

LINSEIS

pushing boundaries



**MEGA
LAB**

Tel. 2310855844, 2106452848

Email. contact@megalab.gr

www.megalab.gr

TGA L81

Thermo **Gravimetric Analyzer**



WWW.LINSEIS.COM



Since 1957 LINSEIS Corporation has been delivering outstanding service, know-how and leading innovative products in the field of thermal analysis and thermo-physical properties.

Customer satisfaction, innovation, flexibility, and high quality are what LINSEIS represents. Thanks to these fundamentals, our company enjoys an exceptional reputation among the leading scientific and industrial organizations. LINSEIS has been offering highly innovative benchmark products for many years.

The LINSEIS business unit of thermal analysis is involved in the complete range of thermoanalytical equipment for R&D as well as quality control. We support applications in sectors such as polymers, chemical industry, inorganic building materials, and environmental analytics. In addition, thermophysical properties of solids, liquids, and melts can be analyzed.

Rooted in a strong family tradition, LINSEIS is proudly steered into its third generation, maintaining its core values and commitment to excellence, which have been passed down through the family leadership. This generational continuity strengthens our dedication to innovation and quality, embodying the essence of a true family-run business. LINSEIS provides technological leadership. We develop and manufacture thermoanalytical and thermophysical testing equipment to the highest standards and precision. Due to our innovative drive and precision, we are a leading manufacturer of thermal analysis equipment.

The development of thermoanalytical testing machines requires significant research and a high degree of precision. LINSEIS Corp. invests in this research to the benefit of our customers.

C L A U S L I N S E I S
C E O D I P L . P H Y S .



To strive for the best due diligence and accountability is part of our DNA. Our history is affected by German engineering and strict quality control.

We want to deliver the latest and best technology for our customers. LINSEIS continues to innovate and enhance our existing thermal analyzers. Our goal is to constantly develop new technologies to enable continued discovery in Science.



*engineering
innovation*

Linseis Service



Customized Solutions - The Linseis Advantage

At Linseis, we believe that every measurement challenge is unique — and so should be your instrument.

While many suppliers rely on standardized configurations, Linseis distinguishes itself through exceptional flexibility and the capability to deliver customer-specific adaptations in record time.

Our experienced engineering teams work hand in hand with you to design and implement fully customized solutions that meet your precise application requirements — whether that means a unique sensor configuration, an extended temperature range, or a specialized software integration.

With decades of experience and a modular product architecture, we turn customization into a standard service — fast, efficient, and reliable.

Choose Linseis and experience what true flexibility in thermal analysis and material characterization means.

Contact form





Service & Support

Redefining Ownership

When investing in analytical instrumentation, long-term value matters just as much as precision. That's why Linseis systems are engineered to deliver the lowest Total Cost of Ownership in their class — combining reliability, efficiency, and flexibility in every detail.

Our instruments are built with robust, high-quality components designed for longevity and minimal maintenance. This means fewer service interventions, shorter downtimes, and reduced operating costs over the entire product lifetime. Intelligent software updates and remote support further ensure that your system remains state-of-the-art, even years after installation.



Thermogravimetric Analyzer

Thermogravimetry measures the weight change of a sample as a function of temperature or time under controlled atmosphere. The precise measurement of mass changes with the TGA L81 improves productivity and provides clear insights into material behavior.

The **LINSEIS TGA L81** is a reliable thermogravimetric analyzer designed for robust performance and high accuracy. Its precision microgram balance provides exceptional sensitivity and resolution, making it an ideal choice for routine laboratory quality control and academic applications.



Advantages of LINSEIS TGA L81

- Precise temperature control
- Fast heating/cooling rates
- Atmosphere control
- High sensitivity
- Automation options
- Expanded analysis

Features of the TGA L81 Furnace

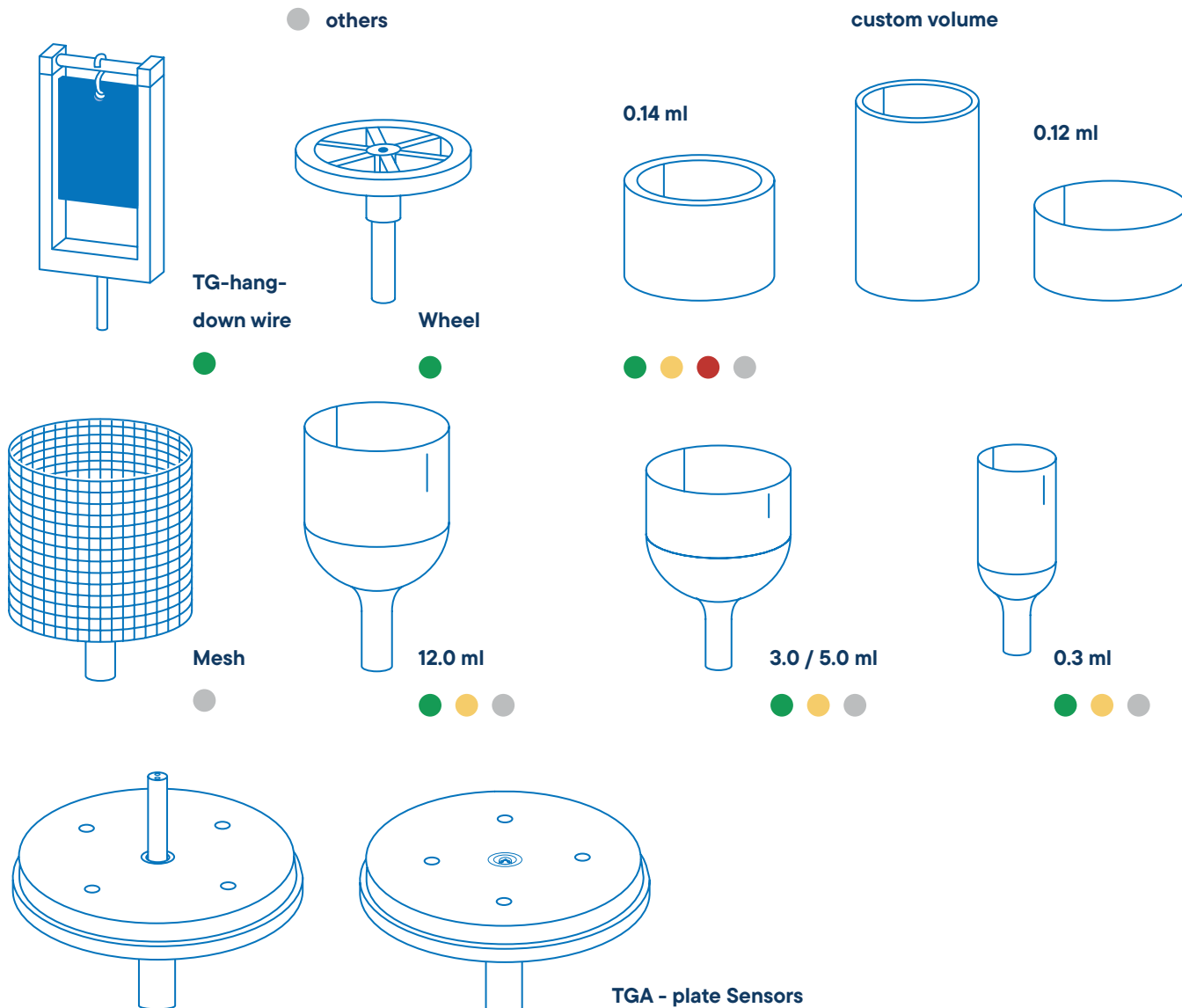
- Innovative top-loading system
- Enhanced heating and cooling performance
- Precise thermal management
- Adaptable sample handling
- Rapid cooling capability

Sensors

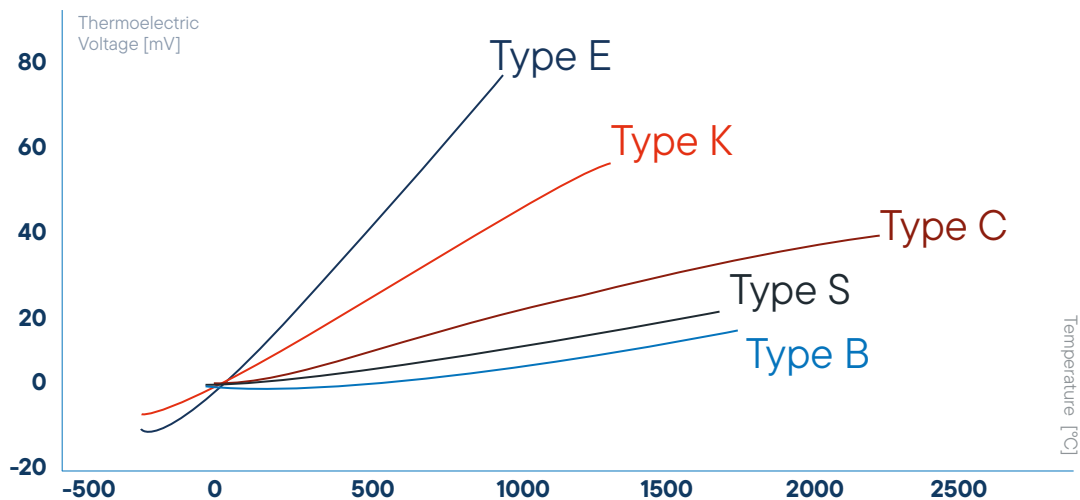
The Linseis TGA can be equipped with an unmatched amount of different user exchangeable TG sensors. Each sensor is available with different thermocouples to provide the highest sensitivity for the desired temperature range and application. Additionally, there are multiple crucible types available that enables the user to find the matching combination for his application.

TGA

- Al₂O₃
- Platinum
- Aluminium
- others



Best possible sensitivity for every application



Thermocouple types:

- Type E** (Chromel)
Constantan: -50 °C up to 900 °C
- Type K** (Chromel)
Alumel: -180 °C up to 1100 °C
- Type S** (Platinum-Rhodium/10%)
Platinum: 0 °C up to 1600 °C
- Type B** (Platinum-Rhodium/30%)
Platinum-Rhodium (6%): 25 °C up to 1800 °C
- Type C** (Tungsten/5%)
Rhenium: Tungsten (26%)
Rhenium: 20 °C up to 2300 °C

All sensors available with the thermocouples illustrated. LINSEIS sensor combinations cover the broadest temperature range in the market (-180 °C up to 2400 °C).

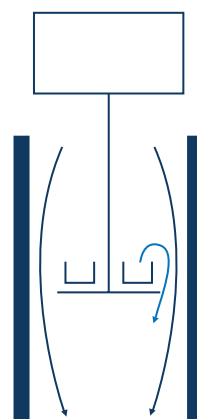
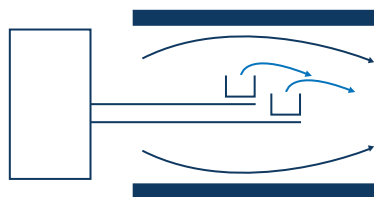
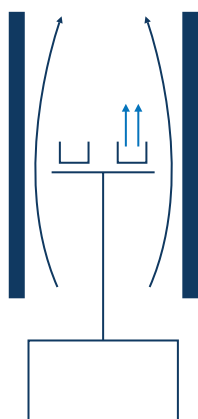
Furnace Programm

Temperature	Type	Element	Atmosphere	TC-Type
-70°C - 400°C	L81/264/RCF	HangDown only Intracooler / Kanthal	inert, oxid., red., vac.	K
-150°C - 500°C	L81/264/500	Kanthal	inert, oxid., red., vac.	K
-150°C - 700°C	L81/264/700	Kanthal	inert, oxid., red., vac.	K
-150°C - 1000°C	L81/264/1000	Kanthal	inert, oxid., red., vac.	K
RT - 1000°C	L81/220 AC	SiC	inert, oxid., red., vac.	K
RT - 1600°C	L81/240 AC	SiC	inert, oxid., red., vac.	S
RT - 1750°C	L81/250	MoSi ₂	inert, oxid., red., vac.	B
RT - 2000°C	L81/260/G/2000	Graphite	inert, red., vac.	C
RT - 2400°C	L81/260/G/2400	Graphite	inert, red., vac.	Pyrometer
RT - 2800°C	L81/260/G/2800	Graphite	inert, red., vac.	Pyrometer
RT - 2400°C	L81/260/T	Tungsten	inert, red.	C
RT - 1000°C	L81/200	Glow igniter	inert, oxid., red., vac.	S/K

Benefits of the vertical top loading design

The vertical “sample on top” design of the LINSEIS thermo-balance provides highest possible accuracy due to a stable position of the sample and easy sample handling.

TGA/ STA PT 1000/1600



Vertical system (sample on top) LINSEIS configuration

Advantages:

- Easy sample handling
- Easy exchange of sample holder
- Stable position of the sample in the furnace

Disadvantage:

- Complicated construction

Horizontal system

Advantages:

- Small buoyancy effects

Disadvantages:

- Very difficult sensor exchange
- Difficult sample handling
- Very high purge gas rate required
- Problems due to sensor expansion during heating/cooling

Vertical system (sample on bottom)

Advantage:

- Stable position within furnace

Disadvantages:

- Difficult sensor exchange
- “Dangerous” gas flow within balance housing (sample gets blown out)
- Sensor position depends on sample weight

Inno

solut



innovative

tions



New features

Electronic Upgrade

The new measuring electronics offer significant performance improvements, inspired by the architecture of the „Linseis Digital Balance“. The benefits of this new digital balance architecture include:

- **Minimization of drift:** Ensures consistently high precision over long periods of time.
- **Improved resolution:** Unique sub-microgram resolution.
- **Highest accuracy:** Improves the reliability of your measurement results.
- **Reproducibility:** Ensures consistent results with repeated measurements.

Linseis Lab Link

With Linseis Lab Link, we offer an integrated solution to address uncertainties in measurement results. With direct access to our application experts via the software, you can get advice on the correct measurement procedure and evaluation of results. This direct communication ensures optimal results and maximizes the efficiency of your measurements for precise analysis and research as well as a smooth process flow.

