



I
N
F
O
R
M
A
T
I
O
N

Tensiometer K11



Ensuring quality with quality – the K11 from KRÜSS is the fully automatic stand-alone instrument with touchscreen operation for quality control measurements of the surface and interfacial tension.

- **Fully automatic determination of the surface and interfacial tension**
- **High-resolution, robust measuring system**
- **Stand-alone instrument with large, high-resolution touchscreen**
- **Ergonomic, intuitive, menu-controlled user guidance**
- **Flexibly configurable measuring templates**
- **Presentation of results, raw data and measuring parameters with report function**



Overview of the K11

- **Fully automatic determination of the surface and interfacial tension for routine laboratory and quality control measurements at the push of a button**
- **High-resolution and constant position force measurement with overload protection**
- **Stand-alone instrument with large, high-resolution, intuitive user interface**
- **Ergonomic, menu-controlled user guidance**
- **Flexibly configurable measuring templates for all methods**
- **Presentation of results, raw data and measuring parameters with report function**
- **Uniform sample table movement with large dynamic range**
- **Closed and illuminated sample chamber**
- **Thermostat connection for carrying out measurements as a function of the temperature**
- **User-friendly calibration for traceability to national reference standards**
- **USB-interface for data storage or a printer**
- **Orientation on national and international standards (e.g. DIN, ISO, ASTM) is possible**
- **Rod method for small liquid volumes and density measurements is possible**



Quality assurance with quality

The Tensiometer K11 from KRÜSS is a stand-alone instrument for routine measurement of the surface and interfacial tension. Standardized automatic measuring sequences with

a high sample throughput and gapless documentation in the measurement report – these services make the K11 the ideal partner for quality control. Predefinition and accurate control of

the measuring sequences without user intervention mean that the instruments meet even high demands placed on the reproducibility of the results.

Intuitive and well-thought-out

With the large-format, high-resolution touch-panel automatic measurements with the ring, plate or rod method as well as lamella tear-off and density measurements are configured, started and saved.

Measuring parameter templates for each method allow a measurement to be programmed in only a few seconds. Speeds, paths and detection sensitivities can be custom-made for the particular measuring task or adapted to comply with international standards.

0.1 to 500 mm/min. Optional accessories allow measurements to be made at temperatures between -10°C and 130°C.

The touch-panel stores the results and measuring parameters as well as raw data such as the time-dependent or path-dependent force values or the lamella height – and therefore incorporates the functions of a software data logger. Clearly-laid-out reports can be transferred to a USB-stick or printed out on a directly connected printer.



The instrument is equipped with a high-precision force sensor that, apart from installation or servicing, does not have to be recalibrated. The force measurement works at a constant position, so that height values such as the surface or lamella height can be determined or set exactly. The sample table with built-in stirrer moves in a speed range from

Quick and easy – four steps to a measuring report

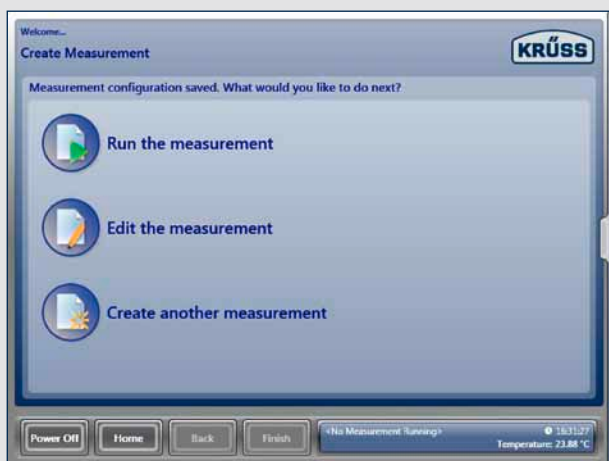


Select measuring method. Measuring templates with standard parameters are included; these are suitable for most cases.

Step 1

Step 2

Define the measurement. A name for the measurement is entered and – if the method requires it – the density value. For individual solutions the measuring parameters can be flexibly altered.

