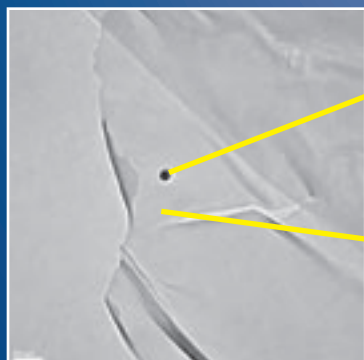


ADVANCED PLASMA CLEANING SYSTEM

Model 950

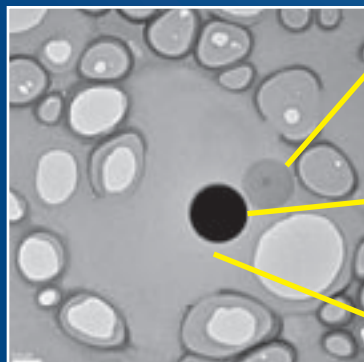
SOLARUS™



1 min exposure before cleaning (1µm high contamination cone)

10min exposure after 30sec cleaning

Si sample showing cleaning efficiency. Test: Contaminate sample (1 drop of oil in 50 ml acetone); 1. Expose 1 min; 2. Clean 30 - 60 sec ;3. Expose 10 min.

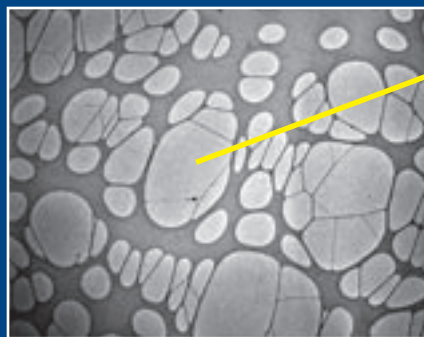


20 sec exposure before cleaning

1 min exposure before cleaning

10 min exposure after 30 sec H2/O2 clean

Holey Carbon Film Sample contaminated with 1 drop of oil in 50 ml acetone.



SOLARUS: No changes after 100sec. H2/O2 cleaning.
Competition: Lacey structure was completely destroyed in less than 30 sec.

Lacey Carbon "Hole" (6 months old off the shelf).

SOLARUS™ - A totally NEW advanced plasma cleaning system for removal of hydrocarbon contamination on TEM and SEM samples. Solarus is a new generation plasma system engineered on new concepts and the latest technology resulting in better performance, simplified use and consistent cleaning results. SOLARUS offers the most effective cleaning system in the market.

Plasma Cleaning Benefits

- Enhanced imaging capability
- Improved accuracy when performing composition microanalysis
- Longer viewing & acquisition times for EDX and EBSD in a SEM
- Use of smaller probe size; a "must" for STEM and EELS analysis in a TEM/STEM.

Advanced Features

The goal in designing SOLARUS was to deliver value to our customers. We wanted a plasma system offering flexibility, ease of use, superior repeatability and high throughput. Our unique design exceeds these goals. We started with a real-time RF auto-match and variable RF power supply (10W - 65W) to ensure optimum plasma power and low loss under any cleaning condition. We then incorporated the H2/O2 gas recipe (Patent Pending). This unique chemistry provides superior cleaning with less sputter damage to all samples including holey carbon films and allows samples to remain significantly cooler during cleaning than with the traditional Ar/O2 gas recipe. The additional mass flow controllers (MFC) support three independent process gases such as H2, O2 and Ar for accurate gas control and long term plasma stability. Finally, the interactive touch screen interface offers seven pre-programmed recipes with optimized process parameters for greater consistency and repeatability.

Operation

SOLARUS is designed to provide consistent results quickly and easily for any user regardless of skills or experience. The interactive touch screen interface makes managing the cleaning process simple by offering continuous feedback including full-time diagnostics. SOLARUS is also multi-lingual offering a choice of six operating languages: English, French, German, Chinese, Japanese and Korean.

