Testing extremes

Dr. Dieter Barz, Executive Board Member, Altracon S.A

The new 2 Pos. Agricultural Tyre Endurance Testing stand that Luxembourg-based machinery manufacturer Altracon developed combines technology innovation with creative ideas. It is is designed to take tyres up to 2.500mm diameter with 20t wheel load capability each

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When technology innovation combines with creative ideas, the product achieves a high level of excellence that can make the vital difference in the market. This is highly significant while developing tyre testing and tyre quality enhancement solutions. The Luxembourg-based tyre machinery producer Altracon has achieved this with the introduction of its new 2 Pos. Agricultural Tyre Endurance Testing Machine that is designed to take tyres up to 2.500 mm diameter with 20t wheel load capacity each.

"This is a big, heavy duty machine with multiple built in design-and functionality features such as Rolling Resistance, Plunger-and-Footprint-Testing capabilities, combined with incredible performance values. Such test stands are by far not built every day. But this was already the second test stand for extreme tyre testing which was delivered within 2016. The experiences from the first project, an aircraft tyre test stand with landing simulation, were helpful to get this project successfully realised in shortest period of time," Dr. Dieter Barz, Executive Board Member, Altracon, told Tyre Asia.

The test machine is subdivided in the centre-module with the drum and drive and the load stations, which are attached to move the wheel radially to the drum. The mechanical interfaces are standardised. All modules have an own rigid frame. The load units are precisely and rigidly mounted to the centre-module with the 3.000mm drum. Each test-wheel axis is equipped with a spin lock-/ brake system. Different test rims are adapted with adapter rings.

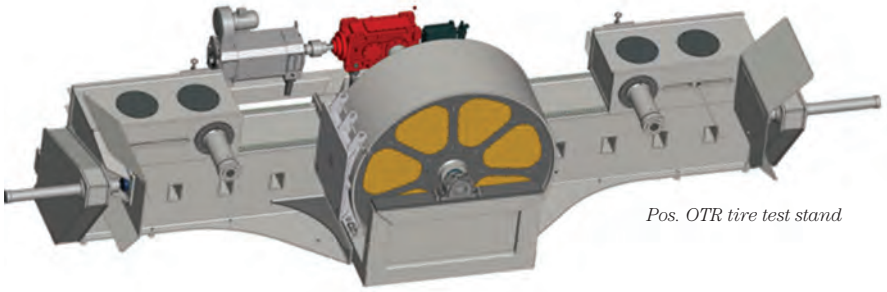
The drum is driven by a high-performance AC servo motor with direct drive torque transmission including a bevel gear. This keeps the test stand compact in its lateral dimension but requires an oil cooling system for the bevel gear to withstand the high power. The test stand is configured to perform tests with up to 120kph.

The wheel load is applied and measured directly in the vertical wheel axis, which keeps the wheel carrier free from bending torque and is especially important when dealing with such high loads. High precision linear guides care for smooth motion of the wheel carriers and contribute to best control performance with highest accuracy. A new reinforced bulge detector system is installed at each wheel carrier. It cares for emergency unloading of the test position in case of a fault detection. The installed Rolling Resistance Measurement System uses a precision

OTR testing station

Foldable platform for ink-footprint application and plunger adaptation

Rolling Resistance Measurement with precision torque-meter



Pos. OTR tire test stand

The control system is equipped with a workstation which uses a graphical user interface (GUI) for easy set-up and management of tests. Internal and external failures will be detected by an integrated safety control system and command a fail-safe shut-down of the system. Failure reports and analyses may be issued. Customised set-up and adjustments are available as a matter of fact

torque-meter, which is installed in the drive axle. This method uses a large and constant lever-arm for sensitive measurements and works independent from the rolling direction. However, the sensitive measurement system is equipped with a mechanical limit stop to allow both, precision measurement with high accuracy for rolling resistance measurements and high torque transmission for powerful acceleration in endurance testing mode. This is in combination with a low resistance air injection lubrication of the wheel spindle bearings offering lowest friction to achieve Rolling Resistance measurements with unbeatable precision.

Foldable platform

A foldable platform for ink-footprint applications can be mounted at the center module and will be clamped to the drum. The drum is then locked for spinning. The platform offers a flat and vertically adjusted surface to load the wheel/ tire to take the footprints. Paper is kept in position with magnets. The same platform will be used to hold a plunger pin for plunger testing. The positioning of the plunger and the test preparation is supported by a laser based positioning system and camera. It may be operated remote from the operator cabin. For safety-reasons will the plunger test be automatically performed after the machine has been taught the test positioning.

Dr. Barz said: "The severe overall testing conditions require an operation of the test stand in a closed and explosion protected room to be save. An intelligent camera system is installed to monitor the test, to support during the adjustment process and even detect visible irregularities to trigger for sending a message to the mobile phone of the operator during his absence if something unforeseen happens.

"Altracon tyre testing machines are equipped with a CAT 3 tyre inflation protection system to avoid the risk that a tyre is still under pressure before safety doors can be opened and protects against hazard burst of a tyre. This is notably an important feature when testing tyre sizes with large air volume such as LT, TBR or OTR."

Test machines from Altracon come with a state of the art control rack architecture, he said. "They are built according CE standard in every respect. Most modern hard and software is applied. The main control of the test machine is performed by a Siemens S7 control system, as this is standard at multiple customers. However, depending on the requested performance level of the machine Altracon reserves to use compatible systems with higher performance. The new Altracon Efficient Power Consumption Management – EPCM - ensures an economic operation of the test stand. Besides the use of low consumption equipment are the required resources actively managed by the system to support environmental care and to keep the operation of the machine on a low budget."

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The standard TCP/ IP remote service connection enables immediate access to the system by Altracon's specialists in case of emergency, assistance or any other cases of urgency. This is done via VPN tunnel, that will be released case by case, to ensure compliance with the customer's data integrity policy.

"A lot of technical features are concealed in this machine, which make this test stand special and technically ahead of the times, which is a typical Altracon standard, Dr. Barz added.