

**VERDER**  
scientific



# ENABLING PROGRESS.

PRODUCT NEWS

## VERDER SCIENTIFIC – YOUR GLOBAL TECHNOLOGY PARTNER

**HEAT TREATMENT**  
**ELEMENTAL ANALYSIS**  
**MATERIALOGRAPHY & HARDNESS TESTING**  
**MILLING & SIEVING**  
**PARTICLE CHARACTERIZATION**

BELSORP MAX X SERIES

### SPECIAL MODELS OF THE BELSORP MAX X SERIES

#### BELSORP MAX X HT

Enabling various types of adsorption (water vapor, VOCs, and more) with a manifold block that can be heated up to 80 °C. A wider range of applications under realistic conditions (cement, concrete, building materials, heat transformation, battery electrodes, GDL fuel cells).

#### BELSORP MAX X HP

Custom solution to enable gas adsorption, BET surface area, pore size distribution, vapor adsorption, and adsorption rates evaluation under high pressure (up to 900 kPa). Used in CO<sub>2</sub> utilization, energy storage, heat pumps, air separation materials (PSA/TSA).

#### BENEFITS AT A GLANCE

- | Extensive product range
- | Gas selector for different adsorbents
- | Measurement temperature control
- | Reduced measurement time
- | BELCONTROL operating software
- | BELMASTER analysis software



Up to 4 measurement ports



Easy upgrade to vapor sorption



Water bath for temperatures from -10 °C to 70 °C

TURBISCAN RANGE

## THE WORLD LEADER IN PHYSICAL STABILITY AND DISPERSIBILITY ANALYSIS OF LIQUID FORMULATIONS

New in 2024: the TURBISCAN ranges joins the MICROTRAC portfolio. The TURBISCAN stability analyzers use Static Multiple Light Scattering (SMLS) for the direct characterization of native concentrated liquid dispersions.

TURBISCAN was the first patented technology allowing accelerated aging tests on unstressed products, becoming a reference for direct stability characterization technology.

### BENEFITS AT A GLANCE

- | 1 to 54 samples capacity
- | Temperature from 4°C to 80°C
- | Turbiscan Stability Index (TSI): a unique and specific parameter to determine and compare the stability of different formulations in one click
- | Accelerated destabilization detection: up to 1,000 times faster than visual observation
- | No dilution, no mechanical stress, in concentrations up to 95%
- | Quantitative measurement of dispersion stability and shelf-life, migration, velocity, particle size diameter, and others.
- | TURBISOFT: dedicated software – data analysis made simple
- | TURBISIZE: Particle Size Distribution software add-on



STABINO ZETA & NANOTRAC FLEX

## NANO PARTICLE SIZING, ZETA POTENTIAL AND CHARGE TITRATION BY DYNAMIC LIGHT SCATTERING

MICROTRAC instruments using Dynamic Light Scattering (DLS) allow Particle Size Analysis in the nanometer range and Zeta Potential analysis. DLS is an established and precise measurement technique for the characterization of particle sizes in suspensions and emulsions. When combined with the Stabino Zeta full Charge Titrations are facilitated.

This product family consists of analyzers that provide information on particle size, zeta potential, concentration and molecular weight in a single system. Microtrac is a pioneer of particle size analysis and has been developing DLS analyzers for over 30 years.





ELEMENTRAC CN-r

## NITROGEN/PROTEIN AND CARBON ANALYSIS WITH ELTRA'S ELEMENTRAC CN-r ACCORDING TO THE DUMAS METHOD

The ELEMENTRAC CN-r offers a powerful approach to elemental analysis, combining efficiency, precision, and cost-effectiveness.

**HIGH ACCURACY:** The ELEMENTRAC CN-r redefines elemental analysis, delivering reliable Dumas results in less than three minutes. Ideal for standard-compliant analysis in food, animal feed, fuels, and fertilizers.

