

**GERSTEL**

# Cooled Injection System

## CIS



GERSTEL Cooled Injection System - internationally the most frequently used universal inlet, with patented septumless sampling head.

Gas chromatographic analysis is now more versatile, reproducible and has lower detection limits than ever before, thanks to temperature programmed sample injection using the GERSTEL Cooled Injection System.

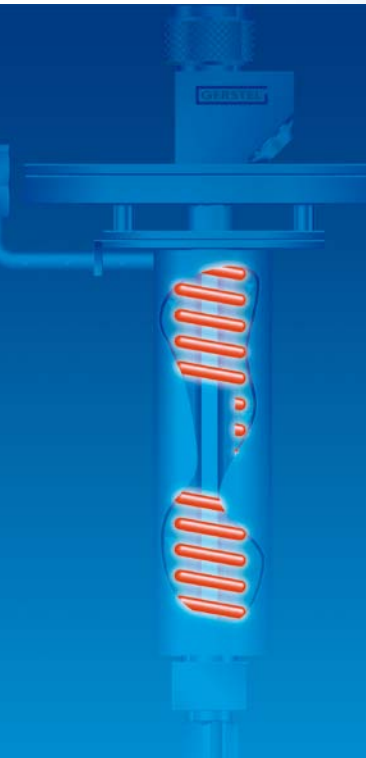
**The GERSTEL CIS provides two essential system-functions:**

- 1 ▶ Universal inlet for all injection techniques: split/splitless; on-column; large-volume up to 1000 µl; and pyrolysis (CIS 6).
- 2 ▶ Cryotrap enrichment in combination with sample preparation systems, for example, GERSTEL Thermal Desorption (TDS or TDU), Dynamic Headspace (DHS) or the GERSTEL Multi Purpose Sampler MPS used for Large Volume Injection (LVI) or headspace (HS).

