

Quantum Dot Market Shares, Strategies, and Forecasts, Worldwide, 2015-2021

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Abstracts

WinterGreen Research announces that it has published a new study Quantum Dots: Market Shares, Strategy, and Forecasts, Worldwide, 2015 to 2021. The 2015 study has 448 pages, 183 tables and figures. Worldwide quantum dot markets are poised to achieve significant growth as next generation systems provide a way to improve traditional displays with vibrant color and decrease the cost of making electronic devices by decreasing manufacturing costs while increasing quality.

Quantum dot markets are set for rapid growth. Quantum dot market driving forces relate to technology maturity. TV displays, fuel cell catalysts, solar quantum dots, a range of applications depend on the ability to manufacture quantum dots consistently and in sufficient quantity to be useful in a commercial environment. Large screen TV displays represent one of the first commercial application for quantum dots.

This TV display market is a good market. The overall flat panel display (FPD) market is anticipated to reach US\$110 Billion by 2017. Growth is driven by widespread use of devices that embed electronic displays. Displays fit in electronic TVs, notebooks, and mobile smart phones. Ample opportunities exist in the automotive sector as display mediums for entertainment and driver assistance systems.

FPDs can tap into opportunities in the advertising sector, where they are used for both outdoor and indoor ad displays. Public display systems are becoming more common. Technology innovation, lower prices, and robust demand bodes well for market development.

Quantum dot films inside FPDs are indispensable to electronic devices that require human operation and as a result LCD and plasma technologies are now commonplace.

In the television industry. Quantum dot penetration of flat panel display markets promise to be huge. Demand for thin TVs is strong, with wall mounted TVs accounting for a major portion of the market. FPDs are popular for buildings and transport applications. They are used in digital picture frames.

Challenges to existing display technology comes from viewer desire for pure colors and low energy consumption. These features are provided by quantum dots. End-use of big TV displays are expected to drive quantum dot markets throughout the forecast period. Industries analyzed include information systems, personal computers, telecom equipment, instrumentation, consumer appliances, transportation equipment, stationary fuels cells, and medical devices.

Quantum Dot (QD) and Quantum Dot LED (QLED) Market is evolving. The quantum dot market depends on techniques for the development of commercial quantity production. Kilogram quantity mass production of quantum dots is a game-changer. High quality, high quantity and low price quantum dots increase the rate of change in consumer electronics markets.

Quantum dot technology offers screen quality far beyond what has been available previously. The quality of light is better for displays with quantum dots. New products are emerging as manufacturers learn to integrate high efficiency / luminescence quantum dots into display products. The level of change represents a paradigm shift that creates new industries, products, and jobs in science and industry. The list of possible quantum dot applications is ever expanding. New applications are waiting for the availability of quantum dots.

Gold Nanoparticles Illustrate Properties Of Colloidal Nanocrystals Size Dependency

Intrinsic physical sizes are comparable to the critical sizes of many important properties of a given class of functional materials

Wavelength of the electron wave function

Diameter of photo-generated excitons

Domain size of magnetic single domains

Large surface-to-volume atom ratio alters the chemical potential of the structural

Large surface-to-volume atom ratio different in comparison to corresponding bulk crystals

Strongly size-dependent solubility of nanocrystals

Presence of size dependent structures in the nanometer regime

Electron band configuration

Surface structure

Surface reconstruction

Unique crystal structures

Unique catalytic properties of gold nanocrystals can be considered an example

Quantum Dot and Quantum Dot LED (QLED) market segments include HDTV and displays, solar, LED lighting, cancer imaging, personalized medicine, telco lasers, and ID tags. All segments are anticipated to achieve spectacular growth, with TV display technology and solar markets reaching over \$1 billion per year in revenue by 2021. Qdot cancer imaging / personalized medicine reaches \$750 million and quantum dot ID Tags go to \$700 million dollars by 2021.

Vendors, including Nanosys and QD Vision synthesize these materials in solution, and formulate them into inks and films. Quantum Dot LEDs (QLED) enable performance and cost benefits.

Quantum Dot LED (QLED) commercial focus has remained on key optical applications: Optical component lasers are emerging as a significant market. LED backlighting for LCD displays, LED general lighting, and solar power quantum dots are beginning to reach the market. Vendors continue to evaluate other applications.

Medical applications are potentially large and beginning to reach a level of maturity that represents real market presence. Early stage work with University College London in cancer imaging is progressing.

