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Dear Readers:

“You can never step into the same river; for new waters are always flowing on to you.” The ancient words of Heraclitus of Ephesus have never seemed as true as they are today. As the world economy evolves and the global competition for resources intensifies, we must all adapt quickly if we wish to maintain our competitive edge.

Throughout this issue of drive&control local, you’ll see examples of changing waters in a wide variety of industries, from marine, wind and solar applications to more traditional industrial applications such as extrusion presses, CNC machines and welding controls. Our mission at Bosch Rexroth is not just to help our customers manage change, but rather to help them drive change in their respective markets. The Allseas topside lifting system (page 4), for one, is a great example of how global engineering partnerships can lead to innovation on a massive scale—and an entirely new and better way of doing something.

As you look through the magazine you’ll also see that Bosch Rexroth’s “local for local” strategy is helping us work hard to improve the customer experience. The added capacity at our manufacturing campus in Fountain Inn, South Carolina, is now producing its first pumps; we’ve announced a new service center in Houston for 2013; and we’re already on version 2.02 of our GoTo Products iPad app, which uses the latest information technologies to give our customers even faster access to our most popular products.

I hope you enjoy reading the latest issue of drive&control local. The changing waters that flow over us today will provide us with future stories of success as we navigate those changes together. The challenges our customers bring to us are the challenges that make us better together. Let us step into the river.

Sincerely,

Berend Bracht
President & CEO,
Bosch Rexroth Americas
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To disassemble topsides of offshore platforms, workers used to have to manually disassemble the structure into transportable individual parts. The new special vessel from the Allseas Group will have a topside lifting system (TLS) that completely lifts the platforms from their steel “jacket” and transports them onto land, making disassembly considerably safer and more cost-effective.

Bosch Rexroth engineered the drive and control system solution for the Pieter Schelte, Allseas Group’s new vessel equipped with the TLS. The system is designed to lift and transport topsides weighing up to 48,000 tons in one piece—equivalent to 80 fully-loaded Airbus A380s. Rexroth provided comprehensive drive and control engineering design services and systems, such as the five megawatt central hydraulic power unit, as well as numerous key components and subassemblies for the TLS. The Pieter Schelte is currently being built in South Korea and will be ready for use in early 2014.

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Advanced solutions and expertise for multiple industries

From automated handling to waste recycling, new brochures detail Rexroth expertise

Three new brochures have been released to provide comprehensive descriptions of the capabilities only Bosch Rexroth can offer to help specific industries solve the unique challenges they face.

*High Efficiency Hydraulic Solutions from Bosch Rexroth* discusses the impact of TIER 4 final emissions regulations on mobile equipment OEMs and operators. It provides expert insight and a range of technology platform options they can use to solve the engineering and operational challenges associated with the significantly reduced particulate (soot) and nitrous oxide diesel engine emissions standards set for 2014.

From baling, cutting and tearing to heavy material movement, our new brochure *Reliable Performance for the Recycling Industry* helps high-throughput recycling and waste management operations understand the complete scope of material moving and handling systems Rexroth offers.

And the *EasyHandling—Scalable Mechatronic Solutions* brochure provides a comprehensive description of Bosch Rexroth’s unique EasyHandling system approach for faster, easier, more economical engineering and creation of a wide range of material handling automation systems.

Download PDFs of these or any other Bosch Rexroth brochure or product information you need by visiting [www.boschrexroth-us.com](http://www.boschrexroth-us.com).

New Houston Service Center for industrial and mobile hydraulics

Facility targeted at rapidly expanding marine and offshore markets

Bosch Rexroth will open a new certified service center in Houston, Texas in 2013 as the next step in a nationwide strategy to align technology hubs in key geographic markets to industry-specific needs.

The new service center will provide state-of-the-art repair, warranty and maintenance resources for mobile and industrial hydraulic AK pumps and motors, large hydraulic cylinders and Hagglunds motors and systems. Sales, training, system and application support specific to the marine and offshore market will also be located in the new facility, which will be staffed by expert applications engineers, project engineers, service technicians and managers trained and certified to support the offshore and marine markets’ needs.

Bosch Rexroth has worked closely with their business partner in the South West Region, Womack Machine Supply Co., to develop service and repair programs to satisfy the needs of the region’s hydraulics users, including market-driven lead times for quotation, repair and return of the product to the customer, along with emergency repair programs and field service.

