ambifood®

Gerhardt Analytical Systems

DUMATHERM® – Efficient, rapid nitrogen determination using the DUMAS method

AUTOMATED PROTEIN ANALYSIS

RAPID

Results in 3 minutes

PRECISE

Accurate results to a threshold of 0.003 mg N

VERSATILE

For solid and liquid samples up to 1 g

EFFICIENT

Very low operating costs, consumables with long service life

SAFE

Closed system – shut the door and leave it to work!

"Reliable results in 3 minutes: nitrogen analysis has never been quicker, more precise and more cost-effective."

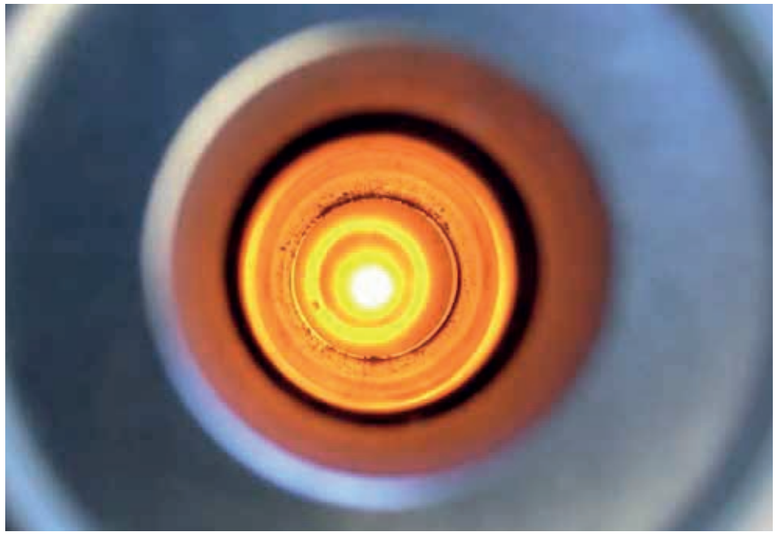
Scan the QR code and watch our DUMATHERM® video.

DUMATHERM® N Pro

A particularly high degree of precision is required when determining the protein content of foods and animal feeds. One of the standard techniques used for this purpose is the Dumas method. This involves combustion of the sample material at high temperatures and, in the presence of a metallic copper surface, reduction of the nitrogen oxide produced to elementary nitrogen.

C. Gerhardt's environmentally friendly, chromium-free, high temperature catalysts make it possible to incinerate samples catalytically and without residue. Up to 64 individual samples (or up to 156 samples following a software upgrade to be introduced in late 2016) can be processed fully automatically and non-stop in a single run, even overnight (activated camera monitoring will also be available following the software upgrade in late 2016). Every sample is reliably tracked at all times. The DUMATHERM® does not require an extractor and can be flexibly employed on a stand-alone basis in any location. Heating time is just 30 minutes and only 3 minutes are required for an individual analysis run. The DUMATHERM® can analyse almost all types of samples, whether solid or liquid, and is capable of reliably and precisely determining even trace content of proteins thanks to use of helium technology and total gas analysis. The detection limit is 0.003 mg nitrogen. Samples weighing up to 1 g can be readily processed.

RAPID PROTEIN ANALYSIS



Inside the reactor

RAPID
Combustion and analysis take 3 minutes. The unit is fully operational in 30 minutes, including a fully automatic system test and leak test.

PRECISE
Thanks to helium technology and total gas analysis, the DUMATHERM® can determine even extremely low nitrogen content reliably and precisely. The detection limit is 0.003 mg N. Standard deviation is less than 0.5%.

VERSATILE
The DUMATHERM® can be used for the analysis of almost all sample matrices. Due to its ingenious water separation technique, the DUMATHERM® is also particularly suitable for the analysis of liquid samples. Larger samples weighing up to 1 g can be readily processed.

FLEXIBLE
When it comes to choice of carrier gas. Argon can be used instead of helium – depending on the type of sample.

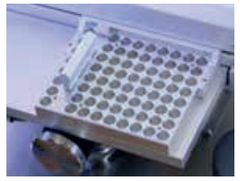
EFFICIENT
The following properties make the DUMATHERM® a particularly efficient 'continuous combustor': fully automated sample feed, low oxygen consumption due to stoichiometric input and rapid catalytic combustion, minimal blank values and very low maintenance costs.

SAFE
The DUMATHERM® is completely software-controlled and can be operated safely in any location without the need for an extractor. Gas flow, temperature, pressure (leakproofing) and valve settings are monitored automatically.

