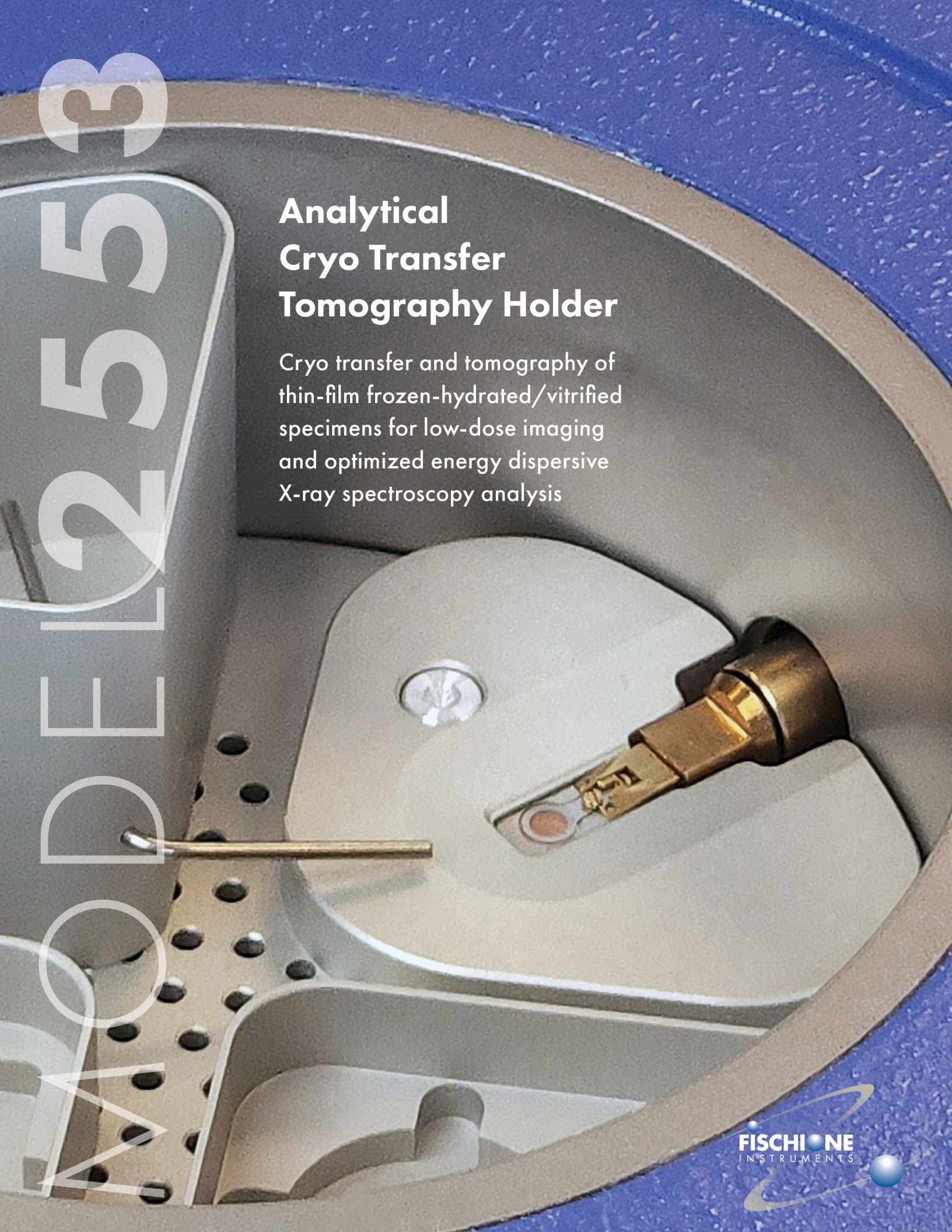
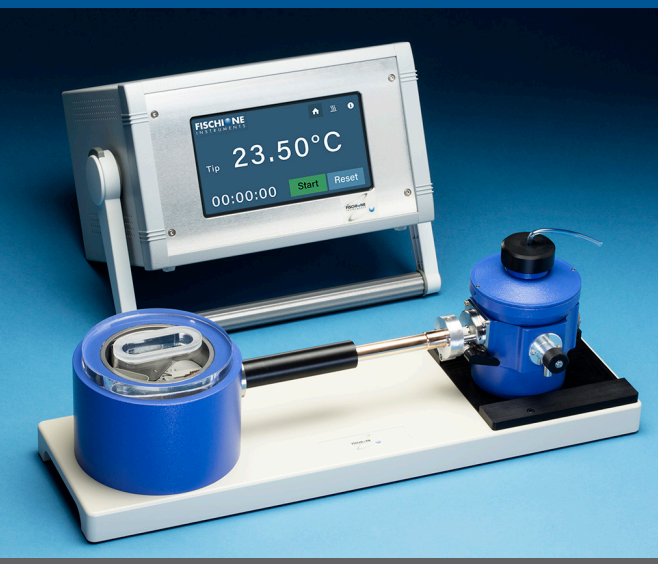
MODEL 2553

Analytical Cryo Transfer Tomography Holder

Cryo transfer and tomography of thin-film frozen-hydrated/vitrified specimens for low-dose imaging and optimized energy dispersive X-ray spectroscopy analysis



FISCHIONE INSTRUMENTS



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Analytical Cryo Transfer Tomography Holder

Cryo transfer and tomography of thin-film frozen-hydrated/vitrified specimens for low-dose imaging and optimized energy dispersive X-ray spectroscopy (EDS) analysis. The beryllium holder tip and clamp minimize X-ray interference for elemental and composition analyses. For use with Thermo Fisher Scientific transmission electron microscopes (TEM), including those having Ultra-X detectors.

