The thermal conductivity analysor **HLC A206** for the production-area and stock-receipt measures thermal conductivity and thermal resistance of 200*200mm plateform insulation materials.

Like all **HLC**-devices this stand-alone unit has to be connected on a standard 230Vac-socket only and needs no water-connection and stands out for easy handling also.

According standards

EN12667:2001
EN1946-3:1999
ISO8301

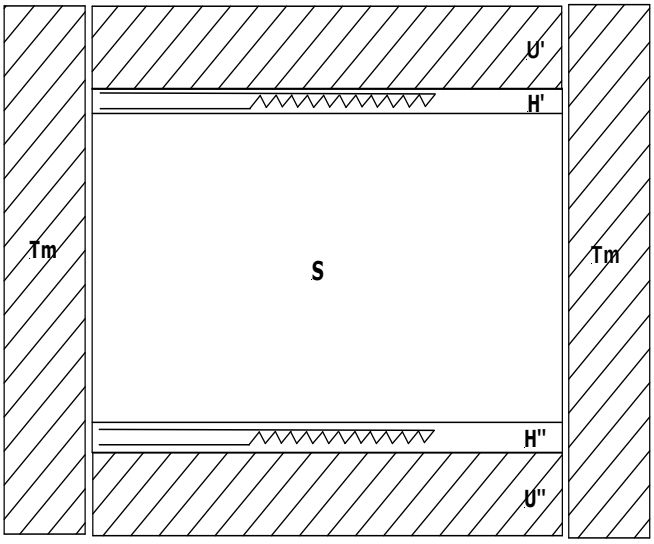
the instrument measures the thermal transfer properties under steady-state conditions of
200*200mm plateform insulation materials
with a thickness of 15...60mm

in meas-ranges of ...
thermal resistance R up to 12m²*K/W
transfer factor τ resp. thermal conductivity λ 5...200mW/(m*K)

By electromotoric positioning
- not only soft insulation materials with automatic distance-positioning
- but also compact foam materials by using the pressure-position-mode on 100N

can be analyzed under exact repeatability conditions.

The relative meas methode was realized with two sensitive heat flow sensors (symmetrical configuration) for a mean temperature of 23°C. With a non metering edge-area of each 50mm up to 60 mm thick insulation materials can be measured at ambient temperature 23°C.



Symmetrical configuration

H''	heat plate	U''	cool plate
H', H''	heat flow meter		
S	sample		
T_m	controlled mean temperature		

Construction

The heat and cool cupper plate is exactly temperatured with a PI-regulated peltier-element on 15°C resp. 31°C. The peltier-units of both secondary sides are against-temperatured with a powerful liquid circulation.
On both plate surfaces are sensitive heat flow sensors adapted..

Through a servo-electronic the lower cool-plate with inserted sample is driven against upper heat-plate. Fixed in the center of the springy cool-plate a linear-measurement-system for automatic thickness registration is installed, a pressure switch under cool plate limits the servo-controlled pressure at 100N.

An independent **HLC A206**-electronic with power supplies for the temperatures control systems and sensor signal read-out is integrated. On a connected PC or Laptop *WINDOWS*-software **WinHLT#** calculates in Online-mode all meas values, which will be displayed in tables and graphic diagrams on desctop.

Features

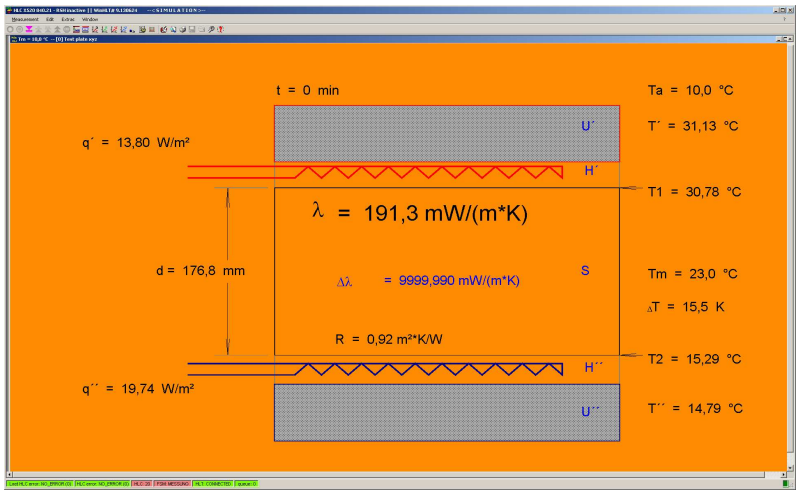
With the Lambda-range until 200mW/(m*K) all conventional insulation materials are measurable, also plates with metallic cover. In consequence of the thermal hemispherical emittance > 0,8 this analyser is for low density materials especialy qualified.

