

Sixteen Eyes Can See Better Than Two – AVT Marlin Cameras Test Pipelines For The Automotive Industry

AICON 3D – Measure the advantage

AICON 3D Systems GmbH is one of the world leading providers of optical camera based 3D measurement systems. The company located in Braunschweig, Germany, develops and distributes

systems for the business areas of inspection and testing as well as car safety and tube inspection. The majority of AICON's clients operate in the automotive and aerospace market. Its latest products for automated test and process control open new worldwide market fields and obtain outstanding growth.



The current situation: complex geometry, highest quality

Like a network of arteries, they ensure power and safety in cars: pipes and tubes – like those used for fuel or brake fluid. When installing up to 12 different lines in a vehicle, every millimeter counts; for one thing because space underneath the vehicle is tight; for another because mistakes in installation – for instance of a brake fluid line – can have detrimental consequences for driving safety.

Traditionally, the automotive industry used mechanical gauges for quality control; the shaped pipe was inserted and checked visually. However, this inspection process proved to be extremely inflexible and cost-intensive, since the gauges had to be manufactured for each tube and vehicle type and had to be altered for even the smallest changes in geometry.



Digital quality inspection: fast and precise

An innovative solution for measurement of tube geometry and quality inspection in pipe production was developed by AICON 3D of Germany: the tube measurement system TubeInspect. The system works with 16 high-resolu-

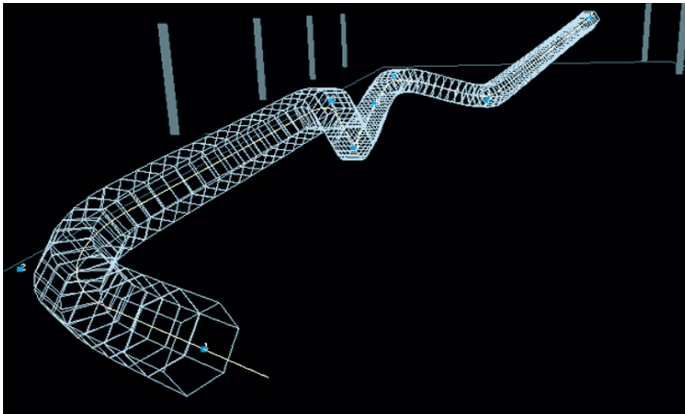
tion digital cameras from Allied Vision Technologies. The line to be measured is simply placed in the optical measurement cell, and its geometry is determined and digitalized via the cameras. TubeInspect measures tubes with diameters from 4 to 200 mm (from a fraction of an inch up to 7.87 inch). The measurement process is extremely fast: The measurement of a line with 15 bends takes about 10 to 20 seconds.

The results of measurement can be recorded in a database and documented during the process. Once the data has been recorded, the software does a target/actual comparison. Variances are displayed in color on screen with the aid of a curved surface tolerance calculation. If the tube measured needs corrections, the system can transmit them via a server directly to the CNC program of the tube-bending machine.

AICON and Allied Vision Technologies: a Success-Story

Thanks to the high resolution of the AVT Marlin digital cameras plus parallel imaging from different angles, outstanding precision is achieved: Bends between 5 and 180 degrees, as well as complex bend-in-bend forms, can be recorded without problems. "The internal memory and delayed data transmission ("deferred mode") of the Marlin camera from Allied Vision

Technologies are especially well suited for TubeInspect", declares Günter Suilmann, Head of Sales at AICON. "In this way, even thin and flexible lines can be recorded synchronously by all cameras, even if they are still oscillating. The FireWire interface (IEEE 1394a) also offers substantial advantages: frame grabber and multiplexer are not needed, which not only simplifies the system architecture but also cuts costs. In addition, cameras with a high-image resolution can be used simultaneously, which enhances measurement precision."



AICON TubeInspect wins Innovationspreis Industrie 2007

The German Industry Innovation Award is bestowed annually by the German "Initiative Mittelstand" (Initiative for small and medium-sized companies) and the publishing house Huber. An independent jury of experts and techni-

cal journalists evaluate the products with respect to their degree of innovation and their value of benefit for small and medium-sized companies. In 2007, TubeInspect, AICON's optical tube measuring system, won the award in the category Optical Technologies.



Use in practice

Thanks to its precision and the fast transmission of corrections to the bending machines, the TubeInspect system has proven itself valuable in the automotive industry for several years. It is currently being successfully used at

about 40 different worldwide locations by leading automotive manufacturers and suppliers, and is also being used in interesting application areas in the aerospace industry.