

The Sights and Sounds of IFPE

Navigating PT Components and Fluid Power in Las Vegas

Matthew Jaster, Senior Editor

If you attended IFPE 2014 in Las Vegas (co-located with ConExpo and Con/AGG), chances are you saw plenty of products and technologies set to redefine the construction and off-highway markets. It's a safe bet, however, that you didn't see everything. Between the outdoor maze

NFPA

BOOTH 81730

Prior to the show, *Power Transmission Engineering* caught up with Eric Lanke, CEO of the NFPA, to discuss the current state of the fluid power industry. Some of the planned topics at IFPE included the trends and challenges of the global construction equipment industry, a report from the International Fluid Power Statistics Committee, a worldwide fluid power market trend by country including Britain, Canada, China, Germany, India, Italy, Japan, Mexico, Taiwan, Turkey and the United States and a report on ISO/TC 131 Work and Priorities.

"In a survey this past year, NFPA members told us the most challenging issues they will face in the next five years include the recruitment of a skilled workforce, differentiating themselves against competing technologies and dealing with the demands of a globally competitive business," Lanke said.

With this information, the NFPA board of directors set their strategic priorities for the next several years. "These priorities include building and connecting our members to an educated fluid power workforce, promoting the technical advancement of fluid power and serving as a forum where all fluid channel partners work together," Lanke said.

On the education front, Lanke reports that a \$100,000 grant to develop a new fluid power lab was

recently awarded to the Milwaukee School of Engineering (MSOE). The envisioned mechatronics/fluid power lab will support a transformative curriculum that will develop students' technical skills through the four years of undergraduate study. "In 2012, the first grant in our program was awarded to Western Michigan University for a lab that is already impacting 40 students in the IME3840 Fluid Mechanics and Hydraulics class. It is anticipated that 130 students in five different undergraduate and graduate level classes will get hands-on experience with the lab each year," Lanke said.

The NFPA is looking forward to a successful 2014 and keeping a close eye on the future of the evolving fluid power industry.

"The fluid power industry continues to be shaped by changes in both technology and geography. On the technology front, electronic controls and hybrid-electric systems are changing fluid power's capabilities and application within a suite of motion control technologies. On the geographic front, U.S.-based fluid power companies are increasingly global in their footprints and their market strategies," Lanke said.

For more information:

NFPA

Phone: (414) 778-3344
www.nfpa.com

of cranes and construction equipment and the eye-opening, innovative booths at IFPE, it's okay to admit that you may have suffered from a case of information overload. Here are a few points of interest for those that didn't attend IFPE this year or didn't see everything they wanted to see.

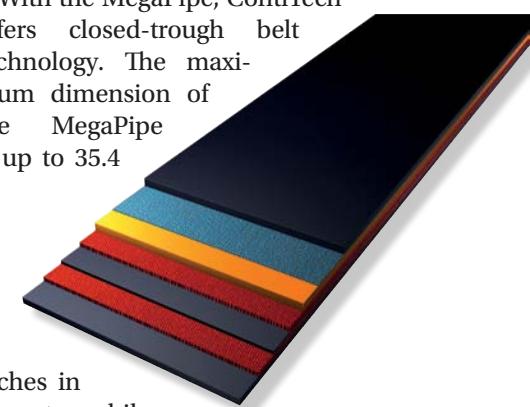
ContiTech

BOOTH 9479

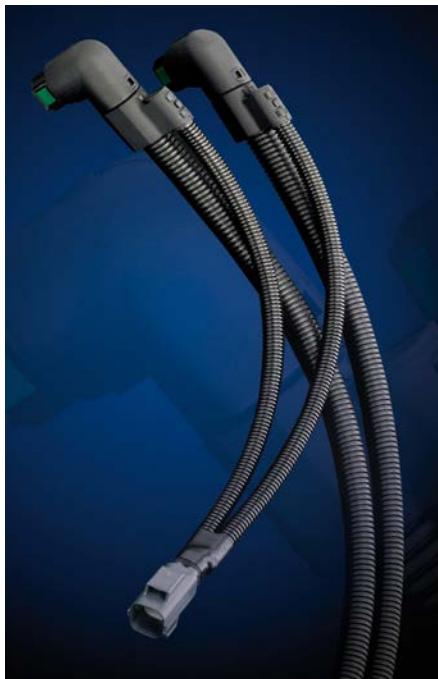
ContiTech offered innovative products for various applications — from heat-resistant conveyor belts and high-performance hose lines to air spring systems for construction and agricultural vehicles.