According to Susan Eustis, lead author of the team that prepared the study, "Quantum

dots QDs are nano-particles in the range of 2 nm to 10 nm diameter. Quantum dots are tiny bits of semiconductor crystals with optical properties that are determined by their size and shape more than material composition. Their small size is of nanoparticles is only now making them able to be manufactured in commercial quantities. They are made through a synthesis process. Strong growth is anticipated as companies master manufacturing techniques that allow consistent production”

Quantum dot markets at \$306 million in 2014 are anticipated to reach \$4.6 billion by 2021 as next generation devices, systems, and displays are triggered by quantum dots. Quantum dots represent the next wave of semi conductor revolution, giving sophisticated functionality based on the size and shape of the nanoparticle not the base material. Because the materials science is so easy to manipulate, the devices can be made very inexpensively with a lot of variety.

Contents

QUANTUM DOT EXECUTIVE SUMMARY

Quantum Dot Market Driving Forces

Quantum Dot (QD) and Quantum Dot LED (QLED) Market

Quantum Dot Market Driving Forces

Cadmium-Free Quantum Dots

Quantum Dot (QD) Market Shares

Quantum Dot and Quantum Dot LED (QLED) Market Forecasts

1. QUANTUM DOT MARKET DESCRIPTION AND MARKET DYNAMICS

1.1 Quantum Dot Market Description

1.2 Quantum Dot TV Display Technology

1.3 Display Technology

1.4 Quantum Dot Light Emitting Diodes (QLEDs)

1.4.1 QLED Quantum Dot Display Is Better Than OLED

1.4.2 Quantum Dots Semiconductor Nanocrystals

1.4.3 Quantum Dot Changes In Energy Band Gaps

1.5 Quantum Dot LED (QLED) Commercial Focus

1.5.1 Life Sciences

1.5.2 Applied Sciences

1.5.3 Medical Sciences

2. QUANTUM DOT MARKET SHARES AND MARKET FORECASTS

2.1 Quantum Dot Market Driving Forces

2.1.1 Quantum Dot (QD) and Quantum Dot LED (QLED) Market

2.1.2 Quantum Dot Market Driving Forces

2.1.3 Cadmium-Free Quantum Dots

2.2 Quantum Dot (QD) Market Shares

2.2.1 Thermo Fisher Scientific / Life Technologies

2.2.2 Life Technologies Qdot Nanocrystal Applications

2.2.3 Nanosys QDEF

2.2.4 NanoSys Materials Architect

2.2.5 Nanosys Product Oriented Collaborations

2.2.6 LG Display Joint Development Agreement With QD Vision

2.2.7 3M

- 2.2.8 InVisage Technologies
- 2.2.9 Sigma-Aldrich Qdot Bioconjugates
- 2.2.10 QD Laser
- 2.2.11 Nanoco Technologies
- 2.2.12 Nanoco Cadmium-Free Quantum Dots (CFQD)
- 2.2.13 Nanoco Group / Dow Chemical Company (NYSE: DOW)
- 2.2.14 Nanoco Joint Development Agreement With Large Lighting Company
- 2.2.15 NanoAxis Nanomedicine Applications
- 2.2.16 NN-Labs
- 2.2.17 Nexxus Lighting Partnership with QD Vision
- 2.2.18 QD Vision
- 2.2.19 QD Vision and Cadmium
- 2.2.20 Quantum Materials Corporation (QMC)
- 2.2.21 NanoPhotonica
- 2.2.22 Ocean NanoTech Organic Soluble Iron Oxide Nanoparticles
- 2.2.23 Quantum Dot Vendor Unit Market Share Analysis
- 2.3.24 Quantum Dot Market Shares, Dollars, Low End Mid-Range, And High End, Mg Shipped
- 2.3 Quantum Dot and Quantum Dot LED (QLED) Market Forecasts
 - 2.3.1 Quantum Dot And Quantum Dot LED (QLED) Market Forecasts, Units
 - 2.3.2 Quantum Dot and Quantum Dot LED (QLED) Market Sectors
 - 2.3.1 Quantum Dot LED (QLED) Application Forecasts
 - 2.3.2 Benefits of QLED Displays
 - 2.3.3 Quantum Dot Commercial Applications – General Lighting
 - 2.3.4 Quantum Dot and Quantum Dot LED (QLED) Display Market
 - 2.3.5 Nanoco / Dow To Sell, Market And Manufacture Cadmium-Free Quantum Dots For LCD displays
 - 2.3.6 Quantum Dot and Quantum Dot LED (QLED) Medical Imaging Dollars
 - 2.3.1 Quantum Dot Telco Laser / QD Laser 1240-1310nm Quantum Dot Lasers
 - 2.3.2 Quantum Dot ID Tags / Quantum Material / Quantum Dot Printed Electronic Ink Formulations
 - 2.3.3 Quantum Dot and Quantum Dot LED (QLED) Solar Market
 - 2.3.4 Nanoco Cadmium Free Nanomaterials Used As Solar Ink
 - 2.3.5 Quantum Cascade Lasers (QCLs)
- 2.4 Quantum Dot Prices
 - 2.4.1 Quantum Dot TV Prices
- 2.5 Quantum Dot Market Regional Segment Analysis

