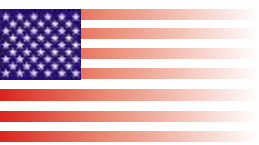


LINSYS



thermal analysis
with **out** limits



LINSEIS

TA

LINSYS - THERMAL ANALYZER

LINSEIS 5 in 1

The most complete Thermal Analyzer on the Market

The TGA, DSC, DTA, TMA, DIL Analyzer from LINSEIS combines all these features in one instrument. Furthermore interchangeable furnaces, an integrated gas- and atmosphere control are available.

The most complete Thermal Analysis system on the market, with unbeaten performance.

Temperature Range

The widest temperature range -150... 2400°C on the market.

All in one Structure

The only thermal analyzer in the market that can measure: DSC, TGA, DTA, TMA, DIL (no need of exchanging measuring systems) at once. The different modules are built around the same structure and do not have to be interchanged.

Physical Properties that can be measured

THERMAL ANALYSIS

- A group of techniques in which a property of the sample is monitored against time or temperature while the temperature of the sample, in a specified atmosphere, is programmed.

Single or Multiple Furnace option

It is possible to use a second furnace to undertake simultaneous measurements. This option prevents the time-consuming change of measurement systems and furnaces, leaving even more time for measurements.

Measurement Precisions

All Linseis Modules guarantee highest accuracy and reproducibility.

Name	Measurement	Object	Unit
DTA	Differential Thermal Analysis	Temperature Difference	°C μ V*
DSC	Differential Scanning Calorimetry	Thermal Flow	W=J/sec
TG	Thermogravimetry	Mass	mg
TMA	Thermomechanical Analysis	Length	μ m
DIL	Thermodilatometry	Expansion	μ m

*The electromotive force of the thermocouple is output directly.

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LINSEIS 5 in 1

DTA

The DTA Technique employs a block that can be heated and cooled at a constant rate. This block contains the substance to be investigated and an inert reference material. In order to detect reactions in the substance during heating or cooling, the temperature difference between the sample and the reference is measured by a thermocouple.

DSC

A technique in which the temperature of the sample unit, formed by a sample and reference material, is varied in a specified program and the temperature difference between the sample and the reference material is measured as a function of temperature.

TGA

A technique in which the mass of the sample is monitored against time or temperature while the temperature of the sample, in a specified atmosphere, is programmed.

TMA

A technique in which a deformation of the sample under non-oscillating stress is monitored against time or temperature while the temperature of the sample, in a specified atmosphere, is programmed. The stress may be compression, tension, flexure or torsion.

DIL

"A technique in which a dimension of a substance under negligible load is measured as a function of temperature while the substance is subjected to a controlled temperature program"

LINSYS - THERMAL ANALYZER

LINSEIS 5 in 1



The seven different LINSYS Models available are

	<i>Temperature Range</i>
LINSYS CRYO	-150 to 500°C
LINSYS 10	RT to 1000°C
LINSYS 14	RT to 1400°C
LINSYS 16	RT to 1600°C
LINSYS 18	RT to 1750°C
LINSYS 20	RT to 2000°C
LINSYS 24	RT to 2400°C

Optionally the system can be ordered with two different furnaces to increase the flexibility and speed of measurements.

Multi-furnace System

The LINSYS thermal analyzer is normally equipped with one furnace. Nevertheless this can be upgraded to a multi-furnace system to provide the maximum flexibility and user-friendliness.

Vacuum and controlled atmosphere

The system design supports highest vacuum (10E-5mbar), inert, flowing or humidified atmosphere. Corrosive conditions can be analyzed with proper precautions. The system is capable of adapting residual gas analysis systems using an optional heated capillary.

Coupling Option

MS (mass-spectrometer) and FTIR spectrometer couplings can be added to receive unique additional information

LINSYS - THERMAL ANALYZER

LINSEIS 5 in 1

LINSEIS® Software

All LINSEIS thermo analytical instruments are PC controlled. The individual software modules exclusively run under Microsoft® Windows® operating systems. The complete software consists of 3 modules: temperature control, data acquisition and data evaluation. The 32 bit software incorporates all essential features for measurement preparation, execution, and evaluation of a Thermo gravimetric measurement. Thanks to our specialists and application experts, LINSEIS was able to develop comprehensive easy to understand user friendly application software.

Features Software

- Program capable of text editing
- Data security in case of power failure
- Thermocouple break protection
- Repetition measurements with minimum parameter input
- Evaluation of current measurement
- Curve comparison up to 32 curves
- Storage and export of evaluations
- Export and import of data ASCII
- Data export to MS Excel
- Multi-methods analysis
- Zoom function
- 1 and 2 derivation
- Programmable gas control
- Statistical evaluation package
- Free scaling

TG Features

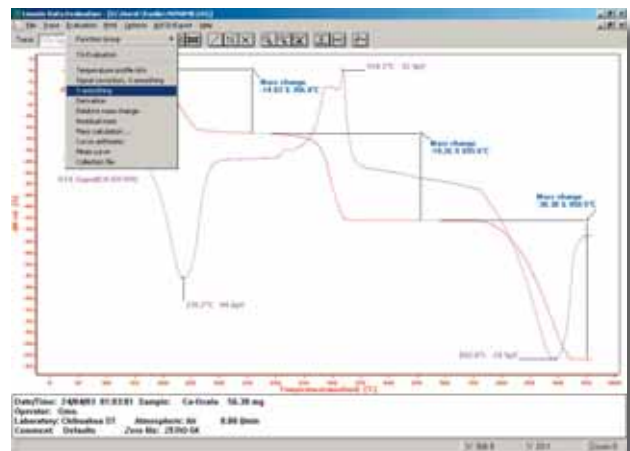
- Mass change as % and mg
- Rate Controlled Mass Loss
- Evaluation of mass loss
- Residue mass evaluation