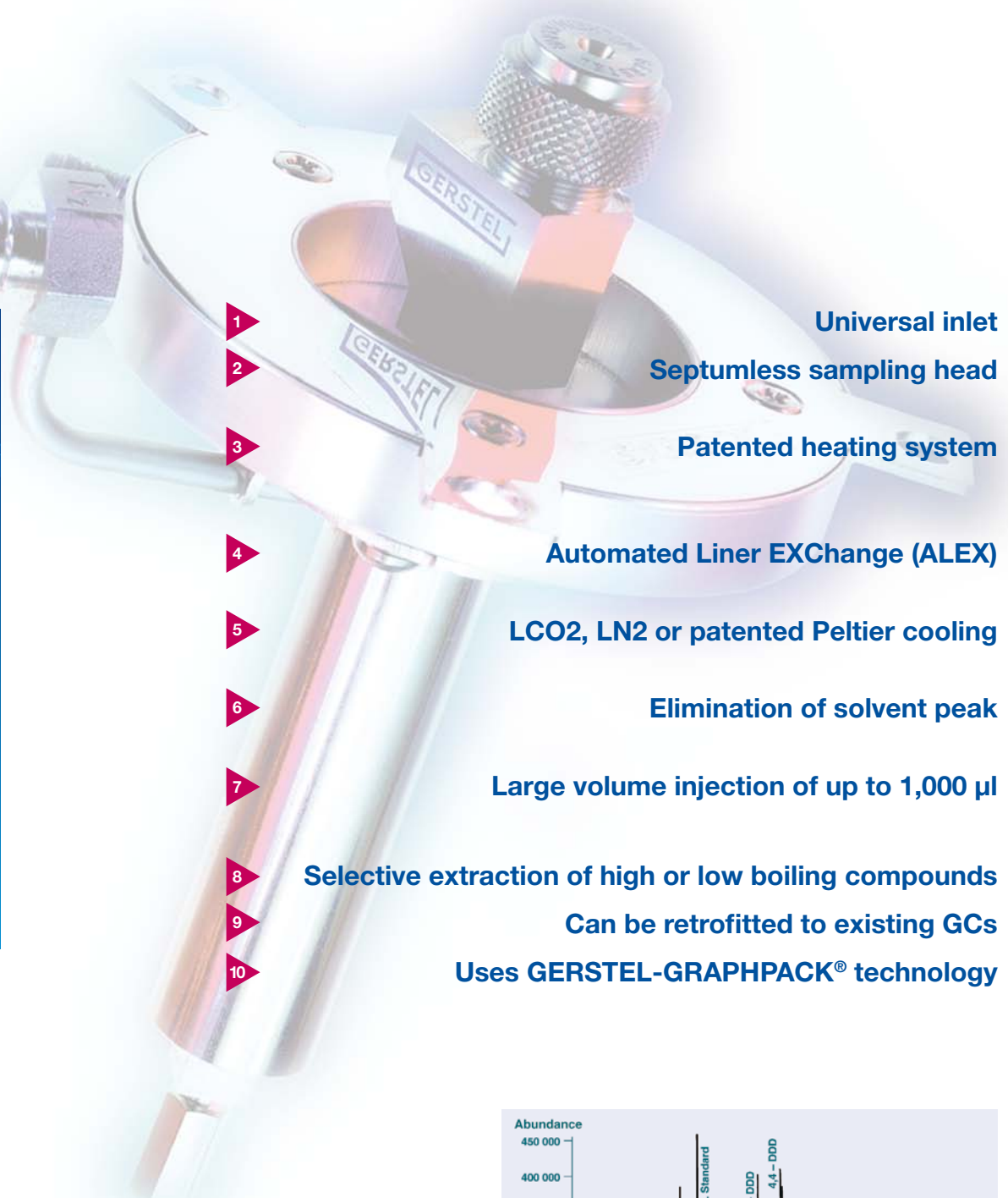
**The main advantages:**

- ▶ **Seven injection modes in one inlet**
- ▶ **Eliminates thermal discrimination**
- ▶ **Reduces decomposition of thermally labile compounds**
- ▶ **Lowers detection limits**
- ▶ **Optimum interface for liquid, gas and solid sample introduction systems**
- ▶ **Ideal cryogenic sample concentrator in split, splitless, and large volume injection modes.**
- ▶ **Allows high desorption flow in splitless sampling mode with TDS**

# 10 important reasons why you should choose a GERSTEL CIS



Patented heating system provides homogeneous, linear- programmable inlet body heating which guarantees optimum performance for all injection applications



Universal inlet

Septumless sampling head

Patented heating system

Automated Liner EXchange (ALEX)

LCO<sub>2</sub>, LN<sub>2</sub> or patented Peltier cooling

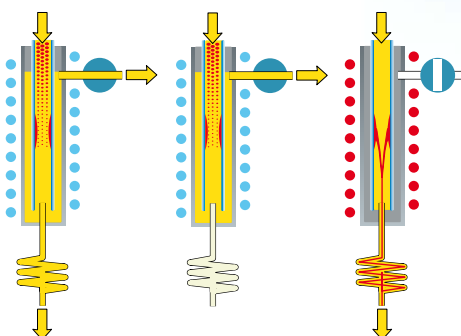
Elimination of solvent peak

Large volume injection of up to 1,000 µl

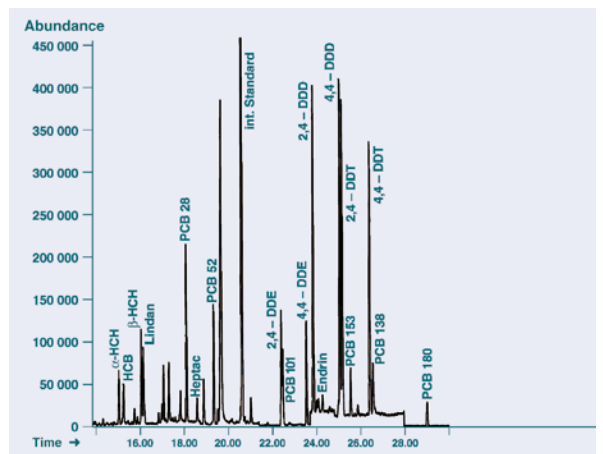
Selective extraction of high or low boiling compounds

