

# Talos L120C G2 (S)TEM

## Proven and Versatile System for TEM and STEM Imaging in Pathology, Cell Biology, and Biochemistry Research

### Industry-leading performance

The Thermo Scientific™ Talos™ L120C G2 (S)TEM features superior optical stability because of the constant power objective lens and yields high quality images provided by the 16-megapixel Thermo Scientific™ Ceta™ CMOS Camera and the new generation of STEM detectors (Panther). Its robust vacuum system with a large IGP enables fast sample exchanges using the standard side-entry mechanism. Long-duration dewar for cooling the system for up to 96 hours facilitates long data acquisition without user intervention.

In line with the other TEM systems in the Life Science portfolio (Thermo Scientific Talos F200C TEM, Tundra™ Cryo-TEM, Glacios™ Cryo-TEM, and Krios™ Cryo-TEM), the Talos L120C G2 (S)TEM offers enhanced automation of column alignments and data collection, providing unmatched ease of use, productivity, operational comfort, and instrument uptime – all of which are important factors for performing 2D imaging and tomography experiments successfully and efficiently.

### Versatility for multidisciplinary use

The Talos L120C G2 (S)TEM is a powerful TEM and STEM solution for 2D imaging as well as 3D tomography. The system can be configured as a basic system for routine TEM imaging of room-temperature samples, as an advanced system for sample characterization by different STEM and EDS detectors, and/or as an entry-level cryo-EM imaging platform. The modular design makes it an ideal solution for multidisciplinary settings in research laboratories and core facilities.

### Key Benefits

- High stability** provided by robust enclosure, constant power objective lens, and remote operation
- High data quality** thanks to high sensitivity and large field-of-view detectors with fast electronics
- Unmatched ease of use** facilitated by alignment auto-functions and application workflows
- Remote operation** enabled by motorized apertures and automatic cryo-box
- Long data collection sessions** enabled by automation software and long-duration dewar
- Quick sample exchange** supported by a robust vacuum system with fast recovery after exchange
- Cryo-EM imaging** with minimal ice growth thanks to the automatic cryo-box enables long data acquisition sessions for single particle analysis

**STEM imaging** with BF/DF and HAADF detectors

**Elemental analysis/mapping** using optional EDS

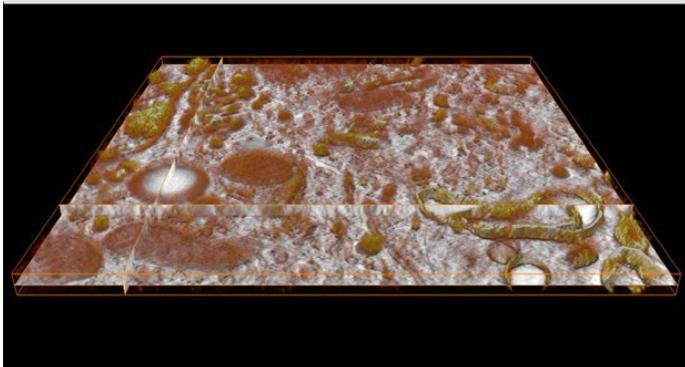


Figure 1. 3D rendering of a reconstructed tomogram of a 200nm section of plastic-embedded human macrophages imaged by the Talos L120C G2 (S) TEM with Ceta16M.

The Talos L120C G2 (S)TEM features easy-to-use software, operating on Windows® 10, supporting multiple user accounts with different access rights to microscope functions and saved data (via Windows settings).

The TEM software allows for easy and fast switching between TEM and STEM modes, different optical and detector settings, or tuning of applied acceleration voltage, all of which ultimately define image contrast and resolution. User-guiding functions for routine microscope alignments (direct alignments) ensure the best imaging conditions for every experiment. The alignment functions are also fully automated for easy and convenient operation by users. Additionally, the user interface allows saving of the alignment settings for multiple operational conditions across many different applications.

A high level of automation and complete digital control over multiple microscope components— including the electron gun, optical elements, motorized apertures, vacuum system, stage, and detectors—facilitate remote control for even more flexibility and convenience.