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GoTo Products iPad App updated with new features

More products, distributor locator added to enhance popular app

Bosch Rexroth recently added new features to the GoTo Products iPad App to make this powerful digital resource even more informative, convenient and easy to use. Version 2.02 now contains features such as:

- Local Distributor locator utilizes a ZIP code or iPad GPS technology to instantly provide directions, maps and contact information
- A “synch” arrow that provides fast access to updated product information
- Updates on the latest product information and new products added to the GoTo Focused Delivery Program
- Ability to include part numbers from multiple categories into one email

The updated App also includes an enhanced user interface for easier, faster navigation and new videos, podcasts, web links and other technical material.

The GoTo iPad App combines all up-to-date product information on Rexroth’s in-demand drive, motion and control products in a single touchscreen driven tool. Enhancing the App is just one example of our ongoing investment in the GoTo Focused Delivery Program, which provides industry-best delivery times for a broad range of our most in-demand products.

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Livingston & Haven receives first hydraulic pump from Fountain Inn plant

Rexroth distributor receives first A10VO pump off new hydraulics manufacturing line

Bosch Rexroth recently commemorated its largest investment in U.S. manufacturing by presenting the first A10VO hydraulic pump manufactured at the newly operational Fountain Inn, SC plant to Bosch Rexroth distributor Livingston & Haven.

Decorated a vibrant red, white and blue, the pump was presented to Livingston & Haven President Clifton Vann IV at a special ceremony on May 14, 2012 at the Fountain Inn plant by Berend Bracht, President & CEO, Bosch Rexroth Americas. The expanded campus at Fountain Inn more than doubles the manufacturing capacity for hydraulics components being manufactured for the North and South American markets. It represents a significant expansion of Bosch Rexroth’s production capacity in the region as a result of the increased demand for mobile hydraulic components, in response to growing mineral, oil and natural gas production on both continents, and the need for mobile equipment builders to comply with more stringent TIER 4 diesel emissions regulations that go into full effect in 2014.

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Adaptive control assures world-class welding quality in real time

Achieve near-perfect uniformity and repeatability in high-speed resistance welding operations and reduce costs and weld quality failures associated with offline sampling and testing of welds.

The global automotive market depends on increasing the quality and fundamental durability of every car manufactured. Models in every vehicle segment need to be produced with the highest levels of precision for superb “fit and finish” that helps protect the manufacturer’s brand around the globe.

That’s why today’s automotive manufacturing platforms use high-speed, automated MFDC Resistance Welding to improve end-product quality and value. Robotic resistance welders provide a highly cost-effective and proven method of rapidly welding hundreds of parts per hour. Adaptive resistance welding control is used to perform every weld—in real time—within the tightest quality tolerances.

The Bosch Rexroth PSQ 6000 adaptive welding system provides one of the most advanced platforms for real-time control of welding. During automated welding, parameters such as current, voltage and resistance are monitored once per millisecond; these parameters are constantly compared in real time against a previously established master resistance curve that controls the process quality.

During a weld in Adaptive Control, actual values of current, voltage and resistance are compared to the master values for a good weld. The PSQ 6000 works together with the weld controllers’ constant current control system to automatically raise and lower the welding current and weld time in real time to ensure it conforms to the master curve for maximum quality.

Today’s global automotive marketplace demands the highest quality performance and throughput from automated welding systems.
Adaptive resistance welding control offers multiple pathways to improving the total cost of ownership of welding systems.

Since 100% of the welds are inspected in real-time, the platform captures a record of each weld, and any variations the controller made, to ensure that the weld was within the established parameters. The Rexroth platform can store and operate multiple welding schedules, as well as change schedules quickly when different components, body types or product changeovers have to be welded to meet sudden changes in demand.

Adaptive resistance welding control also improves worker safety. Current flow to the welding tools is precisely modulated so the possibility of welding explosion becomes practically non-existent.

At many levels, adaptive resistance welding control can improve the total cost of ownership of welding systems by:

• Reducing testing costs—including labor, time for testing, documentation, cost-per-part tested and scrapped and testing materials
• Eliminating weld quality spills and quarantine requirements
• Increasing weld reliability and resulting reduction in costs associated with poor quality (rework of components, recalls, rebates or legal liability)

• Increasing throughput from 100% weld inspection, which means lower cost-per-part with higher levels of production
• Reducing explosion-related costs to enable better better worker safety, cleaner workplace with less contaminants and better quality welds

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Real-time adaptive control of high-speed welding systems is crucial to maintaining highest levels of throughput and product quality.

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Project Frog in San Francisco, CA is a clean technology company that incorporates a sophisticated approach—including parametric design, precision fabrication, energy modeling, lean manufacturing and continuous monitoring—to create sustainable, efficient structures that reduce overall operating costs and also meet stringent Leadership in Energy and Environmental Design (LEED) requirements.