Can be retrofitted to existing GCs

Uses GERSTEL-GRAPHPACK® technology

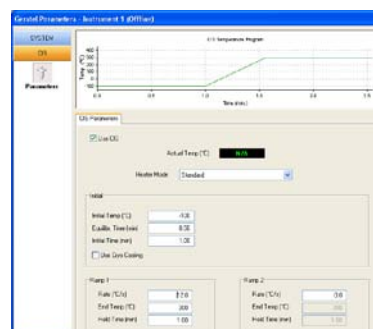
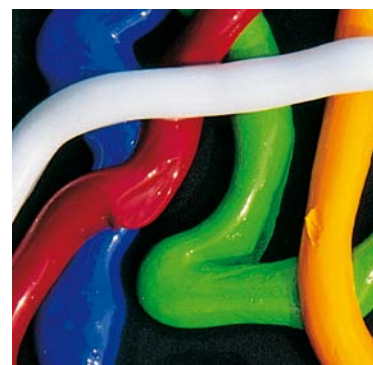


**600 ml PCB pesticide standard**  
 Injection temperature: 25°C  
 Solvent extraction/masking with Stop Flow  
 Total flow: 200 ml/min.  
 Injection speed: 115 ml/min.  
 30 m x 0.25 mm x 0.25 mm HP-5 MS

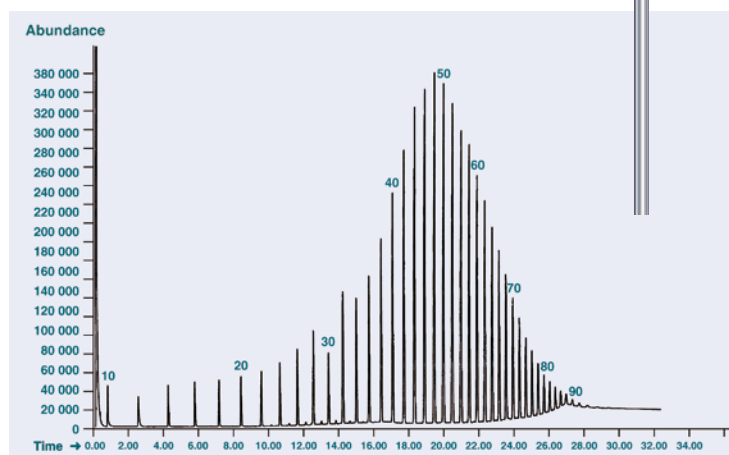




- ▶ Just *one* inlet for all injection techniques
- ▶ *No contamination* by septum particles; no loss of analytes from septum bleed; low-maintenance
- ▶ *Optimal transfer* of analytes to the column, even thermally labile substances, due to programmable linear heating; improved separation performance due to resulting small peak band width
- ▶ *Improved routine analysis* of samples with high levels of involatile compounds, particulates and other solid matrix material
- ▶ *Fast operation cycle time*; cost-effective Peltier cooling eliminates need for coolants when very low temperatures are not needed.
- ▶ *Better chromatographic separation*; protection of the capillary column and detection systems
- ▶ *Reduced detection limits* and time savings due to less sample preparation time
- ▶ *Selective transfer of components to the column*
- ▶ Suitable for almost *all GC models*; a new GC is not required
- ▶ *Reduces system leaks and maintenance; extends column life and increases sample throughput.*



