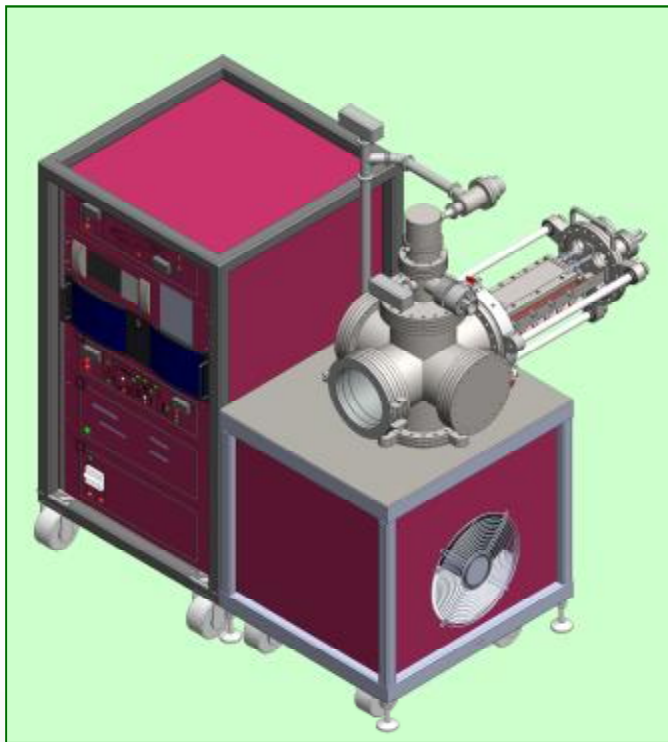


The ASTM E 595 test method determines the amounts outgassed from the bulk of a material normalized with respect to sample size. Materials are tested in accordance with American Society for Testing and Materials Standard "Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment".

SimulTek Research Co. Ltd. offers a new generation Outgassing Test Facility for materials testing per ASTM E 595 and measuring the following parameters:

- Total Mass Loss (TML);
- Collected Volatile Condensable Material (CVCM);
- Water Vapor Regained (WVR).



The ASTM E 595 Outgassing Test Facility includes:

- High vacuum chamber;
- Copper heating bar and collectors plate;
- Temperature control system.

Historically, TML of 1.00% and CVCM of 0.10% are used as screening levels for spacecraft materials.

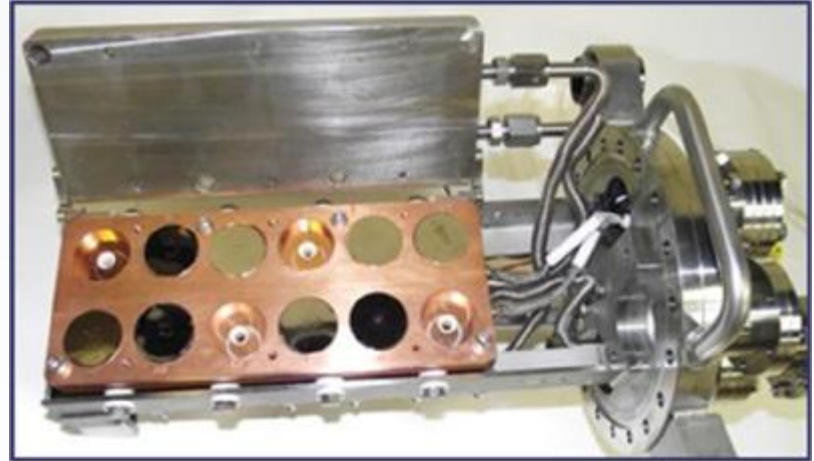
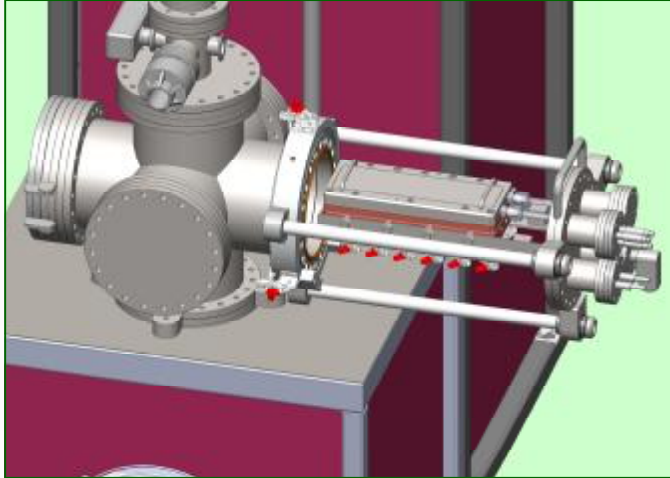
## Outgassing Test Procedure

1. The samples are cut to pieces small enough to place into the Al boats that, in turn, must fit into the specimen compartments of the copper heating bar.
2. The samples are placed into the Al boats prepared for outgassing according to the ASTM E 595. The boats with specimens are conditioned at 23°C and 50% relative humidity for 24 hours.
3. After weighting, the boats are placed in the specimen compartments of the copper heating bar of the outgassing system.
4. The rows and the lines of cells in the copper heating bar are marked with figures and letters providing a unique identification number for each cell. Similar markings are used for all sites on the collector side.
5. The temperature of the chromium-plated collector plates is held at 25°C ± 0.5°C.
6. The temperature of the copper heating bar is held at 125°C.
7. The vacuum pressure in the outgassing chamber is maintained at  $\sim 10^{-6}$  Torr during the outgassing procedure.
8. The duration of the outgassing test is 24 hours.
9. The heating is turned off after 24 hours and the samples are removed from the chamber after the samples are cool enough to handle.
10. All specimens and the chromium-plated collector plates are weighted again.
11. All specimens are weighted again after conditioning for 24 hours at 23°C and 50% relative humidity.
12. The results of the outgassing test of the samples are reported and analyzed.

## Outgassing Test Set-Up

Material testing according to the ASTM E 595 method is carried out by placing known amounts

of material in a 10x12x6 mm<sup>3</sup> container boats that are placed inside a receptacle within a temperature controlling heated copper bar. The receptacle has a venting port facing a collector.



## ASTM E 595 Outgassing Test Facility (OTS-E595)

- Ultra High Vacuum/Test Chamber
- Vacuum System
- Copper heating bar (12 specimen compartments)
- Collector plate (12 collectors set)
- Press Tool for making Al boats
- Temperature control system
- Support Electronics
- Data Acquisition System
- Control Software

