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ADVANCING CANADIAN MANUFACTURING

Volume 73, No. 07 October 2014

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- Brick Brewery consolidates production
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- Motor failure: Linamar calls in the ASG

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It's about value

There are those who will cite shrinking job numbers and share of GDP starting before the recession and beyond as signs that the sun is setting on manufacturing in Canada.

Clearly they have lost site of the value proposition.

October is Manufacturing Month and as Canadian Manufacturers & Exporters (CME) leads the celebration across the country, it's a good time to declare that making things is here is still cool, lucrative and yes, challenging, but key to creating wealth. Post economic apocalypse, manufacturers are not the walking dead. There have been setbacks yet companies, most of them SMEs, are adapting to this century's global reality and making headway, although there's plenty of work to do.

Manufacturing continues to have a huge impact on the economy: it's a \$590 billion affair accounting for 62% of all exports, 10% to 11% of GDP, and it employs 1.7 million Canadians (that's 10% of employment); the pay is good, averaging \$1,020 weekly; and Industry Canada reports sales are up more than 25% since the recession.

Also significant is the resurgence of US manufacturing, which accounts for a \$2.08 trillion share of the country's economy, 12 % of GDP, and employs 17.4 million Americans (or 12 million depending on who you ask), who average about \$77,000 a year. Add to this positive mix the growing number of jobs coming back from overseas as companies recognize cheap labour is becoming less so when other factors are also taken into account.

Since much of Canada's manufactured products (78% in 2012) are destined for US markets, growth south of the border will be very good for business. However, this also points to a weakness. It's much easier to deal with a market that's next door with similar laws and language than to venture too far abroad, but it's obviously a "too many eggs in one basket" scenario.

Canadian companies need to broaden their participation in export markets. More of them are taking the plunge and some are exploring truly exotic locales. For example, INKAS Armoured Vehicle Manufacturing in Toronto is carving out a growing business in the Middle East, Asia, Africa and elsewhere, with a much smaller sales footprint in North America.

SMEs lacking the heft of their peers in the US could use support to explore and enter new markets that trade deals such as CETA are opening up. Those interested in Europe will get some of that assistance through the Coalition for Canada EU-trade, and the Enterprise Canada Network launched by CME and Export Development Canada, which connects companies to more than 30,000 opportunities posted through the European Commission's Enterprise Europe Network.

One of the factors that drives manufacturing's success in the US is the investment made in R&D. More than 70% of all private sector R&D investment comes from manufacturers, compared to 47% in Canada. Both countries will cite challenges transitioning R&D to commercialization, but Canadian companies continue to complain they have very limited access to adequate financing for any kind of investment. They need more diverse sources of venture capital, and tax support for commercialization efforts.

So why should Canadians care about manufacturing? It's key to our prosperity.

Peng-Sang Cau, CEO of Transformix Engineering Inc., a Kingston, Ont.-based manufacturer of automation machinery and active exporter who was recently profiled in the *Globe and Mail*, warns against "blithely" relying on natural resources for economic strength. She says creating wealth comes from ensuring there is manufacturing, and that new companies are starting up and growing.

"Manufacturing is what creates value in an economy. It is what brings all these materials, which are nothing, and makes them into something."

Convey this succinct message to the unenlightened during Manufacturing Month.

Joe Terrett, Editor

Comments? E-mail jterrett@plant.ca.



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» Bulletins

Design firm **Stantec** is strengthening its presence in Quebec with the acquisition of **Dessau's** Canadian engineering operations in Montreal. Dessau's work includes infrastructure and industrial projects. It employs 1,300 people in 20 offices throughout Quebec. It also has offices in Mississauga, Ont. and Ottawa.

COM DEV International Ltd., a manufacturer of space hardware subsystems based in Cambridge, Ont., was awarded a \$7.5 million contract to provide components for a communications satellite that will deliver direct-to-home television content to the Middle East and North Africa. The order, which includes multiplexer equipment, waveguide and coaxial switches, and microwave components, is to be completed by August 2015.

Kruger Inc., a papermaker based in Montreal, is stopping production on the No. 1 paper machine and de-inked pulp plant operations at its **Brompton Newsprint Mill** in Sherbrooke, Que. The shutdown, blamed on declining demand for newsprint, will affect 98 employees and reduce production by 100,000 tonnes.

KANATA Energy Group Ltd. has entered into definitive agreements with **UGR Blair Creek Ltd.**, a developer of unconventional resources in North America, to own and construct natural gas processing infrastructure in northeast BC. The new facilities, to be operational by January, include compression, dehydration, refrigeration and condensate stabilization. Kanata is a Calgary-based midstream infrastructure and service company serving the oil and gas industry.

The Canadian Welding Bureau (CWB) has opened a new Western Region Office in Nisku, Alta. The 18,000 square foot **Welding Education & Training Centre of Excellence** will offer enhanced education, training and certification for welders, supervisors, engineers and inspectors, and non-destructive testing technicians.

UOIT-Baagwating Indigenous Student Centre at the University of Ontario Institute of Technology (UOIT) is now open to indigenous students and the community as a ceremony and seminar space. The centre received \$213,298 through the Community Infrastructure Improvement Fund (FedDev Ontario).

CAE wins \$115M in defence deals

Includes training for USAF, US Army and the RCAF

MONTREAL — CAE Inc. has won a series of contracts valued at \$115 million to provide training systems and services for global defence and security customers.

The Montreal-based aerospace manufacturer said the deal includes a second year of an option for the US Air Force (USAF), a contract to update the Royal Canadian Air Force's CP-140 simulator, and a contract to design and manufacture a UH-72A flight-training device for the US Army.

The USAF contract involves CAE USA continuing to provide classroom, simulator and live flying instruction on the MQ-1 Predator and MQ-9 Reaper drone aircraft for more than 1,500 pilots and sensor operators at Holloman Air Force Base, NM; Creech AFB, Nev.; March Air Reserve Base, Calif.; and Hancock Air National Guard Base, NY.

A contract from the Government of Canada involves per-



CAE will provide the US Air Force training on the MQ-1 Predator and MQ-9 Reaper.

PHOTO: CAE INC.

forming a major visual system update on the Royal Canadian Air Force's CP-140 full-flight simulator. It will include the latest generation CAE Medalion-6000 image generator and new display system.

Common Database architecture capability will be added to the CP-140 to enhance the RCAF's ability to correlate, reuse, and rapidly update data-

bases to support training and mission rehearsal requirements.

CAE was also awarded a contract by Airbus Defense and Space Inc. to manufacture a new UH-72A Lakota Synthetic Flight Training System. It will be delivered to Fort Rucker, Ala. during the summer of 2015. These devices support rotary wing pilot training at the US Army's Aviation Center of Excellence.

ATCO, Petrogas partner on NGL storage

Facility will connect to a hydrocarbon truck and rail terminal

CALGARY — ATCO Energy Solutions Ltd. and Petrogas Energy Corp. are partnering to develop four salt caverns that will have the capacity to store approximately 400,000 cubic metres of propane, butane and ethylene. These facilities will supply the natural gas

liquid (NGL) market in western Canada with an alternative for hydrocarbon storage.

The caverns will be located at ATCO's Heartland Energy Centre near Fort Saskatchewan, Alta.

ATCO said it will work with customers to explore additional hydrocarbon storage capacity

"in this key growth area."

The storage facility will be connected to Petrogas' existing Fort Saskatchewan hydrocarbon truck and rail terminal.

The facility will be built and operated by Calgary-based ATCO, a builder and operator energy and water-related infrastructure.

Cavern drilling and long-lead procurement are underway and commercial operation of two caverns is targeted for the second quarter of 2016. The other caverns are to be completed by the second quarter of 2017.

Petrogas supplies crude oil and natural gas liquid services to propane retailers, refiners and petrochemical producers across North America.

Quebec, Gaz Metro partner for LNG

MONTREAL — The Quebec government and energy provider Gaz Métro are partnering to make liquefied natural gas available in 2016.

Capacity at the Gaz Métro plant in eastern Montreal will be tripled.

Québec will have a \$50 million stake in Gaz Métro LNG, the subsidiary responsible for marketing liquefied natural gas.

The \$118 million project will begin in May 2015 and continue until June 2016.

Stornoway Diamonds will be the first mining company in Quebec to use liquefied natural gas and in the road transport sector, Transport Robert has a large fleet of vehicles running on the fuel. And the Société des traversiers du Québec will use liquefied natural gas for its three new ships starting in 2015, while Groupe Desgagnés ordered two of a series of ships.



Patrick Creaghan, president of ATCO Energy Solutions, and Stan Owerko, president and CEO of Petrogas, at the salt cavern storage facility in Alberta's industrial heartland.

PHOTO: ATCO

Fox solar system connects to the grid

WELLAND, Ont. — EnerDynamic Hybrid Technologies Corp. (EHT) has completed final connection of a 500 kilowatt AC solar PV system to the Ontario electricity grid for E.S. Fox Ltd. under the Ontario Feed-in Tariff (FIT) program.

EHT has manufacturing operations in Welland, Ont. and says the project includes 2,190 Jinko solar panels, Schletter racking and Santerno inverters.

E.S. Fox Ltd., a Niagara Falls, Ont. engineering and construction firm, will own and operate the system, producing approximately 600,000 kilowatt hours annually.



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Linamar boosts forging capabilities

GUELPH, Ont. — Linamar Corp. has added to its forging interests with the purchase of Carolina Forge Co. (CFC) LLC and majority interest in Seissenschmidt AG.

The auto parts and systems manufacturer based in Guelph, Ont. signed separate definitive agreements for CFC's business of high volume hot forged product, located in Wilson, NC, and 66% of Seissenschmidt, which also specializes in high volume hot forgings. Seissenschmidt has three locations in Germany, Hungary, and the US.

Linamar says combined annual sales

of both companies will be close to \$450 million with a combined employee base of about 1,150 people.

The acquisitions fit with Linamar's strategy of offering integrated metal forming/machined solutions to its customers in certain targeted products such as gears. They'll supplement the company's core powertrain business; leverage its business in driveline, gear based products; and address market trends in light weighting and NVH design for gears, differentials, wheel bearings, hubs and sprockets with high speed forging processes.

5N Plus gets \$17.5M to expand exports

OTTAWA — Export Development Canada (EDC) is providing US\$17.5 million in financing to 5N Plus Inc. to help the Montreal-based specialty metals and chemical products company expand its international operations.

5N Plus has grown mostly through acquisitions, but said its strategy is to increase value-added activities, expand recycling operations, broaden its presence in Asia, and capitalize on its international platform.

About 99% of its Canadian sales are exports.

Many of the purified metals it produces, such as bismuth, gallium, germanium and tellurium, are used in solar panels, light-emitting diodes (LEDs) and other eco-friendly materials.

EDC's financing is part of a larger \$125 million credit facility for 5N Plus. Six other financial institutions were included in the facility, with HSBC Bank Canada acting as the lead arranger.

Crown agency EDC provides financing and insurance to help Canadian companies respond to international business opportunities.

» Careers



Matt Lyons

David Lillquist

Mark Estock

Linamar Corp.'s Skyjack Division in Guelph, Ont. has appointed four new regional vice-presidents to oversee its newly expanded North American sales network. **Pat Quint**, formerly the mid-Atlantic territory manager, will cover the east; **Matt Lyons**, formerly the midwest territory manager, will cover the central region; and **David Lillquist**, formerly a regional sales manager for Ritchie Brothers Auctioneers, will cover the west. **Mark Estock**, formerly at Hyster-Yale Materials Handling where he had a variety of roles, will cover national accounts. Skyjack makes aerial lift devices.

Dean Johnson has been appointed president of Acklands-Grainger, taking over from **Eric Nowlin** who has returned to California with his family at the end of his assignment. Johnson joins the Canadian division of the industrial products distributor from Sodexo Canada, where he was president and CEO.



Dean Johnson

Alberta Enterprise Corp. has appointed interim managing director **Kristina Williams** president and CEO. Williams has been with the company for five years and has an extensive background in the technology industry. Alberta Enterprise invests in venture capital funds that finance early stage technology companies.

Paul Timmons, president of Calgary-based Superior Plus Corp.'s specialty chemicals business, is retiring. He has been with the business or its predecessor, ERCO Worldwide, for more than 30 years and was appointed president in 2001. Senior vice-president of operations **Ed Bechberger** will succeed Timmons.

D-Wave Systems Inc., the commercial quantum computing company based in Burnaby, BC, has added **Bill Blake** as its executive vice-president of research and development. He's responsible for hardware engineering, processor development, software and the fabrication process design functions. Most recently he was CTO of Cray Inc.

ElectraGen fuel cells deployed to Jamaica

VANCOUVER — Ballard Power Systems has received an order from its Caribbean distributor, Precision Power & Air, for 13 ElectraGen-ME fuel cell backup power systems that will be deployed in Jamaica's Digicel Group Ltd. network.

The total number of Ballard systems deployed at critical sites around the Caribbean island is now 25.

The majority of the small-footprint backup power systems will go to rooftop base station locations.

The clean-energy fuel cell developer now has 161 ElectraGen-ME systems operating in the Caribbean, which is susceptible to power disruptions resulting from extreme weather conditions, including hurricanes.

Ballard says the methanol-fuelled systems provide extended runtime backup power with high reliability, long product life and minimal preventive maintenance.

The systems include a fuel reformer that converts HydroPlus – a methanol-water liquid fuel mixture – into hydrogen gas to power each fuel cell stack.

Encana acquires Athlon Energy

CALGARY — Encana Corp. is acquiring Athlon Energy Inc., a Texas exploration and production company, in a merger valued at \$7.1 billion, to establish a "premier" position in the Permian Basin in the US.

Encana, an energy producer based in Calgary, said its growth areas now include the top two resource plays in Canada, the Montney and Duvernay, and the top two resource plays in the US, the Eagle Ford and the Permian.

The acquisition adds Athlon's 140,000 net acres in the heart of the oil-rich Midland Basin to Encana's portfolio, giving the company a seventh growth area.

The transaction will add about 30,000 barrels of oil equivalent per day (boe/d) based on Athlon's current estimated production including its recent acquisitions, with potential for approximately 5,000 horizontal well locations and a recoverable resource of approximately 3 billion barrels of oil equivalent.

Encana intends to invest at least \$1 billion in the play and ramp up from three to at least seven horizontal rigs by the end of 2015.

The company says the Permian will make a significant contribution its overall projection of 250,000 barrels per day (bbls/d) by 2017.



EASA-registered Learjet 75.

PHOTO: BOMBARDIER

Learjet takes flight with Roullier

MONTREAL — Bombardier has delivered the first EASA-registered Learjet 75 business aircraft to the Roullier Group in France.

The aircraft and the Learjet 70 have received full type certification from the European Aviation Safety Agency (EASA).

The family owned Roullier Group specializes in plant, animal and human nutrition and employs more than 7,000 people in 46 countries.



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Voith Hydro to equip the Keeyask generating station

HEIDENHEIM, Germany — Voith Hydro has been awarded a contract by Manitoba Hydro to equip the Keeyask Generating Station located in the north part of the province.

The work includes the design, supply and installation of seven new hydroelectric vertical propeller turbine generator units.

The generating station is being developed by the Keeyask Hydro-power Limited Partnership, a venture between Manitoba Hydro and four Manitoba First Nations.

When completed, it will be the fourth largest generating station in the province, providing approximately 695 megawatts of capacity and producing an average of 4,400 gigawatt hours of hydroelectricity each year. The first unit is scheduled for service in 2019.

No financial details were provided.

Voith Hydro Canada is a subsidiary of Voith, a family-owned German engineering firm with more than 40,000 employees worldwide.

Techs get ING Responder training

East Africans qualify for three-line systems maintenance

OTTAWA — ING Robotic Aviation hosted representatives of an East African high-tech security firm for a 10-day maintenance course on its Responder robotic aircraft system.

The Ottawa-based manufacturer of drone aircraft said the students received detailed instruction on the mechanical and electrical properties of the Responder system, as well as programming of the autopilot. They'll now perform first, second and third line maintenance for their systems.

Keymerging Technologies purchased two of the small rotary wing robotic aircraft last year, but said its unnamed customer wasn't in a hurry to take the maintenance training because there have been no issues with the aircraft.

The Responder, equipped with both electro-optical



Two trainees with First Secretary Enock Aroni of the Kenyan High Commission.

PHOTO: ING ROBOTIC AVIATION

and infrared cameras, is used for aerial border surveillance in East Africa.

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» Events

Canadian Energy Supply Chain Forum JWN/AIPMAC

Oct. 28-30, Calgary

The Canadian Energy Supply Chain Forum (CESCF) brings energy companies and their supply chain partners together to explore long-term strategies. Presented by JuneWarren-Nickle's Energy Group (JWN) and The Alberta Institute of Purchasing Management Association of Canada (AIPMAC). Visit www.supplychainforum.ca.

Energy 2014: Powering the Future of Manufacturing

CME-Ontario

Nov. 6, Mississauga, Ont.

Hear how leading Ontario businesses are turning energy costs into opportunities. Supply chain and energy management will be highlighted. Roundtable sessions will cover energy supply chain opportunities, finance, management and policy. Visit <http://on.cme-mec.ca>, Upcoming Events.

Troubleshooting Air and Fluid Handling Systems

STLE-Hamilton

Nov. 6, Hamilton

Presented by the Society of Tribologists and Lubrication Engineers (STLE) Hamilton. The seminar will provide an overview of troubleshooting techniques. E-mail Ken Ray at kray@fuchs.com.

Physical Asset Management Certificate Program

University of Toronto

Nov. 3-7, 10-12, Toronto

For managers of physical assets in plants. An intensive eight-day course in partnership with the faculty of Arts and Sciences at the University of Toronto, School of Continuing Studies, led by Dr. Andrew Jardine, an international authority in the asset management field. Call (416) 978-2400.

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UAW moves on two-tier wages

BY JERRY DIAS

When the North American automotive industry went through wrenching changes over the last few rounds of contract talks, the workers did their part.

After decades of building jobs that provided a decent standard of living for them and their families, and a chance to retire with dignity, they accepted that they would have to give up a number of things – for the time being, at least – to keep the plants running and their jobs intact.

“The time has come for workers on both sides of the border to share in the auto industry’s recovery...”

This was an investment in the future, for them and their communities.

Part of that give-back, particularly in the US, was a two-tier wage structure that paid new hires less than current employees on a permanent basis. That put enormous pressure on workers at the Big Three auto plants in Canada to accept a two-tier structure. Unifor resisted, opting for longer wage progression schedules instead.

The United Auto Workers push to end two-tier wages in US auto plants is a welcome and positive step to eliminate inequities on the shop floor. It should help Unifor improve wages and working conditions in the Canadian auto industry.

