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Infrared Detector Market by Type (Mercury Cadmium Telluride, INGaas, Pyroelectric, Thermopile, Microbolometer), Technology (Cooled and Uncooled), Wavelength (NIR & SWIR, MWIR, LWIR), Application, Vertical and Region - Global Forecast to 2028

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Abstracts

The Infrared detector market is expected to grow at a CAGR of 7.0% from USD 535 million in 2023 to USD 751 million. The growing popularity of uncooled infrared detectors and increasing demand for infrared detectors in imaging applications, and growing adoption of infrared detectors in motion and people-sensing solutions are driving the market.

“Infrared detector market for NIR & SWIR is expected to grow at highest CAGR during the forecast period”

Near-infrared light (NIR) refers to the portion of the electromagnetic spectrum that lies just beyond the visible light range, with wavelengths ranging from approximately 700 to 2500 nanometers (nm). Although invisible to the human eye, NIR light is commonly utilized in various applications and industries due to its unique properties. Near-infrared light offers unique advantages in terms of penetration, reflectance, absorption, thermal sensing, communication, and applications in diverse industries. Its properties make it a valuable tool for various scientific, industrial, medical, and technological purposes.?

The SWIR (Short-Wave Infrared) detector is designed to detect and capture light in the short-wavelength region of the infrared spectrum. SWIR detectors are typically used to sense infrared radiation with wavelengths ranging from approximately 900 to 2500 nanometers (nm). These detectors can detect and convert SWIR radiation into electrical signals for further analysis and processing. Some of the prominent manufacturers of

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NIR and SWIR detectors are Excelitas Technologies Corp. (US), Hamamatsu Photonics K.K. (Japan), Teledyne FLIR LLC (US), and Lynred (France).

“Infrared detector market for uncooled accounted for the largest share in 2022”

The uncooled infrared detector segment held the leading position, accounting for ~77% of the infrared detector market in 2022. An uncooled infrared detector is an infrared sensor that operates at room temperature or slightly elevated temperatures without the need for cryogenic or thermoelectric cooling, employing temperature-sensitive materials or structures that change electrical properties when exposed to infrared radiation, thus offering advantages such as lower cost, reduced power consumption, compact size, and portability. However, they generally exhibit lower sensitivity and spatial resolution than cooled detectors. Ongoing technological advancements continuously improve the performance and capabilities of uncooled detectors, making them suitable for a wide range of applications, including thermal imaging, surveillance, industrial inspection, automotive safety, and medical devices, enabling functions such as non-contact temperature measurement, night vision, object detection, and heat signature monitoring.

“North America is expected to hold the largest market for Infrared detectors during the forecast period”

The infrared detector market in North America has been further classified into the US, Canada, and Mexico. The demand for security and surveillance systems is substantial across diverse sectors such as government, defense, commercial, and residential in North America. In these applications, infrared detectors are pivotal as they facilitate nighttime surveillance, bolster situational awareness, and offer dependable detection capabilities in environments with limited light or challenging conditions. Furthermore, there is a notable surge in the implementation of industrial automation and robotics in North America, particularly in the manufacturing, automotive, and aerospace sectors. Infrared detectors are employed in machine vision systems, quality control, and process monitoring within these industries, aiding in optimizing production processes and ensuring the reliability of the final products.

Breakdown of the profile of primary participants:

By Company Type: Tier 1 – 35 %, Tier 2 – 45%, and Tier 3 – 20%

By Designation: C-level Executives – 35%, Managers - 25%, and Others -40%

By Region: North America– 45%, Europe– 20%, Asia Pacific – 30%, and RoW – 5%

Major players profiled in this report are as follows: Excelitas Technologies Corp. (US), Hamamatsu Photonics K.K. (Japan), Murata Manufacturing Co., Ltd. (Japan), Teledyne FLIR LLC (US), and Nippon Ceramic Co., Ltd. (Japan), Texas Instruments Incorporated (US), OMRON Corporation (Japan), InfraTec GmbH (Germany), Lynred (France), and TE Connectivity (Switzerland)and others.

