



APPLICATION STORY

Machine vision: pick and place with FLIR thermal imaging cameras

Machine vision inspections using visual cameras can occasionally cause recognition problems if the product and background have too little color contrast. In such cases, thermal imaging cameras can be a practical solution - especially if the product has a different temperature than the transport medium. In many cases such temperature differences are caused by the production process. Injection molding applications are ideal for this, for example, because the produced parts come out of the machine here at a relatively high temperature. At the German Rubber Conference DKT 2018 in Nuremberg, two Austrian companies presented a possible solution in this area.

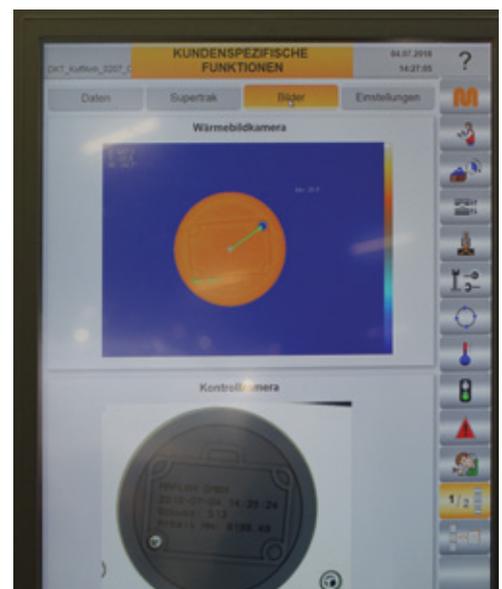
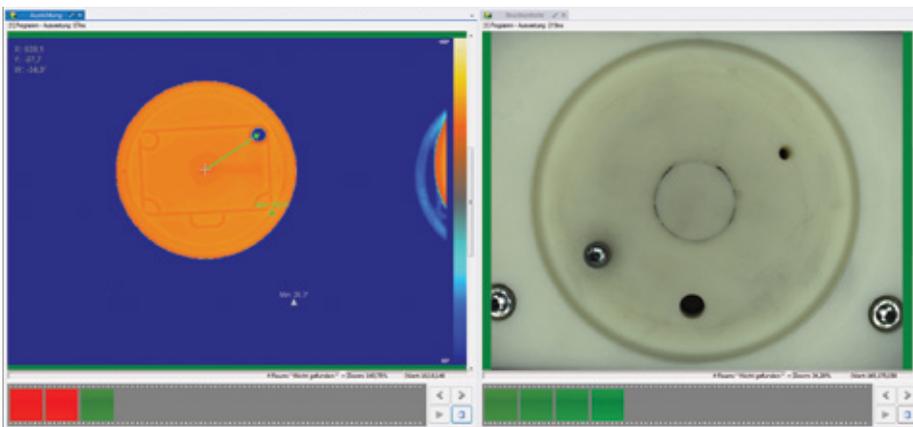
The Austrian company MAPLAN GmbH is an internationally active manufacturer of injection molding machines. With 230 employees worldwide, the company produces approximately 280 elastomer injection molding machines and presses per year,

99% of which are exported to more than 60 countries. In early July 2018, the injection molding specialist presented an application in Nuremberg that included a FLIR A-Series thermal imaging camera.

The FLIR A615 measures the exact position of the freshly-produced rubber luggage tags.



