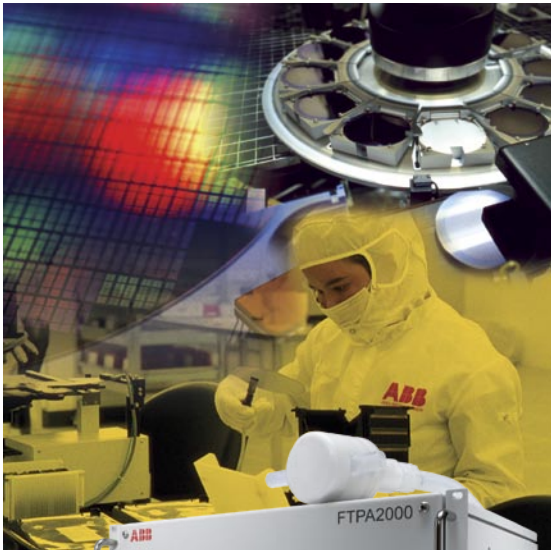


ABB's solution for real-time, on-line wet process monitoring and control in the semiconductor industry

Continuous monitoring of the wet chemistry used in semiconductor manufacturing enhances production yields, decreases risk of failures, and maximizes profits.

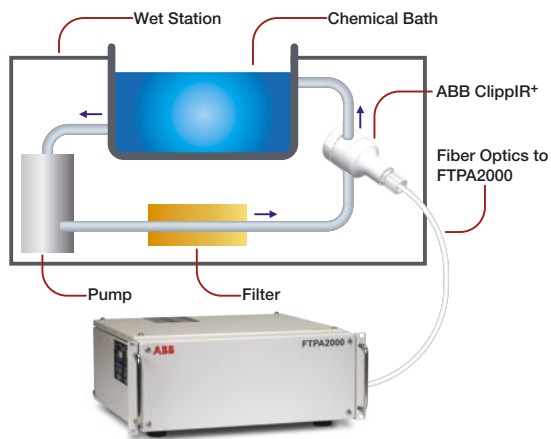


Achieving high throughput, competitive quality standards and low production costs in semiconductor manufacturing requires precise control of the wet processes used. ABB's Wet Process Analyzer (WPA) is designed for continuous on-line monitoring of the chemical concentrations of a wide range of etching, cleaning and stripping solutions and provides the communications protocols necessary for real-time process control.

The cost savings resulting from the extended lifetime of chemicals, reduced chemical consumption and waste and reduced laboratory testing is one of the benefits of real-time monitoring. It has been shown that by improving the lifetime of baths such as SC1, SC2 by 25 to 30%, the payback time for the WPA is typically less than one year. With some very common organic chemicals, the payback time can be approximately 6 months!

The WPA offers many unique advantages and can monitor more than 30 different solutions used in wet process applications (see list overleaf). ABB also provides customized calibration development on customer request.

The FTSW100 Process Software included with the WPA allows full integration of the analyzer into the process environment. Besides displaying the concentration values and trends of the chemical components monitored in each stream, the software automatically archives data and generates warnings or alarms when values are out of their allowable ranges. Alarms notify the operator when the bath is out of specification and can allow the equipment to automatically spike the bath.



Non-contact, infrared measurement

The WPA is a Fourier Transform Near Infrared (FT-NIR) spectrometer connected through optical fibers to a patented Teflon sensing cell called the Clippir. Up to 8 Clippirs can be connected to monitor different chemistries simultaneously. The innovative design of the Clippir allows it to be simply clipped onto the external surface of existing tubing. The infrared light passing through the Clippir enables the system to directly monitor the chemical concentrations inside the tubing with no risk of contamination.

The Clippir is specially designed for semiconductor applications and fits onto any size of Teflon tubing. Because of its small size, it can fit into small chemical cabinets or inside any other part of the wet station. It is also chemically resistant to corrosion and can be used in very aggressive environments.

The FTPA-2000 Series spectrometer is engineered for operating under the harshest industrial conditions, has a very small footprint (43 x 41 x 18 cm) and can be located up to 100 meters away from the Clippirs. It can be placed outside the clean room as standalone unit or can be integrated in the equipment itself.

«SEZ looks for process analyzers which have the lowest cost of ownership and enforce our process performances. We have found ABB analytical instruments to be of value to our operations.»

SEZ

Michael Roth

Director Global Marketing Communications and Operations

Analyze^{IT} Wet Process Analyzer

Teflon Sensing Cell The revolutionary and patented Clippir avoids contamination, is chemically resistant and allows rapid installation on your stream without process interruptions.

