Bruker JUWE

G4 ICARUS

- Simultaneous or Individual Carbon & Sulphur Analyzer

think forward

Elemental Analysis

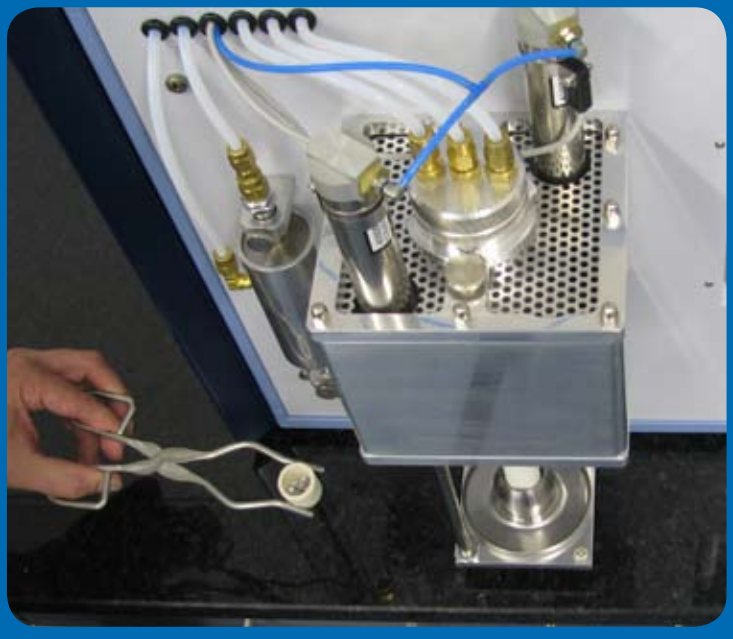
G4 ICARUS with High Frequency Furnace

Steel plants, foundries and other demanding metal industries require high-performance carbon / sulphur analysis

Mechanical properties of solids are defined and influenced by their chemical composition. Certain elements have positive or negative effects on the material's properties. Consequently the control of these elements helps to improve and maintain product quality. Today analytical instruments offer accurate and rapid methods to analyse and monitor element concentrations from the raw material to the finished product.

Especially Carbon and Sulphur have considerable influence on the chemical, physical and mechanical properties of steel and cast iron. The various ferrous applications require specific contents of these elements differing over wide ranges. The concentrations must be in exact compliance with the material specifications.

The sample, placed in a ceramic crucible, is introduced into a HF induction furnace and combusted in an oxygen stream. The resulting reaction gases CO_2 and SO_2 are measured by selective and sensitive NDIR detectors.



Determination of Carbon and Sulphur is gaining importance for other materials, too. Particularly for non-ferrous metals such as Copper, Titanium, Zirconium, and ferrous alloys, it is necessary to know the content of Carbon and Sulphur. This also applies to non-metallic materials, e.g. ores, inorganic chemicals and even coal and other fuels.

In steel production, particularly in the case of stainless steels, knowledge of the composition of the molten steel is very important for obtaining the desired quality. Considerations of economic efficiency demand that the basic and alloying components must be selected on price optimizing terms.

Modern smelting procedures operate with progressively shorter smelting times and technological advances on the consumer´s side impose increasingly smaller tolerances on the individual elements in the steel product. This calls for faster and more accurate analyses to meet these requirements.

The samples taken from the furnace must constitute a representative cross-section of the bath, irrespective of whether the melt is 50 tons or less than 50 kg. The importance of this problem is evident on consideration that only a small portion of the substance is evaluated. Compared to other methods considerable larger amounts of the substance are analysed using the combustion method.

A transition of method has taken place here in recent years, away from the former practice of manual sample taking with scaled cubes to the modern practice using evacuated tubes for the Carbon and Sulphur determination and the use of dipper probes for the analysis with the aid of X-ray fluorescence or emission spectroscopy. Carbon and Sulphur can be analyzed in these samples, too. Many investigations have been carried out and published in recent years on the improvement and rationalization of the sample taking procedure.

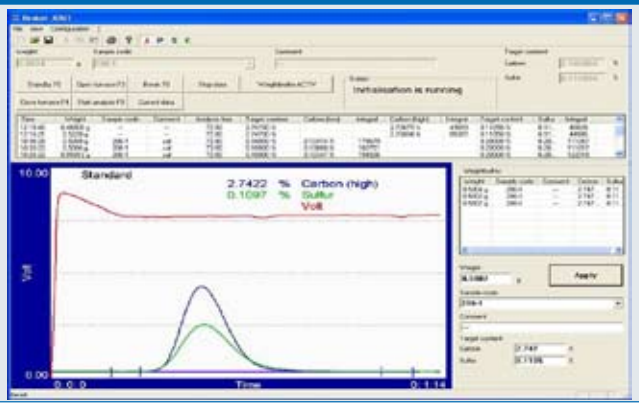
Analysis Software

G4 ICARUS' analysis software is clearly structured and easy to use. All tasks to be performed by the software are organised in four main screens.

