Tensometric
Zugkraftmessung

Information: RK Frictionmeter

Description

The 'RK' frictionmeter is a device which determines the coefficient of friction µ.
The coefficient of friction µ is a measure of the frictional properties of a test specimen.

The device is used to examine the influence of different preparations on the running characteristics of POY, yarns, filaments, wires or other flexible materials or to check the surface structure of thread guides and friction elements.

Options:

- **Friction factor measurement on heated ceramic and steel friction body.**

- **Stick-slip measurement (static friction measurement)**

  Stick-slip friction measurements are carried out at an extremely slow thread speed (approx. 1 mm/min!!). At this speed a constantly increasing tensile force builds up in the test thread after it has passed the frictionbody.
  This tensile force falls quite suddenly when the test thread gets into sliding friction (slip).
  The level of this self-building tensile force is a measurement of static friction.

  The extremely low speed is generated and digitally displayed by the SS26 drawing-off device.
  The same measuring sensors and measuring arrangements are used as for friction factor measurement.

- **Extraction equipment for taking up the drawn-off threads.**

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Measuring principle

A test specimen (thread or thin wire) is drawn over a friction body at a defined wrapping angle and a defined speed.

During this operation the tensile force on the test thread is measured before and after the friction body.
An increase in the tensile force (thread tension) is a measure of the coefficient of friction µ.

The coefficient of friction µ is determined very simply with the RK-WIN software.
It calculates the value according to the Eithelwein formula:

$$\mu = 1/\alpha * \ln (F2 / F1)$$

µ = Coefficient of friction
α = Wrapping angle as a radian measure
F 1 = Tensile force before the friction body
F 2 = Tensile force after the friction body

Method

The tensile force on the test specimen is measured in front of the friction body and is kept constant by an electronically-controlled brake.
The brake is continuously adjustable and features smooth running properties.

Another precision measuring sensor measures the tensile force after the test specimen has wrapped itself around the friction body.

All guiding rollers are fitted with extremely easy-running precision ball bearings.
The friction caused by the measuring sensors and the deflections is extremely small.
This is a basic precondition for the precise measurement of the coefficient of friction.

Test specimen speeds between 2 m/min and 900 m/min can be precisely generated with the drawing-off device. An additional 3 drawing-off speeds, which can be infinitely variably preset, can be simply selected.
The material is drawn off with a non-slipping godet.
The speed of the test thread is read off from a digital display instrument.

Friction factor measurement

The friction factor is measured at the contact points of two materials:

- Thread (or wire) against a solid body such as ceramic or metal

  The wrapping angle of the test specimen around the friction body of 90°, 180°, 270° or 360°
  Any form of friction body can be used
  Round friction bodies with diameters between 2 mm and 60 mm

- Thread against thread

  In measuring the thread/thread friction factor the thread is wrapped around itself so that it forms a friction body at the contact points
  The number of wraps is digitally displayed

Evaluation per PC

The evaluation of a coefficient of friction µ measurement is done with the RK-WIN software.
This software has been specially developed for the requirements of the friction factor and stick-slip measurements.
It offers the graphical representation of the measurement sequence, a measuring report and lots more.
An A/D converter card is also provided with the software package for installing in the PC.

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Technical data:

RK frictionmeter:

1 pc.	Thread brake	: Adjustment range: 2 cN – 25 cN
2 pcs.	Tensile force measuring sensor	: Measuring range 0.0cN to 100.0cN, resolution 0.1cN, swivelling
	Operating voltage	: 220V AC
	Housing dimensions	: W = 530mm, D = 530mm, H = 500mm (without brake)

Drawing-off device for friction factor measurement 19“ 4 height units Type: AX 25

Regulated drawing-off motor

Power : 95 W
Torque : 30 Ncm

- Continuously adjustable drawing-off speed by means of rotary knob
- Adjustment range from 2 m/min to 900 m/min
- 3 presettable drawing-off speeds
- 1 digital LCD drawing-off speed display
- Adjustable smooth acceleration and braking procedure

On back panel:
1 mains connection socket, power supply, 220 V 50 Hz
1 switched mains outlet socket, 220 V 50 Hz.
This is switched on with the drawing-off motor and off when the drawing-off godet is stationary.

Interface for the connection of the PC-supported RK-WIN measured data acquisition and analysis system.

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