

Global Infrared Detector Market: Analysis By Type (Photo Infrared Detector and Thermal Infrared Detector), By Wavelength (Short Wave, Long Wave and Mid-Wave), By Industry Vertical (Automotive, Security, Military and Defense, Healthcare, Manufacturing, and Others), By Region Size and Trends with Impact of COVID-19 and Forecast up to 2028

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Abstracts

Infrared detector is a semiconductor-based electronic device that enables the conversion of infrared radiation (IR) energy into an electrical signal. These devices are capable of detecting and measuring the levels of infrared radiation emitted by objects, and are mainly used to sense the specific characteristics of their surroundings by either detecting or emitting infrared radiations by forming IR images from temperature and emissive differences. The global infrared detector market was valued at US\$468.91 million in 2022. The market value is forecasted to grow to US\$770.10 million by 2028.

Increasing focus on enhancement of security and surveillance in residential and commercial sector, rising government investments in defense sector, rapid industrialization, increasing demand for infrared detectors in imaging applications, growing use IR detectors in non-contact temperature measurement solutions, etc., have been positively contributing towards increased demand for infrared detectors. Other significant factors are increasing popularity of IR detectors in robotics, growing preference of consumers towards better energy management and ongoing technological advancements and innovations in the market by infrared detector manufacturing companies to remain competitive in the market and strengthen their

current portfolios. The market is anticipated to grow at a CAGR of approx. 9% during the forecasted period of 2023-2028.

Market Segmentation Analysis:

By Type: The report provides the bifurcation of the market into two segments based on type: photo infrared detector and thermal infrared detector. Photodetectors are comparatively more useful in detecting wider range of wavelengths and have faster response time in comparison to thermal infrared detectors as interactions of photons with the detector material is comparatively faster. Photo infrared detector market is both the largest and fastest growing segment of global infrared detector market, owing to rapid adoption of more advanced imaging technologies, positive shift towards smart homes and utilization of smart home appliances, rising concerns regarding security in defense sector and high usage of photo IR detectors in commerce, entertainment, manufacturing, and research applications.

By Wavelength: The report provides the bifurcation of the market into three segments on the basis of wavelength: short wave, long wave and mid-wave. Long-wave infrared (LWIR) detector market is both the largest and fastest growing segment of global infrared detector market owing to increased benefits provided by these devices in terms of provision of excellent detection capabilities even in low light conditions, ability to effectively sense thermal signs, and excellent imaging capabilities through aerosols and smoke.

By Industry Vertical: The report provides the bifurcation of the market into six segments on the basis of industry vertical: automotive, security, healthcare, manufacturing, military and defense, and others. Automotive infrared detector market is the largest segment of global infrared detector market, driven by increasing demand for safety features in automobiles, rising incidence of traffic accidents due to low visibility and low lighting conditions, increasing consumer awareness about passenger comfort and convenience, and ongoing technological advancements and innovations by leading companies in the market.

By Region: The report provides insight into the infrared detector market based on the regions namely, Asia Pacific, North America, Europe, Middle East and Africa, and Latin America. North America infrared detector market holds the largest share of global infrared detector market, owing to the presence of a large number of end use industries, increasing application of IR detectors for surveillance, security, and motion sensing purposes in the commercial & residential sector, growing expenditure of companies in

research and development of advanced IR detectors, huge military and defense industry, and increasing use of infrared detectors in spectroscopy & biomedical devices.

North America infrared detector market is divided into three regions on the basis of geographical operations, namely, the US, Canada and Mexico, where the US is the largest market within North America infrared detector market, owing to growing demand of infrared detectors in automotive, defense & manufacturing sectors, rising demand for consumer electronics, and increasing focus of IR detector companies on product innovations, collaborations & acquisitions for expanding consumer base and gaining larger market share.

