

## Skyray Instrument

### XRF On-stream Slurry Analyzer (OSA100)



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### Detection report

Detection times	Rude mineral/%		Lead concentrate/%		Zinc concentrate/%		Tails/%		Return ratio/%	
	Pb	Zn	Pb	Zn	Pb	Zn	Pb	Zn	Pb	Zn
1	3.00	4.18	64.33	2.37	0.14	41.52	0.224	0.408	92.88	84.31
2	2.40	4.22	73.11	0.85	0.05	40.90	0.290	0.454	98.48	83.74
3	2.48	5.27	64.75	1.89	0.31	44.07	0.235	0.418	90.85	82.93
4	3.18	4.03	63.18	1.81	0.29	44.31	0.228	0.378	93.12	84.57
5	2.17	5.98	58.19	4.17	0.28	44.51	0.221	0.422	90.15	83.81
6	2.08	5.78	62.18	3.04	0.57	43.34	0.211	0.397	90.18	84.00

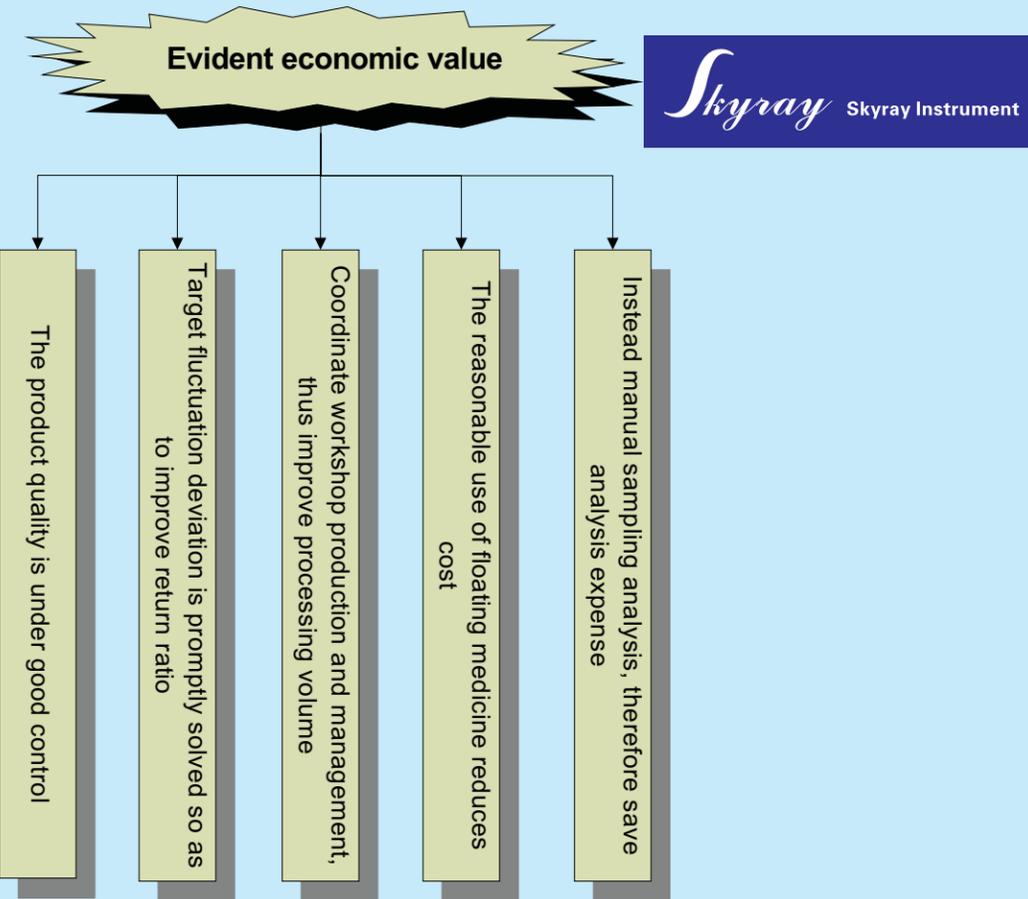
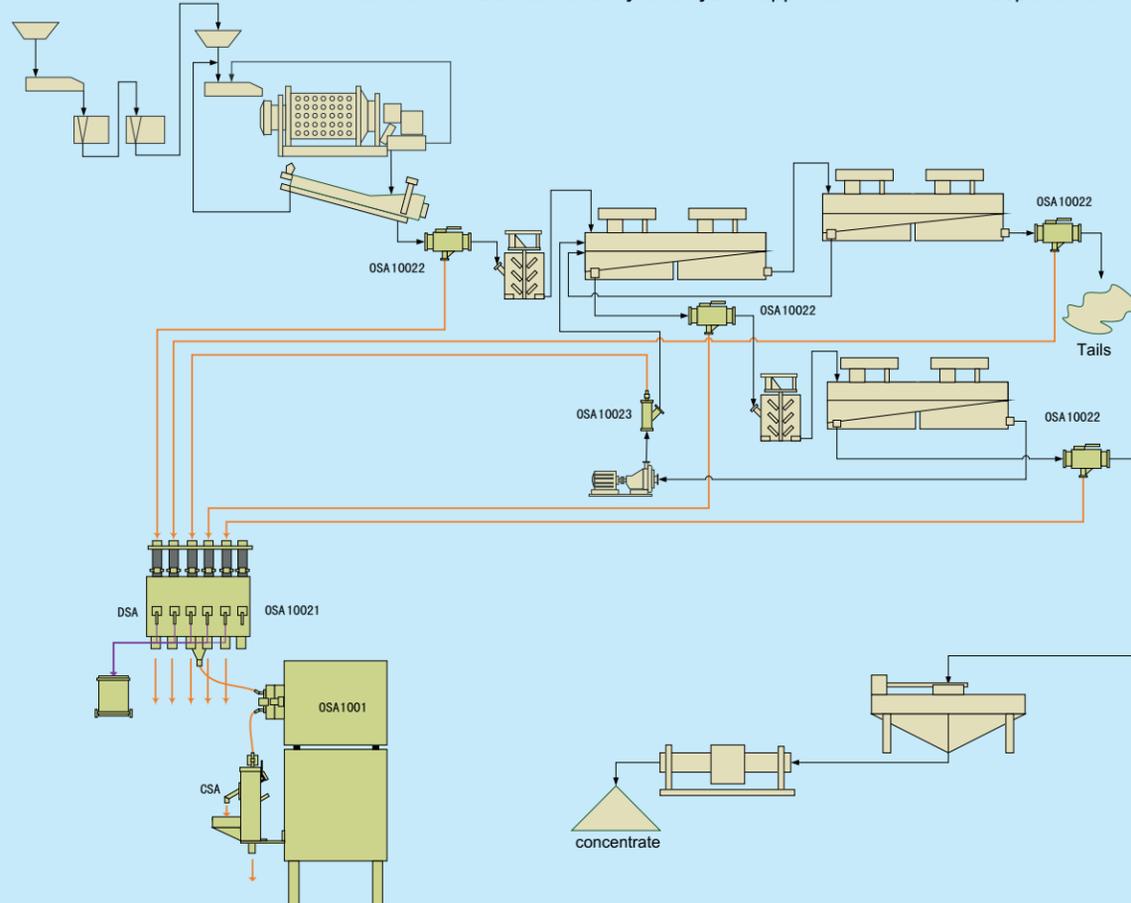
## OSA100 XRF On-stream Slurry Analyzer

XFR On-stream Slurry Analyzer (OSA100), a large scale on-line concentration monitoring analyzer of integration of optic and machinery can be widely applied in such industries as non-ferrous metal, metallurgy and mineral processing. The analyzer has the advantage of automation, high intelligent, stable working, reliability, speed analysis, accuracy and easy operation and maintenance. The system combined with high integration function, compact structure and wide flow channel expansion can satisfy the analysis needs of different scale mine users by adopting modular design conception. Furthermore, it can participate in process automation control.