CIS on-column injection insert

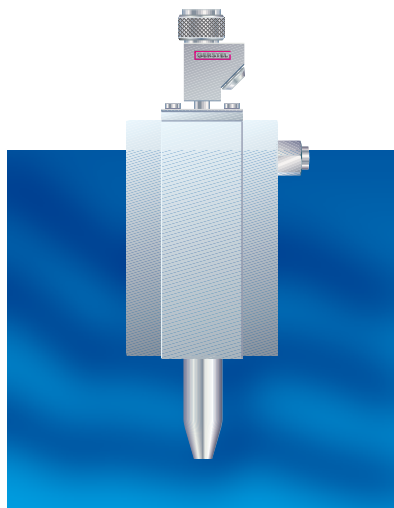


**Polywax 655**  
 On-column injection at 30°C  
 With 0.5°C/s  $\nearrow$  400 °C  
 12 m x 0,53 mm x 0,15  $\mu$ m HT5



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## GERSTEL Cooled Injection System (CIS) models:



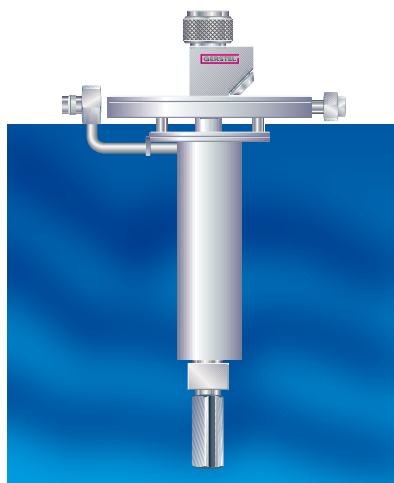
The GERSTEL Cooled Injection System (CIS) is compatible with almost all gas chromatographs on the market, enabling discrimination free introduction of samples as well as Large Volume Injection (LVI) up to 1,000 µl and even pyrolysis. The CIS can be retrofitted to an existing gas chromatograph.

A GERSTEL Controller is supplied with each CIS system. The controller allows easy upgrade with a GERSTEL sample preparation module by simply inserting the appropriate system board.

### 1 GERSTEL CIS 3

The GERSTEL CIS 3 equipped with patented Peltier-cooling. LCO<sub>2</sub> and LN<sub>2</sub> cooling are available as options. The CIS 3 can be integrated into or retrofitted to almost every GC model.

Temperature range -180°C to 450°C.



### 2 GERSTEL CIS 4

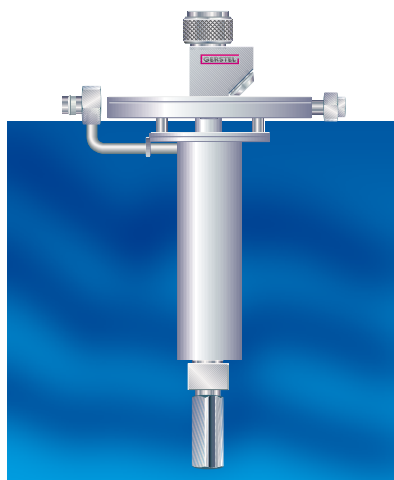
Equipped with LCO<sub>2</sub> or LN<sub>2</sub> cooling as standard, the CIS 4 was designed specifically for Agilent Technologies GC models and can be retrofitted to existing systems. The CIS 4 is available with patented Peltier cooling.

Temperature range -180°C to 450°C.



### GERSTEL MAESTRO Software

Control software for all GERSTEL modules and systems. Fully integrated with Agilent Technologies GC and MSD ChemStation as well as GC MassHunter integrated with sequence table of Agilent LC MassHunter; AB SCIEX Analyst® and Thermo Scientific® Xcalibur™.



### 3 GERSTEL CIS 6

Full temperature range universal inlet, covering from -180 to 650 °C. The CIS 6 offers more flexibility than any other available product in the market place. With a heating rate of up to 18 °C/s, the CIS 6 is an excellent cryo-trapping and GC introduction device for volatile analytes. The high end-temperature enables quantitative analysis of waxes as well as pyrolysis of polymers in solution following solvent evaporation.



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