

## Test stands for the analysis of friction coefficients

### Horizontal

Easy access to test objects with horizontal ANALYSE systems



**Scope of application**  
With the horizontal ANALYSE system from Kistler, fast and precise tests and analyses of fasteners are possible in conformity with international or customer-specific standards – especially for the purpose of determining friction coefficients.

#### System structure

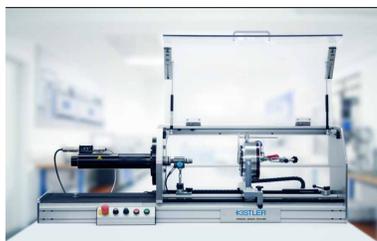
One or two drive units are mounted on the basic horizontal mechanical unit. With the help of a torque/rotation angle sensor, they introduce the tightening torque into the test object via a suitable tool. The preloading force/thread torque sensor is mounted on a slide that can be moved and fixed; it captures the test object for the test object's bearing surface and the counter thread in the thread dimension required for the test, without any risk of torsion.

#### Key data

- Standard torque range up to 40,000 Nm
- Friction coefficient tests in the standard range up to thread sizes of approx. M72
- Test of the prevailing torque of nuts with clamping element
- Horizontal configuration ensures easy, barrier-free access to the test object

#### Options

- Additional drive units on one system allow for a wide range of different requirement profiles
- Measurement of applied pressing force
- Ultrasonic measuring system captures the preloading force by measuring the elongation of the bolt



System up to 1,000 Nm



System up to 40,000 Nm



System up to 8,000 Nm

### Vertical

Vertical systems for small thread dimensions and tests in vertical orientation



**Scope of application**  
ANALYSE systems with a vertical structure are often used to test small thread dimensions or test objects; either according to standards or for specific applications – when the aim is to measure the tightening behavior in certain materials or determine the friction coefficient.

#### System structure

A drive unit on a movable slide with a smooth-running linear guide is mounted on the basic vertical mechanical unit; this drive unit fixes the torque/rotation angle sensor with the help of a click mechanism to secure it against rotation and prevent it from falling. The sensor introduces the tightening torque into the test object via a suitable tool. During this process, the slide with the drive unit is kept in a "floating state" by a weight-balancing mechanism. A manual lever allows vertical movement of the system during tightening. Optionally, movement of the slide and defined loading of the test specimen can be implemented with additional weights or via pneumatic operation.

#### Key data

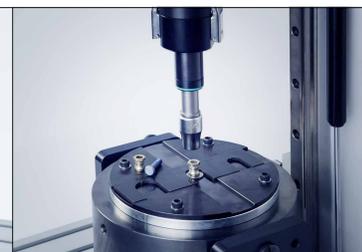
- Standard torque range up to 200 Nm
- Friction coefficient tests in the standard range up to thread sizes of approx. M12
- Tightening tests on wood screws, self-forming and self-tapping screws
- Torque tests on rotating components

#### Options

- Measurement of the insertion depth
- Measurement of applied force by defined axial loading
- Additional weights for defined applied axial force
- Pneumatic operation



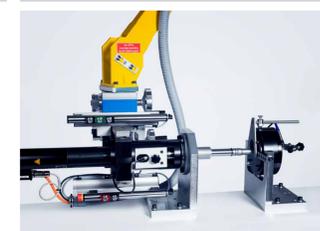
Tightening test



Friction coefficient test

### Special

Handling systems for perfect measurements under challenging conditions



**Scope of application**  
Handling systems from Kistler are used to test threaded joints so that the test object can be analyzed directly under real application conditions.

#### System structure

Accuracy is paramount in the design and operation – especially if installation conditions at the fastening point on the component under test are challenging, for example in the vehicle's chassis area or engine bay. To ensure that this does not happen, the system must not only feature high rigidity but must also offer the desired flexibility. For this purpose, the handling system used offers degrees of freedom that can be fixed electro pneumatically; a swivel gear that can be manually adjusted and fixed, with a spindle changing unit, is mounted on the system. The spindle change device makes it possible to change the drive unit to meet different test requirements. The torque/rotation angle sensor that introduces the tightening torque into the test object via a suitable tool is adapted on the drive unit with the help of a sensor changing unit.

**In addition to the standard systems, Kistler also offers a wide range of special solutions based on the requirements defined by customers and industry standards; in addition, custom designs can be integrated into the solution. This service is available for all components including sensors, mechanical units, drive units, measurement and control technology, software and mechanical adaptations.**



Horizontal ANALYSE system with heat chamber



Small handling system up to 200 Nm



Handling systems up to 1,000 Nm



Extension with an ultrasonic measuring system to measure the preloading force

### Portable

Portable systems for flexible use

#### Scope of application

The INSPECTpro measuring system from Kistler is used for quality assurance in goods receiving departments and for quick checks on fasteners to determine the overall coefficient of friction of the fastener.

#### System structure and testing procedure

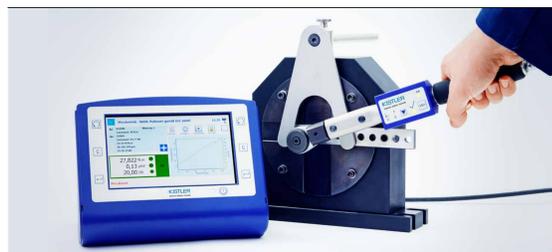
A torque/rotation angle sensor or wrench and a preloading force sensor are connected to the INSPECTpro measuring system, for which the test object is adapted with the help of appropriate devices. While the test object is being tightened, the measurands are shown on the screen in real-time. The overall coefficient of friction is then determined automatically and displayed on the screen.

#### Key data

- Determination of the overall coefficient of friction
- Portable system powered by a rechargeable battery
- Data export for advanced evaluations and documentation

#### Options

- Connection to testXpert software for advanced evaluations and documentation
- Software modules for individual system configuration to perform a variety of additional measurement tasks



The INSPECTpro measuring system from Kistler is used for quality assurance in goods receiving departments and for quick checks on fasteners.

