

The Thermo Scientific CB Omni is the eighth generation cross-belt elemental analyzer providing reliable and accurate analysis of bulk materials. Providing minute-by-minute composition analysis of ores and concentrates will reduce process upsets, therefore increasing your mill throughput. The modular design allows for quick, low cost installation and maintenance.

Thermo Scientific CB Omni

Cross-Belt Online Elemental Analyzer for the Mining Industry



Benefits

- Increases mill throughput
- Reduces the effect of process upsets
- Yields consistent product quality
- Extends mine life
- Reduces energy and refractory consumption in pyrometallurgical process
- Removes the need for continuous sampling
- Low installation costs and requirements



Features

- No need to cut existing structure
- Modular design for ease of installation
- Modules are moveable without the need for heavy lifting equipment
- Belt widths from 600 mm (24 in) to 1800 mm (72 in)
- Variable tunnel heights to accommodate process conditions
- Superior, robust accuracy (ABLCC)
- State-of-the-art electronics
- Flexible plant connectivity
- Comprehensive user interface

The Thermo Scientific CB Omni is a Prompt Gamma Neutron Activation Analysis (PGNAA) system designed to integrate into either a new or an existing conveyor belt line and analyze, in real time, the composition of bulk materials being transported by conveyor belt. The system analyzes the entire material stream and is not subject to errors and costs associated with material sampling.

The CB Omni is the eighth generation analyzer from the industry-leading PGNAA instrument supplier. Released in 2007, the CB Omni incorporates the best and most innovative technology. The result is a unique system that provides unparalleled ease of installation, performance and reliability for bulk material analysis and control.

The CB Omni represents tried and proven technology that has become the standard over decades in cement, coal, and recycled metals applications.

Applications

Thermo Scientific cross-belt analyzer systems are powerful optimization tools in the following applications:

- Material sorting
- Homogenization/blending stockpile control
- Blending of materials from multiple sources
- Mine grade control

Materials include:

- Iron ore
- Sulphide and laterite nickel ores
- Phosphates
- Ores of ferrochrome and ferromanganese
- Bauxite/alumina
- Copper
- Industrial minerals

Material Sorting Applications

In many cases, a process can be optimized if the raw materials can be sorted based on material composition. This can be based on the economic metal component or the concentration of impurities. The CB Omni is perfectly suited for this type of work and rapidly determines when a material composition changes.

Optional software can automatically send a signal to a flop gate or traveling overhead tripper to place material in a location based on its composition.

Blending Stockpile Applications (from multiple sources)

One of the most popular uses of cross-belt online analysis systems is controlling stockpile grade/chemistry to meet quality targets. This ensures smoother downstream processing and provides flexibility in mining operations. Whether the stockpile is longitudinal or circular, the CB Omni allows the producer to achieve consistent stockpiles, with minimal variations within and between piles.

Using optional software, quality control can be accomplished either automatically or with a person in the loop (manually). In either case, the analyzer tracks the chemistry of the stockpile compared to the target chemistry and determines the preferred proportions of the source raw materials.

Proportioning Applications

A primary determinant of pyrometallurgical process efficiency is the chemical uniformity of the feed. Feed uniformity is in turn derived from the precise dosage control for fluxes and slag-builders. Located

The CB Omni: The Best of the Best

The combined expertise of Thermo Fisher Scientific and the ASYS product line we acquired brings the most advanced and flexible technologies to your process.

- Multiple detector configurations to provide optimum accuracy for each application
- Modular design that removes the need to cut the belt line, simplifying the installation process
- Mounts directly onto the conveyor line
- Designed to suit belt sizes from 600 mm to 1800 mm (24 in to 72 in)
- Spectral analysis process, improved calibration methods and the latest generation electronics ensure peak accuracy
- Applications expertise coupled with proven optimization software and highly popular user interface
- Service staff are located around the globe for quick response times

downstream of the last component addition, a CB Omni system provides the precise control needed to reduce feed variability while at the same time minimizing raw material costs and satisfying multiple quality control targets.

Using optional software, dosing can be accomplished automatically with the system's analysis triggering proportioning changes as frequently as each minute. The optional software accounts for varying time delays from the feeders to the analyzer and can accommodate multiple sources and control parameters. The control algorithm minimizes material cost and allows the user to define priorities among the different control parameters.

The CB Omni: The Best of the Best

The CB Omni analyzer is designed for peak performance with maximum flexibility and reduced installation costs.

Easily Integrates into the Conveyor Line

The CB Omni's steel framework sits on and integrates with the conveyor line's existing support structure. In other words, a belt line does not need to be cut to install a CB Omni. The new design minimizes installation complexity and costs. The CB Omni fits cleanly onto a conveyor belt line with few modifications and existing steelwork and catwalks are generally not affected. Furthermore, clearance requirements between the delivery and return strand of the conveyor are minimized, such that bend pulleys used to clear the lower part of the system may not be required.