Project Frog was chosen to create a 5,000-square-foot building in Hunters Point, an evolving neighborhood in the southeastern part of San Francisco. Formerly the site of a naval shipyard that includes more than 700 acres of waterfront property, Hunters Point is transitioning to residential, commercial and recreational usage.

As part of its strategy to improve energy efficiency, Project Frog turned to Bosch Solar Energy Group to supply photovoltaic technology for the roof of the new community center. The rooftop array is comprised of 70 micromorph thin-film solar modules mounted and installed using the Bosch Solar Rack, a convenient slide-in mounting system developed jointly with the Bosch Rexroth Corporation. Offered as a standard product, the slide-in Bosch Solar Rack is designed around Rexroth’s broad line of aluminum structural framing components and can be customized for a given installation.

“Bosch Solar Energy micromorph thin-film technology is ideal for the building due to the exceptional performance of thin film under the low light conditions that can occur during foggy days in the San Francisco Bay area,” explained John Saussele, Director of the Bosch Solar Energy Group.

The black-glass appearance of the slide-in Rexroth aluminum framing system improves solar installation time and costs for sustainable building.

Solar panel installation at the new Hunters Point Community Center in San Francisco featuring custom Rexroth aluminum framing reduces installation time by 50 percent and costs by 40 percent, becoming part of a standard solution for industry leader, Project Frog.

Working with Rexroth’s engineering team, Project Frog increased the length of the racking profiles to span a larger distance and bear directly on the trusses, which allowed them to drastically reduce the number of roof penetrations to 21 locations.
panels, combined with the low-profile racking system, proved to be an excellent match. According to Ash Notaney, Vice President of Supply Chain for Project Frog, the array generates 25 percent of the building’s annual energy. It will surpass California’s Title 24 requirements for energy efficiency standards for nonresidential buildings by at least 54 percent.

“Typically, when photovoltaics are installed on a membrane roof of this size, there can be up to 200 places where the mounting system that holds the array penetrates the roof to secure the structure,” said Notaney. Each of these penetration points must be manually cut and sealed and has the potential to leak, eventually reducing overall building efficiency. But the Bosch Rexroth framing system reduced roof penetrations to 21 locations.

Once the framing system was in place, it took only two workers about one to two minutes to install each panel, including mounting the stops.

The panels are roughly three feet by four feet, and the frameless design of the modules was an excellent fit for the slide-in racking system, which was created with Rexroth’s bolt-together aluminum structural framing.

“Our strategic partnership with Bosch and Rexroth has proven successful as shown with this project,” said Notaney. “We reduced costs more than 40 percent and cut installation time in half, compared to a similar project.”

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“The repetitive nature of the Frog system means the savings to our customers will only continue to grow.”

—Ash Notaney, Vice President of Supply Chain, Project Frog
Wind turbines are immense pieces of equipment: five times larger than they were 10 years ago. The largest wind turbines have blades that are 415 feet long and weigh 25.5 tons. These massive turbines have the capability to produce 15 times as much electricity as those that were built a decade ago.

But turbines in off shore wind farms are subject to winds, driving ocean ice, sea spray and precipitation that can damage the huge blades and other components. Inclement weather and an off shore turbine’s remote location can make access difficult, often limiting service to just one or two times a year.

Component and service advances boost wind power’s ROI

Wind power’s unique features—including large turbines and remote locations where wind farms are built—both contribute to its success and also pose challenges for maintenance and repair.
These challenges can be overcome by employing advanced components, optimizing nacelle design, implementing more intelligent software and engaging a proactive service and preventive maintenance program to minimize downtime and financial risk.

**Advanced components:** As alternatives to planetary gears, new technologies such as direct drives, magnetic bearings and torque-splitting systems, are improving reliability. Direct drives eliminate the need for a gearbox, and using a smaller number of moving parts boosts efficiency and reliability. However, turbines with direct drives cost up to three times as much as those with traditional gearboxes.

An active magnetic bearing system includes a magnetic shaft, controller and multiple electromagnetic coils attached to a stator shaft location. Magnetic bearings reduce the amount of wear, are more efficient than traditional gears and do not require lubrication. However, when exposed to higher loads, they need to be replaced more frequently.

Torque-splitting systems utilize a gearbox design featuring external double helical gears that spread the torque among various generators that operate simultaneously. Like magnetic bearings, torque-splitting systems are unable to handle high loads, but one generator can be replaced without having to remove the entire gearbox.

**Better nacelle design:** Designing the turbine with modular components, including multiple generators and gear units, can simplify access for staff that need to replace faulty equipment. Hybrid gearboxes, like the Rexroth REDULUS GPV main gearbox, weigh 15 percent less than traditional gearboxes making installation and replacement easier and faster.

