

Global Advanced Packaging Warpage Measurement Equipment Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Advanced Packaging Warpage Measurement Equipment market size was valued at US\$ 1080 million in 2025 and is forecast to a readjusted size of US\$ 1958 million by 2032 with a CAGR of 8.4% during review period.

Advanced packaging warpage measurement equipment is a class of precision metrology equipment used in wafer-level packaging, panel-level packaging, 2.5D/3D integration, hybrid bonding, fan-out packaging, HBM-related packaging, and high-density package substrate manufacturing. Its core function is to perform non-contact or low-disturbance measurement of warpage, bow, flatness, coplanarity, thickness variation, curvature, and stress distribution of wafers, glass carriers, organic substrates, molded wafers, packages, and assembled components during processes such as thinning, temporary bonding, redistribution layer formation, bumping, molding and curing, thermocompression bonding, reflow soldering, and final inspection. This type of equipment typically adopts technical approaches such as shadow moiré, digital fringe projection, digital image correlation, white-light interferometry, spectral confocal measurement, laser scanning, capacitive geometry measurement, and multi-sensor fusion. Combined with high-stability motion platforms, temperature-controlled chambers, automated handling, 3D reconstruction algorithms, statistical process control, and MES data interfaces, it helps customers identify deformation risks caused by coefficient-of-thermal-expansion mismatch, wafer thinning, molding shrinkage, bonding stress, and substrate structural nonuniformity. Typical customers include wafer fabs, advanced packaging manufacturers, OSAT providers, package substrate manufacturers, semiconductor material companies, equipment R&D institutions, and quality laboratories.

The industrial value of advanced packaging warpage measurement equipment is shifting from laboratory quality evaluation to a foundational process control tool for advanced packaging manufacturing. As wafer thinning, temporary bonding, redistribution layer stacking, copper pillar and micro-bump formation, molding, thermocompression bonding, and reflow processes become more complex, coefficient-of-thermal-expansion mismatch among different materials continues to amplify three-dimensional deformation risks across wafers, substrates, and packages. Warpage is not merely an appearance or mechanical dimension issue; it can further affect lithography overlay, bonding alignment, bump contact, solder joint coplanarity, package cracking, and long-term reliability. Therefore, customer requirements are moving beyond single height-difference measurement toward full-field warpage profiles, bow, flatness, curvature, TTV, stress, and process statistics, with consistent measurement standards across R&D validation, process tuning, production monitoring, and final inspection. As advanced packaging evolves toward multi-chip integration, high-bandwidth memory, fan-out packaging, and glass substrates, warpage measurement equipment will become an important enabler of packaging process window management, material selection, tool calibration, and yield improvement.

From a technology perspective, there is no single dominant solution for advanced packaging warpage measurement equipment. Instead, multiple technologies are combined according to sample size, surface continuity, thermal environment, accuracy requirements, and production takt time. Shadow moiré is suitable for large-area package and substrate warpage measurement under thermal processes. Digital fringe projection and digital image correlation are more suitable for discontinuous surfaces, device assemblies, and samples with larger height steps. White light interferometry, spectral confocal sensing, laser scanning, and capacitive geometry measurement are more suitable for wafer-level topography, thickness, TTV, bow, warp, and flatness metrology. Production customers increasingly emphasize automated handling, MES connectivity, SPC statistics, defect correlation, and high throughput, while R&D customers place greater emphasis on thermal range, dynamic temperature profiling, local region analysis, and material stress modeling. Future equipment competition will focus on stable measurement under large warpage ranges, algorithmic reconstruction for complex surfaces, data reliability across different material reflectivities, consistency in thermal-state measurement, automation compatibility, and closed-loop software analytics.

From a regional and competitive perspective, the United States, Germany, Israel, Japan, South Korea, mainland China, and Taiwan, China form the main supply base,

but their strengths differ. U.S. and European suppliers have deep capabilities in advanced metrology platforms, industrial software, sensors, and mature customer validation. Israeli suppliers have a strong industrial foundation in advanced packaging inspection and 3D metrology. Japanese suppliers have long-term expertise across wafers, materials, and precision measurement equipment. South Korean suppliers are close to memory, HBM, and advanced packaging customers. Mainland Chinese suppliers are entering wafer geometry, warpage stress, and 3D topography metrology markets, supported by domestic semiconductor equipment localization demand. Demand regions mainly follow the capacity footprint of wafer manufacturing, advanced packaging, OSAT, package substrates, and semiconductor materials. Asia-Pacific will continue to contribute higher growth due to its concentrated downstream capacity. As advanced packaging capital expenditure expands and local supply-chain security becomes more important, suppliers with high precision, automation, closed-loop software, and local service capabilities are more likely to capture incremental orders.

This report is a detailed and comprehensive analysis for global Advanced Packaging Warpage Measurement Equipment market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Size and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Advanced Packaging Warpage Measurement Equipment market size and forecasts, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Advanced Packaging Warpage Measurement Equipment market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Advanced Packaging Warpage Measurement Equipment market size and forecasts, by Size and by Application, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Advanced Packaging Warpage Measurement Equipment market shares of main

players, shipments in revenue (\$ Million), sales quantity (Units), and ASP (US\$/Unit), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for Advanced Packaging Warpage Measurement Equipment

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Advanced Packaging Warpage Measurement Equipment market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Akrometrix, LLC, ERS electronic GmbH, KLA Corporation, Onto Innovation Inc., Camtek Ltd., Vitrek, LLC, Semilab Zrt., E+H Metrology GmbH, Marposs S.p.A., Otsuka Electronics Co., Ltd., etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

Advanced Packaging Warpage Measurement Equipment market is split by Size and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Size, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Size

Eight-Inch Wafer

Twelve-Inch Wafer

Others

Market segment by Output Parameter

Warpage Profile

Bow and Flatness

Thickness Variation

Others

Market segment by Measurement Object

Wafer

Package Substrate

Panel Carrier

Others

Market segment by Application

Bonding Process Control

Redistribution Layer Process Control

Bump Process Control

Others

Major players covered

Akrometrix, LLC

ERS electronic GmbH

KLA Corporation

Onto Innovation Inc.

Camtek Ltd.

Vitretek, LLC

Semilab Zrt.

E+H Metrology GmbH

Marposs S.p.A.

Otsuka Electronics Co., Ltd.

Kobelco Research Institute, Inc.

Nexensor Inc.

Boardstone Intelligent Technology (Shenzhen) Co., Ltd.

AKOptics Semiconductor Co., Ltd.

Suzhou Raphael Optech Co., Ltd.

Chia Sheng Technology Co., Ltd.

Market segment by region, regional analysis covers

North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Advanced Packaging Warpage Measurement Equipment product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Advanced Packaging Warpage Measurement Equipment, with price, sales quantity, revenue, and global market share of Advanced Packaging Warpage Measurement Equipment from 2021 to 2026.

Chapter 3, the Advanced Packaging Warpage Measurement Equipment competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Advanced Packaging Warpage Measurement Equipment breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Size and by Application, with sales market share and growth rate by Size, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and Advanced Packaging Warpage Measurement Equipment market forecast, by regions, by Size, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Advanced Packaging Warpage Measurement Equipment.

Chapter 14 and 15, to describe Advanced Packaging Warpage Measurement Equipment sales channel, distributors, customers, research findings and conclusion.

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