Research Coverage

The study segments the Infrared detector market report into technology (cooled, uncooled), working principle (absorption, reflection, transmission, emission), wavelength (near and short-wave infrared, mid-wave infrared, long-wave infrared), type (mercury cadmium telluride, indium gallium arsenide, pyroelectric, thermopile, microbolometer, PIR motion sensor, IR photodiode sensor, IR imaging sensor), application (people and motion sensing, temperature measurement, security and surveillance, gas and fire detection, spectroscopy and biomedical imaging, scientific applications, and smart buildings) and vertical (industrial, nonindustrial). The study also provides market size for various segments regarding four main regions—North America, Europe, Asia Pacific (APAC), and the Rest of the World (RoW).

Reasons to buy the report

The report will help the market leaders/new entrants in this market with information on the closest approximate revenues for the overall infrared detector and related segments. This report will help stakeholders understand the competitive landscape and gain more insights to strengthen their position in the market and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

Analysis of key drivers (Rapid Adoption of Infrared Detectors in Non-Contact Temperature Measurement, Gas Analysis, Astronomy, and Fire Detection applications, Growing popularity of uncooled infrared detectors and increasing demand for infrared detectors in industrial and manufacturing application,

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Increasing Utilization of Infrared Detectors in Security and Surveillance), restraints (Stringent regulations pertaining to import and export of cameras), opportunities (Rising demand for infrared detectors in emerging countries; Growing Demand for Infrared Detectors in the Automotive Industry), and challenges (Detection of objects/substances placed beyond wavelength range).

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the infrared detector market

Market Development: Comprehensive information about lucrative markets – the report analyses the infrared detector market across varied regions

Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the infrared detector market.

Competitive Assessment: In-depth assessment of market shares, growth strategies and product offerings of leading players like Excelitas Technologies Corp. (US), Hamamatsu Photonics K.K. (Japan), Murata Manufacturing Co., Ltd. (Japan), Teledyne FLIR LLC (US), and Nippon Ceramic Co., Ltd. (Japan) among others.

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6 INFRARED DETECTOR MARKET, BY TYPE

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About

Since decades, IR detectors are used for night vision, heat detection and surveillance. With product development over the years the technology, size and performance of the detectors have changed. Size, weight and power are key parameters which define the performance of IR detectors. Earlier, the detectors had to be cooled for better performance, now a large number of IR detectors are produced using uncooled technology.

IR detectors are successfully changing the conventional methods into modern techniques. Initially, they were developed for the militaryand defense applications, specially catering to the defense market. Since then, the uncooled infrared (IR) detectors have penetrated various applications like people and motion detection, temperature measurement, fire and gas detection and bio medical imaging. Over the last ten years, the commercial applications have grown significantly as a result of improved detector capabilities of uncooled IR detectors.

Commercial applications mainly people and motion detection, temperature measurement, fire & gas detection and spectroscopy will remain the strategic market for IR detector market and many companies will be fighting for larger share of this market.

LWIR spectral range detectors are the most commonly used due to their low price, wider application range and their suitability towards Pyroelectric, thermopyle and Microbolometer technology. Continuous reduction in price of SWIR and LWIR spectral range detectors throughout the forecasted period will be one of the strong factors towards increasing the penetration of these detectors in fast growing application like smart homes , medical imaging.

In terms of geography, APAC region leads in terms of revenue generation with Japan contributing to nearly XX % of the APAC market. Temperature measurement and spectroscopy will be the key applications driving the APAC market. Continuously flourishing economy of Japan and China is expected to be the key reason for this high growth rate.

Apart from the demand side market drivers, the report also analyzes the supply side drivers. One of the major supply side market drivers is the growth of comsumer electronics market.

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Major manufacturers for IR detector are Excelitas (U.S.), Murata Manufacturing (Japan), Nicera (Japan), Flir (U.S.), Ulis (France), Melexis (Belgium), Texas Instruments (U.S.) and Vigo Systems (Poland). The following graph gives an overview of market size and growth.

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