



Assuring IP class rating for thermal cameras



FLIR manufactures thermal imaging tools for use in various harsh conditions. The plant in Estonia is now producing equipment for the marine segment also. The Technical department uses the Nikon Metrology ALTO CMM with CMM-Manager to check the quality of incoming components to guarantee they are as specified. The quality of the magnesium and plastic moulded components from sub-contractors is vital for use in the marine industry as the equipment FLIR produce must adhere to a stringent IP67 class rating, to approve its protection from water and dust.

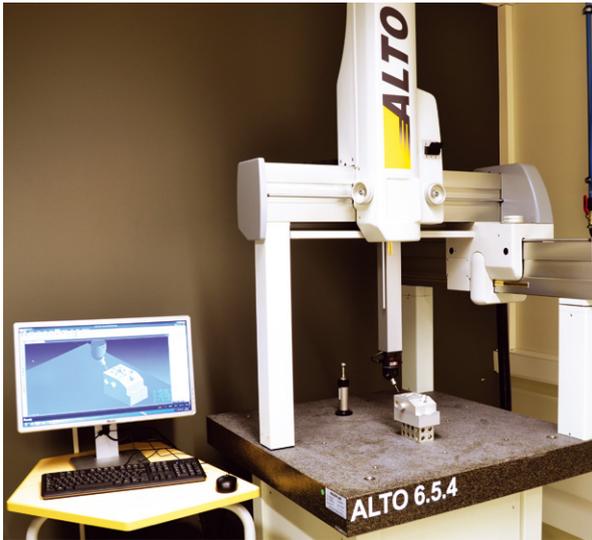
Established in 1978, FLIR began the development of high-performance infrared (thermal) imaging systems, originally for airborne applications. Thermal imaging systems are used to detect the heat that is emitted by all living things, objects or materials – invisible to the naked eye. The equipment produced by FLIR allows the operator to see in total darkness, adverse weather and through air-pollutants such as smoke and haze. Heat sensed by infrared systems can be precisely quantified or measured, allowing the user to not only monitor thermal performance but also identify and evaluate the relative severity of heat related problems. Infrared thermography is the only diagnostic technology that lets you instantly visualize and verify thermal performance. The acquisition of various companies in the 90's led to great expansions as FLIR realized the broader horizons for implementing its

technology. Today, FLIR helps people around the world to save lives, protect the environment and enhance productivity. Its products are adopted widely by fire fighters as well as in law enforcement, military & defence and other industries. For use in such harsh and demanding conditions, the equipment is of a rugged and sturdy design. Combining the precise non-contact temperature measurement, rugged design and life critical applications, FLIR recognized the need for a marine specialised product. For the hard-wearing, tough design to be primed for use in marine applications, the outer shell and component housing must achieve an IP class rating.

ALTO CMM at FLIR (Estonia)

The easy-to-use ALTO CMM from Nikon Metrology aids first article inspection of thermal imaging components at FLIR, required for IP class rating approval.

- The ALTO proves to be the ideal first article inspection tool for FLIR Technical department
- Small footprint means the system can be easily installed in a confined environment
- The ease-of-use means users of all proficiency can get started quickly with measurements and report generation.



■ The user friendly CMM-Manager metrology software acquires and processes the measurement data from ALTO CMM.



The introduction of the ALTO CMM helps to achieve a faster and more accurate component approval process and introduces troubleshooting capabilities.”

Margus Leppsalu - Technical Manager, FLIR.

Perfect fit is vital to guarantee IP class rating

The Technical Department at FLIR is responsible for NPI (New Product Introduction) and monitoring the quality of incoming components is a pivotal aspect of that. A variety of manufacturing processes are used by its subcontractors including machining, injection moulding and thixomolding (semi-solid metal casting). Margus Leppsalu, Technical Manager at FLIR explained that particularly in thixomolding, the magnesium components often have burrs and rough patches, which aren't acceptable in the finished article.

The main structure and body of the equipment is made from magnesium by semi-solid metal casting, often with multiple pieces which fit together like a shell to protect the internal components. The fit of these pieces is vital for attaining the required IP rating. The slots and holes for the fittings which form the seal of the product are the main features that the Technical department are concerned with. A new system to check the alignment and roundness of holes to assure the top quality assembly of its products and achieve the specified IP class rating was vital to be a success in marine applications.

For FLIR, the latest product which will be introduced for the marine segment will be given the rating IP67. The highest dust protection rating of 6 - dust tight and level 7 moisture protection - prolonged immersion up to 1m for 30 minutes.

To coincide with the introduction of the new product, FLIR wanted to find a fast and accurate first article inspection system that would help to check if the measurement reports from supplier were correct. Raymarine, of the same group advised the Technical department at FLIR to invest in a CMM. Due to a relatively small amount of experience using a CMM, a basic system was required to suit all levels of user experience as well as training and support on how to use the machine to be provided. FLIR evaluated its options and consulted Mitutoyo, TESA and Hexagon as well as Nikon Metrology to discover the best options available.

Intelligent CMM-Manager software with straightforward report generation

Previously FLIR used callipers and other basic measurement methods but they offered only a low level accuracy. Another issue with manual tools is being unable to access deep pockets or cavities of some components. Not being able to reach certain features meant that they weren't able to measure them. With the introduction of the small half-gantry, manual CMM and a narrow probe, it is no longer an issue. If parts from suppliers are warped or twisted, they aren't useable, this has become increasingly more important to monitor for the new product release. Alignment and fit of perfectly shaped components is paramount for achieving the specified IP rating.

Margus complimented the speed and accuracy of the ALTO CMM and explained that whilst the system was originally required for FAI (first article inspection), it also has benefits for the Technical department in troubleshooting. The low-maintenance system has been smoothly incorporated into the day-to-day activities at FLIR and serves as a multipurpose consultation tool for the technical department, contributing to an improved quality control process.

When discussing the reporting features of the software, Margus continued to explain that "Creating templates with pre-defined measuring sequences and filled in tolerances will be of great help". The straightforward report creation makes raising queries with suppliers much easier.

As the entry level CMM from Nikon Metrology, the affordable price and usability for all user skill levels has proven the ALTO to be the outstanding tool worthy of investment for FLIR. The solution Nikon Metrology proposed met all of the requirements for FLIR. From the basic CMM accuracy of 3.0+L/250 (ISO10360-2) and the intelligent software's easy-to-learn interface to the short start-up time and training in use of the machine. Within a few hours of training, all users had a basic understanding of the system and were ready to get started.