Analysis Zone Configuration—Tunnel Height, Width and Detector Position

- System accommodates all material profiles and processes
- Tunnel width and height optimized per application
- Adjustable detector position allows optimization to specific application
- Multiple detector option allows for optimized performance per application

CB Omni cross-belt online elemental analyzer



Automatic Belt Load Compensation (ABLC)

The CB Omni incorporates the unique Automatic Belt Load Compensation feature which ensures analyzer accuracy over a range of changing production rates and belt loading. As the material loading on the belt decreases, the background signal from elements in the conveyor itself grows accordingly. If not accommodated this would increase the analyzer measurement error. The unique ABLC feature ensures that the system remains accurate no matter what loading conditions are encountered.

Information Exchange and PC Interfaces

Integration of an online analyzer into a processing plant generally requires a communication interface with a plant control network. The CB Omni is extremely flexible in this regard and is compatible with most major communication protocols. The most popular protocol in use today is OPC. The system configures easily as either an OPC Server or an OPC Client.

Remote Diagnostics and Assistance

All Thermo Scientific online analyzers are equipped with the capability to connect to the system from one of our regional service centers in order to provide rapid interactive assistance. The connection is made either via the web or through a dedicated telephone connection.

Analyzer Components

The CB Omni analyzer system consists of four major subassemblies:

Analyzer Assembly

A unique modular assembly and frame easily mounts onto an existing conveyor belt line without cutting the conveyor structure. The analyzer assembly contains the detection and measurement mechanics of the system.

Electronics Module

Advanced, high-speed digital electronics control, process, monitor and exchange information between the Analyzer Assembly and the Operator Console.

Operator Console

The Thermo Scientific Operator Console is the user interface for the CB Omni system. The OpCon utilizes the Thermo Scientific standard software package that provides analysis data on minute-by-minute, rolling average and interval average basis; product tracking capabilities; extensive graphic functionality; alarms; and the ability to transfer data to control systems over an OPC link or by .csv spreadsheet files. Optionally, the OpCon can be coupled with process control software that allows either automatic or manual control of blending stockpiles or proportioning circuits. Each OpCon has the capability for remote connection through a telephone connection or through the internet for minor repair and troubleshooting.

Reference Standards

Unique modular reference standards are used to qualify and monitor system performance.

Analysis Capabilities

The CB Omni system measures and reports the following elements*

- Ag
- Al
- Au
- Ca
- Cd
- Cl
- Co
- Cr
- Cu
- Fe
- Hg
- K
- Mg
- Mn
- Na
- Ni
- P
- S
- Si
- Ti
- V
- Zn
- Moisture (optional)

**Capability is subject to concentrations being above the limits of detection.*

The CB Omni can compute customer defined ratios, for example:

- CaO: MgO (Basicity)
- SiO₂:MgO
- Ni:Fe



CB Omni operational diagram



Thermo Scientific CB Omni

Specifications	CB Omni 1	CB Omni 2	CB Omni 3	CB Omni 4
Belt Size	600/750/800 mm (24/30/32 in)	900/1050/1200 mm (36/42/48 in)	1350-1400/1500-1600 mm (53-55/59-63 in)	1800-1828 mm (72 in)
Length of Unit	1987 mm (78 in)	1987 mm (78 in)	1987 mm (78 in)	1987 mm (78 in)
Width	1800 mm (71 in)	2076 mm (82 in)	2584 mm (102 in)	2764 mm (109 in)
Approximate Height	1586 mm (63 in)	1677 mm (66 in)	1729 mm (68 in)	1853 mm (73 in)
Weight	3500 kg (7700 lb)	3800 kg (8360 lb)	4500 kg (9900 lb)	5000 kg (11000 lb)

Standard Physical Specifications

Troughing Angle	35° ; 45°
Electronics Enclosure	NEMA 4 enclosure 762 mm tall x 610 mm wide x 305 mm deep (30 in tall x 24 in wide x 12 in deep)
Electronics Connection to Analyzer	Standard 25-meter or 50-meter cable provided; Configurable on request
Operating Temperature	-30°C to +50°C (-22°F to +122°F)

Electrical Specifications

Electronics Enclosure	230 VAC 50 or 60 Hz, 7 Amps 3 wire (L1, N, GND)
Operator Console	120 VAC 50 or 60 Hz, 5 Amps 1 Phase or 230 VAC 50 or 60 Hz, 2.5 Amps 1 Phase

Communications

Electronics Enclosure to Operator Console (Customer Supplied)	Fiber Optic 62.5/125 multimode (minimum of 2 fibers) 2000 meters maximum (longer distances optionally available) or Optional wireless data communication package (Thermo Scientific Wireless Xpert)
Operator Console to Customer Control System (Customer Supplied)	OPC client/server link, major communication protocols, ODBC
Offsite (Remote) Communication	One data quality phone line or internet link required
Isotope	Cf-252 Neutron source; amount defined per application and performance requirements

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