Market Dynamics:

Growth Drivers: The global infrared detector market has been growing over the past few years, due to factors such as increasing IoT connectivity, growth in number of smart homes and buildings, rising demand of IR detectors in various end user industries, increasing use of IR in wearable devices, increasing focus on improved security and surveillance, etc. IR detectors have become an essential tool in making home security systems more accurate and reliable, as well as making homeowners feel safer while they are in and away from their homes. Smart home devices and systems such as smart speakers, smart lighting, & smart security systems, often rely on IR detectors for presence detection, motion sensing, fire and smoke detection, temperature measurement and intrusion detection. Therefore, increasing product deployment in smart homes, ongoing concerns about better home security, rising automation of buildings and high adoption of people/object counting systems by end user consumers, will continue to boost the growth of global infrared detector market.

Challenges: However, the market growth would be negatively impacted by various challenges such as high cost and stringent government Restrictions, availability of alternative technologies etc. In most chemical and petrochemical plants, infrared detectors are increasingly used to detect or identify the gas leakage from the plant to the outer atmosphere or within the plant. However, a catalytic detector is one of the major substitutes for infrared detectors for gas detection application and the major advantage of catalytic detectors over IR detectors is that they can easily identify hydrogen gas, which IR detectors cannot. Besides, catalytic detectors are simple to operate, easy to install, standardized, and have a long lifespan with less replacement cost. Therefore, availability of alternative technologies can impeded the growth of global IR detector market.

Trends: The market is projected to grow at a fast pace during the forecasted period, due to various latest trends such as increasing integration of AI and ML, growing popularity of uncooled IR detectors, technological advancements in spectroscopy and biomedical imaging etc. AI is increasingly being integrated into IR detectors for enhanced image processing, improved object detection & tracking in real-time, autonomous analyses of infrared data based on predefined rules or machine learning models, and assisting IR detectors in recognizing patterns and anomalies within infrared images, further enabling IR detectors to identify specific objects while reducing the burden on human operators, particularly in scenarios where large amounts of data are present. Therefore, increasing integration of artificial intelligence (AI), machine learning (ML), and deep learning technologies will continue to boost the growth of global infrared detector market in the forecasted years.

Impact Analysis of COVID-19 and Way Forward:

COVID-19 brought in many changes in the world in terms of reduced productivity, loss of life, business closures, closing down of factories and organizations, and shift to an online mode of work. Lockdown policies and measures imposed by the government to prevent the spread of virus resulted in an increasing number of restrictions in the form of social distancing policies and the number of people allowed by industries to work in a physical environment, forcing end user industries to continue their operations in a digital environment and in turn incentivizing end user industries and manufacturing facilities to make a move towards industrial automation. Increasing adoption of contactless technologies across various end user sectors to minimize the risk of virus transmission and continue operations effectively, resulted in an increased demand for IR detectors by industrial plants to monitor the efficient functions of motors, electrical peripherals, and bearings, as the non-contact nature of IR detectors makes them ideal for measuring temperatures remotely without interrupting equipment operation. Therefore, COVID-19 pandemic positively impacted the growth of global infrared detector market.

Furthermore, COVID-19 pandemic created an increasing demand for temperature screening technologies in numerous public venues, such as airports, hospitals, and workplaces, driving up the demand for handheld infrared thermometers or thermal imaging cameras needed to screen a large number of individuals in a quick, contactless and efficient manner. As a result, with infrared detectors playing an important role in non-contact temperature screening and providing quick and accurate temperature measurements, increased demand for temperature screening devices fueled the overall global infrared detector market expansion during the period.

Competitive Landscape:

Global infrared detector market is fragmented with increasing number of large and medium-sized players accounting for majority market revenue. Major companies in the market are engaged in strategic agreements & contacts, innovation, testing, and various other R&D activities & initiatives to develop and deploy new and more efficient products in the market and gain larger market share. For instance, On January 19, 2023, Hamamatsu Photonics K.K., announced that the company has developed a new InAsSb photovoltaic detector (P16702-011MN) with preamp offering high sensitivity to mid-infrared light, up to 11 micrometers (μm) in wavelength.

The key players of the market are:

Teledyne Technologies Incorporated (Teledyne FLIR LLC)

Hamamatsu Photonics K.K.

Murata Manufacturing Co., Ltd.

Texas Instruments Incorporated.

OMRON Corporation

TE Connectivity Ltd.

Honeywell International Inc.

Raytheon Technologies Corporation

LYNRED

Excelitas Technologies Corp.

Nippon Ceramic Co., Ltd.

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