DFMC

XRF

X-Ray Fluorescent Elemental Analyzer

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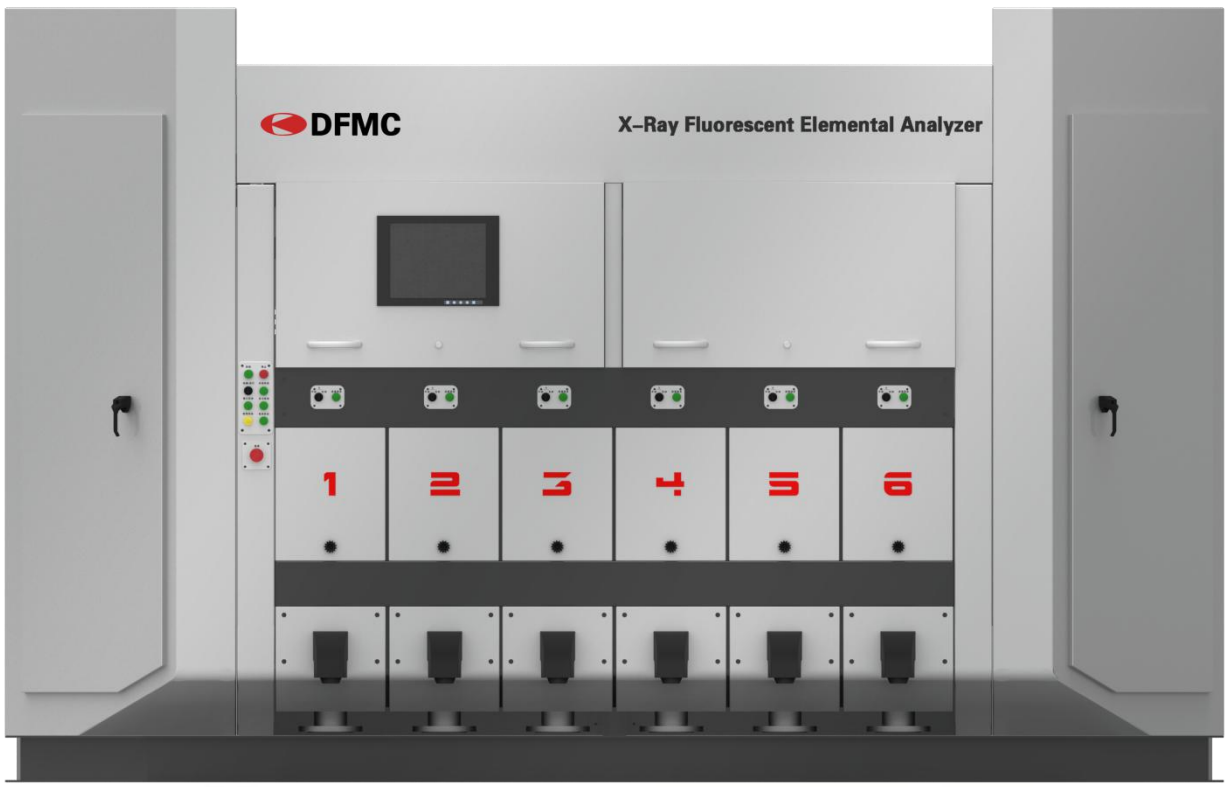
X-Ray Fluorescent Elemental Analyzer (XRF)

I. Product Overview

XRF is one kind of inline multi-stream and multi-element detecting and analytical instrument. It adopts energy dispersion method and motivates various elements in materials, so that these elements generate complex X-ray mixed energy spectrum. XRF analyzes the mixed energy spectrum and thus to calculates types and contents of elements in materials.

XRF is an inline instrument for real-time analysis of element contents in industrial production processes. The instrument directly analyzes and measures slurry and rapidly provides analysis results without the need of complex sample preparation process. It can be involved in and even direct automatic control.