### Outstanding Functions

OSA100 can carry on the real-time on-line monitoring for important operation in production process; in addition, it can provide the latest information and change tendency for operators or managers, so as to point out the change fluctuation, and thus make quick reply to rapid change, and succeed in instructing production. OSA100 is the key way for auto mineral processing, stable production process, reducing production cost, enhancing workshop management and enabling mineral economic value to be the maximum one.

OSA100 On-stream Slurry analyzer applied in mineral separation



#### Beneficial for guaranteeing product quality

Due to prompt grasp of product quality target fluctuation data and rapid production process adjustment, the fluctuation is corrected in time, thus to be able to keep production process in stable process, improve product quality and reduce scraps.

#### Useful for obtaining the best return ratio

As balancing return ratio and concentration, its rapid analysis optimizing the process improves the mineral return ratio.

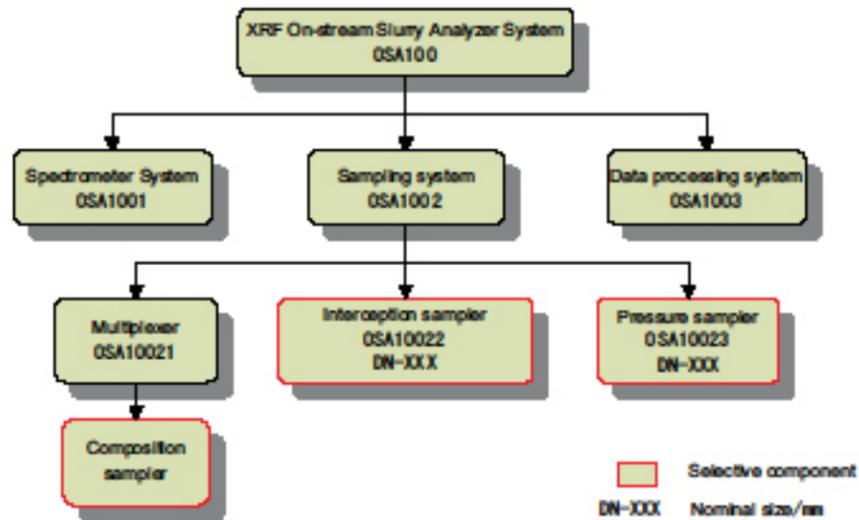
#### Useful for rational use of medicines

Medicine use dose should be adjusted according to concentration in process mineral. Prompt obtaining concentration data can reduce consumed medicine dose.

