

ERJ Future Tire & Rubber Awards 2024

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Name and contact details of person submitting the entry

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Please indicate if we can contact you to request further information about this entry

- Yes, by email

Company/companies (lead customers, suppliers etc) involved in the project or innovation. (Where possible, please give location details.)

VMI Group

Which category or categories in the FTR24 Awards does this entry apply to?

- Factory automation

Please give a title for the project or innovation?

VMI Revolute

Q1. Please summarise the main benefits of this development for the tire and/or rubber industry

The highly automated machine "VMI Revolute" offers a multitude of benefits:

Reduced Cycle Time: With a cycle time approximately half of its predecessor VMI Apexer productivity

is boosted without compromising quality. Its high level of automation allows for one operator to manage multiple machines, thus increasing efficiency.

Higher Up-Time and productivity: Automatic tooling changes and minimal operator intervention for recipe adjustments contribute to reduced downtime and higher productivity, resulting in an increased OEE.

Enhanced sustainability performance: The machine's preparation of apex material minimizes cyclic scrap, and quality control measures reduce rejects after assembly, leading to lower quality costs and improved output.

Increased Operator Convenience: Operators can perform less complicated tasks such as removing rejected bead-apexes, requesting inspection of newly produced ones, and exchange a cart with tool. Surveillance cameras aid in monitoring processes and troubleshooting without interrupting operations.

Increased Flexibility: Highly automated design allows for the use of a wider range of compounds that are too difficult for traditional machines to handle, providing more design options and opportunities to enhance bead apex quality for challenging specifications with taller apexes.

Q2. What are the main technical advances involved?

The VMI Revolute showcases significant technical advances with recipe-driven settings, ability to handle challenging apex compounds, eliminating the need for operator involvement, alongside features like automatic scrap removal/quality control and seamless automatic size change capabilities.

Q3. Which technical challenges did the development team overcome to deliver this project?

The development team overcame technical challenges such as achieving speed changes with high accuracy and low cycle time, addressing potential tensions introduced in rubber materials at these

speeds, accommodating a wider range of end product specifications compared to the existing generation of Bead Apexing, and implementing more quality control measures without manual intervention.

Q4. Please provide data showing the scale of improvement(s) achieved across the key, target metrics/parameters of this project

- Doubled output per machine and per operator with cycle time around 4.3 seconds (depending on the recipe type) which is half the cycle of existing output of available technology.
 - %30 higher output per m2 footprint.
 - Shortest change over time achieved; less than 2 minutes.
 - Apex heights of up to 80 mm, a capability that no other machine currently offers.
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Q5. What is the commercial status of the technology or product?

Revolute has been launched and industrialized. Over a dozen machines have been sold since the launch at Tire Technology Expo, 2022.

Q6. Scope for further enhancements to the technology or product

The goal is to automate the input and output logistics of the machine under the boundaries of the factory layouts, supported by additional vision tools to achieve high accuracy, hands-off, and eyes-off operation for operator-independent bead apex component production.

Many thanks for completing the FTR24 Awards entry form. You can add further information here and/or email supporting information to ERJ Editor: praleigh@eurorubberjournal.com

Hi Patrick, if you need any additional information or have any questions, please let me know! Kind regards, Judith