3 QUANTUM DOT DISPLAY PRODUCT DESCRIPTION

3.1 Samsung

- 3.1.1 Samsung TVs with Quantum Dot Technology
- 3.1.2 Samsung 8K TVs
- 3.1.3 Samsung KN55S9C TV
- 3.1.4 Samsung 4" AM-QLED Prototype
- 3.1.5 Samsung Color Quantum Dot Display QLED
- 3.1.6 Samsung Assessment of QLED
- 3.1.7 Samsung Quantum Dots
- 3.1.8 Samsung Advanced Institute of Technology Nanotechnology Research
- 3.1.9 Samsung Sophisticated And Improved Curved Designs
- 3.1.10 Samsung Sports Live and Video CLips
- 3.1.11 Samsung Platform Powered by Tizen

3.2 LG

- 3.2.1 LG Quantum Dot TV
- 3.2.2 LG Display Joint Development Agreement With QD Vision
- 3.2.3 LG Display / QD Vision

3.3 Sony

- 3.3.1 Sony QD Lifelike Motion

3.4 QD Vision

- 3.4.1 QD Vision QLED Efficiency
- 3.4.2 QLEDs
- 3.4.3 QD Vision QLED Technology
- 3.4.4 QD Vision / Philips Monitors MMD Quantum Dot Monitor

3.5 3M

- 3.5.1 3M Color - QDEF
- 3.5.2 3M / Nanosys Quantum Dot Commercialization of QDEF

3.6 Evident Technologies

- 3.6.1 Evident Technologies Lead Sulfide (PbS) EviDot Quantum Dots
- 3.6.2 Evident Technologies Quantum Dot Properties
- 3.6.3 Evident Product Designed To Generate Electricity
- 3.6.4 Evident Technologies Thermoelectrics (TE)

3.7 InVisage

- 3.7.1 InVisage QuantumFilm Image Sensor
- 3.7.2 InVisage QuantumFilm Image Sensor for Mobile SmartPhones
- 3.7.3 InVisage QuantumFilm Image Sensor for Professionals
- 3.7.4 InVisage QuantumFilm Image Sensor
- 3.7.5 InVisage Dynamic Zoom

3.8 Nanosys

- 3.8.1 Nanosys QDEF
- 3.8.2 Nanosys Precisely Tuned Color
- 3.8.3 Nanosys Brightness And Energy
- 3.8.4 Nanosys QDEF: OLED Performance At An LCD Price
- 3.8.5 NanoSys Quantum Dots
- 3.8.6 Nanosys Quantum Dot Enhancement Film (QDEF)
- 3.8.7 Nanosys Product Oriented Collaborations
- 3.8.8 NanoSys Visual Experience
- 3.8.9 NanySys QDEF Return on Investment ROI and Total Cost of Ownership TCO

Improvements

3.9 Nanoco Technologies

- 3.9.1 Nanoco CFQD Display
- 3.9.2 Nanoco CFQD Lighting
- 3.9.3 Nanoco Quantum Dots
- 3.9.4 Nanoco Quantum Dot Beads
- 3.9.5 Nanoco Cadmium-Based Quantum Dots (NanoDots)
- 3.9.6 Nanoco Cadmium-Free Quantum Dots (CFQD)

3.10 Kateeva

- 3.10.1 Kateeva Inkjet Printing Equipment For Organic LED Mass Production
- 3.10.2 Kateeva OLED Performance Controls To achieve Reliability
- 3.10.3 Kateeva OLED TVs

3.11 Thermo Fisher Scientific / Life Technologies

- 3.11.1 Qdot Probes
- 3.11.2 Life Technologies Corp Invitrogen
- 3.11.3 Life Technologies Qdot Nanocrystals

3.12 NanoAxis

- 3.12.1 NanoAxis Quantum Dots (QDs)
- 3.12.2 NanoAxis AxiCad Quantum Dots

3.13 N-N Labs

- 3.13.1 N-N Labs Cadium Based Quantum Dots
- 3.13.2 N-N Labs Cadmium Selenide Zinc Sulfide Quantum Dots (CZ)
- 3.13.3 N-N Labs Cadmium Selenide Zinc Sulfide Quantum Dots In Water (CZW)
- 3.13.4 N-N Labs Cadmium Sulfide Quantum Dots (CS)
- 3.13.5 N-N Labs Cadmium Telluride Quantum Dots (CT)
- 3.13.6 N-N Labs Cadium Free Quantum Dots / N-N Labs Copper Indium Sulfide Zinc Sulfide Quantum Dots (CIS)229
- 3.13.7 N-N Labs Copper Indium Sulfide Zinc Sulfide Quantum Dots In Water (CISW)
- 3.13.8 N-N Labs Indium Phosphide Zinc Sulfide Quantum Dots (INP)
- 3.13.9 N-N Labs Indium Phosphide Zinc Sulfide Quantum Dots In Water (INPW)