The ContiTech Conveyor Belt Group offers unique conveyor belts for the transportation of hot bulk materials being utilized by industrial companies worldwide. These belts can be used to transport extremely hot materials (up to 1,000 degrees Fahrenheit). The conveyor belt can be manufactured using different components and compounds depending on the type of application, thus ensuring tailor-made solutions.

With the MegaPipe, ContiTech offers closed-trough belt technology. The maximum dimension of the MegaPipe is up to 35.4



inches in diameter, while standard brands do not exceed an external diameter of 27.6 inches. Thus, the capacity of the conveyor system is increased by more than 100 percent compared to conventional closed-trough belts. With this new development, the ContiTech Conveyor Belt Group now provides an enclosed conveyor belt solution which can transport large lump sizes. MegaPipe can be utilized immediately after a primary crusher application.



ContiTech Fluid Technology has developed hot-end fuel lines specifically for modern high-performance engines. They can withstand pressures of up to 35 bar and operating temperatures of up to 180°C. "Thanks to our comprehensive material and process expertise, we are also a development partner and original equipment manufacturer of tailor-made complete solutions for fuel applications including hoses, pipes, tubes, fittings, and quick couplings designed to transport media such as gasoline, diesel, hydrogen, and LPG in engine fuel supply systems," says Achim Liecker, sales manager for industrial vehicles. Elastomers and plastics are used here, combined with materials such as textiles, steel, and aluminum.

Additionally, the company offered its ECO AC refrigerant circulation system from ContiTech Fluid Technology, large hoses for water, oil, cement, and bulk material applications and air springs for off-highway vehicles. These springs can also be used in agriculture implements like boom sprayers, seeders and trailers to stabilize the boom, provide suspension or serve as a low cost actuator with high reliability.

For more information:

ContiTech
Phone: (800) 654-0974
www.contitech-usa.com

Bosch Rexroth

BOOTH 80216

Dana Rexroth Transmission Systems announced during the show that its R2 hydromechanical variable transmission (HVT) is undergoing bench testing in the final validation stage of development. Engineers expect the R2 HVT to enter field testing across a wide spectrum of market vehicles by the end of the year, with production slated to begin within the next 12 months, depending on OEM adoption.

The R2 HVT is a modular platform that delivers a full suite of configuration options and software controls, such as direct or remote mounting, flexibility in shift control and drive strategy parameters, and the deployment of up to three PTOs. It is the latest powersplit system resulting from the 50-50 joint venture between Dana Holding Corporation and Bosch Rexroth AG.

Designed to maximize efficiency and reduce overall vehicle ownership and operating costs, the R2 HVT is suitable for front-end loaders, motor graders, industrial lift trucks, reach stackers, forestry skidders, and other select off-highway applications requiring 180 to 260 hp (135 to 195 kW) of engine output power.

Initial tests on front end loaders with Dana Rexroth's HVT powersplit systems demonstrate fuel savings in the drivetrain of up to 25 percent when compared with the same vehicle outfitted with a conventional torque converter transmission.

"From the beginning, equipment manufacturers have readily recognized the dramatic increases in efficiency that result from combining technologies from Dana and Bosch Rexroth," said Jeroen Decler, managing director of Dana Rexroth Transmission Systems. "As we enter the final stages of testing and development, OEMs are seeing firsthand the unique

benefits that can result from integrating hydrostatic, mechanical, and control systems through a modular approach."

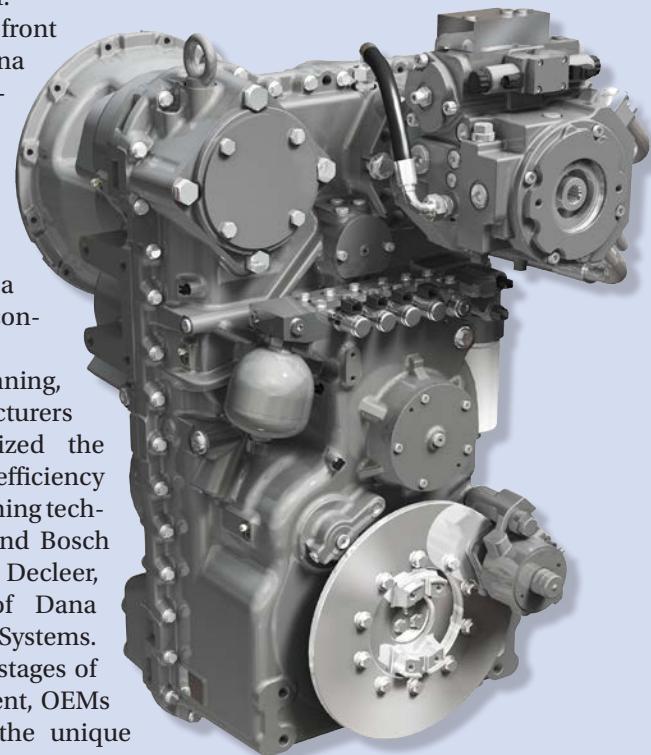
HVTs from Dana Rexroth improve productivity by enabling sensitive, precise vehicle positioning with a stepless drive that offers improved acceleration while maintaining tractive effort. They occupy the same space within the design envelope as conventional torque converter transmissions while allowing for engine downsizing.

