New:

DIP Direct Inlet Probe
for
Agilent GC Mass Spectrometers

- accessory for the Agilent 5975 MSD and 7000 Triple Quadrupole MS in EI and CI mode
- throughput enhancement for the GC/MS system: immediate analysis of samples by direct vaporization into the MS ionization chamber
- rapid MS screening without GC separation
- recording of mass spectra without uncoupling the GC/MS interface: >> no time-consuming changeover from DIP/MS to GC/MS
- special sealing technology - no additional pump required

SIM
Scientific Instruments Manufacturer GmbH

DIP - Proven performance to boost your lab´s productivity

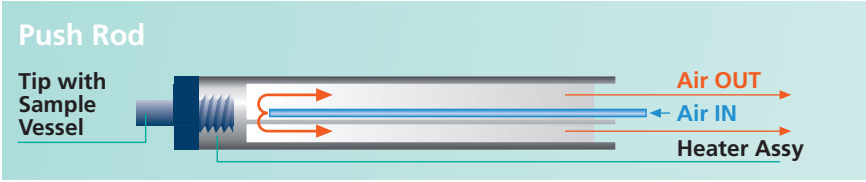
The direct probe technique is a an accepted method used for the analysis of samples via mass spectrometer. This method for introducing samples into the mass spectrometer is quick and easy to use for solid and liquid samples without GC separation. Therefore, it is mostly applied for molecular weight determination and screening methods.

Now it is possible to use this technique for all Agilent GC/MS systems:

The first SIM Direct Inlet Probe (DIP) was originally developed for the 5973 MSD in EI and CI mode. Continuously optimizing this technology, by now DIP systems with well proven functionality are available for the 5975 MSD and the 7000 Triple Quadrupole MS as well. So, the lab´s standard equipment, the Agilent GC/MS system with its proven and highly reliable technology, can easily be improved and be more productive by the SIM direct probe technique.

The DIP system enables direct analysis of liquid and solid samples that need no preceding chromatographic separation. The result is enhancement of the GC/MS application range as well as faster analysis runs. Together with a PAL autosampler, the DIP is a valuable addition for screening methods.

Principle of the DIP



Together with the sophisticated vacuum lock assembly, the heated push rod with integrated purge gas line is the heart of SIM's DIP technology. The probe can be programmed with 3 ramps and heating rates of 0.1-2°C/s up to 400°C, so controlled heating and ideally pre-separation of the sample can be achieved. Immediately after the end of the DIP temperature program, rapid cooling to 30°C with pressurized air safely protects of the O-ring and provides faster analysis cycles. SIM's DIP technology enables elegant switching between DIP/MS and GC/MS without uncoupling the GC/MS interface and without removing the column.

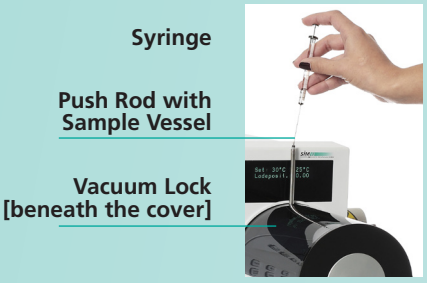
Sophisticated Vacuum-Lock Assembly

The sample is transferred into the vacuum of the ionization chamber via a specially designed vacuum-lock assembly:

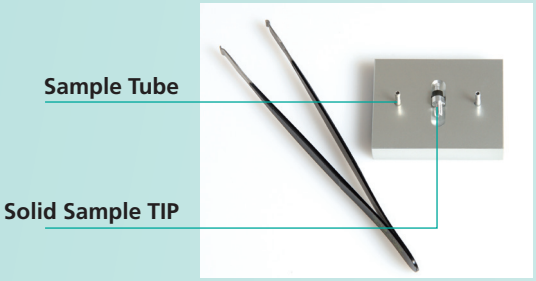
- marginal dead volume: no additional pump for the vacuum lock is required
- automatic insertion of the sample together with specially integrated safety features prevents damage to the ion source and minimizes accidental venting of the MS.