#### Improving technical ability and responsibility of operators; enhancing workshop management.

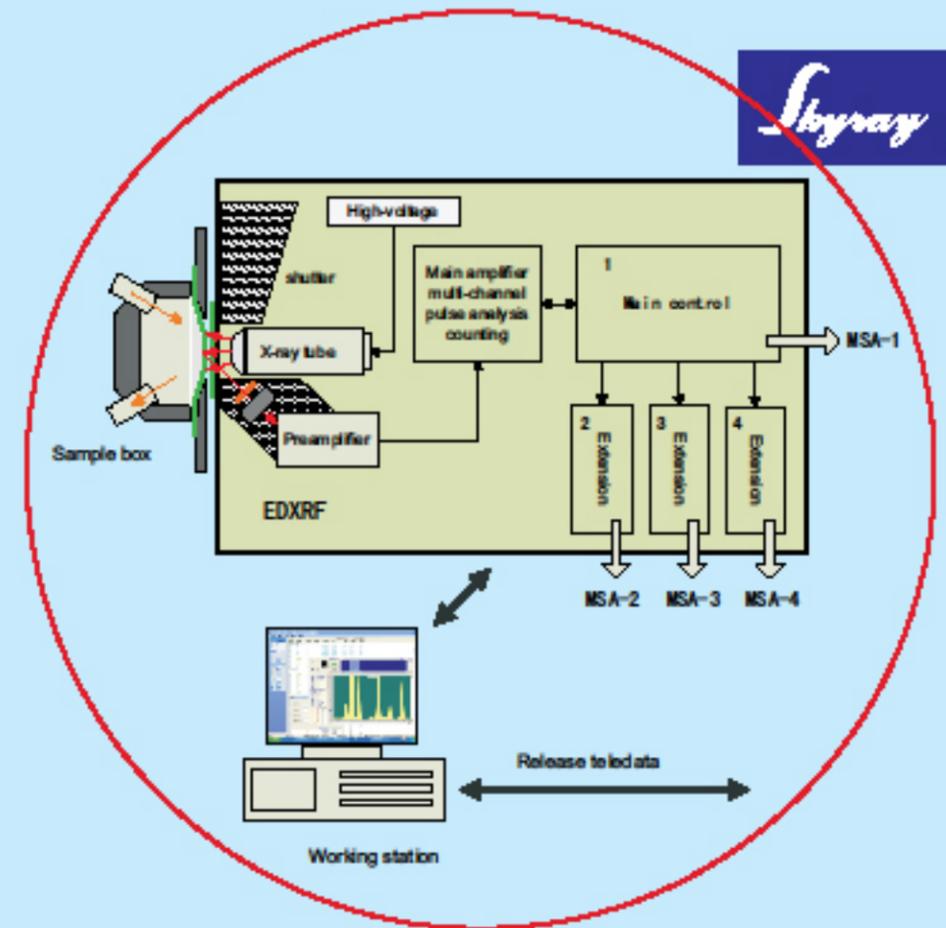
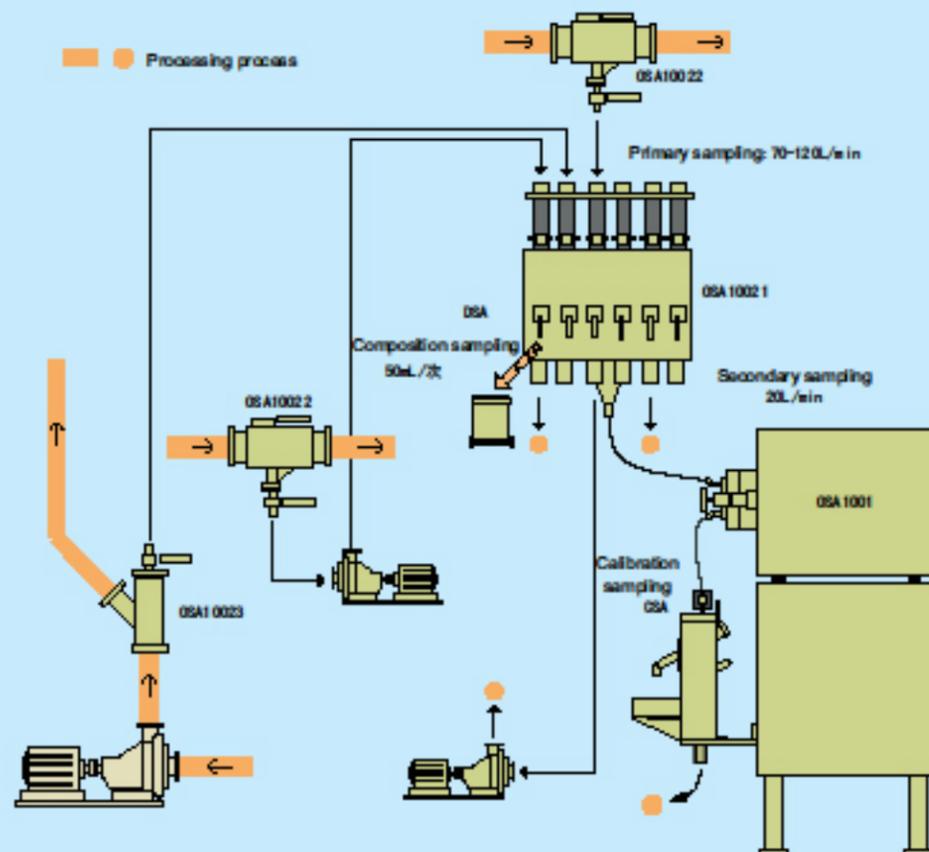
Operators can really feel the good result from production process adjustment through rapid concentration data feedback. Besides, one can avoid operation errors, increasing labor enthusiasm and increase the sense of labor accomplishment, thereby harmonize the workshop production and improve production efficiency.