COST-EFFECTIVE
Low operating costs, long service life, low maintenance costs. The unit comprises high quality, durable components, which are partly capable of self-regeneration.

"Fully automatic and software-controlled: the DUMATHERM® delivers reliable, accurate results."

AUTOMATED SAMPLE INPUT



Exact positioning – precise traceability: all samples have preset positions.

- The unit can process non-stop up to 64 samples fully automatically, even overnight.
- The autosampler is fed via a separate transfer plate: the samples land exactly in the predetermined position without the need for manual adjustment.
- The helium-filled purge chamber is hermetically sealed. There is no risk of falsification of analysis results by the nitrogen content of atmospheric air.
- A dustproof, transparent hood shields the process against external influences and disruptions, but provides a clear view of what is happening.

"The DUMATHERM® has a brand new type of autosampler with X-Y control."

DUMATHERM® -AUTOMATED PROTEIN ANALYSIS

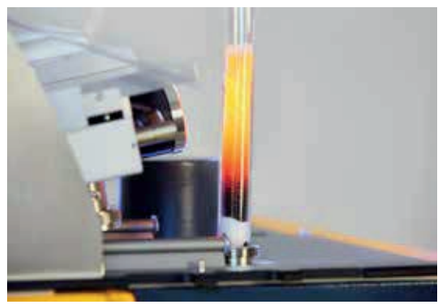
"The DUMATHERM® – durable, reliable, resource-saving precision technology by C. Gerhardt."

EFFICIENT TECHNOLOGY

The combustion gases are analysed directly via a thermal conductivity detector. This significantly shortens the analysis process and the reference result is available in just three minutes. Helium technology and total gas analysis mean that even small samples with low nitrogen content can be accurately analysed. In addition, the sample sizes required reduce gas and energy consumption, process times and costs per analysis. Maintenance work, such as the replacement of the ash insert and reactors, can be carried out safely and easily at operating temperature using simple tools, without the need to shut down the DUMATHERM®.

The DUMATHERM® process

Stoichiometric oxygen input: the software calculates the required oxygen input and combustion time individually. This saves time and money. The parameters for common sample matrices are preset.



Catalytic combustion: combustion at 1,000°C in the vertical, chromium-free combustion reactor takes place catalytically and thus particularly rapidly and economically.

Residue-free ash: samples are sealed in airtight tinfoil capsules and are combusted in a heat resistant ash insert leaving virtually no residue

THE DUMATHERM® MANAGER

The highly sophisticated control software runs the entire analysis process independently. In the event of irregularities, it automatically interrupts the process without laboratory personnel needing to be present.

- The DUMATHERM® is entirely operated and monitored via the user-friendly software DUMATHERM® Manager. All data for analysis is entered via a PC or LIMS connection.
- The software automatically calculates the analysis parameters, such as gas dosage or combustion times, required for the different types of samples and saves these to sample tables.
- The DUMATHERM® Manager continuously monitors gas flow, temperature, pressure and valve settings and records the measurements in a log table (history).
- The software automatically interrupts the analysis process in the event of irregularities, transmits specific error messages for rapid diagnosis and switches to carrier gas saving mode.
- The software issues individual maintenance instructions according to the service intervals specified depending on sample type and quantity.

DUMATHERM® -AUTOMATED PROTEIN ANALYSIS

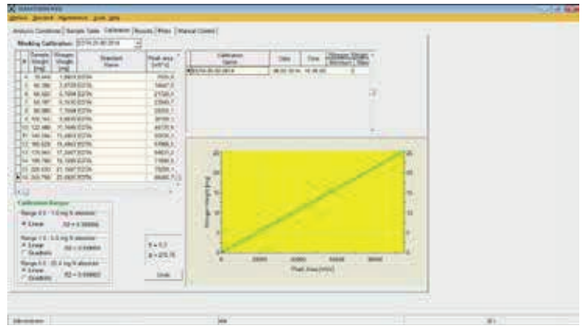
"The DUMATHERM® Manager facilitates preparation of the documentation required of accredited laboratories by ISO 17025."

ADDITONAL FEATURES

- In-house method libraries can be compiled
- Different user levels with different user rights
- Complete traceability of all analysis data, such as dates, results, operator, program data, etc.
- Printout of results of serial and individual sample analyses
- Results database with various filter and sort functions
- Direct transfer of balance data to PC
- Data transfer to and from LIMS systems in various file formats
- Documentation in accordance with ISO 17025

FLEXIBLE CALIBRATION

- The innovative thermal conductivity detector can be individually calibrated for different nitrogen contents with the help of standard substances (e.g. EDTA).
- Very different sample materials can thus be analysed following optimum calibration.
- Calibration remains stable for many weeks: **no subsequent adjustment is required** as part of daily work routine.



