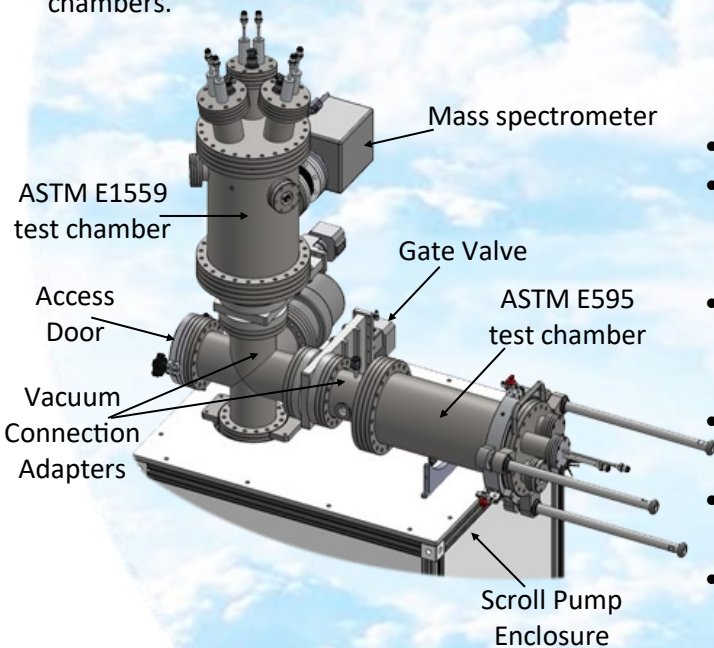


The SimulTek new design of the IOS-2021 system has several advantages compared to other ASTM E595 and ASTM E1559 systems produced at other companies, including our old IOS-2012 Outgassing System.

These main advantages include:

- Absence of the Effusion Cell Mechanical Manipulator, used to transfer the Effusion Cell from the Interlock Chamber into the ASTM E1559 test chamber;
- The ability to run an ASTM E595 test and an ASTM E1559 test in the IOS-2021 system at the same time;
- An easy removal of each of the 3 Cryo-QCM sensors on their 4.5" CF mounting flanges for CQCM service and crystal sensor change;
- K-type control thermocouple and electrical heaters integrated into the Effusion Cell, for better temperature uniformity and for easy electrical connection;
- One mechanical Scroll Pump and one oil-free Turbo Pump (1,300 L/sec pumping speed), able to pump down both ASTM E1559 and ASTM E595 test chambers.



The design of the new IOS-2021 Outgassing System includes:

- The ASTM E595 test chamber based on an 8" CF Full Nipple;
- The ASTM E595 test set-up for 12 samples, that can be loaded at the same time and tested in the ASTM E595 test chamber;
- The ASTM E1559 test assembly (a 6" 4-way cross used as a connection adapter and a 6" OD full nipple used as the ASTM E595 test chamber);
- A 6" Gate Valve between the ASTM E1559 test set-up and the Effusion Cell chamber;
- A 6" Gate Valve between the connection adapter and the ASTM E595 test chamber;
- A Cryogenic Shroud and thermal protection screens in the ASTM E1559 Main Test Chamber;
- A set of 3 Cryo-QCM (CQCM) sensors Mark 18 from QCM Research;
- The CQCM Mounting Assembly, including the electrical and Liquid Nitrogen feedthroughs, independent for each CQCM sensor;
- The 6" Access Door used to install/remove the Effusion Cell in the Interlock Chamber.

The conclusion: Volatile condensable materials from silicone adhesives can contaminate optical surfaces, decreasing the long-term reliability of the device. The new IOS-2021 Integrated Outgassing System from SimulTek can be used to predict the level of contamination, migration and deposition using just one test system. The method is capable not only to evaluate the collected volatile condensable materials and total mass loss but also to identify which species con-dense at different temperatures.