

# Optical Critical Dimension (OCD) Measurement Equipment Market to Expand at a 11.3% CAGR by 2029, Reaching US \$1.9 Bn

*The Business Research Company's Optical Critical Dimension (OCD) Measurement Equipment Global Market Report 2025 – Market Size, Trends And Forecast 2025-2034*

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Optical Critical Dimension (OCD) Measurement  
Equipment Global Market Report 2025

How Much Is The [Optical Critical Dimension \(OCD\) Measurement Equipment Market](#) Worth?

The market for optical critical dimension (OCD) measurement equipment has seen significant

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growth recently and is expected to expand from \$1.11 billion in 2024 to \$1.24 billion in 2025, boasting a compound annual growth rate (CAGR) of 11.6%. The historical growth is linked to elevated semiconductor production levels, heightened demand for smaller electronic components, an increased emphasis on process control within manufacturing, greater adoption of high-tech metrology tools, and boosted investment in foundries.

Anticipated to experience swift expansion, the optical

critical dimension (OCD) measurement equipment market is estimated to reach a value of \$1.90 billion by 2029, displaying a compound annual growth rate (CAGR) of 11.3%. This anticipated growth over the forecast period can be credited to several factors such as the escalating demand for advanced node semiconductors, the growing uptake of 3D NAND and FinFET technologies, increased chip design intricacy, boosted research and development activities for process optimization, and the rising use of AI and machine learning in metrology. The key market trends for the forecasting period are the enhancements in OCD algorithms for improved accuracy,

sophisticated integration of hybrid metrology, the introduction of AI-powered measurement solutions, innovative nondestructive testing methodologies, and progression in real-time process monitoring tools.

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### What Are The Factors Driving The Optical Critical Dimension (OCD) Measurement Equipment Market?

The rise in semiconductor production is anticipated to fuel the expansion of the optical critical dimension (OCD) measurement equipment market. Semiconductors, which offer electrical conductivity between that of conductors and insulators, are extensively employed in electronic devices to regulate current flow. There's an escalating demand for sophisticated electronics like smartphones, electric vehicles, and AI-powered devices, resulting in an upsurge of semiconductor production. The OCD measurement equipment assures precision and yields in chip creation by accurately measuring and maintaining the dimensions of minuscule circuit patterns. For example, the Semiconductor Industry Association (SIA), a US-based trade group, reported in May 2024 that global semiconductor sales reached \$137.7 billion in the first quarter of 2024, a 15.2% rise compared to the first quarter of 2023. Therefore, market growth for the OCD measurement equipment is being fuelled by an increase in semiconductor production. The escalating demand for consumer electronics is expected to drive the growth of the optical critical dimension (OCD) measurement equipment market. Personal and daily use electronic devices such as smartphones, tablets, laptops, and home entertainment systems are considered as consumer electronics. The soaring adoption of smart devices and connected technologies in daily life is increasing the demand for consumer electronics. With the help of the OCD measurement equipment, consumer electronic manufacturers can ensure improved device performance and reliability through precise patterning and dimensional accuracy of microchips. For instance, according to the Electronics and Information Technology Industries Association, a Japan-based trade body, consumer electronics production reached \$201.91 million (¥31,685 million) in February 2024, a rise from \$149.27 million (¥23,425 million) in January 2023. Therefore, the burgeoning demand for consumer electronics is fuelling the growth of the optical critical dimension (OCD) measurement equipment market.

### Who Are The Major Players In The Optical Critical Dimension (OCD) Measurement Equipment Market?

Major players in the Optical Critical Dimension (OCD) Measurement Equipment Global Market Report 2025 include:

- Applied Materials Inc.
- ASML Holding N.V.
- Tokyo Electron Limited
- ZEISS Group
- KLA Corporation

- Hitachi High Tech Corporation
- Nikon Corporation
- SCREEN Holdings Co. Ltd.
- SCHOTT AG
- Bruker Corporation

## What Are The Key Trends Shaping The Optical Critical Dimension (OCD) Measurement Equipment Industry?

Leading firms in the optical critical dimension (OCD) measurement equipment market are prioritizing the development of sophisticated solutions like OCD metrology systems to ensure precise inspection and regulation of manufacturing operations. Essentially, an OCD metrology system is an instrument that utilizes optical methodologies to precisely evaluate the size and structural specifics of semiconductor and microfabrication components. For instance, Onto Innovation Inc., a US firm with expertise in process control solutions, debuted the Atlas S optical critical dimension metrology system in July 2023. The system integrates cutting-edge computing with model-guided machine learning to augment OCD metrology. It employs a Mueller matrix-based analysis coupled with Onto Innovation's AI Diffract modeling engine. This blend delivers a resilient and versatile optical metrology solution which can handle current and prospective industry requirements.

## Which Segment Accounted For The Largest [Optical Critical Dimension \(OCD\) Measurement Equipment Market Share](#)?

The optical critical dimension (OCD) measurement equipment market covered in this report is segmented

- 1) By Type Of Equipment: Standalone Optical Critical Dimension (OCD) Measurement Equipment, Integrated Optical Critical Dimension (OCD) Measurement Equipment
- 2) By Technology: Reflectometry, Ellipsometry, Interferometry, Scanning Probe Microscopy (SPM)
- 3) By Measurement Capability: Single-Dimensional Measurement, Multi-Dimensional Measurement, Depth Profiling
- 4) By Application: Semi-Conductor Manufacturing, Integrated Circuit (IC) Design, Photomask Inspection, Nanoscale Metrology
- 5) By End-User: Foundries, Integrated Device Manufacturers, Research Institutes

### Subsegment:

- 1) By Standalone Optical Critical Dimension (OCD) Measurement Equipment: Metrology Tools, Process Control Systems, Research And Development Instruments, Inline Inspection Systems
- 2) By Integrated Optical Critical Dimension (OCD) Measurement Equipment: Semiconductor Etching Tools With Optical Critical Dimension (OCD), Lithography Systems With Embedded Optical Critical Dimension (OCD), Chemical Vapor Deposition (CVD) Systems With Optical Critical Dimension (OCD), Integrated Process Control Modules

View the full optical critical dimension (ocd) measurement equipment market report:

<https://www.thebusinessresearchcompany.com/report/optical-critical-dimension-ocd-measurement-equipment-global-market-report>

What Are The Regional Trends In The Optical Critical Dimension (OCD) Measurement Equipment Market?

In the Optical Critical Dimension (OCD) Measurement Equipment Global Market Report 2025, North America led as the largest region in 2024, while Asia-Pacific is projected to experience the fastest growth in the forecast period. The report includes data from the following regions: Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East, and Africa.

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