchewan assets for \$595 million to **Whitecap Resources**, an oil player also based in Calgary. The territory produces approximately 11,600 barrels of oil equivalent per day

SkyPower, a global solar energy company and **BYD Company Ltd.**, a Chinese developer of battery technologies, are submitting a joint bid for a 750-megawatt solar power and storage project in India. **Skypower**, a US-company with its hub based in Toronto, said the joint venture will draw upon its global experience, its proprietary development platform and BYD's storage technology.

CCL Industries Inc., a manufacturer of specialty label and packaging solutions based in Toronto, is acquiring **Eukerdruck GmbH & Co. KG & Pharma Druck CDM GmbH**, which has plants in Marburg and Dresden, Germany. Euker is a supplier of folded leaflets, specialty booklets and pressure sensitive labels for pharmaceutical companies in German-speaking Europe. Purchase price is \$31 million.

Automatic Coating Ltd., a Toronto company serving manufacturing and other industrial segments applying liquid and powder coatings, is celebrating 50 years in business. The family firm founded by Harold Bamford has also established the Automatic Coating Centre, which focuses on environmentally responsible methods of pipeline rehabilitation.

Hydrogenics Corp., a manufacturer of hydrogen generation and hydrogen-based power modules in Mississauga, Ont., has been named Innovator of the Year in the Builder (mid-market) category of PwC Canada's 2016 Vision to Reality Awards.

CAE lands \$200M in contracts

Agreements cover flight simulators to training



Deal includes four 320 simulators.

PHOTO: CAE

MONTREAL — CAE has secured flight-training contracts worth \$200 million, which includes the sale of 14 full-flight simulators to airlines and aircraft operators, including Southwest Airlines and Uzbekistan Airlines.

The Montreal-based manufacturer of flight training simulators said the agreements cover a broad range of CAE's products from equipment to commercial pilot training, including:

- Five Boeing 737 full-flight simulators to Southwest Airlines in North America.
- One Boeing 767 full-

flight simulator to Uzbekistan Airlines in Asia.

- One Boeing 737NG full-flight simulator to Avenger Flight Group in North America.
- One A320 full-flight simulator to Sofia Flight Training in Eastern Europe.
- Six full-flight simulators, including one Boeing 737NG, one Boeing 787, three A320s, and one MD11F to undisclosed airlines and aircraft operators in North America.
- Two training agreements for commercial pilot training with leading European airlines.

CME and CRIQ partner on 3D

QUEBEC CITY — The Centre de recherche industrielle du Québec (CRIQ) and Canadian Manufacturers and Exporters (CME) have partnered to share additive manufacturing knowledge and provide assistance that will help Québec companies finance research and development projects.

The partnership also paves the way for collaborative projects, preferred rates for Réseau Québec-3D members to attend CME events and promotion of both organizations' additive manufacturing platforms.

Their representatives will sit on the Canada Makes Additive Manufacturing advisory board as well as the Réseau Québec-3D coordination committee and help Québec businesses quickly adopt 3D printing.

GreenMantra starts up new plant

BRANTFORD, Ont. — GreenMantra Technologies, a manufacturer of high-value waxes and specialty chemicals derived from recycled plastic feedstocks, has completed construction of a new plant that will expand its production capacity to 5,000 tonnes per year.

The Brantford, Ont. facility is a semi-continuous manufacturing operation and has been designed to accommodate future expansions as well as an upgrade to a continuous, fixed-bed process.

The company applies a proprietary catalytic system and patented process to transform hard-to-recycle polyolefin plastics such as grocery bags, shrink wrap, bottle caps, milk jugs and shampoo bottles, into high-value waxes, greases, lubricants and other specialty chemicals.

Its wax products include "drop in" replacements as well as novel waxes that are competitive with those made from traditional petroleum-based feedstocks. They cover a range of applications in coatings, plastics, adhesives, asphalt roofing and paving, and inks.

The project was funded primarily through GreenMantra's private equity investors with grants from the Ontario Innovation Demonstration Fund (IDF) and Sustainable Development Technology Canada.

PLANT OFF-SITE



Tania Sabados, CEO of RapidGear, a manufacturer of custom gears and machinery in Kitchener, Ont., took **PLANT** to the Damascus Gates in Jerusalem.

When you go on a business trip or vacation, be sure to take a copy of **PLANT** with you. If we use your photo, you'll get \$75. Include name, title, company, address and phone number to Off-Site, **PLANT**, jterrett@plant.ca. Photos should be 300 dpi.

Brick a global brewing winner

Waterloo Amber gets Monde Selection rating

KITCHENER, Ont. — Brick Brewing Co. Ltd.'s craft beer division claimed seven awards from the Monde Selection quality awards in Belgium.

Monde Selection, an internationally recognized standard for consumer product excellence, provides quality ratings for consumer goods, including beer.

The Kitchener, Ont. brewer, Ontario's largest Canadian-owned brewery, said its Waterloo Brewing Co. division received special recognition for its Waterloo Amber with the International High Quality Trophy Award for 2016. The red lager has achieved gold product quality in each of the last three years.

Waterloo Grapefruit Radler also won gold for outstanding product quality, while Waterloo IPA, Dark and Pilsner each took home silver, as did the Waterloo Spiced Dunkel and Smoked Applewood Roggen seasonal craft brews.



High quality designation.

PHOTO: MONDE SELECTION

IESO powers up with Leclanché

TORONTO — Swiss battery energy storage developer Leclanché S.A. is delivering one of the world's largest stationary systems to the Independent Electricity System Operator (IESO) in Ontario.

The \$36.6 million contract, covering the primary battery and power conversion equipment for the project, is part of the previously announced \$57-million construction scope to be managed by Leclanché.

The IESO order represents Leclanché's first

major project in North America, where the company is targeting the fast-growing North American energy storage market.

When installed, the 53 MWh Ontario project, to be distributed across six separate sites, will be one of the world's largest battery energy storage projects.

Leclanché has partnered with Mississauga, Ont.-based Deltro Energy Inc., which will procure, design and construct the site facilities and high voltage connections to the grid.

Firm F-35 orders for Avcorp

VANCOUVER — Avcorp Industries Inc. has received a firm order for the remaining units in the next two production phases of the expanded scope on the F-35 Carrier Variant Outboard Wing.

Avcorp, a manufacturer of aircraft structures, has established a New Product Introduction (NPI) process for the transfer of knowledge and skills needed for intricate paint preparation work and the complex installation of control surfaces and systems.

The Vancouver-based company says the NPI planning phase is nearing completion and production began in the second quarter.

Delivery of the first shipset to Lockheed Martin's final assembly and check out facility in Fort Worth, Tex., is scheduled for the third quarter, with subsequent confirmed orders extending to 2018.

Samsung's Windsor Solar breaks ground

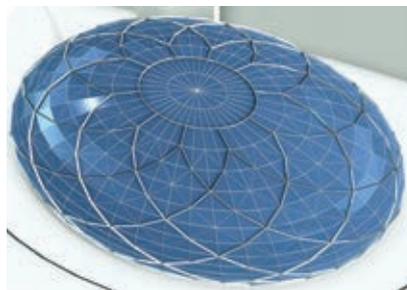
WINDSOR, Ont. — Samsung Renewable Energy Inc. and Connor, Clark & Lunn Infrastructure have broken ground on Windsor Solar.

The 50-megawatt power project will use Ontario-made panels and inverters to generate clean, renewable energy that would potentially supply 8,500 homes annually.

Windsor Solar will use approximately 193,000 panels from Canadian Solar in London, Ont., and solar inverters from SMA America in Toronto.

The installation, to be complete by the fall, will offset approximately 81,000 tonnes of CO₂ each year, the equivalent of taking nearly 15,000 cars off the road.

Samsung Renewable Energy, based in Mississauga, Ont., is a developer of renewable energy.



Largest aluminum dome in the Middle East

PHOTO: OPENAIRE

OpenAire lights up UAE shopping mall

OAKVILLE, Ont. — OpenAire and its partners are completing a 26,013 square-metre, 31-storey Sharjah Shopping Mall in the UAE.

The mall, located less than 10 kilometres from Dubai on the waterfront, will feature an aluminum elliptical dome skylight designed and manufactured by OpenAire, an Oakville, Ont. manufacturer of retractable roof structures and skylights.

The aluminum frame and glazed glass skylight will be the largest aluminum dome in the Middle East, standing 74 metres long, 47 metres wide and 21 metres high.

OpenAire is partnering with M/S International Private Group, Gambert Architectural and Aluminum Light Industries Co. on the project.

Financial details were not released.

FEEDBACK



CARBON TAX GRAB

I found your article "Setting the price for carbon" (**PLANT**, April 2016) to be an accurate description of a carefully planned tax grab. Both federal and provincial governments have found the perfect scenario for creating a feel-good tax among the truly uninformed voters.

These taxes together with many other reforms have and will continue to stifle manufacturing in this country until most of it will be gone and so will the innovations, skills and wealth that stem from this industry.

Rino De Campo
Mississauga, Ont.

A RIDICULOUS ARGUMENT

"...because we [Canada] are responsible for less than 2% of global greenhouse emissions." — *Setting a price for carbon*, **PLANT**, April 2016

At the risk of extracting this from its context in paragraph, this statement (by itself) is clearly a ridiculous argument.

Carbon emissions do not respect political boundaries.

Using the same 'logic', China, the US and Europe could simply each divide themselves into multiple smaller political divisions or states, each new sub-unit with "lower" emissions, and this would somehow address the issue? The logic embedded in the quoted sentence just makes no sense.

Clearly the optimum (and thus correct) approach is to address the specific carbon (or its equivalent) emissions targets that offer the quickest, most cost-effective (carbon-unit-per-dollar) payback, no matter where on the globe they are.

Mismanagement of the carbon emissions issue at the global level is by far the largest risk at this point.

Jeffery Harvey
Halifax, NS

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

CAREERS

Marc Thibert joins WAGO's sales team as regional sales manager for Southwestern Ontario. Prior to joining WAGO, Thibert was a district application specialist for Phoenix Contact, a manufacturer of electrical and automation products with a Canadian office in Milton, Ont. WAGO, its US offices based in Germantown, Wis., makes spring pressure connection technology.



Marc Thibert

Mark van Rooij has resigned as president and CEO of Avcorp Industries Inc. in Delta, BC. Avcorp, a manufacturer of airframe structures for aircraft, has promoted Ed Merlo CFO of Avcorp Group; **Amandeep Kaler** general manager of Avcorp Industries; and Ken McQueen vice-president of human resources, Avcorp Group.

KSB Pumps Inc., the Canadian arm of the German pump manufacturer in Mississauga, Ont., has appointed **Marcus Henderson** business development manager. The company said he'll provide extra support to its coast-to-coast sales teams stationed in Montreal, Calgary, Edmonton and the Maritimes.



Marcus Henderson

Cimcorp Automation Ltd., a manufacturer and integrator of turnkey robotic gantry-based equipment based in Grimsby, Ont., announces **Derek Rickard**, distribution systems sales manager, has been named to the Food Logistics Champions: Rock Stars of the Supply Chain list for the second consecutive year. The honour acknowledges his efforts to attain milestones in safety, efficiency, productivity and innovation throughout the global food supply chain.



Derek Rickard

US GE healthcare repair centre goes OTTO

Robot fleet will automate just-in-time parts delivery, feed work cells

KITCHENER, Ont. — Clearpath Robotics will be supplying its OTTO self-driving material transport device to an expanded GE Healthcare repair facility that's near Milwaukee.

The Kitchener, Ont. robotics company said an OTTO fleet will automate the facility's just-in-time parts delivery.

The plant repairs medical equipment, tests functionality, recycles retired equipment, manages warranty service programs and ships qualified, high quality parts to field services

OTTO vehicles will load and deliver parts to work cells for repair, then dispatch them to shipping.

The innovative robot has earned a Silver designation from the Edison Awards for excellence in new product development.

Nominees were judged by a panel of more than



Material transport on the job.

PHOTO: CLEARPATH

3,000 leading business executives including past award winners, academics and leaders in the fields of product development, design, engineering, science and medical.



The new plant, front and aerial view.

IMAGE: SELLICK

Sellick breaks new ground

Company is gearing up to compete globally

HARROW, Ont. — Sellick Equipment Ltd., a manufacturer of rough terrain and truck-mounted forklifts, has broken ground on a 120,000 square-foot plant at a new industrial park near the company's current Harrow, Ont. home base.

Vice-president David Sellick told the *Windsor Star* in February the company is investing between \$15 million and \$20 million in the new facility, which will take over production from its present 80,000 square-foot location.

The plant is to be completed in 2017.

Sellick opened its doors in 1969 when Walter, with sons Howard (president) and David, converted a

Ford 4500 industrial tractor into a 6,000-pound outdoor forklift.

Walter, 97, was joined by his sons and grandson Colin, systems manager, for the ground-breaking April 20.

"In order to compete on a global scale, we needed to expand and build a state-of-the-art plant," said Howard Sellick.

The company recently introduced a new generation of forklifts with increased lift capacities that feature enhanced ergonomics and environmentally friendly diesel engines.

Sellick employs 71 people and supports 230 dealers across North America, where there are 11,000 forklifts in operation.

PyroGenesis spins off its 3D printing business

MONTREAL — PyroGenesis Canada Inc. is spinning off 80% of its 3D additive manufacturing business into an independent publicly traded company.

The board of the Montreal cleantech company that manufactures plasma waste-to-energy systems and plasma torch products has unanimously approved the plan. The company will produce metal and alloy powders for the 3D printing industry using PyroGenesis' technology, plus distribute powder production systems and equipment under an exclusive worldwide licence.

For the time being the new entity will be called 3DCo.

PyroGenesis will provide maintenance and technical support services to 3DCo for each system purchased for up to \$750,000 per system per year under a non-compete agreement. It will also collect royalty payments of up to 10% from 3DCo's powder production revenues.

Commercial production is to begin as early as this year's third quarter.

The Wohlers Report (2015) says the global demand for 3D printers is to grow from 1,200 machines in 2014 to more than 14,000 in 2020, which will increase the demand for metal powders exponentially to 8.6 millikilograms by 2020. That will generate worldwide revenues of \$3.45 billion.

The small, spherical, uniform titanium powder 3DCo is to produce will account for more than 30% of this demand.



Switch to Tork wipers and save*

23%
less time

23%
less solvent

20%
less effort



Do you use rags or rental shop towels?

You could save time, money and effort with Tork disposable wipers. We make a range of professional wipers for wiping, cleaning and polishing. Tork industrial wipers are designed to do the job right, time after time, without the risk of damaging equipment or your finished product. Try them today!



Visit talktork.com/industrial to start your free trial and see how much you can save.



* Rental shop towels, cotton rags and mixed rags were compared to Tork Heavy-Duty Cleaning Cloths. Panel test conducted by Swerea Research Institute, Sweden, 2014. ** Rental shop towels, cotton and mixed rags were compared to Tork Heavy-Duty and Tork Industrial Heavy-Duty Cleaning Cloths. Panel test conducted by Swerea Research Institute, Sweden, 2014.

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Klean trademark US approved

VANCOUVER — Klean Industries Inc., a provider of gasification and pyrolysis waste conversion technologies, has US approval for its Klean Industries trademark.

The Vancouver company is also preparing filings for new patents based on advancements related to its carbon blending, rubber formulating and mixing systems.

Klean's modular carbon blending systems are fully integrated with computerized control technology that produces specific nano-carbon blends on demand.

The feeding systems discharge pelletized and powder carbon according to pre-determined formulas while controlling the processing of blending systems.

Klean's advanced upgrading technology produces a recovered carbon black that's upgraded through a patented multi-stage refining process.

Moose gets its knuckles rapped

OTTAWA — The Competition Bureau has taken action against what it considers to be deceptive marketing practices by Moose Knuckles, a manufacturer of premium winter jackets.

The jackets are sold in a variety of high-end stores across Canada and typically retail from \$595 to over \$1,000.