**SWIFT RESULTS:** Achieve comprehensive insights in less than 3 minutes, ensuring a balance between speed and accuracy for your analytical needs.

**INTUITIVE DESIGN, SEAMLESS OPERATION:** The CN-r features an ergonomic design with an integrated PC and a tiltable touchscreen for convenient operation. Optimized for high throughput and cost efficiency, it streamlines your workflow.

**ELEMENTS 4.0 SOFTWARE:** Stay ahead with the Elements 4.0 software, compliant with FDA 21 CFR Part 11 and ISO 17025.

**SIMPLIFIED SAMPLE MANAGEMENT:** The innovative autosampler ensures clear sample assignment, minimizing mix-ups in even the busiest labs. Easily handle a large number of samples.

**COMPLETE COMBUSTION:** Working with natural products? The CN-r guarantees complete combustion with a pure oxygen atmosphere, preventing carbon black formation and enhancing result accuracy. Simplify method optimization effortlessly.

**COST-EFFICIENT ANALYSIS:** Benefit from intelligent gas-saving functions and economical consumable use, leading to lower costs per sample. Maximize efficiency without compromising your budget.

ELEMENTRAC CHS-r

## FUEL ANALYSIS WITH THE ELEMENTRAC CHS-r

The ELEMENTRAC CHS-r utilizes a resistance furnace with ceramic tube for simultaneous measurement of carbon, hydrogen and sulfur in organic samples like coal or coke and in selected inorganic samples like ores and building materials.

- | Ceramic tube for combustion temperatures up to 1550°C
- | Wide range analysis from low concentrations up to 100%
- | Ideal suited for analysis of fuels like coal, coke, alternative fuels
- | Precise measurements even in heterogeneous samples due to application of high sample weights





**ELTRA®**  
ELEMENTAL ANALYZERS

ELEMENTRAC ONH-ps



**SIMULTANEOUS MEASUREMENT OF OXYGEN, NITROGEN AND HYDROGEN**

The ELEMENTRAC ONH-ps is the next generation inert gas fusion analyzer which measures oxygen, nitrogen and hydrogen simultaneously in inorganic samples like steel and iron. Whereas the ONH-p2 model determines both hydrogen and nitrogen in a Thermal Conductivity Detector the ONH-ps oxidizes hydrogen to water and uses a sensitive water IR cell for detection.

**ADVANTAGES OF SIMULTANEOUS O/N/H MEASUREMENT**

- | Faster and more efficient than separate O/N and H measurement
- | Reduces analysis costs (no Schuetze reagent required)
- | Increased reliability of O/N/H results which are derived from the same sample

Simultaneous O/N/H measurement is ideally suited for production control or research and development where availability of test material is limited.

**THE NEW ELEMENTRAC H-r**

- | Resistance furnace with quartz tube for temperatures up to 1100°C
- | New digital TCD for precise measurement from the lower ppm up to percentage range
- | XXL furnace configuration for measurement of arc weld material according DIN EN ISO 3690
- | Measurement of diffusible and total hydrogen content (depending on sample) in steel samples



ELEMENTRAC H-r

**WIDE RANGE HYDROGEN MEASUREMENT VIA CARRIER GAS HEAT EXTRACTION**

Two different techniques are commonly used for hydrogen analysis, for example, in steel and arc welding material. Whereas the inert gas fusion method (ELEMENTRAC ONH-p2) utilizes an electrode (impulse) furnace and melts the samples, the carrier gas heat extraction method (ELEMENTRAC H-r) uses a resistance furnace at temperatures up to 1100°C which leaves the sample in its solid state.