The HVT optimizes the operating point of the diesel engine by decoupling engine speed from drive speed, and maintenance costs are reduced by utilizing hydrostatic braking and wear-free directional reversing.

This HVT system helps reduce complexity for equipment manufacturers, since the entire system of gears, clutches, and hydrostatic units is managed by an advanced electronic control unit (ECU) and optimized for efficiency by a single supplier.

For more information:

Bosch Rexroth
Phone: (800) 739-7684
www.boschrexroth.com



Comer Industries

BOOTH 82130

Comer Industries featured a variety of axles, wheel drives and heavy-duty track drives during the show. Some highlights at the show included a series of new-generation axles starting from S-228, which delivers the highest braking and efficiency performance for the category, and the heavy duty track drives PGFR-7003/11003 for track mobile equipment (crawling forestry machines, drill rigs and excavators, compactors, cranes) and for winches or milling applications, which represent compact, flexible and robust solutions. Comer Industries also showcased planetary drive PG-3503PR for crawler cranes and drilling machines, featuring a compact output that provides high performance for maximum torque and loads, axle S-128 for application on compact telehandlers and wheeled excavators, planetary drive PG-954PR for use on concrete pumps.

Other products on display included the planetary drive PGFR-25004 for very large winches and fully tested at Comer Industries' Mechatronics Research Center; the slewing drive PG-5003PR for tower crane applications; the wheel drive PGR-402 with automatic shift, designed to equip tracked

self-propelled machines

with an operating weight up

to 7t; the

track

drive

PGFR-

802 for

crawler

equipment;

the PGFR-2403

single speed

planetary drive for road rollers and the PGFR-1702 drum drive for compactors.

For more information:

Comer Industries

Phone: (704) 588-8400

www.comerindustries.com



track drive PGFR-802 for crawler equipment; the PGFR-2403 single speed

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Comer Industries

Phone: (704) 588-8400

www.comerindustries.com

B&R Automation

BOOTH 83550

B&R offered modular systems for off-highway vehicle architectures and displayed its new MA170 control and I/O system. This device series has been specially developed for use in harsh conditions. An IP65 housing and coated circuit board allows these modules to withstand extreme temperatures from -40°C to +85°C without



difficulties. These new B&R modules are also shock and vibration resistant. The MA330 mobile automation keypad system with intuitive handling, robust design and flexible functionality was also featured. In addition, the company recently equipped mobile devices with CAN bus, and the option to use Powerlink, the deterministic real-time protocol for standard Ethernet. This open source Ethernet proto-

col can address both data and control needs on a single wire, while reducing design costs, minimizing system jitter, and achieving maximum system performance.

The new Panel PC 900 with multi-touch functionality from B&R offers high levels of total computing power. Combining brand new display sizes with multi-touch operation, B&R's new flagship system is more versatile, offering full compatibility with the previous device generation.

Recently, the company also offered Hart Modules to the X20 I/O series. B&R now includes an analog Hart input module and a Hart output module in their successful series of X20 communication modules. These new modules are equipped with two inputs and outputs and use real-time Ethernet Powerlink to transfer Hart data supplied by sensors and actuators directly to the controller. To evaluate the data, the controller forwards information via the process bus to maintenance stations with FDT containers, for example B&R Automation Studio, PACTware or FieldCare.

For more information:

B&R Automation

Phone: (770) 772-0400

www.br-automation.com

Bonfiglioli

BOOTH 80642

The 700CT series from Bonfiglioli offers an extremely compact, lightweight and reliable solution for compact construction equipment for machine weights from 2.5 up to 9 tons. Key features include: integrated axial piston hydraulic motors, high torque capacity: 3,500–12,500 N·m (31,000–110,000 in-lb), gear ratios from 15 to 33, high load capacity, mechanical lifetime seals, rotating output flange with large PCD suitable for sprocket, speed sensor mounting, hydraulically released spring applied parking brake, with external independent port.