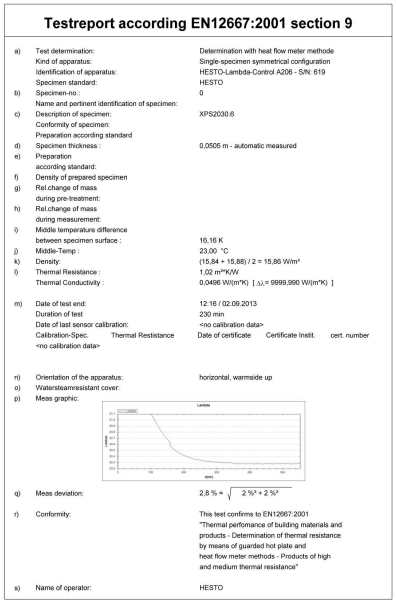
Calibration of the relative measurement is factory-set with several calibration-samples determined per **ISO8302**. With own calibration material, the user can always rapidly and simply test the adjustment.

The instrument needs no special requirements and can be used continuously. When a several day stop occurs, a Standby-mode with switched-off power-consumption can be selected.

WINDOWS-Software WinHLT#

With **HLC A206** supplied WINDOWS-software **WinHLT#** runs under *MS-WINDOWS XP / WINDOWS7*. It records, calculates and archives meas data.





Testreport according EN12667:2001 section 9

a)	Test determination:	Determination with heat flow meter methode
	Kind of apparatus:	Single-specimen symmetrical configuration
	Identification of apparatus:	HESTO-Lambda-Control A206 - S/N: 619
	Specimen standard:	HESTO
b)	Specimen-no.:	0
	Name and pertinent identification of specimen:	
c)	Description of specimen:	XPS2030.6
	Conformity of specimen:	
	Preparation according standard	
d)	Specimen thickness :	0,0505 m - automatic measured
e)	Preparation according standard:	
f)	Density of prepared specimen	
g)	Rel.change of mass during pre-treatment:	
h)	Rel.change of mass during measurement:	
i)	Middle temperature difference between specimen surface :	16,16 K
j)	Middle-Temp :	23,00 °C
k)	Density:	(15,84 + 15,88) / 2 = 15,86 W/m²
l)	Thermal Resistance :	1,02 m²K/W
	Thermal Conductivity :	0,0496 W/(m*K) [Δλ = 9999,990 W/(m*K)]
m)	Date of test end:	12:16 / 02.09.2013
	Duration of test	230 min
	Date of last sensor calibration:	<no calibration data>
	Calibration-Spec. Thermal Resistance	Date of certificate Certificate Instit. cert. number
	<no calibration data>	
n)	Orientation of the apparatus:	horizontal, warmside up
o)	Watersteamresistant cover:	
p)	Meas graphic:	
q)	Meas deviation:	2,8 % = $\sqrt{2\,\%^2 + 2\,\%^2}$
r)	Conformity:	This test confirms to EN12667:2001 "Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance"
s)	Name of operator:	HESTO

With end of measurement the program automatically prints the test report, which is an important request of **EN12667:2001**; additional test declarations for this report will be insert in remanent text-fields. **WinHLT#** stores all these data as a data-set in a table-file on the hard-disc also.
The automatic run will be moderate with meas-menus and grafic diagrams, variable keys leading errorfree to several menues for different modes and parameters. All modes keep stored after meantime analyser or PC power-off also (means an interrupted measurement in this case will continue automatically).

So with unchanged meas-mode normal operation is restricted with inserting sample material into the measurement chamber and pushing the start-key.
WinHLT# includes several language-variants: actual german, english, french, spanish, italian and polish.

