

Development of a mobile dynamic olfactometer and LIMS for odour laboratories

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From Odour Data to
Odour Knowledge

The challenge of sample storage time and the associated risks for odour analysis

When storing odour samples in sampling containers, odour laboratories face the challenge of potential changes in the odour concentration caused by chemical reactions, adsorption and diffusion effects depending on the odour source and compounds. Therefore, internationally acknowledged standards, like the EN 13725 and the VDI 3880, require samples to be analysed as soon as possible after sampling.

Benefits of mobile on-site olfactometry

A mobile laboratory on-site allows you to fulfil all the requirements of EN 13725 as well as ISO 17025, while

- minimizing the risk of exceeding the allowed sample storage time
- minimizing the risk of damaged sample bags and cross-contamination during transport
- increasing the level of flexibility, e.g. to immediately take additional samples or to repeat measurements if needed
- allowing for quicker reporting to clients, as measurement results are available in real-time
- longer-distance projects can be carried out



Figure 1: Example of a mobile odour laboratory, built into a specially designed trailer



Figure 2: The T08 evolution olfactometer can be used as a home-based or as a mobile on-site laboratory

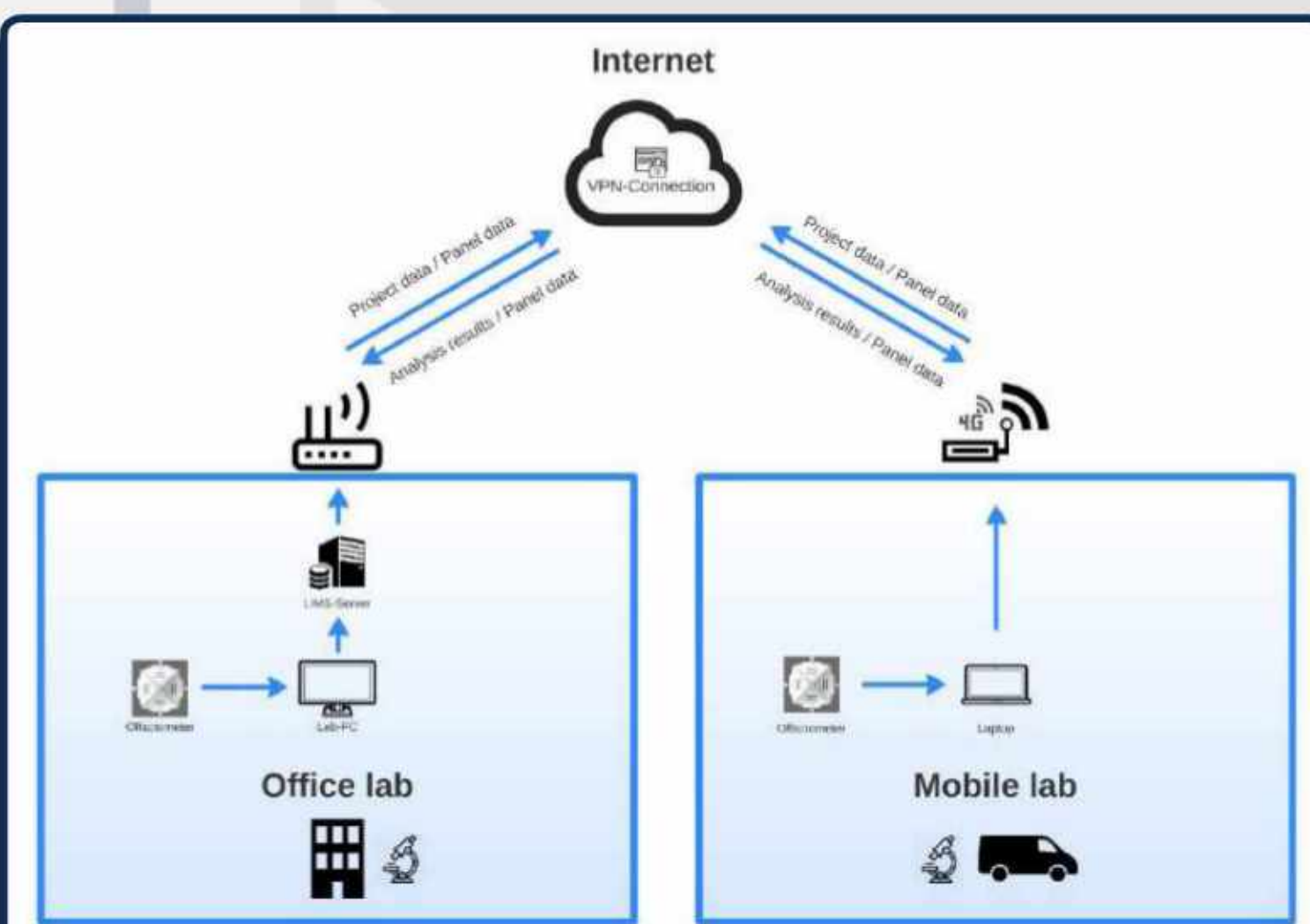


Figure 3: Process scheme using a centralized LIMS if multiple olfactometers are operated in different sites

Development of the T08 evolution olfactometer

The T08 evolution is a mobile 4-station olfactometer specifically optimized for odour measurements on-site, which

- is based on the proven principle of combining gas jet pumps and fixed sapphire orifices
- meets all requirements of EN 13725
- can be used equally as a home-based laboratory, as well as a mobile on-site laboratory
- is small, light and compact, but also robust
- allows for easy and quick installation and commissioning within a few minutes
- provides a Laboratory Information Management System (LIMS) to ensure best quality at all odour measurement sites

Ensuring quality at all odour measurement sites with a LIMS

A LIMS supports odour laboratories in fulfilling essential quality management and quality control procedures in day-to-day lab operation and audit preparation.