On the main screen, the control display, all analyses and signal performance tasks are being executed. The weight may either be entered manually or directly imported via serial interface. The integrated weight buffer allows storage of as many weights as required. Current signal data will be presented in numbers and also as graphical wave form of the analysis. The analyzer can easily be controlled by push buttons. The results of the last five analyses are displayed simultaneously. It is also possible to re-load the signal waveform any time later.

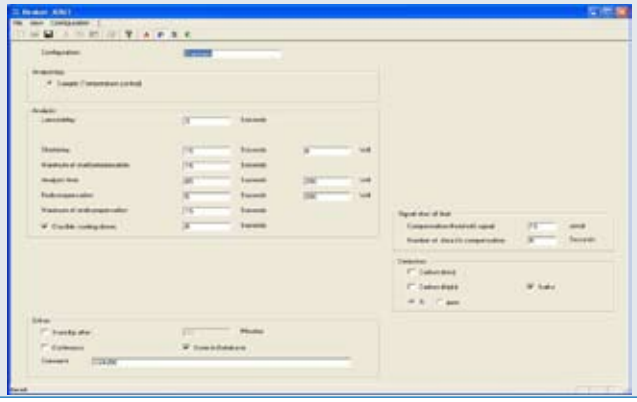
The software supports various brands of balances. Sample weight can be entered manually or transferred directly from the balance to the CS analyzer via serial interface.

Analysis screen



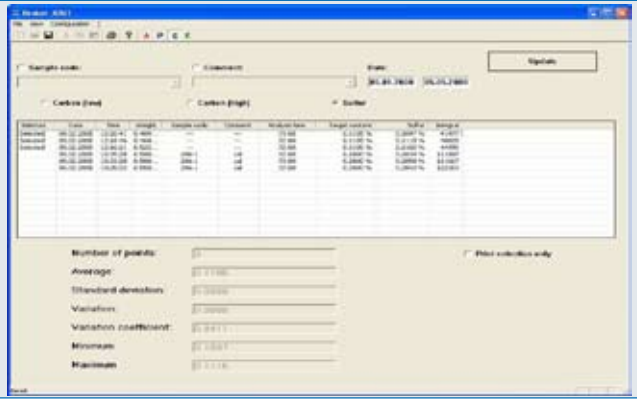
You can perform all analyses and signal performance tasks on the Analysis screen. Current signal data will be presented graphically. The results of the last five analyses are shown simultaneously. Even at later times you can call up any information in the result manager on this screen.

Program settings



Program settings allow you to select all necessary conditions, such as parameters for HF furnace power and time for one specific application; these can then be stored as a set of configuration under a free selectable name. It is easy to call up different configurations for each application.

Statistics



The Statistics screen shows the evaluation of all analyses: Values for average, standard deviation, variance, variance coefficient, minimum and maximum values will automatically be displayed on the screen. An attached printer allows the easy printout of all data.

At your service

For further information regarding G4 ICARUS or any of our other instruments please call our local service or the headquarter in Germany.
We will be glad to assist you with all questions you might have.

Technical data

G4 ICARUS

Measuring apparatus

- Measuring range
  Carbon 0.0001 - 6 %
  Sulphur 0.0001 - 0.35 %
  depending on sample material and weight
- Analysis time
  approx. 40 sec., depending on sample material and weight
- Resolution
  0.1 ppm
- Reproducibility
  better than half of the standard deviation of certified reference material analysed
- Carrier gas
  Oxygen 99,95% purity, 2 bar
- Dimensions & Weight
  (WxDxH) 554 x 600 x 475 mm; 60 kg
  21.81 x 23.62 x 18.70 inches; 88.18 lbs.
- Electrical supply
  230 V, 2.7 kVA
- Sytem requirements
  Operating system: Windows XP
  CD-ROM
  2 serial ports RS 232

Outstanding Characteristics

- Short analysis time, nearly maintenance-free operation
- Combustion method with HF induction furnace and infrared detection
- Continuously adjustable HF furnace power for optimum sample combustion in ceramic crucible
- Selective infrared detectors for CO_2 and SO_2, high resolution and reproducibility
- Clear layout of graphical user interface

Bruker Juwe GmbH

Kastellstrasse 31-35
47546 Kalkar
Tel. +49 (2824) 97650-600
Fax +49 (2824) 97650-629
info@bruker-juwe.com
www.bruker-juwe.com

Art No.COS003/09/2008/Rev.0