

New products: Microfocus transmission tubes of product line *TCNF*

X-RAY WorX has developed an innovative internal cooling for microfocus transmission tubes of the new product line *TCNF*. The new technology reduces the movement of the focal spot by more than 90% compared to the previously used external cooling.

Transmission tubes of the product line *TCNF* are mainly used for highest-resolution computed tomography (CT) with resolutions less than one micron (μm). Typical fields of application are e.g. research and development as well as semiconductor industry. To achieve detailed and sharp high resolution cross-sections, it is very important to maintain a stable focal spot position during the entire scanning time. The external cooling, which was previously developed by X-RAY WorX, already provided improved results compared to X-ray tubes without cooling. Now, the new internal cooling



Microfocus X-ray tube XWT-160-TCNF

reduces movement of the focal spot by an additional amount of 90%.

Technically, the internal cooling is implemented by cooling channels inside the coils of the electron optics. An active cooler ensures a constant temperature of the cooling agent. When working with resolutions of less than 1 micron (μm), the movement of the focal spot is virtually no

longer measurable. Tests in the laboratory showed focal spot movements of less than one micron over a period of four hours. The setup used for the testing was optimized for vibration-free operation. The tube was operated at 100 kV, 2.6 Watt target power and approximately 0.8 μm resolution. In addition *TCNF* X-ray tubes are equipped with the new *High Resolution Diamond Target*, which ensures continuous stability of the target surface during long-term CT-scans.

With both, the internal cooling and the *High Resolution Diamond Target*, the product line *TCNF* is the perfect solution for highest-resolution computed tomography applications requiring an extremely stable focal spot position and long-term stability during the scan. X-RAY WorX offers *TCNF* X-ray tubes with acceleration voltages of 100 kV or 160 kV.

High Resolution Diamond Target for long-term stability of CT-scans

The new *High Resolution Diamond Target* for microfocus transmission tubes accelerates computed tomography applications significantly and increases long-term stability of radiation at minimum JIMA resolution of 0.5 microns.



„High Resolution Diamond Target“

Long-term stability of radiation, which is achieved by an optimized heat deduction of the new target, is important in many applications.

Applying the *High Resolution Diamond Target* in microfocus mode, users can considerably reduce scanning times of high resolution computed tomography scans or inline inspections.

The new target allows a higher target power per unit of area which enables a smaller focal spot size compared to *High Resolution Target*.

The *High Resolution Diamond Target* is a transmission target consisting of a diamond substrate and an ultra-thin

tungsten layer. It is the perfect solution for all applications at resolution lower than one micron (μm). These are often required in high-resolution computed tomography inspections.

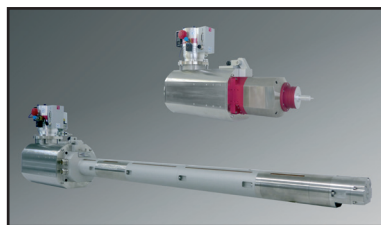
X-RAY WorX transmission tubes of product line *TCNF* will be delivered with the new *High Resolution Diamond Target*. Optionally it is also available for the product lines *TC* and *TCHR*.

Rod Anode X-Ray Tubes - the longest and the shortest – so far..

In December 2013 X-RAY WorX has produced its longest and shortest rod anode tube so far. Usually each rod anode is a custom-made product designed for a special application.

Predominantly rod anode tubes are used for X-ray inspections of areas that are difficult to access. The small focal spot allows highest resolution test results in combination with flat panel detectors.

X-RAY WorX offers three product lines of rod anode tubes for the flexible use for radiographic testing (RT) with film, computed radiography (CR), and digital radiography (DR):



Microfocus X-ray tubes XWT-225 RAC (top) and XWT-225-RAC Superfocus (bottom)

Due to the special requirements regarding the X-ray sources in these industries, there are widespread applications in aerospace, energy, process, and casting industry as well as for inspections of welds.

Product line *RA*, product line *RAC*, with double centering and patented internal cooling of target and sealing, and **product line *RAC Superfocus***, with patented internal cooling of target and sealings and double centering, optimized for digital radiography (DR) applications. Full support of new standard EN 17636-2.

