

AEOLOS 150

THE MOST VERSATILE ELECTRON ANALYZER
FOR CUTTING EDGE XPS, HAXPES AND NAP-XPS

KEY FEATURES

- Beam forming lens for adaptive transmission enhancement
- Operation up to 10 keV
- 60° wide angle detection
- UHV and NAP operation
- New AD-CMOS true pulse counting detector



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The Device for Surface Analysis

The AEOLOS 150 is a cutting edge hemispherical electron analyzer answering the scientific demands of modern surface analysis and metrology. Its versatile design covers many research areas, such as classical high throughput UHV surface analysis, chemical analysis at near ambient pressure conditions and layer thickness studies for buried interfaces and device development. Merging the key functions of the market leading PHOIBOS 150 HV, WAL and NAP analyzers, the AEOLOS 150 combines the best aspects of the current technology, such as flexibility and outstanding performance with new demands on wide angle analysis, compactness and interoperability. Hence, the AEOLOS 150 is the device without compromise for XPS, HAXPES and NAP-XPS.

Technology and Design

The core of the AEOLOS 150 is a fully redesigned lens system, combining a wide angle lens with 60° acceptance and small spot analysis with the aspects of a near ambient pressure analyzer.

To ensure optimum signal intensity a beam forming lens for adaptive transmission enhancement has been developed. This lens for beam forming ensures optimal conditions for various applications. The AEOLOS 150 can be switched between UHV application and NAP operation in-situ without the need of a pre-lens, thus keeping the specific benefits for each operation modes. The shortened design requires less pumping at identical performance strengthening the economic aspects next to the scientific benefits.

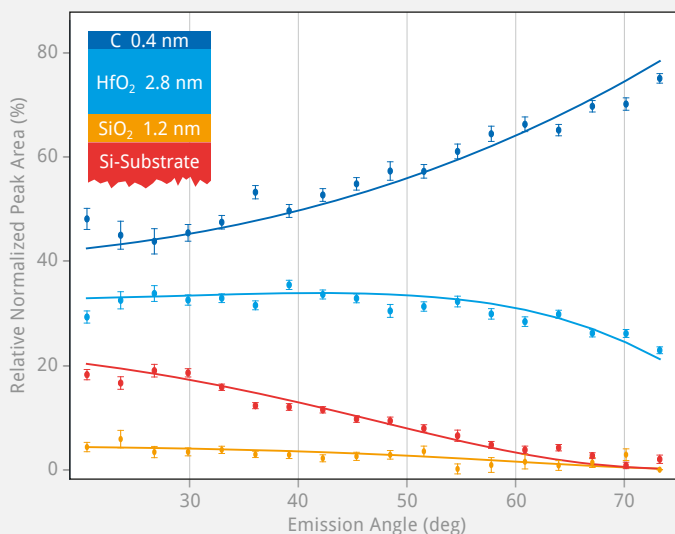
The wide acceptance angle in combination with a new beam forming lens module yields best signal intensity and optimal spectral performance for each individual operation mode in XPS, HAXPE and ARXPS.

Depth Profiling

For destruction free depth profiling the analyzer uses the 60° wide acceptance angle and its high energy capabilities up to 10 keV, to make use of the Multiple wavelength analysis with the new μ FOCUS 450 monochromatic X-ray source. By using several different excitation energies, a clear and comprehensive analysis of the layer thickness can be performed with unrivaled precision.

NAP XPS Extension

To perform those experiments at higher pressure, an additional entrance nozzle with 44° acceptance angle is added to the analyzer cone, next to a separation valve in the analyzer lens. The nozzle can be removed in-situ to switch between UHV XPS and NAP XPS without braking the vacuum. The common specifications of the AEOLOS 150 are not compromised by expanding to the NAP pressure range. The well known high performance of SPECS NAP XPS is supported by the wide SPECS NAP portfolio in excitation sources, systems and vacuum automation.