Long-term stability of EDTA calibration of the DUMATHERM®

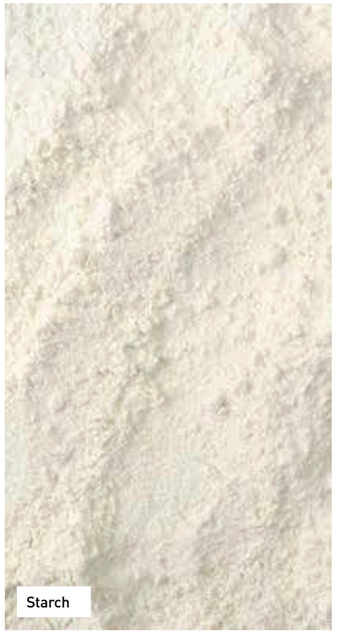
The DUMATHERM® Manager displays the results of analysis in graph and table form

"At the core of the DUMATHERM® is its special thermal conductivity detector. It works without a reference gas flow."

"The DUMATHERM® is also eminently suitable for the analysis of liquids, such as milk and dairy products, beer and soya sauce."


Soya beans


Flour


Starch


Wheat


Beer

VERSATILITY

- **Wide range of uses:** Protein and nitrogen determination in many analytical applications. Application sheets available for all common analytical requirements
- **Three-stage water separation** via a condensation trap, intelligent membrane system and chemical-free absorption trap with colour change.
- **No extractor or laboratory facilities required:** the DUMATHERM® can be used virtually anywhere. Only a power supply and gas connections for oxygen, nitrogen/air and helium (or alternatively argon) are required.
- Suitable for **solid and liquid samples.**

Can be used for analysis of protein content in:

- Milk and dairy products, e.g. DIN EN ISO 14891, Art. 64 of the LFGB (German Food and Animal Feed Code) 01.00,10 and Art. 64 LFGB 05.00,15
- Cereals, e.g. AOAC 979.09, 920.87, 992.23
- Egg and egg products, e.g. Art. 64 of the LFGB (German Food and Animal Feed Code) 05.00,15
- Meat and meat products, e.g. AOAC 992.15 or AOAC 928.08
- Malt and raw materials for brewing, e.g. AOAC
- Animal feeds, e.g. AOAC 990.03
- Cereal products, oilseeds DIN EN ISO 16634
- Beer, wort, brewing grains, e.g.. AOAC 997.09
- Starch etc.

Determination of the nitrogen content in

- Soils (fertilisers) e.g. DIN 11512-20, DIN 19684-part 4 or AOAC 973.48
- Water e.g. DEV (Data Collection Regulation), H11, H28
- Soil improvers and culture substrates
- Fertilisers, e.g. AOAC 993.13, DIN EN 13654-2
- Urine
- Cellulose
- Paper
- Crude oil
- Coffee
- Tobacco
- Plastics
- Explosives

WIDE RANGE OF ACCESSORIES

To help you operate your DUMATHERM®, we can supply the DumaSet® consumables package and other service accessories. These enable you to both maintain the device and have complete control of costs over the long term.

DUMASET®

Affordable set of consumables for the analysis of 1000 solid samples, comprising: Quartz reactor tube, combustion reactor, ash insert (ceramic), tin foils.

MULTIPLE COMBINATIONS

A DumaSet® provides for the analysis of up to 1000 solid samples.

COST SAVINGS

It is more convenient to buy DumaSet® than to order individual components.

CERTIFICATION

A quality certificate is supplied with each DumaSet®.

EASE OF ORDERING

When placing an order, it is not necessary to list all the individual components; a single article number is enough to order a DumaSet®.

LONG SHELF LIFE

Special packaging ensures a long shelf life.

There are other consumables available that can be employed for specific applications of the DUMATHERM®:

DumaReact®	Combustion catalysts (chromium-free)
DumaCop®	Copper for reduction
DumaPad®	Quartz wool pads
DumaDry	Absorbent for the water absorption trap (chemical-free)
DumaEDTA®	Calibration standard
DumaCO$_2$®	CO_2 absorber (regenerating and chemical-free)
DumaPress	Tool for encapsulating samples
Helium saving kit	To save helium when the unit is on standby
DumaCollect® steel	Starterkit reusable stainless steel ash insert including a tool for cleaning the ash insert

"The DumaSet® and customised maintenance programmes ensure reliable operation and complete cost control over the long term."