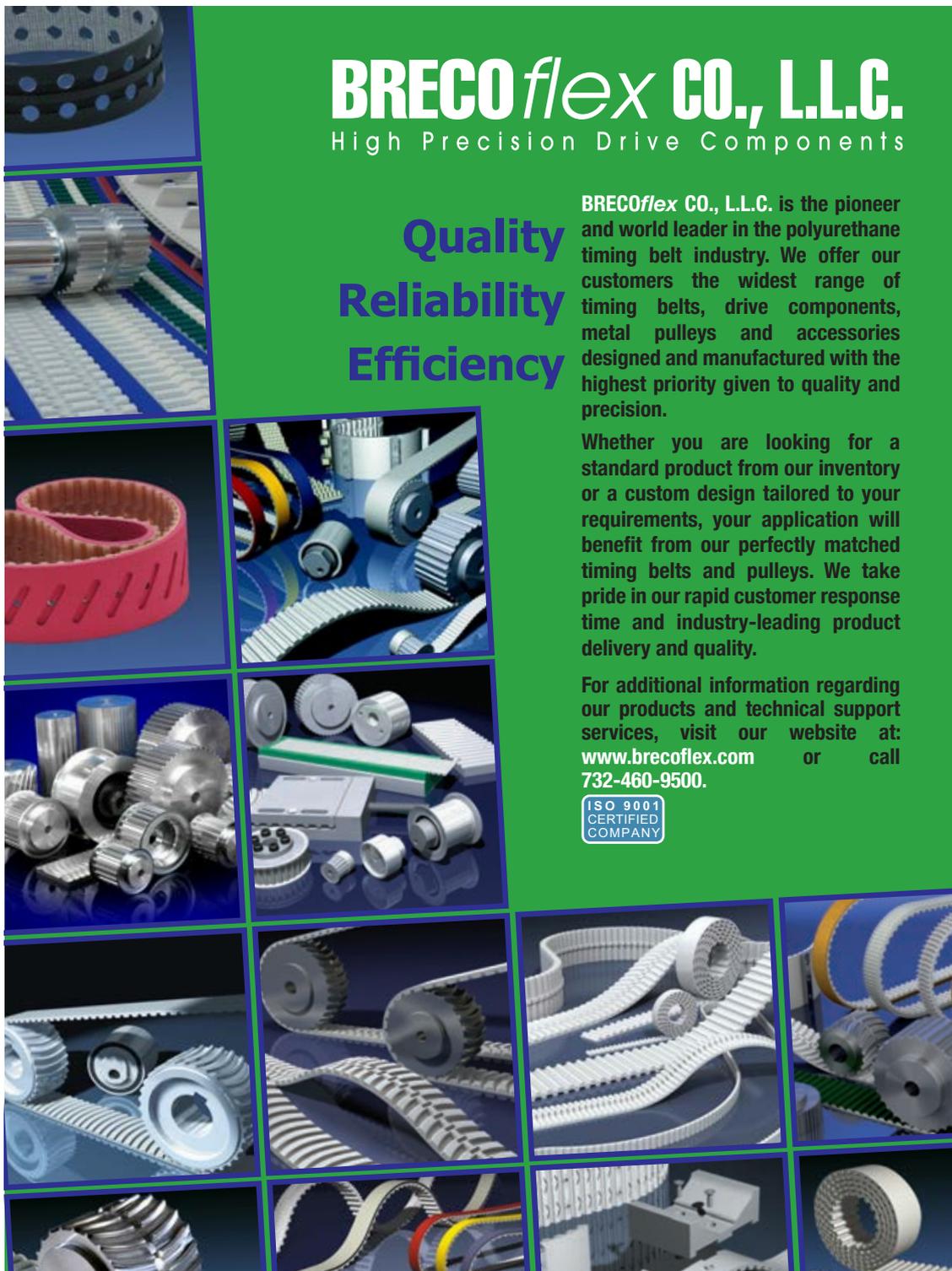
The bureau has filed an application with the Competition Tribunal

alleging that the parkas are marketed as Made in Canada when they are mostly manufactured in Vietnam and elsewhere in Asia.

The application alleges only the finishing touches, such as adding the trim, zippers and snaps, are done in Canada.

Under the bureau's guidelines, Made in Canada should adhere to the following:

- The last substantial transformation of the good occurred in Canada.
- At least 51% of the total direct costs of producing or manufacturing the good have been incurred in Canada.
- There's a qualifying statement, such as "Made in Canada with imported parts."



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\$10M invested in poultry plant

ST-HYACINTHE, Que. — Olymel is investing \$10 million in the expansion (including installation of an air chilling room) of its primary poultry processing plant at St-Damase, Que.

The meat processing company said additional production capacity is expected to create 10 new jobs.

The plant is adding 15,000 square-feet bringing its total area to more than 95,000 square feet.

College goes co-generation in Ottawa

OTTAWA — Algonquin College and Siemens Canada celebrated Earth Day on April 22 with the unveiling of a new high-efficiency co-generation power plant at the Ottawa campus.

The natural gas plant will generate two megawatts of power — enough to cover the baseline power needs of the campus.

The two organizations also signed an MOU that will provide opportunities for students to learn about the future of energy systems.

The college is launching a new graduate certificate program in energy management in 2017.

TRADE



PHOTO: THINKSTOCK

Red tape

It's tangling up US trade

Red tape has one-third of Canadian small businesses thinking twice about trading across the US border, according to a report by the Canadian Federation of Independent Business (CFIB).

CFIB claims government red tape costs companies \$37 billion per year, and almost one third (\$11 billion) is considered unnecessary.

Based on 8,600 responses from small business owners, the updated report from 2010 looks at the performance of both the Canada Border Services Agency (CBSA) and the US Customs and Border Protection (CBP) Agency in facilitating cross-border business.

While both agencies have shown some improvement, 33% of business owners said they would not have started trading had they known about the costs, while 36% point to administrative hassles and lack of transparency around fees, forcing them to reduce their frequency of trade.

Compared to the findings in 2010, CBSA staff showed some improvement in accessibility, knowledge and how it treats customers, but communicating relevant information showed little improvement.

SMEs gave the CBSA website a worse rating for user friendliness than in 2010. They also noted many agents are unaware of several programs, such as Fast and Canpass, put in place to speed up traffic at the border.

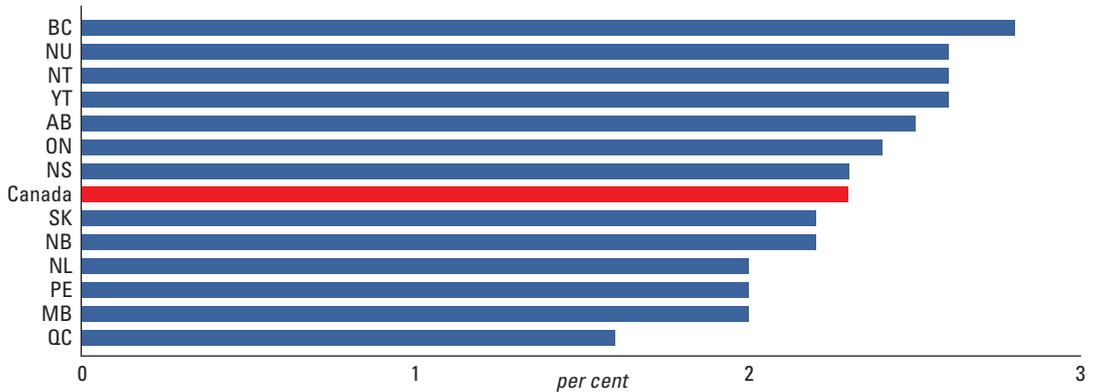
CBSA fared somewhat better than its US counterpart, suggesting that importing from the US is easier. The CBP performed worse than the CBSA on the amount of paperwork and customer service, and website user friendliness.

PLANT PULSE

ECONOMIC DEVELOPMENTS AND TRENDS

billions of dollars

2015-Q4 JOB VACANCY RATE



Canadian employers reported 353,000 job vacancies in 2015's fourth quarter at a growth rate of 2.3%, according to Statistics Canada. BC had the highest rate at 2.8%, followed by Nunavut, the Northwest Territories and Yukon (2.6%). Ontario was 2.4%, while Quebec posted the lowest rate at 1.6%. Manufacturing's rate was 1.8%. The number of manufacturing employees for the quarter was just under 1.5 million, with an average hourly wage of \$20.

1.9 BILLION The number of cigarettes produced by Canadian manufacturers in March, up 20.8% from February. Production increased 1.1% from the same month a year earlier. The number of cigarettes sold in March increased 21.3% from February to 1.8 billion, up 7.6% from March 2015.

Statistics Canada



239,462

Lost-time accidents recorded by workers compensation boards in 2014, which represents 30% of all disabling injuries and illnesses suffered annually by Canadian workers. About 1,000 Canadians die from work-related accidents or disease.

International Labour Organization

\$73,000

Two thirds of Canadian small business owners are earning less than this amount. Employers earning less than \$40,000 outnumber those earning more than \$250,000 by four to one.

Statistics Canada

400,000 Canadians employed as engineering science technicians and technologists in 2013-14. Their employment growth has outpaced Canada's overall growth for the past 15 years and wages are more than 20% higher than the national average.

Conference Board of Canada

7% How much Ontario's exports will grow this year, thanks to a resurgent auto sector, high demand in the US and a low Canadian dollar. This represents the most growth of any province. EDC's semi-annual Global Export Forecast predicts the province's automotive products sector, which accounts for nearly 40% of its exports, will grow by 10% this year. Growth will be bolstered by record-high demand for light vehicles in the US, and higher shipment volumes from assembly plants in Oakville and Windsor, which are now back in full operation following some downtime for modernization and retooling.

Exporting: **JUST! DO IT!**

POLYCORP'S FORAY INTO CHALLENGING MARKETS

The polymer materials manufacturer from Elora, Ont. has a global reputation for quality and complete solutions.

BY MATT POWELL,
ASSOCIATE EDITOR

Peter Snucins' view on the oft-complicated world of exporting is actually quite simple.

"Just do it."

He likes it so much, he's had t-shirts made for his sales staff with the saying blazed across the chest.

The serial entrepreneur, who's been involved in the development of more than 30 companies and is currently president and CEO of Polycorp Ltd., has more than 35 years of experience navigating Canada's business landscape. He knows a thing or two about what it takes to create a successful enterprise and bring it from humble grassroots to global industry leader.

"You can do all the research you want, tap all the government sources you can think of. But at

the end of the day, if you want to grow your business by exporting, you just have to go and do it," he says.

Polycorp is based in Elora, Ont., a town of about 4,000 people in the heart of southern Ontario's Mennonite country. It manufactures engineered elastomeric parts that solve corrosion, abrasion, impact, noise and vibration issues, and serves customers in sectors such as transportation (track encapsulation systems) and mining (grinding mill liners). It also produces protective liners, which are used for rail cars that carry hazardous materials.

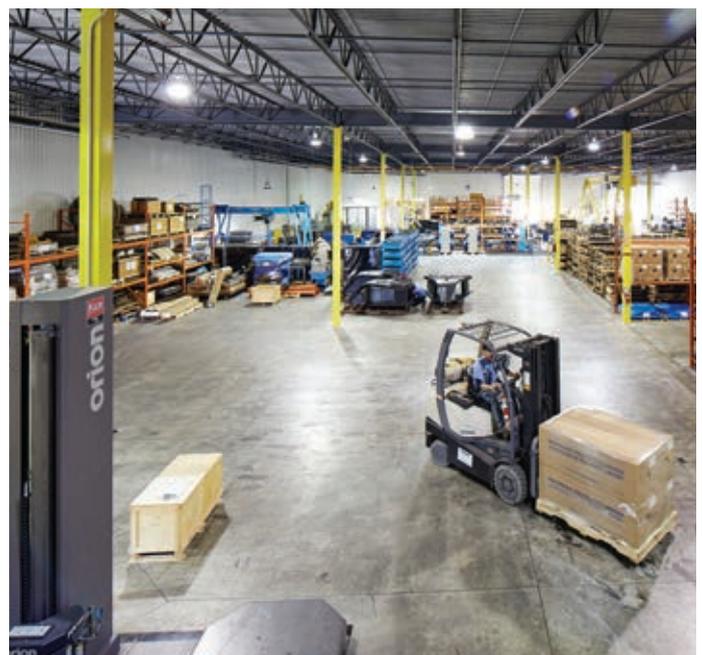
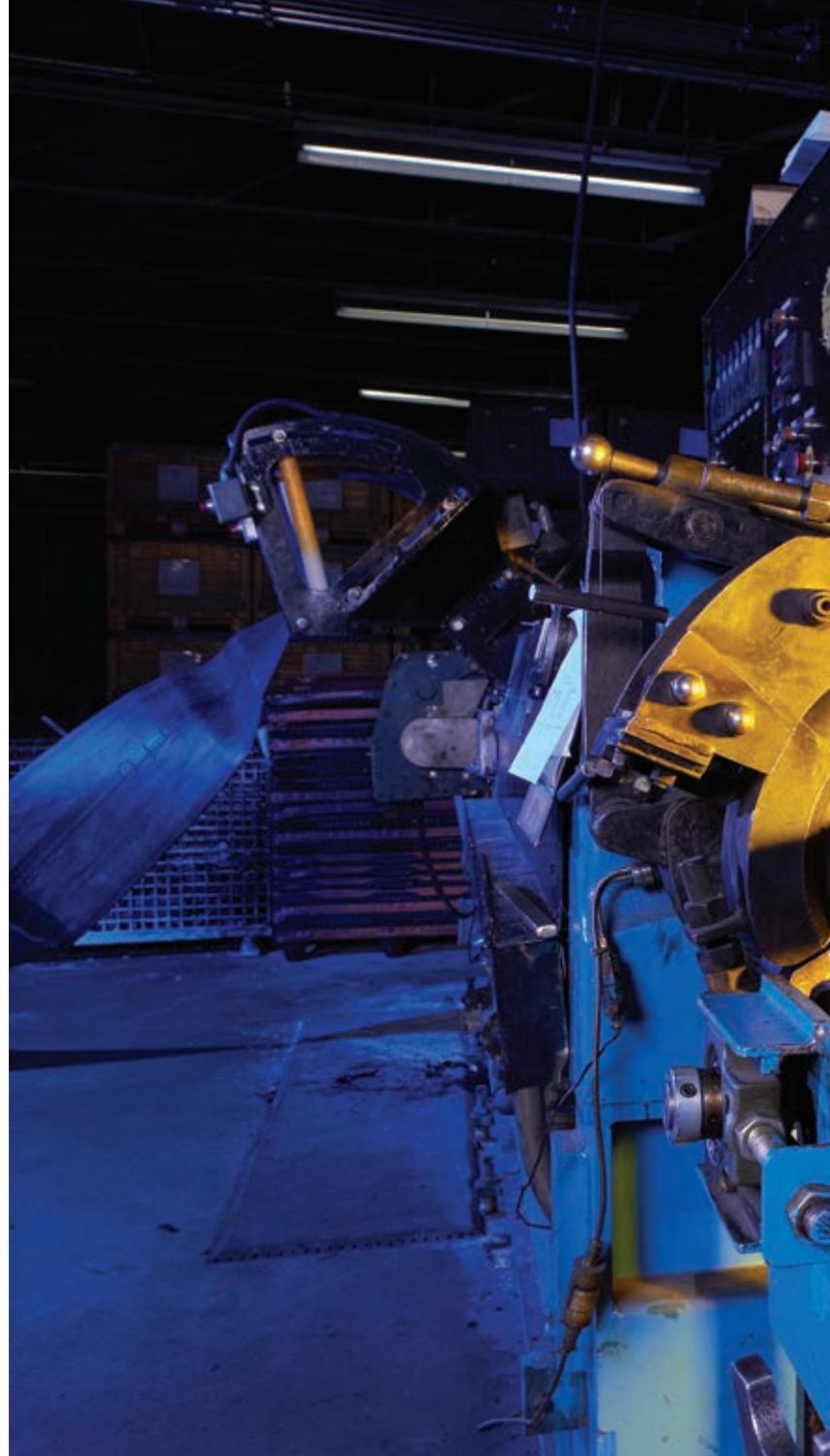
Exports make up 80% of sales – products that are deployed in less than desirable locales, ranging from mine sites in Burki-

(L-R)

An operator prepares a protective linings shipment.

Polycorp's rubber metal mining discharge system.

A protective linings quality assurance station helps the company meet exacting standards for quality and consistency.





Polycorp's Epflex Railseal extrusion process.

PHOTOS: POLYCORP

na Faso, Ghana and Siberia, to modern urban transit systems in Europe and to the more-familiar US market. Closer to home, the Toronto Transit Commission (TTC) uses Polycorp's Track Jacket system to isolate and lengthen the life of embedded streetcar tracks from the city's busy concrete roadways. And Canadian mining giant Kinross has deployed Polycorp's mill liners at its gold operations around the world.