The UAW deserves to be congratulated for this move. The time has come for workers



New US automotive hires are paid less than current employees. PHOTO: THINKSTOCK

on both sides of the border to share in the auto industry’s recovery.

The UAW’s push began with a one-day strike in September at a Lear Corp. plant in Indiana, which makes seats for Ford. The strike ended when the company agreed to end two-tier wages – \$16 an hour for new hires, compared with a top rate of \$21.58 an hour.

The Lear deal is a very proactive and progressive move for the UAW to take, but it’s also a sign that the union is prepared to tackle two-tier wages in its contract talks with the Big Three automakers in 2015.

Looking for a better deal

In Canada, the UAW’s efforts will take pressure off Unifor to accept two-tier wages when contract talks open in 2016.

Together, Unifor and the UAW are sending a clear signal to automakers that it’s time for workers to share in the industry’s incredible recovery over the past few years as sales, profits and executive pay have grown substantially.

According to the *Automotive News*, about one-fourth of the 130,000 US hourly auto workers at the Big Three are two-tier. As well, long-time workers have not had a wage increase in 10 years as they watched stock prices and executive pay packets increase.

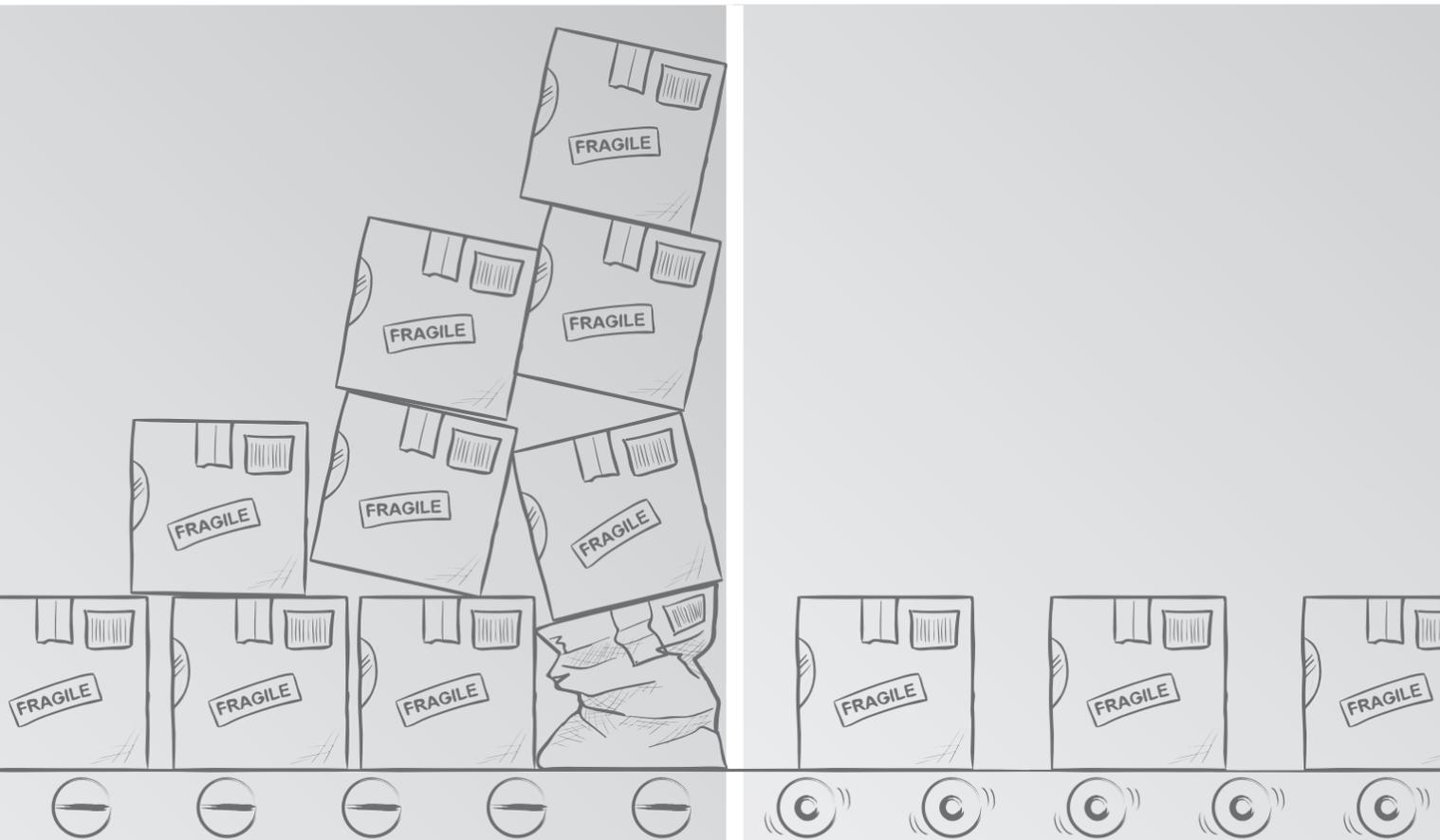
Auto plants are filled with workers itching for a better deal – those being paid less than older co-workers who themselves have watched inflation eat away at their buying power.

When the UAW begins its talks with the Big Three in January, it will be bolstered by a membership that’s anxious for real improvements and fair treatment in return for their sacrifices.

On this side of the border, almost 40,000 Unifor members working at Big Three and auto parts plants are also saying the time has come to share in the industry’s recovery.

And they should.

After all, this is about equality in the workforce. Bank executives are doing very well, the auto industry and its executives are doing incredibly well, so, why shouldn’t the workers?



Uh Oh.

As a manufacturer, you know the importance of paying attention to every last detail. You also know that even the smallest malfunction can have a huge impact on your productivity – and your bottom line.

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Talk to your broker about *Manufacturer’s Choice* or visit www.nbins.com.



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Jerry Dias is the national president of Unifor, Canada’s largest union in the private sector with more than 305,000 members, including more than 21,000 in forestry.

Comments? E-mail jterrett@plant.ca.

PLANT PULSE

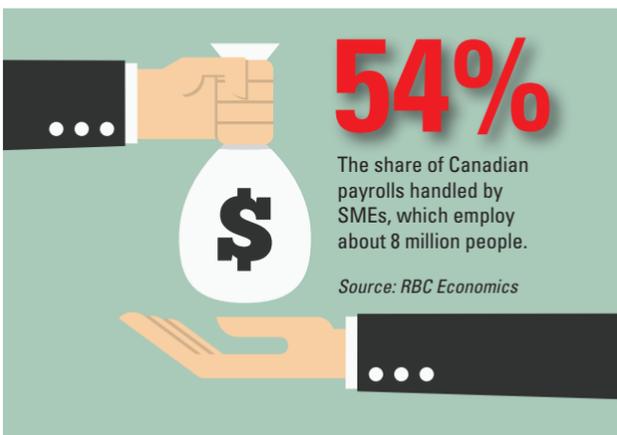
ECONOMIC DEVELOPMENTS AND TRENDS



CAPACITY UTILIZATION TAKES OFF

Canadian industries operated at 82.7% of their production capacity in Q2, up 0.6% from Q1, for a fourth consecutive quarterly gain primarily driven by manufacturing. But growth was moderated by declines in seven industries, particularly primary metals (down 2.2% to 83.1%). Transportation equipment rose 3.9% to a record 93.7%. The upturn was attributed to gains in production, except for ships and boats.

Source: Statistics Canada



The amount global demand for ball, roller, and plain bearings will total with projected annual increases of 7.3%, fuelled by demand for durable goods, higher performing units and energy prices, which make highly efficient bearings more attractive.

Source: World Bearings, The Freedonia Group Inc.



1.79 MILLION

The number of vehicles Canadians are projected to buy this year thanks to enhanced incentives and the popularity of light trucks, especially crossover utility vehicles. This represents an adjustment from an original forecast of 1.77 million units.

Source: Scotiabank Economics, Global Auto Report



Going mobile

Fifty-seven per cent of Canadian employers rely on mobile technology – such as a smart phone or tablet – to do their jobs effectively, according to a BMO Bank of Montreal survey; 64% use it to run their organizations; 10% don't rely on a mobile device at all; 39% provide employees with all or most of the devices; and 38% report their employees use personal devices at work.



Pension pains

Ontario small businesses are feeling vulnerable to the introduction of the Ontario Retirement Pension Plan (ORPP), according to a report by Meridian Credit Union. The study reveals 77% of small business owners believe managing the plan could be their biggest challenge to date: 41% see it as a barrier to growth in 2015, second only to economic uncertainty.

ONTARIO REBOUNDS

One of the top performers: CIBC

Ontario's economy is poised to be the single biggest beneficiary of sturdy US growth and a weaker Canadian dollar in the next two years, likely boosting provincial government coffers by \$4 billion to \$5 billion, reports CIBC World Markets.

Growth is projected to be 2.8% next year, behind Alberta. In 2016, CIBC expects GDP growth of 2.4%, which is above national average.

"From manufacturing shipments to domestically driven signposts in retailing, wholesaling and home-building, Ontario has seen a notable resurgence, shifting from a perennial trailer to among the better performing regions of the country," says Avery Shenfeld, CIBC's chief economist. "Employment hasn't caught fire, but should respond at some point to firming output."

Although Ontario's real GDP has had the tightest correlation to US economic activity, years of plant exits has tightened capacity use in the face of gains in demand.

Shenfeld says Ontario needs to cultivate growth sectors, rebuild capacity and win the battle for new facilities. "Our call for the Bank of Canada to significantly lag the US Federal Reserve in rates hikes next year, and a resulting depreciation of the loonie to 85 cents US should reposition the province as a more cost-competitive location."

Additional enticements are lower federal and provincial corporate tax rates, the shift to the HST and a \$2.5 billion fund set up by the province to court direct investment.

Ontario's economy has underperformed compared to the national average from the 2002-2007 pre-economic crisis period. CIBC is calling for the province to match national growth in 2014 at 2.3% and move slightly ahead in each of the next two years.

"An additional \$4 billion to \$5 billion could be accumulated over two years and used for deficit reduction or to avoid the full burden of what rating agencies have judged to be tough-to-meet spending constraints," says Shenfeld.

He notes that despite the province running ahead of budget targets, its bond performance has been hurt by earlier downgrades in the economic outlook and risks of a corresponding move by rating agencies. As well, a softer outlook implied even tighter spending plans or the further use of tax-hike room in order for the province to meet the targeted date for a balanced budget.

SMEs RECOVER BUT CHALLENGED

Canada's small- and medium-sized enterprises (SMEs) are bouncing back from the recession, but they're still facing a difficult operating environment, says a report from RBC Economics.

Canada's Small Business Landscape cites rising input costs (63%), fluctuations in demand (52%) and increasing competition (48%) as major external obstacles limiting growth.

Almost 40% report employee recruitment and retention as major stumbling blocks to growth. The trend is even more prevalent among medium-sized firms (57%).

Regionally, SMEs in Saskatchewan and Alberta are most likely to cite labour shortages and difficulty attracting and retaining workers where there is heavy competition for qualified workers.

In Ontario, major obstacles include fluctuating demand and increased competition.

Nationally, input prices, government regulations, and maintaining cash flow were cited as concerns.

SRP takes back MANUFACTURING

EXPORTS HEAT UP AS SOME OF ITS PRODUCTION RETURNS FROM CHINA

To better control quality Superior Radiant Products now makes a premium patio heater in Stoney Creek, Ont. rather than in China.

BY KIM LAUDRUM

Kevin Merritt's decision to bring production of Superior Radiant Products' (SRP's) EvenGlo infrared patio heaters back to Canada from China was a move that bucked the offshore manufacturing trend that even his company followed. But the president and CEO of the Stoney Creek, Ont.-based manufacturer of infrared heating products says it was necessary to gain better quality control of the product, which sells for \$2,000 and up, to meet the needs of demanding five-star hotel clients and others in the North American market.

Low labour costs and currency, not to mention access to a burgeoning consumer market, once made China an attractive place to invest, but that's changing now. Reshoring is a growing trend credited with contributing at least 25% of the 500,000 new jobs in the US between 2010 and 2012.

What's causing this dramatic shift? China's cost-competitive advantage in manufacturing over the US shrank to less than 5% by 2012, according to a TD Economics report on offshoring. At the turn of the century, American labour costs were 40 times that of the Chinese. Since then wage inflation in China has risen dramatically – three times the rate in the US – and now labour costs in the American south are a more manageable four times as high. The renminbi is appreciating, oil and transportation costs are volatile and tariffs rose 20% in 2013.

"Producing in China is becoming more and more difficult. Costs are going up, lead times are going up; the

trading requirements are becoming more difficult to deal with because you can't count on the quality and we are expected to pay upfront for the goods. It just wasn't working out for us," Merritt says.

The patented element on SRP's patio heaters was developed and made in Quebec. These were shipped to China for further manufacturing and assembly, and then the value-added goods were shipped back for sale to the North American market. Now those patio heaters, are being made in Stoney Creek.

However, SRP still "controls 100%" of its Chinese production of commercial and industrial space heating units – used in factories, stadiums and chicken barns – through its wholly foreign-owned entity (WFOE) Qingdao Thermpro Ltd. in China.

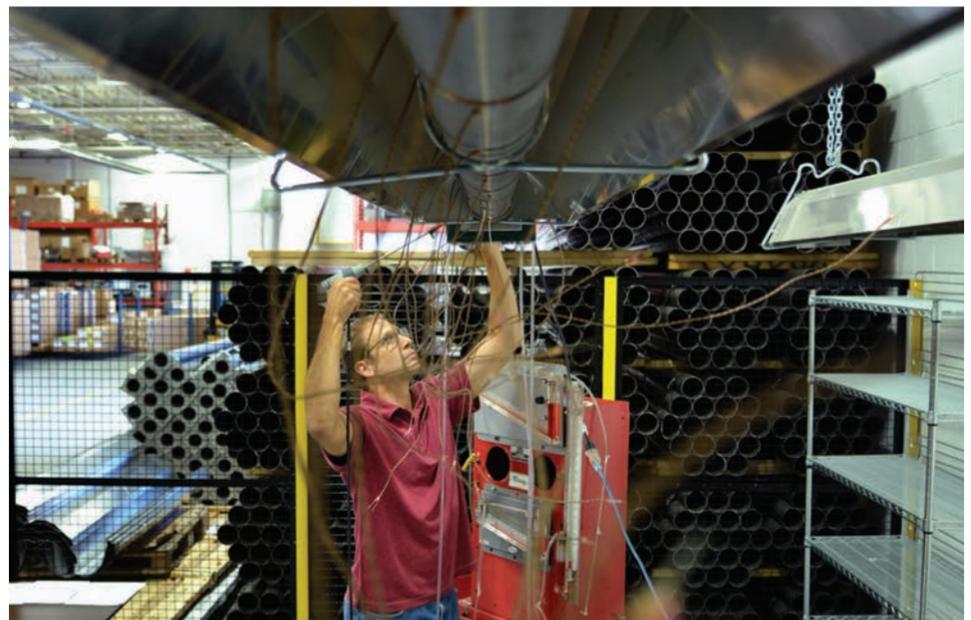
Serving end-user markets

It's a nimble manufacturer that builds a global strategy for coping with the ups and downs of the world economy. This has certainly worked for SRP, which first set up shop in China in 2000 after being approached by a foreign representative office there. SRP shipped product for large projects including Great Wall Motor Co. and ThyssenKrupp AG China. Problem was, the Canadian company was not allowed to sell to its Chinese customers directly. Nor was it allowed to invoice, says SRP export director Lily Ning.

So in 2009, SRP created a holding company in Hong Kong that in turn owns Qingdao Thermpro Ltd. With the WFOE – which took two years to set up – SRP buys and sells from overseas, and manufactures in China. Thermpro has an extensive dealer network there and is responsible for all sales. Most of the products sold in China are developed and supplied from the Stoney Creek facility, Ning says, except some components of the industrial and commercial heaters that are made for the local market and required to meet China's tariffs regulations. Sometimes it just makes sense to make goods close to the end-user market.



Mike Konstantinidis welds supports.



A gas analyzer measures tube temperature at various points.



Kevin Merritt is just getting warmed up with SRP's premium Even-Glo infrared patio heaters. PHOTOS: STEPHEN UHRANEY

"All of the R&D, all of the core components, the critical parts all come from the Canadian operation," says Merritt. "We control the quality that way."

He says business opportunities outweigh the challenges in China as the country's economy continues to boom. "They are building huge factories. Where a typical large job in North America might be 50 to 100 heaters; a large job in China would be 300 to 500 heaters, or more. One operation in China has installed more than 1,600 of our heaters."

He notes the "unbelievable" size of buildings. "I've worked in buildings in China that were a kilometre long and 250 metres wide. You can hardly see the end of the building. Just massive."

SRP's infrared industrial and commercial heaters are "just perfect for those buildings because they can maintain a comfortable temperature for working without having to keep a higher heat for the rest of the building," Merritt says.

And it doesn't hurt that the Chinese government is encouraging natural gas as an energy source for heating to curtail pollution levels.

The US has also changed its energy policy thanks to new supplies of shale gas. SRP expects to grow market share in the US, where it has a light assembly plant in Kennesaw, Ga.

In Europe, SRP has a strategic partnership with GoGas Goch GmbH, a Dortmund, Germany-based manufacturer of heating equipment for soccer stadiums, but it also specializes in developing railcar defrosting and other infrared heat systems. Although there were 15 or so competitors in the European market, GoGas approached SRP because it provides as good a quality product, but at a lower price.

Under the 2010 alliance, SRP products are marketed in Europe, while GoGas products are marketed in North America and China. The strategy also allows for the sharing of product technology and engineering for future developments. Merritt credits this arrangement for the company's growth in its next biggest offshore market: Turkey, where apparently there are a lot of soccer stadiums being built. SRP also has marketing arrangements in Saint Petersburg, Russia.

"We're a net exporter to China. How many Canadian manufacturers can say that? Forty per cent of our business is in exports," John Robinson, SRP's operations manager told **PLANT** during the August grand opening of the new Stoney Creek plant.

Since its inception in 1995, SRP has grown from three employees in a 2,800 square-foot facility to 60 employees worldwide. The company recently moved its headquarters to a 50,000 square-foot facil-

ity, including a 40,000 square-foot fabricating and assembly plant, around the corner from its previous location. Merritt places annual revenues in the "eight figures" range.