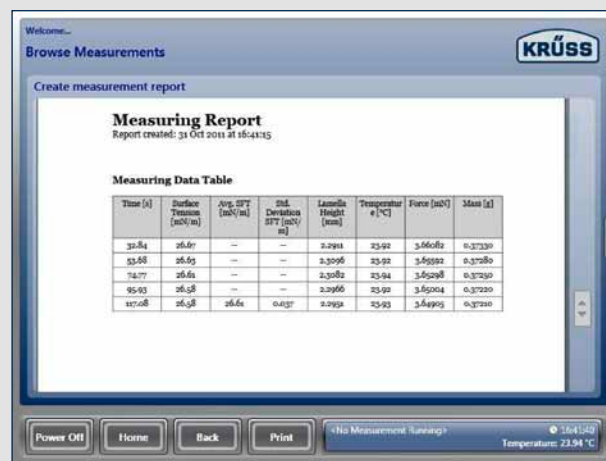


Start the measurement. After the start of the measurement the user is guided through the measuring sequence. Detecting the surface, immersing the measuring body and the measurement itself are all carried out fully automatically. The averaged result, the raw data and all measuring parameters are clearly shown.

Step 3

Step 4

Create the report. The measurement report is drawn up by fingertip; it can be printed out immediately or saved as a Microsoft XPS-file.



Technical data

K11



Measuring range	
SFT / IFT	1 to 999 mN/m
Density	1 to 2200 kg/m ³
Resolution	
SFT / IFT	0.01 mN/m
Density	1 kg/m ³
Measurement rate	12.5 measured values / second
Movement range	>110 mm
Stroke speed	0.1 to 500 mm/min
Max. balance load	120 g
Temperature range	-10 to 130°C
Power consumption	40 W
Mains supply	100 to 240 V AC, 47 to 63 Hz
Display panel	Touchpanel, 800×600 px, 170×127 mm
Dimensions	390×300×585 mm (B×D×H)
Weight (instrument + panel)	21.3 kg

We reserve the right to make technical alterations.

Measuring methods

- Ring method (Du Noüy; corrections as per Huh&Mason, Harkins&Jordan; Zuidema&Waters)
- Plate method (Wilhelmy)
- Rod method for very small sample volumes
- Density measurement of liquids

Optional accessories

- Various thermostat jackets with built-in magnetic stirrer
- Temperature sensor for direct measurement of sample temperature
- Various rings and plates
- Thermostats for different applications
- Density determination set, consisting of special holder and immersion body

Overview of standards (selection)

The measurements can be adapted to comply with the following standards:

ASTM D 0971	Standard test method for interfacial tension of oil against water by the ring method
ASTM D 1331	Standard test method for surface and interfacial tension of solutions of surface active agents
ASTM D 1417	Standard method of testing rubber latices (synthetic)
ASTM D 1590	Standard test method for surface tension of water
DIN 53914	Prüfung von Tensiden: Bestimmung der Oberflächenspannung
DIN EN 14210	Grenzflächenaktive Stoffe - Bestimmung der Grenzflächenspannung von grenzflächenaktiven Lösungen mittels Bügel- oder Ringverfahren
DIN EN 14370	Grenzflächenaktive Stoffe Bestimmung der Oberflächenspannung
ISO 1409	Plastics/rubber - Polymer dispersions and rubber latices (natural and synthetic) - Determination of surface tension by the ring method
ISO 304	Surface active agents - Determination of surface tension by drawing up liquid films
ISO 6889	Surface active agents - Determination of interfacial tension by drawing up liquid films
Amtsblatt der EU	Oberflächenspannung L251/37 (1984)
OECD 115	OECD Guideline for the testing of chemicals - surface tension of aqueous solutions



<http://www.kruss.de>

KRÜSS GmbH
Wissenschaftliche Laborgeräte
Borsteler Chaussee 85-99a
22453 Hamburg / DE
Tel.: +49 - 40 - 51 44 01 - 0
Fax: +49 - 40 - 51 44 01 - 98
E-Mail: info@kruss.de

KRÜSS GmbH
Bâtiment Kerria - Entrée 3, Silic 605
14 avenue du Québec
91140 Villebon-sur-Yvette / FR
Tel.: +33 - 1 - 60 14 94 94
Fax: +33 - 1 - 60 14 95 48
E-Mail: info@kruss.fr

KRÜSS Surface Science Centre
School of Chemistry
University of Bristol
Bristol BS8 1TS / UK
Tel.: +44 - 117 325 0257
Fax: +44 - 117 325 0258
E-Mail: info@kruss.co.uk

KRÜSS USA
1020 Crews Road, Suite K
Matthews, NC 28105 / US
Tel.: +1 - 704 - 847 8933
Fax: +1 - 704 - 847 9416
E-Mail: info@kruss-usa.com