- 3.13.10 N-N Labs Manganese Doped Zinc Selenide Quantum Dots (DD)
- 3.13.11 N-N Labs Manganese Doped Zinc Selenide Quantum Dots in Water (DDW)
- 3.13.12 N-N Labs CuInS/ZnS (CIS, Cadmium Free Core-Shell Quantum Dots)
- 3.13.13 N-N Labs Mn:ZnSe (D-dots, Cadmium free Doped Quantum Dots)
- 3.14 Nexxus Lighting
- 3.15 Ocean Nanotech
 - 3.15.1 Ocean Nanotech Preparation of Quantum Dots
 - 3.15.2 Ocean NanoTech Organic Soluble Iron Oxide Nanoparticles
 - 3.15.3 Ocean NanoTech Water Soluble Quantum Dots
 - 3.15.4 Ocean Nanotech Technology
 - 3.15.5 Ocean Nanotech Water Soluble Quantum Dots - QSH
 - 3.15.6 Ocean Nanotech Water Soluble Quantum Dots - QXH
 - 3.15.7 Ocean Nanotech Organic Soluble Quantum Dots - QSP
 - 3.15.8 Ocean Nanotech Organic Soluble Quantum Dots - QPP
 - 3.15.9 Ocean Nanotech Water Soluble Heavy Metal Free Quantum Dots - CSH
 - 3.15.10 Ocean Nanotech Water Soluble Quantum Dot Beads >> QBA
 - 3.15.11 Ocean Nanotech Water Soluble Quantum Dot Beads >> QBH
- 3.16 QD Laser
 - 3.16.1 QD Laser 1240-1310nm Quantum Dot Lasers
 - 3.16.2 QD Laser 1030-1180nm DFB Lasers For Material Processing And Sensing
 - 3.16.3 QD Laser 640 – 785 nm High Power Lasers With Monitor PD
 - 3.16.4 QD Laser 532, 561, 594nm Compact Visible Laser Module
 - 3.16.5 QD Laser 1270-1310nm Quantum Dot Lasers
 - 3.16.6 QD Laser 1300nm High Temperature Quantum Dot Lasers
 - 3.16.7 QD Laser 1000-1180nm DFB Lasers For Material Processing And Sensing
- 3.17 Quantum Material Corp
 - 3.17.1 Quantum Material Corp Displays & QD-LED
 - 3.17.2 Quantum Material Corp Quantum Dot Display Performance Issues
 - 3.17.3 Quantum Material Corp Quantum Dot Solutions
 - 3.17.4 Quantum Material Quantum Dot Printed Electronic Ink Formulations
 - 3.17.5 Quantum Material Corp Quantum Computing
 - 3.17.6 Quantum Material Makes the Tetrapod Quantum Dot.
 - 3.17.7 Quantum Material Quantum Dots: Man-Made Molecule
 - 3.17.8 Quantum Material Available Across The Entire Light Wavelength From UV to IR Spectra
 - 3.17.9 Rice University Quantum Dot Synthesis
 - 3.17.10 Quantum Material Access2Flow QD Mass-Production
- 3.18 Sigma-Aldrich
 - 3.18.1 Sigma-Aldrich Core-Type Quantum Dots

- 3.18.2 Sigma-Aldrich Core-Shell Quantum Dots
- 3.18.3 Sigma-Aldrich Alloyed Quantum Dots
- 3.18.4 Sigma-Aldrich Quantum Dots Applications
- 3.19 NanoPhotonica

4 QUANTUM DOT AND QUANTUM DOT LED (QLED) TECHNOLOGY

- 4.1 Quantum dots Are Tiny Particles, Nanocrystals
- 4.2 Heavy Metal
 - 1.5.4 QD Vision Replacing Alkyl Phosphine- And Alkyl Phosphine Oxide Solvents
 - 1.5.5 QD Vision Higher-Quality Quantum Dots
- 4.3 TV Color Specifications
- 4.4 Nanoco Technologies Integrating Red And Quantum Dots With Blue LEDs
- 4.5 Mostafa el Sayed
 - 4.5.1 Nanotechnology: Potential Use of Nanoparticles:
 - 4.5.2 Nanomedicine
 - 4.5.3 Nanocatalysis
 - 4.5.4 Plasmonics: Semiconductor Quantum Dots And Rods Can Be Dramatically Enhanced By Plasmon Coupling Interactions
 - 4.5.5 Mostafa A. El-Sayed Awards:
- 4.6 Graphene
- 4.7 Fluorescence
- 4.8 Life Technologies Qdot Nanocrystal Structure
- 4.9 Qdot Bioconjugates
- 4.10 Applications for Qdot Nanocrystals
 - 4.10.1 Life Technologies Qdot Nanocrystal Structure
 - 4.10.2 Tuneability of Life Technologies Qdot Nanocrystals
 - 4.10.3 Qdot Bioconjugates
 - 4.10.4 Applications for Life Technologies Qdot Nanocrystals
- 4.11 QD Vision LED Light
 - 4.11.1 LED backlights
 - 4.11.2 Nanosys QDEF Technology Optical Film Component for LED LCD Backlight
- 4.12 Fujitsu Laboratories Ltd. QD Laser
- 4.13 Rice University Quantum Dots
 - 4.13.2 Combined Graphene Quantum Dots, Graphene Oxide, Nitrogen And Boron Made Into A Catalyst
- 4.14 Ghent University in Belgium i
- 4.15 Nanosensomach
- 4.16 Quantum-Dot Plasmonics and Spasers / QUADOPS