In 2014, Polycorp's exports grew by 27% and included expansion into new markets such as Africa's Ivory Coast.

The company's ranks now exceed 190 employees, 50 of those added in the last three years; and its 55,000 square-foot Elora plant is ISO 9001 certified.

Snucins' first foray into the world of manufacturing was with Mining Technologies International (MTI). He and his business partner at the time grew the company into Canada's largest private manufacturer of mining equipment. MTI was sold in May 2014 to Joy Global, a manufacturer of heavy machinery used in underground and surface mining based in Milwaukee. The deal included MTI's two Sudbury, Ont. plants.

When he founded Polycorp in 1996 following the acquisition of B.F. Goodrich Canada Engineered Products, he first set out to conquer his own backyard, with the intention of becoming North America's largest producer of custom industrial linings. That target was hit in 2002 after Polycorp acquired a major competitor, Polymeric Protective Linings, from RJF International Corp.

"I had to be the biggest in the market across all my product lines before we could consider global expansion," he says. "You've got to get to Kansas be-

Continued on page 14



SERVICE

Continued from page 13

fore you can go to Burkina Faso.”

And the costs of international expansion can be an obstacle to global market entry. Indeed, it's a challenge, especially for small or medium sized manufacturers, to come up with the necessary resources.

“Small companies can't always afford to send people away for two or three weeks at a time,” says Snucins, describing an MTI sale that required his partner to travel back and forth to Siberia 16 times to close what turned out to be the company's biggest deal.

He's also very aware that not all of Polycorp's products suit the North American marketplace. After all, people don't mine gold in Chicago or New York – that's happening in sometimes hostile environments such as West Africa, where mill liners are loaded onto rickety flatbeds and hauled along dirt roads. On the other hand, Polycorp's transportation solutions, such as its Rail Boot and Rail Jacket systems, are used by major North American transit agencies, but not so much in Ghana.

“We're producing a number of niche products that aren't ubiquitous around the world,” he says. “The markets we serve are large by definition, but we're serving niche portions.”

And he notes customers have been willing to pay a premium for the quality the company delivers, buying into a “complete solutions” proposition that drives Polycorp's innovation and product development activities.

“We're providing a lower cost total solution, it's just a little more expensive. If a customer doesn't value that, fine. But they always come back,” Snucins says.

“We sell insurance”

That approach has earned the company a reputation around the world as the go-to supplier for elastomeric products. Its PolyStl mill liners were the subject of a technical paper produced by a mining client that revealed they were giving its mills – around the



Polycorp's 3D moulding, secondary curing and finishing operations.

world – a \$1.35 million cost advantage, per mill, per year. That's a significant savings considering the cost of downtime at a gold mine typically runs at about \$100,000 per hour.

Polycorp's in to the European market after it was granted a contract by Rotterdam's RET transit system to supply rail encapsulation materials that prevent underlying gas pipe from

was a big deal in this scenario because the penalty for any stray sparks is blowing up Rotterdam, and that's a pretty significant penalty,” Snucins says.

Rail isolation isn't new. But Polycorp's application product is unique because it's produced in a single piece. A technical review revealed that Polycorp's polymer-based materials produced nine times the resistivity required by EN standards. The encapsulation system also provides noise and vibration reduction.

“That was our beachhead into Europe. A little company from Elora, Ont. going up against the biggest companies in the world from Germany, Italy, Switzerland – who are all pretty good at what they do. Product validation is huge,” Snucins says.

The company is also no stranger to industry accolades, having been recognized by Deloitte for five consecutive years as one of Canada's best managed companies for best practices and creat-

WE'RE PROVIDING A LOWER COST TOTAL SOLUTION, IT'S JUST A LITTLE MORE EXPENSIVE. IF A CUSTOMER DOESN'T VALUE THAT, FINE. BUT THEY ALWAYS COME BACK...

“To have our product validated like that was huge for us – we're selling insurance for these guys,” says Snucins. “It's a major opportunity for a company from a small town in southern Ontario to be recognized by a global mining giant. That kind of recognition provides us with beachheads into new export markets because our product is being used and its being proven.”

Product validation was also

corroding from stray electrical currents.

The Netherlands city of Rotterdam runs natural gas pipes underground, and encountered the issue when it was laying new tram tracks. Polycorp's solution was to deploy a single piece of rubber casing that was affixed to the tram rails, and is completely closed, which eliminates current leakage into the ground.

“The issue of stray current

ing value in innovative ways. In 2014, it was Grant Thornton Canada's Private Business Growth Award winner, and in November, Polycorp was awarded an Ontario Export Award in the services category.

The company has also been recognized by PROFIT500 for three consecutive years and most recently was named one of Canada's 10 most admired corporate cultures.

Manufacturing velocity

Polycorp's export growth has forced it to become more agile. The Elora plant runs 24/7, and moves like a ballet. Trucks are continuously in and out. Exporting has also meant holding more inventory to build in buffers, thus ensuring product is shipped around the world on time.

"The business has changed in that sense because we have to be able to respond more quickly," Snucins says.

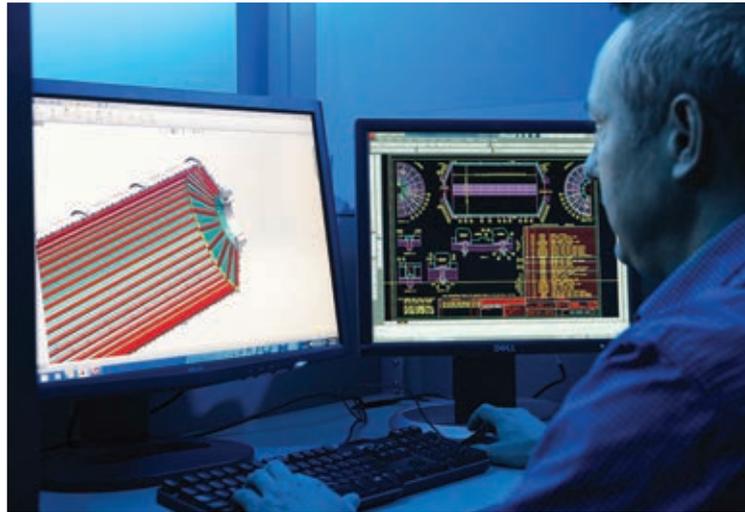
It's also a unique situation considering each of Polycorp's three product lines require different manufacturing processes, suppliers and technological specifications.

Despite the company's global focus, some of its materials come from its own backyard. Snucins recalls needing to source steel for a clip that's part of Polycorp's Rail Seal transit solution. The extruded virgin rubber profile absorbs destructive energy from rail deflection and vehicular traffic to extend the lifetime of a rail crossing.

"I went halfway around the world, to Tianjin, China to find steel. I secured an agreement with a producer there, but by the time the second shipment showed up, things weren't how they were supposed to be," says Snucins.

An employee came to Snucins with a solution: he knew a local Mennonite who was an expert steel fabricator capable of providing Polycorp with the clips.

"The Mennonites have no electricity, there's no TVs, no lights. I don't know how the whole system works, but I was brought



An engineer 3D models a mining mill liner.

to this guy's barn and inside was the most advanced CNC machine you've ever seen. It was spotless," Snucins says. "I'm now getting the same product, which I travelled around the world to source, manufactured by a Mennonite less than 30 kilometers from my plant, delivered by horse and buggy."

Buddy up

While Polycorp has discovered a number of local partners, it's also leveraging strategic alliances with universities across North America to assist with innovation and product development. Snucins believes the value of these partnerships is priceless.

"We were punching above our

weight in terms of what a company from a small town should be doing. You can't be everywhere, you can't be everything from everybody. But universities have been our friends," he says, describing industry-academia partnerships as a massive untapped resource with low entry costs.

The key is ensuring the business and the lab are speaking the same language. Polycorp also collaborates with the Mining Engineering Department at Queen's University in Kingston, Ont. and the University of Utah School of Mines; and it taps the schools for new talent. Snucins is also the founder, former chairman and an active board member of Queens'

GreenCentre Canada, a national centre of excellence and North America's largest centre for green chemistry research innovation and commercialization.

He recalls a scenario where Polycorp tasked a university with developing a glue that sealed rubber linings inside tanker cars carrying harsh substances such as hydrochloric acid.

"We needed something that could be rolled on. They delivered us a solid hunk of glue – that was their definition of success. It didn't work for us because it didn't address our requirements," he says. "We're making things in miles while they make things in molecules. These guys are brilliant, but you have to bridge the gap between the lab and the field."

Snucins, whose background is in merchant banking, admits he never viewed the world of manufacturing as glamorous. Not many do. His career focus in his younger days was on finance or consulting.

"I didn't realize how cool and rewarding this industry could be until later in life."

The man who has been on the board of more than 30 companies now admits Polycorp has delivered one of the most intellectually appealing opportunities of his career – up there with bringing premium SMS text messaging to Canadian wireless networks in the early 2000s.

"[Manufacturing] is like a chess game. Everything has to work. It's a chain, and if one link breaks, you're not making anything and you could go bankrupt."

Exporting is a valuable link in Polycorp's manufacturing chain. What the company makes may not be visible, but the next time you're onboard a tram in Rotterdam, take comfort in knowing that a manufacturer from a town of 4,000 people in southern Ontario provided the products necessary to prevent the city from blowing up.

Comments?

E-mail mpowell@plant.ca.

SERVICES WINNER

The Ontario Export Awards recognize excellence in international trade.

Polycorp Ltd., winner of the 2015

Services award, has increased its workforce by 27% since 2011 and boosted the number of sales agents

and distributors by 47%. Its strategy is to identify, develop and expand core competencies in rubber formulations, technical designs and innovations to serve niche markets with significant barriers to entry. International growth has focused on markets underserved by competitors and Polycorp is driving market share gains by providing technical support, high quality products and post-manufacture service. It validates its higher product prices by developing custom engineering solutions that address specific customer requirements, often in harsh environments.

The Ontario Export Awards are produced by Annex Business Media and CanadianManufacturing.com. Partners include PLANT magazine and several other Annex publications.



EXPORTING

Some final thoughts about Canada, the world and opportunities for business growth.

BY MARK DRAKE

I have had the privilege of sharing my international trade experience with **PLANT** readers for 17 years but retirement from the world of journalism beckons, and this is my last submission. As I wrap up this assignment, I hope you will indulge me if I also share some thoughts about this wonderful country, which I have been happy to call home for the past 36 years.

Go international young man! Canada's market is a small one given its total population of 35.7 million. The international market place is more than 7 billion. Certainly to be successful one needs resources (usually in the shape of a buoyant existing domestic market), a champion to lead the charge and management commitment for the longer term. However, given a competitive, and probably niche product or service, the world can be one's oyster, and success makes a significant difference to the bottom line. After 50 years at the sharp



PHOTO: THINKSTOCK

Canadian trade PERSPECTIVES

REFLECTIONS FROM A VETERAN EXPORTER

end of the business I can tell you international trade is fascinating, compelling and highly rewarding. More Canadian companies – including smaller and medium-sized ones – should join their peers in taking the plunge, especially while the lower dollar

provides an additional competitive advantage. To quote Lord Kitchener: your country needs you! With oil prices in the doldrums, the Canadian economy is looking fragile and an export boom is just what we need.

Much help and encourage-

ment are available. The federal and provincial governments have massive information services for exporters, such as the Trade Commissioner Service (TCS) with staff in all major markets. Export Development Canada (EDC) is there to help with

TRAINING

Need to know

Focus on processes, not design features

BY HUGH ALLEY

When I had to learn to use a new tool, the teacher was enthusiastic. She loved how the tool was designed and was keen about its potential. Yet at the end of the hour I didn't know how to carry out the work. I only needed to know about eight operations, but she focused on design features rather than teaching me about work processes.

A driving instructor spending an hour explaining why the layout of the dashboard is so great may be interesting, but it doesn't help you learn to drive. That requires a combination of skills. Taught well, you can learn the basics in about 20 hours. None of that time would be spent on your vehicle's features.

A worker was taught how to use an industrial laundry machine. It had a lot of features, only a few of which were used. The operator didn't need to know the whole range of the machine's capabilities; just those used at each point of the process. By focusing on the process, the operator could learn to use the machine in about 15 minutes.



Focus on the process.

PHOTO: THINKSTOCK

The next time you have someone struggling with a task, observe their training for five minutes. Listen to what the instructor is saying. If the person is being taught about features of the tool, you know what to do!

Hugh Alley is a senior industrial engineer with Stantec Consulting Ltd., based in Vancouver. Call (604) 866-1502 or e-mail hughralley@gmail.com or hugh.alley@stantec.com.

financial products, and associations and councils offer opportunities for peer review and networking support often directly related to specific markets.

Support the trade agreements. Canada has been negotiating several international agreements recently, including the Trans-Pacific Partnership (TPP) with the US and 10 countries in Asia, notably Japan; and the Comprehensive Economic and Trade Agreement (CETA) with the European Union. These agreements are primarily about market access (in both directions) leading to greater trade, especially by bringing down the non-tariff barriers (rules of origin, regulations and masses of paperwork). The challenge for our negotiators has been the reluctance of politicians to throw off the shackles of our outdated and expensive managed trade arrangements in the dairy and poultry sectors, which are essentially the antithesis of free market access! It's time politicians had the courage to take the axe to these anachronistic arrangements (with appropriate and time-limited compensation to those directly affected). A recent University of Manitoba analysis calculated that this abolition would benefit Canadian consumers to the tune of around \$400 million a year. Let's do it!

Barriers and perspective
Open up the interprovincial barriers. If we want to open international markets, at least we should be able to trade freely within Canada. Alas, we are far from achieving this goal, and once again it's an absence of political will that ensures retention of the status quo. As a European migrant, I find it extraordinary that there is so much insularity and local protectionism. I can buy virtually unlimited quantities of wine in France to take it back to the UK, but can't buy beer in Quebec and take it to New Brunswick. Competition inspires lower prices and greater efficiency (remember how the Ontario wine growers upped their game under the threat of NAFTA and direct competition from California?). Monopoly equals protectionism and the worldwide recession in the 1930s reminds us of what that can cause. We should abolish the barriers (and of course government-controlled

liquor stores).

Don't bite the hand that feeds us. The media are talking up inequality these days and castigating the capitalist system for creating it. Well, maybe it does create inequalities, but it's the only system that creates wealth and moves people out of poverty. This subject is well covered in economist William Watson's recent book, *The Inequality Trap*, where he suggests we should be fighting poverty, not capitalism. He points out that Steve Jobs, the founder of Apple, earned his \$8 billion net worth by providing exciting new technology to millions of satisfied customers all over the world. He admits capitalism "does generate inequality, but by unrelentingly expanding what's possible in terms of living standards, it also enables people to pull themselves up from poverty."

Keep some perspective on climate change. This has moved front and centre on the political agenda, and there's no doubt Canada should play a part in curbing greenhouse gasses. However, our governments (and the people who vote to keep them in power) should be careful not to wreck our fragile economy by excessive emissions controls and heavy carbon taxes. Canada accounts for about 1.6% of worldwide emissions, so – even assuming the science is settled – it would make virtually no difference to the overall climate situation if the whole Canadian economy were shut down.

Support profits and PPP. While governments have important roles to play (creating the right environment for the country to flourish), wealth is created by the private sector. All the more reason to support public-private partnerships (PPPs) where both parties work together for the greater good. And let's not disparage profits. Without them there would be no growth, investment, job creation or poverty reduction – remember what happened under communist rule?

Best wishes as you pursue your international trade agenda.

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

Comments?

E-mail jterrett@plant.ca.



Taking your business to another level.

PHOTO: THINKSTOCK

Growing your business

Options for buying or partnering up

BY MARK BORKOWSKI

Sometimes bigger is better, and smaller manufacturers looking to accelerate their presence and growth in a marketplace have a few options.

One is entering into a strategic partnership with another company, often a supplier, that involves working together to achieve common goals. It's rare for equity shares to be exchanged in this looser type of arrangement.

Acquisitions involve a manufacturer buying up competing or complementary companies, and establishing itself as the new owner, to create a stronger player in a market space.

Mergers involve companies that agree to come together to form a new entity. They come in several flavours:

Horizontal. Two companies that are in direct competition and share the same product lines and markets.

Vertical. A customer and company or a supplier and company. Think of a cone supplier merging with an ice cream maker.

Market-extension. Two companies that sell the same products in different markets.

