

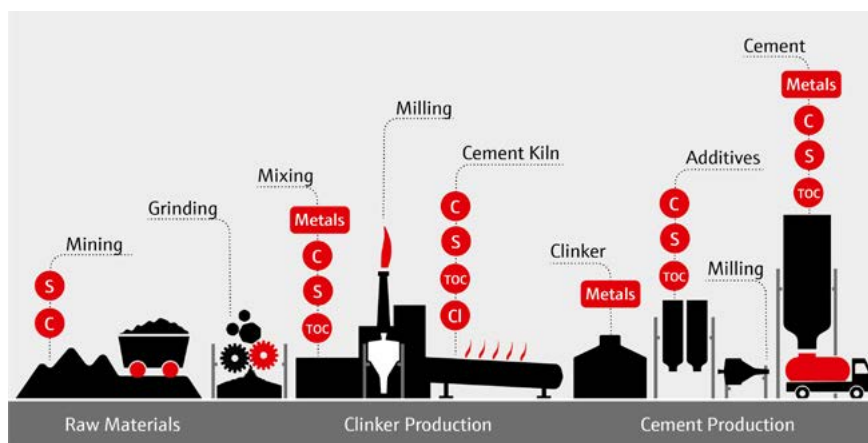
# Analysis of Building Materials C/S/Cl and Metals Determination in Cement and Related Materials

## Highlights at a glance

- Robust instruments for worry-free analysis of challenging samples
- Easy operation and maintenance
- Save time with fast and reliable results
- Low running costs
- Comprehensive service and support offerings

## Analyze with us

- Cl in solid derived fuels
- C/S in combustibles
- C/S in minerals & burnt lime
- Bond types in clinker and cement
- TOC and other carbon species in limestone, gypsum, slag, fly ash and cement
- Metal elements (e.g., Ca, Fe, Mg, Na, K, Al, Ti) in building materials



**Cement is one of the most popular building materials of our time. This is due to its flexible application possibilities, easy processing, extraordinary stability and robustness. As it must meet the highest quality requirements, it is closely analyzed throughout the entire production process. This ensures that product quality is maintained, intermediate products are assessed, and the cement used suits each application. We support you making your cement analysis quicker, more efficient and profitable along the complete value chain.**

### Guaranteeing Product Quality

Strength and durability of cement are affected by its carbon and sulfur content. It is essential to monitor these elements during the entire production

process. From the feedstocks clay and limestone to raw meal, clinker, gypsum, and other additives up to the final product cement, combustion elemental analysis is used for determination of TS ( $\text{SO}_3$ ) and TC/TOC/TIC ( $\text{CO}_2$ ) sum parameters.

### Ensuring Process Safety

A core step in the production of cement and gypsum/anhydride is the calcination of raw material in kilns. The used combustibles (fossil or solid recovered fuels) are controlled for their TC, TS and chlorine contents. This is to ensure quality and to prevent corrosion and excessive emissions of HX and  $\text{SO}_2$ . Metal elements, such as Ca, Al, Fe, Si, and their proportion indicate type and quality of the cement.



Feedstock materials

Combustibles

Decarbonization

Process intermediates

Additives

Cement

Recycling

Material workflow in cement production

### Combustion elemental analysis

The **multi EA 4000** is designed for easy, cost-effective, and fully automated determination of CS, Cl, and the carbon sum parameters TIC/TOC and EC.

- TOC/TIC content of limestone, gypsum, other feedstocks, cement
- CO<sub>2</sub>/SO<sub>3</sub> in cement, clinker, cement raw meal, limestone, lime etc.
- C/S and Cl in solid fuels (coal, coke, waste materials)
- S-bond types (sulfides) in feedstocks and cement
- C/S, TOC, TIC in recycling materials (drywall, concrete, and others)



multi EA 4000

### Elemental analysis

ICP-OES and AAS are an interesting alternative to the classic XRF technique. While the **PlasmaQuant 9100** is the ICP-OES benchmark for the analysis of complex materials, **novAA 800** provides efficient and cost-effective AAS routine analysis.

- Determination of major metal elements (Ca, Fe, Na, K, Mg, Al, Ti, etc.) in building materials
- Analysis of major and minor elements in aqueous pore solutions of cementitious pastes
- Water soluble metal salts (Mg, Na, K, etc.)



PlasmaQuant 9100

### TOC analysis

The **multi N/C x300 series** offers accurate, automated, and reliable CO<sub>2</sub> routine monitoring in amine absorption solutions, as used in carbon capturing. It provides a fast and automated analysis method with high accuracy of results, low standard deviation, and saves you time and sample preparation effort.

- TIC content in amine scrubbing solutions for efficiency control of CO<sub>2</sub> emission reduction from fossil and derived fuels



multi N/C 2300

[Find out more ▶](#)

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Subjects to changes in design and scope of delivery as well as further technical development!