

NDT 4.0: Robotics and defect recognition for automated quality control

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Especially automotive manufacturers with a very high production volume need interaction free in-line systems with Automated Defect Recognition (ADR). This reduces personnel costs and lowers the chance of human errors during the inspection process. Automated inspection systems have to comply to international quality standards like ASTM, VDI, EN etc. and the demanding company standards of VW, BMW, Porsche etc. As the production process of such parts is already completely automated, systems have to be designed for 24/7 operation without human interaction. Additionally, offline inspection stations are used to train the inspection sequences or review the results. This leads to a completely decoupled procedure for 100% system uptime. Typical ADR applications are the detection of porosities, inclusions or cracks in casting parts. It is possible to define certain ROIs and check defect metrics like defect density, defect distance, defect size, defects per area and many more. Thresholds can be defined dynamically. Training of the system does not require any programming skills and can be done through level II or III personnel. This drives down production costs and reduces the inspection bottleneck, while increasing the reliability and process safety. An integration to Industry 4.0 factory solutions allows full traceability of the inspection process down to single part level. More demanding tasks like automated measurement, completeness or density checks can be performed through the unique VAIP (VisiConsult Automated Image Processing) module. Complex test sequences can be performed on static images or in real time. Example applications: The behavior of heat pumps under different temperatures and completeness checks of valves.