Product-extension. Two companies selling different but related products in the same market.

Conglomeration. Two companies that have no common business areas.

Acquisition or merger, the idea is to increase market share and benefit from efficiencies such as:

- **Staff reductions.** They'll involve duplicated departments, likely one of the CEOs and some of the senior executives who will get packages.

- **Economies of scale.** Bigger company equals greater purchasing power with bigger orders for everything from machinery and equipment to office supplies.

- **New technology.** Buying a company with unique technologies sharpens the new company's competitive edge.

- **Improved market reach and industry visibility.** Expanding marketing and distribution provides new sales opportunities.

Creating a larger company also offers an important financial benefit. It's easier to raise capital, which will come in handy when the urge strikes to advance to another level of bigger.

Mark Borkowski is president of Toronto-based Mercantile Mergers & Acquisitions Corp., which specializes in the sale of privately held companies. Visit mercantilemergersacquisitions.com.

CANADIAN HIGHLIGHTS

The adaptable helicopter, designed for a range of utility missions, will operate out of Fort McMurray, Alta.

BY PLANT STAFF

There has been some activity in Canada's aerospace industry that's not related to commercial or business jets. Airbus Helicopters Canada, which manufactures aircraft in Fort Erie, Ont., and boasts that since 1999, one of every two aircraft has come from there, delivered its first H130 for utility missions in North America in March.

The buyer is Phoenix Heli-Flight, a charter helicopter company operating out of Fort McMurray, Alta. The privately owned company carries out a variety of missions that cover exploration, wildlife surveys, utilities, oil and gas, forestry, construction, infrastructure maintenance, corporate transport, general transportation of personnel, freight and wildfire suppression and helicopter emergency medical services to the Fort McMurray and Wood Buffalo areas.

Phoenix Heli-Flight is replacing its EC130B4 with the new H130's utility package. The charter service was sold on the aircraft's wide, unobstructed flat-floor cabin that accommodates an array of equipment, cargo mirrors, a cargo sling, cargo pods and a 50-amp longline controller.

The light, single-engine helicopter, with room for the pilot and up to seven passengers, represents a new addition to Airbus's Ecureuil range. The H130's Fenestron tail rotor and automatic variable rotor speed control significantly reduce noise levels and it has a new Turbomeca Arriel 2D engine. Airbus says more than 70% of the airframe has been modified, which substantially increases the aircraft's versatility for additional missions such as hot and high operations, and aerial work.

Airbus Helicopters was estab-



Phoenix Heli-Flight's new Airbus H130, made in Fort Erie, Ont.

PHOTO: JOLEA BROWN

First Airbus H130 lands

PHOENIX HELI-FLIGHT TAKES DELIVERY



A Pratt & Whitney worker assembling the PW210 helicopter engine in Longueuil, Que. (R) The PW210 helicopter engine.

PHOTO: PRATT & WHITNEY CANADA

lished in Fort Erie in 1984 where it employs about 275 people who operate in a 135,625 square-foot plant. The company also operates customer support centres in Richmond, BC and Mirabel, Que.

Global growth

It's a subsidiary of Airbus Helicopters (formerly Eurocopter) and is wholly owned by the Airbus Group, a global aerospace manufacturer based in France.



The H130 announcement was made at the HAI HELI-EXPO in Louisville, Ky., where there was more Airbus-related news involving Pratt & Whitney Canada, the aerospace engine manufacturer based in Longueuil, Que.

LPR, part of Polish Medical Air Rescue based in Warsaw, has added four more aircraft to its fleet

of twin-engine Airbus H135P3 helicopters powered by Pratt & Whitney Canada's PW206B3 turboshaft engines, boosting the size of the fleet to 27 aircraft.

The new engine is a variant of the PW206B2 and shares the same engine architecture, which is designed for ease of maintenance, and it delivers up to 10% more thermal takeoff power in hot and high conditions. Automatic start and power are shared between the two engines, which have the lowest emission levels in their class.

Pratt & Whitney Canada has also extended the basic time between overhaul for its PW210 turboshaft engines from 3,500 to 4,000 hours.

The extension increases time-on-wing, reduces maintenance costs by more than 10% and applies to all PW210 engines currently in service and future production.

There are approximately 3,500 PW200 engines flying in 80 countries, so far accumulating 9 million flying hours.

Comments?

E-mail jterrett@plant.ca.

TROUBLESHOOTING

Protect your PUMPS

AVOID LIP SEAL AND O-RING FAILURES

Seals and O-rings are designed to protect pumps, but when they fail they can have a devastating effect on machinery.

Almost 70% of rotating equipment breakdowns are due to improper, badly installed or otherwise failing sealing devices.

To address this issue, Patrick Rhodes, applications engineer at Klozure of Garlock Sealing Technologies in Palmyra, NY, presented a technical paper on troubleshooting lip seals and O-rings at an all-day workshop convened by the Hamilton Section of the Society of Tribologists and Lubrication Engineers (STLE).

Here are some highlights from the presentation:

Performance of radial lip contact seals depends on the formation of hydrodynamic meniscus, the curved upper surface of a liquid in a tube caused by surface tension or capillarity. It's not always present. Formation depends on shaft finish and hardness, lubricant properties, lip geometry and lip load.

Common oil seal failure modes are thermal degradation, chemical degradation, lack of lubrication and carbonized lubrication.

Solutions for thermal degradation include decreasing operating temperature and adjusting seal material to higher temperatures.

To solve chemical degradation, upgrade to a compatible lip seal material.

To compensate for the lack of lubrication, increase the lubricant amount. Over- as well as under-lubrication stresses seals.



Watch for signs of degradation.

PHOTO: THINKSTOCK

Also, decrease or regulate the internal pressure.

Upgrades

Solutions for carbonized lubrication are decreasing the lube temperature and upgrading to a lubrication with increased temperature capabilities.

Common O-ring failure modes are extrusion, over-compression and explosive decompression.

Solutions for extrusion include decreasing housing clearances, decreasing application pressure and using a back-up ring.

Solve over-compression problems by decreasing the O-ring cross section and adjust O-ring material for chemical resistance, thermal resistance and compression set.

If an O-ring suffers explosive decompression, slowly release system pressure and adjust material for a higher modulus or hardness.

Applying these measures to prevent lip seal and O-ring failures will lessen the risk of premature equipment breakdown.

— Steve Gahbauer

Comments?

E-mail jterrett@plant.ca.

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THINK LEAN

For problem solving to work, acknowledge that vulnerability exists within your processes.

BY RICHARD KUNST

There are lots of methodologies to help identify and eliminate waste, but there's another monster lurking within our processes ... variability. For this we need formal problem solving tools. Although Six Sigma is the most encompassing, it requires a lot of training before folks are comfortable with all of its statistical tools.

There are a couple of problem types.

Common cause is a problem requiring fundamental improvement to correct (such as reducing variation). It's defined by the observation that "it has always been that way." These types of problems are based on engineering or continuous improvement. They're not characterized by an abrupt change from one state (acceptable) to a new state (unacceptable).

Special cause problems ask the question: What changed? It follows the realization that what was once acceptable has become unacceptable. The goal is a quick return to the previous state and prevent further loss as a result of the diminished state of operation.

Problem solving methodology won't work if it's considered just another activity. It must focus on quality and disturbances to flow.

Linkage to execution is created through daily report-out meetings, morning market and daily walks through plant. The goal is to resolve daily issues within the shift.

Problems generally fall into three categories:

1. Technical – product/process is not capable; there's an excessive scrap level; process is not stable; set-up is difficult/inconsistent; customer is dissatisfied.

2. Operational – throughput, downtime, maintenance, reliability.

3. Organizational – strategic, human resources, administrative inefficiencies.

Certain tools and skills are more effective than others at solving specific types of problems. Your current state of problem solving likely relies on expert opinion and best guess. It's an iterative approach that involves trying alternatives until the correct solution is found and works if enough knowledge and experience is available. However, it doesn't actively promote problem prevention. It deals with immediate issues and moves on; and it doesn't consider side effects of changes that create new problems.

The following are future state conditions:

- Apply a common approach to identifying, defining and solving problems at all levels



Gain traction with problem-solving tools.

PHOTO: THINKSTOCK

Tame VARIABILITY

HOW TO SUBDUE IT WITH FORMAL PROBLEM SOLVING

of the organization and speak a common language.

- Become stable and predictable.
- Reduce the time lag between problem identification and resolution.
- Treat problems, not symptoms to ensure the root cause is eliminated.
- Ensure controls are implemented to sustain gains.
- Identify and address potential side effects of changes prior to implementation.
- Be shop floor and operations friendly.

To the top floor

It's important to raise skills at all levels of organization and engage more resources.

It's not enough to say "Go and solve your own problem." Without the tools and self-confidence to use them, people are reluctant to engage. This leads to problem avoidance and "bubbling up" of issues to more senior levels for resolution, the opposite of empowerment.

Raise skill levels in decision making. A common framework is required to promote thorough analysis that results in the best choices, foreseen side effects and reduced implementation issues. The benefits include: more effective efforts; more actively engaged employees; reduced time lag between identification and solution; and problem solving becomes a way of doing business rather than a special project.

Adoption must be driven by management. Without their involvement, leadership by example and encouragement, newly acquired skills will fade away.

Here's a guide for launching a formal problem solving infrastructure.

- Select a methodology from available alternatives.
- Select champions to lead deployment within each plant.
- Determine if training should be internal or by OEMs.
- Train senior, technical and supervisory personnel, cell leaders and key hourly staff in techniques and tools. Follow up with practice.
- Continue to select projects and lead problem-solving activities by example.
- Launch the "morning market" concept.
- Align the performance measurement system to recognize the importance of problem resolution activities.

As you stabilize your variability through effective problem solving, lean methodologies will gain additional traction.

Richard Kunst is president and CEO of Cambridge, Ont.-based Kunst Solutions Corp., which helps companies become more agile and implement lean solutions. Visit www.kunstsolutions.com. E-mail rkunst@kunstofsolutions.com.

Comments? E-mail jterrett@plant.ca.

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MAINTENANCE

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Reliability programs must identify and eliminate the inevitable.

PHOTO: THINKSTOCK



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Program identifies defects faster and identifies more effective mechanisms for preventing them at each stage.

Your maintenance department takes action to “correct” a defect – presuming a familiar cause – only to find the fix doesn’t correct the problem because it didn’t address the underlying cause. How much time and money, not to mention production, is lost when the corrective action has to be redone or retried until the correct fix is applied?

Enter a defect elimination program (DEP) described by Reid Jenner, vice-president of Canadian operations for Commissioning Agents International, Calgary, at a MainTrain maintenance conference. While many plants correctly focus on preventive and predictive maintenance, he said deploying rigorous analysis tools to identify and address the causes of failure is not enough. There are always careless human acts and unforeseen failure modes that generate unanticipated breakdowns. A fully optimized reliability program requires an equally robust approach to identify and eliminate the inevitable and often very costly unplanned failures requiring correction.

To this end, Jenner argues that defect elimination should be more “proactive,” starting with simple and clear process design and implementation. Just as TQM and TPM can’t be optimized without the fully integrated involvement

of all the functional stakeholders, it's the same with a DEP. It provides faster identification of defects at all stages of the asset life cycle and identifies clearer and more effective mechanisms for preventing them at each stage.

Taking action

The first step is identifying and installing clear and effective data feeds for recognizing equipment defects that require corrective action. These signals come from the following sources:

- boots-on-the-ground operators who recognize unusual deviations in the operating condition of installed assets;
- maintenance technicians performing scheduled maintenance and inspections on equipment;
- reliability engineers performing analyses;
- real-time electronic condition monitoring equipment;
- product quality discrepancies identified by the plant's quality control department;
- internal incident investigations; and
- external regulatory inspections.

Each of these sources and signals should be configured via the plant's integrated enterprise asset/resource management system (EAM/ERP) to provide immediate, clear and direct notification that leads to timely corrective action.

The next step is to ask whether root cause analysis needs to be performed before moving to corrective action.

Applying these steps and procedures saves time and resources and it's much less expensive than reactive maintenance.

— Steve Gahbauer

Comments?

E-mail jterrett@plant.ca.



PHOTO: THINKSTOCK

Modifying how affected workers do their jobs reduces the effects of the disease.

Arthritis affects workers in all walks of life. Common symptoms such as pain, fatigue, joint swelling, stiffness and limited movement, make it difficult to perform any job.

The Arthritis Society of Canada cites it as one of the leading causes of disability in Canada and it typically occurs during the prime working years, between ages 35 to 50. More than half of the 4.6 million affected by the disease are younger than 65 and more than 7 million adults will be diagnosed over the next 20 years.

Modifying the way sufferers do their work helps to reduce the adverse effects of the disease. Pass along these tips to workers:

Modify the work environment. Organize the workspace so frequently used items are within easy reach. Workers should stand square to the workstation to avoid bending or twisting. A footrest decreases pressure on the lower back and an anti-fatigue mat relieves strain while standing for

Dealing with ARTHRITIS

HOW TO REDUCE ITS IMPACT IN THE WORKPLACE

long periods on hard floors. A chair mat makes sliding or turning a chair easier.

Maintain a good posture.

Sit in a proper upright, relaxed position to avoid strain on the back, neck or limbs. Hips, knees, ankles and elbows should be at a 90-degree angle. Place arm rests at the right height, with shoulders and elbows in a relaxed position. A properly adjusted chair provides good support to the back and legs.

For those using a computer.

A split keyboard puts hands, wrists and forearms in a more natural position, and a trackball mouse reduces hand and arm movement. Place the chair within a comfortable distance from the computer with elbows in a relaxed 90-degree angle to the keyboard. Eyes should be about 40 to 70 centimetres from the monitor, which is at eye level.

Be careful when moving or

lifting. Use a dolly or cart to help reduce back, arm and leg strain. Try to roll or slide heavy objects. Push, don't pull. Don't rush. Ask a co-worker for assistance. Use a step stool to reach items that are on high shelves, and use a briefcase on wheels when taking work home or to a meeting.

Wear appropriate shoes or boots. Footwear should support feet and promote good posture. Avoid high heels. Insoles help decrease strain on feet, legs and lower back.

Take care of yourself. Getting enough sleep, a healthy diet and exercising regularly mitigates the effects of arthritis. Work at a moderate, reasonable pace and get extra rest before important events. Alternate between sitting, standing and walking as much as possible and take stretch breaks. Keep moving.

This article was provided by the Canadian Centre for Occupational Health and Safety (CCOHS). The not-for-profit federal corporation provides information, training, education and management systems to promote health and safety. Visit www.ccohs.ca.

Comments?

E-mail jterrett@plant.ca.

WHAT EMPLOYERS CAN DO

- Provide an ergonomic workplace and job accommodation, as required.
- Allow a flexible work schedule – for example, allow the employee to work from home during flare ups and accommodate medical appointments.
- Raise awareness so everyone knows what support systems are available, including the employee benefits plan.
- Encourage and maintain good two-way communication with employees who live with arthritis.

Software developer changes direction and takes online crowdfunding by storm by raising \$3.25 million.

BY JEFF BROWNLEE

Jamil Khan never intended to set a record. He just wanted to create a functional, yet innovative coat that would battle the best Mother Nature can muster during Canadian winters.

The 36-year old has done both and has in essence re-engineered how companies are supposed to enter world markets – he has become an exporter before becoming a manufacturer.

The Toronto resident just capped off Canada's largest ever campaign on Kickstarter – a crowdfunding site aimed at creators – to get seed funding for his brilliant Smart Parka coats. When the campaign closed March 26, he raised more than \$3.25 million from 8,805 backers.

"It's beyond my wildest dreams," says Khan, a native of Pakistan and CEO of North Aware, the company making the Smart Parka. "I set out to raise \$30,000 and surpassed that in the first day. To reach this level is unbelievable."

The Smart Parka is proof innovation can take many shapes and forms. For Khan, that was trying to solve the problem of staying warm during the daily trek to his job as a software developer during one of Toronto's coldest winters on record in 2015.

The solution: four different models for women (three for men) of a functional and stylish coat that includes built-in scarf and mitts, a removable lining for those extra cold days and an extension that can turn the hip-long coat into a mid-length coat. It also boasts a hat pocket in addition to smartphone and tablet pockets, plus a built-in tag that tracks a misplaced coat from a smartphone.

"I looked at this as a problem that needs to be solved," explains Khan. "It was a simple idea that a winter coat should have these things built in and shouldn't be accessories."

