

Elsa Cryo-Transfer Holder Series

Models 698, 698.MS

The Elsa™ cryo-transfer holder series is a next-generation, single-tilt liquid nitrogen holder designed for the frost-free transfer of a sample at liquid nitrogen temperature into a transmission electron microscope (TEM). These holders are primarily used for imaging radiation-sensitive, frozen-hydrated specimens for single particle cryo-electron microscopy (cryo-EM) and beam-sensitive applications such as battery materials.

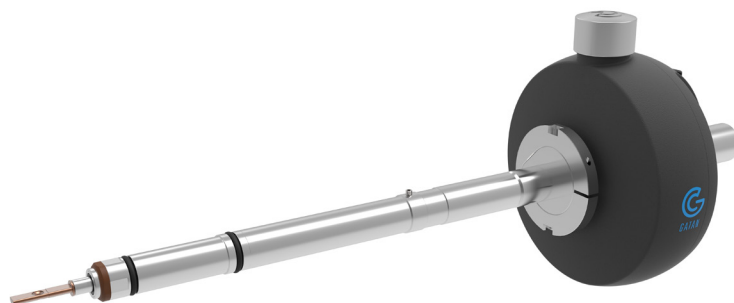
Benefits

- **Larger dewar, redesigned from the ground up:** Increases the liquid nitrogen volume by 2.5x
- **New multi-specimen tip:** Load three TEM grids at once to significantly accelerate system throughput
- **Extended hold time:** Allows >8 h of stable, high-resolution imaging
- **<1.5 nm/min drift rate:** Ensures that image quality is high during data collection
- **Resolve <2.3 Å features:** Enables high-resolution imaging even under cryo-conditions
- **Centrosymmetric design:** Reduces settling and drift during tomography by maintaining the center of gravity during a stage tilt

This holder comes with three different tip configurations. The multi-specimen tip allows three grids to be loaded at once. The ultra-low-profile single specimen tip uses the Quickload™ clipping-free mechanism to secure the specimen and provides the highest tilt range of any side-entry cryo-transfer holder available today ($\pm 80^\circ$ tilt). Finally, the standard tip, often considered the easiest for novice users, uses a clipping mechanism to secure the sample.

The Elsa holder is designed to provide a larger liquid nitrogen reservoir with a hold time of more than 8 h. This allows researchers to perform longer, unsupervised data collection to support overnight or more complex cryo-experiments.

In addition, the Elsa holder utilizes a high-resolution cable so that the holder can be set to maintain a constant temperature throughout an experiment without compromising performance. This helps to minimize specimen drift, reducing the time needed to wait for the stage to stabilize before one can collect an image. This high-resolution cable also enables researchers to isotropically resolve features at <2.3 Å resolution.



The lightweight cryo-workstation provides low-temperature specimen loading to protect the frozen-hydrated grid. A one-piece cryo-shield encapsulates the frozen-hydrated grid to provide protection against damage caused by warming and frost formation during transfer from the workstation to the electron microscope.

A centrosymmetric design makes it easier for novice and expert cryo-electron microscopists to use. As you rotate or tilt the holder, the center of gravity is maintained, reducing settling and drift during tomography experiments. As a result, novice and expert microscopists can acquire higher quality, clearer images.

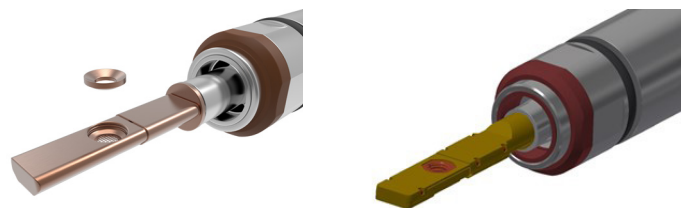


Figure 1. Samples can be mounted on a standard profile holder (left) that uses a clipping or the multi-specimen holder (right), which improves system throughput.

Applications

- Cryo-EM
- Cryo-tomography
- Electron crystallography
- Beam-sensitive materials science

Specifications

Drift rate at 0° tilt	<1.5 nm/min
Isotropic resolution at 0° tilt	2.3 Å
Observable area at 0° tilt	4.1 mm ²
Standard specimen cup/holder tip material	Beryllium copper
Capacity	
Diameter	3 mm
Max. grid thickness	150 µm
Cryogen	Liquid nitrogen
Operating temperature	Less than -170 °C
Time to reach -170 °C	
698	<45 min
698.MS	<55 min
Dewar capacity	250 mL
Time to resolution specifications	<75 min
Hold time below -170 °C	>8 h

Specifications provided herein are approximate and are intended only as guidelines. Drift rate and high-resolution performance are dependent upon ambient conditions and installation of the TEM pursuant to the manufacturer's specifications. Specifications are subject to change without notice.