The SmartCam digital search-and-view camera simplifies interactive sample examination easily and conveniently on a computer screen in daylight conditions. The constant power objective lens then allows for fast changing of magnifications without hysteresis and zooming at identified regions of interest in the examined sample. Individual TEM and STEM images can be recorded using the intuitive Thermo Scientific Velox™ User Interface that includes basic image post-processing functions, such as image filtering and drift-corrected frame integration.

Continually developed and maintained application software packages (MAPS, EPU, TOMO) integrate the Talos L120C G2 (S)TEM into streamlined application workflows compatible with other (S)TEM and SEM/FIB Thermo Scientific products. Imaging of the entire sample area (Atlas) is possible at low magnification for identification of multiple regions of interest and recording

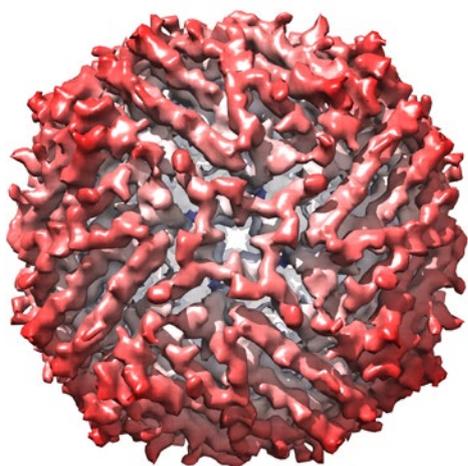
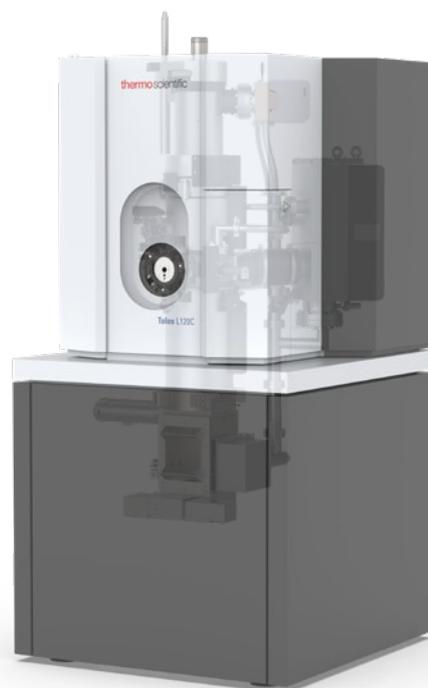


Figure 2. Cryo-EM map of apoferritin reconstructed by single particle analysis at 5.7 Å resolution from a dataset collected by using the Talos L120C G2 (S)TEM with Ceta-F.



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of their context in the imaged sample. Setting of automated data collection from multiple selected regions is then possible with preset or user-defined optical settings. The dedicated application software packages guide users in setting critical data collection parameters and steps to facilitate successful data collection for all users regardless of their experience level.

#### Unique Features and Technical Highlights

- Thermionic electron source (LaB<sub>6</sub> or W-filament)
- Constant-power C-TWIN objective lens providing superior beam stability and fast magnification changes
- Robust system enclosure for high system stability
- Digital search-and-view camera for interactive examination of samples in daylight conditions
- Optional automatic cryo-box and motorized apertures for fast and easy switching and remote operation
- Optional long duration dewar enabling long sessions of data acquisition without user intervention
- Ceta family of 16-Mpixel CMOS Cameras providing large field of view and high read-out speed
- Optimized Ceta-S or Ceta-F Camera for low dose applications of beam-sensitive samples
- Optimized Ceta-D Camera for microED application
- Next-generation Panther STEM detector with high sensitivity and increased speed
- Intuitive TEM and STEM imaging using the Thermo Scientific Velox™ User Interface with image processing functions
- Dedicated software packages for application workflows: 2D imaging mapping (MAPS), single particle analysis (EPU), and tomography (TOMO)

Talos L120C G2 TEM Specifications	
TEM line resolution	0.204 nm
TEM point resolution	<0.37 nm
STEM HAADF resolution	<1.0 nm (with LaB <sub>6</sub> )
TEM magnification range	25–650k × (standard) 35–910k × (enhanced)
STEM magnification range	200–2.2M ×
Maximum tilt angle (stage)	±90°

### Installation Requirements

- Environmental temperature: 18–23°C
- Temperature stability: 1°C per 24 hours
- Relative humidity: <80%
- Room dimensions: 4.0 x 2.98 m (13.2 x 9.78 ft)
- Room height: 2.6 m (8.53 ft)

See the pre-installation manual for detailed information and possible room layouts.

