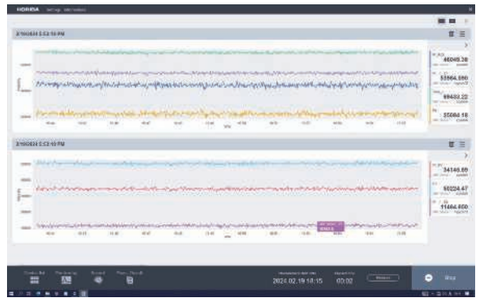
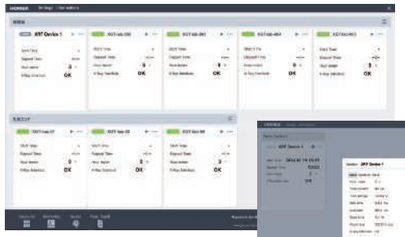
User-friendly Software



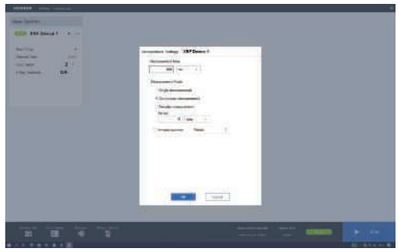
Trend Graph
- Up to 8 parameters per graph can be set
- Data can be exported as .csv

Historical Results
- The results can be extracted for post review
- Data can be exported as .csv



Device Status Overview

Device Status Details



Device Measurement Settings

Standard Specifications

Special Inline XRF configuration can be modified based on technical consultations upon requests.

Major specification	Description
Principle	X-ray Fluorescence
Detector	Silicon drift detector
X-ray tube target	W (Rh / Ag are available depending on application requirement.)
X-ray tube lifetime	Approx. 10,000 hours operation
X-ray voltage	15 – 50 kV
X-ray current	4 – 200 μA
Measurement frequencies	Down to 10 ms
Data interface	MODBUS™ TCP, EtherCAT®, and others upon requests (PROFINET™, CC-Link™ IE, EtherNet/IP™, etc.)
Dimensions	310 mm × 150 mm × 220 mm [W × D × H]
Mass	Approx. 5 kg

* Specifications are subject to change without notice.
* MODBUS is a trademark of Schneider Electric USA Inc.
* EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
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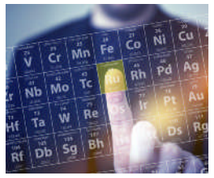
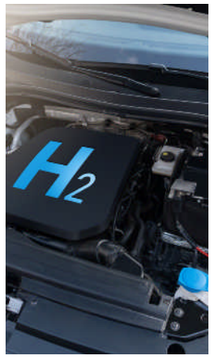


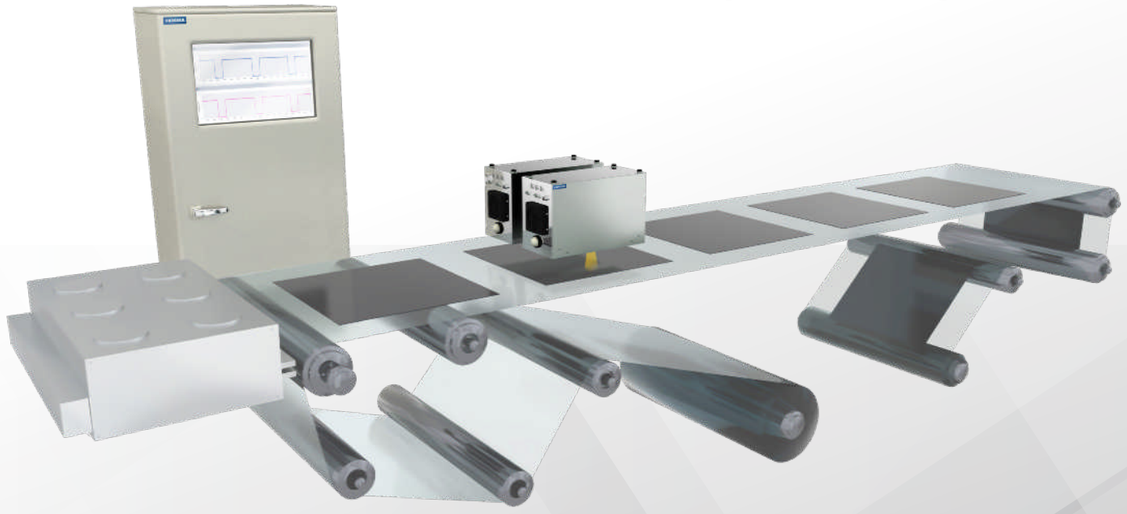
CCM/MEA Catalyst Coating Monitor for Quality Control



Fast, Non-destructive and High Precision
Elemental Analysis Customized to Your Process

