

Quantum Dot Display Market Assessment, By Material [Cadmium-based, Cadmium-free], By Application [Television, Monitors, Smartphones, Tablets, Others], By End-user [Consumer Electronics, Healthcare, IT & Telecommunication, Automotive, Others], By Region, Opportunities and Forecast, 2016-2030F

https://marketpublishers.com/r/Q41185DA3365EN.html

Date: March 2025 Pages: 223 Price: US\$ 4,500.00 (Single User License) ID: Q41185DA3365EN

# **Abstracts**

Global quantum dot display market has experienced significant growth in recent years, with a projected revenue of approximately USD 5.02 billion in 2022, the market is forecasted to reach a value of USD 17.8 billion by 2030, displaying a robust CAGR of 17.1% from 2023 to 2030.

Quantum dot display technology improves color accuracy, energy economy, brightness, and extends display lifespans. These advantages make quantum dot displays desirable to consumers and companies since they provide a better visual experience while lowering environmental impact.

The quantum dot display market is expanding rapidly as a result of rising customer demand for vivid, energy-efficient displays. Additionally, quantum dot technology developments improve performance and cost. The increasing demand for 4K and 8K TVs and the need for high-quality pictures drive market development.

The growing popularity of 4K and 8K televisions fuels the development of quantum dot display technologies. There is an increasing desire for displays that can fully use these high-resolution formats as TV screen resolutions improve. Quantum dot displays are especially well-suited for improved color accuracy and brightness, which are critical for a better viewing experience on 4K and 8K panels. For instance, the US Consumer



Technology Association (CTA) forecasted a 70% rise in 8K TV sales in 2022, and a potential 200% increase in 2023, highlighting the relevance of advanced display technologies like quantum dots in satisfying this demand and improving overall visual quality.

Likewise, in January 2023, Shoei Electronic Materials, Inc. and Eyesafe launched Eyesafe QD, which uses breakthrough blue quantum dot technology to prevent blue light toxicity while improving display colors. It is the world's first marketed blue quantum dot solution, as certified by healthcare specialists.

Energy-Efficient Quantum Displays Promote the Market

Improved energy efficiency is an important driver for the quantum dot display market owing to its beneficial ecological impact and cost-saving benefits. Quantum dot displays use less power to generate high-quality, bright images, resulting in lower electricity use. It fits with worldwide initiatives to reduce energy usage and carbon footprints and saves individuals and companies money through lower energy costs. The attraction of quantum dot displays grows as energy efficiency rules tighten and environmental consciousness develops, propelling their adoption in a variety of applications ranging from televisions to digital signs and mobile devices.

For example, in January 2022, SGS certified Samsung Display's QD-Display for genuine color tones, pure RGB brightness, and ultrawide viewing angle, setting new benchmarks for premium content watching.

Display Size and Panel Innovations Fuel the Quantum Dot Display Market

The usage of smaller panels and the diversity of sizes are important drivers in the quantum dot display market. Quantum dot technology enables low-cost production, allowing QLED displays to be produced in a broader range of sizes, including gigantic 98-inch panels. Furthermore, applying QLED technology to big, thin, and flexible LCD panels simplifies shipping and installation while broadening the variety of applications. The adaptability meets a wide range of consumer and industrial demands, propelling the use of quantum dot displays in a variety of settings ranging from home entertainment to commercial displays.

For example, in June 2023, Samsung Display's QD-OLED TV panels in 77, 65, and 55-inch sizes were recognized as the industry's first 'Pantone Validated' and 'Pantone SkinTone Validated,' assuring accurate color reproduction. Pantone is known across the



world for its color standards.

Dominance of Cadmium-based in Quantum Dot Display Market

Cadmium-based quantum dots have dominated the quantum dot display market owing to their superior optical characteristics. Cadmium-based quantum dots are a popular choice for display applications because of their great color purity, outstanding brightness, and efficiency. They allow displays to attain a broader color range, more accurate color reproduction, and overall image quality improvements. However, it should be noted that using cadmium in quantum dots creates environmental problems. To tackle it, companies are spending on R&D to find cadmium-free alternatives, assuring the quantum dot display market's long-term growth while keeping high-performance requirements.

