

Solarus II System

Model 955

The Solarus® II is the next-generation plasma tool to remove hydrocarbon contamination from TEM and SEM samples and holders. This system is ideal for researchers who want to reproducibly remove organic surface contaminants in a safe, efficient manner.

Benefits

- **Integrated holder bakeout and storage:** Reduces tool footprint and cost of ownership
- **Enhanced user interface:** Use preoptimized recipes for consistent results; as well as guided workflows to ensure proper operation when venting and evacuating the chamber
- **Low-power operation (2 W):** Gently clean delicate samples (e.g., holey carbon grids); as well as prepare hydrophilic surfaces on carbon grids for cryo-electron microscopy
- **New system, same great performance:** Remove hydrocarbons on TEM and SEM samples that may impact analysis

Unique to the Solarus II system, you now have the option to use a single, integrated platform to clean and store electron microscopy specimens and holders. Run back-to-back recipes to plasma clean samples in one chamber, then bakeout a cryo-dewar in the pumping station. Using integrated controller electronics, the Solarus II system eliminates the need to purchase an additional controller or to move one in/out of the lab. This capability not only minimizes the tool footprint but offers a less expensive alternative to purchasing an additional standalone pumping station.

The pumping station option stores up to 3 holders, 3 sample storage modules, or a combination of both to support the diverse needs of a microscopy lab. This expansion capability accommodates TEM and sample storage modules from the standalone turbo pumping station, model 655, thus allowing you to share common parts between the two systems.

The low power operation (≤ 2 W) allows you to clean fragile samples (e.g., holey carbon grids) and prepare hydrophilic surfaces for cryo-electron microscopy. The auto-tune function ensures the radio frequency (RF) power responds to the plasma's changing characteristics and remains stable during operation. This feature combined with the system's unique H_2/O_2 gas chemistry permits more efficient cleaning, reduces sputter damage, as well as minimizes sample heating. The three-gas model allows you to independently control the H_2 , O_2 , and Ar gases.

An interactive touchscreen interface permits the recall of preoptimized recipes for consistent results. The user interface



is equipped with the capability to switch between multiple languages to support operation in labs around the world. During recipe optimization and advanced cleaning operations, the complete protocol is visible from a single screen; no need to toggle between screens to update parameters. Step-by-step instructions for venting and evacuating the chamber help ensure all users are operating the system safely to prevent inadvertent sample or system damage.

Applications

- Material science
- Life science

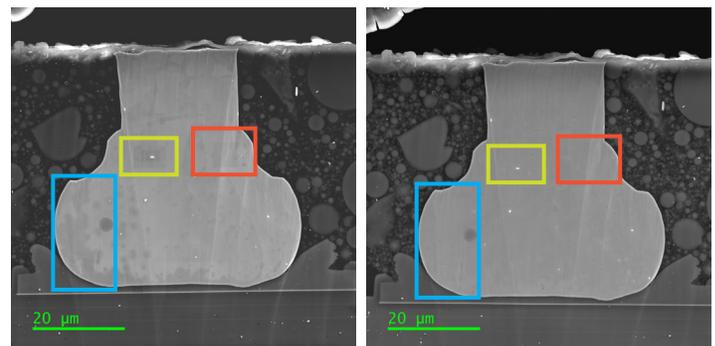


Figure 1. Remove hydrocarbon accumulation that may impact imaging and analyses (e.g., SEI, EDS, CL). Protocol: hydrogen and oxygen; duration: 5 min; sample: a semiconductor device; SEM image.

Specifications

RF power	
Range	2 – 65 W
Auto Tuning network	Assure effective plasma coupling to the generator and chamber
Vacuum/gas	Two-stage, variable speed diaphragm pump (electronic speed control) 80 L/s (2.8 ft. ³ /s)
Flow rate	
Base pressure	6.7e ⁻⁴ Pa (5e ⁻⁶ Torr)
Operating pressure	66.7 Pa (0.5 Torr)
Vacuum	Compact Pirani gauge Inline electromagnetic valve isolates vacuum pump from chamber <1 min pump down, <45 s vent cycle
Chamber (front)	2 ports
Accepts	All side-entry TEM or SEM specimen holder adaptors
Viewing window	Displays plasma when activated
Chamber (top)	Top access
Chamber size – diameter x depth	≤88.9 mm x 50.8 mm (≤3.5 in x 2.0 in)
Accepts	SEM stages, microscope column components, or misc. vacuum pieces
Chamber (side)	Drawer access
Sample size – diameter x height	65 mm x 38 mm (2.6 in x 1.5 in)
Accepts	Multiple 3 mm TEM grids (~25), multiple SEM stubs, and large irregular shaped samples
Cleaning chemistries	Pre- or user-defined recipes – Variable gas mixture, RF power, and time Provides superior cleaning ratio, less sputtering damage, and significantly less sample heating than Ar/O ₂ Traditional gas combination for sites that restrict the use of pure H ₂ or O ₂ Eliminates the introduction of oxygen to samples
H ₂ /O ₂	
Ar/O ₂	
Ar/H ₂	
Other gases	Contact Gatan for more information
O ₂ pressure grade	1.7 bar (25 psi) 99.995%
H ₂ pressure grade	1.7 bar (25 psi) 99.995%
Ar pressure grade	1.7 bar (25 psi) Certified standard (e.g., industrial grade – certified ±2%)
Power requirements	100 – 200 VAC, 50 – 60 Hz, 400 W
Shipping weight	115 kg (250 lb)
Dimensions – length x width x height	583 mm x 531 mm x 76.2 cm (23 in x 20 in x 30 in)

Specifications provided herein are approximate and are intended only as guidelines. Specifications are subject to change without notice.

Ordering

Model	Description
955.B	Solarus II System (Oxygen, Hydrogen)
955.A	Solarus II System (Oxygen, Hydrogen, Argon)
955.N	Solarus II System (Oxygen, Argon)
955.BH	Solarus II System (Oxygen, Hydrogen, Pumping Station)
955.AH	Solarus II System (Oxygen, Hydrogen, Argon, Pumping Station)
955.NH	Solarus II System (Oxygen, Argon, Pumping Station)

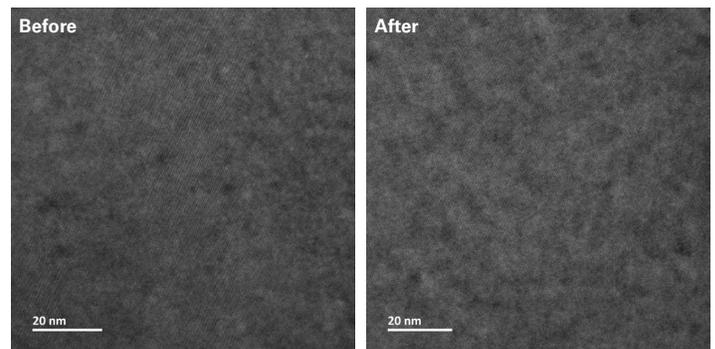


Figure 2. Minimize amorphous surface damage and maintain the sample integrity. Protocol: hydrogen and oxygen; duration: 5 min; sample: silicon 110; TEM image: TF20.



Figure 3. The image shows a single pumping station module installed on the Solarus II system (left) as well as with the Elsa™ holder connected (right).