## Product Configuration



## Working Principle

The primary sampler can take part samples and send them to multiplexer, and then a few samples separated from the multiplexer will be sent to sample cell for analyzing. Adopting EDX Energy Dispersive X-Ray Spectrometer, Characteristics X-Ray of element will be emitted from the sample irradiated by primary X-Ray from X-Ray tube. The characteristics X-Ray separated by detector will be recorded intensity by electric device, and the element content can be calculated based on the intensity.



## Excellent Characteristics

### Automation, High Intelligent Degree

The system realizes computer automatic control sampling, measurement and analysis, composition sampling and data processing. Adopting pneumatic and electric control technology, the system runs reliably, maintains easily and has no environment pollution. With powerful function and high intelligent, the work station can release teledata with own error diagnosis and alarming mechanism.

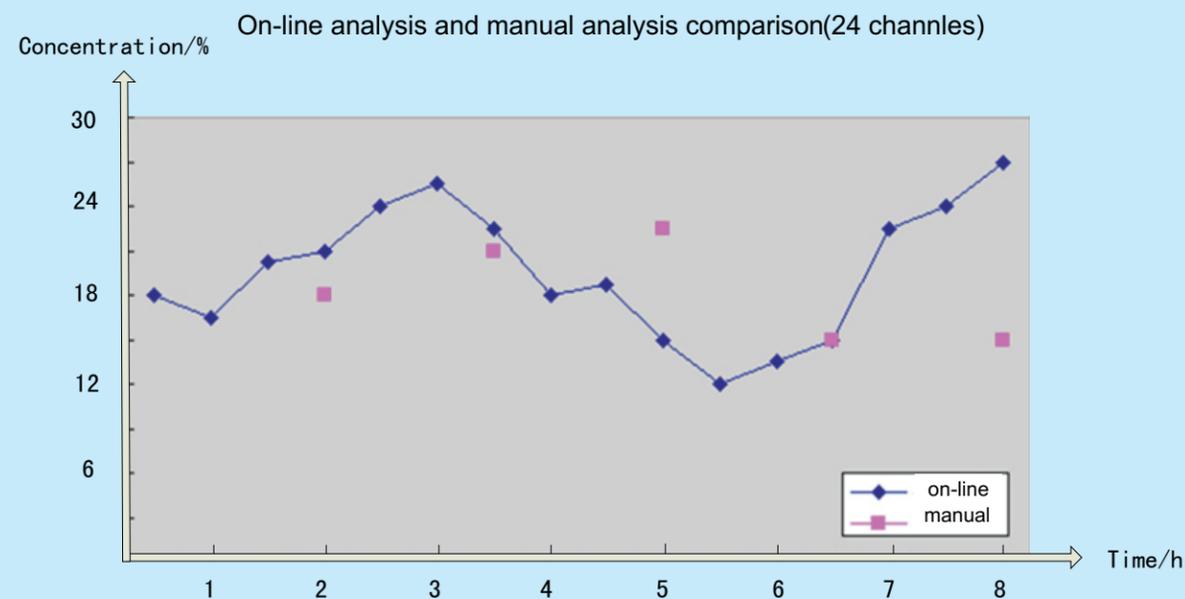
### Stable Analysis and Reliability

The measurement value of monitoring standard sample can give long-term drifting of instrument automatic compensation. Moreover, the instrument has the "linearization calibration" function to greatly improve adaptivity of analysis mathematical model and ensure the analysis precision.