Software Improvements

- **Lex Bus Plug & Play:** Our latest hardware interface Lex Bus revolutionizes the way data communicates within our systems. Lex Bus enables seamless and efficient integration of new hardware and software tools.
- **Improved furnace control:** Our new and further improved furnace control offers a faster heating and cooling as well as more precise temperature control, which leads to better measurement results through better temperature sequencing according to your wishes and requirements.
- **New software with user interface:** Our communication is now even more focused on the needs of our customers to ensure that you are always informed of the latest status and receive support whenever it is needed.
- **Process security:** We have optimized our software for process security to ensure that your data is protected at all times and processed in a fail-safe manner.
- **Error messages and bug fixes:** Our system automatically detects errors and bugs, which are immediately documented and fixed to minimize downtime.
- **Automatic updates and new features:** Our software receives regular automatic updates that not only improve security, but also continuously provide new features.
- **Permanent system monitoring:** Our software constantly monitors the system parameters to ensure optimum performance.
- **Preventive maintenance and problem detection:** Our preventive maintenance approach detects problems and wear and tear before they can cause damage and keeps your device in top shape.



Design Improvements

The new device design is characterized by an elegant aluminum casing that is both robust and aesthetically pleasing. The LED status bar provides a user-friendly visualization of important information. A touch panel enables intuitive operation and contributes to a modern user experience that combines comfort and functionality. The new device design focuses on ergonomic operation.

Unique features

Automatic Evacuation

The devices feature a built-in automatic evacuation capability, ensuring efficient processes and smooth operation.

Vacuum and controlled atmosphere

- Supports high vacuum, inert, reducing, oxidizing, or humidified atmospheres
- Optional pressurization up to 5 bar overpressure
- Analysis of certain corrosive conditions with precautions
- Adaptability for residual gas analysis with optional heated capillary

Evolved gas analysis

Optional gas analysis with MS, FTIR, or GCMS is possible, providing valuable additional information. The system can be configured with standalone and integrated MFC for gas dosing. Additionally, customer-specific options such as a heated inlet can also be integrated into the device.

Gas safety system

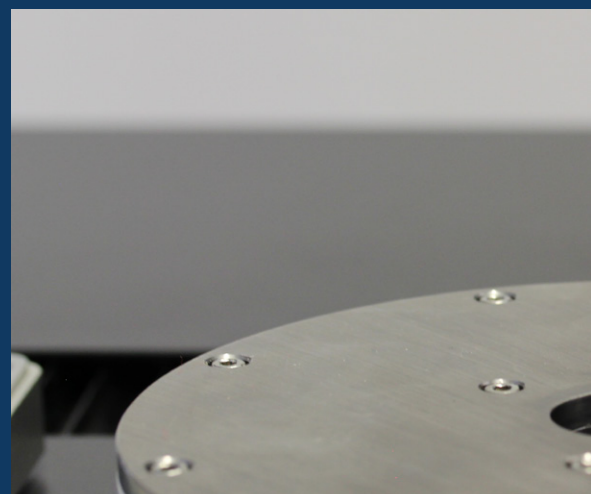
The gas safety system is designed to accommodate various gases such as hydrogen or carbon dioxide, ensuring secure operation and user safety.

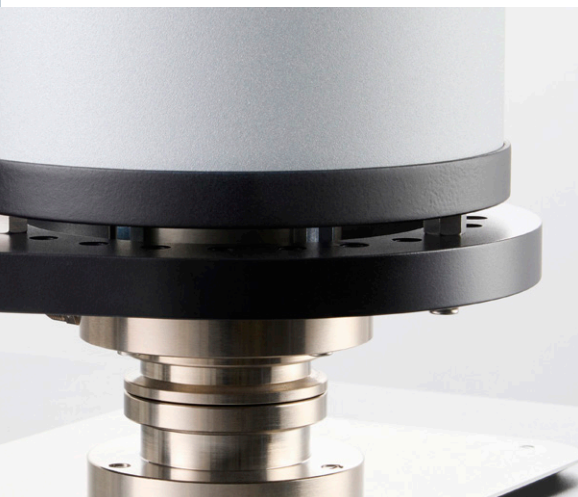
Controlled humidity and water vapour

The device can regulate the humidity and water vapour during the measurement.

Sample robot

Our TGA L81 can be equipped with a proven sample robot for unattended sample measurements for highest throughput.





Wide temperature range -150 °C to 2400 °C

The LINSEIS TGA instruments can be equipped with up to two furnaces at the same time. A broad variety of different furnaces are available to enable measurements in the widest temperature range on the market.

Automatic calibration

We offer an automatic calibration function in the software and hardware. With this function, our TGA automatically calculates a calibration factor, which is also displayed.

Integrated LINSEIS platform

The integrated LINSEIS software offers a comprehensive solution, combining both hardware and software for maximum process security and precision. By providing a unified platform, it ensures seamless integration of components and devices from external partners, resulting in a highly robust system.



Customization

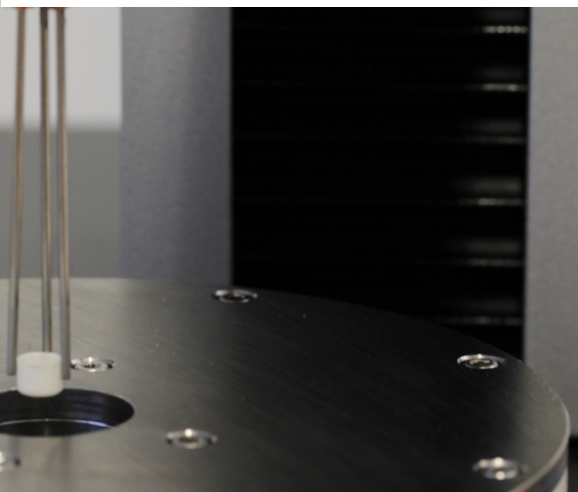
Close collaboration with the customers to tailor unique solutions, leveraging LINSEIS expertise to meet their specific needs.

Service

Our international presence across every continent enables us to deliver the best and fastest service possible.

Accessories starter kit

The accessory starter kit guarantees fast and uncomplicated usage, serving as a complete system for instant application.





Equipment for gas control and safety (H₂, CO, CO₂, etc...)

All Linseis instruments can be prepared for the use in hydrogen atmosphere with just minor adjustments. The most important thing is a safety system that can ensure that there is no leakage and no explosive atmosphere generated outside of the instrument. Therefore, the Linseis safety system uses hydrogen sensors that are coupled to an automatic gas control panel. If there is a leakage or unwanted hydrogen release, the instrument is automatically flooded with inert gas and the hydrogen valves are closed. This ensures a minimum risk level during operation. Besides that, the system contains an optional burn off unit where the gas outlet is connected to, to ensure that also the used gas of the measurement chamber is not just released into the environment. The system can also be operated with several combinations of inert gases and even water vapor besides hydrogen.

In summary, the Linseis safety system comes with the following benefits:

- Automatic evacuation function
- Gas flow control for multiple gases including water vapor and hydrogen
- Emergency shutdown function
- Gas detector system (H₂, CO, CO₂, etc...)
- optional burn off unit
- Continuous monitoring to ensure safe operating conditions



Fig. 1

Linseis equipment for operation under water vapor and controlled relative humidity



For many applications in thermal analysis, the atmosphere plays an important role as it may affect the sample behavior or activate reactions. Humidity influence on building materials, storage time of pharmaceuticals and foods or influence on mechanical properties of polymers are just some of the most common examples. Of course, the Linseis instruments are suitable for such experiments, however there is one fact that is often causing confusion and must be considered carefully: The difference between water vapor and relative humidity.

Relative Humidity Generators are most commonly used for experiments around room temperature, while water vapor applications are most often at higher temperatures. When water is heated to its boiling point or higher than that, the water changes its aggregate form from liquid to gaseous. It is then existing as water vapor (steam). If this steam is introduced into any kind of reaction chamber or instrument, it is called water vapor application. In contrast, every gas can transport and contain a certain amount of water at a given temperature. This is called humidity. Considering air as an example, there is always an amount of water contained in the air, even below the boiling point of water, which is defined as grade of humidity or relative humidity.

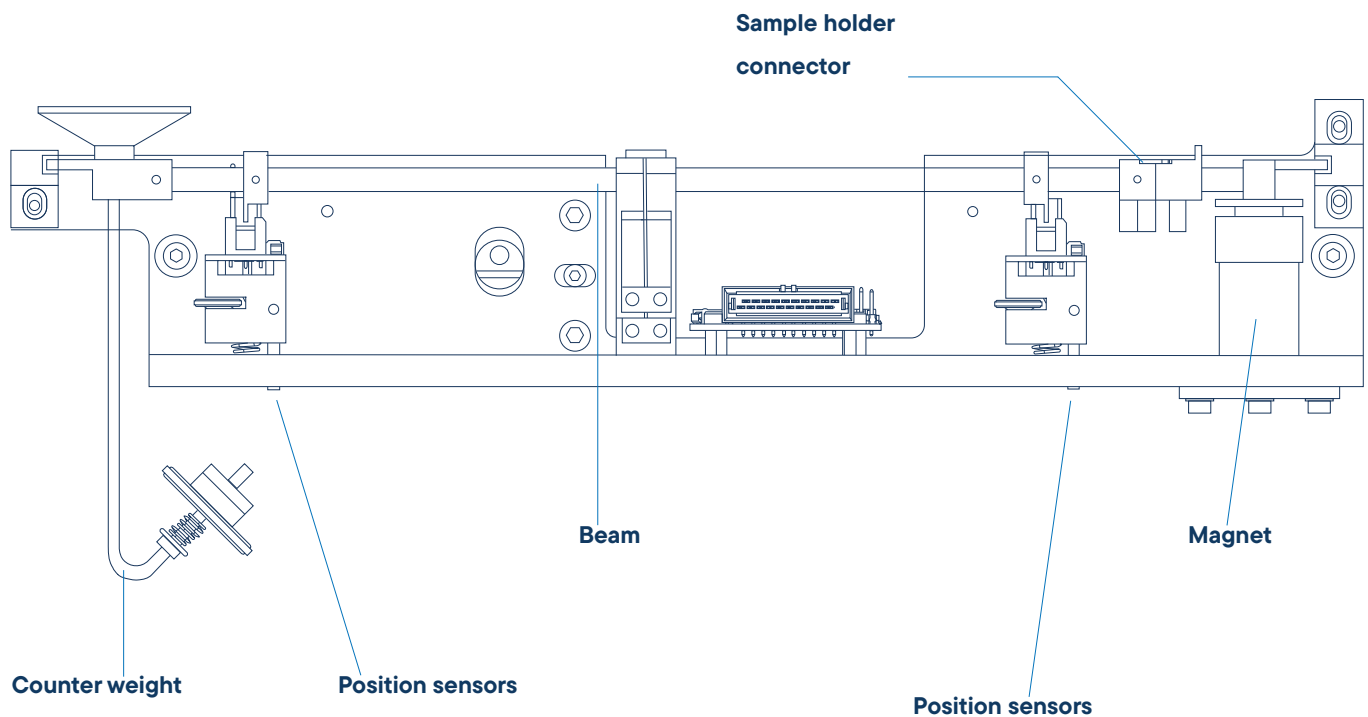


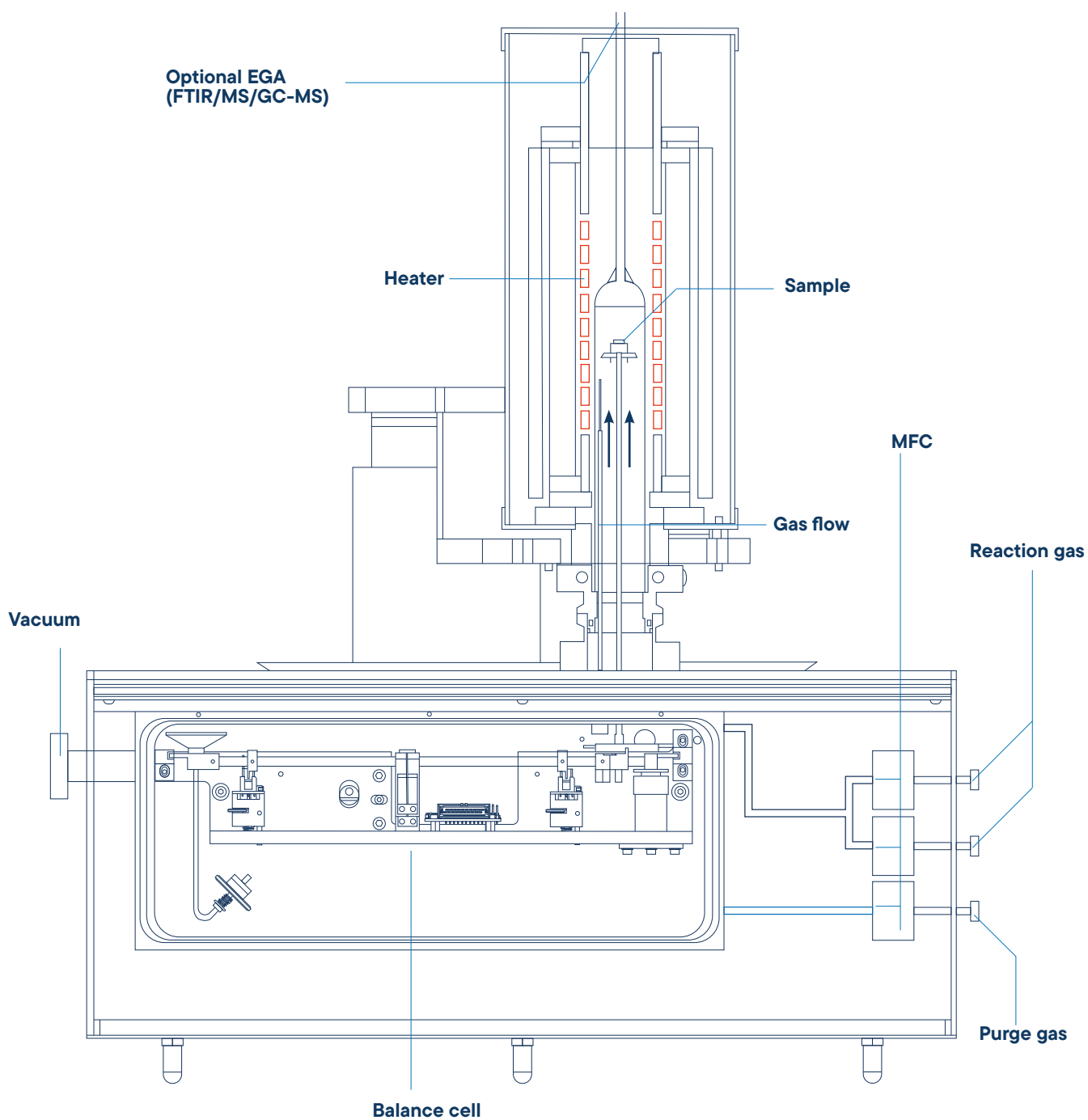
Highest precision beam balance

Our different microbalances are specifically designed to accomplish thermal analysis tasks in the best possible way.

