

Friction coefficient measuring unit RK – LD

According to DIN EN 60851-3 Method B



Description:

The frictionmeter 'RK-LD' has been developed for calculating the friction coefficient μ_d according to DIN specification EN 60851-3 method B.

The measuring unit is used in order to check the influence of different finish on the operating characteristic of enamel copper wire or other flexible materials with diameters from 0,1 to 0,8 mm.

When the friction coefficient μ_d of enamel copper wire is known you will be able to have an effect on the packing density of a motor armature coil during winding.

Configuration:

The unit is composed of three 19" plug-in modules integrated in a 19" housing.

The upper plug-in module includes a measuring device with a tensile force sensor.
 In the middle plug-in module there are two adjustable brakes.
 A rewinder is in the lower drawer.

The measuring unit is complete with the Tensometric software RK-LD-WIN.

This software controls the frictionmeter and calculates the result of a measurement.

Measuring principle:

The wire coming from a reel or barrel is guided over an adjustable brake. From there it is running over a base plate, and thereafter deflected twice so the wire will be running once more over this plate parallel to the first flow. Then it will be rewound on an electric driven reel. A weight plate which is smoothed with a predefined surface roughness will be put on both parallel wires running over the base plate. This weight plate is static and connected with a high precision sensor. During the wire movement under the weight plate a force - which is depending from the friction of the wire – is measured by the tensile force sensor. This force is a measure for the friction coefficient μ .

The friction coefficient μ is calculated by means of the formula:

$$\mu_d = C / E \times 9,81$$

(N)

μ_d	= friction coefficient
C	= tensile force
E	= weight of the weight plate
9,81	= conversion factor Kilogramme (kg) into Newton

Operation:

All rollers are equipped with smooth running miniature precision ball bearings. The friction caused by the wire deflections is extremely low.

The integrated two mechanical brakes are continuously adjustable. These are generating a wire tension and straighten bent wires.

The tensile forces sensor is equipped with high precise strain gages (DMS). The measuring amplifier and the power supply are placed in the housing drawer.

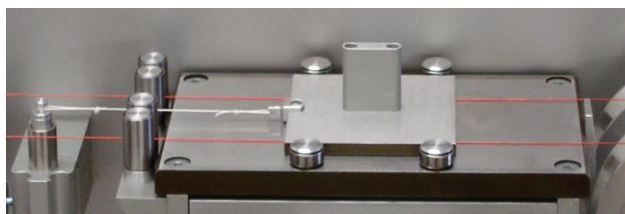
The wire drive is effected by the rewriter. Speeds of 1 m/min to 30 m/min can be continuously and very precisely adjusted. By means of the turn-switch 4 pre-adjustable pull-off speeds can be reproduced quickly. The material is wound in a non-slip way on the rewriter. The speed can be read on a digital display.

The evaluation of the measurements is made by the PC and the friction coefficient software RK-LD-WIN.

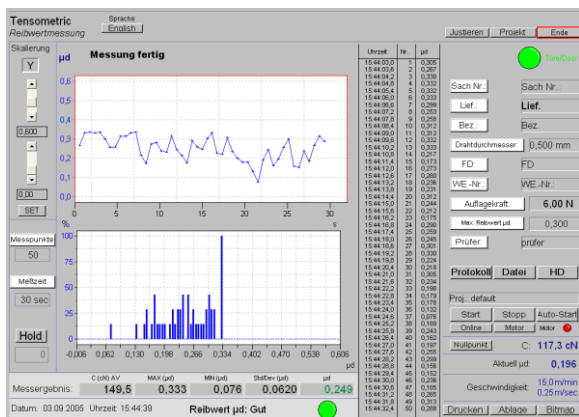
Wires \varnothing 0,4 mm to \varnothing 0,8 mm are checked by normal force 6 N.

Measuring with weight plate 2,5 N:

Measuring with weight plate 6 N:



Software RK-LD-WIN



The software RK-LD-WIN is an efficient measuring program for calculating the friction coefficient μ_d . It is adjusted for Tensometric Frictionmeter RK-LD.

In clearly arranged screen and print graphics the measurements are represented and printed for record. Furthermore the measurement reading is provided both as an ASCII file and a Bitmap file.

At the push of a button the measurement is started and a predefined number of samples will be gathered during a predefined period.

Apart from the friction coefficient μ_d and also the MIN/MAX value and standard deviation are calculated as result of a measurement.

Measuring configurations specific to material (projects) can be recorded and activated at a later date.