



RMC Products Launches ATUMtome to Automate Serial Sectioning for 3-D Imaging Applications

System that facilitates array tomography and was developed by Harvard neuroscientists is now being manufactured under license

Editorial Note: Image links and press contacts are the end of this release.

TUCSON, Ariz. (November 7, 2014) – As research transitions from 2-D to 3-D imaging, there is a growing requirement to increase efficiency in volume imaging of samples. **RMC Products** by **Boeckeler Instruments** answered part of this need by launching the **ATUMtome** (Automatic Tape-collecting Ultramicrotome) this month during the **Society of Neuroscience** meeting in Washington, D.C., booth #2501, in partnership with **ZEISS**.

According to RMC officials, the ATUMtome opens the door to efficient sectioning and handling of thousands of sections that permit 3-D reconstruction of large volumes of biological materials. It also provides a unique tape collecting method that allows sections to be stored for later processing and examination. The instrument is in its **early adopter phase** in which scientists are helping to advance the technology with their feedback.

The tape collecting part of the instrument (ATUM) is under license from **Harvard University** where Professor **Jeff Lichtman** and his team of neuroscientists initially designed the instrument to help collect ultrathin sections which, once imaged, are used to construct a 3-D image of the brain's neural pathways as part of the **Connectomics** efforts to eventually map the entire human brain.

GENERAL FUNCTIONS

The RMC ATUMtome operates with an ultramicrotome and diamond knife included in the system. Typically, researchers mount resin-embedded specimens on the ultramicrotome, cutting serial sections that then float on a water surface in the diamond knife trough. The ATUMtome moves a

continuous ribbon of tape through this water trough, automatically removing the serial sections in sequential order. After the sections are collected, researchers mount the tape strips onto substrates like silicon wafers or glass slides. The populated wafers are now ready for imaging with a scanning electron microscope.

ZEISS offers a dedicated soft- and hardware package that allows researchers to image the large number of ATUMtome serial sections in an automated way. ZEISS Atlas 5 Array Tomography is available for all ZEISS scanning electron microscopes and Crossbeams.

APPLICATIONS

Early adopters of the ATUMtome are primarily using the system for neuroscience research. However, the system's unique ability to collect hundreds to thousands of sections on a continuous tape opens the door for use in many serial section applications.

The system can be used in correlative microscopy applications involving, for example, light and scanning electron microscopy to map nano-particles inside organs and tumors. It can also benefit users who want to image whole cells and correlate the 3-D distribution of specific proteins within these cells. Stored sections can be immunolabeled multiple times for examination under epifluorescence illumination.

“We’re envisioning many research projects opening up because of the ATUMtome,” says Boeckeler President Pat Brey. “By increasing the efficiency in obtaining serial sections and retaining them for future analysis, the ATUMtome is an exciting tool to consider especially among scientists who have wanted to do 3-D reconstruction but were held back because of the impractical effort it would take to handle all the sections needed. Also, scientists who need to retain the sections for future analysis will find the ATUMtome an ideal solution.”

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About Boeckeler Instruments & RMC Products

RMC Products, based in Tucson, Ariz., has played a large part of the nanotechnology scene well before the popularization of the term. In fact, RMC is the continuing operation of the company that developed the first commercial ultramicrotome in 1953 for cutting ultra-thin sections of samples –the MT-1 ultramicrotome. This product eventually evolved into today’s RMC ultramicrotomes that can cut sections at thicknesses of 30 nm or less.

Since Boeckeler Instruments' acquisition of the line in 2000, RMC spread its wings into other sample preparation equipment, including cryosectioning systems, automatic EM tissue processors, glass knife makers, freeze substitution systems and a wide range of associated accessories used in both the material science and cell biology markets. To read more about us, visit <http://www.rmcproducts.com/about-us-part-ii/>

About ZEISS

ZEISS is an international leader in the fields of optics and optoelectronics and develops and produces solutions for the semiconductor, automotive and mechanical engineering industries, biomedical research and medical technology, as well as eyeglass lenses, camera and cine lenses, binoculars and planetariums.

The Microscopy business group is the world's only one-stop manufacturer of light, X-ray and electron microscopes. Its extensive portfolio enables research and routine applications in the life and materials sciences. The Microscopy business group is headquartered in Jena. Additional production and development sites are located in Oberkochen, Göttingen and Munich, as well as in Cambridge in the UK, in Peabody, MA and Pleasanton, CA in the USA. The business group has around 3,000 employees. It generated revenue of 629 million euros in fiscal year 2012/13.

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Image & Caption Info



The ATUMtome automated tape collecting ultramicrotome manufactured under license by RMC Products by Boeckeler Instruments Inc.

Link to full resolution image:

http://www.rmcproducts.com/wp-content/uploads/ATUMtome_Nov2014.png