### Representativeness, Novelty, Rapid Accuracy and Accurate

In order to make sure the sample possessing enough representativeness, novelty and reflecting real process, the slurry sample box adopts fluidics technology by using fluid cross-section sampling and gap sampling and other methods. Calibration sampling may take out two parallel samples one time to guarantee the precision and reliability of sampling. In order to make sure the sample possessing enough representativeness, novelty and reflecting real process, the slurry sample box adopts fluidics technology by using fluid cross-

In addition, under the normal operation condition, the system can give out analysis result of 12 channels in 12-13 minutes with rapid analysis speed, thus achieves production instruction. Comparatively, traditional laboratory analysis with manual sampling cannot succeed in instructing production because the time lags badly and the operators unable to get the production process status and the change tendency in time.



□ **Safe and Radiation-free**

The system of modulus design, high integration, and small volume is easy to operate and maintain. And using pneumatic and electric control working model, it runs stably, reliably and maintains easily without any pollution. Moreover, the system realizes computer automation, intelligent control and management. Maintenance is more or less needed.

□ **Easy Operation and Maintenance**

The system of modulus design, high integration, and small volume is easy to operate and maintain. And using pneumatic and electric control working model, it runs stably, reliably and maintains easily without any pollution. Moreover, the system realizes computer automation, intellectual control and management. Maintenance is more or less needed.

**Primary Sampling**

Primary sampling means taking 70-120L/min process stream from the primary sampler, and then transporting it to multiplexer by gravity or pumping. OSA100 sampling system has 2 kinds of on-line primary samplers, which are interception sampler and pressure sampler respectively. These 2 kinds are optional to users.

□ **Interception Sampler**

- Mineral flow is cut and ensures enough representativeness.
- Stable, reliable pneumatic and electric control circuit ensures a long time and effective work.
- Trash is removed from the cut and the channel is flushed automatically.
- Realize cut size alteration and sampling quantity adjustment automatically without dismantling sampler.
- Install interface with standard flange.
- The outlet can be horizontally installed in 360 degrees and also vertically installed downward to adapt each space in workshop.



□ **Pressure Sampler**

- The chamber with turbulent flow design and sampling in cone-shape mouth guarantees a typical sampling.
- Sampler can work efficiently for a long time under the stable and reliable pneumatic and electric control circuit.
- Automatically flush the channel in certain time.
- Install interface with standard flange.
- Optional installation in any directions.



## Secondary Sampling

Secondary sampling is to send 20L/min primary sampling separated from the multiplexer box for analyzing. The multiplexer is a multi-function and automatic device combined channel flush and composition sampling. Designed with 6 channels, the expansion capacity can be up to 24 channels. The integrated composition sampler can realize sampling all the day.

### Multi-Channel Switch Converter

- Sampler can work efficiently for a long time under the stable and reliable pneumatic and electric control circuit.
- The integrated chamber structure exempts the maintenance.
- The unique mesh support design may clean up dirty automatically thus greatly reduce maintenance work.
- Fast and clean flush of channel through inversed-cone and linear mouth.
- Flanges, direct interface or curved interface. The curved interface can connect the tube horizontally in 240 degrees angel.
- Modular configuration; flexible installation.



### Composition Sampler

- Sample flow is cut and ensures enough representativeness.
- Automatic sampling and independent installation of channel without sample pollution and exempt from maintenance.
- Substitute automatic tube sampler.

## Calibration Sampling

The establishment of analysis model is realized through calibration sampling by calibration sampler.