The move to a larger footprint was the perfect opportunity to implement lean manufacturing principles from the get go. Management consultant Nigel Southway served as sensei, encouraging input from everyone involved in production. This includes those stamping and bending the sheet metal, assembling components, to packaging and shipping. Key criteria included a build-to-order capability, ensuring the plant was responsive to seasonality, supporting a high mix of products, providing wide-aisle material handling, developing flexible work cells, and cross-training all staff. Interestingly, Southway is involved with SME (Toronto chapter) and the Take Back Manufacturing Initiative, which encourages companies to bring manufacturing back to Canada from overseas.

Ontario's resources

Because there are so many variations of BTUs used in SRP's burners, the decision was made to adopt a new ERP software. Plant manager Bruno Briere says this has helped enormously with the company's customized manufacturing approach. Each item is produced as needed. Items are made just-in-time so there's very little inventory kept in the plant.

Why would a global manufacturing company choose to stay in Stoney Creek? Merritt credits Hamilton and Toronto's "tremendous" resources in both blue- and white-collar workers, proximity to major transportation arteries that offer easy access to Detroit and Buffalo border crossings and the GTA, "all of which are major markets for us."

It doesn't hurt that it's also a beautiful area near Niagara Falls and great for entertaining foreign visitors.

But another plus is Ontario's corporate tax.

"Don't say that too loud. But I think it's a favourable situation for corporations in Ontario now compared to the US. Certainly the labour costs and overheads might be a little higher, but the corporate tax rates are certainly lower," Merritt says.

"We all rushed to get our products made offshore because labour costs were so much lower in China," says Merritt, who observes low labour cost isn't everything.

There are many other factors to consider. Take a closer look at your other costs. As SRP discovered, manufacturing closer to home is more feasible than you might think.

Kim Laudrum is an award winning, Toronto-based business writer specializing in manufacturing. E-mail klaudrum@rogers.com.

Comments? E-mail jterrett@plant.ca.



Mothusi Dominic spot-welds housings.



Mary Tomasic assembles garage heaters.



Blower assemblies with collars.

» Exporting

Exhibiting at international trade events is a big-ticket item that requires planning and attention to detail.

BY MARK DRAKE

Most of us have run a lemonade stand or helped our children do so. There we learned the basics of marketing and selling, such as being alert for potential customers, and having an effective presentation, competitive pricing and a good product. Scale it up a bit and it's all good for the international trade show.

For most exporters, trade shows are a critical part of the marketing mix, but they're extremely expensive and represent a sizeable budget item, especially for companies operating in several countries. Planning and attention to detail are important. Here are some points to consider:

Which market and why. Are you exhibiting for positive impact compared with competitors, to launch new products and services, or to try to break into a new market?

Type of show. There are huge international fairs such as Hannover Messe that are prestigious but pricey, and where small booths are almost invisible, and more focused international shows such as the annual Las Vegas electronic wizardry shindig. Smaller regional and strictly business-focused events cover specific sectors of the economy. Choose the type of show where you'll stand out and make a strong impression with an attractive booth. Partnering with associations, government missions or even other non-competitive organizations offer opportunities for cost sharing.

Booth design. Make it visitor-friendly and uncluttered. Angled mirrors can help make the booth look larger. Exhibits should take up no more than 30% of the



Taking your SHOW on the ROAD?

HOW TO GET THE MOST OUT OF TRADE EVENTS

space. The design must attract passing traffic and emphasize solutions and benefits rather than products per se. There should be an area for quiet one-on-one discussions with serious clients, and enough space (ideally at least 25 square feet per person) for the sales and technical team (dressed in similar outfits) to operate effectively. See www.skylinetoronto.com for design ideas.

Booth location. This can be tricky. Large regular exhibitors reserve their places from one year to the next, aiming for their previous central or corner booth, or use their clout to oust someone from a coveted position. Location is everything.

Other costs. There are many and some variables but they usually include: transporting the booth and equipment, utility connections, cleaning, accommodation and per diems for everyone

attending, post show clean-up and return of the equipment.

Personnel. Have sufficient sales and technical support staff on hand to handle the expected number of visitors, plus management to deal with top-level visitors or policy questions. While shows represent an attractive break from routine and can be fun, working a booth is extremely tiring, and the team should be in top form.

Training. Put your best people on the team, and check out their sales-show selling techniques. They need to be highly knowledgeable about the products, confident, customer friendly and full of energy! Train them in open ended questions, such as: What brings you into our booth today? What's your connection with our industry sector? Once the team member speaks with someone, he/she needs to quickly assess if this is a gawker, brochure collector or qualified lead.

Hannover Messe in Germany (April 13-17, 2015) is a huge international trade fair featuring industrial technology. PHOTO: : HANNOVER MESSE

Before the show. Unless breaking into a totally new market, know your major customers. Write and invite them to stop by. Maybe arrange a small "by invitation only" drinks party for major customers in the area. Advertising in sector trade magazines is a cost effective opportunity or use social media if that works for your organization. Create some excitement!

After the show. Optimize your ROI by following up with all qualified leads as quickly as possible. If preparation is likely to take some time, an interim e-mail or letter should be sent to the enquirers thanking them for visiting the booth, and indicating when to expect a detailed follow-up. Their interest has been raised at the show – keep it warm.

Evaluation. Bearing in mind the time and money involved in the whole process, the results should be examined dispassionately by all concerned. Was participation worthwhile? How much business has been (or will be) obtained as a result? Were costs in line with budget? What does a cost/benefit analysis indicate? What are the lessons learned? Should the exercise be repeated?

Help. Try www.eventseye.com and www.10times.com for trade show details by sector around the world; www.tsnn.com has trade show news and a global event search tool; Canadalexport (published regularly online by Foreign Affairs, International Trade and Development) lists trade events; and the Trade Commissioner Service (www.tradecommissioner.gc.ca/tradeevents) lists shows of potential interest to Canadian companies.

As with the lemonade stand, if it's run better they will come!

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

» Training

Your workforce resource

Lessons learned from the TWI summit

BY HUGH ALLEY

In early May about 200 people gathered in Nashville for the TWI Summit. This conference focused on how to use the modules created in the early 1940s by the Training Within Industry service to address the challenge of producing war goods with a rapidly expanding workforce that had relatively little industrial experience. The three modules (Job Instruction, Job Relations and Job Methods) involve key skills needed by every supervisor. And with so much talk about a skills shortage, the TWI model is still very relevant.

Here are seven takeaways from the summit:

We underestimate the improvement that is possible. Bourgault makes air seeders in northeast Saskatchewan. In a two-week event, the company reduced the assembly time for its biggest seeder by 50%. Operators were involved in establishing standard work and spent little capital. Defining the current best way resulted in most of the gains, which at 50% exceeded



People learn more when they're dealing with a real business problem.

PHOTO: THINKSTOCK

expectations.

We underestimate the impact of soft skills related to leadership. Several companies reported a significant reduction in error rates when they used Job Relations. It shifted the discussion from "who is to blame?" to "what are the facts of the situation?" which led to better decisions.

People learn best from real business problems. Setting out a problem that actually matters to the company (rather than by

example from a book) is an important part of making training effective.

Standard work is critical; the Job Instruction breakdown helps. It's a simple structured way to capture the current best way. People are instructed quickly and efficiently on how to do the task.

Improvement ideas from employees create sustainable competitive advantage. Two presenters observed that when companies treat this as a core competence, constant improvements become a unique competitive advantage. Ideas are so specific to the business they can't be copied.

The Toyota Kata is a powerful model for continuous improvement. Improvement and coaching routines are an excellent daily complement to TWI methods. They help move an organization from event-focused improvement to continuous improvement.

The TWI model works in any setting. Presenters represented manufacturers, retailers, hospitals, investment fund managers, dairy operations and hospitality.

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

Comments? E-mail jterrett@plant.ca.

» Entrepreneurship

Starting up?

How to avoid the obstacles

BY MARK BORKOWSKI

Fear of failure prevents many people from putting their dreams of starting a business on hold, but there are two others, according to the Global Entrepreneurship Monitor 2013 report, a study by Babson College and several other universities. The business is not profitable or there are financing problems.

One way to ensure your business will be profitable before you start it is to run it on a limited basis, ideally while you're still employed. You may discover some initial assumptions about your market were not correct, allowing you to adjust the business plan.



There are financing options available from sources other than banks.

PHOTO: THINKSTOCK

Preventing financing shortages starts with performing due diligence on what startup costs will actually be.

Network with owners of businesses similar to yours and get a sense of what your outlays will be the first and second year; ask how soon you revenue will flow, and how much you'll need to cover business and personal overhead with cash from outside of the business. And ask established owners what could go wrong, such as a major repair to a piece of equipment.

If you're planning to buy an established business, the franchisor or owner will provide extensive financial information during the due diligence process. If you're not clear on the fine points, have an experienced small-business attorney or accountant review it.

Banks don't like to loan money to startups, so you will likely need to try other avenues.

Most of initial financing comes from personal savings, but there are other resources, such as home equity or retirement accounts. Sometimes new business owners will live on a spouse's income during the startup.

Having adequate funding is essential to your success. Plan ahead so you don't run out of cash.

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

Comments? E-mail jterrett@plant.ca.

» Additive Manufacturing



Producing specialized parts with 3D technology.

PHOTO: THINKSTOCK

Wanted: 3D printing skills

NA demand is up 103% from 2013; engineers top the list

The demand for candidates with 3D printing and additive manufacturing skills continues to rise, up 103% a year from August 2013, according to Quebec City-based job data firm Wanted Analytics.

In an analysis of four-year hiring trends, the number of job advertisements requiring workers with these skills increased 1,834%. The most sought after were engineering positions followed by production, information technology and education.

Manufacturing had the highest number of job listings as the sector works to improve 3D technology that will make it easier, cheaper and quicker to produce certain specialized parts.

Industries with the greatest demand for 3D skills are:

- computer peripheral equipment manufacturing;
- colleges, universities and professional schools;
- tire and tube merchant wholesalers;
- search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing; and
- aluminum sheet, plate and foil manufacturing.

While demand has grown, recruiting conditions have worsened. In July, 3D printing and additive manufacturing scored a 44 on Wanted's Hiring Scale, which determines likely recruiting difficulty on a scale of 1 to 99.

The score has since increased to 55 as demand increases and it will likely continue to rise as more companies start fishing from the talent pool.

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» Automotive R&D

Growing the BIO-ECONOMY

NEW MATERIALS THAT REPLACE PLASTIC

Automotive applications for new materials derived from nature will lower vehicle weight and reduce greenhouse gas emissions.

BY AMAR KUMA MOHANTY AND MANJUSRI MISRA

The depletion of petroleum resources and a growing list of environmental regulations are pushing the research and development of new materials and eco-friendly products that are less dependent on fossil fuels and reduce levels of greenhouse gas emissions.

A key area of interest is bio-based polymers, biocomposites and bionanotechnology in new material applications.

Tensile and impact strength, flexibility, durability, density and most importantly, price-performance ratio are of primary importance in end-user performance.

And very few end-users will pay more for 'green' materials. If in fact, there is a competitive price-performance ratio (particularly in light-weighting auto applications), adopting biomaterials is a no-brainer – as long as there's little or no change in existing processing equipment. The balancing of variables is a classic scientific problem, and the production of biomaterials involves multiple variables.

Research conducted at the University of Guelph's Bioproducts Discovery and Development Centre (BDDC) focuses on the design, synthesis, characterization and applications of novel hybrid biomaterials in vehicles, packaging, consumer products and energy storage devices.

The centre has generated five active patent applications and marketed products for flowerpots, storage bins and a grade of bio-black for plastic industries. Patent pending technologies include simultaneously improving both heat resistance and impact strength of polylactic acid-based, injection-moulded biocomposites.



Automakers are turning to more materials from nature to make their vehicles greener. Rice hulls are used in Ford's F-150 to reinforce plastic in an electrical harness. PHOTO: FORD

Plastic aboard today's automobiles averages 181 kilograms. It improves fuel economy by reducing weight, but is made from petroleum. At least 45 kilograms of that can be replaced by bio-based material, especially interior parts of the car.

Sustainable substitutions

BDDC researchers have successfully run trials to substitute a percentage of plastics with bio-based hybrid composites. Not only does the eco-friendly material reduce greenhouse gas emissions, its less dense structure makes vehicles lighter.

In the past five years, BDDC (through AUTO21-funded research) has attempted to increase bio-based content in automotive parts up to 34% while maintaining material integrity and performance at a competitive cost. The leap in the percentage of biomass was achieved by using perennial grasses and a bio-carbon hybrid in biocomposite formulations. Researchers have successfully introduced novel bio-carbon to many automotive prototypes, including console boxes, air duct controllers, fender covers and spare tire covers.

The automotive sector is a major driver of bio-based materials development, which provides a new revenue stream to farmers, extends the value chain of crops

and creates jobs.

But success will depend on trust and collaboration between researchers, industry and biomass farmers.

AUTO21 Network researchers Amar Kumar Mohanty and Manjusri Misra are professors at the University of Guelph and contribute to AUTO21's Hybrid Biocomposites for Automotive Applications. AUTO 21 is a national research initiative supported by the Government of Canada through the Networks of Centres of Excellence Secretariat. Visit www.auto21.ca.

Comments? E-mail jterrett@plant.ca

» Patents

Mantra secures Canadian patent for ERC process

A pilot plant will convert CO₂ to formate salts and formic acid

Mantra Venture Group Ltd. and its subsidiary, Mantra Energy Alternatives Ltd. now have the Canadian patent for their ERC (electro-reduction of carbon dioxide) process, which converts carbon dioxide into high value chemicals and fuels.

Similar patents have been granted in China, Australia, and India.

"The timing of this news could not be better, as we are preparing to launch our pilot unit in Canada in the coming months," said CEO Larry Kristof. "The patent will serve as the basis for a great deal of additional intellectual property generated from the pilot."

The pilot plant, for the conversion of carbon dioxide to formate salts and formic acid, will operate at a Lafarge cement plant in Richmond, BC early next year.

The Vancouver-based clean tech incubator said the pilot is the world's first demonstration of electrochemical carbon dioxide reduction in an industrial setting, paving the way for the first commercial installations.

Mantra Energy Alternatives is currently developing two electrochemical technologies designed to make reducing greenhouse gas emissions profitable, ERC and MRFC (mixed-reactant fuel cell).

ERC converts the carbon dioxide into useful products such as formic acid and formate salts. By utilizing clean electricity, the process offers the potential for an industrial plant to reduce emissions while generating a saleable product and a profit.

MRFC is an unconventional fuel cell that uses a mixture of fuel and oxidant, which reduces the complexity and cost of the fuel cell system.

» Performance

Improve your innovation efforts

Report offers principles for practical strategies

Despite public policies aimed at encouraging businesses to innovate, Canada's business record remains mediocre and a Conference Board of Canada report says performance won't improve unless companies change their approach to strategy, structures, and processes.

Innovation Management for Established Businesses: Management Matters, highlights practical strategies to help companies strengthen their innovation performance. It observes established businesses are likely to be large and will need a more organized approach. It recommends focusing on the following principles:

- Bold leadership is at the heart of innovative companies.
- Strategy determines what and how companies will innovate.
- Organizational structure influences the innovation effort.
- Successful companies give their innovation efforts adequate resources and stay the course.
- Innovation process management with appropriate metrics is important.
- It's people who innovate, so people management is an important element of success.

The research was funded by the Conference Board's Centre for Business Innovation. Visit www.conferenceboard.ca for a copy of the report.



WE'RE 24TH!

Canada's innovation and business sophistication ranks 24th out of 144 economies, according to the World Economic Forum 2014-2015 Global Competitiveness Report. The international think tank cites innovation as the 12th pillar of competitiveness. Insufficient capacity to innovate was one of the top factors (4th) bugging Canadian businesses.

Primex Manufacturing Harnesses the Power of Open Architecture ERP

Headquartered in Langley, British Columbia, where the company maintains a manufacturing facility and two warehouses, Primex Manufacturing Ltd. specializes in the design, engineering and fabrication of proprietary plastic injection products. “We have a variety of offerings,” says Director of Finance Vickie Heese, “including a comprehensive line of HVAC venting solutions, but the enclosures we make for telecommunications companies such as Telus, Rogers, Bell, and Shaw are our most important product. In addition, we have a business development team that works with our customers and prospective customers to find solutions to their needs, and to help them better service their customers. The development team also attempts to predict the plastics products that will be needed in the future.”

Established in 1971, Primex works closely with telecom customers to design cabinet-style enclosures that house cable, networking wires and hardware, and provide protection from external factors such as rodents and

weather. “Each enclosure design is built specifically to answer the needs of today’s broadband installers,” says Heese. “What sets us apart from the competition is our ability to design, customize, and deliver a top-quality product that meets every one of our customers’ enclosure needs, whether it’s for copper wire, modern fibre optics, modems and routers, or anything else required. The versatility of our products helps telecom and cable companies manage the transition to broadband with less cost and with greater flexibility and adaptability for future technologies.”

For the last 15 years, Primex has run its operations using SYSPRO Enterprise Resource Planning (ERP) software. “We use a good number of SYSPRO modules,” says Heese, “including General Ledger, Accounts Payable, Accounts Receivable, Work in Progress, Inventory, Product Configurator, Bill of Materials, Sales Orders and Cash Book. One of the things we really like about SYSPRO is that it works with the other software we use to run our business. We find the interoperability of SYSPRO with Microsoft and other software to be very useful, especially when it comes to writing reports. SYSPRO’s General Ledger module is really good at capturing the information we need to run the company, and without it we couldn’t do our reporting. However, I prefer to create the reports themselves using Power Pivot, the data analysis tool in Microsoft Excel.”

SYSPRO, says Heese, is also instrumental in facilitating the collaboration process between Primex and client companies. “One of our customers will ask for a solution, and our engineers and designers will create a prototype, after which the company might say ‘Great!’ but ask us to change the design a bit. We work together to perfect the mold, and then we manufacture the product. All of this is made easier by working in the flexible environment provided by SYSPRO ERP.”

Mark Campbell is Primex’s Senior Manager Inventory and Order Fulfillment. “Not counting the financial

side of the business,” says Campbell, “I’m probably the primary SYSPRO user in the company. Like many manufacturing companies, we use a variety of business software applications that need to exchange information. In addition, we need to connect external devices such as barcode scanners to our ERP. SYSPRO’s Integration Framework allows us to do all that. It also improves information sharing, reduces duplicate data entry and enables data to be stored in one place for consolidated reporting and analysis.”