**Improved controls:** Reliability can also be improved with redundant control and monitoring systems. A lubrication and oil condition monitoring system can detect the effects of wear and friction in cooling systems.

A robust remote online monitoring system can continually inspect the status of the rotor blades and alert off-site operators to any conditions that deviate from the normal operation of the turbine. Condition monitoring systems can extend the life of the equipment by detecting problems at an early stage, so components can be easily repaired instead of replaced.

**Expert service and maintenance:** A service and support organization with wind-power-specific technical knowledge and engineering expertise can perform preventive care, overhauling, remanufacturing and upgrades. Advanced failure analysis programs can determine why a fault occurred and suggest changes in components or service to improve reliability.

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Critical components in the aerospace and defense industries, such as engine housings, wings and control surfaces, undergo rigorous testing to ensure quality and safety, but require special methods that won’t damage or permanently alter the product during inspection. Historically, x-ray methods were used in non-destructive testing (NDT) to check the strength of welds and look for defects. But complex shaped carbon fiber and other advanced composite materials can’t be x-rayed.

As a result, Marietta Nondestructive Testing, LLC (MNDT)—working with Bosch Rexroth and its automation distributor, Livingston & Haven of Charlotte, NC—needed to get creative in developing testing equipment.

“X-ray is limited in determining the defect size and depth in composite parts; however, it can be accurately inspected using ultrasonic technology,” said Curtis Cooper, director of engineering for MNDT.

Servo-controlled nondestructive ultrasound testing machine offers faster scanning, more versatility

Large, complex parts inspire completely automated inspection system
The most common automated ultrasound testing machines employ immersion tanks filled with water as a medium through which the sound waves travel. But with complex parts, the immersion tanks are impractical. Consequently, technicians usually scan complex parts by hand, a slow and labor-intensive process that often results in overlapping scans, which can lead to inaccurate or inconsistent test results.

To overcome the challenges of scalability, reliability and speed, the engineers at MNDT designed the gantry style AG2 Overhead Scanner—a rigid, multi-axis, automated testing machine capable of scanning large, sophisticated parts and intricate shapes, without the use of immersion tanks.

The precise servo motion control of the system became a critical factor in the scanner’s design. In order for the machine to offer multiple axes of motion, component synchronization had to be tightly controlled so the testing would be accurate. “Each nozzle is roughly five inches from the face of the part,” said Cooper. “Since the two nozzles face each other, they have to be lined up. We were able to make streams of water, which are each manipulated by five axes of servo motion, concentric within 0.020 of an inch.”

To ensure precise control, accuracy and reliability, MNDT used drive and control components from Bosch Rexroth. Rexroth’s components—including digital servo drives and controllers, profiled guide rails and pneumatic components—allow the machine to follow intricate path planning for scanning complex, curved objects with tightly controlled motion tolerance. Rexroth distributor Livingston & Haven provided design and programming expertise for the new line of machines.

“Because of the path planning and motion control, this machine is greatly improved over other inspection equipment,” said Cooper. The new squirter-based machine can perform scans accurately and quickly with complete part coverage. “We can scan parts at about 25 inches per second, which increases our speed and output,” said Cooper.

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Orthopedic and medical device technology is constantly changing, and Acumed—a global leader and pioneer of innovative orthopedic and medical solutions—is often in the forefront of those changes. When Acumed’s manufacturing processes change and evolve, Bosch Rexroth extruded aluminum framing makes it easy to evolve thanks to versatile, bolt-together products that let them expand, modify or reconfigure their processes at any time.

Rexroth structural framing consists of dozens of high-strength, anodized extruded aluminum profile types and hundreds of accessories. Acumed found it to be ideal as a light, clean, strong material for a wide range of applications specific to medical device manufacturing: workstations, work cells and laminar flow hoods for assembling sterile orthopedic products. The Rexroth T-slot channel and cover strips are easily disassembled and reconfigured, and they can be repurposed into different structures throughout the Acumed facility—for nimble responses to the changing medical world.

The ability to use Rexroth framing to build nearly any custom structure helped Acumed achieve unique workstation and assembly area capabilities. From framing designed for workbenches, Acumed created a mini-cleanroom, permitting sterile assembly in a confined space.

To change workflow to meet new needs, workstations can be quickly reworked to form a new work cell configuration. And while most of these new structures were assembled on the Acumed floor, customization decreased as Acumed began to rely on “tweaking” a proven configuration to meet specific needs.

Helping support Acumed as it evolved its workstation systems has been Pacific Integrated Handling, a Rexroth distributor with a strong background in aluminum framing solutions. PIH introduced Acumed to Rexroth’s structural framing products.

