

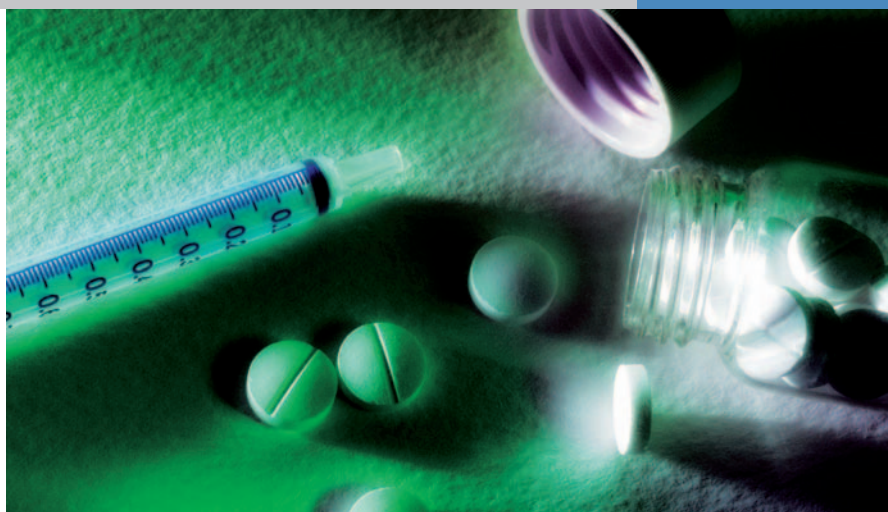
The Thermo Scientific Direct Sample Probe system is ideal for qualitative or semi-quantitative analysis of materials difficult, if not impossible, to elute chromatographically. Designed to eliminate sample preparation time, this accessory complements the range of Thermo Scientific GC/MS instrumentation.

Direct Sample Probe

Efficient sample introduction accessory for Thermo Scientific GC/MS systems



Thermo Scientific DSQ™ II GC/MS shown with the Direct Sample Probe and Vacuum Interlock



Rapid and Reliable Sample Analysis

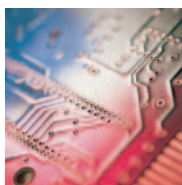
In today's busy laboratories, time is of the essence and every minute counts. The Direct Sample Probe provides an alternate means of sample introduction that reduces or eliminates sample preparation time. The technique also requires a minimal sample amount for testing. This system, designed for use with a broad range of Thermo Scientific GC/MS systems, is ideal for the quick screening of samples or for any application that doesn't require a GC column separation.

- Quick, simple method for sample introduction directly in mass spectrometer source
- Accurate analysis of highly polar, thermally labile solid or liquid compounds
- Compatible with all modes of ionization and mass analysis
- Switch to probe in under three minutes with GC interface undisturbed
- Available in two styles: Rapid heating filament Direct Exposure Probe (DEP) or slower volatilization Direct Insertion Probe (DIP)

Sample Introduction Options Meet Your Analysis Needs

A single controller box with interchangeable probe tools makes it easy to select the best method of sample introduction. The probe is available in two sampling configurations to meet your analysis needs:

- **Direct Exposure Probe (DEP)** – Rapid heating filament for liquids or solutions. The DEP is ideal for rapid molecular weight confirmation of solids dissolved in a suitable solvent.
- **Direct Insertion Probe (DIP)** – Slower volatilization with heated capillary tube for solid samples. The DIP can be utilized for rapid analysis of solids or trace components in solid matrices such as forensic samples, tissue, etc.



The probe is able to determine the mass spectrum of substances that are not typically subjected to chromatography. Samples can be thermally labile, highly active, or have physical characteristics (for example, boiling point) that would prohibit or limit their ability to be analyzed using gas chromatography. A probe allows the user to place a small amount of sample on the probe's end. The probe end is inserted directly into the ion source, and the sample is vaporized directly in the source. The probe not only provides a rapid means of sample preparation and introduction but also provides an alternative to conventional methods of complex sample analysis.

Easy to Use Controller for Sampling Options

The **Direct Probe Controller (DPC)** is used to communicate information from the sample probe (DIP or DEP) to the mass spectrometer. The DPC also allows the user to enter heating and data acquisition parameters to the mass spectrometer. Direct probe systems



Direct Probe Controller has a keypad that allows the user to enter method parameters and start and stop probe methods

allow rapid sample screening for any application which does not require a GC column separation. Another advantage to using a DIP or a DEP is to have a wide range of samples volatilize directly into the ion source.