Providing ultra light weight design to follow fast weight changes and symmetric construction for ultra low drift long term measurements.

Linseis micro balance
especially designed for
thermal
analysis instruments





Advantages of LINSEIS balance design

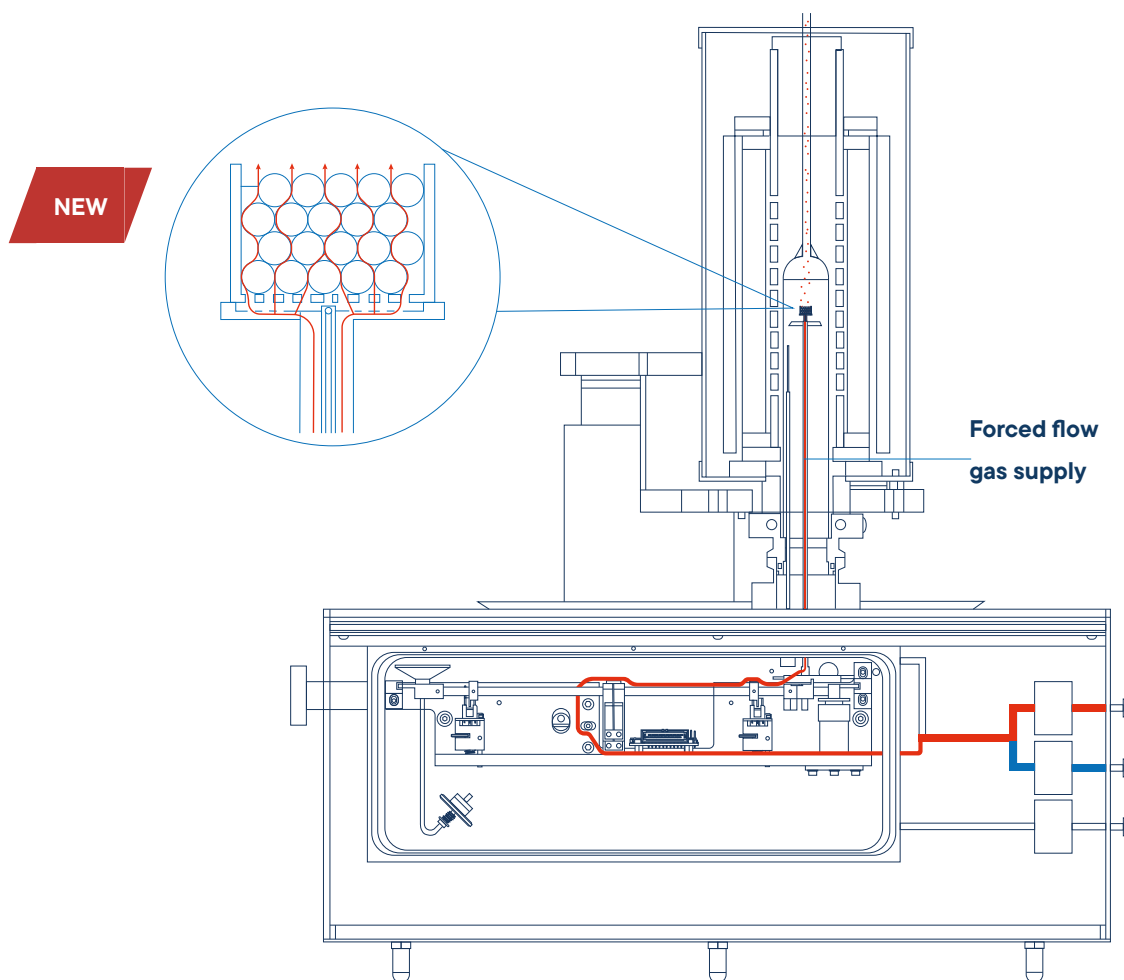
- Sample mass compensation by a counterweight enables improved sensitivity
- Improve symmetrical design for high interference levels
- Not affected by local gravity
- Not affected by thermal fluctuations
- Highest possible PRECISION
- Concept enables easy maintenance
- Depending on model, balance can handle from mg up to 50 g sample mass



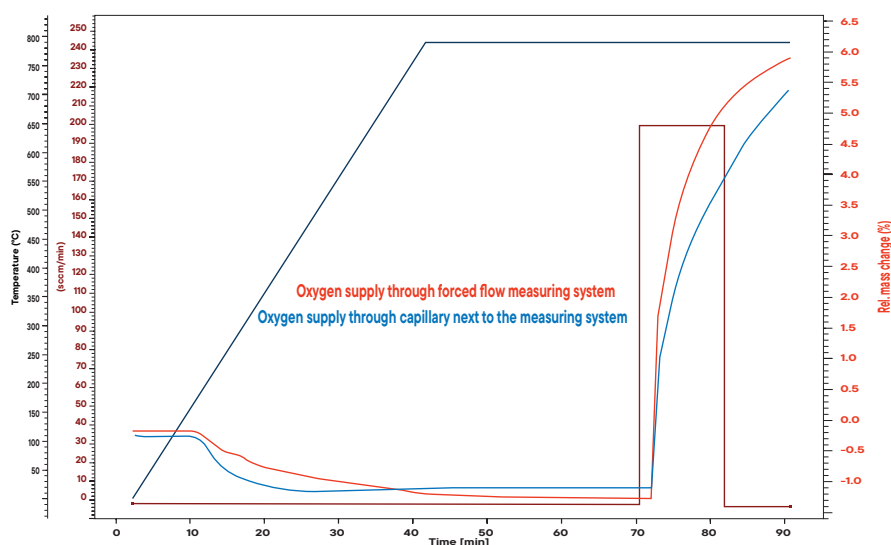
Forced-flow offers several advantages in the investigation of gas/solid phase reactions

Patented (EP 4 632 226 A1)

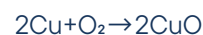
1. Controlled Conditions: Precise control of reaction conditions for a reproducible environment.
2. Faster Reaction Times: Acceleration of slow reactions through continuous flow.
3. Better Mixing: Uniform distribution of reactants for improved reaction kinetics.
4. Continuous Analysis: Enables real-time monitoring and control of the reaction.
5. Scalability: Easier adaptation to different volumes and flow rates for optimized production.



Oxidation rates of copper with different gas supplies



During the oxidation of copper, copper oxide is formed, with reaction speeds depending on the gas supply. The Forced-Flow principle ensures that the gas is quickly and evenly distributed across the entire sample material from the outset. This allows faster reaction rates compared to conventional methods where the gas slowly comes into contact with the sample. The reaction for the formation of copper oxide can be represented as:



The Forced-Flow principle ensures that the oxidizing agent (O_2) reacts rapidly and efficiently with the copper (Cu), leading to accelerated reaction rates.

The image shows a simulated fluidized bed. It is possible to observe the fluidized bed during the reaction using a camera. A fluidized bed is a system where solid particles are kept in motion by a gas stream, enabling intense mixing and efficient reactions. The vigorous movement of the solid material in the fluidized bed reactor ensures uniform distribution and mixing of solid and gas, crucial for efficient chemical reactions.





deliv

outst

set



ering

anding

vice

Software

All LINSEIS thermo analytical instruments are software controlled. The individual software modules run exclusively under Microsoft® Windows® operating systems. The complete software consists of a data acquisition, data evaluation and administration module and incorporates all essentials: features for measurement preparation, execution and evaluation of a thermoanalytical measurement. Thanks to our specialists and application experts, LINSEIS was able to develop comprehensive, easy to understand, user friendly and application driven software.

Features-Software:

- Data security in case of power failure
- Thermocouple break protection
- Repetition measurements with minimum parameter input
- Evaluation of current measurement
- Curve comparison of up to 50 curves
- Storage and export of evaluations
- Export and import in ASCII format
- Data export to MS Excel
- Multi-methods analysis (DSC, TG, TMA, DIL, etc.)
- Zoom function
- 1st and 2nd derivation
- Programmable gas control
- Curve arithmetics
- Statistical evaluation package
- Free scaling
- Automatic calibration
- Optional Kinetic and Lifetime Prediction
- Software packages
- Interface to MS and FTIR

TG – Features:

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





The **LINSEIS Thermal Library** software package comes as an option for the well-known, user friendly LINSEIS LiEAP (Linseis Evaluation and Acquisition Platform) software that is integrated in almost all our instruments.

The Thermal Library allows the sample material identification by comparing the measurement curve with a data base providing thousands of references and standard materials within only 1-2 seconds.

Multi-Instrument

LINSEIS instruments such as DSC, STA, TGA & LFA can be controlled with the same powerful LiEAP software platform.

Report Generator

Convenient template selection to generate customized measurement reports.

Kinetic software

Kinetic analysis of DSC, DTA, TGA, EGA (TG-MS, TG-FTIR) data for the study of the thermal behavior of raw materials and products.

Multi-User

The administrator can generate different user levels providing different rights to operate the instrument. An optional Log file is also available.

Database

State of the art database design enables easy data handling.



Technical Specifications

	TGA L81	
Temperature range	-150 up to 2400 °C	
Vacuum	10 ⁻⁵ mbar (depends on vacuum pump)	
Pressure	up to 5 bar (optional)	
Heating rate	0.01 up to 100 °C/min (depends on furnace)	
Temperature precision	0.01 °C	
Sample robot	optional 42	
TG	1	2
Resolution	0.01 µg	0.02 µg
Sample weight	Balance can read weight automatically automatically	
Measuring range	5 g / ± 2500 mg (mass change)	25 g / ± 2500 (mass change)

Contract testing

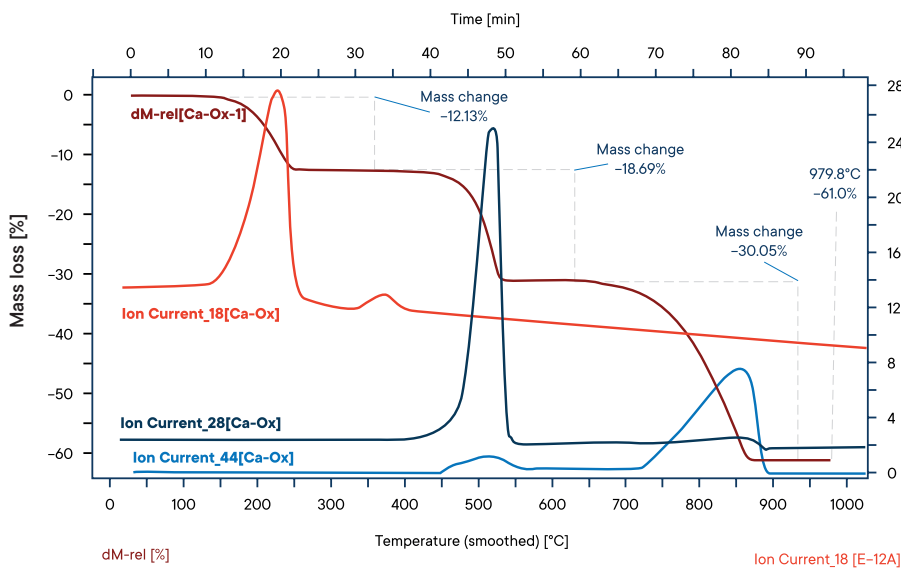


Applications

TGA Overview

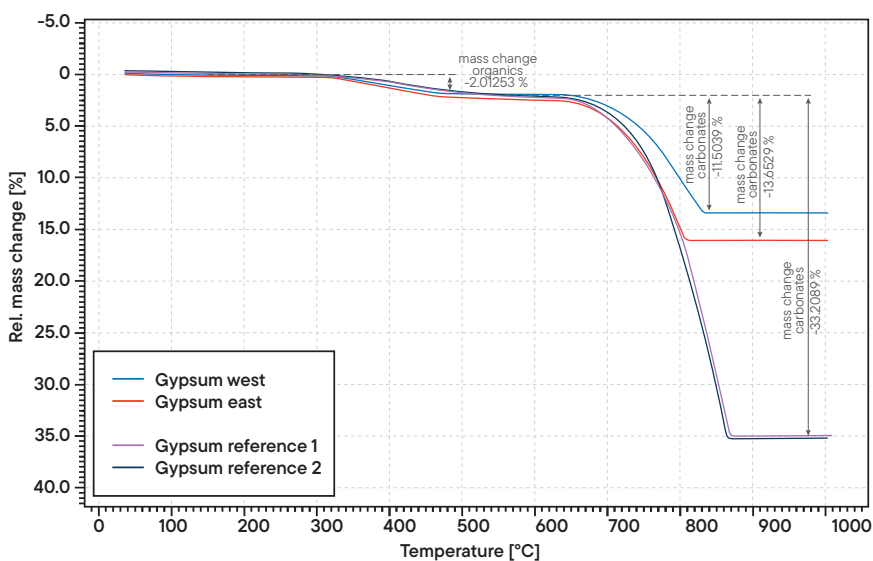


Decomposition of $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$



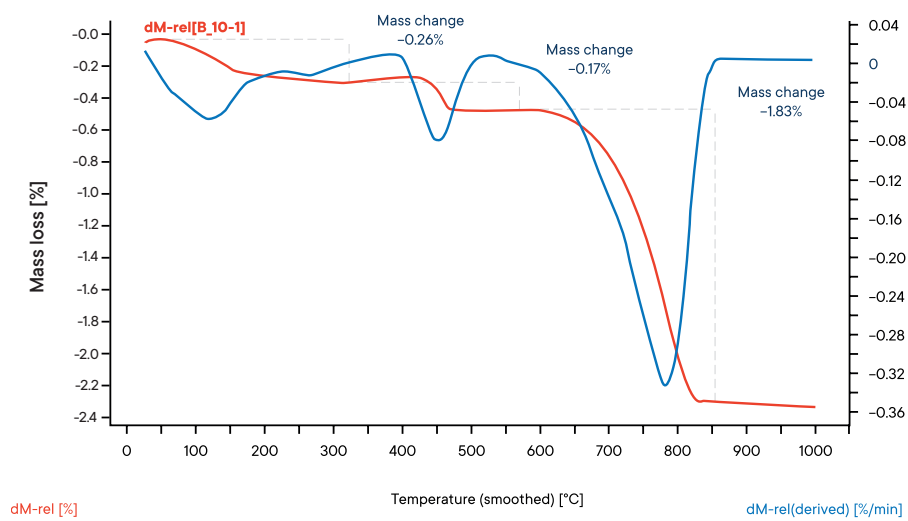
The evolved gases from the decomposition of calcium oxalate has been fed into the mass spectrometer with a heated capillary. The ion currents for mass numbers 18 (water), 28 (carbon monoxide) and 44 (carbon dioxide) have been imported into the graph.