"Acumed keeps our Rexroth materials on hand at their facilities and their own
specialists build it to conform to their processes,” said PIH Technical Sales Specialist Deanna Peterson. “But they don’t have to carry a large inventory because so much of Rexroth’s framing can be reused.”

Acumed also uses Rexroth EcoSafe frame profiles. The reusable, recyclable properties of the material allows considerable design flexibility—such as producing guarding components and mounting components to create protected areas to safeguard sensitive medical devices or the users of ergonomic workstations. When a structure is no longer needed, it is simply dismantled and stored for future reuse. One benefit of a clean and well-organized manufacturing operation is the positive effect it has on visitors, including physicians and other medical professionals. A visitor on a recent plant tour remarked, “This is the cleanest, most organized facility I’ve ever seen.” Thanks to continuing sales growth,

“The Rexroth materials allow us to reconfigure work areas quickly, using our own in-house resources.”

—Loren Blanchard, manufacturing manager, Acumed

Acumed also continues to expand. And as new advances in skeletal and orthopedic devices result in changes to Acumed’s manufacturing processes and physical space, Rexroth framing provides the strong, reliable and resilient framework to keep their production responsive to those changes.

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Hydraulics and controls retrofits breathe new life into extrusion presses

Today’s state-of-the-art PLCs and closed-loop pump controllers provide much finer accuracy and allow adjustments during the extrusion cycle to keep production moving.

Today’s extruded parts producers need to improve the performance and operational effectiveness of extrusion presses to stay competitive. Customers such as vehicle component manufacturers are seeking faster turnarounds and smaller order lot sizes. Technical demands are requiring more complex profiles and lower-cost extrusions. Industry consolidations are compelling parts producers to maximize press utilization, uptime and return on investment.

While some companies invest in brand-new extrusion presses, many are investigating the feasibility and technical issues associated with retrofitting and upgrading hydraulics and controls components on the press. If the press frame is sound, a retrofit and upgrade can extend the life of the press and provide a more flexible, reliable, long-term manufacturing solution that raises press performance to the desired levels.

A new high-capacity aluminum extrusion press may cost $2 million or more, a retrofit about half as much. In retrofits, the hydraulics and controls components and systems are analyzed to see where more efficient, latest-generation technologies can improve performance. Improvements may include advanced programmable logic controllers (PLCs) and human machine interfaces (HMIs), closed-loop controllers and hydraulics systems such as the pumping station, valves (including in-line and manifolds) as well as the interconnected piping.
Hydraulics and controls retrofits breathe new life into extrusion presses

The benefits of a retrofit include:

• Minimal system disruptions and downtime
• A longer operational life of major (i.e., costly) press components such as the press frame
• More throughput, improved troubleshooting and increased parts precision
• Improved operating conditions and easier maintenance

Five key improvements can be achieved with upgrades and retrofits:

Current levels of extrusion control—retrofits make sense if you need greater endpoint precision and reductions in scrap. An improved control system architecture with state of the art PLCs and closed-loop pump controllers enhances the precision and automation of the hydraulics circuit, achieving much higher levels of position, velocity and endpoint control.

Hydraulics efficiency and effectiveness—older presses with servo valves are more complex and can require increased maintenance and fluid filtration; replacing these hydraulics with proportional control valves and manifolds simplifies hydraulic architecture while improving performance.

Energy efficiency—electric motors drive the hydraulic pumps which drive extrusion presses; in older presses, these motors tend to be oversized, to compensate for inefficiencies downstream. Utilizing variable-speed pumps that deliver energy on demand can allow motor “right-sizing” and save energy.

Working environment—safety for the machine operator and protecting the press from damage are critical; retrofitting controls and hydraulics can enable automated safety features that enhance plant safety, reduce costs and lengthen press life.

Overall operating costs—retrofits can shorten the payback period by reducing maintenance costs, cleaning up factory floor conditions, saving on replacement of hydraulic fluid due to losses from leaks and significantly improving press uptime, changeover time and throughput.

It is crucial that you investigate your pump efficiency and performance; the payback on this investment can be expected to be significant.

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Preparing for TIER 4 Final: 2014 starts now

In 2014, diesel systems will be required to operate emitting only 10 percent of currently permitted levels of soot particulates and nitrous oxide (N₂O).

In 2014, TIER 4 Final Regulations will be in effect, and diesel systems will be required to operate generating near-zero targeted emission levels. This significant reduction will force many mobile equipment manufacturers to fully redesign their systems. And those redesigns can have a large impact on the function of the machine through the drive and control hydraulics, as well as on the performance, flexibility and reliability of the mobile equipment.

Crucial engineering and design decisions must be made now. If not, manufacturers may be forced to make complex, last-minute changes to mobile equipment design that will increase costs and affect the competitive value of backhoes, cranes, tractors, drilling rigs and other mobile systems.