Designed for insertion of liquid and solid samples

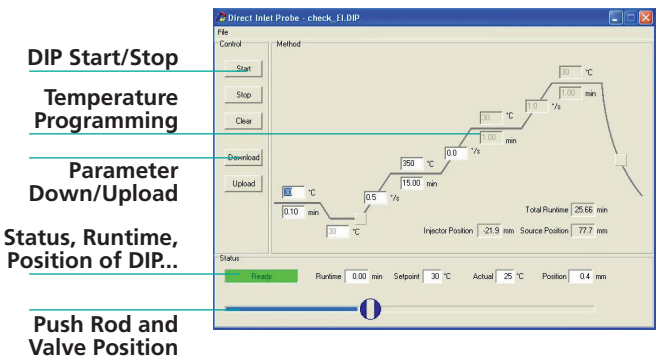
Interchangeable probe tips for liquid or solid samples can be filled manually or automatically:



The liquid probe tip remains at the push rod and is cleaned by heating.



Solid samples are put in special aluminium tubes that fit in the solid probe tip.



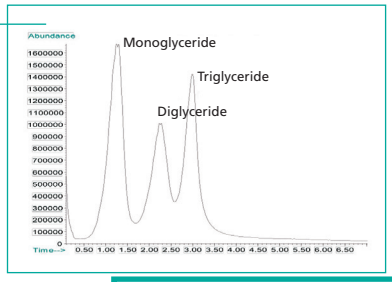
DIP software

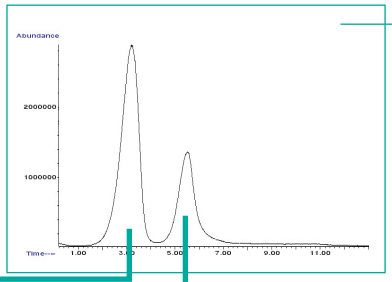
The push rod of the DIP system is controlled by the user-friendly DIP software. The values of the temperature program are entered directly in the temperature profile, which will display the total runtime. During the analysis - the values for runtime, temperature and push rod position can be viewed in the status bar. Moreover, push rod position and valve position are graphically displayed. Automatic data acquisition with MS ChemStation or Mass Hunter Software starts together with the DIP start.

APPLICATIONS

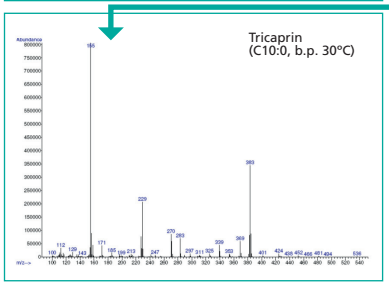
For data analysis take advantage of all the advanced capabilities of the GC/MS systems with MS ChemStation and Mass Hunter Software. This also includes the use of spectral libraries for identification of the components.

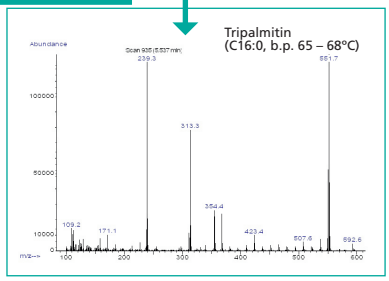
Mixture of mono-, di- and tri-glyceride separated by special temperature program 5973 MSD, EI, liquid, TIC



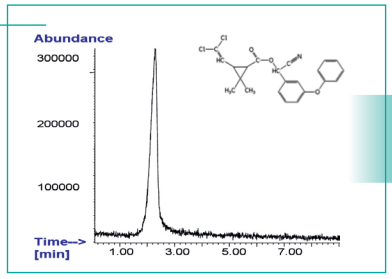


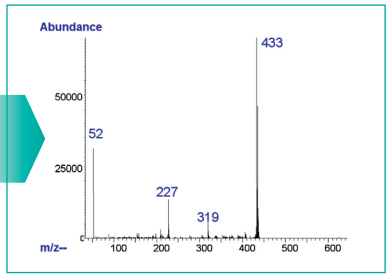
Triglyceride-mixture 5975 MSD, EI, liquid, TIC





Pyrethroid Cypermethrin, PCl/NH_3, solid, TIC



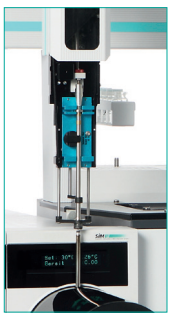


OPTIONS:

DIP Add-On: PAL Autosampler

You can boost your lab's output with the versatile PAL autosamplers: In addition to common liquid injection with a syringe, SIM developed a special tube gripper as PAL supplement which is used for automated insertion of solid samples in sample tubes.