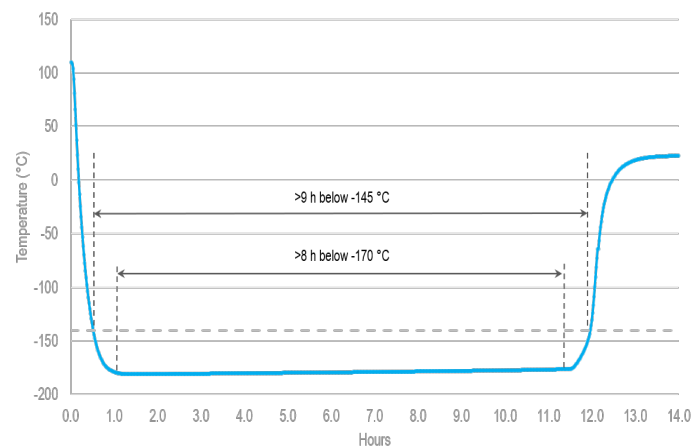


Figure 2. The Elsa cryo-transfer holder allows you to double your experiment time: >9 h below -145 °C with >8 h below -170 °C.

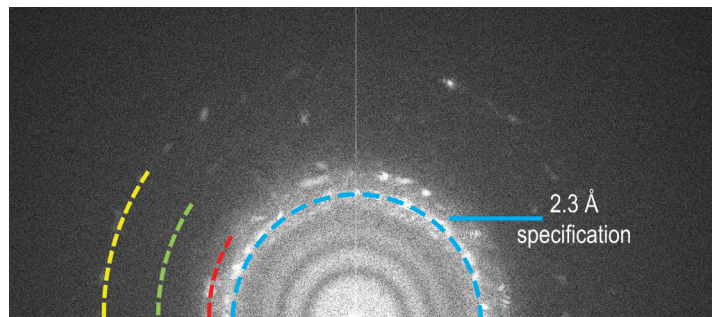
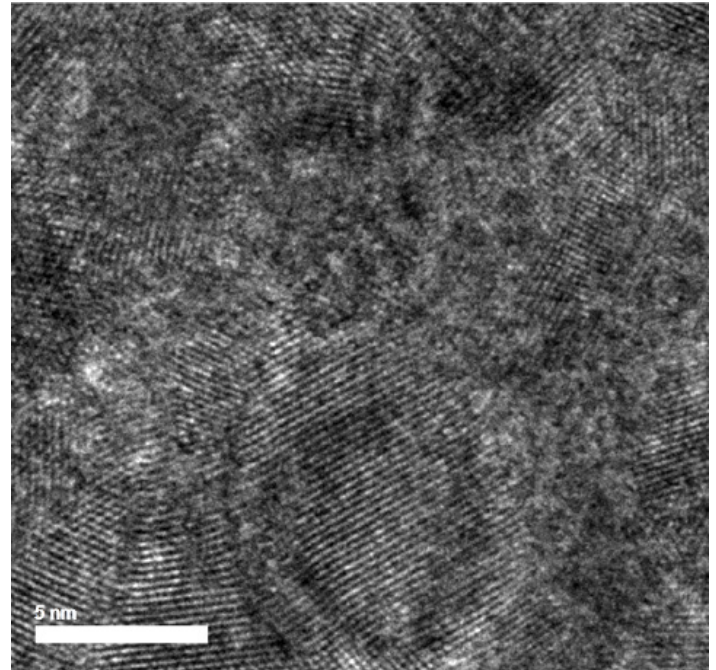


Figure 3. A high-resolution image of gold lattice at cryo-temperatures using the Elsa cryo-transfer holder (top). The holder shows excellent resolution and drift that allows high-resolution features (blue 2.3 Å, red 2.0 Å, green 1.45 Å, yellow 1.2 Å) to be readily visible (bottom).

Ordering

Model	Description
698.STP	Elsa Cryo-Transfer Holder (Standard Profile, Workstation, Temperature Controller)
698.ULP	Elsa Cryo-Transfer Holder (Ultra-Low Profile, Workstation, Temperature Controller)
698.MSP	Elsa Multi-Specimen Cryo-Transfer holder (Multi-Specimen Holder, Workstation, Temperature Controller)

Other products to consider

- K3[®], K3 IS direct detection counting cameras
- Alpine[®], Alpine Vista direct detection counting cameras
- BioContinuum[®] K3 imaging filter
- Latitude[®] S low-dose automation software