Mass change of gypsum



TGA measurements of various gypsum samples show several characteristic mass losses: at around 200 °C, bound crystal water is released, while between 600 °C and 900 °C, the decomposition of the carbonate components begins. Minor differences between the samples indicate varying contents of organic components and carbonates.

Thermal decomposition of cement



The TGA measurement of a cement sample shows three characteristic mass losses: below 400 °C, adsorbed water is released; between 400 °C and 700 °C, hydroxides decompose; and at around 800 °C, calcium carbonate decarbonates. These steps reflect the typical thermal decomposition and phase transformation of cement.

LINSEIS

pushing boundaries

LINSEIS GmbH Germany

Vielitzerstr. 43
95100 Selb

Tel.: (+49) 9287 880 0
E-mail: info@linseis.de

LINSEIS Inc. USA

109 North Gold Drive
Robbinsville, NJ 08691

Tel.: (+1) 609 223 2070
E-mail: info@linseis.com

LINSEIS China

Kaige Scientific Park
Room 120, Building T3, No.1220
Yuqiao Road, Pudong, Shanghai

Tel.: (+86) 61 90 12 03
Tel.: (+86) 50 55 06 42
E-mail: info@linseis.com.cn

LINSEIS India

Plot 65, 2nd Floor, Sai Enclave,
Sector 23, Dwarka05-800
110077 New Delhi

Tel.: +91-11-42883851
E-mail: sales@linseis.in



WWW.LINSEIS.COM

LINSEIS

pushing boundaries

TGA L83

Thermo
**Gravimetric
Analyzer**



WWW.LINSEIS.COM



Since 1957 LINSEIS Corporation has been delivering outstanding service, know-how and leading innovative products in the field of thermal analysis and thermo-physical properties.

Customer satisfaction, innovation, flexibility, and high quality are what LINSEIS represents. Thanks to these fundamentals, our company enjoys an exceptional reputation among the leading scientific and industrial organizations. LINSEIS has been offering highly innovative benchmark products for many years.

The LINSEIS business unit of thermal analysis is involved in the complete range of thermoanalytical equipment for R&D as well as quality control. We support applications in sectors such as polymers, chemical industry, inorganic building materials, and environmental analytics. In addition, thermophysical properties of solids, liquids, and melts can be analyzed.

Rooted in a strong family tradition, LINSEIS is proudly steered into its third generation, maintaining its core values and commitment to excellence, which have been passed down through the family leadership. This generational continuity strengthens our dedication to innovation and quality, embodying the essence of a true family-run business.

LINSEIS provides technological leadership. We develop and manufacture thermoanalytic and thermophysical testing equipment to the highest standards and precision. Due to our innovative drive and precision, we are a leading manufacturer of thermal analysis equipment.

The development of thermoanalytical testing machines requires significant research and a high degree of precision. LINSEIS Corp. invests in this research to the benefit of our customers.

C L A U S L I N S E I S
C E O D I P L . P H Y S .

To strive for the best due diligence and accountability is part of our DNA. Our history is affected by German engineering and strict quality control.

We want to deliver the latest and best technology for our customers. LINSEIS continues to innovate and enhance our existing thermal analyzers. Our goal is to constantly develop new technologies to enable continued discovery in Science.



Engineering & Innovation

Thermogravimetric Analyzer

Thermogravimetry is a technique that monitors the sample mass against time or temperature in a specific atmosphere while the temperature is undergoing controlled changes. This technique mainly serves the determination of material compositions. It is a common used analysis method in the chemical and pharmaceutical industry. Thermogravimetric analysis (TGA) is typically performed on polymers, food, pharmaceuticals as well as many other materials.

Unsurpassed performance

L - DSC – Combined weight change and differential scanning calorimeter



Unsurpassed Sensitivity

Sub microgram balance with thermostatic controlled measurement chamber



Benchmark Resolution

For detection of fast weight changes



Reliable Automation

Up to 90 position autosampler



Ultra Fast Heater

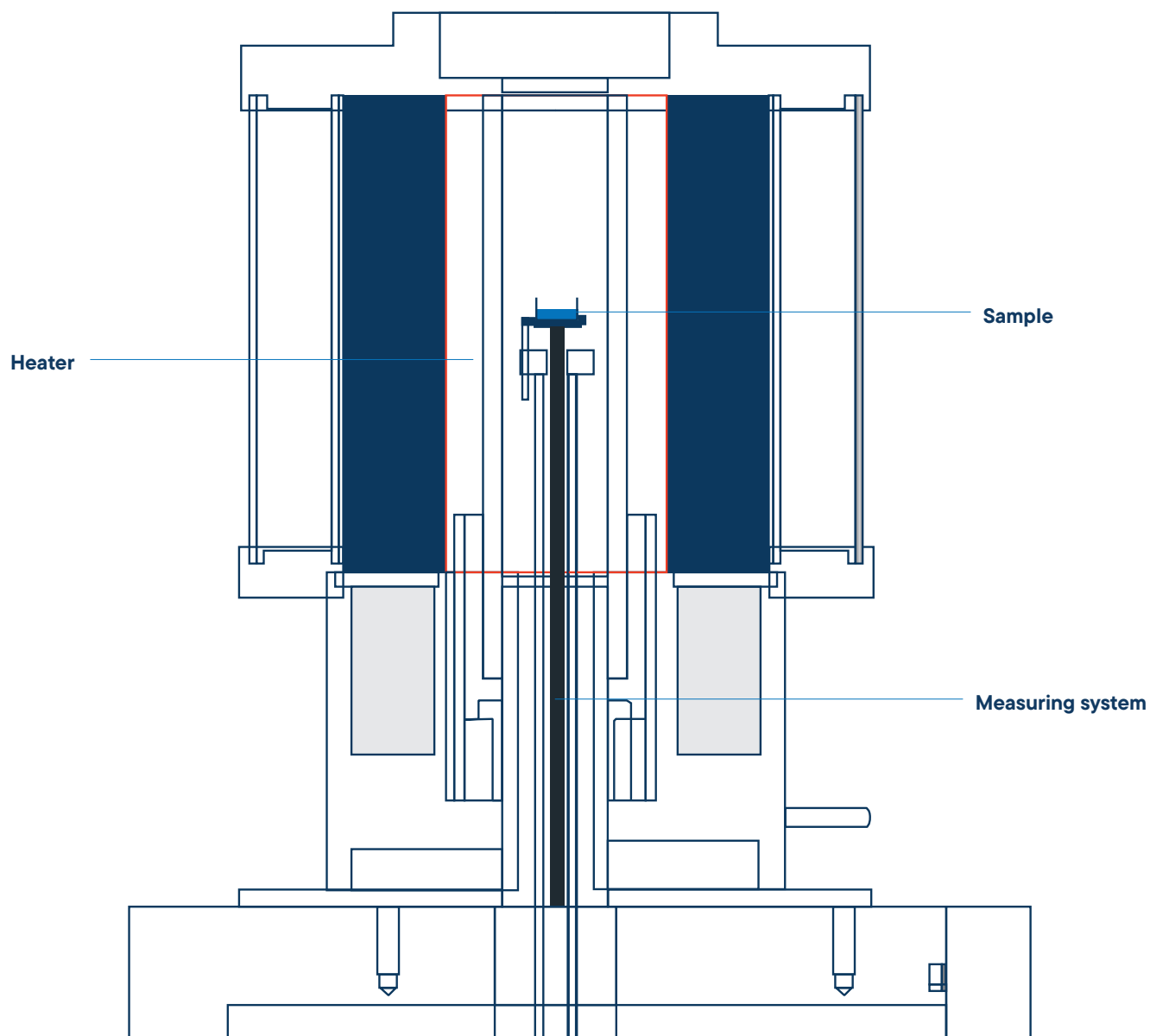
– 250 °C/min heating speed



TGA L83

The **LINSEIS TGA L83** is a robust and reliable TGA outperforming most competition high end models. The sub microgram balance offers highest sensitivity and resolution. The instrument is perfectly suited for academic teaching and day to day laboratory quality control applications.

Furnace design



Advantages of LINSEIS TGA L83

- Precise temperature control
- Fast heating/cooling rates
- Atmosphere control
- High sensitivity
- Automation options
- Expanded analysis

Features of the TGA L83 Furnace

- Innovative top-loading system
- Enhanced heating and cooling performance
- Precise thermal management
- Adaptable sample handling
- Rapid cooling capability

Measurement Systems & Crucibles

The Linseis TGA L83 provides flexibility with a selection of user-exchangeable sensors, each compatible with various thermocouples to ensure optimal sensitivity for different temperature ranges and applications. Additionally, a variety of crucible types is available, allowing users to tailor the system to their specific analytical needs.

Crucibles



Cap

0.12 ml



Cap

0.12 ml



Cap

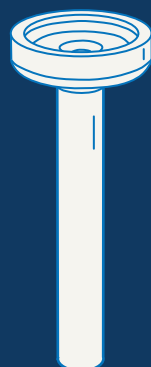
0.3 ml or costum volume

Pin-on-crucible

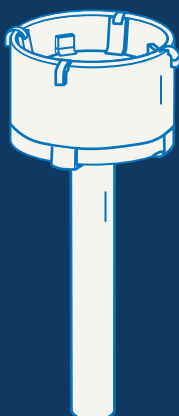


- Al₂O₃
- Platinum
- Aluminium
- others

Sample holders



06-500-500_K
06-500-500_S
TG-Sensor for
put-on-crucible



06-500-510_S
Compact
DSC-Sensor



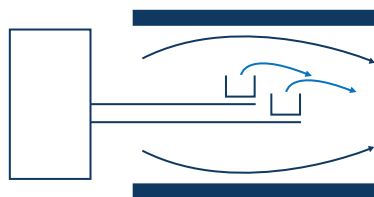
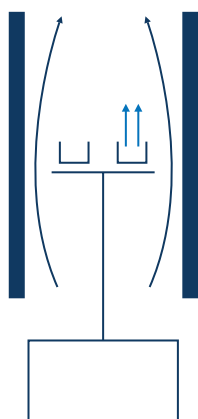
06-500-505_S
TG-Sensor for pin-
on-crucible



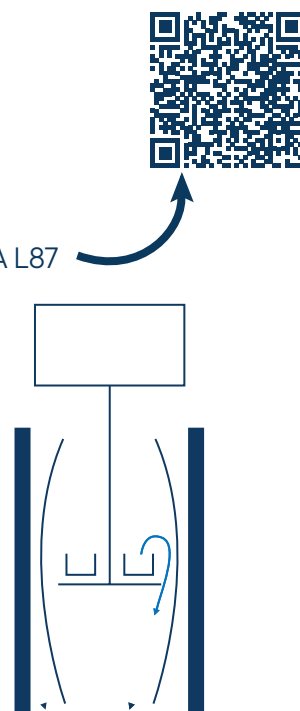
Benefits of the vertical top loading design

The vertical “sample on top” design of the LINSEIS thermobalance provides highest possible accuracy due to a stable position of the sample and easy sample handling.

TGA L83



STA/TGA L87



Vertical system (sample on top) LINSEIS configuration

Advantages:

- Easy sample handling
- Easy exchange of sample holder
- Stable position of the sample in the furnace (critical for good DTA/DSC and Cp results)

Disadvantage:

- Complicated construction

Horizontal system

Advantages:

- Small buoyancy effects

Disadvantages:

- Very difficult sensor exchange
- Difficult sample handling
- Very high purge gas rate required
- Problems due to sensor expansion during heating/cooling

Vertical system (sample on bottom)

Advantage:

- Stable position within furnace
- Best choice for long-time TGA-measurements (low drift)

Disadvantages:

- Difficult sensor exchange
- “Dangerous” gas flow within balance housing (sample gets blown out)
- Sensor position depends on sample weight

deliv



outst

ser



erining

anding

vice



New features

Electronic Upgrade

The new measuring electronics offer significant performance improvements, inspired by the architecture of the „Linseis Digital Balance“. The benefits of this new digital balance architecture include:

- **Minimization of drift:** Ensures consistently high precision over long periods of time.
- **Improved resolution:** Unique sub-microgram resolution.
- **Highest accuracy:** Improves the reliability of your measurement results.
- **Reproducibility:** Ensures consistent results with repeated measurements.

Linseis Lab Link

With Linseis Lab Link, we offer an integrated solution to address uncertainties in measurement results. With direct access to our application experts via the software, you can get advice on the correct measurement procedure and evaluation of results. This direct communication ensures optimal results and maximizes the efficiency of your measurements for precise analysis and research as well as a smooth process flow.