5. QUANTUM DOT COMPANY DESCRIPTION

5.1 3M

5.1.1 3M at a Glance (Year-end 2014)

5.1.2 3M Business Groups

5.2 Apple

5.2.1 Apple Offers Mobile Communication And Media Devices

5.2.2 Apple Business Strategy

5.2.3 Apple Product Introductions

5.2.4 Apple Second Quarter 2015 Revenue

5.2.5 Apple iPhone

5.2.6 Apple HomeKit

5.3 Evident Technologies

5.3.1 Samsung and Evident Technologies Enter Into LED Patent Agreement

5.4 InVisage

5.4.1 InVisage Funding

5.4.2 InVisage Next-Generation Phone Camera Sensor Production Capability

5.4.3 InVisage QuantumFilm Photosensitive Camera Layer Image Sensor

5.4.4 InVisage Light Absorbing Material

5.4.5 InVisage Dynamic Range

5.4.6 InVisage Named as Hot Startup to Watch by EE Times

5.5 Kateeva

5.5.1 Kateeva Investors

5.6 LG Display

5.5.1 QD Vision and LG Display Join Forces to Develop New Generation of Active Matrix Displays Based on Quantum Dot LEDs (QLEDs)

5.7 NanoAxis

5.7.1 NanoAxis Mission Statement

5.7.2 Nano Axis Industries

5.7.3 NanoAxis QD Applications

5.8 Nanoco Technologies

5.8.1 Nanoco Patents

5.8.2 Nanoco's Mission

5.8.3 Nanoco Research And Manufacturing

5.9 NanoPhotonica

5.10 NanoSys Inc.

5.10.1 Nanosys, working with 3M, created Quantum Dot Enhancement Film (QDEF), Samsung Uses Nanosys Film Technology

5.10.2 Nanosys Closes Sixth Funding Round: \$15M New Investment To Expand Quantum Dot Manufacturing

5.11 N-N Labs

5.11.1 N-N Labs Technology

5.12 Neophotonics

5.13 Nexxus Lighting

5.14 Ocean Nanotech

5.14.1 Ocean Nanotech Technology

5.15 Philips / MMD

5.15.1 Philips

5.15.2 Philips Market Opportunities

5.15.3 Philips SPZ5000/00 Web Cam

5.15.4 Philips Lighting Positioning

5.15.5 Royal Philips Electronics of the Netherlands

5.15.6 Philips Enables Consumer Lifestyle

5.15.7 Philips Lighting

5.15.8 Philips Market Opportunity

5.15.9 Philips Visicu

5.15.10 Philips Addresses Healthcare Landscape

5.15.11 Philips/Respironics Monitoring Solution Powered By Cinterion TC65i:

5.15.12 Philips Healthcare Revenue

5.15.13 Philips Accelerate! Positioning

5.16 QD Vision

5.16.1 QD Vision and Cadmium

5.17 QD Laser

5.17.1 QD Laser. / Fujitsu

5.18 Quantum Material Corp

5.18.1 QMC Mass-Production of Thin-Film PV Quantum Dot Solar Cells

5.18.2 QMC Mass-Production of Printed Electronics

5.18.3 QMC QD Nanotech Applications

5.18.4 QMC QD Printing Applications

5.19 SAIC

5.20 Samsung

5.20.1 Samsung Group Moves Toward QLED Displays

5.20.2 The Samsung Philosophy

5.20.3 Samsung Values

5.20.4 Samsung Vision 2020

5.20.5 Samsung Electronics

5.20.6 Samsung Finds Talent And Adapts Technology To Create Products

- 5.20.7 Samsung Adapts to Change, Samsung Embraces Integrity
- 5.20.8 Samsung Telecom Equipment Group
- 5.20.9 Samsung Memory Over Logic
- 5.21 Shenzhen Vigor Electronic Co.
- 5.22 Sigma-Aldrich
 - 5.22.1 Sigma-Aldrich Life Science and High Technology Company
 - 5.22.2 Sigma-Aldrich Photophysics
 - 5.22.3 Sigma-Aldrich Qdot Nanocrystal Structure
 - 5.22.4 Sigma-Aldrich Relative Size of a Qdot Nanocrystal
 - 5.22.5 Sigma-Aldrich Qdot Bioconjugates
 - 5.22.6 Sigma-Aldrich Applications for Qdot Nanocrystals
- 5.23 Sony
 - 5.23.1 Sony PLAYSTATION Eye Webcam - USB 2.0