ABOUT ELTRA

**FURTHER COMBUSTION ANALYZERS FOR DETERMINATION OF C, S, N, O, H AND THERMOGRAVIMETRIC ANALYZERS**



Oxygen Nitrogen Hydrogen Analyzer ONH-p 2



Carbon Sulfur Analyzer CS-i



Carbon Hydrogen Sulfur Analyzer CS-580 A



Thermal Analyzers TGA Thermostep

Since its foundation in 1981 ELTRA develops and manufactures state-of-the-art, robust combustion analyzers for elemental analysis of a large variety of solid materials. These ensure reliable, reproducible and highly precise measurements of carbon, sulfur, oxygen, nitrogen or hydrogen concentrations. In 2007, thermogravimetric analyzers were added to the portfolio. ELTRA is one of the leading manufacturers of combustion analyzers worldwide.

[www.eltra.com](http://www.eltra.com)

**CARBOLITE**  
**GERO** 30-3000°C



**BENEFITS AT A GLANCE**

- | Inert process gas
- | Cooling trap
- | Plug & Play solution
- | 15 kW heating power
- | Movable
- | Small footprint
- | Touchpanel controller
- | Freely programmable

GLO 8/13

**ENTRY LEVEL SOLUTIONS FOR  
ADDITIVE MANUFACTURING**

CARBOLITE GERO offers the GLO 8/13 furnace, a compact and versatile debinding and sintering solution for additive manufacturing. This furnace features rotationally symmetrical heating elements that encompass a 180 mm iD cylindrical retort, providing even heating throughout its length. It is suitable for all additive manufacturing processes that require either nitrogen, argon, or forming gas (N<sub>2</sub>/H<sub>2</sub>, 95/5% or Ar/H<sub>2</sub>, 98/2%).

With a maximum temperature of 1300°C, this furnace can accommodate nearly 80% of printed metals.

LHTG 200-300/30-1G SMART

**BATTERY MATERIALS AND  
GRAPHITIZATION**

To achieve the highest quality in graphitization, it is crucial that all materials in direct contact with the load are as clean as possible.


At CARBOLITE GERO, the hot zones of all graphite furnaces are constructed solely of pure graphite materials. The top loader furnace LHTG is equipped with a circular mantle heater arranged in a perfectly symmetrical meander that encircles the sample like a belt.

The upper roof and lower bottom of the usable space are tightly sealed with graphite felt insulation.



**BENEFITS AT A GLANCE**

- | Available as 2200 – 3000 °C
- | Touchpanel with PLC
- | Small footprint
- | Low power consumption



HTF 17/64 & HB 17/430

## SOLUTIONS FOR TECHNICAL CERAMICS

At CARBOLITE GERO, we pride ourselves on providing standard debinding and sintering solutions to our customers. Our close collaboration with R&D and industrial partners enables us to continually enhance our furnaces and offer the best possible solutions.

The outcome of this endeavor is our optimized HTF and HB furnaces. These front loader and top hat furnaces provide exceptional versatility, effortless handling, and an energy-efficient design that ensures optimal temperature uniformity. Standard sizes of up to 160 L are available at low lead times.

**BENEFITS AT A GLANCE**

- | 1700 & 1800 °C furnaces
- | Frontloader or Hood furnace
- | Touchpanel controller with or without PLC

**FURTHER LABORATORY AND INDUSTRIAL FURNACES AND OVENS UP TO 3000 °C**



**AX**  
Laboratory Oven



**LHT** High Temperature  
Laboratory Oven



**ELF** Laboratory  
Chamber Furnace



**TF**  
Tube Furnace



**LHTG**  
for Graphitization



**GPCMA**  
Inert Gas Furnace



**EBO** for  
MIM & CIM



**HTK120** for  
MIM & Sintering

ABOUT CARBOLITE GERO

CARBOLITE GERO is a leading manufacturer of laboratory and industrial ovens and furnaces covering a temperature range from 30 °C to 3000 °C. In addition to the wide range of standard products, CARBOLITE GERO develops customized solutions for complex heat treatment processes including applications under vacuum, inert gas or reactive atmosphere.