Software Improvements

- **Lex Bus Plug & Play:** Our latest hardware interface Lex Bus revolutionizes the way data communicates within our systems. Lex Bus enables seamless and efficient integration of new hardware and software tools.
- **Improved furnace control:** Our new and further improved furnace control offers a faster heating and cooling as well as more precise temperature control, which leads to better measurement results through better temperature sequencing according to your wishes and requirements.
- **New software with user interface:** Our communication is now even more focused on the needs of our customers to ensure that you are always informed of the latest status and receive support whenever it is needed.
- **Process security:** We have optimized our software for process security to ensure that your data is protected at all times and processed in a fail-safe manner.
- **Error messages and bug fixes:** Our system automatically detects errors and bugs, which are immediately documented and fixed to minimize downtime.
- **Automatic updates and new features:** Our software receives regular automatic updates that not only improve security, but also continuously provide new features.
- **Permanent system monitoring:** Our software constantly monitors the system parameters to ensure optimum performance.
- **Preventive maintenance and problem detection:** Our preventive maintenance approach detects problems and wear and tear before they can cause damage and keeps your device in top shape.

A close-up photograph of a laboratory instrument. In the foreground, a white perforated metal basket is visible, containing several small, white, cylindrical samples. A thin metal probe or needle is positioned vertically, passing through the basket. The background is blurred, showing more of the instrument's structure. A large red diagonal shape is overlaid on the left side of the image, containing text.

Design Improvements

The new device design is characterized by an elegant aluminum casing that is both robust and aesthetically pleasing. The LED status bar provides a user-friendly visualization of important information. A touch panel enables intuitive operation and contributes to a modern user experience that combines comfort and functionality. The new device design focuses on ergonomic operation.

New Hardware Features

- **Tri-couple DTA measuring system:** DTA measuring system with three thermocouples for the smallest endo-/exothermic effects in inhomogeneous samples
- **Jacketed DTA measuring system:** For corrosive samples
- **Patented „forced flow“ method:** Enables forced flow through your TG or TG-DTA. Our system enables forced flow through the sample, where by up to 100 % reaction gas is fed directly to the sample. This novel method enables scalable measurements for the first time, allowing precise analysis under real conditions.

Unique features

Measurement System

The TGA's measurement system features a high-precision platinum balance, ensuring accurate and reliable thermogravimetric analysis (TGA) data. Additionally, the innovative L-DSC sensor attachment allows the simultaneous detection of differential scanning calorimeter (DSC) signals, providing combined thermal analysis capabilities in a single system. This dual functionality enables comprehensive thermal characterization for various applications.

Options

The TGA system offers several advanced options to expand its functionality:

- **Evolved Gas Analysis (EGA):** The system can be coupled with gas analysis tools such as GC_MS (Gas Chromatography), MS (Mass Spectrometry) or FTIR (Fourier Infrared Spectroscopy) to analyze gases evolved during decomposition or chemical reactions.
- **Turbo-Molecular Pump:** Ideal for achieving ultra-high vacuum and maintaining clean gas atmospheres, this option enables precise measurements in controlled environments.
- **Vapor Generator:** An optional feature that facilitates controlled vapor introduction for advanced material studies.

Gas Dosing System

For enhanced gas management, the TGA L83 includes an optional automatic gas dosing system equipped with Mass Flow Controllers (MFCs). This system supports two independently controlled gas channels, allowing precise adjustment of gas flow rates directly through the software. This flexibility is essential for optimizing experimental conditions for various materials and processes.





Atmosphere

The TGA's robust design allows measurements under a wide range of environmental conditions, including:

- **Inert Atmosphere:** For stable thermal analysis without reactions.
- **Oxidative and Reducing Conditions:** Suitable for studying material behavior in reactive environments.
- **Vacuum Conditions:** Ideal for sensitive samples requiring minimal contamination.

Additionally, the system supports analysis under corrosive conditions when the appropriate precautions and compatible materials are used. Residual gas analysis can also be performed by integrating an optional heated capillary, ensuring comprehensive atmosphere monitoring.

Precision

The TGA simplifies calibration with its automatic software and hardware integration. This function calculates and applies calibration factors automatically, ensuring consistent and accurate results. The calibration factor is displayed for user confirmation, streamlining the preparation process and enhancing reliability.





Equipment for gas control and safety (H₂, CO, CO₂, etc...)

All LINSEIS instruments can be prepared for the use in hydrogen atmosphere with just minor adjustments. The most important thing is a safety system that can ensure that there is no leakage and no explosive atmosphere generated outside of the instrument. Therefore, the Linseis safety system uses hydrogen sensors that are coupled to an automatic gas control panel. If there is a leakage or unwanted hydrogen release, the instrument is automatically flooded with inert gas and the hydrogen valves are closed. This ensures a minimum risk level during operation. In addition, the system includes an optional combustion unit to which the gas outlet is connected to ensure that the gas used in the measuring chamber is not simply released into the environment. The system can also be operated with several combinations of inert gases and even water vapor besides hydrogen.

In summary, the Linseis safety system comes with the following benefits:

- Automatic evacuation function
- Gas flow control for multiple gases including water vapor and hydrogen
- Emergency shutdown function
- Gas detector system (H₂, CO, CO₂, etc...)
- optional burn off unit
- Continuous monitoring to ensure safe operating conditions



Linseis equipment for operation under water vapor and controlled relative humidity

For many applications in thermal analysis, the atmosphere plays an important role as it may affect the sample behavior or activate reactions. Humidity influence on building materials, storage time of pharmaceuticals and foods or influence on mechanical properties of polymers are just some of the most common examples. Of course, the Linseis instruments are suitable for such experiments, however there is one fact that is often causing confusion and must be considered carefully: The difference between water vapor and relative humidity.

Relative Humidity Generators are most commonly used for experiments around room temperature, while water vapor applications are most often at higher temperatures. When water is heated to its boiling point or higher than that, the water changes its aggregate form from liquid to gaseous. It is then existing as water vapor (steam). If this steam is introduced into any kind of reaction chamber or instrument, it is called water vapor application. In contrast, every gas can transport and contain a certain amount of water at a given temperature. This is called humidity. Considering air as an example, there is always an amount of water contained in the air, even below the boiling point of water, which is defined as grade of humidity or relative humidity.



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:

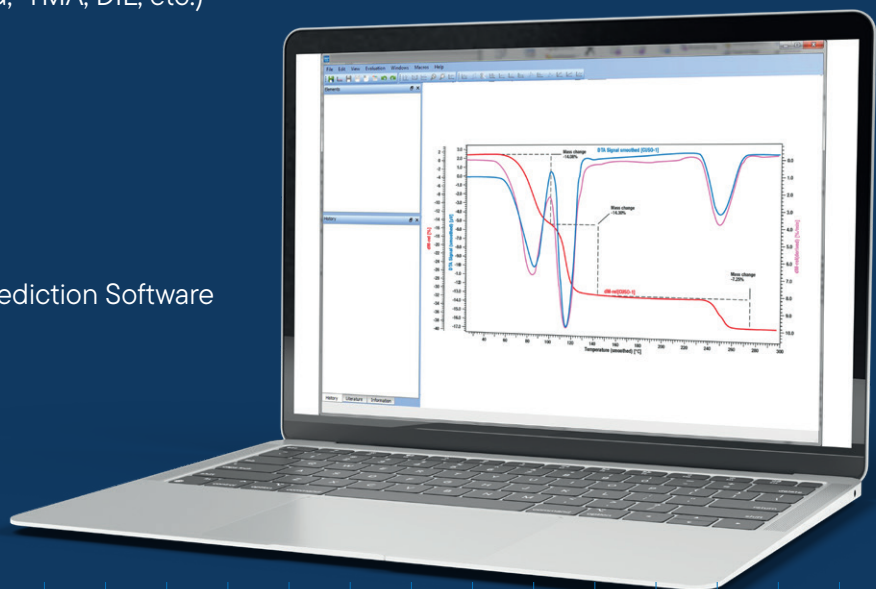
temperature control, data acquisition and data evaluation. The 32 bit software incorporates all essential features for measurement preparation, execution and evaluation of a Thermogravimetric measurement. Thanks to our specialists and application experts, LINSEIS was able to develop comprehensive easy 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 (DSC TG, TMA, DIL, etc.)
- Zoom function
- 1 and 2 derivation
- Programmable gas control
- Statistical evaluation package
- Free scaling
- Automatic calibration
- Optional Kinetic and Lifetime Prediction Software packages

TG – Features:

- Mass Change as % and mg
- Rate Controlled Mass Loss
- Evaluation of Mass Loss
- Residue Mass Evaluation



Technical Specifications



	TGA L83	
Design	Top-loading	
Temperature range	RT up to 1100 °C	
Heating and cooling rates	0.001 to 250 °C/min	
TG	1	2
Resolution	0.01 µg	0.1 µg
Sample weight	Balance can read weight automatically	
Measuring range	5 g / ± 2500 mg (mass change)	50 g / ± 2500 mg (mass change)
Gas atmospheres	Inert, oxidizing, reducing, vacuum	
Vacuum	Up to 10E ⁻³ mbar	
Gas Dosage	Built-in MFC block with 3 gases (one purge gas and two reaction gases)	
Cooling rate	< 12 min (1100 °C - 100 °C)	
Sample holder	TGA	
Sample robot	90 positions	
Crucible	Pt, Al ₂ O ₃ , Au, Al, Ag etc.*	

*Technical data may vary depending on furnace and components



Plus
bound

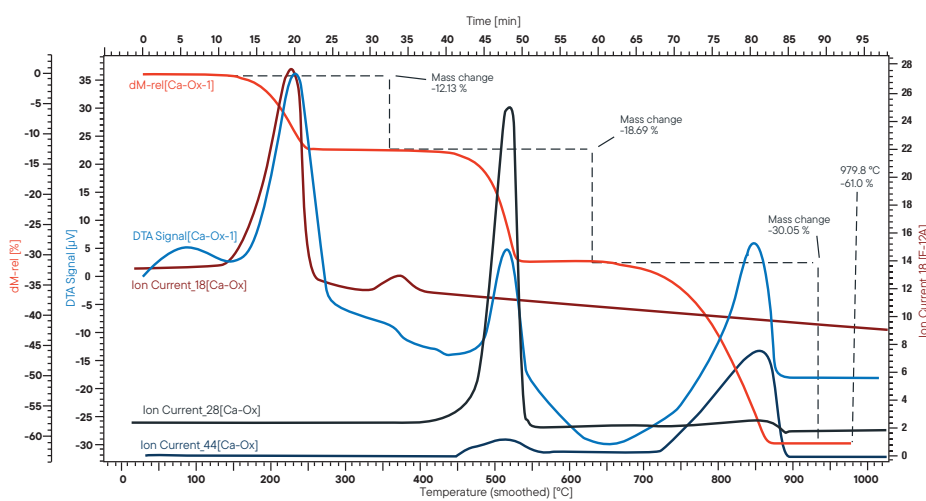


hiring
arises

Applications

TGA L83

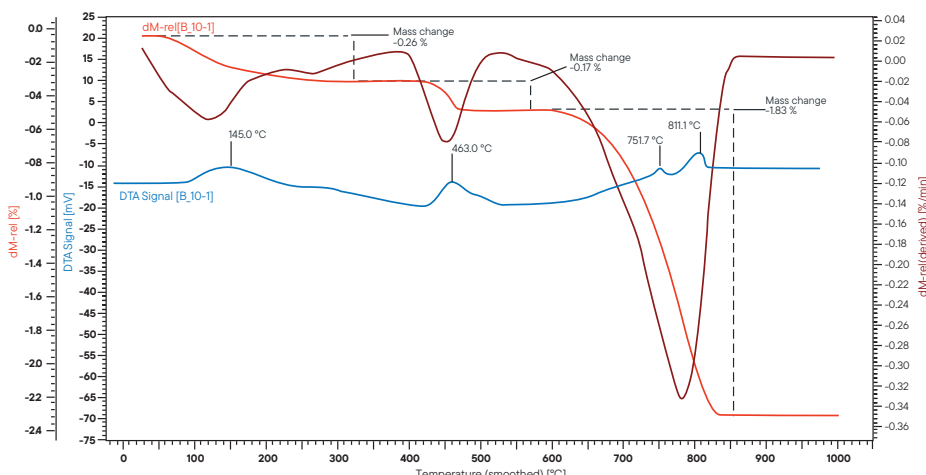
Decomposition of $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$



The curves on the left show a calcium oxalate reference run. On the blue and red curves (relative and absolute Δm), three mass loss steps are visible: the first step corresponds to the release of H_2O , the second to the loss of CO , and the third to the loss of CO_2 . The resulting calcium oxide (CaO) subsequently reacts with the water from the first step, which remains in the reaction chamber if the atmosphere is static. This reaction forms calcium hydroxide (Ca(OH)_2) during cooling at around 580°C .

This final step is difficult to observe with a standard TGA due to typically slow cooling rates. However, in this case, a full measurement cycle was completed 20 minutes. The heating and cooling rates were 2 K/s but can easily be increased to up to 100 K/s using an inductive TGA.

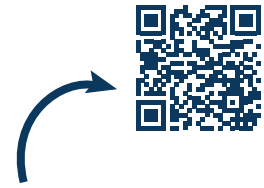
Cement



The measurement on the left was carried out with a TG-DSC. The main parts of cement are tri-calcium silicate, di-calcium silicate and tri-calcium aluminates.

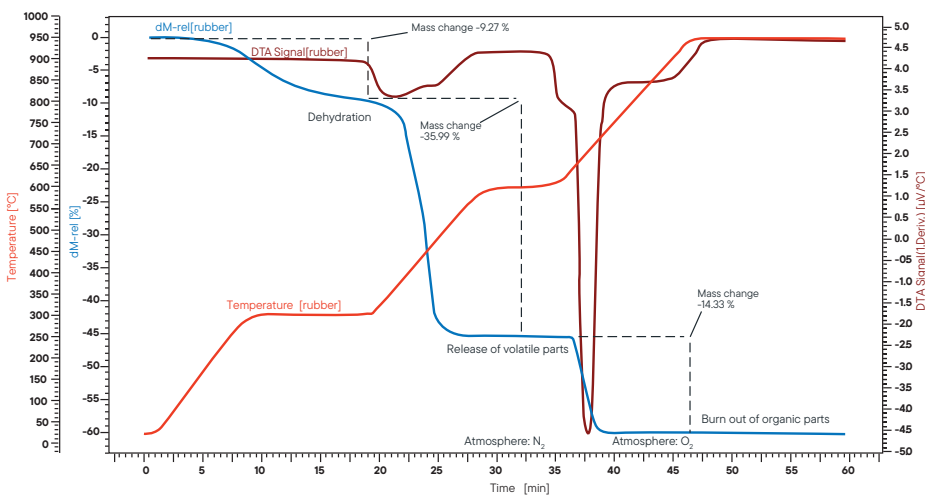
After mixing the raw cement with water, different hydrates slowly form. When put in a STA, the absorbed water evaporates first during thermal decomposition, then hydrates of the calcium silicate decompose and at 570°C the hydroxides of calcium, magnesium and aluminum follow.

