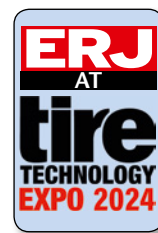


TireShow24 at Hanover expo



ERJ selection of top advances in the fields of technology, machinery and materials from leading exhibitors at this year's Tire Technology Expo

Engineering sustainable solutions

At the upcoming Tire Technology Expo, Zeppelin Systems will major on how the company creates solutions exactly to customer needs towards ensuring maximum productivity and highest quality. The company will present leading-edge materials-handling technology and concepts which have evolved from decades of plant-engineering experience. Zeppelin Systems will also highlight 'sustainable premium technology solutions that meet

the highest standards in terms of environmental- and health-protection. From upgrading an existing system to building a new plant, Zeppelin Systems will further showcase optimal engineered solutions for the mixing room and beyond, with 'green ticks' as standard.' Visitors to the Zeppelin Systems stand will also be offered an overview of the company's systems and solutions for smart-storage, pneumatic conveying, weighing, and feeding of powders, chemicals, solids, and liquids, as well as advanced recycling technologies, all carefully managed by automation packages.



Geared up for predictive maintenance



At Tire Technology Expo, Sew-Eurodrive will showcase an innovative concept, called DriveRadar IoT Suite, for industrial gear units. This condition-monitoring and predictive maintenance system enables end-users to analyse/predict the condition and behaviour of drives. Presentations will include an extruder application, where mechanical parameters of the industrial gear unit are measured by high-precision sensors and then evaluated and interpreted using machine-learning technology. Algorithms then help allocate anomalies directly to a component, with an app providing customers with a transparent overview of gear-unit condition.

Smart tire building... inspired by AI

The VMI booth at Tire Tech Expo 2024 will be all about 'Smart solutions that optimise tire building and will further transform the industry. New advanced camera-based vision systems, self-learning AI algorithms and self-adjusting processes all contribute to further automation, improved flexibility, higher accuracy and the highest consistency and quality of products.' Visitors to booth 8054 can discover VMI's vision to smart tire building.



Curing press advance

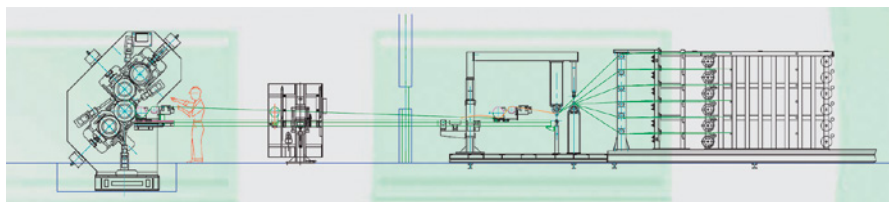
HF TireTech Group will present the Curemaster PCR curing press at Tire Tech Expo 2024. The unit was developed in response to strong customer demand following the introduction of the HF Curemaster TBR four years ago. The truck & bus tire press, says the company, has become a benchmark in terms of overall performance and is in operation by manufacturers worldwide. The innovative machine concept is said to "set itself apart from other curing presses, particularly due to the space savings, significantly reduced energy-consumption, reduced transportation costs and a shorter set-up time with improved performance in terms of clamping force." HF



TireTech's R&D team has now transferred this concept to a PCR curing press and is launching the Curemaster PCR curing press, 'a common control curing press which, despite its minimalist design and concept, can still be flexibly adapted to individual customer requirements.'

Calender technology advances

Comerio Ercole during the Hanover show will present a 'revolutionary new patented technology named Fast-steel, for steel-cord, automatic-change threading in the radial tire calendaring process.' Usually the stop of the calender-line for the steel-cord production changeover takes between two and four hours despite the use of devices to speed up the change of pressure rollers required for different diameter and EPI density of steel cords. With the new Faststeel system, downtime is reduced to less than half an hour only, allowing a real quick



change of production. Comerio Ercole strongly invested in R&D developing innovation, while keeping sustainability as major reference. The new digital platform Hercules, due to advanced techniques of big data analyses, AI and machine-learning is now a data-driven analysis tool for a continuous improvement of production process, including energy-consumption



optimisation, as well as added-value after-sales services. Comerio Ercole experts will explain further on the company's stand, Hall 21 Booth 8006, at Tire Tech Expo 2024.