GC/MS with 5975 MSD-DIP

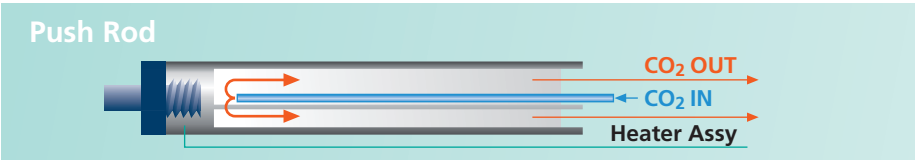


Sampling of solid samples with tube gripper

GC/MS with Triple Quad-DIP

CO_2-Cooling Kit:

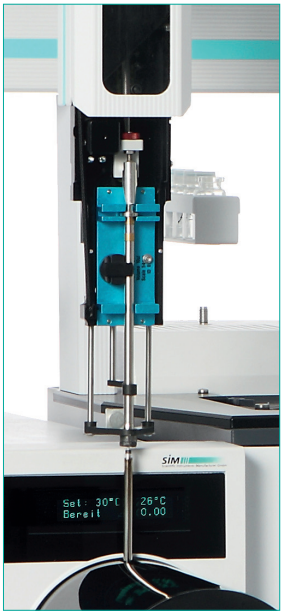
To minimize the loss of high volatile components during the insertion, this kit enables cooling the sample tip down to 5°C until the target position in the ion source is reached.



SPECIFICATIONS

DIP for 5973/5975 MSD and 7000 Triple Quadrupole MS

Requirement:	GC/MS System with Standard or Performance Turbo Pump or Dual Stage Turbo Pump
Modes:	DIP and GC/MS without uncoupling the GC/MS interface and without removing the column
Samples:	liquid or solid samples
Temperature range (push rod):	RT up to 400°C
Temperature program:	heating and cooling of the probe tip at ramp rates (0.1°C/s to 2.0°C/s)
Sample Inlet:	Direct Inlet Probe (DIP) with automatic sample transfer into the ion source via vacuum lock
Control system:	DIP firmware and software to control the system by PC or via control panel of the DIP
Ionization mode:	ECI, PCI, NCI
Analysis of mass spectra:	acquisition, data handling and reporting according to the respective mass spectrometer with MS ChemStation or Mass Hunter software
Controller:	230/110 V, 50/60 Hz, 0.2 A
Dimensions (GC/MS and DIP):	88 cm (w) x 77 cm (d) x 50 cm (h) as GC/5975 MSD and additional the DIP (21 cm) in front of the MSD; 88 cm (w) x 86 cm (d) x 57 cm (h) as GC/7000 Triple Q MS and additional the DIP (21 cm) in front of the MS (without data system and printer)
Weight (GC/MS and DIP):	100 kg (DIP, 5975 MSD, 7890 GC); 130 kg (DIP, 7000 Triple Quad MS, 7890 GC) (without data system and printer)
Options:	• automation and online-analysis by combination of the DIP with a PAL autosampler (for liquid and solid samples) • CO_2-cooling kit for high volatile samples



Article	Order No.
5975-DIP System incl. Controller for Agilent 5975 MSD (ionisation: EI)	B 1600 59 75
5975-DIP System incl. Controller for Agilent 5975 MSD (ionisation: EI/CI)	B 1602 59 75
7000-DIP System incl. Controller for Agilent 7000 Triple Q MS (ionisation: EI)	B 1600 70 00
7000-DIP System incl. Controller for Agilent 7000 Triple Q MS (ionisation: EI/CI)	B 1602 70 00

Note: the GC/MS-System is not included

Agilent Technologies
Channel Partner

SIM
Scientific Instruments Manufacturer GmbH

Im Erlengrund 21
D-46149 Oberhausen
info@sim-gmbh.de
phone +49 (0) 208 94 10 78-0
fax +49 (0) 208 94 10 78-88
www.sim-gmbh.de