FLIR A615



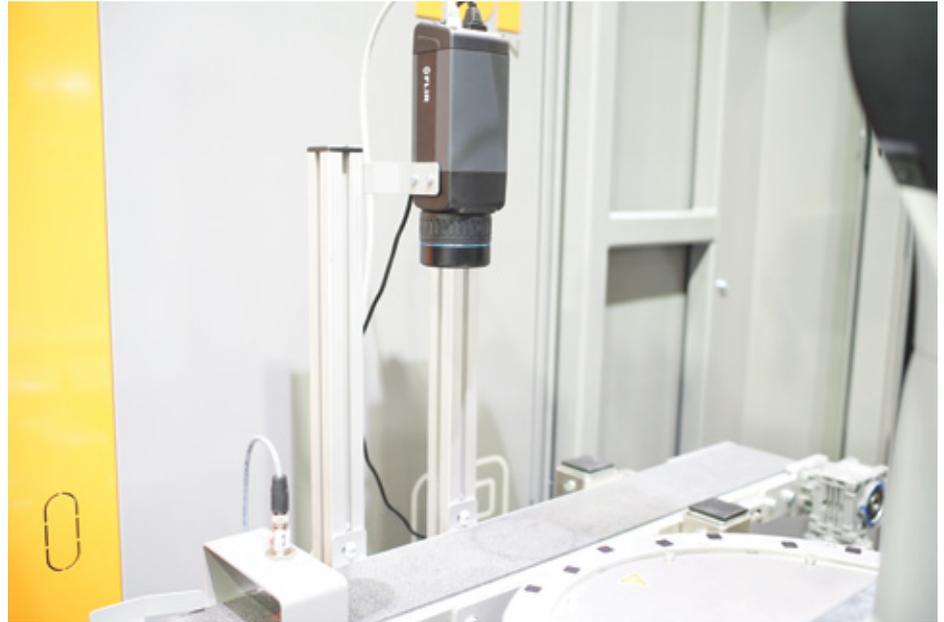
The thermal image shows not only the exact position, but also the temperature distribution of the luggage tags directly after production.

A SYSTEM IS PLANNED FOR THE DKT CONFERENCE

For the Nuremberg trade fair DKT, MAPLAN planned the on-site production of give-aways for trade fair visitors. The company produced customizable rubber luggage tags in an extrusion line; they were then repositioned by a robot and labelled using an inkjet printer. As with many other projects, MAPLAN worked closely with RELISTE GmbH as the integrator to implement this automation solution. RELISTE has offered high-quality products to its customers in the Austrian market for more than 45 years, while the RELISTE Vision Group, founded in 2008, works as an integrator for FLIR thermal imaging cameras in the automation sector.

LOW CONTRAST: TEMPERATURE AS A SOLUTION

In the planned system, the weak contrast ratios between conveyor belt and product initially proved to be a challenge. In a conventional pick and place application, a robot was to remove the luggage tags from the conveyor belt and position them for printing with an inkjet printer, which was ultimately to personalize the tags for the stand visitors. The robot should receive the information as to where the product is on the conveyor belt from a camera. But with light-gray luggage tags on a light-gray conveyor belt, doubts quickly arose about the functional stability when using a visual camera. RELISTE proposed an unusual but pragmatic solution. "Instead of a conventional visual camera for product recognition, we proposed a FLIR thermal imaging camera," explains Dipl. Ing. Thomas Trauttenberg, Managing Director of RELISTE. The model RELISTE recommended was a FLIR A615, which offers 640 × 480



The fixed FLIR A615 conforms to a wide range of standards, making it a plug-and-play device for third-party machine vision software.

thermal resolution. "The thermal imaging camera does not use visual light, but the heat radiation resulting from the extrusion process for reliable product detection.

"The solution convinced us because it was very simple and worked right from the start," adds MAPLAN's technical manager Rudolf Eisenhuber. "The high thermal imaging resolution of the FLIR A615 also enables quality analysis, which we would like to demonstrate with more complex injection molded parts in the future."

For the future, MAPLAN and RELISTE are considering the possibility of additional evaluation of thermal information for rubber

injection molding machines. The use of a thermal imaging camera could also provide additional information about the quality of a product. This method is particularly interesting for complex shaped components. In this regard, FLIR thermal imaging technology could contribute to optimizing the injection molding process.

FLIR A615

The FLIR A615 is used for thermal monitoring and quality assurance of production processes. The compact thermal imaging camera can be fully controlled from a PC and, thanks to its compliance with a wide range of standards, is suitable as a plug-and-play device with software for machine vision applications from third party manufacturers such as National Instruments, Cognex, and Halcon. It is compatible with the GigE Vision standard and supports the GenICam protocol. The FLIR A615 has a high-resolution detector with 640 x 480 pixels and enables high-speed IR windowing. With its high thermal sensitivity of 50 mK, it captures and visualizes the smallest image details and the slightest temperature differences. Its Gigabit Ethernet port allows 16-bit image streaming to the computer in real time.

For more information on thermal imaging cameras or this application example, visit

www.flir.com/automation

The images contained herein may not reflect the camera's actual resolution.

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