Khan created 15 different versions with a lot of trial and error before he was comfortable with the final designs.

"The biggest challenge was learning how to change things (in the design)."

Yet, this begs the question: What do software development and becoming a fashion designer have in common?

"Absolutely nothing," Khan admits. "It's been a complete learning experience from day one."

And that learning experience started in February 2015 when Khan quit his job to pursue his passion full-time. He spent the next few months perfecting the designs, with the first prototype manufactured in October.

"I quit my job because I knew it would work,

Innovative EXPORTER

KICKING OFF THE SMART PARKA



Jamil Khan models North Aware's Smart Parka.

PHOTO: NORTH AWARE

I was onto something," he says. "I asked a few friends to join and help me do this and no one did – they said it wouldn't work."

The sole-proprietor chose to go the Kickstarter route in January because he felt it was the perfect platform. The online community agreed with him.

Going global

"It's hard to launch in retail and go global," Khan says. "[Kickstarter] is a cost-effective way to market and get the word out there."

He has received orders from more than 15 countries including the US, Sweden, Russia, the UK and even a few from Los Angeles.

"LA, really?" he says with an air of disbelief. "When the market tells you something, you don't ask questions."

However, members of the Smart Parka campaign have been keeping him busy answering many questions in online forums. Everything from sizing, to colour options and yes, where he is going to manufacture the coats.

He's mulling over his options right now and would will either manufacture the parkas in Canada or Vietnam. All coats are to be delivered by the end of August.

Khan admits the learning experience has

melded into overall business operations, including shipping abroad and challenges with a low loonie, which is hurting imports.

"There are many moving parts to exporting and I'm learning at the speed of light," he says.

Regardless, he extended the Kickstarter reduced offer for approximately \$295 compared to \$740 until May.

Looking ahead, Khan says he will be busy promoting the Smart Parka all over the world, particularly the EU.

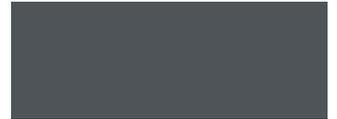
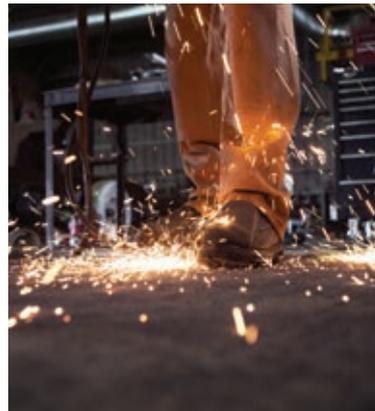
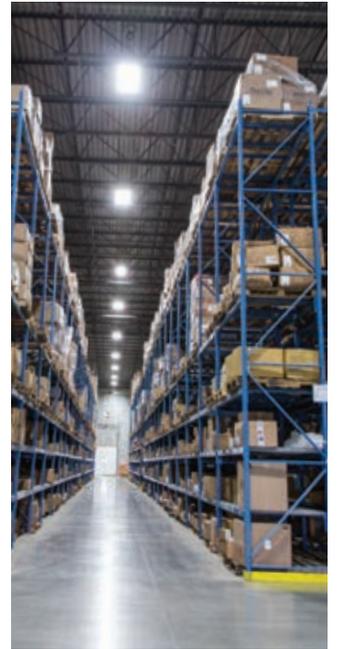
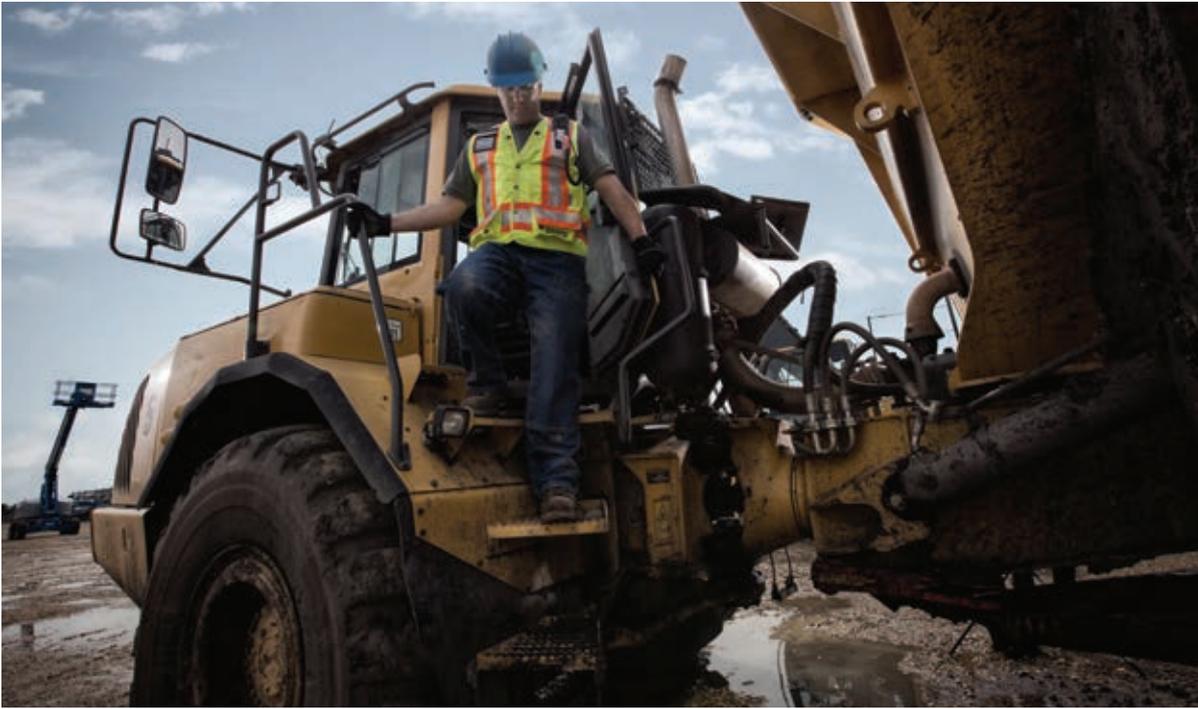
"I'm in a hurry," he says. "I am going to be travelling a lot and establishing my presence in a lot of markets so competitors don't take my market share."

As he looks back, Khan admits he took a leap of faith with Smart Parka. But that's what made it a success.

"I'm all in, including my entire life savings," he concludes. "I'm a risk taker, but you have to take risks if you want to be successful."

Jeff Brownlee is an Ottawa-based communications specialist and business writer. E-mail jeffsbrownlee@outlook.com.

Comments? E-mail jterrett@plant.ca.



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COLLABORATION

Workspace provides an incubator for innovators to experiment and gather insight from peers with similar interests.

Innovators, designers and manufacturers in Brampton, Ont. have access to advanced technology and experts thanks to a unique partnership between the city, the Brampton Public Library and Sheridan College.

MakerSpace Brampton offers residents and businesses new technology, tools, expertise, programs and events at the library where they can brainstorm, network and build on their ideas.

That's where Elizabeth Gyurán saw a flyer promoting the program developed to make advanced technology available to residents and businesses. Her car buff husband was excited at the prospect of 3D printing for car parts that are no longer available, but she wasn't thinking about how it would change her home-based business.

Yet it did.

"MakerSpace Brampton has set me on a whole new path," says Gyurán, owner of Pick Pocket Designs, a manufacturer of handbags. "When I saw the 3D printer, I got to thinking about what I could do with it."

Her thoughts turned to an Old World technique called leather moulding. With a 3D printer at her disposal and expert guidance from Sheridan College faculty, she began experimenting with a new way to expand her product line.

"I'm printing moulds, making shapes that you normally could not do, or at least would be very difficult to do," Gyurán says. "It has been an incredible opportunity to have access to this new and emerging technology and being able to try it for free. Once you start trying it, your mind starts racing about what you can do with it."

Rebecca Raven, CEO of the library describes MakerSpace Brampton as a "collaboratory" where experts from Sheridan Col-



Commercial drone systems made for industrial clients by Sheridan CAMDT were showcased at the Mayor's Innovation Roundtable.

PHOTO: MAKERSPACE

Brampton's technology PLAYGROUND

MAKERSPACE PROGRAM DRIVES GRASSROOTS CREATIVITY AND INNOVATION

IT'S A SANDBOX, A NEUTRAL SPACE WHERE
PEOPLE CAN COME TOGETHER AND SHARE AND
TRADE IDEAS AND BUILD ON THE EXPERTISE OF
ONE ANOTHER...

lege lead workshops on new technologies, including 3D printing, robotics and architecture, while Brampton economic development and library staff deliver seminars that inspire creative thinking.

Community building

"It's a sandbox, a neutral space where people can come together and share and trade ideas and build on the expertise of one another."

Sheridan is driving new technologies with its Centre for Advanced Manufacturing and Design Technologies, but the college wanted to expand the opportunities presented by the school to a grassroots audience.

"Science, technology, engineering and math are critical to the economic development of any region," says Farzad Rayegani, director of Sheridan's

advanced manufacturing centre. "A strong economy must rely on the production of something. If we don't produce, the economy won't be strong enough to support the services we cherish, like healthcare, policing and education. With MakerSpace Brampton, we are bringing the community together to build something and boldly say that we are still a nation of manufacturing."

For more information visit www.brampton.ca, and search "MakerSpace."

— Contributed by MakerSpace Brampton

Comments?
E-mail jterrett@plant.ca.

RENEWABLES

Soup maker uses saveONenergy incentive to fund 40% of \$12 million project and 100% of a feasibility study.

BY MATT POWELL, ASSOCIATE EDITOR

After two long years, Campbell Co. of Canada has unveiled a hot new power project at its Toronto manufacturing operation that will cool its dependency on traditional energy sources.

The \$12 million Combined Heat and Power (CHP) plant is part of a global effort to source 40% of the company's energy from renewable sources by 2020. The system uses a natural gas turbine that drives a steam generator to produce electricity and heat the plant.

The facility, established in 1931 in the Royal York Rd. and Lakeshore Blvd. area of Toronto's Etobicoke neighbourhood, employs 1,300 people. It produces 12.5 million cases of soup every year and sources two-thirds of its vegetables from within 160 kilometres of the facility.

Campbell covered 40% of the CHP project's costs, totalling \$5 million, through Toronto Hydro and the SaveONenergy initiative. A detailed engineering study was also entirely funded by the Ontario government incentive program, says Doug Dittburner, Campbell's chief engineer and power services manager.

CHP fit nicely into the Toronto plant's footprint because of its high heat and electrical load requirements. The facility has also deployed a one megawatt solar power complement on its roof.

"Getting through the feasibility study was the key thing to do; it provided us with the ability to move forward with the CHP project and receive the incentive grant, which makes it easier to get approval from world headquarters," Dittburner says. And the Toronto facility is the only plant within the manufacturer's global footprint to be outfitted with the technology.

Campbell also invested in a \$100,000 compressed air upgrade, a major LED lighting retrofit and is looking into a reverse osmosis system to supply water that will make a new boiler more efficient. A condensing economizer has also reduced greenhouse gas emissions by 2,200 tonnes per year.

CHP uses a natural-gas-fuelled engine to generate electricity and produce heat that generates steam, which Campbell's uses to cook soup. The system's 4.6 megawatt combustion gas turbine generator and heat recovery steam generator produce 90,000 pounds per hour of steam; then the hot combustion gas is delivered to a secondary system.

Hot exhaust air produced by the turbine



A Campbell employee monitors the CHP plant's control panel.

PHOTOS: TORONTO HYDRO

Campbell POWERS UP

CHP PLANT BOOSTS ENERGY SAVINGS



The CHP's 4.6 megawatt combustion gas turbine generator.

is delivered to a recovery steam generator, which uses the energy to produce steam. The CHP plant provides 95% of the facility's electricity needs, with the remaining 5% coming from the Toronto Hydro grid.

Waste-free

"Any waste heat is captured by a heat recovery steam generator," says Dittburner, noting the CHP system will make the Toronto plant more competitive as a manufacturer in Ontario, and on a conversion cost per case basis.

Campbell's sustainability journey started in 2010 when it set an aggressive goal to halve its environmental footprint by 2020. The CHP plant will keep the company on track to meet

its goal, and also provides a reliable tool to avoid production shutdowns with emergency back-up power.

Toronto Hydro sees the CHP as a strong energy efficiency solution for manufacturers that draw at least 500 kilowatts of power each month; have a year-round need for hot water or steam; and for plants that operate at least 6,000 hours annually.

Part of the "2020" plan also includes a drive to recycle 95% of generated waste, deliver 100% of global packaging from sustainable materials and reduce water use by 20%.

CHP is the first project of its kind within Canada's largest city to tap into saveONenergy. The program, which delivers incentives through local utilities, is funded by Ontario's Independent Electricity System Operator (IESO).

In 2014, business conservation efforts through saveONenergy programs resulted in almost 600 gigawatt hours of energy savings.

Dittburner is a big supporter, and encourages manufacturers to explore how the program can help them, especially given Ontario's high-cost energy environment.

Indeed, he says without the incentives from SaveONenergy, the CHP project wouldn't have flown.

Comments? E-mail mpowell@plant.ca.

A reported \$7 billion climate change action plan could have dramatic consequences for manufacturers, their investments and competitiveness.

BY MATT POWELL,
ASSOCIATE EDITOR

The Ontario government is preparing to usher in a new era in a bid to slash the province's carbon footprint with a far-reaching plan that could potentially disrupt manufacturing, particularly the automotive sector.

The *Globe and Mail* got a hold of the Ontario Liberal government's \$7 billion plan to quickly phase out natural gas for heating, provide incentives for building retrofits and deliver rebates to purchasers of electric cars.

There is skepticism among manufacturers and the energy sector that the plan is workable; however, Sarah Petrucci, a senior policy analyst at Clean Energy Canada, an initiative of the Centre for Dialogue at Simon Fraser University in Vancouver, thinks it's fair.

"[The plan] puts Ontario ahead of the pack. It sends a signal that will create market opportunities for the technologies companies [will need] to meet the province's carbon targets."

She notes the plan would pull technology into the marketplace instead of pushing it, as was the case when renewables were first introduced in Ontario.

There are concerns such a broad plan that touches on every facet of the economy is too much too fast.

"We already have a carbon tax called 'high electricity rates,'" says Jayson Myers, president and CEO of Canadian Manufacturers & Exporters, the Ottawa-based industry association that represents more than 10,000 manufacturers.

"The uncertainty this is generating will negatively impact



ONTARIO is giving CO₂ the BOOT

POTENTIAL RAMIFICATIONS FOR MANUFACTURERS

businesses and their investment intentions in Ontario at a time when the conditions are right economically to be trying to attract investment."

The programs will be funded with revenue from Ontario's new cap and trade system, which was approved by the legislature May 18. They'll act as a driver to cut carbon emissions to 15% below 1990 levels by 2020, 37% by 2030 and 80% by 2050.

"We have to be careful not to undermine what makes the Ontario economy work, and that's manufacturing," Myers warns. "There needs to be more thought put into the economics of a plan like this to make sure it's practical."

The plan sets a target to boost electric cars sales to 5% of all vehicles by 2020, and then 12% by 2025. To make it happen, there's an incentive fund of \$285 million for new electric vehicle purchases, worth up to \$14,000 per car. Buyers will also get their hands on another \$1,000 for installing a home charging station. The province plans to lift its portion of the HST from EV sales and introduce

an extra subsidy for low- and middle-income households to help them replace older vehicles. Another \$20 million has already been committed to building a vehicle charging station network.

Cash for cars

But auto sector analysts, including Automotive Parts Manufacturers' Association (APMA) president Flavio Volpe, believe the province's EV targets will be impossible to meet.

"...[the government] is forcing Ontarians to pay themselves subsidies to buy electric vehicles that won't actually exist," he told the *Globe and Mail*.

New grants, rebates and subsidies totalling \$3.8 billion would be directed to building retrofits and the eventual elimination of natural gas as a heating source, while cutting CO₂ emissions by 3 million tonnes. Natural gas would be replaced with geothermal, solar or electric heat sources.

Myers is particularly concerned about replacing natural gas with electricity.

"That's going to take huge investment in generation and

Ontario's plan is for electric vehicles to make up 12% of total car sales by 2025.

PHOTO: THINKSTOCK

transmission, and I'm not sure renewables are going to be up to the job," he says. "What's the plan for energy provision going forward? That's already a major issue in Ontario, especially for manufacturers."

