Electronic sensors for odorant monitoring: What's up and What's going on in CEN?

Franz-Bernd Frechen
University of Kassel, Department of Sanitary & Environmental Engineering (DESEE), Kurt-Wolters-Str. 3, D-34125 Kassel, Germany;(E-Mail: *frechen@uni-kassel.de*)

Abstract

Since many years innovative manufacturers work on making the human nose dispensable by means of any kind of technical sensor. There are many important reasons to aim for this, as the sensory measurement according to EN 13725:2003 is personnel-intensive, costly, time consuming and a real off-line measurement method. The advantages of any kind of machine that could replace the human nose as a sensor are thus evident:

- a real on-line measurement (depending upon the structure and kind of the machine), allowing
  - on-line supervision
  - closed loop process control
- a much cheaper method (depending upon the machine and its price, of course)
- a much quicker answer to the question
- a less personnel-intensive method
- a less subjective method (?)
- a "non target analysis" method

Was it wishful thinking to create an eNose? Anyway, CEN decided to set up a committee, namely CEN/TC2 64/WG 41, to work on this issue, and the birthday of the group was 22nd October 2015. So, it is still a real young group, but active, as it had its third meeting already. As usual, task groups were formed that specifically deal with

- Minimum requirements for instrumental odour monitoring
- Validating the relationship odour metric and odour
- Terms and definitions
- Descriptions and review of scope relevant technologies

As can be seen, some of these tasks are standard content of any standard, but nevertheless a big work to fulfil. Concerning the heart of the standard we are aiming for, odour metric relationship might be the biggest challenge. One of the big hinders is that the relevant variable, sensory measured odorant concentration according to EN 13725:2003, is not a real perfect method, as it has a large uncertainty of measurement itself, which makes any type of metric difficult. A different approach to solve this might be to just define standards of performance in defined situations that qualify any technology as appropriate, leaving the metric in the manufacturers hand and in the black box. However, also this approach has its problems, especially a correct definition of the test requirements and reproducible results.

All in all we still will have a long way to go. Nevertheless, some aspects that will fence our way will be presented in the lecture, e.g. discussion of mathematical problems and also case studies of usage of today's machines for odorant monitoring that of course are undertaken in many cases, even without a CEN standard …