- Parallel sampling ensures the reliability and accuracy.
- Sampling can be on and off. Easy to operate and switch narrow gap.
- Sampling channel have the function of auto flush and clean, exempt from maintenance.
- The integrated chamber structure may auto switch to discharge the slurry.



## Slurry Sample Box

- In order to make sure the sample arriving at the sensitive analysis area in window possesses enough representativeness and novelty, the slurry sample box adopts fluidic technology and particular design of chamber structure.
- Change film in analysis window by hand continuously in 4-5 seconds, without cutting off high voltage of X-Ray light tube, and without opening sample box holder.
- The system can cut off sample flow once the film is damaged. In addition, the instrument with protective film can protect light channel from being polluted or the instrument from being destroyed. The system can cut off sample flow once the film is damaged. In addition, the instrument with protective film can protect light channel from being polluted or the instrument from being destroyed.

## Working Station System

The working station controls the analysis instrument system running and completes the data analysis, management and issue.

- High intelligent; self-diagnosis and error alarming mechanism.
- Powerful channel configuration function can make analysis and daily sampling independently in optional order.
- The system has characteristic integration, using practical multivariate linear regression analysis method to establish and complete analytical mathematics model.
- The quality/instant return ratio information will be shown in table or trend chart and can be released in Intranet, Internet or scene display monitor terminal.
- Easy operation and excellent interaction.

