# SIM

# Olfactory Detector (OFD)

## GC-OLFACTOMETRY (GC-O)

GC-O is a separation technique combining the high resolution of capillary GC with the highly sensitive human nose as detector. This is one of the **most effective analysis methods** for flavoring and fragrance industries because the human nose is often more sensitive than any physical detector.

**Applications:**
- flavors and odorants in cosmetics and food
- smelly components in environmental analysis and waste control
- off-odor detection in chemical and plastics industries
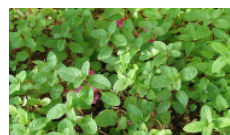
## SIM Olfactory Detector (OFD)

After GC separation, the OFD is used to record odor assoziation of an eluted substance and its intensity in function of time. A capillary transfers the eluate of the GC column from the oven to the "sniffing port". This is a glass cone at the outside end of the capillary, where the tester can "sniff" the olfactory impressions of the compounds.

Developing the SIM OFD, a high value was set on the following prerequisite conditions that allow optimal and interference-free interpretation of the olfactory impressions:

- **Absolutely olfactory neutrality** of all used components so that the olfactory perception of the eluted substances is not disturbed: The **transfer capillary** is inside a heatable stainless steel tube. The white insulating hose at the outside of the transfer line is odorless even at high temperatures (no polymers!).

- **Heatable transfer line without „cold spots"** for the correct sniffing of high boiling compounds: A heating element all along the stainless steel enables heating up to **350 °C**. The heating temperature is controlled by ChemStation or another suitable software.

- **Comfortable working position** is enabled by the sniffing port which is vertically adjustable to individual requirements: Due to the ergonomic sitting position, the tester can fully focus on the sensory perception.

- **Humidified air** (see water bottle sitting above the sniffing port holder) is mixed into the glass cone to prevent the nasal mucosa from drying out. For this also an odorless tube is used.

- **Simultaneous detection with other GC detectors** (e. g. FID, MSD, ECD) At the end of the column, flow is split into the OFD part and the part for a conventional detector. Either a standard parallel spitter or a microfluidic splitter is used for this technique. Simultaneous detection enables the definite correlation of the odor impressions to the recorded chromatogram.
  The **Microfluidic-Splitters** (with/without make-up gas, Deans-switch) use Agilent Capillary Flow Technology that gives you the ability to precisely divert the gas flow pneumatically. Also all gas flows can be adjusted comfortably by means of the instrument software.
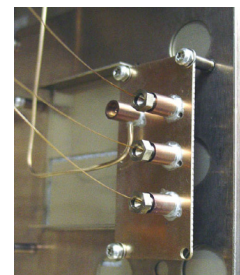


