Pressemitteilung / Press release

System for non-destructive surface testing

Georgensgmünd (D) 2014: In aerospace applications, as well as other sectors such as the automotive industry, the highest quality is of decisive importance. Even the tiniest defects can entail serious consequences. As a result, components are produced at toolcraft with the highest precision. The quality of products can be quickly and reliably verified by the system for non-destructive surface testing. The precision parts and high-tech components are wetted with a fluorescent penetrant for this purpose, thereby making even the smallest cracks visible under UVA light.

Expansion of the performance range

On an area of 105 m², the new system offers the opportunity to check components using a non-destructive method for cracks, overlaps, folds, pores and binding errors in the surface. The process is predominantly used on metallic materials, although it can also be applied to other materials such as ceramics – assuming the surface is suitable for testing with penetrants. The system itself occupies an area of 75 m². Great emphasis was placed on cleanliness when building the surface testing system. The system and all equipment are made from stainless steel. As a result of its properties, this material is ideally suited for crack testing, because substances with elevated pH values are used. Harmful, flammable and volatile substances are employed, as a result of which the entire area is strictly monitored and is just allowed to be entered by specialist personnel during the entire test procedure.

Surface testing – effective at the same time as being kind to the environment

Each testing process starts with preliminary cleaning of the components in an alkaline bath. Following this, the alkali is washed off again in a three-stage bath cascade using demineralised water. To protect the environment, an activated charcoal filter continuously filters the process water and prepares it for further cleaning processes. Furthermore, toolcraft has installed an additional water treatment plant. This filters the water required for the process itself so it can be reused in further test procedures.

Once the fluorescent penetrant has been applied by an electrostatic method, the component undergoes intermediate cleaning. Following this, it is immersed in an emulsifier bath in order to partially dissolve the penetrant. Immersion in the water stop bath is used for finishing the process. The testers apply a dry developer before assessing the component. This picks up the penetrant remaining in the defects and shows it up under UVA light. Even microscopically small cracks are revealed in the evaluation cabin; these are cracks which can have a decisive effect in aerospace applications.

Verifiable quality – strictly monitored

The highest standards are met during the test procedure. In addition to a re-emulsifiable material on quality level 3 (high) being used, top priority is given to regular monitoring of the test instruments. Furthermore, before the start of each test procedure, a sample plate is put through the entire process. "Check cracks" have to be found on this. Only if all four stars are identified under the UVA light at the end of the test, the quality test of the actual component can start. Any existing defects are documented according to the highest quality standards, and exclusively by qualified specialist personnel.

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About toolcraft

toolcraft is a pioneer of forward-looking technologies, such as 3D metal printing and the construction of customised turnkey robotics solutions. The company tests and develops innovative engineering processes until they are ready to be used on production lines. As a provider of comprehensive solutions, toolcraft covers the entire process chain, from the initial idea to manufacturing, quality assurance and testing in the areas of CNC machining, 3D metal printing, injection moulding, spark erosion (EDM) and mould making. Its clients include market leaders in the semiconductors, aerospace, medical technology, optical, special machinery manufacturing, motor sports and automotive industries. Building close working relationships with collaborative partners as well as universities, other institutions of higher education and research centres is an important part of its corporate philosophy. The medium-sized family-owned company, located in Georgensgmünd and Spalt, was founded by Bernd Krebs in 1989.