There are several technology challenges, highly inter-related, that will need to be addressed to meet TIER 4 final requirements:

**Comprehensive exhaust gas aftertreatment:** The combination of exhaust gas treatment and particle filters will have to be optimized. This will increase development outlays and costs, both for components regarding the exhaust gas recirculation system and for additional aftertreatment catalytic reduction systems.

**Expanded space requirements:** TIER 4’s drastic emission reductions are expected to compel system redesigns that may require 15 to 40 percent additional space on mobile
machines—and for small to medium-size construction machinery, fitting it all in is a major engineering challenge.

**Increased cooling requirements:** Diesel engines will need to operate in a narrow optimum temperature band to maintain emissions compliance; this places new burdens on diesel cooling systems, reducing peak combustion temperatures.

**Changed dynamic response of diesel engines:** TIER 4 final could have an impact on overall machine performance if designers choose only to downsize the diesel engine to achieve compliance. However, by also optimizing the transfer of available power with the hydraulic system performance, it’s possible to downsize the diesel engine and still achieve identical machine performance.

**Higher equipment and operating costs:** While there is no question that the new exhaust cooling systems will require mobile equipment re-design, engineering and end-user costs can escalate if a piecemeal approach is taken to solving individual emissions and equipment re-design issues.

Bosch Rexroth has invested continuously in developing technologies to respond to the requirements of TIER 4 final. Rexroth has developed a state-of-the-art suite of systems, built on a whole-system approach to optimizing energy efficiency and environmental compliance in mobile machines:

- **Reduced emissions**—through intelligent networking and control of both diesel engines and hydraulics components.
- **Increased efficiency**—through optimized individual components that increase overall efficiency, delivering power to hydraulics systems while demanding less power from diesel systems.
- **Enhanced energy efficiency**—hydraulics components such as Green Valves that provide added functionality while simultaneously making reduced energy consumption possible throughout the system.

Despite compliance challenges, manufacturers need to to finish their system redesigns now so that there is sufficient time, after the prototype stage, to test TIER 4 final compliant systems and bring them to production readiness. The good news for partners and customers is that Rexroth’s application know-how and comprehensive suite of hydraulics technology has been designed to answer many of the performance and space challenges associated with TIER 4 final, helping users reduce both the time and cost it will take their operations to be ready for 2014.

> www.boschrexroth-us.com/tier4final

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Paper Converting Machine Company (PCMC) of Green Bay, WI, is a global leader in tissue converting, packaging, flexographic inline tag and label printing, nonwovens and envelope technology. As PCMC began developing a new generation of presses, the company focused on using technology to reduce the factors that affect printers’ productivity and competitiveness. “The industry wanted faster changeovers to help increase profitable printing time,” said Dave Wall, Engineering Value Stream Leader for Printing, Coating and Laminating at PCMC. “Printers wanted to eliminate physical waste and wasted time.”

Customers also wanted to reduce the time it took to set up registration and impressions to print good product, reduce energy consumption and system complexity and make it easier to maintain highly complex presses. To satisfy these requirements, PCMC integrated a range of Rexroth electric drives, controls and linear motion products into the new Fusion Flexographic System.

The PCMC Fusion Flexographic printing press is an all servo-driven platform that includes up to 21 axes for a ten-color press, or 17 axes for an eight-color machine. There are also seven axes for web conveyance and tension control from the unwind axis to the rewind axis.

Rexroth drive and control systems powering the Fusion press include IndraDrive M servo drives with regenerative and DC bus sharing capabilities and IndraDyn T frameless torque motors, all controlled by the IndraMotion MLC motion logic controller.

To reduce changeover times and commence running jobs faster, PCMC used Rexroth intelligent IndraDrive servo drives to create a new setup feature called PrintSense. The image cylinder and anilox inking cylinder in each deck are brought together to reach “the kiss point” where the image impression will be correct.

IndraDrive motor feedback data is captured and used by pre-established algorithms to calculate when the proper feedback setpoint is reached, eliminating the need for initial setup. This means printing can start faster and keep the Fusion system running at peak efficiency.

The PCMC Fusion Flexographic printing press uses a Rexroth drive and control system including servo drives, frameless motors and Rexroth ball screws and linear rails for a printing platform that offers faster changeover times and reduced energy consumption.
Changeover has also been improved through use of Rexroth linear motion products. The image and inking rolls on the press are mounted in frameworks called “decks.” Each deck must move in and out for job changeovers; however, once printing commences, the decks must be extremely rigid and hold the rolls in position to keep perfect registration while they spin up to maximum speed.

