

15 minutes instead of 72 hours

Automated image processing achieves 288 times faster spinneret inspection

The company Industrielle Sensorysysteme Wichmann has been an expert partner for sophisticated image-processing solutions for nearly 20 years. Specializing in user-specific solutions for contact-free quality inspection, ISW has developed an inspection microscope that inspects spinning-plate capillaries for thread manufacturing 288 times faster than previous solutions.

The ISW GmbH specializes in developing user-specific solutions in the field of image processing for measuring tasks, position recognition, quality assurance and the evaluation of data matrix codes. Bolstered by a record of more than 5,000 successfully installed systems worldwide, the company defines innovation-boosting solutions which are oriented towards the market and the individual user for a great variety of sectors and fields such as automotive and food, beverage, packaging, electronics and pharmaceutical industries as well as aviation. "Our customer is a plant manufacturer who wants to offer his textile industry client an up-to-date and much more time-saving inspection system to check spinning-plate capillaries than available until now" states Stefan Tukac, project engineer at ISW. Spinning-plate capillaries are drill holes with a diameter of only 0.35 millimeters which are located on the outer tracks of nozzle plates. The 800 millimeter wide, circular plates are used as tools in manufacturing basic materials for textiles. For this purpose, plastic polymers obtained from recycled PET bottles are pressed through the capillaries under very high pressure. This produces up to 46,000 individual threads, which are then interwoven into a tow. In various further process steps, these tows are refined into a textile substitute resembling cotton that forms the basis of many high-tech textiles.



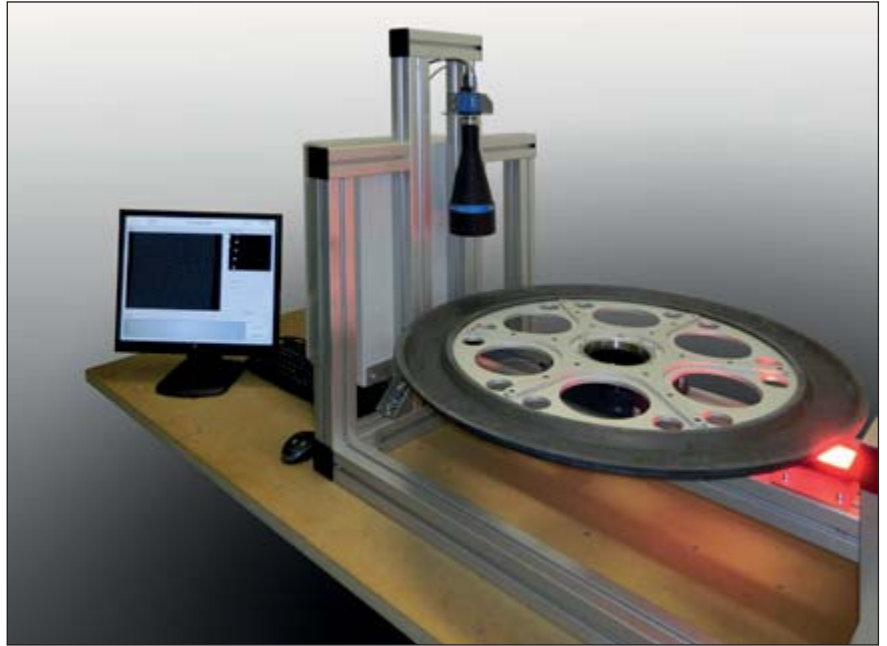
The TXG cameras from Baumer combines many technical features. Its ingenious temperature management, robust design and dust protection system permit long time stable measuring results in industrial surroundings. A wide variety of accessories such as Power over Ethernet (PoE) or Multi I/O guarantee nearly unlimited types of applications. Picture: Baumer