**Microfluidic Splitter mit EPC**

## Data Acquisition – SIM Olfactometry Software:
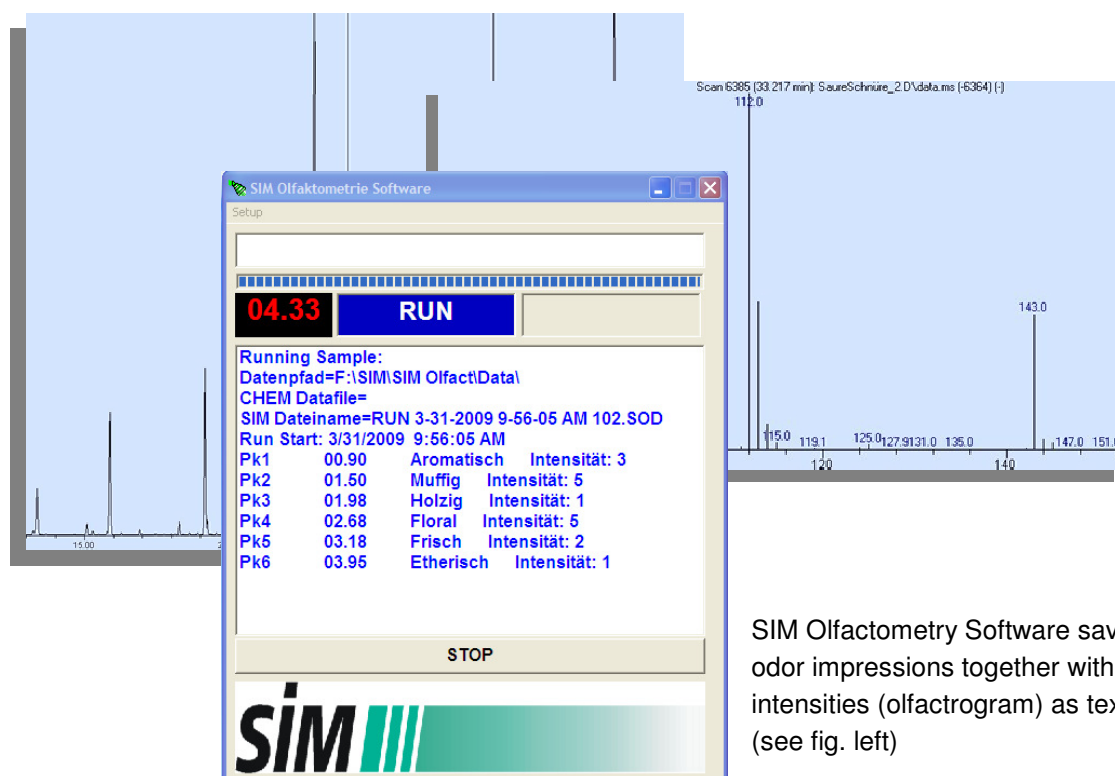


SIM Olfactometry Software saves odor impressions together with the intensities (olfactrogram) as text file (see fig. left)

- completely **integrated** for **Agilent ChemStation** and MS ChemStation as the text file is saved in the data folder of the GC run

- using other chromatography data systems (e. g. EZ Chrom), free selection of memory location and file names enables clear allocation of the data

- **Odor impressions** can be recorded with different input devices:
    - Pen tablet with character recognition
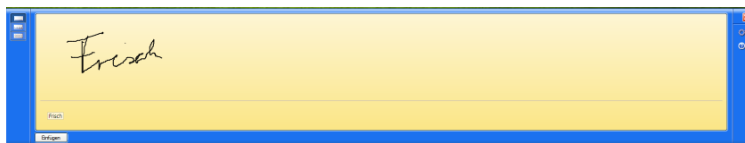


    - PC keyboard
    - Voice recording with a headset microphone

- Numbers are used to describe the **intensity level.**

- Different ways for **rapid recording** of odor impressions – according to the testers' preferences – that give lots of flexibility and allow to concentrate on the sniffing not on writing down the impressions:

    - Free definition of shortcuts for input via keyboard or pen tablet

    - Menu bar with predefined odors and intensities
      input via mouse or pen tablet, storage of individual odor classes (for different samples or different testers):



## Integration of the OFD into Agilent ChemStation / MSChemStation

- Temperature of the transfer line as well as all gas flows can be controlled by ChemStation/ MSChemStation (saved in the methods)
- Olfactogram is saved together with the related chromatography data of the GC run in the same folder

| Article | Order No. |
|---|---|
| Olfactory Detector for 6850/ 6890/ 7890 GC* | OD 1000 68 90 |
| Parallel Detection-Kit (Standard) | OD 1100 68 78 |
| Paralel Detection Kit (Microfluidic-Splitter) | OD 1200 68 78 |
| Paralel Detektion Kit (Microfluidic-Splitter with Makeup) | OD 1300 68 78 |
| Paralel-Detektion Kit (Microfluidic Deans Switch) | OD 1400 68 78 |
| SIM Olfactometry Software incl. Graphiktableau | OD 2000 68 78 |
| | |
| *OFD for other gas chromatography systems available on request | |