Furthermore: the DUMATHERM® is environmentally friendly! The catalysts are chromium-free, no chemicals are used in water and CO_2 separation and the water absorbent is also chemical-free.

TECHNICAL DATA

Sample size	0.5 mg – 1 g
Sample capacity	1 – 64 samples
Analysis time	3 – 5 min, depending on sample type and quantity
Recovery rate	> 99.5%
Helium detection limits:	0.003 – 50 mg N absolute
Argon detection limits:	0.1 – 50 mg N absolute
Standard deviation	< 0.5% (assuming standard preparation of the samples for the method in question)
Operation	via PC* using the DUMATHERM® Manager
Gases required for operation	Helium (alternatively argon), grade 5.0 (99.999%) Oxygen, grade 5.0 (99.999%) Compressed air or nitrogen, grade 2.6 (99.6%, oil- and water-free)
Gas equipment	Ultra high grade gas pressure regulators, size 1/4" cylindrical screw thread
Gas input pressure	3 – 6 bar
Ambient temperature	15°C < t< 35°C
Power rating	230 VAC
Dimensions (W x D x H)	870 x 710 x 860 mm (closed) 1108 x 710 X1118 mm (open)
Weight	approx. 85 kg
DUMATHERM® power consumption	1380 W
Autosampler power consumption	90 W
Current	max. 6A
Digital balance required	Optional, min. precision 0.1 mg


DUMATHERM® - FAST NITROGEN DETERMINATION

Technical Data DUMATHERM®

Order information DUMATHERM®

For more details of technical specifications and ordering information, please request our product data sheet.

*PC and printer are not supplied with the DUMATHERM®.

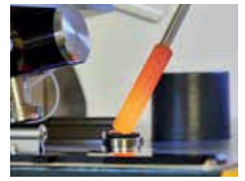
SERVICE AND MAINTENANCE

C. Gerhardt products are high quality products for routine laboratory use. We employ only high quality, durable materials in order to ensure maximum functionality and reliability. Laboratory apparatus is subject to high levels of use. Consumables, heat and high sample throughput leave their mark on any item of equipment. Hoses, seals and glass components must be regularly checked, cleaned and if necessary replaced.

A maintenance and service agreement from C. Gerhardt maintains the serviceability and reliability of your DUMATHERM®.

DUMATHERM® MAINTENANCE PROGRAMME

- General visual inspection and cleaning
- Verification and calibration of the autosampler
- Zero point calibration of the flow controller
- Leak testing of the entire system
- Software updating (if available)
- Hardware updating (if available)
- Complete function test
- Analytical testing of the unit
- Electrical testing in accordance with VDE 0701
- Record of the work carried out



ADDITIONAL SERVICES

- Repairs in situ or at C. Gerhardt's premises
- Cost estimates
- Telephone and email support
- Individual solutions for your equipment pool

QUALIFICATION IQ / OQ / PQ

It goes without saying that we also perform the IQ / OQ / PQ in accordance with our manufacturer specifications.

Our authorized C. Gerhardt Partner is happy to develop an individual maintenance and service contract with you for equipment from our company.

Telf: 229962069
Fax: 229940082
geral@ambifood.com
www.ambifood.com

C. Gerhardt – Qualität made in Germany

AUTOMATING STANDARD ANALYSES

Completely automated laboratory analysis systems from C. Gerhardt are highly developed special equipment. They automate recurring analysis processes in accordance with national and international standards and norms. They continuously provide precise and reproducible analysis results quickly, at low cost, economically and highly efficiently.

An excerpt from our product portfolio

COMPLETELY AUTOMATIC HYDROLYSIS

HYDROTHERM – automatic acid hydrolysis system for fat determination according to Weibull-Stoldt. When combined with SOXTHERM®, HYDROTHERM is an ideal system solution for total fat determination.

COMPLETELY AUTOMATIC FAT EXTRACTION

SOXTHERM® – automatic fast extraction system for fat determination

COMPLETELY AUTOMATIC WATER STEAM DISTILLATION

VAPODEST® – fast distillation system for Kjeldahl nitrogen/ protein determination and water steam distillation as sample preparation for further analysis.

COMPLETELY AUTOMATIC CRUDE FIBRE EXTRACTION

FIBRETHERM® – completely automated processing of the boiling and filtration processes for determining crude fibre, ADF and NDF.

Date: 05/2016 | We reserve the right to introduce technical modifications without prior notification

Gerhardt
Analytical Systems