According to Campbell, SYSPRO is the financial and operational backbone of Primex, but off that backbone the company runs a number of specific 3rd-party solutions. “For example, we use Compuplus’ ABC barcoding software, LabelView to design and manage our barcode labels, Microsoft Dynamics CRM, Excel Power Pivot, and Budget Maestro by Centage. We also have three access databases that were developed by students from BCIT as a summer project and that they continue to maintain. Thanks to SYSPRO’s .net Solutions, we

have all of the company’s information at our fingertips on a continuous basis, and we can use the software of our choice to access, feed, and mine our data.”

SYSPRO’s .net Solutions facilitates integration with other operating environments, including Microsoft Windows, Microsoft Office, Microsoft SQLServer, UNIX and LINUX. By utilizing a multi-platform software product, companies such as Primex gain scalability and flexibility, and are able to select the exact functions needed to increase operational control and efficiency. Based on the Microsoft .NET Framework, SYSPRO’s e.net Solutions allows the integration of third-party software, external devices and business systems, and cloud-based applications. SYSPRO can be extended, for example, to integrate with external applications such as shipping companies’ tracking systems. In addition, .net Solutions facilitates the integration of SYSPRO with scanning and Smart technologies, streamlining picking and packing processes, as well as inventory stock takes.

Working through the .net Solutions interface maintains the security and integrity of the core SYSPRO ERP system, while allowing external applications to safely access data. In addition, SYSPRO Office Integration allows users such as Heese to easily and securely access SYSPRO data through their favourite Microsoft Office products, such as Word, Outlook and Excel, even though SYSPRO may not be installed on the client machine.

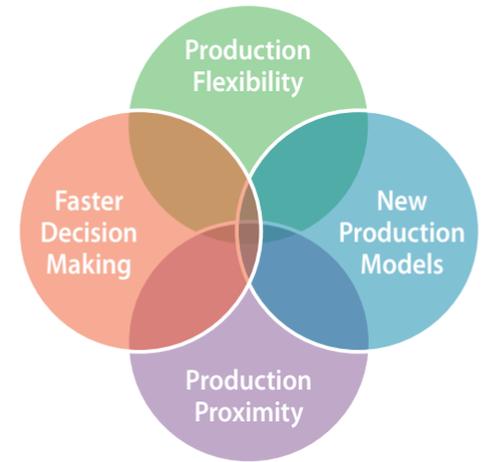
“Rather than forcing us to design our business around inflexible procedures,” says Heese, “SYSPRO allows us to use the tools we find most practical for running our business. In the final analysis, that’s good for the company. It increases our ability to survive and grow in a competitive marketplace.”

For more information about Primex Manufacturing, please visit www.primexfits.com.



primex

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www.syspro.com/primex

“Rather than forcing us to design our business around inflexible procedures, SYSPRO allows us to use the tools we find most practical for running our business. In the final analysis, that’s good for the company. It increases our ability to survive and grow in a competitive marketplace.”

Vickie Heese
Director of Finance
Primex Manufacturing

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» Integration

It's divesting one of its Ontario facilities as part of \$9-million expansion plan to vertically integrate.

BY MATT POWELL, ASSISTANT EDITOR

You can never have enough beer, but is it possible to have too much real estate to meet demand efficiently?

Brick Brewing Co. Ltd. is uncovering operating efficiencies and boosting productivity by shuttering one of its three brewing facilities, and moving production to another to reduce overhead costs.

The Canadian-owned, publicly traded brewer, one the few, is investing \$9 million to expand its Kitchener, Ont. production facility in an effort to realize operational savings of \$1 million annually, and it's doing so by funding a portion of the investment from proceeds of the sale of its original downtown Waterloo brewhouse.

"This investment will simplify our operation and enables a step-change in efficiency, productivity and cost reduction," says George Croft, president and CEO of the company that has 150 employees and market capitalization of \$30 million.

Brick, perhaps best-known for its Laker beer line and for introducing the buck-a-beer phenomenon in the early 2000s, is in the process of transferring its entire production and distribution operations. When the project is completed by the end of October 2015, the facility will be vertically integrated for its Laker and Waterloo beer brands, and its Seagrams cider and cooler lines.

Brick's three current production facilities in Waterloo, Kitchener and Formosa, Ont. present a familiar set of inefficiencies and cost disadvantages, one being transportation. The various beers brewed in Waterloo are trucked to Kitchener for bottling and distribution.

"For a brewery of our scale, having three facilities is incredibly uncompetitive in the marketplace," says Russell Tabata, Brick's chief operating officer. "This investment, which has been part of our strategic plan for years, enables us to consolidate all of our capacity into one facility."

Time for change

The Waterloo facility was established 30 years ago in a 145-year old former furniture factory. Today, the company produces 500,000 hectolitres of product annually, which translates in hoser terms to 6.1 million two-fours.

"Uptown Waterloo is changing – it's transformed into a more residential area.



A 3D rendering of Brick's expanded 150,000 square-foot production facility in Kitchener, Ont.

PHOTO: BRICK BREWING

Hopped UP

BRICK BREWING INVESTS IN EFFICIENCY

More people are living downtown, so having a factory smack in the middle of downtown creates some challenges. Those factors helped us justify the timing of the project."

Tabata says the decision to close the Waterloo facility was a tough one.

"The justification really comes from all the production efficiencies that you gain from having an integrated facility where you don't have to double and triple handle the product."

The \$1 million in annual savings will come from direct operating costs, which includes reduced energy use thanks to a new, high-tech brewhouse imported from Krones Steinecker, a German manufacturer of packaging, bottling and brewing systems. It's up to 25% more energy efficient and wastes less raw product, such as malt and yeast. And a network of pipes will move the brew around so the company won't need trucks to transfer processed product.

Although Brick is adding 15,000 square-feet to the existing 100,000 square-foot Kitchener plant, Tabata says the company won't increase capacity.

For Brick, it's not about having the biggest operation, it's about streamlining operating processes to remain competitive in the hostile booze market. And for customers, that will keep Brick's craft-quality beer flowing.

Comments? E-mail mpowell@plant.ca.

» Chemicals

E-course preps for WHMIS changes

The GHS will have common rules for classifying, labelling chemicals

There's a new e-course available that educates workers about the upcoming changes to the Workplace Hazardous Materials Information System (WHMIS) as it aligns with the Globally Harmonized System (GHS) of classifying and labelling chemicals.

GHS will have a common set of rules for classifying hazardous products, common rules for labels and a standard format for safety data sheets.

The Canadian Centre for Occupational Health and Safety (CCOHS), in partnership with the Workplace Hazardous Materials Bureau of Health Canada, is offering the course free to the first 100,000 participants for up to one year.

CCOHS, a federal government agency based in Hamilton that's a resource for workplace health and safety, recommends WHMIS (After GHS) for Workers course for those who work in plants where chemical products are used.

Participants who complete the e-course will better understand labels; recognize the pictograms (symbols) and the hazards they represent; identify the hazards represented by each hazard class; and learn how to find additional information about hazards and protective measures on safety data sheets.



E-learn about hazard symbols.

PHOTO: THINKSTOCK

The course features case studies, quizzes and an "ask a question" option.

Employers who want to track successful course completions can purchase a multi-user account with automated tracking. Visit www.ccohs.ca/products/courses/whmis_workers.



LEAN ALERT

Fancy computer-generated charts and graphs are nice to look at but if the information is old, what good are they? Dr. Christoph Roser, professor of production management at the Karlsruhe University of Applied Sciences in Germany, suggests filling in the data by hand on a pre-printed form. The big advantage is that it can be done on the shop floor where the folks who will have an impact on performance measures will be directly engaged in tracking KPIs and achieving goals.

Check out Roser's blog at www.allaboutlean.com.

» Think Lean

Measuring SUCCESS

CONTINUOUS IMPROVEMENT REQUIRES EFFECTIVE METRICS



Measuring progress shows what is and isn't working.

PHOTO: THINKSTOCK

Measuring the progress of your lean initiatives is important but you need to use metrics that matter.

BY RICHARD KUNST

Leaders know metrics are necessary to define what success looks like, measure progress toward a defined target, and assess performance against standards, but they also demonstrate success to people who might otherwise roll their eyes. Used properly, they drive better decisions, problem solving and improvement, yet many organizations operate with few, if any, metrics that provide meaningful information.

Clarity, focus, discipline and engagement are behaviours that provide the necessary foundation for achieving outstanding business performance. Without them, organizations create varying degrees of chaos and the most common and destructive of them is “fire fighting.” In many companies, it’s a normal behaviour and in the most extreme cases, it’s encouraged because management rewards the heroes who save the day rather than those working to prevent chaos.

How does this relate to measurement? Improvement is defined as reducing (or closing) the gap between a defined current state and a target condition. If your company is hooked on fire fighting, your

target condition is to reduce (or eliminate) the need for it. After you identify the root causes, then test, adjust and implement the countermeasures, it’s time to gauge your success.

One way to quantify a reduction in chaos is to conduct brief employee surveys. Another is to simply get anecdotal feedback to the question: “Does it feel better?” There are some important improvements that may be tougher to measure, but they’re the right things to do.

Senior management is focused on cash flow, EBITA and profit but how does that translate to the front line employees as a controllable metric?

Take time to convert corporate goals to tangible goals that are understood by people at all levels of the organization. The deeper you go, the more granular the goals need to be if they are to resonate with employees.

Make them fun, controllable and achievable. For instance, if your workers are taking an hour to unload a truck at receiving, challenge them to do it in 45 minutes. Reducing the unloading time by 15 minutes requires a 25% improvement. This is a major accomplishment on paper when viewed through your profit and loss statement, but it’s also a tangible target for frontline employees. It’s a metric that quickly identifies specific “disturbances to flow” that will impede reaching the goal. Management can then offer support and coaching.

It may be difficult to meet the target initially, but it will make subsequent wins easier to accomplish.

Once you have the metrics it’s all about how you “question for performance.”

The next frontier is to help every supervisor, manager, director and senior leader become proficient in improvement basics, problem solving and, ultimately, improvement coaching.

Improvement teams

An effective coach requires the following three skills sets:

- The technical aspects of improvement (mindsets, tools, and practices).
- Proper problem solving via plan-do-study-adjust (or its related forms).
- Coaching techniques.

There’s also value in coaching the coach, then reflect on how you’re developing your improvement teams and leaders. Are they replacing solution-based thinking with clear problem definition, root cause analysis and critical thinking? Listen to the words you use. Be clear about what you are actually asking people to do, because that’s what you’re going to get.

Here’s an example. A manager and his direct report were discussing the next round of improvements. The conversation was going around in circles: people habitually jump to solutions instead of first digging into the problem. But he was really asking for an improvement so-

lution when he should have opened with, “I want the overtime to be 10% or less.”

When the tone of the conversation changed the improver came back with:

“Today, it is working like this, and we are running overtime as high as 30% in the worst weeks.”

“To keep overtime under 10%, we will need the process to operate like this.”

“As my first step, I intend to...”

You create a learning environment when you question an individual to self-realization. There are several types of questioning skills:

- Open questions invite a huge amount of information but you may get a little.
- Closed questions seek a specific answer but you may get more than you bargained for.
- Turn-around questions ask similar things by using content conveyed to gather additional details.

The most important skill is your ability to “question to the void” ... which means asking the same question repeatedly until there’s no more information to gather. Not doing so risks jumping to a premature solution.

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

Comments? E-mail jterrett@plant.ca.

» CCOHS Safety Tips

H&S meetings to remember

10 tips to keep them on track

The health and safety committee works with the employer to create and maintain a safe workplace so it’s important meetings are organized and effective. Here are 10 tips to help make your meetings meaningful:

- **Set the schedule.** Plan ahead for the next year to make the meeting dates predictable so people can prepare in advance and manage their schedules.
- **Post and remind.** Use notice boards to make members and others aware of meeting arrangements. Send reminders a week in advance.
- **Set the stage.** Create an agenda that includes items submitted by other members and circulate it to the committee well before the meeting.
- **Keep it on track.** The co-chairperson should start on time



Engage your employees by encouraging them to make suggestions.

PHOTO: THINKSTOCK

and move the meeting along by following the agenda and keeping discussion focused on health and safety matters, within the available time.

- **Educate.** Set aside time at every meeting for talks from inspectors, suppliers, experts on equipment and procedures, or watch an informative webinar or video.
- **Recommend action.** State the problem clearly, based on

known facts; investigate the problem to find the root cause; and make recommendations.

- **Wrap it up.** End all discussion items with a decision and definite outcomes, indicating which action will be taken and by whom.
- **Prioritize.** Note items that appeared more than once on the agenda and make sure they are addressed.
- **Document.** Keep accurate and clear minutes. Include time and date, who attended, items discussed, recommendations (and rationale), and time and date of the next meeting.
- **Communicate.** Inform all employees about committee activities and decisions by posting, distributing or providing online access to documents.

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

» Green Processes

A solid set of standards and processes gets employees and suppliers on board with Oakville's zero waste-to-landfill commitment.

BY MATT POWELL, ASSISTANT EDITOR

Ford of Canada's Oakville Assembly plant is a busy place these days. Not only did the automaker invest more than \$700 million at the facility in 2013, it will soon manufacture the Ford Edge crossover for export in more than 100 countries, and 1,000 jobs will be added to do so.

Now it can add zero waste-to-landfill to the list of activities around the plant.

The automaker's largest Canadian production facility, which produces the Ford Edge and Flex, and Lincoln MKX and MKT standing at close to 5.5 million square-feet across 487 acres, is the first of the company's assembly plants in North America to achieve the environmental designation.

It's quite an accomplishment. The plant employs more than 4,000 workers, after adding the 1,000 new jobs, and it handles as many as 10,000 parts daily. That's a lot of people and suppliers to get onboard with such a green commitment.

"It's been quite a journey," says Greg Twomey, Oakville's environmental and engineering manager. "We've had a real direction to reduce our waste to landfill over the last five years, and have done so in an incremental, step by step process to get to the point we're at today."

The zero waste-to-landfill goal has been achieved thanks to a commitment to a set of standards and processes that are part of the company's environmental operating system, and employee buy-in.

In 2013, the plant recycled close to

Driving out WASTE

LANDFILL IS NOT NECESSARY FOR FORD'S OAKVILLE ASSEMBLY PLANT



Many years of process improvement went into the zero waste-to-landfill initiative.

PHOTO: FORD

2,000 tonnes of wood, cardboard, paper and plastic, saving more than 5,000 cubic metres of landfill space and more than 32 million litres of water.

That's enough landfill space to fulfill the municipal waste disposal needs for a community of more than 5,500 people for a year. Wastewater treatment plant sludge is also reused, and sent to a power generation company where it's converted into energy that's cycled back in the community.

Oakville's success is contributing to the automaker's global waste to landfill target of 40% per vehicle produced from 2011 to 2016. It already achieved the 40% between 2007 to 2011.

Ford is also dabbling in greener materials, including a partnership with Heinz that's working to produce auto parts

from recycled tomato skins. It's already using coconut-based composite materials and sources soy foam seat cushions and headrests.

Now 21 Ford facilities around the globe maintain zero waste-to-landfill status. By Ford's strict definition, this means not sending any operational waste to a landfill.

Sustainable packaging

The Essex Engine Plant received landfill-free status in 2012 followed by the Windsor Engine Plant last year.

"When it comes to waste streams, you want to reduce what comes into the plant and the biggest factor is your relationship with your supplier base," says Twomey.

To avoid piles of cardboard, the plant

uses more sustainable packaging such as collapsible, reusable plastic totes. For more complex parts, Ford engineers work with suppliers to develop new, waste-free packaging.

"When talking about the Three Rs – reduce, re-use, recycle – we try to reduce first. Sometimes if we need unique sizes, we need to design unique containers to make it work," says Twomey.

Suppliers are also notified of any changes to Ford's sustainability standards.

"The standards we put in place are corporate wide processes and procedures that allow people to learn from what we do," says Twomey. "There's always challenges when it comes to the supply chain, so we have to be nimble in making adjustments to keep short term disruptions to a minimum. That's an ongoing process."

Employees undergo environmental training, and plant manager Will Cowell gives the current 3,000 plant workers the most credit. He says there's also a high level of environmental awareness that generates useful feedback.

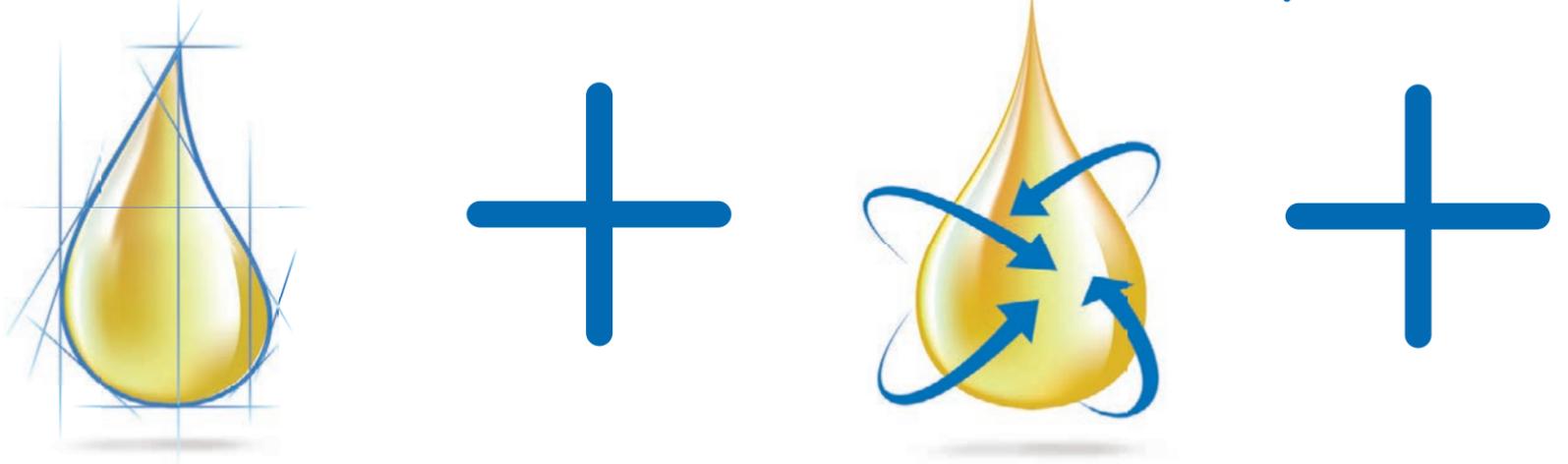
"They're the people on the floor, the people that are getting their hands into the waste stream and the people we really need to cooperate with," he says.

As a corporate objective, zero waste-to-landfill drives Oakville Assembly's commitment to continuous improvement, Cowell adds.

That's a positive way to direct sustainable processes into action on the production floor.

Comments? E-mail mpowell@plant.ca.