[www.carbolite-gero.com](http://www.carbolite-gero.com)



MILLING SIEVING ASSISTING

### THE NEW PLANETARY BALL MILL PM 300

## POWERFUL AND ERGONOMIC BENCHTOP MODEL WITH JAR VOLUMES UP TO 500 ML

With the new PM 300 Planetary Ball Mill, RETSCH offers a powerful instrument that combines efficiency with significantly improved handling and increased sample throughput. The mill accommodates 500 ml grinding jars and allows for processing up to 2 x 220 ml sample material per batch. The maximum speed of 800 rpm is a prerequisite for highest pulverization energy and short processing times.

#### SIMPLE AND ERGONOMIC HANDLING

- | Easy and safe clamping of the grinding jars thanks to lockable sun wheel and ergonomic clamping unit
- | Free access to grinding chamber and jars for easy cleaning

#### BETTER PLANABILITY

- | Upon entering the grinding parameters, the display indicates the expected finishing time
- | Smart service interval notification based on usage

#### HIGH FLEXIBILITY

- | Two grinding stations for jars of min. 12 ml and max. 500 ml
- | GrindControl to measure temperature and pressure inside the jar

## EASYFIT GRINDING JARS FOR EXCELLENT RESULTS

The name says it all - the brand-new EasyFit grinding jar line for all RETSCH Planetary Ball Mills offers

- | Easy clamping
- | Absolutely tight fixing thanks to Advanced-Anti-Twist functionality - even at high speed
- | Interchangeable lids for the 3 lid sizes that fit the whole range



### ACCESSORIES

## ACCESSORIES FOR PROCESSING SMALL VOLUMES IN BALL MILLS

#### MULTI-CAVITY JARS FOR MIXER MILLS MM 500 CONTROL AND MM 500 NANO

- | Available with four 10 ml and two 25 ml cavities
- | Made of stainless steel
- | Pouring aids included

#### 5 ML STAINLESS STEEL JARS FOR MM 400 AND MM 500 VARIO

- | Adapter holds 4 jars, so that 8 samples (MM 400) and up to 24 samples (MM 500 vario) can be processed simultaneously

#### 2 ML STAINLESS STEEL REACTION VIALS FOR ALL MIXER MILLS AND THE CRYOMILL

- | MM 500 control and MM 500 nano: adapter for nine 2 ml stainless steel reaction vials or 18 single use reaction vials of 1.5 ml or 2 ml
- | CryoMill: PTFE and steel adapter for 1.5 ml and 2 ml polymeric single-use reaction vials or 2 ml stainless-steel reaction vials. 6 samples per batch can be processed
- | MM 400 and MM 500 vario: PTFE adapters enable simultaneous preparation of up to 20 samples (MM 400) and up to 50 samples (MM 500 vario)





**LABORATORY MILLS AND SIEVE SHAKERS FOR SAMPLE PREPARATION AND CHARACTERIZATION OF SOLIDS**



*Jaw Crusher  
BB 500*



*Knife Mill  
GRINDOMIX GM 200*



*Ultra Centrifugal Mill  
ZM 300*



*Cutting Mill  
SM 300*



*Vibratory Disc Mill  
RS 200*



*Planetary Ball Mill  
PM 100*



*Mixer Mill  
MM 500 control*



*Vibratory Sieve Shakers  
AS 200 series*

ABOUT RETSCH

RETSCH is the worldwide leading solution provider for neutral-to-analysis sample preparation and characterization of solids. The product range includes innovative size reduction devices and analytical sieve shakers characterized by excellent performance, operating convenience, safety and a long lifetime.

[www.retsch.com](http://www.retsch.com)

**VERDER**  
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**EXPERT  
KNOWLEDGE  
FOR YOU!**

The VERDER SCIENTIFIC companies see themselves as solution providers. We not only offer competent application support and technical assistance, we also share our knowledge and expertise through **seminars, webinars, recordings** and **freely accessible knowledge bases**.

Our application experts process and measure your samples in our **in-house application laboratories** or in an **online live demonstration**.