These programs would be managed by a new Green Bank, which the report says would be modelled after a similar program in New York State. Within the \$3.8 billion commitment is \$1.2 billion to help factories and industrial businesses cut emissions by 2.5 million tonnes, and there's \$375 million dedicated to research and development for new clean technologies.

The Ontario Natural Gas Alliance says the proposal to switch from natural gas to electric heating is ill-conceived and prohibitively expensive, estimating the policy would cost Ontario households up to \$3,000 more each year.

"Using cap and trade proceeds to switch Ontarians to electric heat would be disruptive and will not allow us to achieve our emission reduction goals," the alliance said in a release.

Petrucci believes Ontario has the tools it needs to meet the plan's policies thanks to a strong knowledge base and growing technology hubs in the manufacturing sector.

Myers remains less optimistic, despite acknowledging manufacturing's need to drive energy efficiency and make investments to reduce carbon emissions.

"The ink is hardly dry on cap and trade, and if this is the actual plan I would caution the government to do its homework and ensure the economics of such a plan don't sacrifice the competitiveness of important sectors to the economy, including manufacturing."

The Wynne government is to reveal more details about its action plan in June.

Comments?

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Ford of Canada's Oakville, Ont. assembly plant (seen as it is today) was opened in 1953 and another plant was opened in Talbotville, Ont. in 1967.

PHOTO: FORD

The Sixties turned the 1950s on its head, and was a turning point for Canada's automotive industry.

BY JOE TERRETT, EDITOR

Something happened when the calendar turned over from 1959 to a fresh decade.

As the sun rose on the Sixties, post-war growth continued, but there was industrial, technological, social and political revolution in the air.

Where to begin... the Cold War with the Soviet Union was at its chilliest, the first manned Soviet space flight in 1961 led to American astronaut Neil Armstrong's stroll on the Moon in 1969, the introduction of the first oral contraceptive in 1960 launched a sexual revolution, and an explosion of rock and roll brought the Beatles to the world's attention in 1964. There was political upheaval, youth challenged authority, the oppressed asserted their civil rights and there were a lot of recreational drugs taken.

It was also an important decade for Canada.

In 1960, aboriginals were given the right to vote without having to give up their status or treaty rights, the Quiet Revolution in Quebec became more audible in 1963, Canada got its own flag in 1965, Canada celebrated 100

ROCKING the 60s

PLANT AND THE DECADE OF CHANGE

years as a country in 1967, the first Trudeau (Pierre) became Prime Minister in 1968, the same year Medicare came into effect, and in 1969, three New Brunswick engineers invented air hockey. Scores!

In the world of manufacturing, Americans owned more than half of Canada's companies and by 1967 owned 88% of Canadian oil. On the upside, branch plants

75 YEARS

employed Canadians who paid taxes and their operations benefited from American technology. On the downside, the profits

went south and as we have seen in recent times, many companies have followed, redirecting jobs to the homeland.

The 1960s was a key decade for Canada's automotive industry, which was facing difficulties in the early years. The Big Three OEMs (Ford, General Motors, Chrysler) were importing an increasing number of cars and parts from the US, as in Not

PLANT MANAGERS SALARY SURVEY 1965

The September 1965 issue of *PLANT Administration & Engineering* looked at what plant managers were being paid and based on 164 responses, the editors were not impressed. More than 70% of respondents were pulling more than 70 hours a week on the job, managing hundreds of employees and earning \$13,000 a year, plus a 5% bonus if they were lucky. And many plant managers were making much less.

The article noted some interesting trends that are similar to what's going on today.

- Good executives were hard to find and keep. **PLANT**



PHOTO: BANK OF CANADA

predicted the shortage would reach a crisis point in five years.

- Union negotiations had narrowed the gap between hourly and mid-management wage increases.
- New jobs and new skills were demanding better training.
- Environmental issues such as pollution and noise control were falling under government scrutiny and new legislation.

The verdict? **PLANT** editors pronounced plant managers overworked and underpaid.

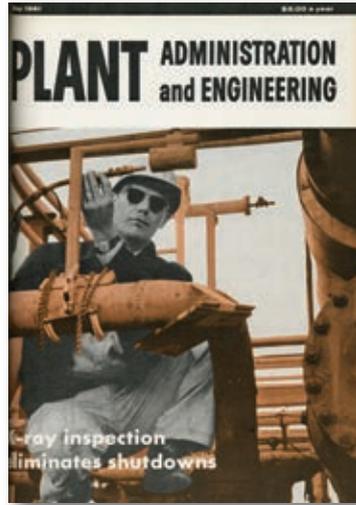
And how are they treated today? Watch for the EMC-**PLANT** Salary Survey report in the July/August issue.

Made in Canada.

At issue, says the *Canadian Encyclopedia*, was the proliferation of styles and models. "... Canada's plants simply could not keep up with the Canadian consumers' demand for the latest models; they also could not keep up with the latest technological developments, such as the increasing popularity of automatic transmissions."

As a result, there was some rethinking by the two governments about auto trade, which led to the Auto Pact in 1965 and the active participation of the Big Three. This was a controversial move, because it was a conditional free trade arrangement that lifted tariffs and created a continental, unified automotive industry.

But it meant Canadian plants would build as many cars as were sold in Canada; and the manufacturers agreed to invest the equivalent of 60% of Cana-



A new name, May 1961.

dian sales in their Canadian operations for three years.

PLANT Administration and Engineering (name change made in May 1961) predicted in its January 1965 issue this agreement would be just the beginning of free trade regions.

"It's a matter of sound economics. After 100 years, we're fed up

to the teeth – or should be – with subsidizing to a ridiculous extent our present east and west within the confines of our national boundaries. Nationalism is one thing, economics is something else again..."

PLANT noted auto experts were expecting a 5% increase over the previous year of output hikes. Meanwhile, Ontario Economics Minister Stanley Randell predicted "far reaching" effects from this "continental blurring."

"Should freer trade become a reality, the Canadian exporter would almost overnight expand his North American market tenfold."

Yet he "shuddered at the thought of facing the tidal wave of American duty free products that would surge over the border."

Free trade

Turns out the Auto Pact was beneficial to the industry and

Canada's economy. The *Canadian Encyclopedia* notes by the 1970s Canada's share of the market doubled from its less than 5% in 1965. In the 1980s the sector grew with the addition of plants from Toyota and Honda elevating Canada's industry to the world's sixth largest.

But with the US Free Trade Agreement in 1989 and NAFTA in 1993, the Auto Pact was rendered obsolete, then illegal in 1999 when the World Trade Organization ruled it unfair to Toyota and Honda.

Today Canada's automotive industry is in flux as new investment is channelled to Mexico and the US. Globalization continues to change the dynamics of the industry, and it remains to be seen what effect recent free trade agreements will have, or where Canada will fit in.

Comments?

E-mail jterrett@plant.ca.



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SECURITY



iLobby repurposes reception staff for higher value duties.

PHOTO: INKAS

Manage visitors VIRTUALLY

iLOBBY PLATFORM ELIMINATES LOGBOOKS

Tablet-based system from INKAS streamlines visitor registration to enhance plant safety and security.

BY MATT POWELL,
ASSOCIATE EDITOR

The INKAS Group of Companies is well known for producing some of the world's most impressive, and expensive, armoured vehicles at its Toronto plant.

Now the company, through its AppGear division, wants to virtualize a manufacturing facility's visitor management

system with iLobby. The innovative tablet-based visitor registration and management platform enhances the security of business infrastructure and streamlines a visitor or tradesperson's experience at a plant.

It shows exactly where everyone is within the facility, at all times.

"The platform is the evolution of the entire INKAS group, and builds on the theme of security

and safety in the workplace," says David Fraser, COO of INKAS Armoured Vehicle Manufacturing.

"In the back end, iLobby also provides some analytics about how productive your employees were."

The system works as a virtual receptionist, prompting visitors, tradespeople and delivery personnel to register through a tablet, keying in personal information, the company they work for, and a vehicle's license plate number.

Continued on page 34

SUPPLY LINES



High vacuum transformer oil purification system. PHOTO: WAJAX

WILSON ACQUIRED

Wajax has purchased Wilson Machine Co. to expand its asset management capabilities.

Buying the Montreal company, which repairs rotating machinery and gearboxes, allows Mississauga, Ont.-based Wajax to manage a customer's asset life cycle in-house.

Oil Filtration Systems Inc. products have also been added to the line up. The Boerne, Tex.-based manufacturer's equipment removes contaminants from a variety of industrial fluids.

NEW REP

VAC-U-MAX, a manufacturer of vacuum systems in Belleville, NJ, has a new rep in Ontario.

Dickson Industrial Insight & Innovation Inc. (DI3), a provider of bulk handling systems based in Cobourg, Ont., will pursue new business and promote VAC-U-MAX's vacuum cleaning systems.

PARTNERSHIP DEAL

ATEK Access Technologies has entered into its first Canadian partnership with a fluid management company based in Edmonton.

Titan Logix will sell ATEK's Tank-Scan wireless tank monitoring products and identify new ways to apply them.

The scanners monitor fluid levels in multiple tanks, across numerous sites, from anywhere with an internet connection.

ATEK develops M2M technologies in Eden Prairie, Minn.

Continued from page 33

They'll be prompted to pose for a photo and an ID badge will be printed. The system will then send an instant visitor notification to specific employees the person is in the building to see via text message, e-mail or voice alert, and provide both parties with the location within the building where a meeting will take place.

were repurposed when the telephone keypad was introduced.

In highly regulated industries that require compliance with regulations such as PCI, GMP or ITAR, iLobby ensures appropriate security and visitor protocols are in place, which is handy during an audit. The platform produces standard and fully customized reports instantly.



Tablets are placed in reception and delivery areas.

PHOTO: INKAS

The cloud-based platform collects signatures on health questionnaires, waivers, NDAs and legal documents. It also eliminates administrative burdens during regular auditing through a central database that stores an entire visitor history profile with export options. A tablet can also be placed in delivery areas to track trucks coming in and out.

All-seeing

An evacuation mode assists during emergencies by dispatching notifications to all employees. If there are visitors in the building, they're listed in the employee notification. Health and safety personnel receive a complete list of all visitors and contractors to assist in the headcount process.

"Instead of having a person at your front desk, the system allows companies to reprofile them to a position in which they're generating revenue," Fraser says, noting the concept is similar to the way telephone operators

Fraser says the idea took about a year from concept to working prototype, and has been in the field for five months. It combines all facets of INKAS's business divisions, including cash-in-transit, armoured vehicle and point of sale. There's a number of pricing options, starting at free and ranging up to \$199 a month for the corporate package, which includes a 10-inch tablet, cellular connection, unlimited users, a multi-site licence and a badge printer. An enterprise package is also available for larger operations.

iLobby fits in nicely with the growing virtual scope of manufacturing facilities. While the system may not directly impact what's happening on a plant's production line, it does provide valuable insights into what's going on across the entire facility.

Comments?
E-mail mpowell@plant.ca.

PRODUCT FOCUS
TEST, MEASURE



High torsional stiffness.

COUPLINGS PROVIDE STRESS RELIEF

Test dynamometers experience high input speeds and high torque loads that stress transducers and connected components. CD Couplings from Zero-Max assure these systems generate accurate torque measurements.

Characteristics of the coupling's proprietary composite disc pack include: high torsional stiffness; low reaction loads under (inevitable) misalignment; and medium axial stiffness. These properties provide a more predictable ANF point.

A low reaction load under misalignment greatly reduces unnecessary loading on the torque transducer to increase the accuracy of the overall system.

The composite disc design flexes well over 2 degrees without fatigue and without compromising operational life. With this increased angular capacity along with the low reaction loads under misalignment, the length needed to accommodate the required radial misalignment is significantly less than a comparable metallic flex element. The result is a more compact assembly with fewer vibration issues.

Zero-Max is a provider of motion control solutions based in Plymouth, Minn.

www.zero-max.com

ZERO IN ON HOT SPOTS

Fluke's 279 FC TRMS integrates a full-featured thermal digital multimeter (DMM) with a thermal camera in one device to speed up troubleshooting.

Technicians quickly check for hot spots in fuses, wires, insulators, connectors, splices and switches with the imager, then troubleshoot and analyze issues with the DMM.

There are 15 electrical measurement functions including AC/DC voltage, resistance, continuity, capacitance, diode test, min/max, and frequency. The optional iFlex clamp wraps around conductors and wires in tight, hard-to-reach spaces and expands its



Analyzes issues.

measurement capabilities to include AC current up to 2,500 A. The 3.5-in (8.89 cm) full-colour LCD screen aids clear viewing of images.

The device is part of Fluke Connect, a system of wireless test tools that communicate via the cloud-based Fluke Connect app, or Fluke Connect Assets software, to share thermal images and electrical measurements in real time via smartphones or tablets.

Fluke Electronics Canada LLP in Mississauga, Ont. is part of Fluke Corp., a manufacturer of electronic test tools.
www.fluke.com

MULTIMETER TROUBLESHOTS ELECTRICAL ISSUES

Ideal Industries Inc.'s 490 Datalogging Digital Multimeter helps troubleshoot problems in industrial applications such as power distribution systems, electro-mechanical equipment and motor drives on the plant floor, and also it performs a range of basic maintenance tasks. Features include auto-sensing functions, easy-to-read backlit LCD and simple toggle operation.



Also covers maintenance tasks.

It's safety rated for CAT III 1000 V and CAT IV 600 V with True RMS readings for error-free testing; auto AC/DC voltage (1,000 V) and current

mode with frequency indication; auto selection for resistance/continuity/diode/capacitance; and data acquisition, logging up to 20,000 records.

High frequency rejection mode provides accurate voltage/frequency readings on non-sinusoidal waveforms.

There are two models: the entry-level 61-497 multimeter and the 61-498 with 100,000 count display and higher accuracy.

Ideal manufactures electrical instruments in Sycamore, Ill. www.idealind.com

HANDHELD TESTING GETS SMARTER

Dwyer Instruments Inc.'s UHH2 universal handheld test equipment provides the functionality and versatility of the Mobile Meter Software App on a rugged IP68 Android based handheld device.

Wireless anemometer, hygrometer and pressure probes communicate to the base unit using Bluetooth and they all display simultaneously.

Each UHH2 includes a base unit, UHH-BTG wireless mobile gateway, two USB charging cables, charging block, mini-screwdriver, user manual and headphones.

Dwyer makes test and measurement instruments in Michigan City, Ind. www.dwyer-inst.com



Wireless probes.

METERS KEEP A CLOSE EYE ON GAS LEVELS

Fox Thermal Instruments' has updated its FT1 thermal mass flow meter to include retractors for five probe sizes, a HARD communication option and FC, FMc Class 1 Division 1 approvals for gas monitoring.



ATEX-rated.

They're equipped with Fox's Gas-SelectX gas menu for air, argon, butane, carbon dioxide, methane, natural gas, nitrogen, oxygen, helium, hydrogen, propane and 3-gas mixes where natural gas, air and digester gases need to be monitored. It's also used in heavy industrial applica-

tions such as HVAC, pulp and paper mills and glass and ceramics operations. They're rated to ATEX and IECEx Zone 1 approvals.

A Zero CAL-CHECK i-situ calibration validation routine, RS485 Modbus RTU or BACnet MS/TP communication protocols are standard. A USB port connects to a PC. The FT1 View platform configures graphing and datalogging.

Fox manufactures thermal instruments in Marina, Calif. www.foxthermalinstruments.com

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PRODUCT FOCUS

MODULES MEASURE TEMPERATURE, ENERGY

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

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



X20 I/O system.

X20ATB312.

The compact (12.5-mm wide) module is wired using a X20TB1F 16-pin terminal block. The module also allows direct resistance measurement and sets the filter time individually.

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

The module measures current and voltage up to the 31st harmonic, so it's precise. High sensitivity and a fourth channel makes it suitable for measuring leakage current on neutral lines. The signals are pre-processed before passing on as digital variables, which reduces the load on the controller.

B&R, based in Atlanta, Ga., is a manufacturer of automation products.

www.br-automation.com

of actions and the force required to insert the needle can affect the internal pressure. It also benefits any package size with unknown internal conditions.

The sensor is located at the tip and is inserted directly into the headspace, eliminating the need to extract headspace to conduct a test.

The optical sensor "fluoresces" or gives off light directly related to the amount of oxygen present in the headspace. The Model P also measures oxygen permeation rates down to 1 cc per m²/day.