Each image cylinder and inking cylinder incorporates two Rexroth precision ball screws and four profiled ball rails. Rexroth ball screws and ball rails combine high rigidity and high load capacity in compact sizes, delivering precise tolerances and operating error-free for thousands of hours.

According to Wall, PCMC has been continuously building machines, secured repeat orders and is expecting more growth. “The improved changeover times, the simpler system design for more profitable printing time and the energy savings are all helping to contribute to the Fusion’s success,” Wall said.

“The industry wanted faster changeovers to help increase profitable printing time.”

—Dave Wall, Engineering Value Stream Leader for Printing, Coating and Laminating at PCMC

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Advanced Rexroth technology such as IndraDrive regenerative drives enable the Fusion to operate with increased efficiency while consuming less power.

The Rexroth IndraMotion MLC control system provides a full range of pre-engineered technology function blocks, helping PCMC speed the Fusion’s commissioning time and enabling printers to set image registration faster and reduce non-productive changeover time.
The value Bosch Rexroth provides doesn't end when our products are delivered to customers... it’s only begun. drive&control local spoke with key service personnel Arnie Mueller and Larry Guidon to find out how Bosch Rexroth's service and support operations make a difference.

Mueller is Director – Service Operations for the Factory Automation group, which supplies technology for industry segments such as printing and converting, automotive and food processing & packaging. Guidon is a Sales Service Representative from the Machinery Application and Engineering group, which serves heavy industry segments such as bulk material handling, marine and offshore and industrial manufacturing.

Why is service so important to Bosch Rexroth?

Factory Automation (Mueller): Service is a main part of any major competitive business. By supporting the customer with service activities such as help desk, repair services, field service, spare parts, life cycle extension and retrofits, Bosch Rexroth is able to use information from these activities to make continuous improvements to the products we develop and supply for industry.

Machinery Application and Engineering (Guidon): When companies look at Bosch Rexroth for new equipment, they see a company that stands behind their products and provides the service, which is needed for the future – services such as part sales, repairs, field service and even training. The service packages we offer help future sales and the growth of our overall business.

What are the benefits of Remanufacturing?

Mueller: A remanufacturing project (what Rexroth calls the “Reman” process) covers components like drive amplifiers or motors. It lets us test existing, installed Rexroth products and check them for stability and longevity. When a product is repaired through the Reman process, all wearing parts are replaced, all appropriate design enhancements are implemented and the product is tested to meet the original factory design specifications. This will ensure that the product operates just as it did when it was new from the factory; in addition, products that have been through the Reman program receive a two-year warranty.

Guidon: The Rexroth Reman process offers other benefits, including environmental/sustainable value: Instead of the old unit being thrown away, it goes through the Reman process and starts its life over again. Another benefit is time-savings: Many times the Reman product is available quicker than a new product, helping customers reduce their downtime.

How does retrofitting improve performance?

Mueller: A retrofit solution should be implemented in the following situations: Repairs and spare parts are no longer economical or readily available, the machine process has been modified and exceeds the original design parameters of the control and drive system or there is a desire to improve machine performance within the constraints of the mechanical system. Retrofits bring many benefits, but it is important that all of the design conditions have been identified and have been reviewed by the appropriate engineering disciplines. Typically, retrofits are less costly than purchasing a complete new machine.

Guidon: When retrofitting an older system with new technologies the improvements to the system could be seen in different areas. Overall speed, cycle times, reduced failure rate of produced product or power savings are just a few areas of improvement.

What type of repair work is available and recommended?

Mueller: The type of repair work performed varies from product to product. Typically, units that are sent in for repair have one or two issues that prevent the unit from operating correctly. Of course, there are times when a product has been damaged so much that it is not economical to repair. In some cases we recommend that the customer purchase a spare unit. The repair process covers mechanical, electrical and product enhancements. Rexroth follows a standard process with all repairs: First, the unit is checked and tested physically and electrically prior to any repair. A check is made...
using the serial number to verify if the unit has been in for repair before. A determination is quickly made to decide if a unit is repairable. After the basic checks, the unit is cleaned and then the troubleshooting process begins. The faults are typically detected during the troubleshooting process and the technician defines the parts that will be needed to make the repair. Once the repair has been completed, the unit is tested for functionality and verifies that it meets the original specifications. The serial number database is updated with the repair information and the unit is re-labeled and boxed.

**Guidon:** One word sums it up, quality. All Certified Service Centers (CSC) must follow the guidelines and processes set by the Rexroth lead plants based on the product being repaired. The list of products which are repaired is very long and is increasing. When a product needs to be repaired, it is best to contact your local CSC to see how Bosch Rexroth can help.

