

Tire testing sensor

A precise and wireless speed sensor is said to make tire aquaplaning tests more accurate and easier to reproduce

When developing new tires and rims, prototype tests provide valuable information on safety and optimization potential. A standard test for tires is the aquaplaning test. This is because aquaplaning – the phenomenon of the tire floating on the water of a wet road surface – is particularly dangerous because the tires lose direct contact with the road, potentially making the vehicle uncontrollable.

Aquaplaning can occur wherever (rain) water cannot drain off unhindered. Therefore, the ability to optimally displace water and thus ensure road grip even in wet conditions at high speeds is an important development goal. In addition, the greater safety achieved in this way is also a marketing criterion.

The testing of a tire's performance during aquaplaning can be carried out with the help of speed sensors. Traditional sensor solutions typically consist of two parts: a torsion bar with an (optical) sensor on the body, which forms the outer reference point; and an encoder fixed to the wheel.

However, for harsh environments where uneven surfaces and flying particles such as gravel, water and dirt are present, wireless sensor solutions without an external reference point are suitable.

The recently developed Dx-Speed sensor from Caemax has a completely new sensor architecture for this purpose, allowing for a whole



ABOVE: Caemax Dx-Speed enables robust and precise wheel speed measurement directly on the wheel

series of different tire types to be tested safely, precisely and repeatedly.

What makes the sensor special is that it operates without an external reference point. It is simply placed with the housing on the wheel or shaft to be measured. This mechanically simple design results in extremely short setup times.

Above all, the tests can be repeated easily. The complicated alignment of the sensor to an external fixed point, as is usual with other systems, is completely

eliminated. The wireless sensor, data from which is recorded telemetrically, can be used to exactly detect the point where the speed of a wheel changes, i.e. when aquaplaning occurs. The measurements remain precise over various test series and complete batches of tire types can be examined in the shortest possible time.

Several sensor housing variants are offered, including the facility to adopt custom designs from a manufacturer. In addition, the sensor can be used for other wheel and component tests on a telemetry basis. For this purpose, the sensor can be inserted into a half-shell housing. This housing also

Forward



ABOVE: Aquaplaning tests without wheel pulse encoder

accommodates the transmitter (Dx-SCT) by which the data is transmitted. The housing protects the sensor against dirt and splash water and allows test drives in the field. All data is transmitted in real time through the universal Dx-Telemetry system. A major strength of the system on the sensor and receiver side is its modular and flexible design, which can be added to or changed at any time.

Thanks to the innovative design of the sensor, which dispenses with an external reference point, a new approach to the precise measurement of the speed of rotating shafts or wheels is available even in harsh operating environments.

By eliminating the external reference point, sensor accuracy is increased, and the unit is more robust and easier to mount, making aquaplaning tests precise and easily reproducible. ◀