



MACHINERY

By Sharad Matade

HF Q GUARD: PRECISION, QUALITY, TRACEABILITY

HF Group, the global market leader in machinery and systems for the rubber processing tyre industry, has brought out another innovation, HF Q Guard, to meet the growing demand for precision in splice measuring, quality control and traceability in the entire manufacturing process.

HF Tire Tech Group is one the largest manufacturers of high-end technical, tyre building machines and curing presses in the global tyre industry.

"HF Q Guard is the next step to our HF ONE tyre building machine and lifts tyre production to a new level when it comes to precision, quality and traceability. High-resolution images are taken with LEDs. We can get details of the height and width of materials inside the high-resolution images. HF Q Guard can also detect the edge of the materials, and that is a new thing," said Hartmut Hoops, Head of Process Engineering, Tire Building Machines, HF TireTech Group.

HF Q Guard comes into two variants: HF Q Guard 1000 and HF Q400 covering inspection width of 1000mm and 400 mm respectively. HF Q Guard sensor technology works with high precision and accuracy. It measures splices in real-time with an accuracy lower than half of a millimetre. The system covers a drum speed of up to 1500 mm/s speed, and distance to the surface is about 1.4 metres.

With its features, the HF Q Guard offers advantages to over the current laser splice



Hartmut Hoops, Head of Process Engineering, Tire Building Machines, HF TireTech Group



Benefits

- Complete tracking of tyre data during the tyre production process
- Data storage for later analysis (Big Data)
- Meets today's and future requirements of the automotive industry (traceability of production data)
- Retrofit ability on older machines (manufacturer independent)
- Independent visual inspection during the tyre production process
- Analysis for optimising the tyre construction process

measurement systems, which have to be closer to the drums, need better light and are sensitive to vibrations of the drums.

Another feature of HF Q Guard is its compatibility to the existing and new tyre building machines available in the market, and it can be integrated very quickly and at low cost.

The new product is so robust, which could be fitted at any position to the drums, which is another advantage over the laser splice measuring machines. As it takes a few hours for installation, HF Q Guard needs minimal production downtime.

"The whole system is calibrated. A key factor about the installation of HF Q Guard is that we need a few information. We need to know the positioning of the drums. We can start with very limited interfacing to the machines. We need some information as such as the layer sequence, building procedure and tolerance of the tyres. Data collection is initiated by elegant technology," says Hoops.

Over the years, HF has developed innovative products that can be upgraded easily. The company has developed machine platforms such as PCR/LTR, PLT 2, and PLT 2 SD along with the award-winning HF ONE for which upgrades are planned to include the latest technologies such as auto bead loading, automated tyre handling, and the latest control systems with state-of-the-art HMIs. Servers can be added for additional strips such as Run-Flat technology or reinforcement strips.

According to the company, HF Q Guard can be used with almost all platforms.

Tyres could be damaged due to defective manufacturing. During manufacturing, if cord-cutting, building or vulcanising process are not done correctly, it could lead to damages in the tyres. The result is that the inner layers of the tyre are too close to the surface or that structural defects in the tyre occur. HF Q Guard significantly reduces the risk of the faulty tyre through permanent quality checks. The digital twin of a tyre can thus store the complete data on the surface of each layer and all splice length information.

"We have one IPC which does the algorithm for splice analysing, and

that also connects to the cameras, and compression of data. We could also have possibilities to connect the existing PLCs in the machines, and we can connect data such as tolerance, width, building sequence as from there as well. On other hands, there are new tyre building machines have their data set on built tyres, and we can combine all data from the splice measurement systems and the machines itself for analysing systems," says Hoops.

Measurement data of tyres are prepared for visualisation according to individual needs, and this makes it possible to inspect the individual surfaces of the materials to identify defects in the construction or the tyre material used. Expand the existing scope of functions of the splice measurement of the HF Q Guard at any time to include features needed for improving quality assurance. HF Q Guard grows with specific requirements.

Overall market trends for the mobility and regulatory pressure are putting pressure on tyre manufacturing to have equipment that not only makes quality products but also are smart, flexible and compatible. OEs will be more focused to check its supplier's consistency in process and quality. From tyre makers, OEs now expect data on the material mix, extrusion process, tyre building, curing and finished products.

As HF Q Guard collects data and manages the complete documentation, it can help to prove that non-defect building of tyres at the factory any point of time.

The company has already spent a year on engineering the units and hardware, cameras and other components running.

In the next six months, HF Tire Tech will work on the collection of data and the results of HF Q Guard, and after that, the company will bring the product into the market.

"HF Q Guard has been tested in house on materials and are still in the process do the same in next months. We start a field test in the next months. The company will install HF Q Guard at the customer's factory to collect the data, and the company already found the customer to conduct the actual test," says Hoops. ■