Simple Four-Step Operation:

1. Load the sample
2. Select a recipe
3. Touch START to begin the cleaning cycle
4. Touch VENT to remove the sample

Sample Loading

Loading and cleaning samples in SOLARUS is simple and fast. The front loading chamber ports accept either one or two side entry TEM sample holders; adapters accept any manufacturer's TEM holder. The chamber also has easy access through the top loading lid for cleaning multiple TEM grids (> 50 individual grids) or multiple SEM samples.

Process

The full-time turbo drag pumping system speeds up the entire cleaning cycle. Typical run rates are less than 2 minutes for two TEM samples in TEM holders, versus up to 20 minutes for other plasma cleaners in the market.

- Pump down - 50 seconds vs. 3 minutes
- Cleaning rates 30sec - 120sec vs. 2min - 10min
- Venting - 5 seconds vs. 6 minutes



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SPECIFICATIONS

RF Source

Solarus contains a 50 Watt RF power supply (13.56 MHz) with an Auto Tuning network to assure effective plasma coupling to the generator and chamber. CE Certified to guarantee compliance with FCC guidelines.

Vacuum / Gas

Pumping System

A two stage variable speed diaphragm pump (electronic speed control).
A 70 liters/sec turbo molecular drag pump.

Pressure

Base pressure - 5E -6 Torr (6.6E - 4Pa)
Operating pressure - 400mTorr (0.05Pa)

Vacuum Gauge

Compact Pirani Gauge

Chamber

- Multiple entry and viewing ports
- Two front ports accept TEM adaptors compatible with all side-entry TEM or SEM specimen holders.
- Top loading entry accepts multiple 3mm TEM grids (~25), multiple SEM stubs and large irregular shaped samples.
- Top loading entry accepts SEM stages, microscope column components or miscellaneous vacuum pieces. Chamber dimensions (3.5" Dia. x 2.0" Deep).
- Front viewing window displays plasma when activated.
- Inline electromagnetic valve isolates vacuum pump from chamber producing < 1 min pump down and < 5 sec vent cycle.

Gas / Controls

Precision Gas Flow Control - Mass flow controllers accurately gauge gas levels to achieve superior and repeatable cleaning results.

Cleaning Chemistries

Users can select from a fixed list of recipes (differing by gas mixture and time) or manually adjust the process time to their own specification.

- H₂/O₂ - Gatan has found this chemistry to provide superior cleaning ratio, less sputtering damage, and significantly less sample heating than Ar/O₂.
- Ar/O₂ - This is the traditional process gas combination in electron microscopy. Gatan has not yet found a processing advantage to Ar/O₂ over H₂/O₂, but some sites may have restrictions on the use of pure H₂ or O₂.
- Ar/H₂ - This chemistry eliminates the introduction of oxygen to samples.
- Other gases - Please contact Gatan for compatibility.

Gas Requirements

- O₂ at 25psi (1.7 bar) Grade 99.995%
- H₂ at 25psi (1.7 bar) Grade 99.995%
- Ar (Option) at 25psi (1.7 bar) Certified Standard (i.e. industrial grade - certified +/- 2%)

Power

Universal Voltage / Frequency - 100VAC - 240VAC / 50-60Hz / 1000W

Dimensions and Weight

100cmW x 61cmD x 46cmH (39"W x24"D x 18"H top lid open)
Shipping Weight - 250 lbs (115 kg)

Warranty

One year

ORDERING INFORMATION

Please contact your Gatan sales representative for complete ordering information. Not all accessories and options are listed below.

Model No.

950.B
950.M

Description

Solarus Advanced Plasma System
Solarus includes an additional Ar mass flow controller

Installation/Training

950.T Installation and basic operator training (optional)

Accessories

950.08350 Philips P1 Adapter (All Non-Compustage TEMs)
950.08380 JEOL J5 Adapter (1210, 2010, 3010)
950.08410 Hitachi H3 Adapter (S900, S5000)
950.19060 JEOL J2 Adapter (100, 200, 1200, 2000, 1010, 6000)
950.19061 Hitachi H1 Adapter (500, 600, 700, 800, 7000, 7100, 8000, 8001, HF2000, HD2300, H7500, H7600, H7650)
950.19069 Philips P5 Adapter (All Compustage TEMs)
950.19081 Topcon Adapter
950.10035 SEM Sample Mounting Tables x3

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