Prinzip and method of operation

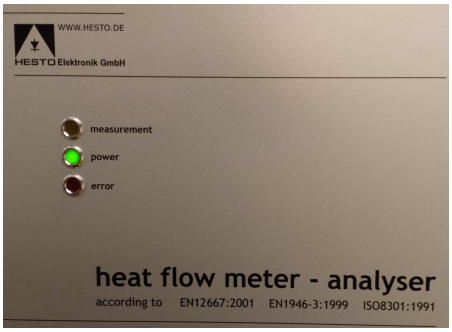
After the specimen was insert and "start"-button was pushed the measurement chamber will be closed by electromotoric positioning while a linear-measurement-system (solution 0,05mm) automatically registrade the thickness. On the upper specimen surface a cupper-plate is exactly temperatured on 31,0°C with a PI-regulated Peltier-element. An equal unit temperatures the lower specimen surface on exact 15,0°C. Two sensitive heat flow sensors are integrated on both plate surface.
HLC A206 transfers the meas-values to the PC. With the adjust-parameters (stored on hard-disc) **WinHLT#** calculates as follows:

Sign	*Size*	*Unit*
R	thermal resistance	m²*K/W
λ	thermal conductivity	W/(m*K)
A	sensitive area	m²
d	average thickness	m
T_1	temperature hot side	K
T_2	temperature cold side	K
Φ	heat flow rate	W

$$R = \frac{A * (T_1 - T_2)}{\phi}$$

$$\lambda = \frac{\phi * d}{A * (T_1 - T_2)}$$

The necessary physical thermal balance (means steady-state condition) is ready, if both heat flux sensors deliver stable and similar signals. This status is indicated on the desctop and with a blinking LED "measurement" on **HLC A206** front. If operator finish measurement via select in menu now, chamber opens electromotorically and moves out specimen. **WinHLT#** print out the test report (as pdf and/or on a connected printer) and stores final meas data as a data-set on hard-disc.



3 year guarantee and manufatorer direct-service

The instrument needs no special requirements and is designed for continuous operation time. Produced in Germany near Frankfurt/Main, the reliability and durability is protected with a **3-year guarantee**. In service-case the manufactorer helps fast and direct.

Inspection and Cleaning Service

Quality assurance according to **EN ISO9000 ff.** is standard in the insulation industry. The accordance standard prescribes as an elemental condition a cyclic check with certification of the test equipments. Accomplish to this demand we offer for **HLC A206** a low-price and fast inspection/cleaning service inclusive acceptance-protocol with meas date, results and links to used reference materials.

Optional automatic Sample-Handling-System **RSH2**

With the automatism specimen-handler option **RSH2** the analyser **HLC A206** becomes a fully automatic meas-system. An industrial robot picks measured plates out of meas-chamber and puts it on a storage-stack, thereafter he gets next to be measured plate from a pick-up-stack and brings it into analyser. So one after another could be measured without any manual intervention stacked specimens between 15...60mm thickness in size 200*200mm. Specimens with Barcode on an adhesive label will be identified with a included reader-unit and last meas-data together with barcode-number and -text will automatically stored on end of measurement as a data-set in a file on PC harddisc.

General Specifications **HLC A206**

Construction accord. **ISO8301**	Single-specimen symmetrical configuration, heat flow meter on heat- and cold-plate each
Specimen thickness automat. Meassystem	15 to 60mm (according to **EN1946-3:1999**) incremental Linear-Measurement; Display Solution 0,1mm
Specimen size, weight	200*200 mm, max. 1,5kg
Case sensitive area	each 100mm
Width of non metering area	each 50mm
Measurement-Range	**λ** (***T***) 5...200mW/(m*K); additional calculation + display of λ_{10} value according **EN10456** **R** up to 12m²*K/W
Accuracy	< ± 3% at 23°C ambient temperature
Repeatability	< ± 1%
Mean temperature	**23°C**, ±1°C
Temperature hot plate	31,0°C < ± 0,1°C
Temperature cool plate	15,0°C < ± 0,1°C
Ambient temperature	23°C, ±1°C
Positioning	electromotoric, distance selectable from 15,0 to 60,0mm; selectable pressure positioning with 100N
Meas time	about 20 minutes for 20mm thickness;for thicker material up to several hours until steady-state condition
Warmup time	about 120 minutes after power-on
PC-Interface	USB2.0
Power Requirements	230V/50Hz about. 300W
Instrument Size	600* 750*600mm (B*H*D)
Noise	about 40dB
Instrument Weight	about 100kg
Delivery scope	analyser **HLC A206** with power- and pc-interface-cable, a XPS/EPS test sample for cyclic check of analyser ("Internal control"), pc-software **WinHLT#** (pc is not part of standard delivery)