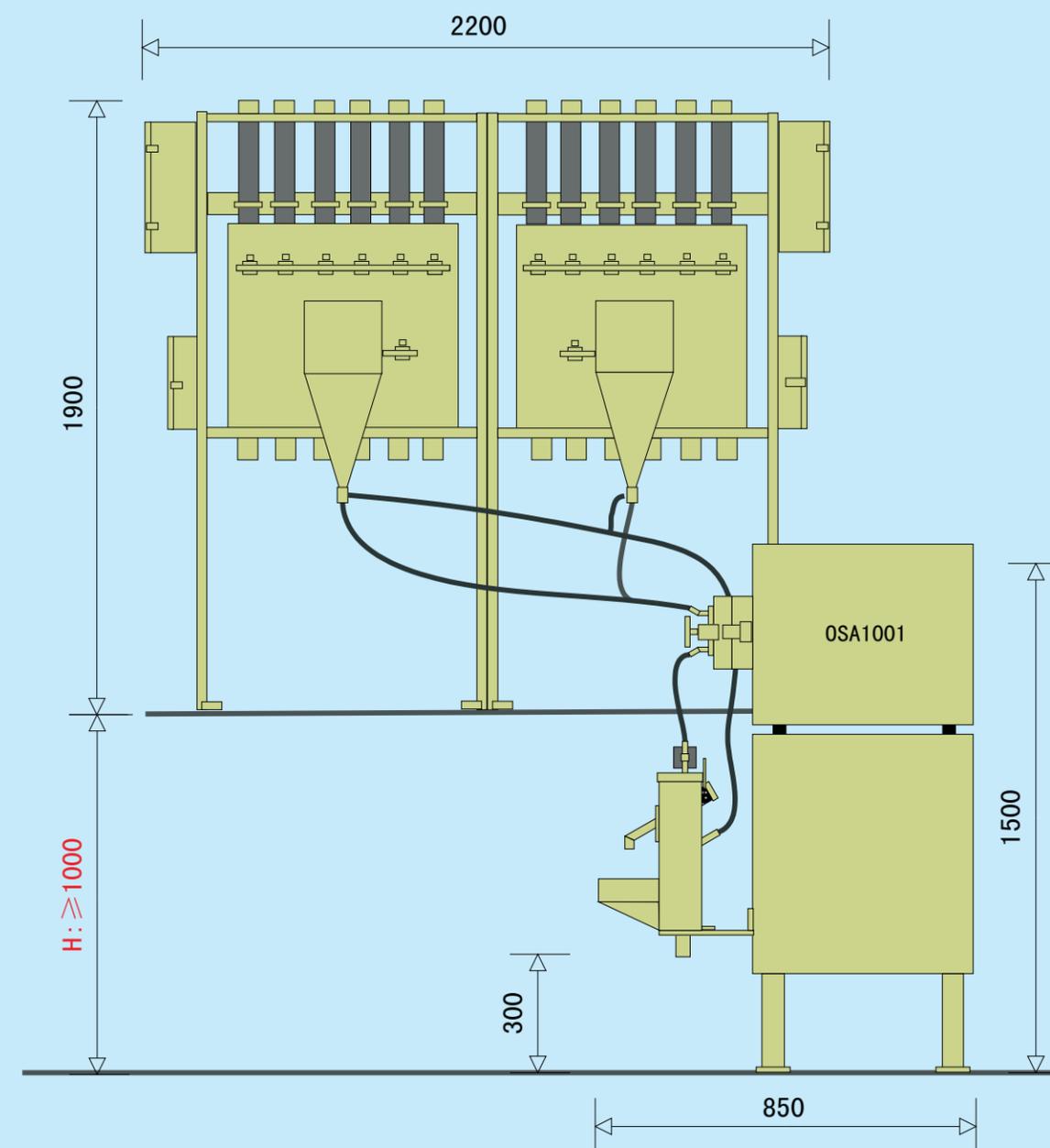
## Technical Data

- Analysis method: Energy Dispersive X-Ray Fluorescence Analysis Method
- Measurable Element: Elements of No between 20th-92th can be measured
- Channel Capacity: Measure up to 24 channels in any sequences. The system can make configuration by 6, 12, 18, 24 channels according to users' needs.

- Primary sampling: 70~120L/min
- Secondary sampling: About 0L/min
- Composition Sampling and Period: Typical routine sampling is 50ml, and the period is 10 minutes, adjustable.
- Measurement Time of strength: Set different measurement times for every channel. Typical value is 30 seconds.
- Measurement Period : Calculate on the basis of measurement time of every channel. Taking 30 seconds as the basis, it takes 12-13 minutes to measure 12 samples current.
- Short-time Stability : Under certain condition, the stability of measurement strength is better than 0.1%
- Long-time Stability: The measurement value of monitoring standard sample can give long-term drifting of instrument automatic compensation, and the software can be measured by monitoring sample. The standard sample with linear calibration can give analytical mathematical model calibration.
- Detection Limit : For most elements, the minimum detection limit is 30-500ppm.
- Slurry Density: Generally it is 10-40%, and the upper limit depends on sand pump.
- Content Range:0.005-100%,, the slurry weight percentage.
- Accuracy : The accuracy specification is based on the measurement of the flowing slurry samples using measurement times for real applications. Accuracy of measurement is a function of sample parameters such as matrix composition, mineralization and particle size. Typically under normal operation conditions, for minor concentrations, the relative standard deviation is 6%-12%; for major concentrations, it is 2%-8%.
- Air Source: Pressure: 0.4-1.0Mpa, and the average consumption is 15L/min.
- Rinse Water: Pressure: 0.2-0.6MPa, and the average consumption is 30l/min. Clean water for manufacturing or drinking water.
- Power Supply: 220V±5V/50Hz(suggest fitting purification and alternating current power with stable voltage)
- Earthing: Independent earthing, and resistance is not more than 4Ω
- Humidity: Not more than 70%
- Ambient temperature for operation: +15℃~+30℃
- Storage temperature:-25℃~+60℃
- External Dimensions and Weight:
  - Interception sampler: DN200, 110kg, Length\*Width\*Height=750\*650\*850
  - Pressure Sampler" DN100, 60kg, length\*width\*height=550\*500\*750
  - Multiplexer: 6 channels, 180g, length\*width\*height=1100\*100\*1900
  - Spectrometer: 150kg, length\*width\*height=500\*600\*1900

## Requirement for

The typical installation method of the system is of 2 layers layout, and the position H is not more than 1000mm.



Application Fields