

Excellence in Thin Film Metrology

PQ Ruby Laser Ellipsometer Reflectometer

**In-line Process Control Tool for Dielectrics
and Transparent Films**



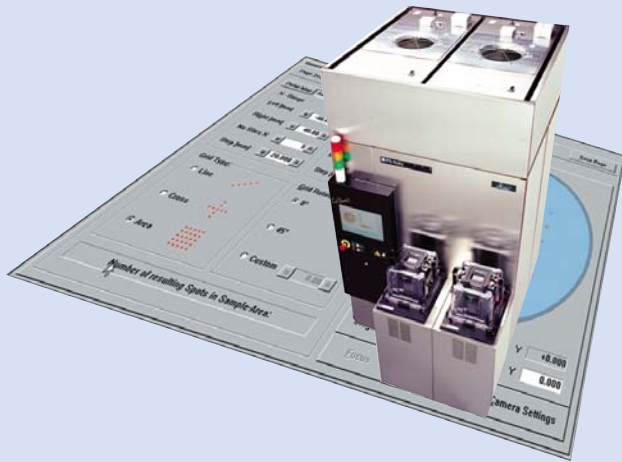
HORIBA GROUP

Explore the future

EMISSION • FLUORESCENCE • FORENSICS • GRATINGS & OEM • OPTICAL SPECTROSCOPY • RAMAN • THIN FILM

PQ Ruby

Integrated Thin Film Metrology



- ❑ Proven sub-angstrom repeatability
- ❑ Highest precision and long-term stability
- ❑ 10 μm microspot for patterned wafers
- ❑ Compact, clean-room design
- ❑ Robust software for production use

To address the advanced requirements of new semiconductor device technologies Jobin Yvon delivers the PQ Ruby solution. The PQ Ruby integrates two measurement technologies within a single, integrated platform to provide reliable process metrology for the full range of thickness measurements simply, accurately and reliably.

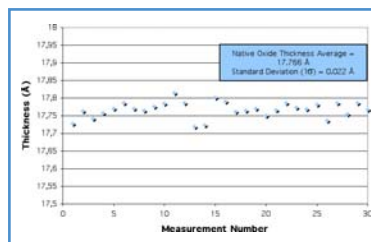
This thin film metrology tool provides unique advantages in terms of automation, standardization, small footprint and high throughput.

The PQ Ruby meets all of your thin film metrology requirements by delivering exceptional performance and ease-of-use. The PQ Ruby provides a very cost effective solution for improving fab productivity.

Extensive Capabilities for In-line Process Control

The PQ Ruby provides fully automatic characterization of thin dielectric and transparent films for substrates up to 200 mm diameter.

Using a combination of Laser Ellipsometry and Spectroscopic Reflectometry the PQ Ruby is capable of determining the thickness, optical refractive index, absorption constants and reflectivity of films up to 30 μm thick, with submonolayer sensitivity.



Precise, stable and accurate thin oxide measurement

Three cassette loading options are available for the PQ Ruby Laser Ellipsometer / Reflectometer:

- **Single Load Port Open Cassette**
- **Dual Load Port Open Cassette**
- **Dual Load Port SMIF System**

The PQ Ruby has been specifically designed for in-line process control in IC production.

The tool also offers full support in R&D environments and thus allows for a smooth transition to full in-line process control at a later stage.

Transparent films – such as ultra-thin gate oxides, nitrides, low-k stacks, CMP oxides and ARC – can be analyzed, as well as absorbing films such as silicon on insulator (SOI), polysilicon on oxide and high-k materials.

Simultaneous evaluation of multilayers such as oxide-nitride-oxide (ONO), oxide-poly-oxide (OPO) and poly-silicon on oxide can be carried out using the patented Dual Infra Red option or the integrated reflectometer.

The system has been designed for measurements on patterned wafers and can be managed optionally by GEM/SECS software.

In production, a throughput of more than 150 wafers per hour is achievable.

RQ RUBY SPECIFICATIONS

Light sources	Lasers	Halogen/Deuterium Light Source	Halogen Light Source
Wavelength range	HeNe Laser	190-1000 nm	450-850 nm
Optional wavelength range	790 nm / 1300 nm / 1500 nm		
Spot size options	From 0.8 x 2.4 mm down to 10 x 30 µm	Ø 20 µm	Ø 10 µm
Film thickness range	0 to 10 µm	50 nm to 30 µm	100 nm to 30 µm
Precision	< 0.01 nm		< 1 nm
Accuracy	< 0.1 nm		< 1 nm
Measurement time	< 1 sec/pt		0.5 to 5 sec/pt
Throughput	> 150 wafers/h		> 100 wafers/h
Sample sizes	100, 125, 150 and 200 mm (other sizes available on request)		
Microscope viewing	High Magnification: 0.5 x 0.7 mm / Low Magnification: 2.0 x 2.8 mm		
XYZ motor stage accuracy	± 1.0 µm		
Autofocus system	Standard		
Pattern recognition option	Cognex Patmax® 8100		
GEM/SECS option	Complies with: E4 / E5 / E30 / E17.1		
Load Port options	Single & Dual Integrated Open Cassette Load Ports / Dual Integrated SMIF Load Ports		
Clean room compatible	Better than Class 1 (built-in MiniEnvironment)		
Standards compliance	CE, S2, S8, E15		
Uptime	> 96 %		
MTBF	> 3000 h		
Footprint	Single Load Port: 0.90 x 0.83 m / Dual Load Port: 1.20 x 1.20 m		
Weight	Single Load Port: approx. 300 kg / Dual Load Port: approx. 450 kg		

Worldwide Customer Support

Jobin Yvon SAS manufactures state-of-the-art thin film characterization and optical instrumentation, and is today the leading supplier of thin film metrology and optical solutions to original equipment manufacturers (OEMs). Our instruments are manufactured under a strict quality assurance program and are supported by a worldwide network of strategically located facilities in the United States, Europe and Asia that are ready to provide assistance when and where it is needed.

Our staff of highly trained service and application specialists install and certify instrument performance, and conduct technical and application user training for smooth and efficient commissioning of the instruments.

This commitment to product excellence and continued support is part of the Jobin Yvon culture.

In the USA:

Jobin Yvon Inc.
3880 Park Avenue
Edison, NJ 08820-3012
Toll-Free: **1-866-jobinyvon**
Tel: +1-732-494-8660
Fax: +1-732-549-5125
E-mail: info@jobinyvon.com
www.jobinyvon.com

In France:

Jobin Yvon S.A.S.
Z.A. de la Vigne aux Loups - 5, Av. Arago - 91380 Chilly Mazarin
Tel : +33 (0) 1 64 54 13 00 - Fax: +33 (0) 1 69 74 88 61
Email: tfd-sales@jobinyvon.fr
www.jobinyvon.fr
Germany: +49 (0) 89 4623 17-0
Italy: +39 0 2 57603050
U.K.: +44 (0) 20 8204 8142

In Japan:

Horiba Ltd., JY Optical Sales Dept.
Higashi-kanda Daiji Building
1-7-8 Higashi-kanda, chiyoda-ku
Tokyo 101-0031
Tel: +81 (0) 3 3861 8231
www.jyhoriba.jp
China: +86 (0)10 6849 2216
Korea: +82 2 576 8650

LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
 $\lambda = 633 \text{ nm}$, $P \leq 1 \text{ mW}$

This instrument complies with 21 CFR 1040.10
and IEC 60825-1 (08-2001)