Automatic weighing in the mixing room



Lawer, in Hall 21 Booth 9022, is an Italian company specialised in automatic weighing equipment for powder products, including pigments, additives, and chemicals, with single or multi-scale technology. Lawer supports the mixing room with its automatic powder micro-ingredients weighing system, Supersincro, which guarantees high productivity, constant quality, and complete process traceability eliminating the "human error" factor. It's a custom system that feed different chemicals, stored in silos, hoppers, big-bag, and interchangeable silos, in a variable size bag produced automatically.

Productivity in slitting and spooling

Spoollex and its Calemar converting machinery division will highlight their key role in supplying rubber slitting and spooling machines for passenger, light truck, high-speed and two-wheeler tire plants. The spotlight will be on fully automated lines for in-line continuous processes as well as automated loading/conveying/unloading solutions with a complete cell.

Liquid-phase mixing technology

Ecombine will highlight its continuous liquid-phase mixing process, which mixes tire-applicable rubber solutions and filler slurry – mainly consisting of silica/carbon black – directly in the liquid phase. Among a range of benefits, the technology imposes less constraint on filler morphologies and filler loading, while also greatly improving dispersion. Along with enhanced fill-polymer interaction, liquid mixing results in better overall performance of the

products while reducing energy-consumption compared with traditional compounding methods for combining synthetic rubber polymers and advanced nanofiller materials. At Tire Tech Expo, company experts will explain how Ecombine's streamlined manufacturing processes can minimise energy-consumption and deliver its EVEC-branded rubber materials that improve the rolling resistance, wear and wet-breaking performance of tires.

Silane-modified synthetic rubber for EV tires

Kuraray will introduce its latest silane-modified liquid butadiene rubbers, a new series tailored for the EV market. The materials incorporate a reactive silane group that "greatly enhances" interaction with silica fillers and natural rubber – particularly important for EV tire applications. The company experts will explain how this synergy can yield improvements in tire-grip, rolling resistance and abrasion resistance, leading to

an extended tire lifespan and superior driving dynamics. With molecular weights from the thousands to 100,000, Kuraray's liquid rubbers, including isoprene, butadiene, styrene and bio-based farnesene are said to improve tire manufacturing processes and overall tire quality. The company will also present its latest research into the use of silane-modified LBR in silica-enhanced rubber formulations, especially for EV tires.

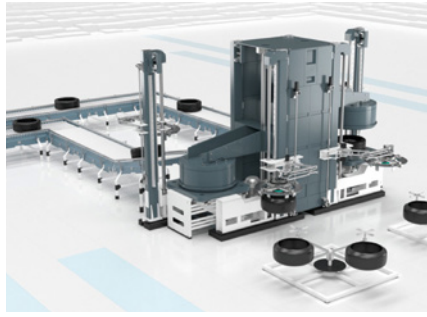
Sustainable solution SBR and lithium BR

ZS Elastomers, a JV between Zeon and Sumitomo Chemicals, will highlight how its advanced solution SBR and lithium BR technologies can contribute to the tire industry's transition to sustainable raw materials. The "fourth-generation" elastomers are designed to optimise silica dispersion, improve rolling resistance and enhance grip performance in high-performance tires. ZS will also emphasise

how synergy between advanced polymer technology and sustainable raw materials is key to protecting the environment and raising standards of living. Stemming from an MOU signed with Shell Eastern Petroleum in 2022, Zeon has recently obtained ISCC+ certification for biomass-derived raw materials. ZS can, thereby, provide the European tire market with ISCC+ certified SSBR and lithium BR.