For instance, in May 2023, Nanoco Technologies and Guangdong Poly Optoelectronics have teamed together to provide cadmium-free quantum dot materials for displays and lighting films, providing ecologically responsible choices for both Chinese and foreign markets.

North America Dominates Quantum Dot Display Market

Due to strong demand and technical advancements, North America is at the forefront of the quantum dot display market. The region has seen significant expenditures in research and development owing to the presence of prominent industrial giants such as Samsung, Quantum Materials Corp, and Nanosys. Quantum dot displays have gained popularity in North America, considering energy-efficient and bright visual performance, making them increasingly common in consumer electronics and business applications. Furthermore, increased consumer awareness of sustainable and high-quality display technology supports the North American market's leadership position.

For instance, in February 2023, the 34-inch QD-OLED monitor from Samsung Display was Eyesafe Certified 2.0, which reduces dangerous blue light emissions while preserving good color fidelity to analyze blue light emissions, the certification uses the Radiation Protection Factor (RPF).

Government Initiatives Acting as Catalyst for Quantum Dot Display Market

The United States government has played a critical role in advancing the quantum dot display market through programs such as the National Quantum Initiative Act. This 2018



law established a coordinated Federal effort to advance quantum research and development for economic and national security goals. The Act offers financing and support for quantum information science and technology research, development, and application, as well as workforce development and collaboration across government agencies, businesses, and universities. These programs have pushed quantum dot display technology forward, stimulating innovation and ensuring the United States's leadership in quantum information science and its diverse applications.

For example, in October 2023, the 2023 Nobel Prize in Chemistry was awarded for the discovery and synthesis of quantum dot technology, with implications for optical devices, solar cells, biomedical imaging, and potentially quantum dot displays.

## Impact of COVID-19

Before COVID-19, the quantum dot display market expanded due to increased demand for high-quality displays. Conversely, the pandemic disrupted supply networks and limited manufacturing, resulting in short-term setbacks. Following COVID-19, the market recovered as remote work and entertainment increased demand for improved screens. Simultaneously, the emphasis on sustainability and energy efficiency increased, with quantum dot displays gaining attention for their environmentally favorable properties. As consumers and industries sought superior visual experiences, energy efficiency, and sustainable technology solutions, the pandemic prompted digital transformation, boosting the usage of quantum dot displays in diverse applications, including TVs, monitors, and healthcare equipment.

Future Market Outlook (2024 - 2030F)

Quantum dot displays will be crucial in advancing augmented reality (AR) and virtual reality (VR) experiences.

For higher-resolution and more accurate diagnoses, quantum dot screens will be increasingly employed in medical imaging equipment.

Quantum dot displays, which provide improved infotainment and dashboard displays, will become prevalent in high-end automobiles.

Outdoor displays are expected to become brighter and more readable due to quantum dot technology, which will assist the advertising and signage businesses.



Key Players Landscape and Outlook

The global quantum dot display market is characterized by fierce competition among key players. Industry leaders such as Koninklijke Philips N.V., LG Electronics, Inc., Samsung Electronics Co., Ltd., Nanoco Technologies Ltd, and Sharp Corporation are driving innovation and market expansion. These companies invest heavily in research and development, aiming to enhance color accuracy, energy efficiency, and screen sizes. The market outlook is optimistic, with a focus on sustainability and energy-efficient displays. Quantum dot technology is expected to become more prevalent in consumer electronics, healthcare equipment, and automotive displays, ensuring a competitive landscape with a strong emphasis on technological advancements and product diversification.

In September 2023, Shoei Chemical, along with its North American subsidiary Shoei Electronic Materials, acquired Nanosys' quantum dot business assets, putting Shoei in a strong position to grow its role in the advanced materials market. Under Shoei's ownership, Nanosys will continue to improve quantum dot technology.

In April 2022, Nanjing Bready Advanced Materials and Nanosys launched xQDEFTM Laminate, an air-stable quantum dot film that provides high-quality color and brightness for displays at a cheaper cost.



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\*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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