 - 5.23.2 Sony SNC-EP520 36x Day/Night IP PTZ Camera
- 5.24 Thermo Fisher Scientific / Life Technologies
 - 5.24.1 Thermo Fisher Scientific Acquires Life Technologies
 - 5.24.2 Thermo Fisher Scientific / Life Technologies
- 5.25 Trust
- 5.26 Flat Panel displays Major market Participants
 - 5.26.1 Selected Quantum Dot Installations by Vendor

Tables

TABLES

Table ES-1 Quantum Dot Market Driving Forces

Table ES-2 Quantum Dot QLED Features

Table ES-3 Quantum Dot Market Factors

Table ES-4 Quantum Dot Display Characteristics

Figure ES-5 Quantum Dot (QLED) Market Shares, Dollars, Worldwide, 2014

Figure ES-6 Quantum Dot and Quantum Dot LED (QLED) Display Market Forecasts, Dollars, Worldwide, 2015-2021⁴⁴

Table 1-1 Advanced Display Technology Features

Table 1-2 QDot Products Medical Sciences Focus

Table 1-3 Gold Nanoparticles Illustrate Properties Of Colloidal Nanocrystals Size Dependency

Table 2-1 Quantum Dot Market Driving Forces

Table 2-2 Quantum Dot QLED Features

Table 2-3 Quantum Dot Market Factors

Table 2-4 Quantum Dot Display Characteristics

Figure 2-5 Quantum Dot (QLED) Market Shares, Dollars, Worldwide, 2014

Table 2-6 Quantum Dot (QLED) Market Shares, Dollars, Worldwide, 2014

Table 2-7 Quantum Dot Vendor Initiatives

Table 2-8 Life Technologies Qdot Nanocrystal Applications

Table 2-26 Quantum Dot Market Shares, Low End Mid-Range, and High End, Mg Shipped Dollars, Worldwide, 2014⁸²

Figure 2-27 Quantum Dot and Quantum Dot LED (QLED) Display Market Forecasts, Dollars, Worldwide, 2015-2021⁸⁴

Table 2-28 Quantum Dot and Quantum Dot LED (QLED) Market Industry Segments, Dollars, Worldwide, 2015-2021⁸⁵

Table 2-29 Quantum Dot and Quantum Dot LED (QLED) Large Companies Production

Figure 2-30 Quantum Dot and Quantum Dot LED (QLED) Market Forecasts, Units, Worldwide, 2015-2021

Table 2-31 Quantum Dot and Quantum Dot LED (QLED), Units (Mgs) and Dollars, Worldwide, 2015-2021

Figure 2-32 Quantum Dot and Quantum Dot LED (QLED) Market Segments, HDTV and Displays, Solar, LED Lighting, Cancer Imaging, Personalized Medicine, Telco Lasers, and ID Tags Dollars, Worldwide, 2015-2021

Table 2-33 Benefits of QLED Displays

Table 2-34 Quantum Dot Areas

Table 2-35 Quantum Dot Semiconductor Areas

Table 2-36 Quantum Dot Optoelectronics Areas

Figure 2-37 Quantum Dot and Quantum Dot LED (QLED) Lighting Market, Dollars, Worldwide, 2015-2021

Table 2-38 Optoelectronics Solid State Lighting Quantum Dot Product Advantages

Figure 2-39 Quantum Dot and Quantum Dot LED (QLED) Display Market Forecasts, Dollars, Worldwide, 2015-2021

Figure 2-40 Quantum Dot and Quantum Dot LED (QLED) Medical Imaging Dollars, Worldwide, 2015-2021

Figure 2-41 Quantum Dot Telco Laser Markets, Dollars, Forecasts Worldwide, 2015-2021

Figure 2-42 Quantum Dot ID Tags Forecasts. Dollars, Worldwide, 2015-2021

Figure 2-43 Quantum Dot and Quantum Dot LED (QLED) Solar Market Forecasts, Dollars, Worldwide, 2015-2021

Figure 2-44 Samsung UN65JS9000 65" curved-screen 4K SUHD TV

Figure 2-45 Quantum Dot and Quantum Dot LED (QLED) Regional Market Segments, Dollars, 2014

Table 2-46 Quantum Dot and Quantum Dot LED (QLED) Regional Market Segments, 2014"

