

# TECHNICAL NOTE

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## Best Practices for Keeping HAPSITE ER, HAPSITE Smart Plus, and HAPSITE Smart Deployable Ready

### RECOMMENDATIONS

- ◆ Perform weekly startup
- ◆ Store HAPSITE® in Extended Standby
- ◆ Complete a Basic HAPSITE Operation course

### BACKGROUND OF HAPSITE OPERATION

GC/MS instrumentation requires a vacuum system (the pressure less than atmospheric pressure) for MS operation. To maintain acceptable vacuum pressure, the vacuum pumps (NEG and ion pumps) must remain active. When the NEG and ion pumps are not operating, atmosphere and humidity will leak into the system. This will raise the pressure inside the vacuum system, compromising its integrity and rendering the unit unfit for rapid deployment.

In cases where the instrument is shut down (weeks or months), the NEG and ion pumps may be unsuccessful in restoring acceptable pressure (less than  $6.0 \times 10^{-3}$  Pa). The use of the Service Module may be required to restore an acceptable vacuum.

### RECOMMENDED STORAGE MODES FOR HAPSITE

A GC/MS has a complex gas flow system, and frequent use of HAPSITE helps maintain optimal gas flow conditions throughout the instrument.

It is recommended that HAPSITE is stored in Extended Standby. In Extended Standby, both the NEG and ion pumps will continue to operate in order to maintain proper vacuum conditions. HAPSITE is connected to external power, which requires electricity; however, Extended Standby does not require consumables. HAPSITE can also charge batteries when in Extended Standby which increases deployment readiness.

HAPSITE has a large temperature range for operation and storage. During operation, or when in Extended Standby, the temperature range for the external environment must be between 5 and 45°C. However, if HAPSITE must be stored

without power for long period of time, the recommended storage range is -20 to 50°C.

Refer to your HAPSITE Operating Manual for instructions to put your system into Extended Standby.

### KEEPING THE HAPSITE DEPLOYABLE READY

If the HAPSITE is stored long term without routine startup and blank run analysis, operational readiness cannot be guaranteed. Furthermore, regular use will also allow operators to note any problems and take corrective action prior to the need for use in an emergency situation.

It is strongly recommended to run a weekly GC/MS blank. At a minimum, it is recommended to run a GC/MS blank at least every three weeks, regardless of whether HAPSITE is in Extended Standby or in complete shutdown.

NOTE: Extended Standby is not a substitute for system operation. Using the system or running a weekly blank run is the best method to ensure overall system operational readiness.

### OPERATOR SKILL LEVEL

An INFICON trained operator is required to properly perform and evaluate the operational readiness of a HAPSITE. INFICON recommends that operators attend a HAPSITE Basic Operating course.

A trained operator can:

- ◆ Properly set up the instrument for use
- ◆ Ensure proper operating temperatures are achieved
- ◆ Verify the Tune parameters are acceptable
- ◆ Certify the blank run chromatogram is acceptable
- ◆ Recognize operational issues and take the necessary corrective action

## PROCEDURE TO VERIFY PROPER HAPSITE OPERATION

- 1 Run an Analyze PPM method or GC/MS Loop blank run to verify system performance (refer to HAPSITE Operating Manual for instructions on how to run methods). Check retention times, ratios of internal standards, and internal standard identifications to indicate:
  - ♦ Flows are correct
  - ♦ Instrument temperatures are set correctly
  - ♦ Tune is accurate
- 2 Check the total MS pressure, which is recorded in the Tune Report. The total MS pressure indicates the vacuum of the MS system, which needs to be less than  $6 \times 10^{-3}$  Pa in order to function properly.
- 3 Once the blank has been run and verified, return HAPSITE to Extended Standby.

## TROUBLESHOOTING GUIDE FOR HAPSITE OPERATION ON A NEG

Repeat all the steps for the initial start-up of the HAPSITE if the instrument did not start on the first attempt (this may require two or three efforts). A HAPSITE that has lost acceptable vacuum during storage may recover after a few attempts to start the system.

## USING THE SERVICE MODULE TO RESTORE AN ACCEPTABLE VACUUM SYSTEM PRESSURE

If excessive pressure has built up in the system, the Service Module will need to be used to restore an acceptable vacuum. Please refer to the Service Module Operating Manual for proper use and operation of the Service Module with HAPSITE. Misuse of the Service Module with HAPSITE can result in damage to the HAPSITE or NEG.



### CAUTION

**Do not use the Service Module to maintain vacuum in HAPSITE when an activated, working NEG pump is installed.**

## IN SUMMARY

Proper HAPSITE operational readiness cannot be guaranteed if HAPSITE Analytical Module is shut down for long periods of time. Running weekly blank runs is the best known method for ensuring proper system conditions and operation. Storing the instrument in Extended Standby helps to maintain proper vacuum conditions between system use.