Explore the future HORIBA

HORIBA Inline XRF Monitor for CCM/MEA Catalyst Coating Process

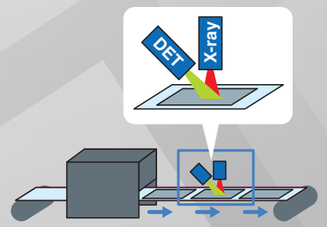


High Sensitivity and Longevity

- Thin film metrology [µm]
- Elemental quantification [%, ppm]
- Loading analysis [g/cm²]

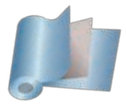
For

✓Quality control (proper amount, homogenous distribution, paste adhesion)
✓Process control (closed loops)
✓Material cost optimization



System setup image

The Challenges in Fuel Cell and Electrolyzer Production



I don't want to waste or destroy expensive materials for quality control.

Non-destructive solution

XRF offers non-destructive solution.
No sample preparation required.

24/7 production is difficult to monitor manually around the clock.

Continuous analysis

Direct measurement in production line with the Inline XRF Monitor enables 24/7 analysis.
Moreover, the X-ray tube lifetime is approximately 10,000 hours.

I need to collect multiple analysis results from each production line.

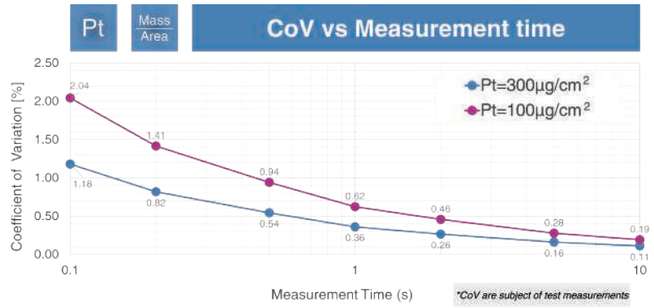
All in one data collection

Multiple Inline XRF Monitors can be installed in each production line with all analysis data shown in one dashboard. No additional time are required to collect individual analysis data.

Roll to Roll Coating Inspection for Fuel Cell and Electrolyzer

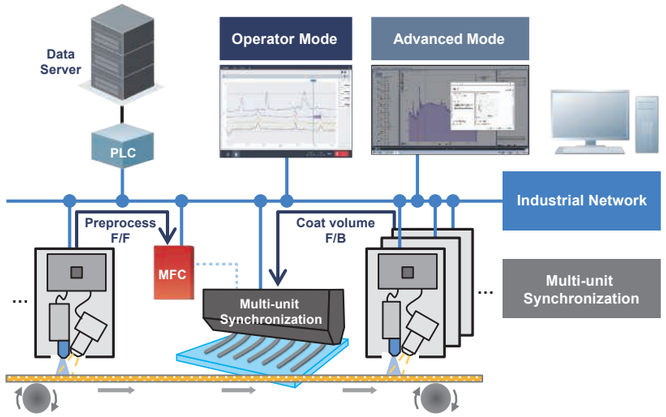
Principle	X-ray Fluorescence
Selectable element range	Ru(44) / Ir(77) / Pt(78) *Other elements are available on consultation basis.
Measurement method	Inline continuous measurement
Measurement time	10 ms – mins ▶ Measurement time will be adapted to particular application and process requirement
Irradiation diameter	Up to 100 mm ▶ Fixed diameter will be adapted to the particular application requirement
Working distance	Up to 150 mm ▶ Distance will be adapted to particular application and process requirement, other distances can be adapted on requests
Traverse functionality	Consulted upon requests

Fuelcell and Electrolyzer



Performance example: CoV of PGM vs Measurement time
* PGM: Platinum Group Metals
** Other elements are available upon requests

Network and Software Integration



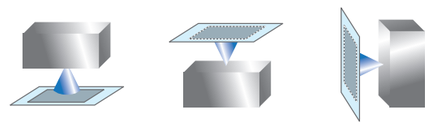
Operator Mode

- For operation - operation user interface for production line operator
- Linkage interface to host system

Advanced Mode

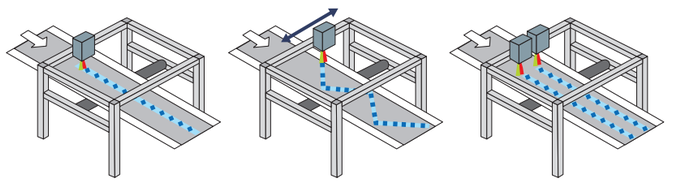
- For maintenance and calibrations
- Connected only for maintenance via network
- Separated advanced functions from monitoring software
- Overwrite calibration curve and parameters into ROM

Selectable Mounting Orientation



Top Down | Bottom Up | Side

Line Measurement Options



Single Line Measurement | Traversal Measurement | Multi-line Measurement