With Bonfiglioli Trasmital hydraulic motors with fixed OR dual displace-

ment, flushing valve circuit (suitable for closed-loop applications), the 700CT series is an efficient solution that will provide smooth and reliable operation for many years.

With one of the widest ranges of torque available on the market today and countless configurations, the 700C series from Bonfiglioli is suitable for any size crawler machine in any off-highway application. The 726C (on display at IFPE), is a travel drive that transmits up to 625,000 N·m (5.5 million in-lb) of torque in heavy-duty excavators up to 350 tons and cranes and drilling rigs up to 400 tons. With advanced engineering and technical

Danfoss

BOOTH 80529

Danfoss has introduced the 210/250 cm³ pump frame sizes that complete its H1 family of piston pumps and bent axis motors for high-power mobile machines. With these additions, the now comprehensive range comprises 14 pumps with displacements covering 45–250 cm³, five bent axis motors spanning 60–250 cm³ and five control options – a scope that leads the market for advanced transmission solutions. “The largest frame sizes in our range bring new-generation hydrostatics to agricultural harvesters, combines, forestry machines and shredders, meeting OEM demands for top design flexibility and operational precision, efficiency and safety,” says Markus Plassmann, product marketing manager for high power closed circuit products. Featuring a compact, lightweight design, the H1 pumps and motors afford maximum flexibility when designing systems for today’s emission and functional safety legislation. High operating efficiency compensates in full for the lower rpm of emissions-compliant engines – the motors outperforming the competition by up to six percent. “As we approach full implementation of the US Tier 4 emission legislation in 2014, OEMs need effective transmissions that maximize the use of available engine power,” says Plassmann. “H1 provides the necessary flexibility and functionality, improving fuel economy and saving power for other vehicle functions.”

A patented integrated speed limitation (ISL) circuit adds to the high-level pump functionality, enabling improved vehicle braking with no risk of engine over-speed.

In designing the optimized electric controls, Danfoss has paid attention to the SIL 2 functional safety requirements that, along with Tier 4, are driving the trend to-

wards intelligent machine management. Enabling automatic adjustment of vehicle driving characteristics to on or off-highway conditions, H1 Automotive Control (AC) is pre-SIL 2 certified. “H1 AC brings intelligent electronics to machines such as tele-handlers, wheel loaders, dumper and sweepers, which need to maintain a constant speed when moving up and down-hill,” Plassmann explains. “In transport mode, H1 AC switches to automotive driving characteristics for the best operator comfort.”

Most recently, Danfoss has supplemented H1 AC with Eco Mode and Cruise Control options. Configured to lower engine rpm during on-highway transport, Eco Mode cuts fuel consumption by up to 20 percent. The entire H1 family is compatible with the Danfoss Plus+1 control platform, including pre-tested software blocks that save on system development time, bringing new applications faster to market.

For more information:

Danfoss
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www.powersolutions.danfoss.com



specifications, it is suitable for heavy duty applications like mining. Key features of the 700C series include a torque range 1,000–625,000 N·m (8,850–5.5 million in-lb), gear ratios from 5.3 to 492, rotating housing, high load capacity, mechanical lifetime seals, compact design, cartridge axial piston motors, flange axial piston motors, orbit motors, failsafe parking brake (hydraulically-released parking brake on request). The 724C and 722C for mining crawler cranes, 710CK for excavators and 720C for lift cranes were also on display during the show.

For Class 1 material handling vehicles, Bonfiglioli supplies high ef-



ficiency, low noise planetary axles and drives with integrated, high performance electric motors and low maintenance braking systems. Typical applications include 3- and 4-wheel counterbalance lift trucks and ground support equipment. With a guaranteed reduction in energy consumption, the electric powertrains enable

longer battery times, extended service intervals and a lower total cost of ownership. Complemented by a range of idle steering systems based on number of axles or steering units, the 600F series is suitable for material handling vehicles (CB forklifts, airport equipment), indoor and outdoor use, CB trucks with lift capacity from 1.6 to 5.0 tons, GSE vehicles with draw bar pull from 6,000 to 25,000 kgf (13,227 to 55,115 pound-force).

For more information:

Bonfiglioli USA
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www.bonfiglioliUSA.com