Baumer
Passion for Sensors

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Application report

Guarantee traceability through faultless laser marking

OM70 high performance laser distance sensors ensure greater precision in marking laser systems from Trumpf

With its TruMicro Mark ultrashort pulse lasers, Trumpf Schweiz AG offers a reliable and highly precise solution for laser marking. Adding an image processing solution maximizes the process reliability with the help of automated processes for focusing the marking laser, object detection, and result verification. The OM70 high performance laser distance sensor from Baumer is the essential component for the automated focusing of the marking laser, the so-called autofocus function. Thanks to the highly precise distance measurement of the OM70 on a variety of marking object surfaces, high preparation costs can be reduced and waste lowered.

The traceability of a product within the entire production process is gaining in importance especially within the scope of Industry 4.0. Product data that is as detailed as possible should be available for each phase of the product life cycle, both during the manufacturing process as well as during the service life. A basic prerequisite for fulfilling this requirement is the clear identification of components or end products. Product labeling is absolutely essential for this and is usually implemented with the help of laser marking for reasons of durability and precision. Trumpf Schweiz AG is among the leading suppliers of such laser technology. With their marking lasers, they offer their customers an optimum solution for high-quality laser marking. With the addition of the VisionLine image processing system with integrated autofocus function, Trumpf provides an additional option for automation that significantly improves the quality and efficiency of the marking process.

Project manager Tobias Hofmann from Trumpf Schweiz AG confirms this: "With the autofocus function (automated moving of the laser head to the optimal working distance), even components with larger tolerances can be easily and precisely marked without the intervention of the user. The OM70 laser distance sensor from

Components are automatically marked with the marking laser station from Trumpf. The autofocus function increases the process stability of the marking. The distance between the marking unit and the marking object is determined with high precision and reliability by the OM70 high performance laser distance sensor.

Baumer proved to be the optimum solution for reliable and precise measurement on the marking surface. This provides increased process reliability and less waste."

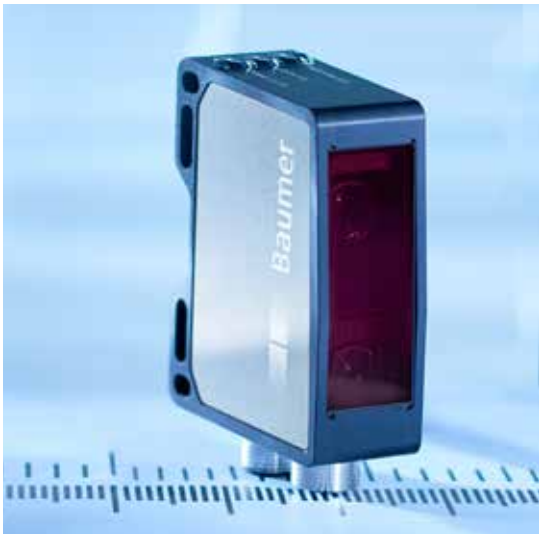
What matters most – quality combined with efficiency

The experts of Trumpf Schweiz AG have developed an exceptionally reliable modular image processing solution: VisionLine Generation 3. This system primarily helps to automate the necessary processing steps, thus ensuring high-quality marking with maximum efficiency. Two monochrome cameras of the VCXG type from Baumer provide information for detecting the location of the marking object in the x and y direction. Automated functions for object detection, processing, and verification of the result are integrated with the help of suitable evaluation software. This way, the position of the workpiece can be recognized and the data can be forwarded to the marking process to correct the position. Before marking, the autofocus function automatically moves the z axis of the laser head to the optimum working distance. For this process, the distance between the marking unit and the object is determined by the OM70 high performance laser distance sensor.

Cost reduction thanks to automation with the OM70

"Without the autofocus function, the marking content for the marking laser must be positioned manually, which can only be done precisely enough with high-cost equipment," explains Tobias Hoffmann, pointing

out the advantages. Imprecise positioning of the object to be marked would result in non-homogenous marking and thus waste. The autofocus function with the distance measurement by the OM70 guarantees precise positioning without these additional expenses. The repeatability of this process step is +/- 50 µm or



The OM70 laser distance sensor from Baumer is the best choice for the integrated autofocus function of the marking laser. The precision of the sensor ensures particularly precise positioning of the marking unit, which increases the process reliability. Thanks to homogenous marking independent of the marking object characteristics, waste can be reduced in this process step.

+/- 70 µm, depending on the installation situation of the OM70, thus offering a reliable solution for the positioning. The OM70 is primarily distinguished by its performance on various materials and reliability even on glossy surfaces such as titanium base alloy or alloyed stainless steel in the medical technology sector, which are challenging for other sensors. With the highly focused laser beam, even the smallest objects can be detected and measured. During measurement, the OM70 is not affected by any ambient conditions. One challenge in this regard, for example, is the red pilot laser, which is part of the marking laser and may lead to disruptions of the measurement, as it operates in the same wavelength as the red transmitter beam of the OM70. However, due to the functioning principle of the triggering of the OM70 in which a measurement is triggered by an external signal, reliable results can be achieved with the pilot laser turned off. Another challenge is the high ratio of extraneous light that is caused by the illumination of the image processing. This also does not affect the OM70 thanks to its very high resistance to extraneous lighting up to 175 kLux. This makes the OM70 a particularly efficient solution for automated laser marking.

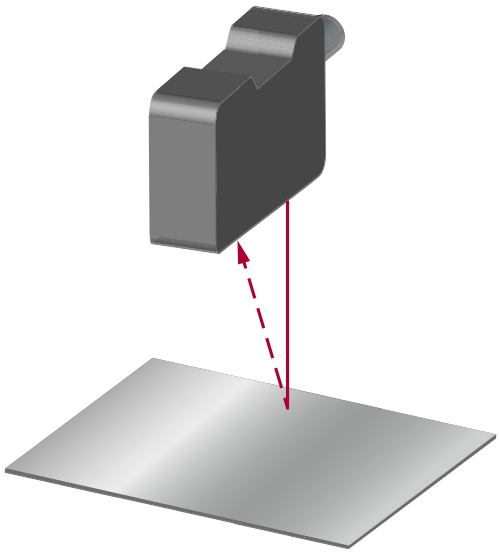
The TruMicro Mark ultrashort pulse laser with autofocus function precisely marks even in the most limited space and on difficult surfaces.

Outlook – increased automation for increased efficiency

The continuous traceability of products and thus product labeling as well will continue to increase in importance in the future. The high quality requirements for the marking are always coupled with the assumption of the maximized efficiency of the marking process and thus the short possible cycle times with minimum

error rates. This requires the automation of the process steps for increased throughput. Trumpf Schweiz AG offers innovative products and services for this automation, with cost reduction potential. Frequently, sensors and cameras are used as information suppliers that help keep the process under control at all times. Mr. Hoffmann is sure that the long-term collaboration between Trumpf Schweiz AG and Baumer Electric AG will become even closer in the future. "Trumpf and Baumer have the same outlook. They focus on the needs and challenges of their customers, which raises the quality and performance aspect of their own products to the highest levels."

Further information::
High performance laser distance sensors
www.baumer.com/OM70



Reliable measurement without tradeoffs: The high performance laser distance sensor OM70 from Baumer automatically adjusts to the different characteristics of the marking object. The OM70 provides a stable measurement signal even on very glossy surfaces such as alloyed stainless steel.

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