Figure 2-47 Nanoco Technologies Global Presence

Figure 3-1 Samsung KN55S9C TV

Table 3-2 Samsung KN55S9C TV Features

Figure 3-3 Samsung 4" AM-QLED Prototype

Figure 3-4 Samsung Full-Color Quantum Dot Display QLED

Table 3-5 Samsung SUHD TV Features

Figure 3-6 LG Quantum Dot TV

Figure 3-7 QD Vision Different Colors Quantum Dot

Figure 3-8 Sony KDL-55W900A 55-Inch 240Hz 1080p 3D Internet LED HDTV (Black) (2013 Model)

Figure 3-9 QD Vision QLEDS

Table 3-10 QLED Features

Figure 3-11 QD Vision QLED

Figure 3-12 Philips Monitors MMD and QD Vision

Figure 3-13 3M COLOR DISPLAYS

Table 3-14 Evident Technologies Lead Sulfide (PbS) EviDot Quantum Dot Specifications

Figure 3-15 Evident Technologies Nano-Sized Semiconductors

Figure 3-16 Evident Technologies Quantum Dot Semiconductor Nanomaterials

Figure 3-17 Evident Technologies Next Generation Materials Systems

Table 3-18 Evident Technologies Thermoelectric Devices Benefits

Figure 3-19 InVisage QuantumFilm Image Sensor

Table 3-20 InVisage QuantumFilm Image Sensor for Mobile SmartPhones Features

Figure 3-21 InVisage QuantumFilm Image Sensor

Figure 3-22 InVisage Dynamic Zoom

Figure 3-23 Quantum Dot Size and Color

Table 3-24 Nanosys Target Markets

Table 3-25 Nanosys Applications

Table 3-26 Nanosys Product Oriented Collaborations

Table 3-27 Nanosys Venture Firm Collaborations

Figure 3-28 Nanosys Quantum Dots

Figure 3-29 NanoSys Quantum Dots Edgelit Blu Stack Integration System

Figure 3-30 NanoSys QDEF

Figure 3-31 Nanoco CFQD Display

Figure 3-32 Nanoco Technologies Quantum Dots

Figure 3-33 Nanoco Quantum Dot Beads

Table 3-34 Nanoco Quantum Dot Beads Features

Figure 3-35 Nanoco Technologies is Supplying CFQD Cadmium-Free Quantum Dots

Figure 3-36 Kateeva Precision Deposition with Inkjet Printing

Figure 3-37 Kateeva YIELDjet Inkjet Technology Operating In The Field

Figure 3-38 Close-up of Kateeva Inkjet Head Array Showing Three Packs Of Three Printheads On An Existing Yieldjet Mass-Production System

Table 3-39 Kateeva OLED Commercialization Performance Factors

Table 3-40 Kateeva Key Parameters Needed To Control And Calibrate The Print Algorithm

Table 3-41 Kateeva Maximization of OLED Performance

Table 3-42 Kateeva OLED Performance Controls To Achieve Reliability

Figure 3-43 Life Tech Qdot Probes

Table 3-44 Life Tech Qdot Probes Features

Table 3-45 Life Technologies Qdot nanocrystal Conjugates Life Science Products And Applications

Figure 3-46 Life Technologies Corp Invitrogen

Figure 3-47 NanoAxis Quantum Dot Size Comparison

Figure 3-48 NanoAxis AxiCad Quantum Dots

Table 3-49 NanoAxis AxiCad Quantum Dot Forms

Figure 3-50 N-N Labs Cadmium Selenide Quantum Dots (CSE)

Figure 3-51 Nexxus Lighting QD Bulb

Figure 3-52 Ocean NanoTech Photoluminescence, powder, and TEM of Colors at the Wavelength f Emission