You can see this effect as mass loss steps (red curve) with parallel endothermic effects on the DSC signal (blue curve). Subsequently, carbon dioxide is released from the carbonates, showing a huge mass loss step at around 800°C .



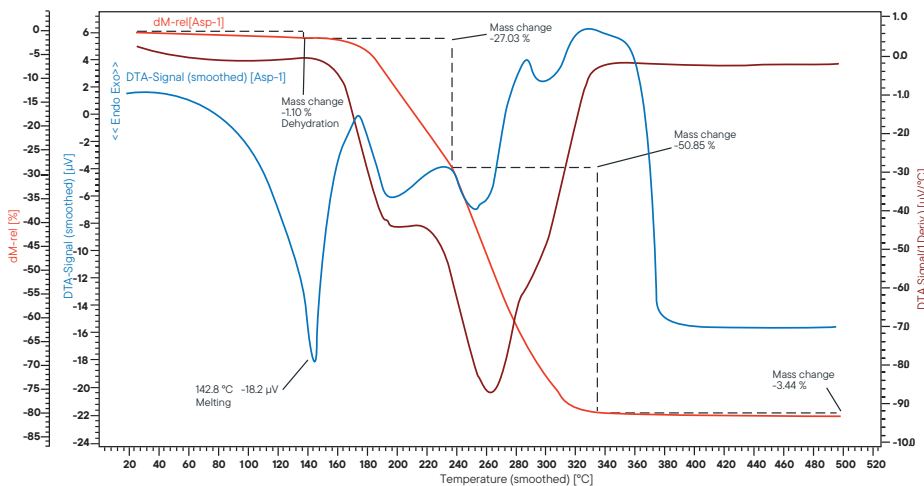
Linseis Service Lab

Decomposition of rubber



The measurement of an industrial rubber sample was conducted using a simultaneous thermal analyzer (STA L82) in a nitrogen atmosphere. The sample was heated in three steps at a rate of 30 K/min each. The blue curve shows the relative weight loss. In the first step, dehydration of the sample occurs, releasing 9.3 % water, with no effect observed on the corresponding DTA signal (dark red curve). In the second reaction step, volatile components (36.0 %) are released by pyrolysis under nitrogen, identified by an exothermic peak on the DTA curve. In the third step, the atmosphere changes to oxygen, leading to the combustion of the remaining carbon, resulting in a 14.3 % weight loss. The remaining 40.4 % consists of inorganic components like ash, lime or fillers.

Aspirin



In this application acetylsalicylic acid (Aspirin) was measured by STA L82 with focus on the DSC-signal. By DSC, decomposition reactions can be observed and substances such as pharmaceutical compounds can be investigated and identified. The measured ASS sample shows the following effects: At the beginning of the heating process, some adsorbed water is released, resulting in a weight loss of about 1 %. At 140 °C the melting point of the aspirin is reached, resulting in an endothermic reaction, measured on the DTA trace. At 60 °C, decomposition of the molten drug takes place in several stages.

The decomposition products are volatile, resulting in a total weight loss of almost 100 %.

LINSEIS

pushing boundaries

LINSEIS GmbH Germany

Vielitzerstr. 43
95100 Selb

Tel.: (+49) 9287 880 0
E-mail: info@linseis.de

LINSEIS Inc. USA

109 North Gold Drive
Robbinsville, NJ 08691

Tel.: (+1) 609 223 2070
E-mail: info@linseis.com

LINSEIS China

Kaige Scientific Park
Room 120, Building T3, No.1220
Yuqiao Road, Pudong, Shanghai

Tel.: (+86) 61 90 12 03
Tel.: (+86) 50 55 06 42
E-mail: info@linseis.com.cn

LINSEIS India

Plot 65, 2nd Floor, Sai Enclave,
Sector 23, Dwarka05-800
110077 New Delhi

Tel.: +91-11-42883851
E-mail: sales@linseis.in



WWW.LINSEIS.COM

LINSEIS

pushing boundaries

TGA L87 MSB

Magnetic
**Suspension
Balance**



WWW.LINSEIS.COM



Since 1957 LINSEIS Corporation has been delivering outstanding service, know-how and leading innovative products in the field of thermal analysis and thermo-physical properties.

Customer satisfaction, innovation, flexibility, and high quality are what LINSEIS represents. Thanks to these fundamentals, our company enjoys an exceptional reputation among the leading scientific and industrial organizations. LINSEIS has been offering highly innovative benchmark products for many years.

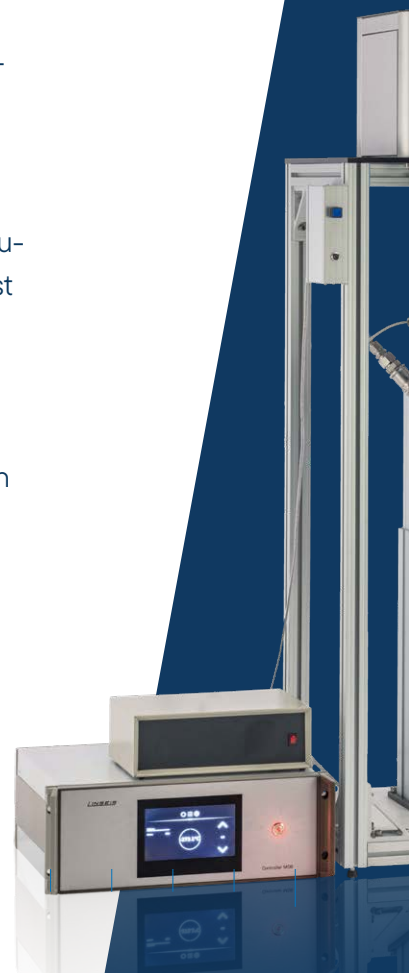
The LINSEIS business unit of thermal analysis is involved in the complete range of thermoanalytical equipment for R&D as well as quality control. We support applications in sectors such as polymers, chemical industry, inorganic building materials, and environmental analytics. In addition, thermophysical properties of solids, liquids, and melts can be analyzed.

Rooted in a strong family tradition, LINSEIS is proudly steered into its third generation, maintaining its core values and commitment to excellence, which have been passed down through the family leadership. This generational continuity strengthens our dedication to innovation and quality, embodying the essence of a true family-run business.

LINSEIS provides technological leadership. We develop and manufacture thermoanalytic and thermophysical testing equipment to the highest standards and precision. Due to our innovative drive and precision, we are a leading manufacturer of thermal analysis equipment.

The development of thermoanalytical testing machines requires significant research and a high degree of precision. LINSEIS Corp. invests in this research to the benefit of our customers.

C L A U S L I N S E I S
C E O D I P L . P H Y S .



To strive for the best due diligence and accountability is part of our DNA. Our history is affected by German engineering and strict quality control.

We want to deliver the latest and best technology for our customers. LINSEIS continues to innovate and enhance our existing thermal analyzers. Our goal is to constantly develop new technologies to enable continued discovery in Science.



Engineering & Innovation

Linseis Service



Customized Solutions - The Linseis Advantage

At Linseis, we believe that every measurement challenge is unique — and so should be your instrument.

While many suppliers rely on standardized configurations, Linseis distinguishes itself through exceptional flexibility and the capability to deliver customer-specific adaptations in record time.

Our experienced engineering teams work hand in hand with you to design and implement fully customized solutions that meet your precise application requirements — whether that means a unique sensor configuration, an extended temperature range, or a specialized software integration.

With decades of experience and a modular product architecture, we turn customization into a standard service — fast, efficient, and reliable.

Choose Linseis and experience what true flexibility in thermal analysis and material characterization means.

Contact form





Service & Support

Redefining Ownership

When investing in analytical instrumentation, long-term value matters just as much as precision. That's why Linseis systems are engineered to deliver the lowest **Total Cost of Ownership** in their class — combining reliability, efficiency, and flexibility in every detail.

Our instruments are built with robust, high-quality components designed for longevity and minimal maintenance. This means fewer service interventions, shorter downtimes, and reduced operating costs over the entire product lifetime. Intelligent software updates and remote support further ensure that your system remains state-of-the-art, even years after installation.



Thermogravimetric Analysis

LINSEIS TGA analyzers set new standards in performance, precision and reliability. With exceptional sensitivity and automated processes, we ensure dependable results every time. The integrated platinum measurement system guarantees unparalleled accuracy for every measurement.

Our instruments offer the flexibility to perform analyses under a variety of conditions—whether inert, oxidative or reducing atmospheres as well as vacuum.

Trust in our TGA technology to deliver the most precise results for your applications.

Discover the power of precision with **LINSEIS Thermogravimetric Analyzers (TGA)**. These instruments are designed to measure mass changes in materials under controlled temperature conditions, providing critical insights into thermal stability, composition and decomposition behavior.

The Technique

Thermogravimetry (TGA) using a thermobalance is an analytical method in which the mass change of a sample is measured as a function of temperature and time.

This method is used e.g. to determine material compositions and is a widely used analysis method in the chemical and pharmaceutical industry.

The highly sensitive measuring system and the specially developed furnaces allow exceptionally good measurement results at extremely high heating and cooling rates in a temperature range from **-196°C to 2400°C**.

The LINSEIS TGA operate in agreement with national and international standards such as

ASTM E 1131·E 2550

ISO 17225·11358 (Part 1-3)

Magnetic Suspension Balance

LINSEIS TGA L87 MSB

The Magnetic Suspension Balance (MSB) enables precise gravimetric measurements over a wide temperature and pressure range, as well as in chemically reactive or corrosive atmospheres.

The sample holder levitates and is connected to the microbalance via the coupling of a permanent magnet and an electromagnet, allowing the measuring chamber to be hermetically sealed from the sensitive balance, thus enabling measurements under extreme conditions.

An integrated position sensor continuously detects the position of the floating magnet.

A PID (proportional-integral-differential) controller controls the electromagnetic force so that the position of the floating magnet is kept stable.

The magnetic coupling allows the sensitive microbalance to be operated outside the high-temperature or high-pressure environment.

This provides optimum protection against thermal, mechanical and chemical stresses while maintaining consistently high measurement accuracy.



Areas of application

- Gas adsorption
- Gas desorption
- Density determination of solids and liquids
- Catalyst research
- Thermogravimetric analysis under special conditions
- Moisture uptake and release
- Polymers and composites
- Energy storage and fuel technology



MAGNETIC SUSPENSION BALANCE

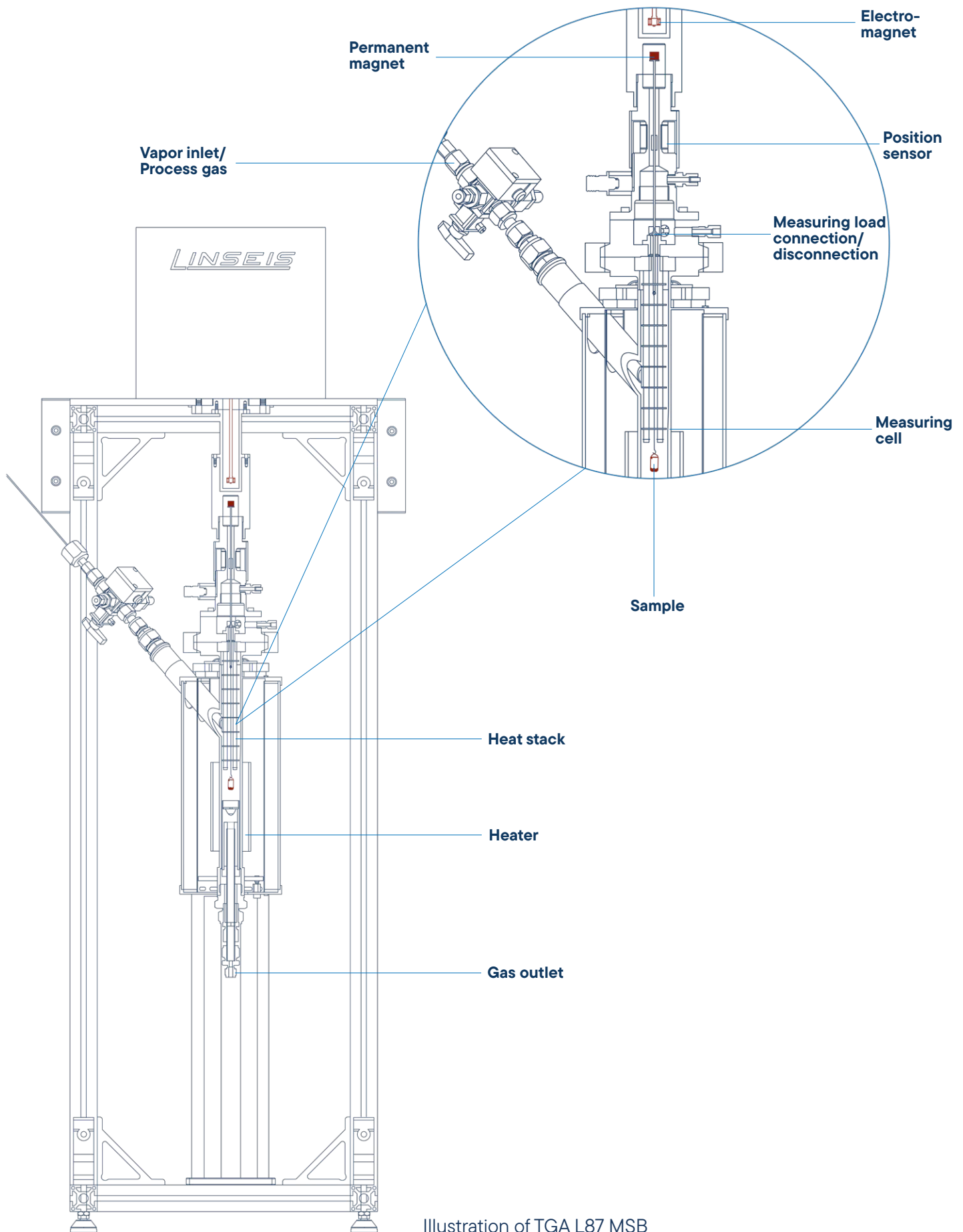
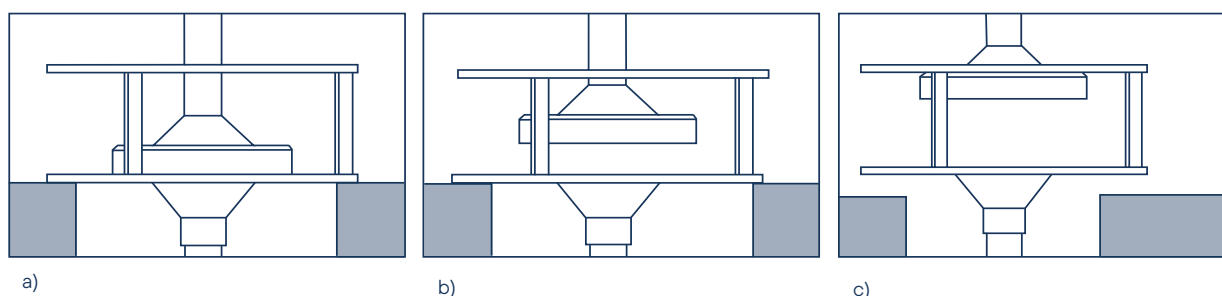


Illustration of TGA L87 MSB

Measuring Principle of the TGA L87 MSB



Default Position

In the standby position, both the lower cage and the upper cone rest on the support of the measuring system. No weighing is performed in this state, ensuring system stability and readiness for operation.