II. Operating Principle

XRF uses X-ray fluorescence spectrum analysis technology and the method of energy dispersion to analyze the element content in the material. Materials are exposed to rays with suitable energy so that atoms in pulps are ionized and in excited state. Inner-shell electrons are excited and

therefore vacancies appear. Such vacancies are filled by outer-shell electrons at high levels rapidly (within 10-15s) so that energy level transition occurs. Energy difference between energy levels is released in the form of characteristic X-rays. When pulps contain several elements, each element will emit several types of characteristic X-rays. Such X-rays received by detector and small electronic pulses will be generated. The peak amplitude of these pulses is proportional to the energy of incident X-rays. The intense of X-rays is proportional to the content of elements in slurry. Scattered X-rays can be used for slurry concentration correction.

III. Product Feature

- **Real-time**: Online and real-time detection, the analysis results are quickly given.
- **Representativeness**: The reasonably designed measuring device and good flow ability and uniform mixing of slurry in measuring cells ensure that the measurement results accurately reflect actual slurry status.
- **Adaptability**: Measurement is not influenced by concentration, particle size, bubble, velocity, delamination and other field factors and the instrument can operate properly in various complex and harsh industrial sites. Adopting room temperature semiconductor detector, the operation can be achieved at room temperature without the need of liquid nitrogen refrigeration. The analyzer uses X-ray tube instead of radioactive source.
- Our company has developed innovative nuclear electron technology and nuclear energy spectrum analysis technology to completely analyze and process complex energy spectrum generated after excitation of many elements and cancel mutual interference among different elements.
- Stable working status, high analysis accuracy, high reliability, easy operation and maintenance and friendly and human-oriented software interface.

IV. Performance Parameters

1. Instrument Dimensions

Item	Value
Net weight of 6-stream X-ray fluorescent analyzer	1900Kg
Effective volume of one analytic cell	76.51L
Overall dimensions (L×W×H)	4260×1650×2420mm
Space required for basic operation and maintenance (L×W)	7000×4000mm

2. Technical Parameters

- Analysis method : X ray fluorescence spectrum analysis technology
- One XRF can measure up to 12 streams
- Type of analyzable elements: various elements having atomic number over 20th
- Range of analyzable element content: 100% ~ 0.001%
- Precision: The precision of the sample is influenced by the composition of the mineral matrix, the nature of the mineral, the grain size and so on. Normally, relative error is 1~4% under high content, 3~6% under low content, 10~20% at extremely low content.
- Stability: Under certain conditions, the stability is no more than 0.3%, long-term drift can be automatically corrected.
- Analysis time: Each sample flow takes 1 minute, settable by user.
- Analysis cycle: The analysis cycle of six sample flows is usually 8 minutes.

3. Site Conditions

- **Flow-rate requirement**:

  Optimum flow range: 5~10 m^3/h
- **Requirements for flushing water**:

  Domestic water, clean, free of suspended particles; 0.3 MPa < water pressure < 0.8MPa

Flushing water consumption: 10~20 L/h depending on spraying intensity and number of water nozzles in the analytic cell.

- **Requirements for power supply**:

  Power supply for the analyzer: 380/460VAC, 3 phase. Normal operation power: below 4KW, max. starting peak power: below 8KW, earth resistance of grounding: <4Ω.

- **Requirements for compressed air**:

  Supply pressure: 0.6MPa ~0.8MPa.

  Clean and dry compressed air, handled by 0.1 micron filter, with a dew point of less than 2℃ (dew point refers to the temperature at which air becomes saturated and produces dew).

  Compressed air consumption: 25L/h or lower.

- **Temperature Requirement**:

  Working stream temperature: 0~40℃;

  Ambient temperature: -20℃~50℃;

  Ambient humidity: 0~90%

V. Product Application

XRF can detect several elements in the material simultaneously, such as Fe, Cu, Pb, Zn, Mo and the elements of which atomic number over 20th, and the detection accuracy reaches the international advanced level. The product has strong adaptability, low maintenance amount and stable performance. Widely used in non-ferrous metals, ferrous metallurgy and other industries, it plays an important role in stabilizing and improving product quality, improving metal recovery and saving costs.

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