Table 3-53 Ocean NanoTech Organic Soluble Iron Oxide Nanoparticles Target Markets
Figure 3-54 Ocean NanoTech Soluble Quantum Dots Type
Figure 3-55 Ocean NanoTech Soluble Quantum Dots Accesories and Tools
Table 3-56 Ocean NanoTech Core Competences
Table 3-57 QD Laser Semiconductor Laser Solutions
Figure 3-58 QD Laser 1270-1310nm Quantum Dot Lasers
Figure 3-59 QD Laser 1300nm High Temperature Quantum Dot Lasers
Figure 3-60 QD Laser 1000-1180nm DFB Lasers For Material Processing And Sensing
Table 3-61 Quantum Material Corp Quantum Dot Display Performance Requirements
Table 3-62 Quantum Material Corp Quantum Dot Display Performance Issues
Table 3-63 Quantum Material Corp Quantum Dot Display Solution Features
Table 3-64 Quantum Material Corp Quantum Dot Solutions Performance Advantages
Figure 3-65 Quantum Dot Characteristics:
Figure 3-66 Sigma-Aldrich Alloyed Quantum Dots Of The Compositions
CdS_xSe_{1-x}/ZnS of 6nm Diameter Emits Light Of Different Wavelengths By Just
Changing The Composition
Table 3-67 Sigma-Aldrich Quantum Dot Advantages
Table 3-68 Sigma-Aldrich Quantum Dot Applications
Table 3-69 Sigma-Aldrich Quantum Dot Advantages Over Medical Imaging Biosensors
Table 3-70 Global Availability Of Silicon Nanowires Via Aldrich Materials Science Target
Markets
Table 3-71 Nanosys Manufacture of Quantum Dots Distributed by Sigma-Aldrich
Table 3-72 Sigma-Aldrich (Nasdaq: SIAL) Distribution of Nanosys Quantum Dots
Table 3-73 Sigma-Aldrich (Nasdaq: SIAL) Quantum Dot Applications Supported
Figure 4-1 Splitting of Energy Levels In Quantum Dots Due To The Quantum
Confinement Effect, Semiconductor Band Gap Increases With Decrease In Size Of The
Nanocrystal
Figure 4-2 Rec. 2020 Color Gamut
Table 4-3 Nanotechnology: Potential Use of Nanoparticles:
Figure 4-4 Mostafa A. El-Sayed
Figure 4-5 Schematic of the Overall Structure of a Life Technologies Qdot Nanocrystal
Conjugate
Figure 4-6 Relative Size of a Life Technologies Qdot Nanocrystal and other Small
Atomic Structures
Figure 4-7 Tuneability of Qdot Nanocrystals
Figure 4-8 Bioconjugate Color Based On Same Underlying Material (Differ Only In Size)
Table 4-9 Life Technologies Qdot Nanocrystal Applications
Figure 4-10 QDVision LED Light 307
Figure 4-11 Technological Advances That Have Enabled Laser Operation At High

Temperatures

Figure 4-12 Rice University Graphene Quantum Dots

Figure 4-13 Flake-like Nanoplatelets Made Of Graphene Quantum Dots

Table 5-1 3M VALUES

Table 5-2 3M BUSINESS GROUPS

Figure 5-3 InVisage Investors

Figure 5-4 InVisage Next-Generation Phone Camera Sensor

Figure 5-5 InVisage QuantumFilm Photosensitive Camera Layer Image Sensor

Figure 5-6 InVisage QuantumFilm Light Absorbing Material

Figure 5-7 InVisage Percentage Of Photons: QuantumFilm Sensor Storage of Electrons
At Different Wavelengths

Figure 5-8 Kateeva Precision Deposition with Inkjet Printing

Figure 5-9 Kateeva Sharp Image with Brilliant Color

Figure 5-10 Kateeva Investors

Figure 5-11 LG Display Vision

Table 5-12 NanoAxis QD Life Sciences Applications

Table 5-13 NanoAxis QD Solar Technologies Applications

Table 5-14 NanoAxis QD LED Lighting Applications

Table 5-15 NanoAxis QD Advanced Materials Applications

Table 5-16 NanoAxis Solar Technologies Quantum Dot Features

Table 5-17 NN-Labs Nanocrystal Product Lines

Table 5-18 Properties Of Colloidal Nanocrystals Size Dependency

Table 5-19 Ocean NanoTech Quantum Dot Types

Figure 5-20 Philips Addresses Healthcare Continuum Market

Figure 5-21 Philips SPZ5000/00 Web Cam

Table 5-22 Philips SPZ5000/00 Web Cam Upload For YouTube Features

Table 5-23 Philips SPZ5000/00 Web Cam Features

Figure 5-24 Philips Global Presence

Figure 5-25 Philips Global Trends And Challenges

Table 5-26 Philips Positions To Simplify Global Healthcare Delivery For The Long Term

Table 5-27 Philips Healthcare Delivery Product Positioning

Figure 5-28 Philips Delivering Margin Improvement and Decreasing Manufacturing
Overhead

Figure 5-29 Philips Healthcare Information Systems Market Shares

Table 5-30 QD Laser Efficient Semiconductor Solutions Characteristics

Table 5-31 QD Laser Efficient Semiconductor Solutions Applications

Figure 5-32 Samsung Values

Figure 5-33 Samsung Vision

Figure 5-34 Sigma-Aldrich Qdot Nanocrystal structure of a Conjugate

Figure 5-35 Tuneability of Qdot Sigma-Aldrich Nanocrystals

Figure 5-36 Multicolor Immunofluorescence Imaging With Qdot Secondary Antibody Conjugates

Figure 5-37 Sony PLAYSTATION Eye Webcam - USB 2.0

Figure 5-37 Thermo Fisher Scientific QDot Products

Table 5-38 Life Technologies Corporation Qdot Nanocrystal Applications

Table 5-39 Trust Corporate Highlights

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