DSC/DTA Features

- Glass transition temperature
- Curve subtraction
- Complex peak evaluation
- Multipoint calibration for sample temperature
- Multipoint calibration for change of enthalpy
- Cp calibration for heat flow

DIL/TMA Features

- Rate Controlled Sintering (RCS) software
- Interchangeable Thermocouples for various atmospheres
- Sinter process evaluation
- Glass transition and softening point evaluation
- Signal-steered measuring procedures
- Softening point determination and system shut down
- Linear thermal expansion evaluation
- Several system correction features
- Automatic zero point adjustment
- Auto-scheduler for up to 16 uninterrupted runs



LINSYS - THERMAL ANALYZER

LINSEIS 5 in 1

LINSYS TGA -150 to 2400°C

Depending on your requirements there are two balances for high resolution and maximum temperature range. Both modules benefit from LINSEIS' long-term experience. Many different sample holders' in different dimensions are available. Since one of the beneficial features of these systems is the large sample weight (up to 25 grams), one clearly has an advantage, when evaluating heterogeneous samples. The balance design supports highest vacuum (10E-5mbar), inert, flowing or humidified atmosphere.

	<i>Resolution</i>	<i>RMS Noise</i>	<i>Temperature</i>
TG Platinum	0.5uW	<1uW	-150 to 1650°C
TG L81	1uW	<1.5uW	-150 to 2400°C

TG Platinum

The TG Platinum balance was specifically designed to enable measurements with highest accuracy and lowest baseline drift. Furthermore the system enables superb reproducibility and easy handling.

- High capacity
- High resolution
- High vacuum

TG L81

This research type balance was developed for a very broad temperature range. It has a very good reproducibility and low baseline drift.

- High temperature
- High vacuum
- High capacity

LINSYS DSC and DTA

Many different DTA and DSC measuring systems are available, depending on the temperature range of interest. This guarantees highest resolution within the temperature range of interest.

DSC Measuring Systems

<i>DSC</i>	<i>Temperature Range</i>
DSC Cryo	-150 to 500°C
DSC 08	800°C
DSC 16	1550°C
DSC 18	1750°C

- Measurements up to 1750°C
- Cp measurements
- Many different crucibles

DTA Measuring Systems

<i>DTA</i>	<i>Temperature Range</i>
DTA Cryo	-150 to 500
DTA 10	1000°C
DTA 16	1600°C
DTA 18	1750°C
DTA 20	2000°C
DTA 24	2400°C

- Measurements up to 2400°C
- Many different crucibles

LINSYS - THERMAL ANALYZER

LINSEIS 5 in 1

Many different TMA and DIL measuring systems are available, depending on the temperature range of interest. This guarantees highest resolution within the temperature range of interest.

TMA Measuring System

Measuring Range	-150 up to 2400°C
Resolution	0.2nm
Noise (RMS)	3.5nm
Measuring Range	+/- 250mm
Force	0.01 to 1N
Frequency	0.01 to 1Hz

DIL Measuring System

Measuring Range	-150 up to 2400°C
Resolution	0.2nm
Noise (RMS)	3.5nm

Some Technical Features

LINSYS

Temperature Range (°C)

Resolution

RMS Noise

Sample Size

Crucible Volume

DTA

DSC

Some Technical Data

TGA

TMA

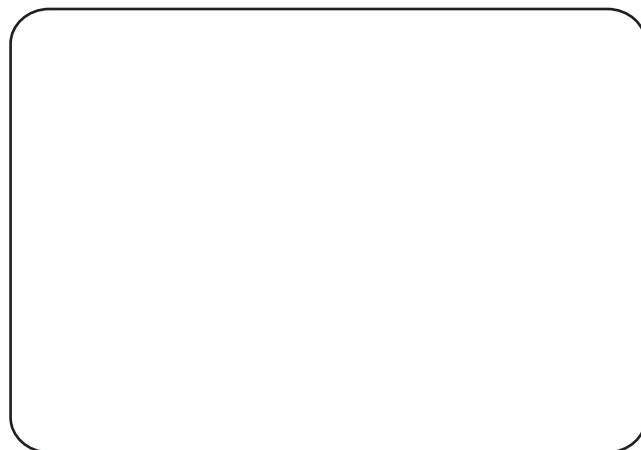
DIL

-150 - 500	-150 - 500	-150 - 500	-150 - 500	-150 - 500
RT - 1000	RT - 1000	RT - 1000	RT - 1000	RT - 1000
RT - 1400	RT - 1400	RT - 1400	RT - 1400	RT - 1400
RT - 1600	RT - 1600	RT - 1600	RT - 1600	RT - 1600
RT - 1750	RT - 1750	RT - 1750	RT - 1750	RT - 1750
RT - 2000	-	RT - 2000	RT - 2000	RT - 2000
RT - 2400	-	RT - 2400	RT - 2400	RT - 2400
0.05uV	0.3uW	0.5ug	0.2nm	0.2nm
-	4uW	<1ug	3.5nm	3.5nm
-	-	-	-	-
-	-	-	-	-

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