MOCON is a provider of test and measurement instruments based in Minneapolis.

www.mocon.com



Detects wear within 0.10 mm.

MONITOR CHAIN DRIVE ELONGATION

IWIS Drive System's Chain Condition Monitoring system measures elongation in simplex, duplex and triple drive chains while they're in operation and it provides an early warning when a chain is worn.

Different speed ranges and changes of load direction are not a problem. Contact-free measurement results transfer to a computer via USB connection or are displayed on a special LED interface in 0.5% graduated steps. The system detects wear within 0.10 mm and runs at speeds of 30 fps or more.

It uses a 24 VDC power supply and delivers feedback with on-board LED lights or via the USB connection.

The unit works effectively in harsh conditions and mounts permanently on conveyors in hard to reach places.

It's distributed by Wajax Industrial Components in Lachine, Que.

www.wajaxindustrial.com



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Measures to 1cc per m²/day.

TEST YOUR HEADSPACE

MOCON Inc.'s OpTech-O2 Model P test system helps food, pharmaceutical and medical device companies improve the accuracy of their package headspace oxygen readings.

It uses a patent-pending pressure needle and a sensor to automatically measure internal package pressure and calculate the correct oxygen reading. (Internal package pressure directly impacts the accuracy of the oxygen reading.)

This ability is particularly important for small packages such as blister packs because a variety



Four models, basic to advanced.

APPLY HIGH PRECISION TO SMALL INDENTATIONS

Mitutoyo's HV-100 Vickers hardness testing machines (in A, B, C, D models) with 0.1µm resolution measure small indentations with high precision. Automatic operation is available via AVPAK software performed on a Windows PC.

The basic HV-110/120 A system is equipped with a high-performance motorized test force selection and turret mounts easily controlled via a colour touch screen panel. A list function makes it easy to perform multi-point average hardness evaluations.

HV-110/120 B, C, D are advanced models with AVPAK dedicated image analysis software that enables automatic indentation reading and excellent automatic edge detection. It eliminates reading variations and visual error, and data is easily customized.

HV-110/120 C, D testers add

power X-Y stage for automatic continuous testing. D testers add automatic focusing and create a fully automatic system that shortens the total cycle time for hardness testing, from indentation to analysis and to the creators of a report.

Mitutoyo Canada Inc. in Mississauga, Ont. provides measurement and inspection instruments. www.mitutoyo.ca

PROBE MINIMIZES DOWNTIME

Michell Instruments' HygroSmart HS3 configurable humidity and temperature probe alters RH and temperature conditions to keep up with process changes or new developments.

The probe also keeps maintenance to a minimum. Set the zero/span range and output signals, then choose from five output parameters (including dew point) on a PC via proprietary application software.

Minor calibration adjustments are easily made, with a five-point digital trim adjustment to maximize accuracy without replacing the sensor.



Corrosion-resistant body.

The probe has a solid corrosion-resistant body for harsh industrial conditions, it delivers 145 psig (10 bar) pressure and has a NEMA 4 (IP67) ingress rating. Accuracy is 0.8% RH.

Michell is a manufacturer of moisture and humidity measurement technologies based in Rowley, Mass.

www.michell.com



For building and roof inspections.

AIRBORNE THERMAL IMAGING

FLIR's Zenmuse XT Aerial Thermal Imaging Kits, with advanced options for both inspection and first responder applications, takes thermal imaging into the air.

Building and roof inspections are done in minutes by a drone equipped with a thermal camera, and done according to your schedule.

Features include: digital zoom at 2x, 4x, 8x (6.8 mm) and 2x, 4x (13 mm); FPA/digital video display formats at 640 x 512 (6.8 mm) and 336 x 256 (13 mm); high

gain scene range for 6.8 mm at -25 to 135 degrees C; high gain scene range for 13 mm -25 to 100 degrees C; and low gain scene range at -40 to 550 degree C.

FLIR is a manufacturer of thermal imaging cameras and sensors based in Wilsonville, Ore.

The unit is distributed by ITM Instruments in Newmarket, Ont. www.itm.com

X-RAY GOES LARGE

Teledyne DALSA's Rad-ikon 2022 CMOS detector handles large format non-destructive testing and industrial x-ray applications.

Resolution is 2,064 x 2,236 pixels (99 micron) covering 20.4 x 22.1 cm with real-time imaging of up to 30 fps and a fast, reliable Gigabit Ethernet or Camera Link interface. Other features include: 5 lp/mm resolution; energy range from 10 to 225 kV; 14-bit digitization of images; and SDKs, drivers and programming support.



14-bit digitization.

Teledyne DALSA in Waterloo, Ont. makes high performance digital imaging technology. www.teledynedalsa.com

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PRODUCTS AND EQUIPMENT

ELECTRONICS



Imperial or metric thread sizes.

FASTNERS FOR PRINTED CIRCUIT BOARDS

PEM ReelFast surface mount fasteners from PennEngineering cover a variety of printed circuit board applications. They mount, stack or space; attach components; create right-angle attachment points; or enable repeated access without loosening screws.

All types are supplied on tape and reel compatible with existing SMT automated installation

equipment and they install permanently.

Where necessary, a polyimide patch is affixed to the end of the fasteners for vacuum pickup. Production benefits include avoiding potential board damage and scrap due to improper secondary installation operations by off-line equipment.

The product line includes Type SMTSO steel nuts and spacers/standoffs; Type SMTSOB brass versions with or without threads; Type SMTRA with re-usable threads at right angles to boards for mounting board to chassis, chassis to board, or component to board; Type SMTPFLSM all-metal spring-loaded captive panel screws; and Type PSHP captive panel screws with colour plastic caps for access to assemblies without loose screws.

PennEngineering is a fastener manufacturer based in Danboro, Pa.

www.pemnet.com

POWER CONVERSION

DRIVE PROGRAMS PROTOTYPE APPLICATIONS

Haydon Kerk Motion Solutions' PBL4850E programmable 3-phase brushless motor drive replicates the functionality of stepper-based drives on brushless counterparts as the two types now share a common graphical user interface.

The interface automatically populates motion profile parameters based on the entry of just a few motor characteristics. Complex parameter calculations or in-depth motor knowledge are unnecessary, which allows users to easily prototype applications. The 4-quadrant brushless controller uses sinusoidal commutation to produce smooth motion, which minimizes torque ripple. The drive further refines motion by incorporating trapezoidal and s-curve motion profiles.

Programmable current control goes up to 5.6 A with an optional current boost during ramping of up to 6.5 A peak with an input voltage of 12 to 48 VDC.

Hall cell signals are used for phase initialization and an encod-



Current control up to 5.6 A.

er provides positional feedback. There are eight opto-isolated general purpose inputs (rated for 5 to 24 VDC, 8 mA maximum per input) and outputs (5 to 24 VDC, 200 mA maximum).

Haydon Kerk's IDEA software is configurable with a number of programming units. Selecting units of revolutions creates a platform for users to generate complex velocity motion profiles geared to rotary-based applications.

The drive also integrates into systems that require the storage of multiple programs and extended memory, then executes them outside of the software without a connection to a computer.

Hayden Kerk is a manufacturer of motion control products based in Waterbury, Conn.

www.haydonkerk.com

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POWER SUPPLY

POWER SUPPLIES HANDLE HEAVY LOADS

MicroPower Direct's MPU-600S power supplies deliver 600 W of output in a compact U-Channel package for industrial power applications that require high power density.

The power supplies are equipped with a universal AC input; active power factor correction; full safety approvals; robust filtering and compact construction.

Standard models operate from a universal input of 90 to 264 VAC. Outputs are factory set to 12, 24, or 48 VDC, but cover a range of 2 to 60 VDC.

Features include filtering to EN 55022 Class B, active power factor correction to EN 61000-3-2 D, peak output power to 900 W, and 3,000 VAC input/output isolation.

All models are protected for overload, over voltage, over temperature and short circuit faults. An N+1 current share feature connects up to four units. The units are certified to CE and approved to EN 60950. All models operate in temperatures from 0 to 70 degrees C.

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

www.micropowerelectronics.com



Universal input of 90 to 264 VAC.

TUBES AND HOSES



Speeds up assembly time.

HOSES REQUIRE FEWER CONNECTION POINTS

Parker Hannifin's Parflex 56DH diagnostic hose provides constant psi of 6,000 in microbore sizes of 2 to 4 mm, allowing the hose to fit into tighter routings while minimizing signal loss.

The 56DH integrates a Parker Pressure Diagnostic (PD) port to speed up assembly time by eliminating the stack of hose fitting, bulkhead adapter and PD nipple.

It also comes in longer lengths than comparable rubber hose for fewer connection points to provide faster response in critical mobile applications.

Parker's Parflex division based in Ravenna, Ohio is a manufacturer of thermoplastic and fluoropolymer hoses and tubing.
www.parker.com/pfd

HOSES

HOSES STAND UP TO HYDRAULIC, WATERBLAST APPLICATIONS

CRP Industrial's Reflex ultra high pressure (UHP) hoses stand up to general hydraulic applications, including hydraulic jacks, bolt tensioning and testing.

Seven hose styles, which are abrasion and impulse resistant, come with working pressures up to 40,600 psi. They're also chemical, ozone, ultraviolet light and seawater-resistant; and are cut-, crush- and age-proof.

The hoses come with a combination spiral layered steel rein-



Chemical, cut and crush resistant.

forcement and have an insert and ferrule that maintain component and assembly integrity. Operating temperature range is from -30 to 70 degrees C. All hoses are certified to TÜV: ISO 9001:2008 and ISO 14001:2004.

CRP Industrial is a manufacturer of thermoplastic hoses based in Cranbury, NJ.
www.crpreflex.com

SCANNERS

3D SCANNER ADDRESSES INCREASING MANUFACTURING STANDARDS

Creaform's MetraSCAN 3D scanner has been re-engineered to address increasing manufacturing quality standards.

Enhancements include volumetric accuracy of 0.064 mm regardless of environment instabilities; and a measurement rate of 480,000 m/s, which is 12 times faster than previous generations.



Accuracy of 0.064 mm.

TRUaccuracy, the optical-based data acquisition process, provides measurement accuracy for small to large parts and assemblies that are insensitive to the instabilities of the environment.

The system addresses potential quality control issues at any stage of the production cycle, regardless of part complexity and material, and does so efficiently on black, multi-coloured or shiny surfaces.

Single-point measurements are possible with the HandyPROBE Next portable CMM, which is compatible with VXinspect, Creaform's dimensional inspection software.

Creaform is a manufacturer of 3D portable measurement technologies based in Levis, Que.

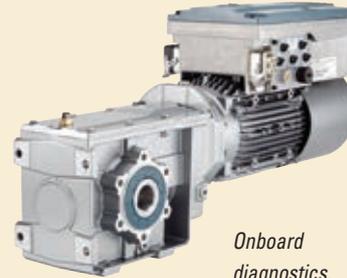
www.creaform3d.com

DRIVES

G110M DRIVES DELIVER FLEXIBLE CONTROL

Siemens' easy-to-install Sinamics G110M motor-integrated drive for Simogear gear motors delivers flexible control, integrates safety and saves space in material handling applications.

Rated to IP66, the motor drive handles conveyor, warehousing, logistics and automotive manufacturing challenges thanks to high torque density, low noise and high efficiency.



Onboard diagnostics.

There are plug connections for onboard I/O to speed up installation, while optional power connectors deliver time savings.

The system comes pre-configured and the drive provides onboard diagnostics.

Optional internal braking resistors, motor brakes, integrated "Quick Stop" and limit switch features are suitable for conveyor applications.

Integrated safety functions such as "Safe Torque Off" are activated via a fail-safe input or via Profisafe, without additional safety monitoring components.

Siemens is a global manufacturer of industrial products based in Munich, Germany. Its Canadian corporate headquarters is based in Oakville, Ont.

www.siemens.com

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PRODUCTS AND EQUIPMENT

MATERIAL HANDLING



Finished to sanitary standards.

BAG FILLER PREVENTS WORKER INJURIES

Flexicon Corp.'s rear-post bulk bag filler has a patented swing-down head at floor level that provides safe, ergonomic spout connections, and a low-profile loading deck to easily move filled bags using pallet jacks.

The cantilevered fill head pivots downward vertically, placing the

inflatable bag spout seal, inflator button and four-bag loop latches within an arm's length of an operator standing on the plant floor.

Once the operator connects the bag straps and activates the inflatable bag spout collar, the filler automatically pivots the fill head to horizontal, inflates the bag to remove creases and activates a flow control inlet valve or feed conveyor.

The controller raises and vibrates the loading deck at programmed intervals as load cells register the gain in weight to densify material and promote flow into bottom corners of the bag. It automatically stops the flow of incoming material when target weight is attained, deflating the bag spout collar and releasing the bag straps so the bag can be removed using a pallet jack or forklift.

The filler is made of carbon steel with a durable industrial coating. Stainless steel product

contact surfaces are finished to sanitary or industrial standards, and come with mechanical or pneumatic conveyors.

Flexicon is a manufacturer of conveying and material handling products based in Bethlehem, Pa. www.flexicon.com



Capacities of 3,000 and 4,500 lbs.

PALLET TRUCKS HANDLE HEAVY LOADS

Presto Lifts' PowerJak electric pallet trucks are equipped with powered lift and drive to easily transport palletized loads in manufacturing and warehousing applications.

The trucks come in two models with capacities of 3,000 and 4,500 lb., with heavy duty reinforced forks that have a lowered height of 3.4 in. and raised height of up to 8 in. The outside dimension of the forks is 27 in. with a load centre of 24 in.

Forward- and reverse-drive switches on both sides of the handle accommodate left- or right-hand operation. A turtle setting reduces drive speed by 50% for precise positioning control in tight areas.

Travel on rough or uneven surfaces is smooth with dual articulating front casters. An auto-reversing belly switch protects operators from injury when walking the unit backwards, while an automatic brake halts travel when the drive/steering handle is released.

An easily visible and accessible instrument cluster includes a key switch to prevent unauthorized use, an LED battery status indicator, a digital hour metre and an emergency e-stop.

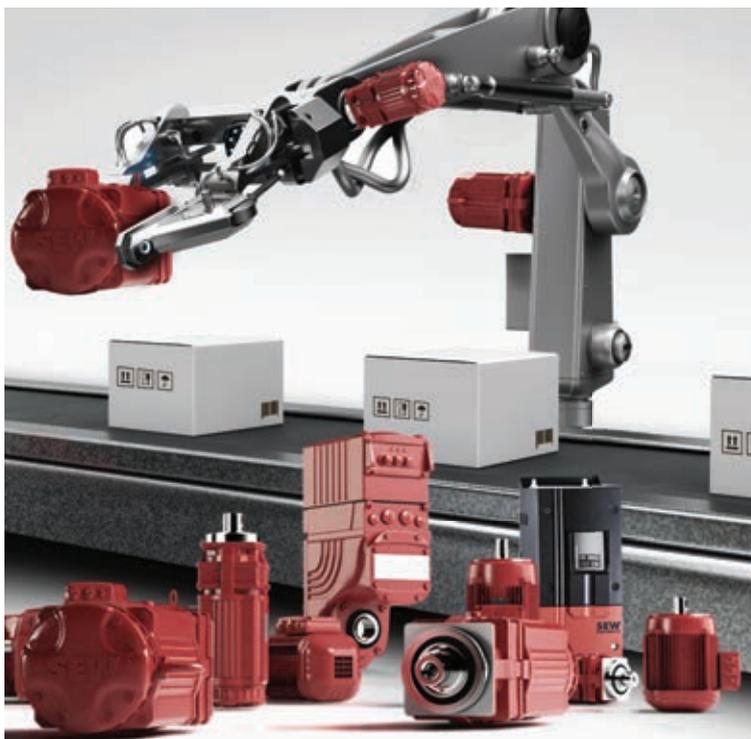
The trucks are powered by two 12 VDC, 75 AH batteries.

Presto Lifts is a fork truck manufacturer based in Norton, Mass.

www.prestolifts.com

WATCHDOG WDC4 MONITORS BELT SPEED

4B Components Ltd.'s Watchdog Super Elite WDC4 control unit processes signals from up to 15 sensors for belt speed and misalignment, bearing temperature, pulley misalignment and plug



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VALVES

VALVES ADJUST FOR DILUTE, DENSE PHASE CONVEYING

Schenck Process' PT45 diverter valves are equipped with adjustable alignment stops for dilute phase or dense phase conveying applications.