Multiple Analysis One WPA can monitor up to 8 different streams, analyzing 4 different species in each stream (maximum 32 parameters).

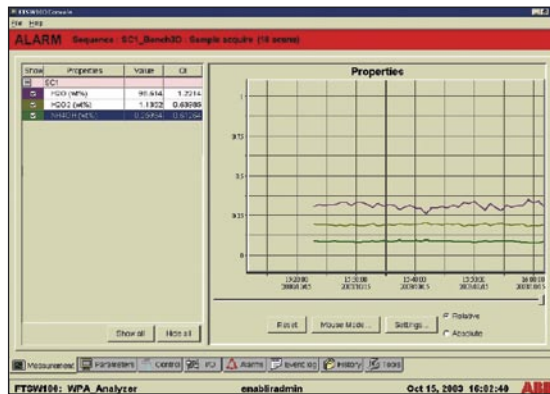
Infrared (IR) Analysis IR-based analysis for semiconductors avoids interference from dissolved metals and particles circulating in the stream.

In-situ Measurement No need for impractical bypass lines; optical fibers bring IR light to the stream, allowing direct measurement through the process tubing.

Remote Monitoring The WPA can be located up to 100 meters away from measuring points (Clippirs), and outside the clean rooms, if desired.

BATH	CHEMICALS
SC1 (APM)	NH ₄ OH, H ₂ O ₂ , H ₂ O
SC2	HCl, H ₂ O ₂ , H ₂ O
HF (DHF)	HF, H ₂ O
SPM (Piranha)	H ₂ SO ₄ , H ₂ O ₂ , H ₂ O
HF-HCl	HF, HCl
BOE (BHF)	NH ₄ F, HF, H ₂ O
DSP	H ₂ SO ₄ , H ₂ O ₂ , H ₂ O
SHF	HF, H ₂ SO ₄ , H ₂ O
KOH / H ₂ O ₂	KOH, H ₂ O ₂ , H ₂ O
AFN	Acetic Acid, HF, HNO ₃ , H ₂ O
EG-HF	Ethylene Glycol, HF, H ₂ O
Vapox Etch	Acetic Acid, Ethylene Glycol, HF, H ₂ O
SILOX	NHF ₄ , HF, Ethylene Glycol, H ₂ O
TMAH	TMAH, H ₂ O
TMAH / H ₂ O ₂	TMAH, H ₂ O ₂ , H ₂ O
Citric Acid	Citric Acid, H ₂ O
Phosphoric Acid	H ₃ PO ₄
MAE (HF type)	H ₃ PO ₄ , HNO ₃ , H ₂ O, HF
MAE (AA type)	H ₃ PO ₄ , HNO ₃ , H ₂ O, Acetic Acid
IPA/KOH	IPA, KOH, H ₂ O
Cyantek CR-7S	(Proprietary chemistry)
Microstrip-5002	(Proprietary chemistry)
EKC 265	(Proprietary chemistry)
Kanto Deer Clean	(Proprietary chemistry)
ESC MR 10	(Proprietary chemistry)
ESC 784	(Proprietary chemistry)
ESC 774	(Proprietary chemistry)
ST-250	(Proprietary chemistry)
ST-255	(Proprietary chemistry)
Rezi-38	(Proprietary chemistry)
ALEG310	(Proprietary chemistry)
CLK 888	(Proprietary chemistry)
ACT 970	(Proprietary chemistry)
ACT 930	(Proprietary chemistry)
OTHER CHEMICALS SUPPORTED ON REQUEST	

FTSW100 Process Software Measurement screen displays concentration values and trends



Features

Accurate, on-line, real-time monitoring of wet chemistries

Non-contact measurement

Fast measurement (< 1 min), multiple connectivity protocols

Multi-stream analysis (up to 8 streams)

Multi-component analysis (up to 4 species per stream)

Remote monitoring through fiber-optic cables, small footprint

Unsurpassed stability and reliability

No reagents required

Worldwide after sales service and support

Benefits

Savings due to increased bath lifetime, reduced chemical consumption, no downtime for off-line laboratory analysis

No chemical loss, no contamination, no down time for installation

Allows real-time process control

Low cost of analysis per stream

Enforces process performance where specifications are critical, reduced probability of wafer scrubbing

Flexible installation possibilities

No drift, little maintenance

Turn-key operation

Fast service interventions



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