- **Ideal for specimens that require liquid-nitrogen cooling for transfer to the TEM for imaging and analysis**
- **Beryllium tip and clamp reduce the addition of spurious or system radiation**
- **Base temperature less than -175 °C**
- **Advanced mechanism for frost-free transfer**
- **Integrated cradle clamp for tool-free specimen mounting**

CRYO-ELECTRON TOMOGRAPHY

Cryo-electron tomography is a well known technique used for the evaluation of biological specimens. Structural details are imaged in three dimensions in a transmission electron microscope at cryogenic temperatures to reveal information from specimens.

With advancements in energy dispersive X-ray spectroscopy and innovations in TEM specimen holder technology, three-dimensional elemental composition information is readily achieved. Fischione Instruments' advanced specimen holder technology enables tomography at high tilt angles in narrow-gap pole pieces for both the life and the physical sciences.

Liquid nitrogen cooling for the transfer of frozen-hydrated/ vitrified specimens

The Analytical Cryo Transfer Tomography Holder is an advanced single-tilt holder that provides cryogenic specimen cooling with an extended field of view at high-tilt angles up to 70°. Tomographic data can be acquired in TEMs with restrictive pole-piece geometries.

Included with the Model 2553 Analytical Cryo Transfer Tomography Holder are a cryo workstation and a temperature controller.

Optimized for EDS

The Analytical Cryo Transfer Tomography Holder is optimized for EDS; the holder tip and clamp are manufactured from beryllium, which has a low atomic number and thereby reduces X-ray production by the holder. While the holder is optimized for EDS, it is also ideal for any application that requires high specimen tilt angles.

Simple specimen loading and transfer

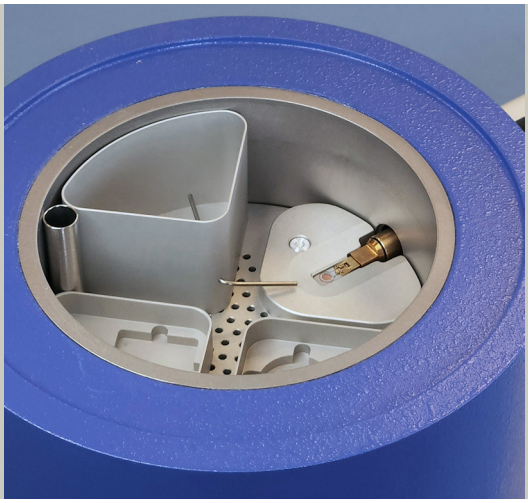
The innovative design of the holder's specimen tip makes specimen loading and transfer very easy.

To load a specimen, the holder is inserted into the cryo workstation or the TEM to cool down. The holder tip is cooled via an integral, boil-free liquid nitrogen dewar located at the rear of the holder. The cooled holder tip is thermally isolated from the holder body, which maximizes resolution and minimizes drift.

The holder dewar and the cryo workstation are both filled with liquid nitrogen. The modular design of the cryo workstation's grid box allows you to reposition the reservoirs to enhance ease-of-use for both right- and left-handed operation. Once a temperature of less than -175 °C is achieved, a specimen is loaded from the grid box into the holder tip.

The holder accepts a 3 mm diameter TEM specimen grid, which is secured by the holder's one-piece, 360° integrated beryllium specimen cradle clamp. The specimen clamp is optimized to provide a uniform positive force on a regular TEM specimen grid. The thin profile of the clamp maximizes specimen visibility, even at high-tilt angles.

The cryo workstation's integrated liquid nitrogen drip feed helps keep the specimen in a wet liquid nitrogen temperature environment and minimizes contamination. A modular grid box docking container allows the grid box to remain immersed in liquid nitrogen. Designated tool parking areas keep cooled tools right where they are needed.



CRYO WORKSTATION

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The specimen holder's beryllium tip retracts into a cryo shield located inside the holder barrel, which allows the specimen to be transferred in the holder from the cryo workstation to the microscope while maintaining specimen vitrification. This shield prevents any atmospheric water from condensing on the specimen during transfer to or from the microscope.

Accurate temperature reading; rapid cool down

The temperature controller connects directly to the specimen holder dewar and displays the holder tip temperature. The holder rapidly reaches a working temperature of less than -175 °C in either the cryo workstation or a TEM. Hold times in excess of 4 hours are readily obtained with the 200 ml dewar capacity. A zeolite absorption medium enhances dewar vacuum.

Regenerating the zeolite

The dewar zeolite must be regenerated periodically. This process is made easy with the one-touch **Zeolite Regeneration** button on the temperature controller. Fischione Instruments recommends the **Model 9030 Turbo Pumping Station** to evacuate the dewar during regeneration.

Plasma cleaning

Prior to freezing thin films, TEM carbon support grids should be cleaned to remove hydrocarbons and to make the grids' surface hydrophilic. Fischione Instruments recommends that you clean the support grids with the **Model 1020 Plasma Cleaner** or **Model 1070 NanoClean**.

Collision protection

Fischione Instruments' advanced tomography holders are compatible with the TEM's touch alarm that stops goniometer movement if a pole touch occurs. Follow the microscope manufacturer's recommendation for operating the goniometer at high-tilt angles.

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