There's 45-degree port-to-port rotation, two-way switching, cast iron or aluminum housing, tunnel, and end plates with a 316 stainless steel actuator and arm assembly. Inlet and outlet ports are flanged to mate 150# ANSI patterns.

The housing and tunnel on the aluminum valve are hard anodized to boost wear resistance, while a pneumatic actuator provides a 2 to 4 s actuation time between ports.

A 4-way double solenoid air control valve is fitted with a NEMA 4-rated enclosure and a NEMA 4/4X position proof switch with 2 DPDT switch elements.

Schenck Process is manufacturer of pneumatic conveying products based in Whitewater, Wis.

www.schenckprocess.com



45 degree port-to-port rotation.



Modbus TCP/IP protocol-connected.

conditions in conveying applications.

Easy to install and simple to set-up, the system logs alarm details and shuts down the elevator/conveyor and feeding system. A 3.5-in. colour graphic LCD screen displays the entire system's status.

The unit supports belt speed monitoring for variable frequency drives and misalignment inputs for contact, pulse and temperature sensors. Jog and

acceleration monitoring detects equipment issues during the start-up sequence.

The controller settings are password protected and are set up either directly on the LCD screen or by a free PC software application and transferred via SD card.

It's connected using the Modbus TCP/IP protocol, or integrated into HazardMon.com, a secure cloud-based solution that provides live system status, graphs and historical data that's viewed on any web-enabled device.

4B Components is a manufacturer of material handling components based in Morton, Ill. www.go4b.com

ENCLOSURES

LIGHTWEIGHT CABINETS ARE STRONGER THAN STEEL

Intertec explosion proof cabinets protect field instrumentation in



High thermal resistance.

Zone 1 and 2 hazardous areas for housing forward-placed analyzer equipment in process facilities such as petrochemical/oil refineries and fertilizer production/storage plants.

They're constructed of glass reinforced polyester composite materials, which are corrosion resistant and similar in strength to stainless steel, but about 75%

lighter. Thermal resistance is higher than metal to simplify cabinet construction and it reduces energy requirements for heating and cooling equipment.

Intertec, an enclosure manufacturer headquartered in Germany with Canadian manufacturing operations in Sarnia, Ont., says the cabinets are useful for containment applications, including equipment that is susceptible to explosions.

Panels are chemically bonded to create a seal that prevents hazardous gas ingress and reduces air consumption, which is used to create the slight-positive over-pressure required for explosion-proof protection.

A control unit regulates the flow of inert purging gas or compressed air and monitors the pressure inside the cabinet to keep it maintained slightly above atmospheric pressure to compensate for any leakage.

www.intertec.info

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PRODUCTS AND EQUIPMENT

MACHINING

CUTTERS HANDLE HARD-TO-MACHINE METALS

Dormer Pramet's Penta HF positive axial rake, high feed cutter makes easy work of machining applications on materials such as heat treated and difficult to machine steels, stainless steels and heat resistant super alloys (HRSA).

The cutter, with five edge inserts, has an internal cool-



Reduces cycle times.

ant for deep cavity milling and helical applications, particularly low-horsepower requirements.

The company, a global

manufacturer of cutting tools headquartered in Sweden with Canadian operations in Mississauga, Ont., says the Penta HF alongside its PDMW inserts reduce cycle times in structural steel applications.

A special surface finish improves corrosion resistance, reduces wear and lowers friction resistance.

www.dormerpramet.com



One, two or four pole pairs.

Only a short 300 ms current pulse is required for actuation and deactivation.

The bi-pole gripper handles heavy and complex ferromagnetic parts, and comes with one, two, or four pole pairs in different arrangements.

For handling thin sheets, the gripping force is reduced in eight stages with an additional control unit. The grippers are also used in confined spaces and operate in temperatures up to 40 degrees C.

Schunk is a manufacturer of clamping and gripping technologies based in Germany with operations in Mississauga, Ont. www.us.schunk.com

HIGH HOLDING FORCES IN SMALL SPACES

Schunk's digitally controllable EGM-M compact gripper is strong enough to handle parts weighing up to 10 kg.

The magnetic field reaches to the outer edge, so there's no interfering contours, and it positions anywhere on the workpiece.

No compressed air or vacuum is required to actuate the monopole grippers. They're powered with electro-permanent magnets.

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Ultrasound Solutions



AUTOMATION

PANEL METERS DISPLAY ANALOGUE PROCESS DATA



AutomationDirect's ProSense digital panel meters display analogue process, temperature, load cell and potentiometer inputs.

Parameters are configured to be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation.

Two-point direct- or reverse-acting linear scaling values are entered manually or by introducing actual sensed process values in Teach mode.

Meter faces are IP65-rated and come with 1/32 and 1/8 DIN housings to save space. Analogue output is 0-20 or 4-20 mA.

Analogue process signals are displayed from +/-10 V to +/-20 mA. A four-digit red LED display is scaled into engineering units from -1,999 to 9,999 with a selectable decimal point location. Non-linear processes are scaled by entering up to 16 points.

Two SPST relay outputs activate on increasing or decreasing input signals with hysteresis or time delay operation, retention and reset of minimum and maximum display values. A tare function minimizes display bounce and display brightness adjustments.

Temperature inputs are pre-configured for fixed temperature ranges based on the type of temperature sensor used and are displayed with 1 or 0.1 degree of resolution. Analogue process signals, and temperature are displayed in either Fahrenheit or Celsius from RTD or thermocouple temperature sensors, load cell, or potentiometer inputs.

AutomationDirect is a supplier of industrial automation technologies based in Cumming, Ga.

www.automationdirect.com

Powder & Bulk Solids Events Calendar

Advanced Manufacturing

Expo | Mexico

November 15–17, 2016

Centro Banamex
Mexico City, Mexico
ManufacturingMx.com

MONTRÉAL SHOWCASE

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

November 30–December 1, 2016

Palais des congrès de Montréal
Montréal, Québec
PBSmontreal.com

TORONTO

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

May 16–18, 2017

Toronto Congress Centre
Toronto, Ontario
PBStoronto.com

TEXAS

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

October 10–11, 2017

NRG Center
Houston, TX
PBStexas.com

INTERNATIONAL

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

April 24–26, 2018

Donald E. Stephens Convention Center
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PRODUCTS AND EQUIPMENT

LIGHTING

SEE AND HEAR THIS LED

You not only see Larson Electronics' HAL-TL-5X10W-C-PA LED signal lights, you can hear them.

The Class 1 Division 2 hazardous location LEDs have a 110 dBA audible horn for environments where explosive gases, vapours and dusts are present, such as refuelling stations and

processing status indications in plants.

There's five 10-W LED lamps that produce an amber, red, blue, green and white light output. They're configured to operate on a steady burn, strobe or steady burn and strobe combination. Each LED generates 1,050 lumens of light output.

The audible alarm sounds a unique tone for each setting to alert operators in hazardous loca-

tions, and is loud enough to hear over noisy industrial machinery and equipment.

Wiring is made through a 3/4-in. NPT conduit access hub that works on 120 or 240 VAC standard line voltages, or 24 VDC for low voltage operation. A NEMA 4X-rated explosion proof junction box protects internal wiring.

Power is provided by individual conductors to allow indepen-



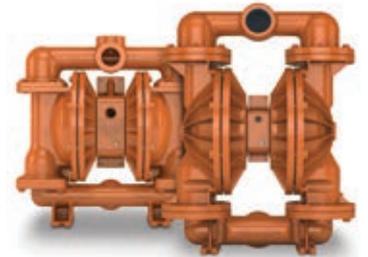
Generates
1,050 lumens.

dent operation of each lamp and tone combination.

Larson is a manufacturer of industrial lighting based in Kemp, Tex.

www.larsonelectronics.com

PUMPS



NPT, BSPT threaded connections.

DROP-IN PUMPS ELIMINATE RE-PIPING

Wilden's aluminum 420/430 Advanced FIT AODD pumps fit bolt-to-bolt and pipe-to-pipe so there's no repiping necessary.

The 38- to- 76-mm pumps come with either aluminum or stainless steel wetter path options.

Bolted product containment enhances pump performance. The Pro-Flo SHIFT air distribution system is included to boost energy efficiency and maximum MTBR.

The pumps are supplied with NPT or BSPT threaded connections and 430 models come with ANSI or DIN flanged pipe connections.

Wilden, part of the PSG Dover Group, is a pump manufacturer based in Grand Terrace, Calif.

www.wildenpump.com

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SENSOR SENDS MOTOR SERVICE ALERT

Wireless smart sensors from ABB alert plant operators when low-voltage motors need servicing. This reduces downtime, extends their lifetime, conserves energy and makes it easier for SMEs to use the Internet of Things, Services and People (IoTSP).

The sensors, which attach directly to motors, provide information on operation conditions such as vibration, temperature or overload, and they calculate power consumption. This helps with maintenance planning while reducing downtime by up to 70%, extending life up to 30% and reducing energy consumption by as much as 10%.

The Swedish-Swiss automation giant says the sensors install at the factory or can be retrofitted on already operating low-voltage motors within minutes.

The sensors are not electrically connected to the motor, which blocks unauthorized access. Data is transmitted wirelessly via encryption protocols to a secure, cloud-based server where it's analyzed using special algorithms.

www.abb.com/iotsps

DISPLAY COVERS TOTAL OPERATION

The iWAREHOUSE telematics system, which integrates multiple systems in a single, factory-installed display unit, is available on the Raymond Reach-Fork truck.

There's telematics functionality (via subscription), plus the truck operator has the ability to toggle between operations information, a height-tilt indicator and the Vantage Point operator camera system displays.



Multifunctional truck display.

This more complete visualization of lift truck data appears on an updated 7-in., full-colour touch screen.

Raymond Corp. is a Greene, NY manufacturer of lift trucks and other warehouse and material handling products.

www.raymondcorp.com

Industrial Literature Reviews

1/4 TON OF REFRIGERATION



EXAIR Vortex Tubes produce up to 10,200 Btu/hr. with no moving parts. Stainless Steel Vortex Tubes convert an ordinary supply of compressed air into hot and cold streams.

Temperatures are adjustable from -50° to +250°F. Applications include cooling hot melts, cutting tools, welding horns, electronic controls, soldered parts and gas samples.

www.exair.com/18/130.htm

EXAIR Corp.

AUTOMATED SYSTEMS FOR CONVEYING

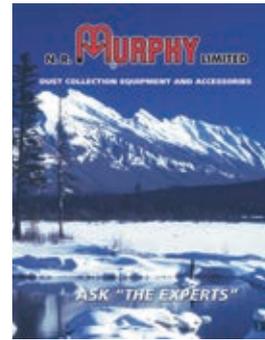


This brochure offers a detailed overview of the VAC-U-MAX range of pneumatic conveying components and automated systems for conveying, weighing and batching of powders and bulk materials

in food, pharmaceutical, chemical and petrochemical processes. www.vac-u-max.com/landingPneumatic.cfm

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EVENTS

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

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

MainTrain 2016 PEMAC

Sept. 19-22, Mississauga, Ont. PEMAC's 18th annual conference focuses on sustainable and effec-

tive strategies for maintenance and asset management programs. Visit www.maintrain.ca.

FPIRC16 NFPA

Oct. 12-14, Minneapolis The Fluid Power Innovation and Research Conference (FPIRC) brings together industry and academic research through technical sessions, networking opportunities, lab tours and panel discussions. Visit www.nfpahub.com.

Advanced Manufacturing Canada SME

Nov. 2-3, Toronto

Conference and exhibition covers automation and robotics, additive manufacturing/3D printing, materials and software. Learn how to produce products faster and at lower cost with the implementation of new technologies. Visit www.advancedmfg.ca.

FABTECH 2016 AWS/SME

Nov. 16-18, Las Vegas North America's largest metal forming, fabricating, welding and finishing event features products, developments and tools for improving productivity. Visit www.fabtechexpo.com.



Heading down the debt path again

BY GWYN MORGAN

The federal government's planned \$30-billion budget deficit, to be followed by three more deficits totalling \$113 billion, brings to mind former US Secretary of State Henry Kissinger's observation: "It's not often that nations learn from the past, even rarer that they draw the correct conclusions from it."

The budget deficit is triple the "modest" and declining \$10-billion deficit promised by Prime Minister Justin Trudeau during last year's election campaign.

Likewise in 1970, Trudeau's father Pierre forecast a "minimal" \$5-billion federal deficit. That was followed by a dozen years of out-of-control spending that drove the deficit to over \$32 billion and saw the national debt balloon by more than 700%. Canada's prime lending rate reached an incredible 22%, causing a great many personal and business bankruptcies while collapsing private investment. Sky-high interest rates drove up the cost of servicing that national debt, spawning even higher deficits.

Canada, once one of the world's strongest nations financially, was transformed into an economic basket case.

Ottawa would implement 27 consecutive annual deficit budgets before tough spending cuts stabilized and eventually reduced our country's debt burden.

Today, our national debt stands at \$617 billion and Finance Minister Bill Morneau's recent deficit forecast would take that to \$730 billion by 2021. Even with today's record low interest rates, debt servicing will eat up \$26 billion this fiscal year. If interest rates were to rise by a modest 2%, the cost of servicing that increased debt would rise to more than \$44 billion by 2021, leaving the next government with no choice but to run even higher deficits or slash program spending.

Okay, so taking on more national debt is risky, but isn't it true that deficit spending is necessary during times of economic difficulty? And doesn't economic growth eventually make it easier to balance the budget and pay down the debt?

Answering the first question requires defining "economic difficulty." The Conservative government, along with virtually every other government in the developed world, ran large deficits in response to the 2007-08 global financial crisis. Fortunately, a series of previous budget surpluses lowered the national debt, placing Canada in the strongest financial position of any G7 country to

implement stimulus spending.

The moral of the story is that governments should keep their financial powder dry and only run deficits when the economic need is both imperative and temporary. The current period of low growth doesn't come anywhere close to meeting the criteria. And what if this low growth period is not a temporary situation?

There's good reason to believe that lower growth will be the new normal. Demographics alone make this highly likely. The boomer bubble is greying, with profound implications on labour force growth, the No. 1 driver of economic growth in almost every country.

Statistics Canada forecasts labour force growth will slow to just 0.5% per year during the term of the federal government. Some 250,000 baby boomers are retiring each year. Soon that number will grow to 400,000. This will have a profound impact as a smaller pool of working-age taxpayers must fund the rising health care and social costs of a burgeoning population of seniors.

And if the Liberals remain focused on trying to grow the economy through government spending, rather than policies that encourage private sector wealth creation, the chances of a rebound in growth will be very unlikely indeed.

Running up the national debt in the face of these realities means handing the next generation a massive debt burden.

Some of that next generation are uniting to fight against that legacy. Generation Screwed is a movement made up mainly of millennials (born from the early 1980s to the mid 1990s).

Their website opens with "Past generations voted to spend more and more money expanding entitlements and the size of government. They are handing the next generation the bill." The website includes a link to a "How screwed are you?" map that shows combined federal and provincial debt per person depending on where you live.

I met some of these young anti-debt activists during a recent trip to Ottawa. One of them said to me, "Parents try to leave their kids some money. Governments will leave us nothing but debt."

Ironically, it was their millennial cohorts who helped elect the government that will make that debilitating legacy a lot larger.

Gwyn Morgan is the retired founding CEO of EnCana Corp. This column is distributed by Calgary-based Troy Media © 2016.

Comments? E-mail jterrett@plant.ca.

TODAY, OUR NATIONAL DEBT STANDS AT \$617 BILLION AND FINANCE MINISTER BILL MORNEAU'S RECENT DEFICIT FORECAST WOULD TAKE THAT TO \$730 BILLION BY 2021...



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IN DOWNTIME**



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Cleaning time reduced by 75% – Manual cleaning of powder residue in blenders after each batch resulted in a significant production loss for a food producer. Solution: Two TankJet® 75 tank cleaners automate the cleaning process; production time increased by two hours per shift.

Scrap decreased by 80% – Sesame seeds that didn't stick to dough due to inconsistent moisture application were eroding profitability for a food processor. Solution: An AutoJet Modular Spray System that precisely controls the volume of water applied and makes automatic adjustments when line speed changes.



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- 4-20 mA output on select models
- Input types available: +/-10V, +/-20mA, RTD Pt100, Thermocouple (Type J, K, T, N), Potentiometer, Load cell (+/-15mV, +/-30mV, +/-150mV)

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