ELTRA®

ELEMENTAL ANALYZERS

part of VERDER scientific

ELEMENTRAC® CS-*d*

NEW

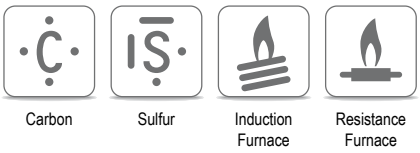
ELEMENTRAC CS-*d*

Unique Dual Furnace Technology

Reliable Carbon & Sulfur Measurement for Any Type of Sample

The new ELTRA ELEMENTRAC CS-*d* is a reliable, precise and robust combustion analyzer designed for the measurement of carbon and sulfur concentrations. The element-selective IR detectors provide a wide measuring range from the lower ppm range up to 100 % for both elements. Due to the unique combination of two different combustion techniques in one analyzer, the ELEMENTRAC CS-*d* ensures reliable C/S measurement in both organic and inorganic sample materials.

Typical sample materials for the ELEMENTRAC CS-d:
Steel, iron, cast iron, copper, ceramics, soil, fuel, oil, coal, coke



ELEMENTRAC CS-*d*
Unique Dual Furnace Technology

ELTRA's advanced analyzer technology

Benefits

- Unique combination of induction & resistance furnace
- Massive gold IR path
- Wide working range from 2 ppm up to 100 % C/S

The ELEMENTRAC CS-d is equipped with a resistance furnace for combustion of organic and an induction furnace for combustion of inorganic sample materials. For reliable carbon and sulfur analysis both furnaces can be used independently, without the need for hardware adjustments.

The common detection and measuring unit consist of up to four independent element-selective IR cells with massive gold IR path. This ensures a wide working range in combination with higher resistance against halogens and acids. The ELEMENTS software for the ELEMENTRAC CS-d provides a clear structure for fast and efficient working and in addition many unique functions for safe and comfortable analysis of critical samples. Both furnaces of the new ELEMENTRAC CS-d feature innovative tools to support a safe, reliable and precise carbon & sulfur analysis.

Solutions for best carbon and sulfur recovery

To ensure the measured sulfur and carbon concentrations are not too low, the ELEMENTRAC CS-d uses an electrical heated dust trap and an enlarged temperature-controlled catalyst furnace. The dust trap significantly reduces condensations and forming of sulfuric acid whereas the catalyst furnace guarantees effective oxidation of traces from carbon monoxide.
The catalyst furnace can also be used in the "resistance furnace mode" where carbon monoxide can be produced in larger amounts when a lower combustion temperature is applied.

Induction furnace

- Rapid C/S analysis (40 seconds)
- Virtually no sample preparation
- Analysis of pins, wires, powders, dust

Solutions for the resistance furnace

The resistance furnace of the ELEMENTRAC CS-d is equipped with a ceramic tube and can be used in a temperature range from 600°C up to 1550°C. The combustion temperature is applied via the ELEMENTS software in steps of 1°C. The oxygen is supplied via a short ceramic tube and subsequently sucked over the sample to ensure complete combustion and no sample loss due to swirling. The low blank sample port with camouflage allows for precise carbon measurement of low carbon concentrations due to reduced introduction of atmospheric CO_2. Thanks to the camouflage, observation of the combustion is safe.