Key benefits include:

- Improved data quality through avoidance of transcription errors and media breaks
- Improved data security through role-based user management with access control
- Improved data access through simultaneous availability of the system
- Increased efficiency by managing samples, projects and results, equipment, panel and laboratory data in a centralized system
- Full traceability across all QM relevant data
- Full traceability of all changes made to the system through a detailed change history
- Operating multiple olfactometers with a centralized LIMS ensures data availability and consistency when measuring on-site

Date	ITE	n-Butanol (ppm)	Standard	ppm	g	g	g	g	g	g
2019/04/30	1553.09	40.00	0.0087	38.44	0.05	-1.48	0.36	-0.08	0.33	
2019/04/30	1576.02	40.00	0.0319	31.95	0.05	-1.48	0.36	-0.08	0.33	
2019/04/30	1710.00	40.00	0.0354	31.40	0.05	-1.47	0.36	-0.07	0.33	
2019/04/30	1772.60	40.00	0.0308	33.05	0.05	-1.47	0.36	-0.07	0.33	
2019/04/30	1386.75	40.00	0.0423	43.27	0.05	-1.47	0.36	-0.07	0.33	
2019/04/30	1386.37	40.00	0.0378	37.77	0.05	-1.48	0.36	-0.08	0.33	

Figure 4.1: Overview of the laboratory performance criteria in the laboratory information management system (LIMS)

Date	Panelist	g	g
2019/04/30	Victoria Becker	1.7565	373406
2019/04/30	Emma Zimmermann	1.8541	373406
2019/04/30	Julian Vidor	1.4935	303390
2019/04/30	Nora Vigh	1.8089	360687
2019/04/30	Luis Scheller	1.3930	373406
2019/04/30	Maja Peters	1.7565	303390
2019/04/30	Reference	1.7522	428912

Figure 4.2: Example overview of an individual panellist performance on n-Butanol in the LIMS software

Sample	Method	Finished at	Result	Project
colour sample 5	Forced Choice	04/30/2019 2:17 PM	29086.51	---
2019/04/30 Test sample Coffee	Yes/No	04/26/2019 9:20 PM	29087.32	101310222A
reference sample 2	Forced Choice	04/30/2019 2:19 PM	1552.09	152278840K
reference sample 24	Forced Choice	04/30/2019 2:12 PM	1676.02	---
colour sample 25	Yes/No	04/30/2019 2:10 PM	1676.02	---
reference sample 33	Forced Choice	04/30/2019 2:10 PM	1665.49	144420664K
colour sample 19	Yes/No	04/30/2019 2:10 PM	1579.22	103300042Z
reference sample 39	Forced Choice	04/09/2019 2:42 PM	1935.85	---
colour sample 32	Hedonic tone	04/09/2019 2:42 PM	---	---
colour sample 39	Yes/No	04/09/2019 2:36 PM	1648.35	---

Figure 4.3: Example overview of an individual measurement in the LIMS software