

## CleanConnect Sample Transfer System

### Inert gas and vacuum sample transfer solution

Thermo Fisher Scientific continually invests in efficient vacuum technology for SEM and DualBeam systems, including loadlocks for fast sample transfer in and out of the microscope. The Thermo Scientific CleanConnect System extends this capability, enabling seamless connectivity from a glove box to the SEM or DualBeam under inert gas or vacuum.

The Thermo Scientific™ CleanConnect™ Sample Transfer System was developed for applications in which sample integrity is as critical as the final result, time to image is critical, or when keeping the chamber under vacuum is necessary. The CleanConnect System provides an integrated, cost-effective solution for easy and fast automatic transfer of samples with inert gas/vacuum protection into the microscope chamber. This vacuum interlocked solution facilitates handling of various kinds of samples prepared for SEM/DualBeam™ systems using standard stub holders up to 25 mm diameter.

Mounting on the port to the right of the chamber door, the CleanConnect System is comprised of a loading chamber, gate valve unit, vacuum control, sample transfer capsule, and transfer rod. The transfer rod supports a sample shuttle, which is guided through the gate valve opening and onto the stage. Loading and unloading of the sample shuttle is at pre-programmed stage coordinates. Pumping and venting of the loading chamber are integrated into the vacuum system of the SEM or DualBeam and is software-controlled.

The innovative and modular design of our SEM and DualBeam microscopes make a field-retrofit of the CleanConnect System possible for most systems.

#### Key Benefits

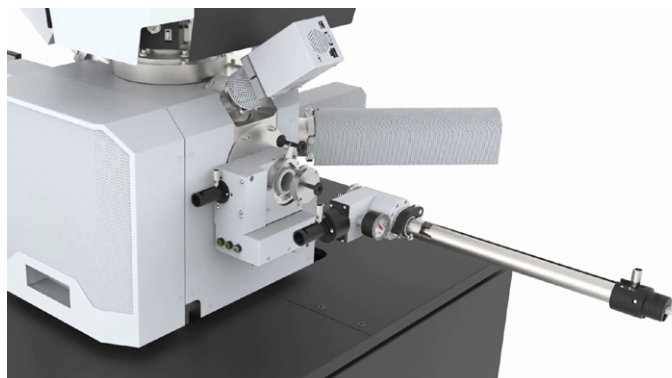
Sample integrity is preserved by the use of inert gas sample transfer

Ergonomic and modular design enables uncomplicated sample handling

Seamless, automatic integration to a variety of Thermo Scientific SEM/DualBeams

Compact design requiring no changes in system footprint or microscope specifications

Compatible with most glove box systems and available with optional direct glove box connectivity



**Figure 1. CleanConnect Sample Transfer System.** This cost-effective solution provides fast and easy automatic transfer of samples with inert gas/vacuum protection into the microscope chamber.

## Essential specifications

Compatible with most Thermo Scientific SEM and DualBeam systems.

### System control: hardware-interlocked

- Simple, three-button control on the main unit
- Hardware Interlock prevents simultaneous opening of the gate valve and venting of the CleanConnect System

### System control: software-integrated

- Software integrated for systems with compatible software versions
- Software provides automatic switching off of the electron beam, stage movement to dock position, flush cycles of the sample capsule, and GIS retraction (where applicable)

### Operation

- Sample cycle: loading sample, pump down until first image, and unloading in  $\leq 2$  minutes
- Three flush cycle modes with customizable pressure and number of flush cycles

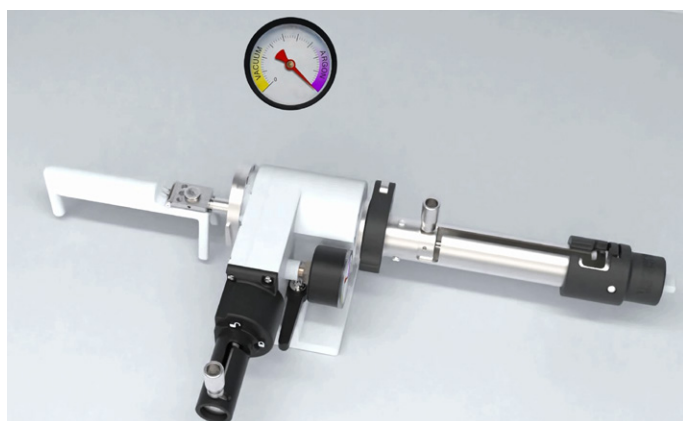


Figure 2. The CleanConnect System consists of a loading chamber, gate valve unit, vacuum control, sample transfer capsule, and transfer rod.

### Vacuum system

- Vacuum is integrated with the SEM or DualBeam, requiring no additional vacuum pump
- Integrated and interlocked with the system to ensure safe and simple operation
- Evacuation time: ~60 seconds

### Documentation

- User manual with instructions included

### Warranty and training

- 1-year warranty
- Simple design means training is not necessary

### Installation requirements

- Installation port must be free (no other accessories can share this port)
- Environment: same requirements as standard microscope, as indicated in the pre-install manual
- For software control, the system needs to be using a compatible software version
- Clearance must be available on the right side of the instrument to accommodate use of the transfer rod
- Optional CleanConnect System glove box port for compatible glove boxes

### Sample sizes

- Maximum diameter:  $\leq 25$  mm
- Maximum thickness:  $\leq 15$  mm

*Height gauge included to check specimen clearance before insertion into the unit*

### Consumables

- Standard commercial stubs (up to 25 mm, not included)
- Sample shuttle allows for one 25 mm commercial pin stub, up to four 12.5 mm commercial pin stubs, and locations for up to three TEM grids using a Thermo Scientific S/TEM grid row bar

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