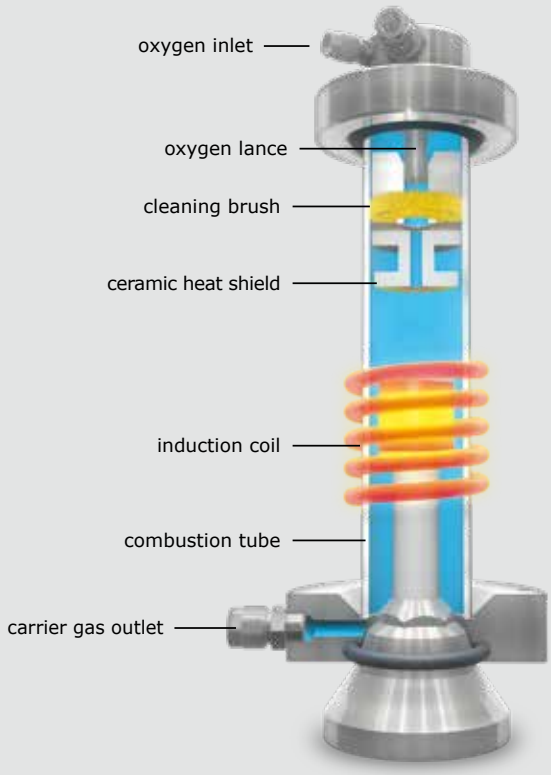
Resistance furnace

- Ceramic Furnace from 600°C to 1550°C
- Analysis of high sample weights (e.g. 350 mg coal)
- LED light indicates correct sample introduction
- XXL balcony for application and storage of combustion boats

Intelligent lance management / oxygen supply

Depending on the sample material and properties, the ELEMENTRAC CS-d permits individual control of the oxygen supply during inductive combustion. When a solid iron sample is analyzed, a lance flushes the entire oxygen flow to the center of the crucible to ensure complete oxidation of the carbon and sulfur contained in the sample. For dusty samples, the oxygen flow is alternatively supplied through the combustion chamber to avoid swirling and loss of sample material. This procedure allows for accurate analysis of low density samples like SiC.

As an additional feature the applied power of the induction furnace can be varied. Samples with low melting point (tin, magnesium) can be analysed with lower rf power, whereas cast iron is analyzed with high rf power. Also ramping is possible to assure a smooth start of combustion.



Graphic: Combustion module CS-*d* ▶

Specifications

CS Analyzer	ELEMENTRAC® CS-*d*
	
Measuring ranges[1]	**Nominal sample weight**
88200-1116[1]	350 mg resistance furnace | 500 mg (1000 mg) induction furnace
	C: 0.0002 – 12 % | 0.004 – 62,8 %
	S: 0.0002 – 6 % | 0.0006 – 31,4 %
General Data	
Analysis time (nominal)	45 Seconds (induction furnace) 90 Seconds (resistance furnace)
Calibration	Solid (Liquid[2]) CRMS
Detection	Up to 4 IR cells; with gold path[3]
Typical samples	Steel, iron, cast iron, ceramics, copper (induction furnace) Coal, coke, plants, soil, oil (resistance furnace)
Reagents	- Sodium hydroxide - Magnesium perchlorate - Pt/Si catalyst (Cu(II)O as alternative)
Power supply	230 V AC ±10 % 50/60 Hz, max. 20 A One power supply for each furnace
Required gasses	- Oxygen ,99,5 % pure (2-4 bar) - Compressed air, oil/water-free (2-4 bar)

[1] other configurations on request
[2] in resistance furnace (applied on quartz sand)
[3] for path lengths 10 mm and longer

Options

- Carrier gas pre-heating furnace
- Pre-heating furnace for crucibles and boats
- Vacuum cleaner for dust removal in induction furnace (with or without HEPA filter)
- Economic configurations for carbon- or sulfur-only measurements
- 36 position autoloader for induction furnace
- TIC module for determination of Total Inorganic Carbon via acidification

Standard-compliant work

Thanks to the dual furnace technology employed in ELTRA's ELEMENTRAC CS-d, the analyzer fulfils the requirements of many international standards. It provides safe analysis of metals, ores, catalysts, soil, rock, waste, petroleum, coal, coke, ash, carbon black and many more materials. The CS-d is compliant with the following standards:

Standard	Number
ASTM	E-1019 ; E-1587;E-1941;E-1915; D-1552; D-4239; D-5016; D-1619
ISO	9556;15349-2; 7524; 15350; 10694; 10719;4935; 13902; 7526; 4689-3; 15178
UOP	UOP 703-09
DIN EN	13137;15936;723;19539:1744-1

ELTRA®
ELEMENTAL ANALYZERS

Eltra GmbH
Retsch-Allee 1-5
42781 Haan, Germany

Phone +49 2104/2333-400
Fax +49 2104/2333-499
E-Mail info@eltra.com
Internet www.eltra.com

part of VERDER scientific

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