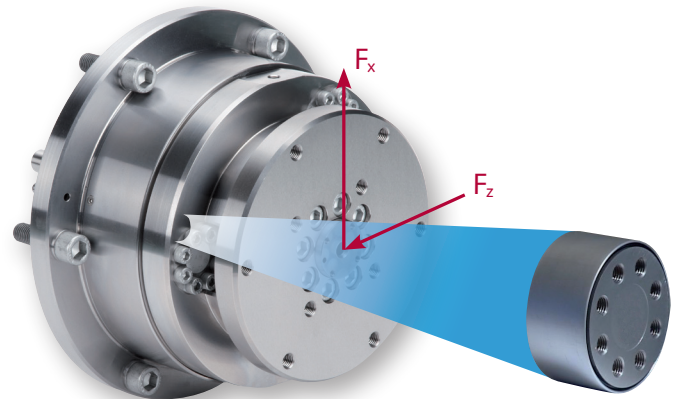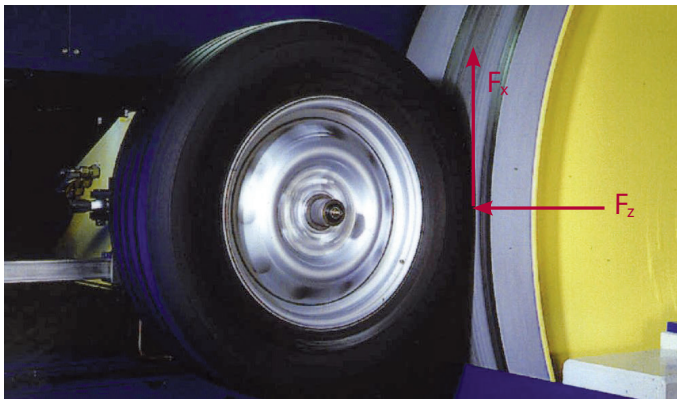# Rolling resistance measurement on tire test stands

Based on ISO 28580, SAE J1269 and ECE R117

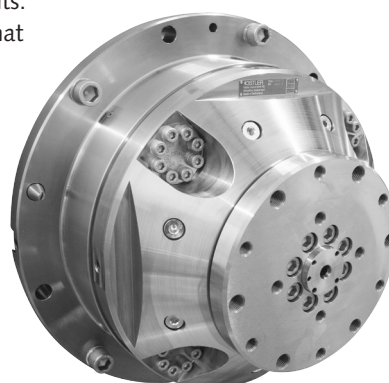RoaDyn S220 for passenger car tire rolling resistance measurements

The 2-component RoaDyn S220 measuring hub for passenger car tires and RoaDyn S260 measuring hub for truck/bus tires are developed to measure minimal tangential force deviations F_x at the tire contact area. This type of measuring hub is generally applied at tire test stands. Because of the high sensitivity of specially developed strain gage load cells, rolling resistances of only a few Newtons can be measured.

In contrast to other commonly used test procedures based on torque, deceleration and power measurement methods, our RoaDyn S220/S260 measuring hubs work in accordance with the force measurement method. The chief advantage of this method is the reduction of parasitic losses because of the reaction force being measured as close as possible to the tire contact area. The subsequent data conversion eliminates the impact of crosstalk. This allows highly accurate rolling resistance measurements. Another advantage compared to the other methods is that several tires can be tested simultaneously on a drum.

The RoaDyn S220/S260 measuring hub supports tire R&D departments in implementing highly sought-after power saving measures in the short term.
In addition it will also help to find the balance between fuel efficiency, corresponding CO_2 emissions and the preservation of relevant tire safety characteristics and tire endurance.

Features of RoaDyn S220/S260

- Rolling resistance measurements of tires based on current regulations
- Static measurement of the vertical force F_z can be used for tire machine controlling
- Modular design
- Shaft mounted on ball bearing
- High stiffness
- Excellent linearity
- Analog or digital data output
- Prepared for oil lubrication
- Calibrated at the factory

RoaDyn S260 for truck/bus tire rolling resistance measurements
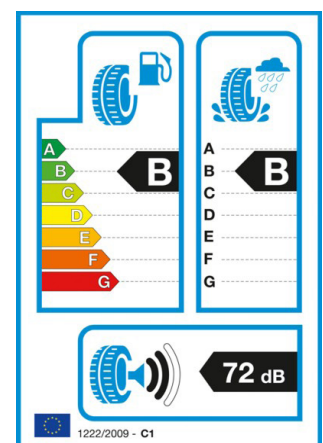
RoaDyn multi-component measuring hubs: tire characteristics and endurance from passenger cars to trucks and special vehicles

RoaDyn P530, Type 9295B	RoaDyn S530, Type 9289A013	RoaDyn S5MT, Type 9289A263
High speed uniformity	**Durability / wear**	**Force & torque**
For car tires and wheels (piezo), measuring range $F_z = 0 ... 30$ kN, rim sizes ≥13"	For car tires and wheels (strain gage), measuring range $F_z = 0 ... 30$ kN, rim sizes ≥13"	For medium truck tires and wheels (strain gage), measuring range $F_z = 0 ... 100$ kN, rim sizes ≥17,5"

Features	Applications
• Application-specific load cell technology (piezoelectric or strain gage) • The compact design optimizes the force flow and reduces the bending moments which results in highest precision • Universal measuring instrument for laboratory and production tire test stands • Measurement of radial, lateral and tangential forces • Measurement of overturning, steering, drive and braking torques • Measurement of dynamic and static out-of-balance and radial and lateral runout • Determination of tire characteristics such as irregularities, vibration measurements, etc. • Excellent linearity and high sensitivity • High rigidity – therefore high natural frequency which results in a wide frequency range • Excellent signal quality accross entire measuring range • Factory calibrated	• Tire development • Validation of tire models • Rim development • Quality inspections during tire production **Tests** • HSU – High speed uniformity • Flat spot • NVH • Durability / wear • Non-uniformity • Force & torque

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