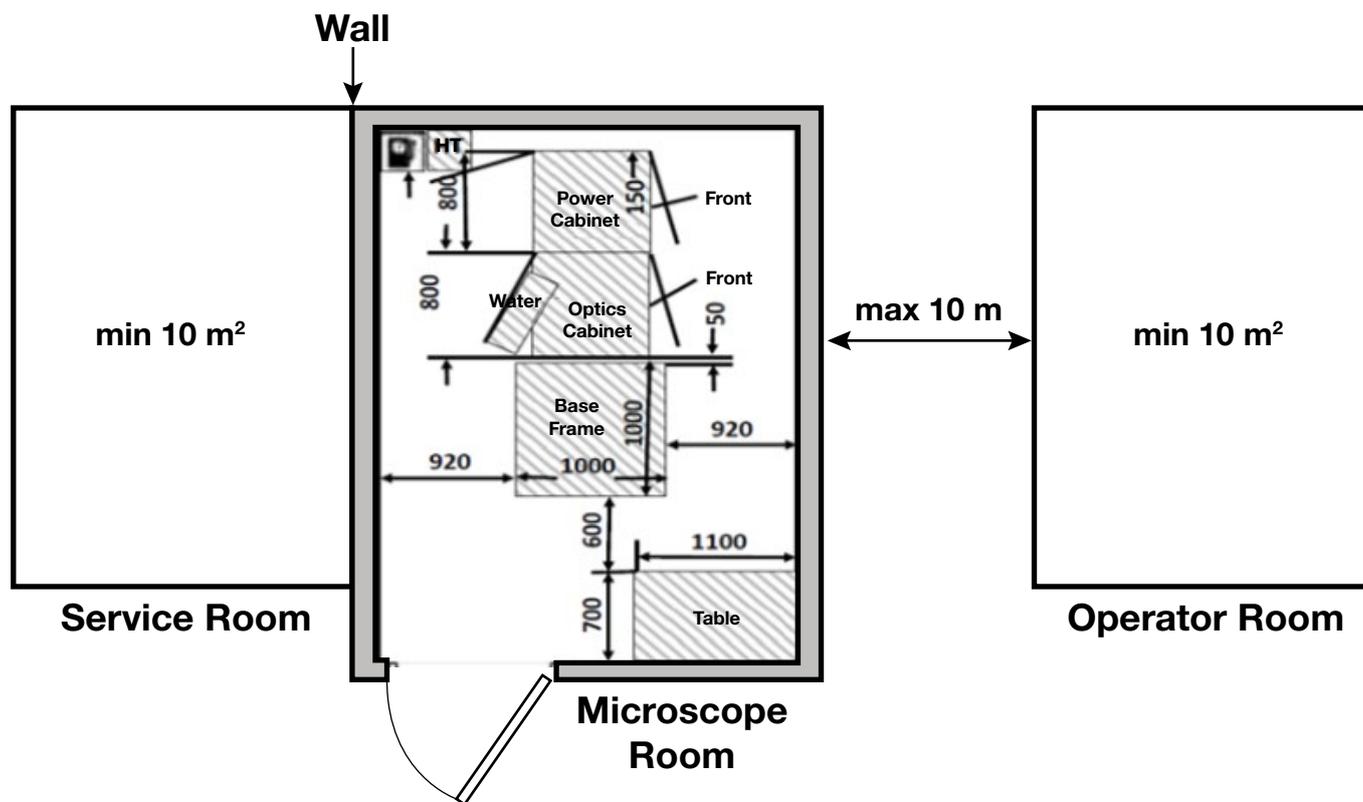


Figure 3. Recommended room layout for Talos L120C. The indicated dimensions are in millimeters.