Calibration Position

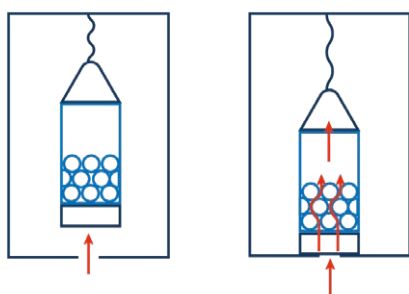
During calibration, the cone is magnetically coupled and held within the cage, causing only the upper suspension rod to levitate. This allows precise determination and calibration of the balance signal under defined conditions.

Measurement position

In the measurement mode, the magnetic coupling lifts both the cage and the sample holder. The complete sample weight is transmitted to the balance, enabling accurate and reproducible measurement of the sample mass under real experimental conditions.

Forced-flow offers significant advantages in the investigation of gas/solid phase reactions

- 1. Controlled Conditions:** Precise control of reaction conditions for a reproducible environment.
- 2. Faster Reaction Times:** Acceleration of slow reactions through continuous flow.
- 3. Better Mixing:** Uniform distribution of reactants for improved reaction kinetics.
- 4. Scalability:** Easier adaptation to different volumes and flow rates for optimized production.



The illustration on the left shows a schematic representation of the weight measurement of a TGA L87 MSB.

The image on the right shows the principle of forced flow operation in a magnetic suspension balance. The sample gas is passed completely through the solid material and exits at the top. This significantly optimises the reproducibility, reaction control and significance of the measurement results.



Inno

soluti



*uative
tions*

Unique Features

Evolved Gas Analysis (EGA):

The system can be coupled with gas analysis tools such as GC (Gas Chromatography), MS (Mass Spectrometry) or FTIR (Fourier Transform Infrared Spectroscopy) to analyze gases evolved during decomposition or chemical reactions.

High-speed data acquisition

Modern electronics enable the synchronous recording of temperature, pressure, and mass changes with high temporal resolution. This allows even fast reaction processes and transitions to be recorded and evaluated in detail.

Isolated weighing system

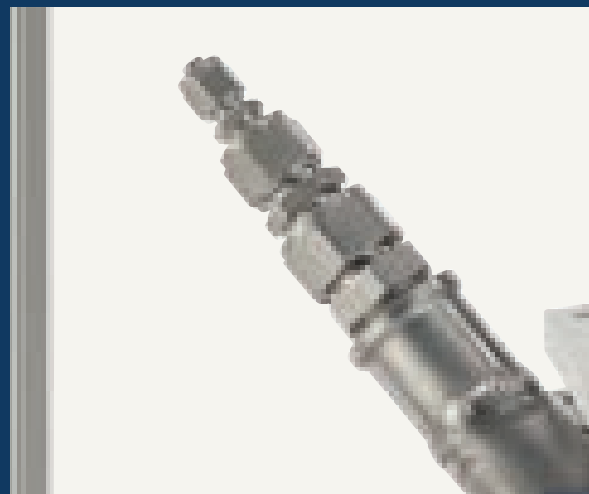
By enabling a hermetic isolation of the balance from the sample chamber, the non-contact weighing design eliminates the risk of damage caused by reactive gases, pressure or temperature effects.

Furnace with optical ports

The integrated optical access points allow in-situ observations during the experiment. This enables, for example, spectroscopic analyses or visual process monitoring under controlled temperature and gas conditions.

Wide temperature range -196 °C up to 2400 °C

Covering measurements from ultra-high vacuum up to 500 bar and temperatures ranging from -196 °C to 2400 °C, Linseis offers the widest range of temperature and pressure capabilities. The TGA L87 MSB is perfectly suited for an extensive variety of applications.





Simultaneous measurement

TGA L87 MSB enables simultaneous determination of sample and gas phase density using a dual sample configuration. Both the reaction gas density and the sample volume are measured in situ in the same chamber, ensuring automatic and highly accurate buoyancy correction. This delivers reliable results even under changing gas atmospheres and across the entire pressure and temperature range.

Gas safety system

The gas safety system is designed to accommodate various gases such as hydrogen or carbon dioxide, ensuring secure operation and user safety.



Controlled humidity and water vapour

Linseis TGA L87 MSB can regulate the humidity and water vapor during the measurement.

Customization

Close collaboration with the customers to tailor unique solutions, leveraging LINSEIS expertise to meet their specific needs.

Service

Our international presence across every continent enables us to deliver the best and fastest service possible. In addition, Linseis systems are designed for maximum reliability and longevity, ensuring a low total cost of ownership. Optimized maintenance concepts, durable components, and long-term software support guarantee sustainable value for your investment.





Equipment for gas control and safety (H₂, CO, CO₂, etc...)

All Linseis instruments can be prepared for the use in hydrogen atmosphere with just minor adjustments. The most important thing is a safety system that can ensure that there is no leakage and no explosive atmosphere generated outside of the instrument. Therefore, the Linseis safety system uses hydrogen sensors that are coupled to an automatic gas control panel. If there is a leakage or unwanted hydrogen release, the instrument is automatically flooded with inert gas and the hydrogen valves are closed. This ensures a minimum risk level during operation. Besides that, the system contains an optional burn off unit where the gas outlet is connected to, to ensure that also the used gas of the measurement chamber is not just released into the environment. The system can also be operated with several combinations of inert gases and even water vapor besides hydrogen.

In summary, the Linseis safety system comes with the following benefits:

- Automatic evacuation function
- Gas flow control for multiple gases including water vapor and hydrogen
- Emergency shutdown function
- Gas detector system (H₂, CO, CO₂, etc...)
- optional burn off unit
- Continuous monitoring to ensure safe operating conditions



Linseis equipment for operation under water vapor and controlled relative humidity



For many applications in thermal analysis, the atmosphere plays an important role as it may affect the sample behavior or activate reactions. Humidity influence on building materials, storage time of pharmaceuticals and foods or influence on mechanical properties of polymers are just some of the most common examples. Of course, the Linseis instruments are suitable for such experiments, however there is one fact that is often causing confusing and must be considered carefully: The difference between water vapor and relative humidity.

Relative humidity generators are most commonly used for experiments around room temperature, while water vapor applications are most often at higher temperatures. When water is heated to its boiling point or higher than that, the water changes its physical state from liquid to gaseous. It then exists as water vapor (steam). If this steam is introduced into any kind of reaction chamber or instrument, it is called water vapor application. In contrast, every gas can absorb and contain a certain amount of water at a given temperature. This is called humidity. Considering air as an example, there is always an amount of water contained in the air, even below the boiling point of water, which is defined as grade of humidity or relative humidity.



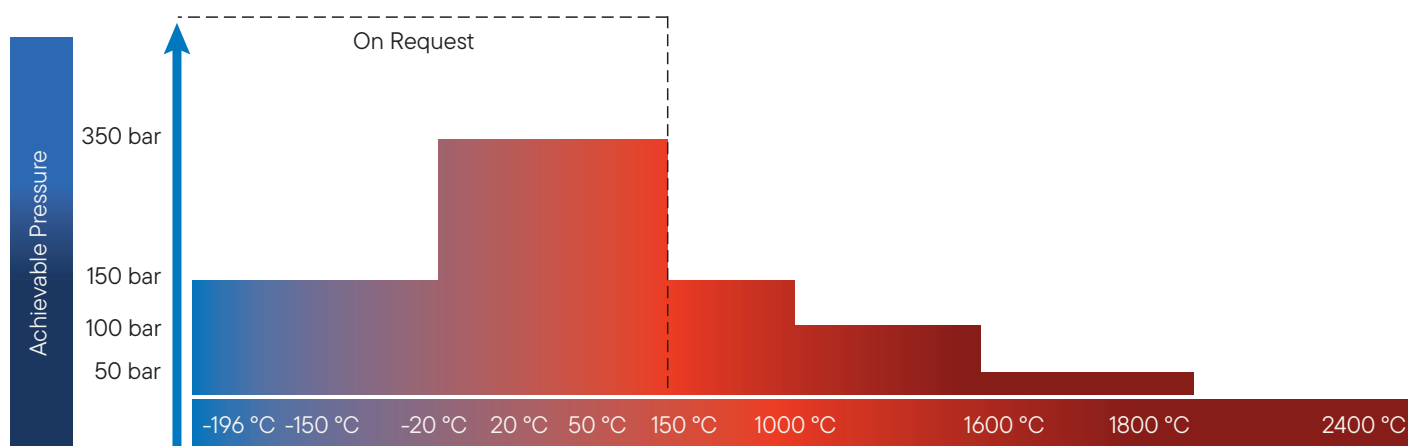
Temperature Control

The **TGA L87 MSB** offers an exceptional operating range covering measurements from **-196 °C up to 2400 °C** and vacuum conditions up to **350 bar**.

This range enables precise thermogravimetric analysis under almost all atmospheric or process conditions – from cryogenic to high-temperature and high-pressure environments.

The achievable pressure levels extend across the entire temperature range, covering most application needs with standard configurations. For specific requirements, customized setups with extended pressure capabilities or specialized gas-handling systems are available on request.

Through this modular and adaptable design, the TGA L87 MSB system can be individually configured to match your specific research or industrial requirements, ensuring maximum flexibility and long-term value.

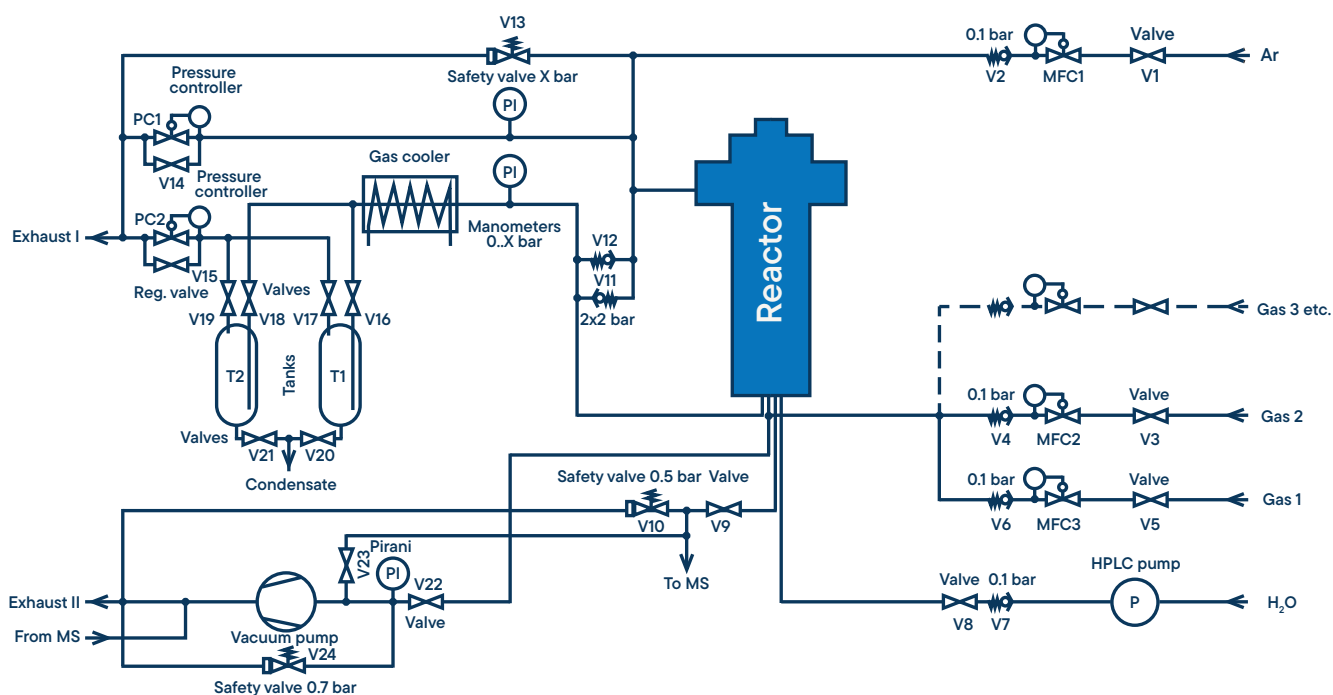


Gas/Vapor Flow Diagram

The optional gas and vapor flow system enables precise control of complex reaction atmospheres.