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The Power of Knowledge Engineering



Prototype of CO2 Solutions' enzyme-enabled carbon capture unit in Montreal.

PHOTO: CO2 SOLUTIONS

A pilot with Husky Energy and a program run by EERC will put the enzyme-enabled carbon capture technology to the test.

PLANT STAFF REPORT

Oil sands and heavy oil extractors are under a lot of pressure from governments, environmentalists, citizens and celebrities to do something about escalating greenhouse gas emissions as their energy plays are developed.

A key concern is what to do about all that carbon dioxide (CO₂) generated by extraction operations. One potential solution is the development of carbon capture and sequestration (CCS), or carbon capture and storage, but it's an expensive proposition so far and there are concerns that stowed CO₂ will escape some day and create a lot of environmental havoc.

CO₂ Solutions, a developer of an innovative enzyme-enabled carbon capture technology based in Quebec City, believes it has a lower cost and greener solution that adds a U for utilization to the CCS acronym.

Its patented technology, using the enzyme carbonic anhydrase – naturally found in living organisms to manage CO₂ during respiration – is aimed at stationary emissions sources such as oil production, power and steam plants and metals production facilities, and leverages existing solvent-based gas scrubbing processes.

A salt solvent and the enzyme scrubs collected flue gas and absorbs the CO₂ on the left side of the process. The CO₂-absorbed solvent is then sent to the right side where regeneration occurs, freeing the solvent of the CO₂ and recovering a pure stream of the gas. The CO₂ is compressed, stored and used for other applications rather than being pumped it into the ground and sequestered. Some of these uses include helping greenhouse plants grow faster, PH regulation in the pulp and paper industry, and for carbonation at bottling plants. But it is also a promising solution for oil and gas companies. Billions of barrels of harder to recover heavy oil reserves can be extracted pumping captured CO₂ into aging wells.

CO₂ Solutions has been busy testing and piloting its technology and has made a couple of important announcements. It's going to run a pilot at Husky Energy's Pikes Peak South heavy oil site in Saskatchewan, and CO₂ Solutions says the project will be sized to capture up to 10 tonnes of CO₂ per day.

The federal ecoEnergy Innovation Initiative is providing \$5.2 million for the project. Another \$500,000 came from the Climate Change Initiative Management Corp., Alberta's climate change investment

Continued on page 20

» Diversion
Not going to waste

Reuse, recycling and composting adds to GDP

There are major economic and environmental benefits in line for Ontario if the province cleans up its act by expanding its recycling, reusing and composting, according to the Conference Board of Canada.

The Ottawa-based research firm's report for the Ontario Waste Management Association (OWMA) claims greater diversion of residential and non-residential waste, including industrial, commercial and institutional streams, would increase employment and economic activity in the province by almost 13,000 jobs and \$1.5 billion in GDP.

About 47% of residential waste in Ontario is currently diverted, while only 11% of non-residential waste is kept out of landfills.

That means only 23% of the combined 12 million tonnes of waste generated in Ontario in 2010 was diverted. Roughly 33% is shipped to Michigan and New York for disposal.

The big benefits would kick in by boosting the combined residential and non-residential streams by 60%.

According to the OWMA, the province's waste management industry currently employs more than 13,000 people.

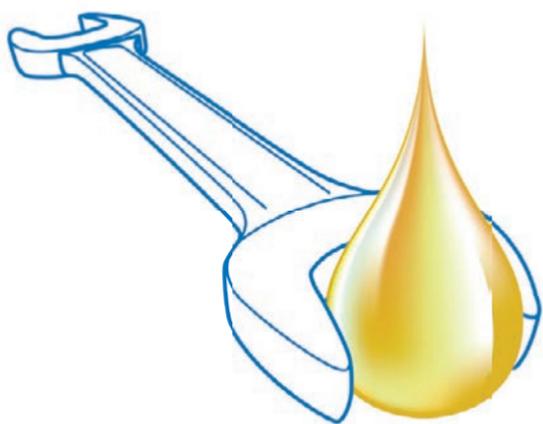
The report notes that some manufacturing jobs could be affected if firms were to replace virgin material with recycled material.

However, diverting waste helps to avoid the impact on the environment and costs associated with the extraction and processing of new materials.

What to do with CO₂?

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Sustainability

EERC testing

Continued from page 19

arm.

Procurement has started and construction is to be completed early next year with commissioning in the first quarter. Operation will conclude in the third quarter, for a run time of 2,500 hours.

Initial lab testing at CO2 Solutions' 96,000 square-foot R&D facility proved that its process operated at a 0.5 ton per day scale, which significantly reduces the cost of CO2 capture below current technology.

The company also signed an agreement with the University of North Dakota's Energy & Environmental Research Center (EERC) to join its carbon capture program as a sponsor.

Under the Advancing CO2 Capture Technology: Partnership for CO2 Capture Phase III program, CO2 Solutions will test its technology in December at EERC's facility using natural gas and coal flue gas.

Benchmarking performance

The program is evaluating several carbon capture technologies that are among the most advanced systems under development, for use at power and steam generation plants.

CO2 Solutions says data collected from the EERC tests, which will have approximately twice the capacity of its largest testing to date, will provide valuable input for the Husky Energy pilot, plus performance benchmarking of its enzyme-accelerated process against other solvent-based processes.

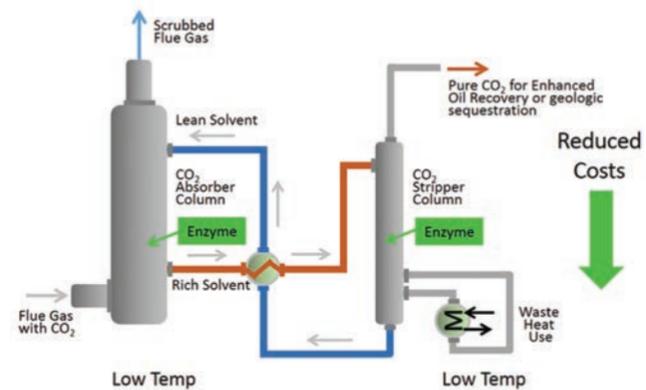
"We expect the program will benefit our US market entry, particularly for commercial applications such as enhanced oil recovery, through the exposure of our technology to the program's prominent industry participants," says Evan Price, president at CEO of CO2 Solutions.

He says the EERC program also offers a flexible platform that allows for the testing of different equipment configurations.

The US Department of Energy provides part of the program's funding.

CO2 Solutions is realigning its testing program as it prepares for commercial opportunities in North America.

It has ended its association with Neumann Systems



How the CO2 Solutions system works.

PHOTOS: CO2 SOLUTIONS

Group, a designer and builder of emissions control systems for power plants and other industrial applications that's based in Colorado Springs, Co., saying in a press release that the collaboration is "no longer in its best interests."

The companies announced in July they were accelerating preparations for a pilot facility in Colorado Springs that would capture approximately 10 tonnes of CO2 per day. Start-up was originally set for April 2015, but it was moved ahead to October.

"We are now focusing our attention and resources on alternative collaborations to meet our objective of offering a low-cost, next-generation commercial CO2 capture system for applications such as enhanced oil recovery," says Price.

Thom Skinner, CFO of CO2 Solutions, says the two companies are parting amicably, noting one such alternative collaboration is the EERC program.

"The EERC is a primary testing ground for CO2 capture in the US. This provides significant credibility and an introduction to a [variety] of prominent players in the CO2 capture and reuse market. North Dakota is also a prime market for CO2 applied to enhanced oil recovery (EOR). We have limited resources and we have to pick our spots carefully," says Skinner. "The opportunity to test at EERC was one we didn't want to pass up."

If the tests and pilots prove CO2 Solutions' process is a winner, perhaps it will have the added effect of reducing the amount of CO2 exhaled by the fossil fuel extraction critics, or at least give them something to talk about.

This article includes files provided by Noelle Stapsinsky from the report in the September/October issue of PLANT West (CO2's GHG solution).

Comments? E-mail jterrett@plant.ca.

» Transportation

Eclipse launches green bike initiative

Employees cut emissions riding instead of driving between sites

Eclipse Automation is doing its bit to spare the climate the unnecessary vehicle emissions that would be generated when employees travel between its local offices in Cambridge, Ont.

The supplier of custom automated manufacturing equipment is offering its workforce the use of bicycles to get around the sites and associated offices where it operates a 25,000 square-foot manufacturing facility. Eclipse makes equipment for the solar, health sciences, transportation, mining, consumer/industrial and telecommunications/electronic industries.

"Our expansion in Cambridge and the US continues to challenge us to find innovative solutions to maintain and improve efficiencies," says company president Steve Mai. "The industrial bikes have been a simple and effective solution for commuting between our multi-facility growth initiatives in Cambridge."

The bicycle project is aimed at helping its 175 employees become more knowledgeable about, and engaged with the company's environmental policies and objectives.

Six Fiori Torus bikes purchased from a local shop in Hespeler, Ont. for about \$4,000 sport the company logo and will be used to get to and from the custom manufacturing plant, the sports and software offices, and the automation plant where the head office is also located, all along a stretch of industrial land on Thompson Dr.

The company plans to eventually expand the initiative at its other locations.

Eclipse has expanded its operations in the US this year. Eclipse Automation Southeast LLC operates a 25,000 square-foot engineering and manufacturing operation in Charlotte, NC, and Eclipse Automation Southwest LLC in Fremont, Calif.

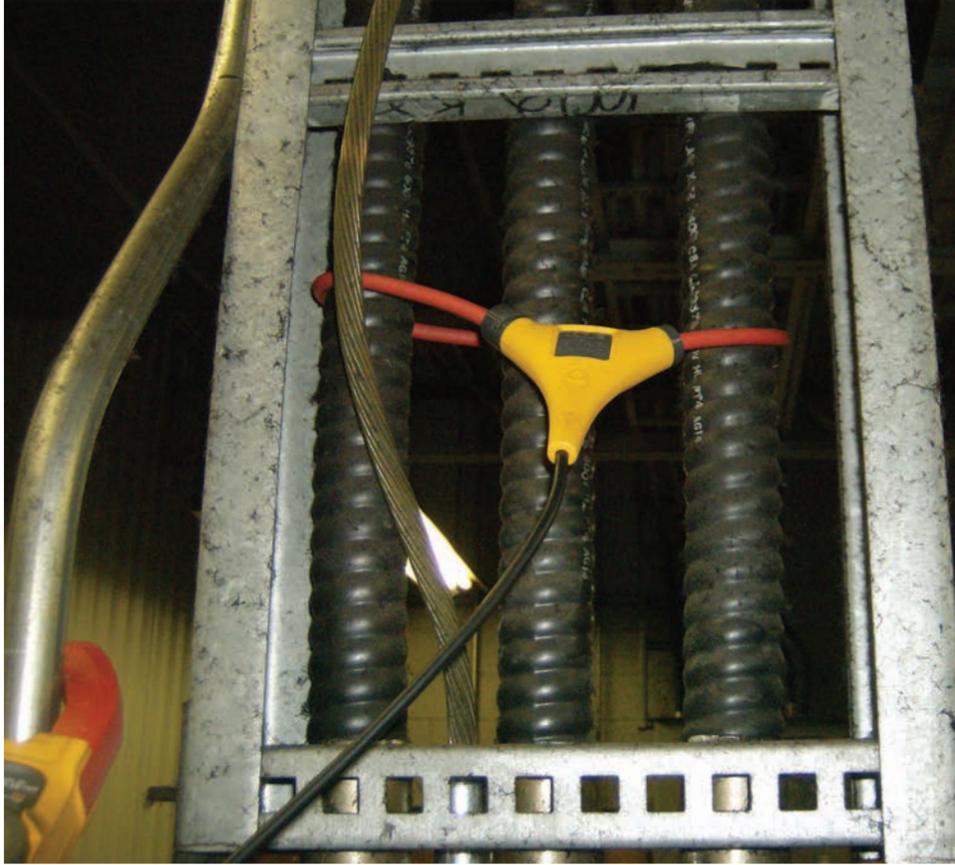


Green transportation: one of six Fiori Torus bicycles. PHOTO: ECLIPSE AUTOMATION

C I E N

CANADIAN INDUSTRIAL EQUIPMENT NEWS

» Troubleshooting



Linamar technicians clamped the iFlex flexible current probe around the three feeder cables at each compressor to show the differential flowing on the grounding conductor. PHOTOS: LINAMAR

When MOTORS fail

CAMTAC SENDS IN THE ASG TEAM

When three air compressor motors failed at one of its automotive parts plant, Linamar's advanced systems group went looking for trouble.

Camtac Manufacturing was having trouble with the motors on each of three 300 horsepower compressors at its Guelph, Ont. plant. They were failing repeatedly, despite being relatively new and receiving regular service. It was unusual enough for one to fail, but to have three go could be catastrophic for the manufacturer of engine components and complex assemblies.

Camtac belongs to the global driveline systems group of Linamar Corp., the automotive parts manufacturer also based in Guelph, Ont. that has 44 plants worldwide and 2013 revenues of \$3.6 billion.

"One failure is a happenstance; twice is a coincidence; but the third time it



Technicians measured a significant amount of ground current flowing from each air compressor with a Fluke 381 clamp meter.

happens you figure there's something else afoot here," says Leigh Copp, chief engineer and business unit manager for Linamar's Advanced Systems Group (ASG), which fixes complex problems at the company's 25 plants in the Guelph area, as well as those in the US, Mexico, Germany, Hungary, France and China.

Getting the motors rewound would cost up to \$8,000 each, plus associated downtime costs. A sudden compressor

failure can also be contagious. Low air pressure faults cause failures in other machinery.

Luckily, the motors had failed at different times so crews worked around the repairs, but by the time the third motor went down in 2011, Camtac turned to the ASG for a diagnosis.

Power enters the Camtac plant through a 5,000 kilovolt-ampere (kVA) transformer that supplies a 5,000-amp, 600-volt main service. From there, 1,200-amp subservice feeds are distributed throughout the plant, including the one that powers the three compressors. The cable tray for the subservice feed holds two parallel runs of single conductor cable for each of three phases and one grounding conductor in the middle of the tray.

Copp and his team started with the compressor motors using a Fluke 381 Clamp Meter with an iFlex flexible current probe to measure voltages and currents.

"We found that there was a small unbalance in the motor voltage, but almost a 10% unbalance in the motor current, which could cause significant overheating," says Copp.

That was a headscratcher. Typically, a 1% voltage unbalance wouldn't cause a 10% current unbalance. They measured the voltage at the main service, finding it was balanced but the unbalance in the subservice was not present at the main service.

A Fluke 345 power quality clamp meter looked for harmonic content in the motor current, but found little distortion, while a Fluke 1550B digital insulation tester found no deterioration or other problems with the insulation in the compressor motors. But they found phase-to-phase resistance much better matched on the new motors and that the in-service motors were being subjected to a heating effect that damaged the windings.

Moving from the motors to the subservice, the team found a high 160-amp ground current flowing in the bond wire between the subservice and the main service.

"Although 160 amps is permissible, typically there shouldn't be any ground current flowing unless you have leak," says Copp.

The neutral tap was verified solidly bonded and all of the ground bonds were in good shape. They also used a Fluke 1625 GEO earth ground tester to verify

Continued on page 22

» Supply Lines



Almost 300 products added to the program.

PHOTO: BOSCH REXROTH

GOTO GOES FURTHER

Bosch Rexroth's GoTo focused delivery program has been expanded.

The program, launched in 2009, now has more than 3,500 drives and controls parts numbers that the German manufacturer of industrial products delivers to customers across North America.

Almost 300 additional products have been added to the program, lead times have been shortened (less than 10 days for 98% of the products). A new GoTo Products app retrieves local pricing, finds sales help or distributors, adds products to a cart and e-mails them for a quote.

It also shares content via social media, creates multiple wish lists for easy re-ordering and provides quick access to videos and other useful content.

Bosch Rexroth Canada has locations across Canada. Visit www.boschrexroth.com/goto.

SLING-CHOKER DISTRIBUTES O'BRIEN CRANES AND HOISTS

O'Brien Installations Ltd., a manufacturer of cranes and hoists based in Burlington, Ont., is expanding its reach in Canada. It's joining Sling-Choker Manufacturing's distribution channel, which has many locations in Canada, but primarily represents Northern Ontario, Quebec and Manitoba.

Sling-Choker, a Sudbury, Ont. distributor of industrial and MRO products, will handle O'Brien's overhead, jib and workstation cranes, chain hoists and wire rope hoists.

The distributor will be able to speed up deliveries and help solve customer problems in a timely fashion, O'Brien said.

HELICAL LICENSED TO LINCOLN

Lincoln Electric Co., a manufacturer of welding products and systems based in Cleveland, has been granted an exclusive worldwide licence for Helical Robotics' proprietary magnetic robotic technology.

The agreement expands Lincoln's offerings, which includes a trackless automated arc welding and cutting solution.

Helical Robotics, based in Oregon, Wis., designs, develops and manufactures mobile magnetic robotic platforms.

Lincoln Electric has locations across Canada.

Finding balance

Continued from page 21

the ground grid was working properly.

But when they measured the ground currents flowing from each air compressor through the cable trays and metal air pipe, there was more bad news.

Using a Fluke scopeMeter 190-204 with four Rogowski coil current transducers, the technicians measured the magnitude and phase of the components of the ground currents that were flowing in the conductors and the adjacent cable tray.

"It became clear that some inductive effects were contributing to the ground current and they might contribute to the voltage unbalance," says Copp.

Measurements at the main service showed almost 200 amps of ground current flowing through the various grounding wires at the service. Copp and two other engineers suspected that they had a ground loop caused by phase currents.

Elevated ground current

At the end of December 2011, Copp and his team used an eight-hour shutdown to conduct as many static tests as possible, and verified that there weren't any broken strands in the cable between the sub- and-main service. They measured the resistance of the parallel runs of cable with a micro ohmmeter and found they were all closely matched. They also removed and cleaned the ground, bond and phase conductor connections.

But there was still an elevated ground current present when the plant returned to service.



The Fluke 381 clamp meter's remote display attached to compressor #2 provided easy monitoring from several feet away.

Based on the shutdown tests, the team concluded that the problem stemmed from the arrangement of the conductors between the main service and the 1,200-amp subservice.

"We believed that the bonding conductor was placed in the wrong physical location in the tray, resulting in an interaction between the ground conductor and the phase conductor magnetic fields, which caused ground current to flow," says Copp.

Although the ground conductor was placed according to best practices from cable manufacturers and the NEC/CEC codes, he says the investigation suggests those practices may need to be re-examined.

With further testing, the ASG team and counterparts at Camtac determined that moving the ground conductor close to the side rail of the cable tray would mitigate induced ground currents.