**What types of warranties are offered on repairs?**

**Mueller:** Units that are repaired through the standard process carry a 12-month warranty period on the complete product. Warranty starts at the time of shipment.

**Guidon:** The warranty on a repair is the same as new when the product is repaired per the CSC specifications. There are times when the customer will ask for a partial repair. On these rare occasions, the standard warranty does not apply.

**What types of spare parts are available?**

**Mueller:** A variety of spare parts are available for the Electric Drives and Controls products: Complete replacement units as well as typical maintenance parts like fans/blowers, hard drives, memory sets, programming modules, etc. Internal parts like PC cards and transistor modules are not sold due to the complexity of the products and the internal programming required to set the parameters for the designated unit.

**Guidon:** In addition to seals and bearings, the normal wear parts inside are available as spare parts through our organization. Repair kits for pumps and motors are available and even filter elements are now being offered. It would be best to contact your local CSC when parts are required.

**What are the benefits of training?**

**Mueller:** There are multiple benefits to attending a product training class—from the basic understanding of the equipment and the nomenclature, to in-depth product operation and troubleshooting. Understanding how the equipment works aids in the troubleshooting process so that the system can be traced down to the area where a unit is not operating correctly. Many times, maintenance personnel are frustrated by not being able to clearly diagnose where the highest possibility of the error may be coming from; in these cases where it cannot be determined, the control components are systematically changed out one at a time until the suspect unit is found. This is a very long and risky process. Training helps prepare the maintenance group to be able to troubleshoot the equipment quickly and efficiently so that maximum uptime and productivity of the machine can be ensured.

**Guidon:** Training is a great tool as it takes people from the principles of hydraulics to design of a hydraulic system. Training explains pump controls and how proportional and servo valves work. As people learn more about hydraulics they will received a better understanding of why maintenance of a system is so important. Training also explains the risk of a hydraulic system and what precautions are needed when working on a hydraulic system.

→ www.boschrexroth-us.com/service

**Contact:** Susan Strauss
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CNC simulator provides training, testing and development options for drilling, turning and milling

The IndraMotion MTX micro Trainer from Bosch Rexroth gives machine operators the ability to simulate, develop, test and transfer CNC programs—all from a personal computer without disrupting production.

The software package is available as a free download from www.boschrexroth-us.com/MTXmicro. It is an easy-to-use CNC simulator that provides a machine-like representation of Rexroth’s IndraMotion MTX micro CNC user interface. It is a user-friendly support tool for Rexroth’s IndraMotion MTX micro, a low-cost compact CNC solution for standard machining applications.

IndraMotion MTX consists of a compact HMI interface and a powerful multi-axis drive controller with performance CNC and PLC control. Designed for tool operators, machine builders, instructors and students, the training software offers realistic operation and programming capabilities for milling, turning and drilling sequences, independent of any machine tool hardware. The program runs on Microsoft Windows® XP or Windows 7 operating systems with no licensing required.

Contact: Karl Rapp
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Bosch Rexroth tradeshow appearances in 2012

Scheduled to exhibit at multiple industry shows during the remainder of the year

<table>
<thead>
<tr>
<th>Tradeshow</th>
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<tr>
<td>International Manufacturing Technology Show (IMTS)</td>
<td>Sept. 9 – 15</td>
<td>Chicago, IL</td>
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<tr>
<td>Label Expo Americas</td>
<td>Sept. 11 – 13</td>
<td>Rosemont, IL</td>
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<td>MINExpo</td>
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<td>Las Vegas, NV</td>
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<td>Pack Expo</td>
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<tr>
<td>FABTECH/Metalfom</td>
<td>Nov. 12 – 14</td>
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<tr>
<td>International Workboat Show</td>
<td>Dec. 5 – 7</td>
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<tr>
<td>Power-Gen International</td>
<td>Dec. 11 – 13</td>
<td>Orlando, FL</td>
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Bosch Rexroth participates in a range of tradeshows that is as diverse as our capabilities: from food processing and packaging to mining and machine tools, metal forming and the maritime industry. We have applications experts from your industry on-site to help you solve your demanding drive, control and automation challenges. To see Rexroth technology in action make sure to pay us a visit.
High performance machining with minimal energy consumption: Intelligent CNC controls combined with advanced electromechanical, hydraulic and pneumatic technologies increases the productivity of your machine tools. Proven Rexroth technology, application-specific CNC functions, user-friendly operation and standardized programming all help optimize your machining time and minimize downtime. Combine these advantages with preprogrammed technology functions, and the result? High performance and lower operating costs each day while you reduce your carbon footprint. Machine tool productivity: That’s our pledge when you work with Rexroth to find an ingenious solution for your application.