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Global Solar Cell Quantum Efficiency Tester 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 Solar Cell Quantum Efficiency Tester market size was valued at US$ 328 million in 2025 and is forecast to a readjusted size of US$ 538 million by 2032 with a CAGR of 7.3% during review period.

The Solar Cell Quantum Efficiency Tester is an instrument used to measure various parameters of solar cells, such as spectral response, quantum efficiency, reflectivity, and short-circuit current density. It is an important testing device for solar cell structural analysis and electrical performance parameter calibration. The solar cell quantum efficiency calibration system mainly includes: a light source, a chopper, a monochromator/filter wheel, a bias light source, a lock-in amplifier, a preamplifier, a control system, and data recording and processing software. The measurement principle of the solar cell quantum efficiency tester is to irradiate the solar cell with adjustable intensity bias light to simulate its different operating states, while simultaneously measuring the short-circuit current generated by the solar cell under monochromatic light irradiation at different wavelengths, thereby obtaining the spectral response of the solar cell. The metrological characteristics of the Solar Cell Quantum Efficiency Tester include: monochromatic light spot inhomogeneity, bias light spot inhomogeneity, bias light spectral matching degree, relative spectral response measurement indication error, spectral response measurement repeatability, short-circuit current measurement indication error, reflectivity measurement indication error, wavelength indication error, spectral bandwidth, temperature control platform indication error, stability, and uniformity. The solar cell quantum efficiency tester is calibrated within a wavelength range of (280~1600) nm, and includes equipment for measuring the quantum efficiency of monocrystalline silicon, polycrystalline silicon, thin-film, and multi-junction solar cells. The Solar Cell Quantum Efficiency Tester is a professional testing

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device used in the photovoltaic industry to measure key performance parameters of solar cells, such as quantum efficiency (QE), external quantum efficiency (EQE), internal quantum efficiency (IQE), and spectral response. By measuring the output current of the solar cell under monochromatic light irradiation at different wavelengths, this tester can accurately assess the photoelectric conversion efficiency and the impact of material and structural design on performance. It is an indispensable instrument for R&D institutions, production lines, and quality control. Quantum efficiency test results are crucial for photovoltaic material optimization, process improvement, and product consistency assurance. In 2025, the global production of Solar Cell Quantum Efficiency Tester is estimated at 6,500 units, with a unit price of approximately US$49,000 and a gross profit margin of approximately 34%.

With the continued expansion of the global photovoltaic industry and the acceleration of energy transition, the market for solar cell quantum efficiency testers has ushered in a period of rapid development. Photovoltaic technology is increasingly evolving towards higher efficiency and lower costs, and various new solar cell materials such as PERC, TOPCon, heterojunctions, and perovskite/tandem layers are emerging, placing higher demands on performance testing such as quantum efficiency and spectral response. Quantum efficiency testers can accurately reveal the response characteristics of solar cells under different wavelengths of light, providing crucial technical support for R&D institutions and photovoltaic manufacturers to improve efficiency and yield. Global carbon neutrality and renewable energy policies are driving steady growth in photovoltaic installations, thereby driving widespread demand for high-precision testing equipment. Despite the broad market prospects, the solar cell quantum efficiency tester industry also faces multiple challenges. First, the technology for this equipment is highly complex, with key components such as monochromatic light sources, spectral calibration systems, and high-precision current detection relying on imports or high-end suppliers, limiting the competitiveness of some domestic brands. Second, global supply chain instability and changes in trade policies can create uncertainty in equipment prices and delivery cycles. Furthermore, industry customers' demands for equipment performance and service responsiveness are continuously increasing, putting significant pressure on small and medium-sized manufacturers and requiring them to continuously increase R&D investment to maintain their technological advantages. In the downstream market, the demand for solar cell quantum efficiency testers is showing a diversified trend. Research institutions and universities continue to conduct research on new photovoltaic materials and structures, resulting in a stable demand for high-precision quantum efficiency instruments. Photovoltaic cell manufacturers regard quantum efficiency testing as a crucial link in production line quality control and yield improvement. Under the background of intelligent manufacturing, automated, high-

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throughput testing equipment is gradually becoming mainstream, driving the upgrade of traditional manual or semi-automatic equipment to intelligent systems. With the continued expansion of global photovoltaic installations and the industrialization of new high-efficiency photovoltaic technologies, the market demand for solar cell quantum efficiency testers will maintain steady growth.

This report is a detailed and comprehensive analysis for global Solar Cell Quantum Efficiency Tester market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type 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 Solar Cell Quantum Efficiency Tester market size and forecasts, in consumption value ($ Million), sales quantity (Units), and average selling prices (K US$/Unit), 2021-2032

Global Solar Cell Quantum Efficiency Tester market size and forecasts by region and country, in consumption value ($ Million), sales quantity (Units), and average selling prices (K US$/Unit), 2021-2032

Global Solar Cell Quantum Efficiency Tester market size and forecasts, by Type and by Application, in consumption value ($ Million), sales quantity (Units), and average selling prices (K US$/Unit), 2021-2032

Global Solar Cell Quantum Efficiency Tester market shares of main players, shipments in revenue ($ Million), sales quantity (Units), and ASP (K 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 Solar Cell Quantum Efficiency Tester

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

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To assess competitive factors affecting the marketplace

This report profiles key players in the global Solar Cell Quantum Efficiency Tester 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 Tau Science, Labsphere, Newport Corporation, JASCO Corporation, Hamamatsu Photonics, Bentham Instruments, Abet Technologies, EnliTech, Zolix, Beijing SOFN Instruments Co., Ltd., etc.

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

Market Segmentation

Solar Cell Quantum Efficiency Tester market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, 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 Type

Wavelength Range 300~1100 nm

Wavelength Range 300~1800 nm

Wavelength Range 300~2500 nm

Others

Market segment by Light Source

Single Light Source

Dual Light Source

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Market segment by Sales

- Direct Selling
- Distribution

Market segment by Application

- Colleges and Universities
- Research Institutes
- Enterprises

Major players covered

- Tau Science
- Labsphere
- Newport Corporation
- JASCO Corporation
- Hamamatsu Photonics
- Bentham Instruments
- Abet Technologies
- EnliTech
- Zolix
- Beijing SOFN Instruments Co., Ltd.
- Oriental Spectra Co., Ltd.

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BeiJing RayLight Technology Co.,Ltd.

Millennial Solar LLC

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 Solar Cell Quantum Efficiency Tester product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Solar Cell Quantum Efficiency Tester, with price, sales quantity, revenue, and global market share of Solar Cell Quantum Efficiency Tester from 2021 to 2026.

Chapter 3, the Solar Cell Quantum Efficiency Tester competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Solar Cell Quantum Efficiency Tester 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 Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

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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 Solar Cell Quantum Efficiency Tester market forecast, by regions, by Type, 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 Solar Cell Quantum Efficiency Tester.

Chapter 14 and 15, to describe Solar Cell Quantum Efficiency Tester sales channel, distributors, customers, research findings and conclusion.

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4 CONSUMPTION ANALYSIS BY REGION

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