Tests revealed a significant reduction after relocating the conductor.

Turns out it was the right diagnosis. There have been no increases in ground current or compressor motor failures.

This is an edited version of an article provided by the Fluke Corp., a manufacturer of testing tools. Fluke Electronics Canada Inc. is based in Mississauga, Ont.

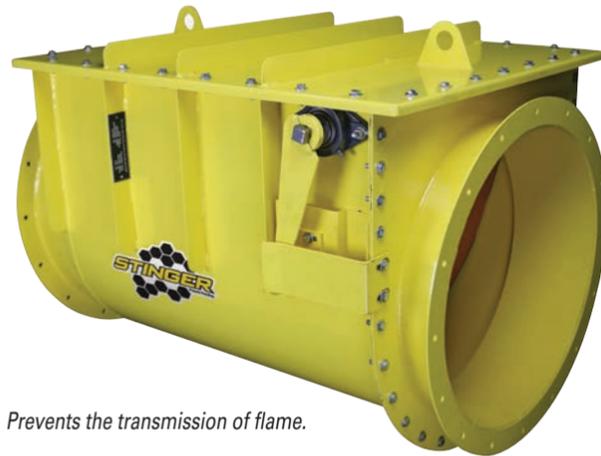
Comments? E-mail jterrett@plant.ca.

Dust, vacuum, air, filtering

FLAP VALVE BLOCKS DUST EXPLOSIONS

Camfil Air Pollution Control's Stinger valve isolates dust collector explosions to prevent a deflagration from travelling back through the inlet pipe into the workspace. The explosion flap valve, which complies with NFPA standards, retrofits to most dust collection systems.

Camfil says its lightweight, patent-pending composite blade closes faster than heavier steel blades typically used for dust collector inlet protection. Because it's



Prevents the transmission of flame.

lightweight, less pressure drop is needed to hold the blade open during normal flow, which saves energy. Also, the composite material has a smooth surface and doesn't use stiffeners that allow dust to build up on the blade to compromise performance.

During normal operation, the airflow holds the blade open. If a deflagration occurs in the dust collector, a pressure wave travels through the pipe faster than the flame front and closes the flap valve to protect downstream personnel and equipment from injury and damage.

When the valve is fully closed, a latching mechanism keeps it shut, preventing the transmission of flame while keeping smoke, dust and burning debris from travelling through the inlet pipe into the plant.

The blade is easily replaced, sparing the entire valve from replacement after an explosion. A wear-resistant liner also functions as a wear indicator and shows when the blade needs to be changed.

Camfil is a Jonesboro, Ark. manufacturer of dust collectors for industry. Canadian offices are located in Concord, Ont.

www.camfilapc.com

MORE COMPACT FUME EXTRACTION

Bernard's Clean Air fume extraction gun, redesigned to be lighter and smaller than many standard guns, provides welders with a more comfortable option for reducing fume and smoke.

Sized to be of nearly the same dimensions as a regular Bernard semi-automatic MIG gun, it's for almost any medium- to heavy-duty solid or flux-cored welding application.

An easy-to-slide nozzle shroud on the front of the gun adjusts to one of four fixed positions. The small size of the vacuum chamber provides good joint access and visibility, while a 360-degree hose swivel on the rear of the handle improves flexibility and reduces wrist fatigue.

The hose is crush- and snag-resistant for manoeuvrability and it limits hang-ups on nearby equipment or fixtures. It's durable enough to eliminate a bulky vacuum hose cover in most applications and threaded connections make replacement easy.

The gun comes in 400-, 500- and 600-A models with a 45- or 60-degree neck bend to maximize wire feeding.

Bernard, based in Beecher, Ill., manufactures premium semi-automatic GMAW (MIG) and FCAW (flux-cored) welding guns, consumables accessories and manual arc products.

www.bernardwelds.com



Easy-to-slide nozzle shroud.



Force and flows easily adjusted.

NOZZLE DELIVERS AIR POWER

EXAIR's 1-in. High Power Stainless Steel Flat Super Air Nozzle produces a flat 1 in. (25 mm) wide airstream with a strong blowing force of 16 oz. (462 g) when mounted 12 in. (305 mm) from the target.

It handles tight spaces and its Type 316 stainless steel construction stands up to corrosive, high temperature,

food, pharmaceutical and chemical environments.

A precise amount of compressed air is released through the 0.025 in. (0.64 mm) air gap opening that's set with a stainless steel shim positioned between the body and removable cap. The airstream pulls in surrounding room air to produce a forceful stream of high velocity, laminar airflow. Air consumption is 17.5 scfm (495 slpm) at 80 psig.

It meets OSHA deadend pressure standard CFR 1910.242(b). Sound level is 82 dBA, which meets OSHA noise exposure standard 29 CFR 1910.95(a), and the nozzle is CE compliant.

Force and flow are easily adjusted by installing different shim thicknesses and there are optional swivel fittings and Stay Set flexible hoses to aim the nozzle.

Nozzles are also available in zinc aluminum alloy for rugged industrial applications.

EXAIR Corp. is a manufacturer of compressed air-operated products based in Cincinnati.

www.exair.com



Uses water streams.

WET COLLECT COMBUSTIBLE DUST

Micro Air HydroMax Wet Collectors use engineered water streams to drop out and filter combustible dust, containing it in the bottom of the collector for safe removal.

Options include a downdraft table attachment, vacuum attachment, 99.97% DOP HEPA after filter and powered sump fan.

Micro Air Clean Air Systems is a manufacturer of clean air systems based in Wichita, Kan.

www.microaironline.com

SYSTEM FILTERS DIESEL PARTICULATE

Nett Technologies Inc. has received verification from the California Air Resources Board (CARB) for its BlueMAX NOVA 300e system.

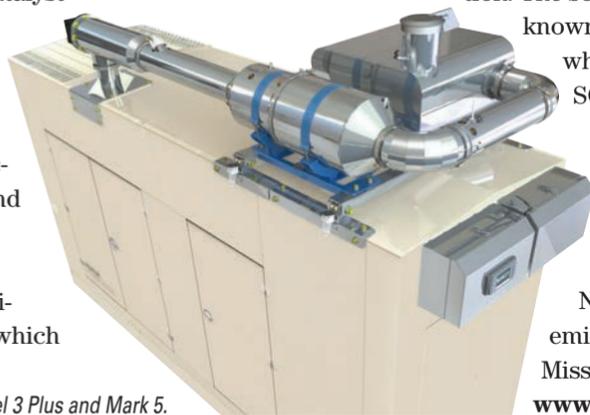
The diesel emission control retrofit system is verified to Level 3 Plus (reduction of 85% or more) for diesel particulate matter (PM) and Mark 5 (reduction of 85% or more) for nitrogen oxides (NOx).

The verification applies to Tier 1, 2 and 3 engines above 56 kW originally certified without a catalyst or exhaust gas recirculation (EGR).

Nett Technologies says it's suitable for prime power and peak power shaving generators.

The system incorporates both an active diesel particulate filter (ADPF) and selective catalytic reduction (SCR).

The Active DPF system consists of a diesel oxidation catalyst (DOC) positioned upstream of a catalyzed DPF, which



Verified for Level 3 Plus and Mark 5.

traps the PM emissions from the diesel engine. The catalyst lowers the PM oxidation temperature allowing the filter to passively regenerate at temperatures above 300 degrees C. When the engine exhaust temperature is not sufficient for passive regeneration, the DPF is regenerated by an HC injection over the DOC catalyst.

NOx is reduced over the SCR catalyst through chemical reactions with ammonia produced by urea decomposition. The solution of 32.5% urea in water is known as diesel exhaust fluid (DEF), which is injected upstream of the SCR catalyst.

A colour display provides operator feedback and control that records both system and error codes, meeting the most stringent ARB requirements.

Nett Technologies Inc. is an emissions control company based in Mississauga, Ont.

www.nettinc.com

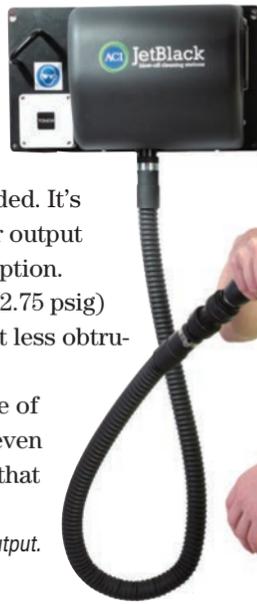
MORE DE-DUSTING POWER

ACI's personnel JetBlack de-duster has been remodelled and upgraded. It's more compact yet has a greater air output without increasing energy consumption.

Output has been increased 10% (2.75 psig) and its more compact size makes it less obtrusive and easier to install.

Because it delivers a high volume of air at low pressure it can be used even against exposed skin – something that

Greater air output.



can be fatal with compressed air. And operating costs are 90% lower than typical compressed air systems.

The standard hose length is 142 cm (56 in.), and noise levels are still lower than 78 dBA.

A spare filter is included, and all replacement parts are interchangeable with the old and newer versions.

Air Control Industries (ACI) is a manufacturer of air control equipment with North American offices in Windsor, Me.

www.aircontrolindustries.com/us/

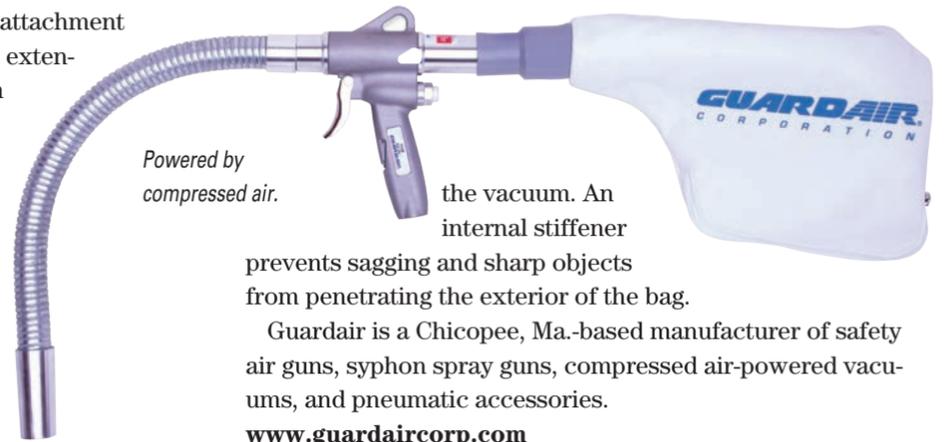
MORE ATTACHMENT OPTIONS FOR EASIER VACUUMING

Guardair Corp.'s Flexible Gun Vac expands attachment options with its 18-in. tapered flexible metal extension that accepts all standard 1¼ in. vacuum accessories.

The flexible metal extension makes cleaning easy in hard-to-reach areas by capturing debris rather than blowing it around.

It's powered by compressed air, so there's no electric motor to burn out.

Cleaning metal chips, dirt, dust and finer materials such as powders and talc is easier thanks to the high-filtration, zippered collection bag that attaches to the rear of



Powered by compressed air.

the vacuum. An internal stiffener

prevents sagging and sharp objects from penetrating the exterior of the bag.

Guardair is a Chicopee, Ma.-based manufacturer of safety air guns, syphon spray guns, compressed air-powered vacuums, and pneumatic accessories.

www.guardaircorp.com

VACUUM HANDLES CLASS II, DIV.2

VAC-U-MAX's compressed-air powered industrial dust vacuums handle Class II, Division 2 environments easily thanks to a bumper-to-bumper grounded and bonded design that meets NFPA 77 requirements.

Made of carbon steel, the 55-gal. units include an extra-large washable internal dust filter that's static-conductive, PTFE-coated and rated to 99.9% efficiency at 1 micron. A noise muffler and guard keeps sound levels below 80 dbA.

The vacuum systems, which don't use electricity or generate heat, include cover, drum, dolly, vacuum hose and cleaning tools, compressed air hose with quick-disconnect fittings and polybag drum liners.

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

www.vac-u-max.com



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DUST, VACUUM, AIR, FILTERING



Maintenance-free.

WELDING, GRINDING TABLE CLEARS THE AIR

Nederman's industrial welding and grinding table takes care of pollutants before they reach the worker's breathing zone.

The maintenance-free table, which extracts fumes, dust and particles, connects to an external fan either in a system with other tables, with extraction arms and filters, or as a single unit.

A dust connection for an external fan on top of the table is used as a filter between the table and the fan. Suitable filters include FilterBox, FilterMax C25 or modular FilterMax models.

External fans add flexibility to extraction capacity. Recommended airflows are from 590 to 2,360 cfm, depending on table size. Each extraction point can be shut off by a motor.

Air is extracted either in the back of the table or downwards through the grid in the table surface. Fumes and light particles will be extracted mainly by the airflow in the back and heavier particles will fall down to the dust drawer, in the bottom of the table that's easily emptied from the front of the unit.

The easy-to-install tables are equipped with a side-hanger for a welding torch when not in use. They come in three sizes and are used in explosive environments, if grounded correctly.

Nederman is a manufacturer of industrial air filtration products based in Mississauga, Ont.

www.nederman.com

HEAT TRACING



IP66, NEMA 4X-rated.

HANDLES THE HEAT

Nelson Heat Trace's AX Connection Kits provide heavy-duty industrial heat tracing engineered to meet stricter NEC hazardous location safety standards in oil and gas production, refineries, petrochemical plants and power generation facilities.

The kits, approved by CSA and FM for NEC Ordinary and Hazardous locations, withstand extreme conditions.

Nonmetallic, impact-resistant polyester enclosures are rated IP66 and NEMA 4X, making them suitable for corrosive environments. The enclosures are also fitted with reinforced standoffs to prevent cracking, and are carbon-impregnated to keep static charge from building up.

DIN-rail mounted terminal blocks help maintain the connection, while spring-clamp terminals simplify wiring. They fit all wattages of Nelson's Self-Regulating heating cables (LT, HLT, QLT and CLT).

Nelson Heat Trace, an Appleton Group brand based in Appleton, Wis., produces heat trace cables and controls.

www.emersonindustrial.com

TEST AND MEASUREMENT

GENERATORS PRODUCE PURE SIGNALS

Saelig Co. Inc.'s Rigol Technologies DSG3000 signal generators are available in three and six GHz versions to provide standard AM/FM/Phase modulation. They support internal and external modulation and operate with USB, LAN, LXI-C, and GPIB remote control interfaces for wireless communication and radar testing.



Output range to 13 dBm.

They generate waveforms with high signal purity, typical phase noise of less than 110 dBc/Hz at 20 kHz, and a wide output range of -130dBm to 13dBm. There's also standard pulse modulation with an on/off ratio up to 80 dB and an optional pulse train generator.

Amplitude accuracy is better than 0.5 dB, while a standard 0.5 ppm internal clock can be upgraded to 5 ppb high stability oven-controlled clock.

The units feature a wear-free electronic attenuator and an automatic flatness

calibration function via external automated power meter control over USB, which is used as a test system for cables, attenuators and amplifiers.

They're compact, measuring standard 2U in height to save space when used with the optional rack mount kit.

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

www.saelig.com



4 to 20 mA output.

TRANSMITTERS EASE FLOW MONITORING

Dwyer Instruments Inc.'s DFMT2 digital paddlewheel flow transmitter provides instantaneous, totalizing flow monitoring in a two-piece design. It separates the control panel from the application for reverse osmosis water systems and other applications where space is limited.

A large backlit display makes navigating the menu structure simple. The unit uses paddlewheel technology with selectable 4 to 20 mA or pulse output with a corrosion resistant PVDF sensor to enhance the transmitter's lifetime.

Dwyer is a manufacturer of test and measurement equipment based in Michigan City, Ind.

www.dwyer-inst.com

HOSES

APP MAKES HOSE SELECTION EASY

Parker Hannifin has added 357 products to HoseFinder, making its mobile app more versatile for selecting and locating critical hoses for industrial applications.

The products join a database of more than 5,000 items from the Hose Products Division.

The STAMP (size, temperature, application, media and pressure) search

feature to browse, users are able to filter through products grouped into general categories, such as hoses, fittings and accessories

The app, available for iPhone and Android devices, has a custom search function that directs users to the closest distribution locations.

Parker Hannifin is a manufacturer of motion and control technologies and systems based in Cleveland.

www.hosefinder.com



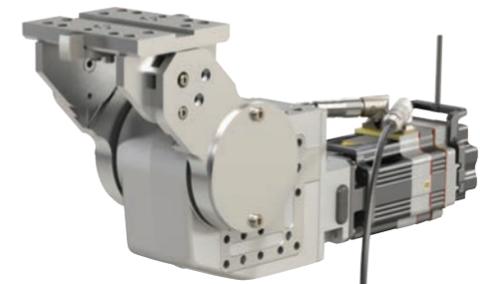
iOS, Android-compatible.

WORKHOLDING

PIVOTS ENHANCE CONTROL

DE-STA-CO's 98 W electric pivot, smaller and lighter than traditional pneumatic units, provides uniform torque and enables manufacturers to add a pivot in tight spaces for better operational control of electrode tip dressers, clamps and other tools.

A worm gear replaces a pneumatic toggle mechanism to give the unit's arms 360-degree rotation. The saddle arm mount is adjustable in 45-degree increments for changing the pivot angle without swapping the unit's head.



Internal coolant supply.

The pivot operates in a programmed setting with limited opening angles or one with infinite opening angles. It's compatible with multiple motors and is interchangeable with common pneumatic pivot units equipped with 125, 160 or 200 mm cylinders.

Its 500 Nm of torque suits a variety of applications and requires only four seconds for the arms to rotate 135 degrees.

DE-STA-CO is a developer of workholding tools based in Auburn Hills, Mich.

www.destaco.com

GEARS

HELICAL GEARBOXES DELIVER ABSOLUTE PRECISION

B&R Automation has added two new helical members to its gearbox line: the 8GP70 with a shaft output and the 8GF70 with a drive flange, both of which have improved synchronization characteristics and low noise level while operating at high speeds.



IP65-rated.

DRIVES

HIGH TORQUE, LITTLE MAINTENANCE

Baldor Electric Co.'s energy-efficient Dodge HT500 synchronous drive system delivers high torque, requires minimal maintenance and is energy efficient with less overhung load than V-belts for a longer lifecycle in wet and oily environments.

The sprocket and belt package comes in eight and 14 mm metric pitches. Carbon fibre cords deliver higher torque and carrying capacity than aramid fibre tensile-made belts.

The sprockets are made with a modified curvilinear tooth profile for 8 mm and 14 mm pitches. A stock of compact, power-dense TAPER-LOCK, fin fan QD, and there are minimum plain bore sprockets.