The DPC automatically detects if a *DIP* or *DEP* is connected, and will display the DIP or DEP series of menu controls for setting the temperature and for heating the probe tip.

The **Direct Insertion Probe (DIP)**, also referred to as a solids probe, allows the user to introduce solid or liquid samples directly into the ion source, which is used to rapidly analyze solids or trace components in solid matrices. Typical samples may include:

- Forensic Samples
- Tissue Samples

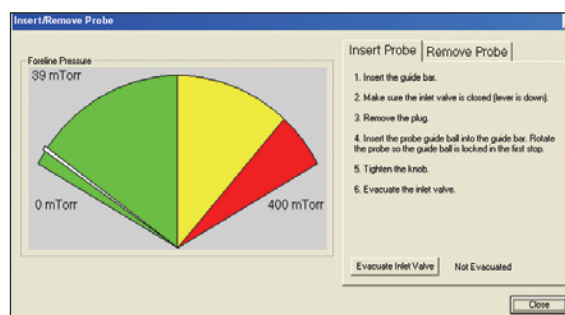
You can load either liquid or solid samples into your DIP. Liquid samples may be injected directly into the sample cup, or you may choose to dilute your liquid sample in a solvent. Solid samples can be placed directly into the sample cup, or you may choose to dissolve solid samples in a solvent.

The **Direct Exposure Probe (DEP)** allows the user to rapidly introduce and analyze thermally labile or polar compounds that are otherwise not introduced using a DIP or a GC. A DEP is ideal for confirming the rapid molecular weight of solids dissolved in a suitable solvent. Typical samples may include:

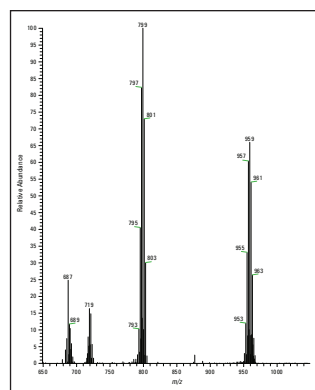
- Antibiotics
- Small peptides
- Complex lipids
- Surfactants
- Nucleosides
- Unstable polymers
- Saccharides

Using a DEP in CI mode is sometimes referred to as *DCI (direct chemical ionization)*. Many thermally labile compounds may be vaporized or ionized before thermal decomposition occurs. Also, a higher evaporation temperature can be obtained than with other

sample introduction techniques. Hence, one major benefit of using a DEP is to get molecular ion information not easily obtained from other techniques. The DEP is most often used with CI, although it works very well with EI. Depending upon the compound, the heat of the ion source alone may be sufficient to volatilize the sample from the filament. Alternatively, the probe filament may be heated very rapidly. The low thermal inertia of the filament allows rapid heating rates and high surface temperatures. Volatilization of the sample from the DEP filament occurs very rapidly in comparison to the heated sample cup of the DIP. As a result, less thermal degradation of the sample occurs.



The Insert/Remove Probe User Interface walks the user through the steps of inserting and removing the direct sample probe. These steps prevent the introduction of air into the analyzer. The gauge provides a visual means of monitoring the system vacuum.

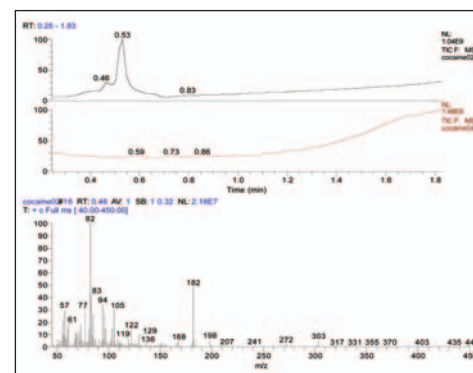


Analyze flame retardants in electronic components directly, without chromatographic separation, for quick and easy material characterization.

Spectrum of *deca*-BDE in electronic components by DIP.

Screen for drugs of abuse in residues or powders, with mass spectral identification and confirmation, without the solvents and in less time.

Probe-a-gram of cocaine "residue", a "blank" run, and cocaine spectrum.



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