From cradle to cradle

Pepperl+Fuchs will feature a compact RFID solution for tracing tires and semi-finished goods "from cradle to cradle". Typically integrated into the gripper of the curing press, the UHF reader is designed to provide the clear identification of green tires during vulcanisation via RFID tags. The technology, says P+F, "validates the green tire and verifies the tire, production order and production parameters (pressure, temperature, process time)" even under harsh conditions. Automated documentation of the man-



ufacturing process is said to ensure the traceability of production parameters during the entire life of the tire.

Silane advances

Momentive will present advances to its silanes, which are used to chemically link polymers and fillers and help achieve optimal tire performance and enhanced sustainability through reduced emissions and improved rolling- and wear-resistance. On show will be grades that improve the processing of challenging tread compounds via lower temperatures and fewer mixing steps. Momentive will also spotlight a new silane said to impart improved tire wear and rolling resistance and products with bio-based content of up to 80%.

Vegetable oil as a bio- plasticiser

Cheeshine has developed a new series of modified cashew oil and soybean oil (non-food chain) with high biomass content and free from PAHs. The 'special modification improves the processing property, has excellent low-temperature performance, good plasticising effect, excellent physical property and low rolling resistance. Modified vegetable oil does not cause harm the environment, equipment

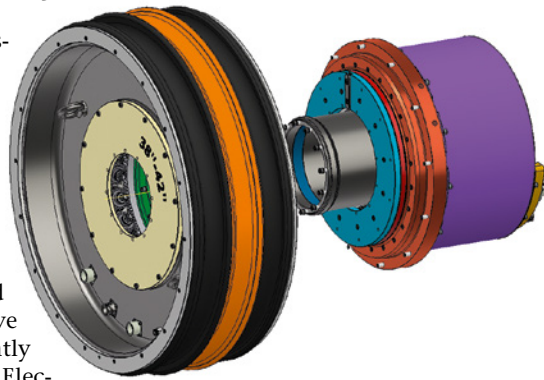
or personnel under correct operation, and greatly reduces the toxicity and corrosiveness of original cashew oil. Furthermore, modified vegetable oil has good compatibility with various rubbers, instead of TDAE, esters or polyether plasticisers. It will help to accelerate the transformation of the bio-based industries and plays an important part in contributing to low-carbon energy conservation.'

Machine vision QC

Sick GmbH will highlight the value of automated visual inspection during the complete tire manufacturing process in meeting the quality standards expected in the industry today. Presentation will include the company's high-speed 3D camera Ruler3000 – recently updated with a powerful 3R laser. The unit is designed to ensure high-precision 3D measurements even on dark rubber at full production speed.

Intelligent bead lock system

Marangoni Meccanica will present a new, patented system to automate the loading and unloading operations of the carcass and green tire. This tooling is said to offer complete and precise control over the diameters of the flanges, even during shaped carcass rotation. A key feature is that the inboard and outboard flanges can move synchronously or independently according to user preference. Electronic control by drive also enables precise control of the bead lock force,



which can be adjusted according to the recipe and adaptable during the cycle.

Automated testing

Metravib will showcase new features and capabilities of its newest instrument technologies, including new Dyna+ software for the DMA+ series. Benefits are said to include extended testing capabilities, new test sequencing possibilities, extended test controls, advanced DMA tests and fatigue tests fully mixable and automated. Other features claimed include: Optimal repeatability with optimised automated tension mode using Xpander, a six-axis robot dedicated to DMA+ range for automated tension, compression and shear tests; and an operator-alert function to enhance remote communication between the testing machine and the operator.

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(Frame & Independent Type)



Tire Drum Testing Machine
(For BC/MC/PC/L/TB Tires)



**Full Automation
Batch-off Machine**
(For 100-600 Liter Mixer)



**Simplex / Duplex
Triplex / Quadriplex
Pin Barrel Extruder**



Calender Head Extruder
(W 600-1,000mm)



Calender Head Extruder
(W 100-500mm all in one type)





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