Split-tapered options and a variety of tooth counts, materials and plating meet the requirements of most applications.

Baldor is a manufacturer of electric motors and power transmission products based in Fort Smith, Ark.

www.baldor.com



Resists harsh environments.

The a manufacturer of automation equipment based in Atlanta says the IP65-rated gearboxes' backlash option reduces it to as low as <1 arcminute.

Both gearboxes handle applications that place especially high demands on smooth operation, synchronicity and low excitation frequencies. They're available in five different sizes with gear ratios ranging from i=3 to i=100.

Compatible designs and connector dimensions allow machinery to be easily adapted to changing requirements without making changes to basic designs.

www.br-automation.com

MACHINING



1/2 to 2 1/6 in. versions available.

CUTTERS GET THROUGH HEAVY MATERIALS

Hougen Manufacturing's Silver annular cutters easily handle single and stacked plate materials.

The tools are made of heat-treated and precision-ground M2 high-speed steel with a hybrid tooth geometry for drilling holes in both single plate and stacked plate materials.

They come in diameters from 1/2 to 2-1/16 in. in with a 1- and 2-in. depth of cut. The standard 3/4-in. two flat shank fits most magnetic drill arbours.

Hougen is a manufacturer of magnetic drills and cutters based in Swartz Creek, Mich.

www.hougen.com

Internal coolant supply.



ADAPTORS ENHANCE BORING PRECISION

Walter Tools' counterboring and precision boring tools connect to its Cpto adaptor interface for multiple process applications that require a single tooling interface.

The connections are available in five coupling sizes for small and large machines. Twin-insert models with medium and maxi versions for holes of 20 to 640 mm have an internal coolant supply and are suitable for symmetrically or radially displaced roughing operations.

Either aluminum boring-bar, cartridge or bridge constructions are used, depending on the hole diameter.

PrecisionDIGITAL single-edged precision boring tools provide precise holes with a diameter of 3 to 124 mm. An optoelectronic encoder reads micron-precise digital results.

Solid carbide boring bars are available for holes with a diameter up to 0.39 in. Bridges for large diameters handle speeds up to 16,000 rpm.

The interface is clamped using a conical polygon in accordance with ISO 26623, with a small cone angle to create a high clamping force and good support face. The force is evenly distributed around the circumference of the polygon. The connection is backlash-free, self-centring and doesn't need a special locking device.

The adaptor is also shorter, making it resistant to bending while keeping vibration to a minimum.

Walter is a manufacturer of precision cutting tools based in West Waukesha, Wis.

www.walter-tools.com

PUMPS

VANE PUMP HANDLES HARSH CONDITIONS

Blackmer's 4-in. XLW4A sliding vane pump handles a variety of abrasive liquids, including oxide primers, inks and paints, and provides wear-resistance to critical pump operations thanks to a hardened rotor and shaft liner.

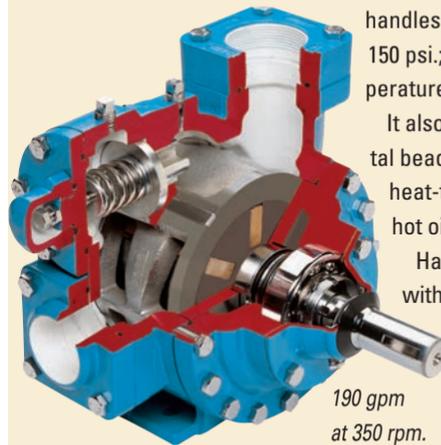
The pump produces flow rates up to 190 gpm at speeds to 350 rpm; handles viscosities to 20,000 SSU; differential pressures to 150 psi.; working pressures to 350 psi.; and works at temperatures up to 149 degrees C.

It also handles applications such as vertical and horizontal bead mills, solvent recovery, tank-bottom recirculation, heat-treater supply, enhanced oil recovery and crude or hot oil transfer.

Hardened internal parts allow the pump to be used with liquids that have suspended abrasive particles up to 250 microns at concentrations of up to 25%.

Blackmer is a manufacturer of rotary vane and centrifugal pumps based in Grand Rapids, Mich.

www.psgdover.com



190 gpm at 350 rpm.

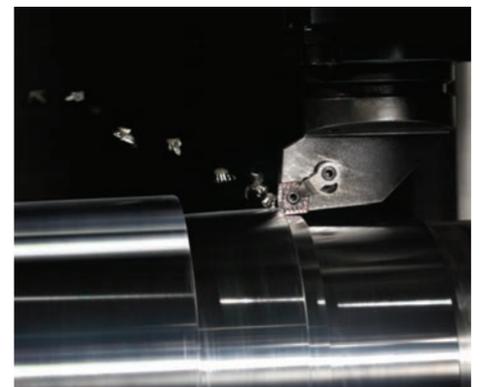
INSERTS PERFORM PRECISION GRINDS

Widia's Victory turning inserts come in new geometries and grades.

For difficult-to-machine materials such as Inconel and Rene or cobalt-chromes and high-alloy stainless steels, the Victory FS geometry has a ground, high positive design for tasks where surface finish and minimal part deflection are critical. Precision grinding, proprietary nose geometry and an optimized edge treatment helps the insert retain its cutting edge with minimal heat generation and good chip breaking at finishing parameters. A high rake angle reduces cutting forces and built-up edge.

It's available in WS10PT, a high-performance PVD grade, with a two-layer coating that increases integrity and reduces depth-of-cut notching.

The Universal Roughing geometry increases roughing and medium turning performance in stainless steels and steel workpieces thanks to a chip breaker and rake profile design that doesn't have any



Reduces cycle times.

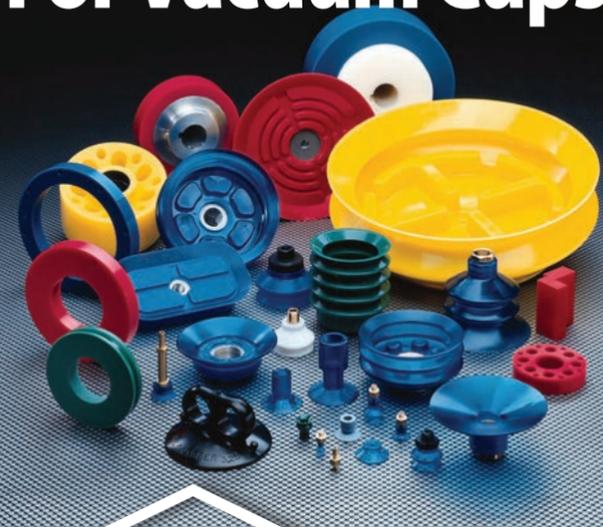
inflection points to break up stringers without concentrating cutting forces that result in breakage.

A positive rake angle reduces cutting forces while improving depth of cut notching resistance, and a multi-layer coating with a ZrCN top coat extends performance and improves wear identification to increase speeds or feed rates.

Widia is a manufacturer of cutting tools based in Fort Mill, SC.

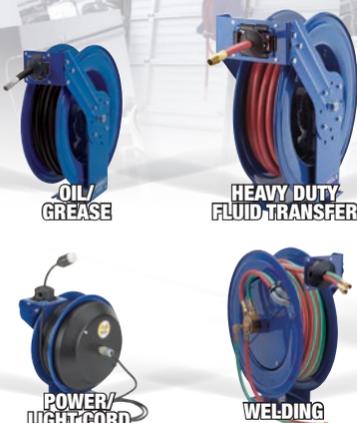
www.widia.com

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www.vi-cas.com • 513-791-7741

BUILT WITH TRADITION FOR QUALITY SINCE 1923



Versatile guide arm adjusts to wall, floor, ceiling & vehicle mounting

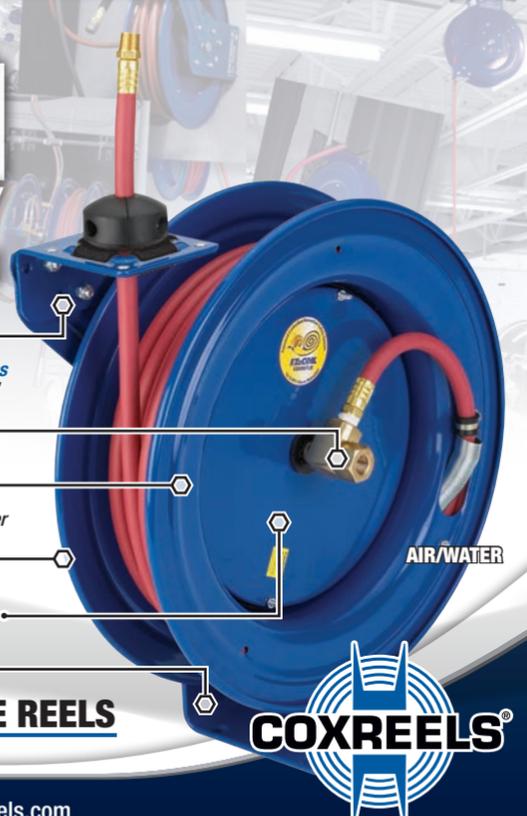
External fluid path with machined from solid brass 90° full-flow NPT swivel that screws directly on 1" solid steel axle, for simple seal maintenance and fast and easy hose installation

High quality steel construction with our durable CPC™ powder coat finish

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Clean pipes and tubes at pressures up to 40,000 psi with NLB Corp.'s Typhoon RPN4009 self-rotating water jet nozzle, which handles diameters as small as 0.75 in.

The nozzles are precision machined and coated with titanium nitride for longer life. They're available with cutting, cleaning or polishing heads, measure just 4-3/4 in. long and operate at a maximum flow of 9 gpm with rotation of 7,000 rpm.

NLB Corp. is a developer of water jet systems based in Wixom, Mich.

www.nlbcorp.com



Up to 40,000 psi.

SENSORS

SENSORS MAKE TROUBLESHOOTING EASY

Carlo Gavazzi's Tripleshield CA30CA capacitive proximity sensors are immune to dust, humidity and electromagnetic interferences. They include diagnostic alarms and two LEDs that simplify troubleshooting during installation in harsh environments.

An optional dust alarm output provides early warnings if there's accumulation on the face of the sensor. Rated to IP67 and IP69K, NEMA 1, 2, 4, 4X, 5, 6, 6P, 12, and ECOLAB approval for chemical resistance, the sensors withstand temperatures up to 120 degrees C. An optional temperature alarm output warns if the sensing face surface exceeds 60 degrees C.

The sensors come in a variety of con-



NEMA, ECOLAB-rated.

figurations for use in plastics, agriculture, pellet burning stoves, packaging, material handling, and food and beverage applications.

They have a sensing distance of 2 to 22 mm (flush) or 4 to 30 mm (non-flush), 10-40VDC, NO & NC, NPN or PNP and 200 mA transistor outputs.

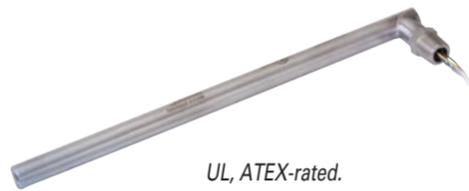
Carlo Gavazzi, a sensor manufacturer based in Buffalo Grove, Ill., says the sensors exceed most norms, including electrostatic discharge in excess of 40 kV; electrical burst transients up to four kV; and surge (with 500 Ω) greater than two kV.

www.gavazzionline.com

LVDTS HANDLE TOUGH ENVIRONMENTS

Macro Sensors' nuclear LVDT position sensors provide precise position measurements in high temperature and mild radiation environments.

Available in three models – HSTAR, HLR and HSAR – the AC-operated LVDTs are made of materials that handle exposure to radiation up to 100 MRad.



UL, ATEX-rated.

The HSAR hermetically sealed sensors are constructed of stainless steel along with coil windings that are sealed against hostile environments to IEC standard IP68. The conduit exit ensures a hermetic seal from the operating environment.

For harsher environments, the HLR 750 meets UL and ATEX requirements for Class I Division 1 & 2, Zones 1 & 2. They're available in Teflon-free, half bridge versions, which the company says are used in steam turbine applications.

The passive sensors also operate in more robust applications, offering a high MTBF. LVDT electronics can be partitioned from harsh environments to operate under extreme conditions such as position and gauging applications within pressure and boiler water reactors, valve assemblies, nuclear fuel rods and snout machines.

Macro Sensors is a sensor manufacturer based in Pennsauken, NJ.

www.macrosensors.com

CLAMPS

CHUCK HANDLES LARGE WORKPIECES EASILY

SCHUNK's ROTA-S manual chuck, which weighs 60% less than conventional chucks that have the same capacity. At an identical table load, it allows workers to machine much heavier workpieces without taking up too much space.

For smaller workpieces, extended guideways disassemble easily. A lubrication system ensures permanently high clamping forces, while dirt seals prevent chips and dust from entering the chuck.

The ROTA-S assembles easily on a machine table, and retrofitting is quick with the optimized jaw quick-change system.

The unit is available in 700, 1,000, and 1,200 sizes for ROTA-S plus. The manual chuck ROTA-S plus 2.0 is available in 315, 400, and 500.

Depending on size, the chuck (without top jaws) weighs 170, 360 or 490 kg.

Schunk is a German manufacturer of clamping technologies. It has Canadian sales operations in Mississauga, Ont.

www.schunk.com



60% weight reduction.

MOTORS



230 and 460 VAC versions.

IN FOR THE LONG RUN

AutomationDirect's Marathon AC motors with an integrated encoder install in machine tools, conveyors, packaging and batching machines, printing equipment, pumps and fans.

The 230/460 VAC Max+ inverter-duty motors replace 90 and 180 V permanent magnet DC systems, producing more torque per amp. Max+ series 1000:1 constant torque (TENV) motors also replace multi- and single-phase motors, and function as a variable speed upgrade for standard fixed speed systems.

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

www.automationdirect.com

MATERIAL HANDLING

BAG LIPS GET A GRIP

Piab's BGI piGRIP bag lips include an internal retainer piece as well as three additional diameter sizes that handle different types of bag materials, especially hard-to-handle thin bag material, such as plastic film.



Getting a grip.

Six sizes of 25, 34, 41, 48, 63 and 80 mm provide a larger range for choosing the exact cup for specific applications.

They get a grip on stand-up-pouches filled with liquid or dry/wet food/substances, and allow for very small and oblong or narrow flexible packages, such as fast-food ketchup packs (handled by the 25 mm). The 80 mm version handles heavy bags or sacks.

A retainer piece prevents thin bags or films from being drawn into the cup, improving grip performance and eliminating marks on the thin bag materials.

A stronger bonding solution between the lip and bellows prevents lips from coming off during working cycles, even for extremely rough conditions, such as high speeds and greasy environments. And a locking sleeve guarantees the lip stays in position, which also provides a cost savings opportunity thanks to a locking solution. Only the lip needs replacing, not the entire bag cup-fitting.

Piab is a developer of vacuum solutions based in Sweden.

www.piab.com

COUPLINGS

SPLIT-RINGS OPTIMIZE UPTIME

Electro Static Technology's Aegis iPRO-MR ring combines shaft voltage bearing protection with continuous monitoring of voltage in real time to ensure optimum uptime and reliability of large motors and generators, especially in remote locations.

The rugged and maintenance-free split-ring prevents damage that could otherwise cause generator or motor failure, unplanned downtime and costly repairs.



Fits large shaft diameters.

They're available in a range of sizes to accommodate large motor shaft diameters, and mating halves that make field retrofits on coupled equipment easy. Multiple rows of conductive microfibres completely surrounding the shaft to provides millions of discharge points for harmful currents.

Compatible with current-monitoring equipment, the iPRO encircles the motor shaft with patented microfibres, for a path of least resistance to the ground and effectively diverting currents away from bearings. It handles high frequency shaft currents up to 100 MHz.

Electro Static Technology is a manufacturing of bearing protection rings based in Mechanic Falls, Me.

www.est-aegis.com

POWER CONVERSION



2:1 input.

CONVERTERS ARE EFFICIENT TO 85%

MicroPower Direct's MA300RW 3W DC/DC converters provide a wide 2:1 input range; single and dual outputs; tight regulation and low noise operation across 30 models up to 72 VDC for a variety of board level power applications.

The converters are available across inputs of 4.5 to 9, 9 to 18, 18 to 36 or 36 to 72 VDC; providing outputs of 3.3, 5, 12, 15, 24, ±5, ±12, or ±15 VDC.

They're efficient to 85%; provide ±1%

line/load regulation; have an input/output isolation of 1,500 VDC; and input filtering that complies with EN 55022 and EN 61000.

All models are protected for output overloads and have continuous short circuit protection (with autorecovery). They're packaged in a compact 1.25 x 0.80 x 0.40 in., 24-pin DIP compatible case, with an industry standard pin-out. Each model handles a temperatures between -40 to 70 degrees C and they're cooled by free-air convection.

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

www.micropowerelectronics.com



IP68/69K-rated.

in demanding environments and wet areas, or where sensitive interconnections have to be shielded to protect against harsh weather, extreme temperature fluctuations and corrosive liquids such as cleaning chemicals or oils.

They're impermeable to moisture, humidity, dust and dirt thanks to materials and seals that are UV and ozone resistant and function within a temperature range of -40 to 125 degrees C.

www.harting.com

CONNECTORS

CONNECTORS SIMPLIFY DATA COLLECTION

Harting's Han HPR heavy-duty power connectors with passive UHF RFID-equipped housings track data such as part numbers for requisitioning or purchasing replacements fast.

The connectors come in 6B, 10B, 16B and 24B sizes. An integrated transponder has a read range of 1 m and is rated to IP68/69K.

Harting, a German connector manufacturer that has Canadian operations in Montreal, says the connectors are used for external electrical interconnections,

STORAGE

BINS SIMPLIFY INVENTORY CONTROL

Akro-Mils' two-tone Indicator bins provide a low-cost, single bin Kanban system that makes inventory control easy.

There are four-sizes and two colour combinations to simplify visual recognition. The bins are stocked using the divider to designate volume for inventory reserve. Users pick from the large stock area until reaching the divider; flip the bin to show inventory levels are low; and replenish.

FITTINGS

FITTINGS PROTECT ELECTRICAL WIRING

O-Z/Gedney has expanded its 4QS Steel Liquidtight fittings with trade sizes now ranging from 3/8 to 4-in. in straight, and 45 and 90 degree body designs. Use them in applications that require protection of electrical wiring from liquids, vapours or solids such as machine tool building, motor and transformer terminations, robotics assembly and air conditioning installation.

Insulated or non-insulated versions provide a compact form factor for a tighter turning radius. A zinc-plated steel body and nut for the straight connectors, and a malleable iron/zinc plated design for the 45- and 90-degree bodies, minimizes maintenance.