More than 550,000 capillary inspections per month

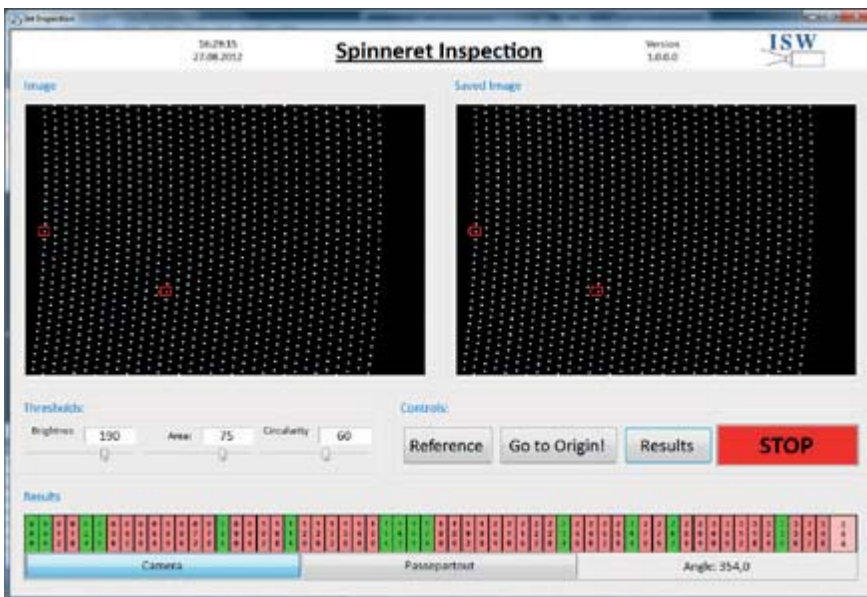
A plant contains up to 12 nozzle plates, each of which has more than 46,000 spinning-plate capillaries. To ensure the quality of the tow density, they must be checked every month and individually cleaned if necessary. "Until now, this inspection was performed manually by specialist personnel, who had to check every single drill hole with a jet orifice microscope via a linear unit" explains Stefan Tukac. This way, the complete inspection of a plate with the accompanying steps to clean blocked capillaries lasts up to 3 days. "Our customer wanted an inspection system that could dispense with this great time expenditure and specified a maximum inspection time of one hour per nozzle plate" Stefan Tukac says in summing up the challenge. "The automated image processing system

we developed even requires only 15 to 20 minutes", he adds. The ISW application achieves an image-supported, 100 percent check by means of a Gigabit Ethernet camera, a telecentric lens and appropriate background illumination. While the nozzle plate revolves automatically on the inspection assembly, the digital camera captures 120 images per checking operation. Due to the background illumination, the image exposures subsequently show the specialist personnel which capillaries are blocked and must be cleaned. ISW relies on powerful GigE cameras of the TX series from Baumer to realize this customer application. The globally operating, family-owned group is one of the international leaders in developing and manufacturing industrial cameras and vision sensors. "Following the market breakthrough of GigE interface technology, we use only

Baumer cameras in nearly all image processing projects” declares Stefan Tukac. “Besides, these cameras have already proven their long-term stability and reliability in another project for the same customer”, he adds. The spinning plates are inspected by a monochrome TXG50 with 5 megapixels that offers excellent signal and image quality. The TX series is based on modern CCD sensors and covers a large number of small, extremely powerful industrial cameras with resolutions ranging from VGA up to 5 megapixels. The broad Baumer Vision portfolio has been developed especially for challenging applications that demand high standards of performance and quality. From the high speed CMOS cameras of the HX series to the high-resolution SX digital cameras and the flexible MX board level models – the Baumer cameras are keystones of modern image processing applications in many sectors.



Inspection assembly for inspecting and cleaning more than 46,000 spinning-plate capillaries in only 15 to 20 minutes. Picture: ISW GmbH



The application HMI of the spinning-plate capillary inspection system shows a live image of the current exposure on the left image section and a stored exposure of the reached angle position on the right. The current cursor position can be called up in a zoomed section for a more precise inspection. After an inspection run, the discovered faults, related to a 360° scale, can be displayed in the lower image section. Picture: ISW GmbH



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