Two layer thin film on Si-wafer, depth profile gate oxide

AD-CMOS Detector

With the AD-CMOS detector, the AEOLOS 150 is equipped with the most modern detection system available. A camera based true pulse counting mechanism ensures best count rates at highest linearity, as well as lowest noise operation and full flexibility in multi dimensional operation. The detector can be operated in single channel mode with full snapshot capability and in adaptive dimension modes to collect up to 12 ARXPS channels for depth profiling simultaneously.



Accessoires and System Integration

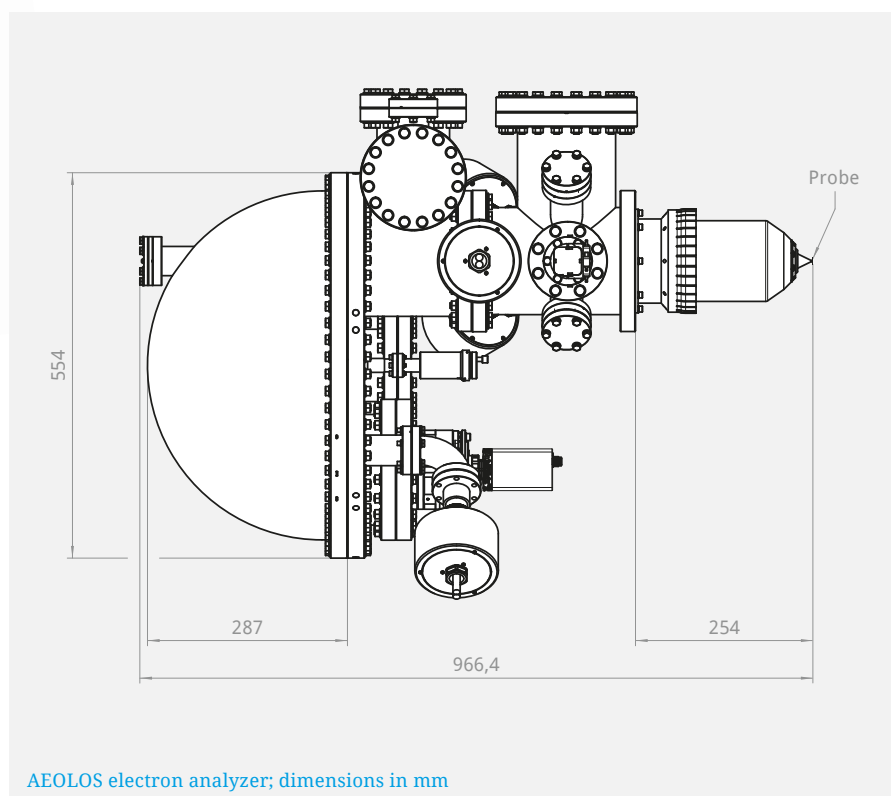
The new μ FOCUS 450 is a matching next generation X-ray small spot monochromator with multiple excitation lines and flexible spot size between $> 100 \mu\text{m}$ and $1000 \mu\text{m}$. The fully computer controlled device allows for measurements with different X-ray lines, e.g. from Al, Ag and Cr. It perfectly fits the experimental and geometrical demands of the AEOLOS 150.

The AEOLOS 150 can be integrated in all common SPECS XPS system modules and is the key component on the new SPECS EnviroMETROS metrology system. Adaptive transmission mode for XPS, HAXPES, ARXPS and NAP XPS.

Technical Data

Specification	Value
Pressure range	UHV to 100 mbar
Acceptance angle	60° in UHV and 44° in NAP
Energy range	up to 10 keV
Pass energy	1 to 200 eV
Angular resolution	$\pm 2.5^\circ$
Mounting flange	DN150CF
Pumping Requirements (NAP)	3 Pumping Stages
Separating Valves	Available for NAP Operation
Lens Modes	Adaptive Transmission Mode for XPS, HAXPES, ARXPS and NAP XPS
Magnetic Shielding	Dual μ -Metal Shield
Detector	AD-CMOS

Dimensions



SPECS Surface Nano Analysis GmbH
Voltastrasse 5
13355 Berlin / Germany
www.specs-group.com

T +49 30 46 78 24 0
F +49 30 46 42 083
E info@specs.com

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