A captive gland that stays in the connector makes installation quick and easy. A hex-shaped gland nut and an extra long hub protects conductors against abrasion. A reusable ferrule can be disassembled to save time and money in retrofits.

OZ-Gedney, part of the Appleton Group based in Appleton, Wis., is a developer of hazardous location products.

www.o-zgedney.com



Sizes from 3/8 to 4 in.



12- and 18-in. depths.

Reserve colour coding prevents stock-outs; reduces excess inventory; and a rolled ridge provides added strength. The double hopper bins can be filled or picked from both sides.

They come in 12- and 18-in. depths for use on standard wire shelving, steel shelving and pick rack systems.

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

www.akro-mils.com

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This plant is accessed through a rigid slit roll up door, operating at more than 60 inches per second.

Shutting out ENERGY loss

COLOUR FASTER PLANT DOORS GREEN

Based on recent research, doorway protection against energy loss does not have to come in the form of a bulky, slow-moving door.

More manufacturing and processing plants as well as distribution centres are becoming LEED-compliant facility-by-facility. As of last year, there were 738 LEED-certified plants worldwide, representing 195 million square-feet. Another 343 million square-feet are in the pipeline.

Certainly cost is a key driver. Although there are still many industrial/commercial buildings not LEED-rated, many plants are looking to significantly reduce energy use.

The challenge is dealing with doors. Every industrial facility has a steady traffic stream moving in, through, and out of the building. Conditioned air is important for productivity and to maintain the specified interior climate needed to achieve desired product quality, yet all these areas deal with temperature differentials on the inside and out.

The doors that accommodate this traffic represent holes in the building envelope allowing conditioned air to escape and wasting energy each time traffic runs in and out from the docks, to the warehouse, to QA/QC labs, and finally to packaging.

Heavy panel sliding doors inside the building and sectional garage-style doors on exterior walls are heavily insulated for high R-value, but are slow moving and impede traffic that has to beat the clock.

When schedules are taking a beating, energy savings are sacrificed for faster doors.

Thanks to recent research conducted by the Door and Access Systems Manufacturers Association (DASMA), industrial and commercial buildings can have high door speed, and save energy.

These findings are changing the way the industry looks at doors and certification.

After nearly two years of research featuring third-party lab testing, DASMA developed a method to demonstrate the efficiency of high-speed doors in building envelope energy calculations. A high-speed, fabric door was the model used for performance testing and evaluation, comparing thermal transmittance (U-factor), air leakage, and motor horsepower values with conventionally operating insulated doors. The research showed high-speed doors become

more efficient when cycled 55 or more times per day. (See the **Annualized Energy Consumption Analysis** chart).

Bear in mind many doorways high-speed cycle beyond 55 cycles a day and can go as high as 75 to 100 cycles. Bottom line – no matter how well insulated and tight sealing a door may be, neither matters if the door is rarely closed because of frequent use.

Turns out high-speed doors are excellent at controlling “air exchange” – the air flowing through an opening when a door is not fully closed. Depending on the application, when taking thermal transmittance (U-factor), air leakage, and door power use into consideration, air exchange can be the most significant part of the total energy loss for a door.

Granted, high performance doors are built for speed, not for bulk and can't meet prescriptive U-factor requirements. Because of the relatively thin fabric and vinyl or rubber composition of the curtain, door U-factors approach 1.20. However, the research found minimal doorway exposure time with high-speed doors means door U-factors were less important.

Updated standards

Industry codes, along with the 2015 edition of the International Energy Conservation Code (IECC) and the ASHRAE standards, will recognize the contribution of high-speed doors to energy conservation. Because municipal, provincial and federal governments require code compliance, the addition of high-speed doors offer another weapon to attack energy loss: additional flexibility for builders and building management.

The codes incorporate the maximum air leakage requirement. Code users are likely aware of the conventional wisdom surrounding the importance of door assembly air leakage as well as U-factor. These parameters together are critical considerations when evaluating insulated doors.

When a high-speed door is specified for a building, it should comply with the new performance standard. With this in mind, the door manufacturer should supply you with opening and closing speeds, plus U-factor and air leakage performance values for a more accurate assessment of doorway needs based on actual or projected use.

When a slow, solid panel door is hit it can be misaligned or taken out of action and the doorway left exposed. Rapid door operation means material handling vehicles rarely catch up with the moving panel. If they do, many of these doors have a quick reset feature to put the panel back in its track and the door back into operation.

Lightweight panels with a roll-up design put less strain on operating parts and require lower horsepower drives.

What's more, with winter on its way, rapid door operation on exterior doorways minimizes exposure to cold winds so workers can continue to work in comfort.

One of the big complaints about sustainability compliance is that green gets in the way of making a profit. With the assurance that doorway speed plays a roll in saving energy, plants will reduce energy use and get more out of their material handling equipment investment.

This article was contributed by Rytec Corp., a manufacturer of high-speed doors based in Jackson, Wis. Jeff Wendt, Rytec's dealer development manager, is the chair of DASMA's High Performance Door Division. Rytec's PredaDoor was used in the study tests. Visit www.rytecdoors.com.

Comments? E-mail jterrett@plant.ca.

ANNUALIZED ENERGY CONSUMPTION ANALYSIS			
Door Type		High Speed	Conventional
Door Size	ft x ft	8 x 8	8 x 8
Opening Speed	in/sec	32	8
Hold Open Time	sec	10	10
Closing Speed	in/sec	24	8
Cycles/Day	average	55	55
Air Leakage	cfm/sf	1.3	0.4
U-Factor		1.20	0.25
Assumed Door Operator Horsepower hp	2	0.5	
Energy Consumption – Air Exchange	kWh	6,109	9,954
Energy Consumption – Air Leakage	kWh	416	126
Energy Consumption – Conduction	kWh	4,443	916
Energy Consumption – Door Operator	kWh	58	50
Total Energy Consumption	kWh	11,026	11,046

» Plantware

PRESSURE CHECKING GOES MOBILE

Need to check the pressure in a refrigerant, oil or water line, or gas cylinder? You can use your cell phone or iPad if you're within 150 ft. thanks to the TDWLB pressure/temperature sensor from Transducers Direct.



Sensor is all digital.

Powered with a coin-cell battery, controlled with a smartphone app (T-Direct TD-WLB on iTunes and soon Android) and certified Bluetooth Smart, it lets the operator name each sensor one time securely, then program setpoints/alarms for multiple sensors, monitor readings and graph activity over time – all from a phone, tablet or computer.

The TDWLB, designed for intermittent rather than dynamic machine-control applications, is available in two different compensated accuracies of 1% and 0.25%, with optional temperature sensing.

The US-made sensor is all digital, so there's no mechanical components, wear parts, analogue circuitry and setpoint drift.

A one-piece, precision-machined stainless steel diaphragm and header provides 10 times the life of a conventional diaphragm and eliminates all springs, pushrods, micro switches and O-rings. All wetted parts are stainless steel.

The TDWLB senses pressure by using a time-to-digital converter to measure the duration of a capacitive discharge across the changing resistance in a Wheatstone bridge topping the diaphragm. The circuitry splits the signal from the bridge, creating a redundant signal that ensures continuous machinery operation if one half fails.

Transducers Direct is a Cincinnati-based manufacturer of transducer, sensor and industrial components. www.transducersdirect.com

LDT SIMPLIFIES INSTALLATION

The GEMCO ReadyLink linear displacement transducer (LDT) from AMETEK Factory Automation has an EtherNet/IP network interface that requires only a single point network connection for configuration



Built-in web page.

and control, simplifying installation and wiring.

Magnetostrictive technology delivers absolute non-contact feedback and the versatile LDT supports Line, Star or DLR (Device Level Ring) topology.

It comes in two styles: the 953N Rod Style package installs into hydraulic cylinders while the 957N Brik low-profile package incorporates the same electronics but is housed in an aluminum-style extrusion.

ReadyLink is a smart device featuring a RapidRecall network configuration module and a built-in web page to aid in the configuration of the LDT. A static IP address is assigned via the web page or by using three rotary DIP switches to set the last octet manually.

The module also stores all user configurations. If the LDT ever needs replacement, the module installs on the replacement unit, restoring all user configurations.

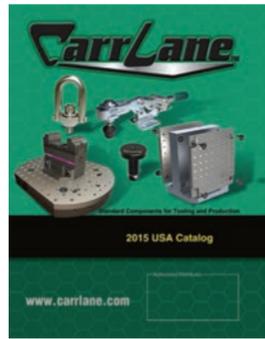
ReadyLink has an active measuring range of up to 300 in., and wide power supply voltages from 7 to 30 VDC. There's visual and output signal diagnostic feedback and standard off-the-shelf cord sets. Five tri-colour LED indicators, located on the cover of the RapidRecall module, verify proper operation and distinct diagnostics for quick troubleshooting.

Applications for the ReadyLink include pulp and paper, steel mills, lumber and forest products equipment, primary and secondary metals processing such as stamping, roll forming and die-casting, tire and rubber, plastic injection-moulding and material handling machinery.

AMETEK Inc. is a global manufacturer of electronic instruments and electric motors. AMETEK Factory Automation is based in Clawson, Mich.

www.ametefactoryautomation.com

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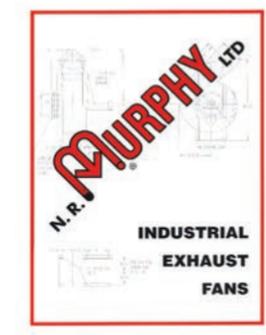
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Corporations play a vital role in society

BY GWYN MORGAN

One of history's most powerful lessons is how Marxist-socialist theory inspired the subjugation and impoverishment of half the world's population while free-enterprise capitalism saw the other half achieve historic levels of prosperity, social progress and personal freedom.

A starkly clear example is Germany. When the Berlin wall came crashing down in 1989, West Germany had risen from the ashes of war to become the

“Private business creates the vast majority of jobs and drives social progress by funding essentially all social services...”

world's second-largest economy, while socialist East Germany was an impoverished wasteland. Yet in recent years the principal conveyer of the benefits of free-enterprise capitalism, the corporation itself, has come under attack. Increasingly, the words “corporate” and “profit” are being used as derogatory adjectives.

Sadly, very few students are being taught these colossal 20th century lessons. Indeed, many teachers and

university professors expose students to the same left-wing anti-business rhetoric espoused by their union leaders.

Some even see sinister motives behind well-intended corporate philanthropy. University professors decry putting donor's names on plaques recognizing support for the construction of classrooms or laboratories and some even believe that corporate recruitment literature should be banned from campus. Where

do they think jobs for their students will come from and who pays the taxes that help pay their salaries?

Assuming the education system hasn't done enough to make “corporation” a derogatory adjective in the minds of students, along comes Hollywood. Movies such as James Cameron's 2009 blockbuster *Avatar* features a greedy corporate boss intent on destroying the forest home of native humanoids on the distant planet of Pandora to mine a precious mineral called unobtainium. The hugely popular *LEGO Movie* features President Business as an evil tyrant out to destroy the world. There's even an organization called “Counter Corp” that sponsors an annual “Anti-Corporate Film Festival” in San Francisco. Add to this the anti-corporate pronouncements of numerous pop-stars and it's indeed a miracle any positive thoughts about the private sector survive the teenage years.

When those with a public voice portray “corporate” as a derogatory adjective, they must not go unchallenged. Thoughtful, clear public communication from business leaders is vitally important. And rather than being defensive, leaders should remember they have a great story to tell.

Driving social progress

Private business creates the vast majority of jobs and drives social progress by funding essentially all social services – both directly and through taxes paid by employees. Successful profitable corporations also bolster private and public sector pension plans through share price growth and dividends.

A widespread misconception that corporate leaders must address is that small business is good and big business is bad. In fact, big businesses provide the core economic base for small and medium-sized businesses. It's a vital symbiotic economic ecology. Large corporations are also the prime philanthropic contributors to social agencies, healthcare, education, amateur sports and the arts.

CEO's have an agenda full of priorities, but they need to remember that investors, employees and regulators aren't their only stakeholders. If corporate leaders don't tell this tremendously positive story, who will?

Every chief executive must recognize that public thought leadership is crucial, both to the future and their enterprises and our country. They should communicate and demonstrate the contribution free-enterprise business makes in providing the young with opportunities to achieve their career potential, and generate wealth. Remembering those lessons will help Canada remain one of the world's best places to live.

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

Comments? E-mail jterrett@plant.ca.

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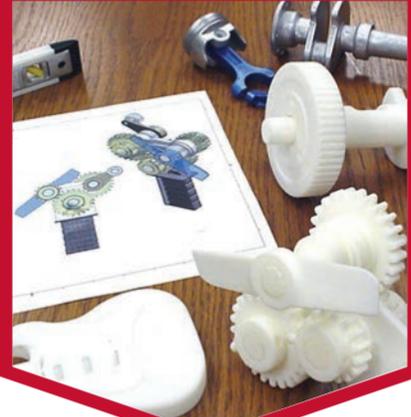
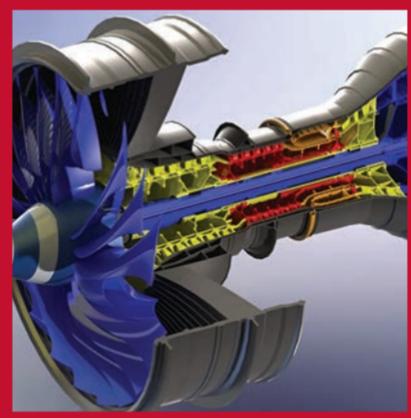
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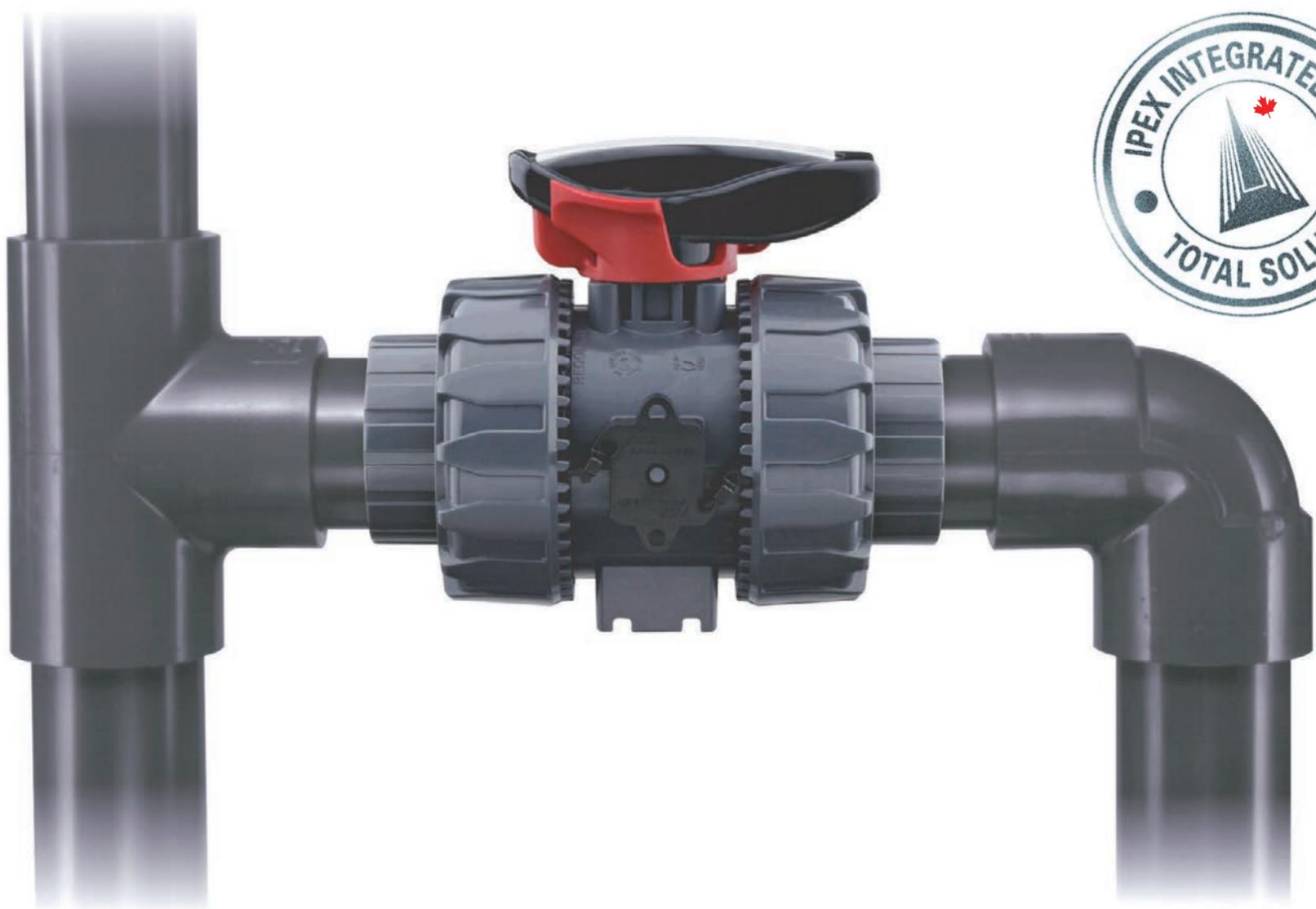
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Only IPEX offers a complete system of Pipe, Valves and Fittings engineered and manufactured to strict quality, performance and dimensional standards. Available in Industrial PVC, CPVC, ABS and Natural and Pigmented Polypropylene – for Process Piping, Double Containment, High-Purity, Acid Waste and Compressed Air applications, as well as a full range of specialty systems and products.

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IPEX Inc. designs and manufactures one of the world's most diverse lines of integrated thermoplastic piping systems. All engineered from the ground up to handle the full range of today's Industrial, Mechanical, Municipal and Electrical applications.

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Double Containment



High-Purity



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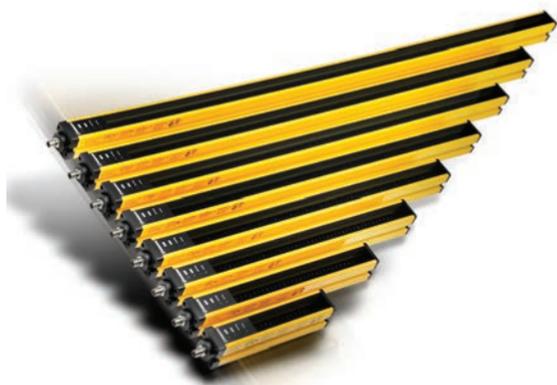
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