Two successful „Microfocus Training Weeks“ in March 2014

X-RAY WorX is looking back on two more successful „Microfocus Training Weeks“ which took place in March 2014.

Eleven participants from all over the world (Japan, India, USA, England, Belgium, Germany) gained comprehensive experiences and skills in microfocus X-ray technology, preventive services and maintenance of microfocus X-ray systems as well as diagnostics. In addition, intercultural exchange of experiences and socializing have been also an important part of the training.

Next Training: 15. - 19. September 2014



If you are interested in the detailed agenda or you like to apply, please contact our service department: service@x-ray-worx.com. We are looking forward to welcome you at “Microfocus Training Week” in Garbsen!

X-RAY WorX grows for the fourth year in row

Just four years in the market, X-RAY WorX can already look back on an exciting and successful corporate development. For the fourth time, the company now increased its profits – in 2013 by 15%.

Managing Director Holger Behnsen explains the success of X-RAY WorX as follows: „Since its establishment in 2010, X-RAY WorX has continuously developed. In this process R&D, production, sales as well as employees, customers and partners have been considered equally and included into planning and projects. Following this philosophy, we could ensure a stable and sustainable growth.”

This fact is also reflected in figures: Starting with six employees, X-RAY WorX now employs 13 people. In 2012, new employees and a steadily growing production required movement to a larger premise. The new production floor – with more than twice of the previous size – is providing sufficient space for development, production, warehouse and a modern working environment for employees.



In 2012, the first patent of X-RAY WorX was accepted and more were registered. This emphasizes the companies' ambition as one of the technology leaders in the field of micro-

focus X-ray technology. Further developments can be highlighted: the rod anode tube *RAC Superfocus* with double centering, the microfocus tubes with cooled tube head or the internal cooling of the transmission target. In addition, the company is working on intelligent control systems as well as on solutions to increase the availability of X-ray tubes, and to reduce movement of the focal spot.

Within four years, X-RAY WorX built partnerships with competent and experienced system manufacturers and system integrators in all major industrialized regions of the world. These companies are successfully cooperating in management of end user projects. The special competences in areas such as dimensional measurement, computed tomography, or inline X-ray inspection, enable X-RAY WorX to concentrate on development of new projects in microfocus X-ray technology.

X-RAY WorX is well positioned for the future: “Over the next years, we expect to continue our successful growth”, said Holger Behnsen. “Currently we are working on important developments in the field of microfocus X-ray technology. We face the future with great confidence, in terms of economic development but also in terms of employees and worldwide cooperation. Due to this positive outlook, we decided to offer an apprenticeship for young people. In September 2014 our first student will start as industrial business management assistant in our company.”

■ Technical product data sheets

Technical product data sheets provide a good overview of the technical features and characteristics of X-ray tubes from X-RAY WorX. Latest data sheets are available for:

- **Product lines: TCNF and THE PLUS**
- **JIMA resolution test and target types**

The technical data sheets are available on request from our [sales department](#).

■ New version of X-COM 1.4

In January 2014 the new version 1.4 of X-COM operating software had been released as well as a new PLC firmware version 1.14.

New features of X-COM version 1.4:

- Initial startup procedure for tubes after installation and commissioning
- Leakage current test improving diagnostics and stability
- Improved handling of maintenance functions, update of documentation
- Additional system log file for various parameters and measurement results like filament lifetime, leakage current, X-ray settings etc.
- Menu function to save all system log files to one directory
- API extension: Flag XrayReady, to indicate stable radiation as a starting signal for image acquisition

For further information and details please contact our [sales department](#).

The next updates of X-COM and PLC software are scheduled for end of December 2014.

■ Experience Hanover!

Welcome to a British year! Five places - one royal topic: “Hanover's monarchs on the throne of England 1714 - 1837” is the great national exhibition in Lower Saxony for all who are interested in the history of royals on the British throne coming from Hanover.

Several museums and castles are providing information and insights into this historical era as a part of the 300th anniversary of German-British personal union.

The events take place from the beginning of May until the end of November, e.g. in the royal castle of Herrenhausen, Wilhelm Busch Museum, castle Marienburg or state museum.