

Thermal Vacuum Testing – Without a Vacuum Chamber

Thermal plate integrates directly with vacuum bell jar for RF device testing

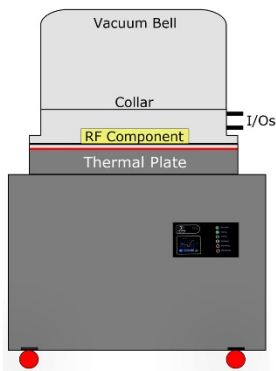


Figure 1.
Compressor-based system

inTEST Thermal Solutions has designed a thermal cycling plate that integrates directly with a customer's vacuum bell jar for space and altitude testing of RF modules, microwave components, and high power devices. The wide temperature range and stability of the plate is ideal for both thermal stressing of electronics and long periods of power supply testing.

Vacuum Bell Jar Integration

The plate is designed with mounting holes that allow the customer-supplied vacuum collar to mount and seal directly to the plate surface. The result is a portable, thermal vacuum environment that simplifies connecting vacuum and thermal test equipment. Vacuum and I/O feedthroughs can be located on any side of the collar for easy, 360° test access. Plate surface dimensions vary to accommodate bell jar and collar sizes. Plate surface and collar materials are matched to maintain the vacuum seal during thermal expansion and contraction induced by temperature cycling.

Temperature Performance and Control

The system delivers MIL-STD temperatures (-70 to 200°C) with $\pm 1.0^\circ\text{C}$ stability using either cryogenic or compressor-based cooling technology. The compressor-based system shown in Figure 1 does not require expendable coolants making it a cost-effective solution for applications requiring long dwell times. The plate's touch-screen controller features programmable and automated temperature cycling, real-time graphing, data logging, and remote communications (IEEE, RS232, Ethernet, USB). Advanced temperature control algorithms maximize temperature transition rates at the unit-under-test (UUT) to reduce cycling transition times.

Benefits

- No vacuum chamber required
- Easy integration of vacuum lines and IOs with thermal system
- Easy access on all sides of test setup
- Portable
- Versatile as an active heat sink or thermal cycler
- Plate surface sized to match bell jar and collar
- Cryogenic or Compressor-based refrigeration

Learn more about thermal plates at <http://intestthermal.com/products/platforms-plates/overview>

The inTEST Thermal family includes three temperature-related corporations: Temptronic, Sigma Systems, and Thermonics. Products include thermal chambers and plates, portable temperature environments, and process chillers. Contact us at info@intestthermal.com to discuss your unique thermal test and conditioning needs.