Multiple gas lines with individual mass flow controllers and valves allow accurate adjustment of flow rates, gas composition and pressure. Integrated safety and cooling components ensure stable operation even under high-pressure and high-temperature conditions.

The modular setup supports the introduction of gases, vapors and liquids, including water vapor via an HPLC pump, providing maximum flexibility for a wide range of experimental applications.



Key features

- Precise atmosphere control
- Flexible configuration
- Wide operating range
- Modular design
- Integrated safety system
- Efficient condensation and cooling
- Vacuum and purge functionality
- Glove box/Hot cell version available

Software

All LINSEIS thermoanalytical instruments are PC-controlled and operated with dedicated software under Microsoft® Windows®. The complete package is structured into three modules: temperature control, data acquisition and data evaluation.

The 32-bit software provides all essential functions for the preparation, execution and analysis of thermogravimetric measurements. Developed in close collaboration with our specialists and application experts, the software combines comprehensive functionality with an intuitive and user-friendly interface.

Software

- Program capable of text editing
- Data security in case of power failure
- Thermocouple break detection
- 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 (DSC TG, TMA, DIL, etc.)
- Zoom function
- 1st and 2nd derivative
- Programmable gas control
- Statistical evaluation package
- Free scaling
- Automatic calibration
- Optional kinetic and lifetime prediction software packages

Features (TG)

- Mass Change in % and mg
- Rate controlled mass loss
- Evaluation of mass loss
- Residue mass evaluation
- Fully automatic, software-controlled calibration during measurement





The **LINSEIS Thermal Library** is available as an optional extension to the well-established and user-friendly **LINSEIS LiEAP** (Linseis Evaluation and Acquisition Platform) software, which is integrated into almost all of our instruments. With the Thermal Library, sample materials can be identified within just 1–2 seconds by comparing the measurement curve against a comprehensive database containing thousands of references and standard materials.

Multi-Instrument

LINSEIS instruments such as DSC, STA, TGA & LFA can be controlled with the same powerful LiEAP software platform.

Report Generator

Convenient template selection to generate customized measurement reports.

Kinetic software

Kinetic analysis of DSC, DTA, TGA, EGA (TG-MS, TG-FTIR) data for the study of the thermal behavior of raw materials and products.

Multi- Lingual

Our software is available in many different user exchangeable languages, such as: English, Spanish, French, German, Chinese, Korean, Japanese, etc.

Multi-User

The administrator can generate different user levels providing different rights to operate the instrument. An optional Log file is also available.

Database

State of the art database design enables easy data handling.





pus

bound

shing
larries

Technical Specifications

Standard MSB L87

Model	Resolution	Range	Vacuum	Pressure max.	Temperature range	Dosing system	Options
MSB-TGA-2400	10 µg/ 1 µg	25g/10g		1bar	-150 °C up to 2400 °C**	static & dynamic	Vapor
MSB-TGA-1600	10 µg/ 1 µg	25g/10g	10E ⁻⁵ mbar*	5bar	-150 °C up to 1000 °C optional: RT up to 1600 °C**	static & dynamic dynamic	Vapor Vapor
MSB-TGA-1800	10 µg/ 1 µg	25g/10g		50bar	RT up to 1800 °C	static & dynamic	
MSB-TGA-1000	10 µg/ 1 µg	25g/10g		150bar	RT up to 1000 °C	static & dynamic	Vapor
MSB-TGA-1500	10 µg/ 1 µg	25g/10g		150bar	RT up to 1500 °C	static & dynamic	Vapor

* level can be controlled ** depends on furnace

This technical specifications provided represent a non-binding exemplary overview. Detailed information tailored to specific applications or individual requirements will be made available upon request.

Contact form





LINSEIS Contract Testing

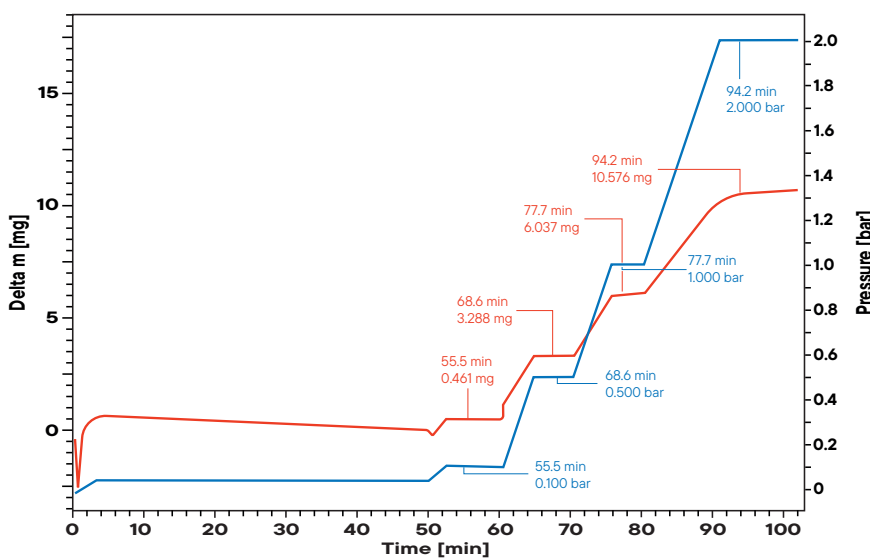
Thermal Sorption MSB L87

Model	Resolution	Range	Pressure max.	Temperature range	Dosing system	Options
MSB-HP-150-10	10 µg	25g	150bar	RT up to 400 °C Optional: -20 °C	static & dynamic	Vapor with optical ports
MSB-HP-150-1	1 µg	10g	150bar	RT up to 400 °C Optional: -196 °C/-20 °C	static & dynamic	Vapor with optical ports
MSB-HP-350-10	10 µg	25g	350bar	RT up to 400 °C Optional: -20 °C	static & dynamic	Vapor with optical ports
MSB-HP-350-1	1 µg	10g	350bar	RT up to 400 °C Optional: -20 °C	static & dynamic	Vapor with optical ports



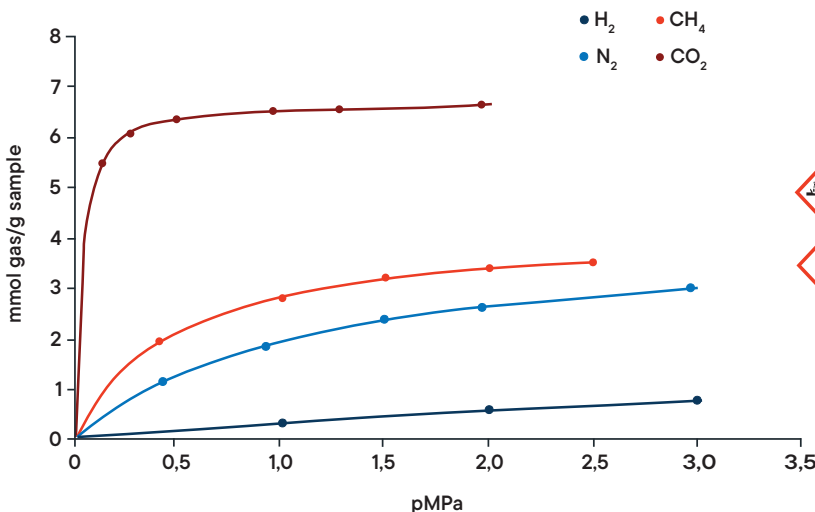
Applications

Isothermal adsorption by Zeolite



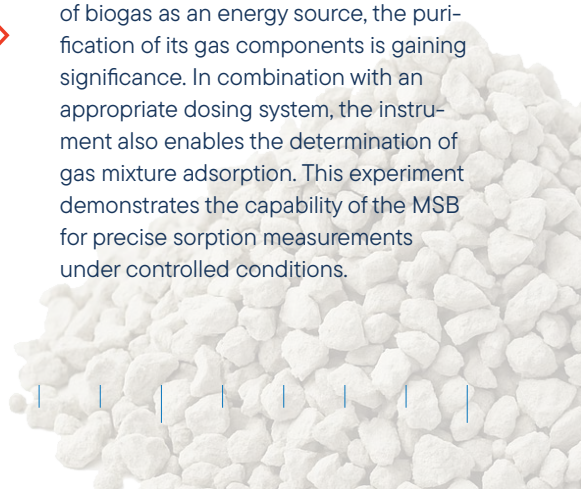
The adsorption behavior of a zeolite sample was investigated under isothermal conditions using the MSB L87. The experiment was performed at room temperature with a stepwise pressure increase from 0.1 to 2.0 bar. At each pressure step, the uptake of gas molecules by the zeolite framework was monitored through the corresponding sample mass increase. The recorded adsorption capacities ranged from 0.461 mg at 0.1 bar up to 10.576 mg at 2.0 bar. The stepwise isotherm clearly demonstrates the high affinity and capacity of zeolite materials for gas adsorption.

Adsorption of Biogas on Zeolite



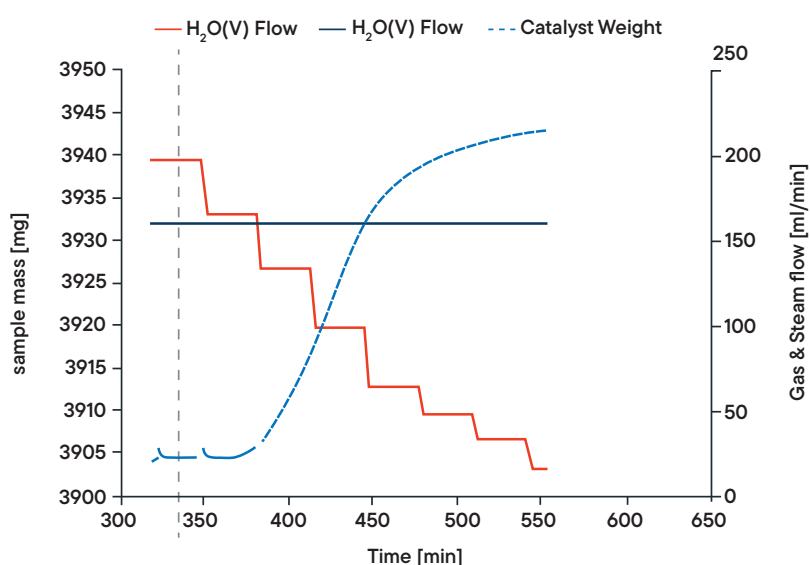
The adsorption behavior of biogas components was investigated using the LINSEIS MSB L87.

Pure gas isotherms of CO₂, CH₄, N₂ and H₂ were measured on zeolite, an industrially relevant sorbent for biogas purification. With increasing importance of biogas as an energy source, the purification of its gas components is gaining significance. In combination with an appropriate dosing system, the instrument also enables the determination of gas mixture adsorption. This experiment demonstrates the capability of the MSB for precise sorption measurements under controlled conditions.



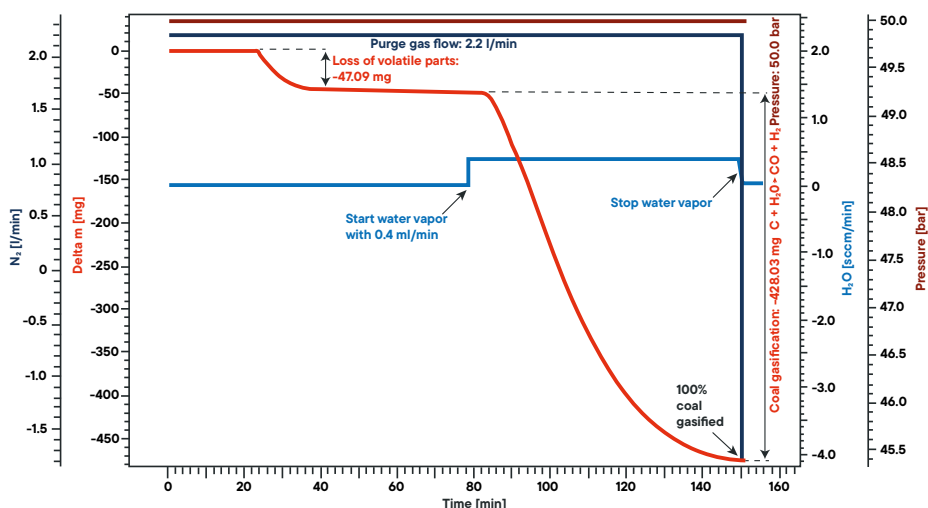


Catalyst coking



The example illustrates the formation of coke on a catalytic material under process-relevant conditions of 20 bar and 650 °C in a reactive CH₄/H₂O atmosphere. As the steam partial pressure is gradually reduced, the reaction equilibrium shifts toward carbon formation, leading to a continuous mass increase of the catalyst due to coke deposition. The maximum specific coke deposition rate determined from the measurement is 0.32 mg g⁻¹s⁻¹, highlighting the strong influence of steam concentration on the coking behavior of the catalyst.

Application example: Coal gasification



The gasification behavior of coal was studied at 50 bar using the LINSEIS MSB L87 with a purge gas flow of 2.2 l/min. Initially, the release of volatile components caused a mass loss of 47.1 mg. After stabilization, water vapor was introduced at 0.4 ml/min, initiating the coal gasification reaction. The sample showed a continuous mass decrease until complete conversion, resulting in a total mass loss of 428.0 mg. This experiment highlights the suitability of the system for kinetic investigations under high-pressure and reactive conditions.

LINSEIS

pushing boundaries

LINSEIS GmbH Germany

Vielitzerstr. 43
95100 Selb

Tel.: (+49) 9287 880 0
E-mail: info@linseis.de

LINSEIS Inc. USA

109 North Gold Drive
Robbinsville, NJ 08691

Tel.: (+1) 609 223 2070
E-mail: info@linseis.com

LINSEIS China

Kaige Scientific Park
Room 120, Building T3, No.1220
Yuqiao Road, Pudong, Shanghai

Tel.: (+86) 61 90 12 03
Tel.: (+86) 50 55 06 42
E-mail: info@linseis.com.cn

LINSEIS India

Plot 65, 2nd Floor, Sai Enclave,
Sector 23, Dwarka05-800
110077 New Delhi

Tel.: +91-11-42883851
E-mail: sales@linseis.in



WWW.LINSEIS.COM

03/2026