IEEE P2520.2.1
Machine Olfaction Devices and Systems used for General Outdoor Odor Monitoring
(SEN/SC/TMODS/OOM/2520.2.1)

Working Group Meeting Minutes
13 September 2021 / 10:00 AM – 11:00 AM (ET)
WG Vice-Chair: Susan Schiffman
WG Secretary: Cynthia Burham

1. Call to Order

The Vice-Chair called the meeting to order at 10:02 AM ET. She also announced that the meeting was being recorded for the purpose of preparing minutes. The meeting was held in Zoom rather than the usual WebEx platform due to accessibility issues.

2. Roll Call and Disclosure of Affiliation

Affiliation FAQs: http://standards.ieee.org/faqs/affiliation.html
The Vice-Chair asked attendees to type their name, affiliation, and status (if the first WG meeting attended) into the chat window. A few minutes were allowed for participants to access and complete the sign-in process.

The Secretary recorded the attendee's responses in the P2520.2.1 Registration Form (Google): https://docs.google.com/spreadsheets/d/1ydvTFKxRSYRrpT1CX-22zaNkETV4_aqD2NDVSoxxfk8/edit?usp=sharing

The participant information from the chat window and from the participant list has been merged and may be found in **Attachment A**.

3. Approval of Agenda

The Vice-Chair displayed the announced agenda and asked whether minutes from the July meeting were available. The minutes from the July meeting were not available and approval was set aside for the next meeting scheduled to be held on October 11, 2021. The Chair delayed approval of the agenda until later in the meeting in order to obtain and confirm quorum. Quorum was obtained before conclusion of the meeting and agenda approved.

4. IEEE Patent & Copyright Policies

a. Call for Patents

https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf
Per standard IEEE-SA WG meeting practice, the Chair reviewed the required policy regarding potentially essential patents. No one raised concerns for consideration.

b. Copyright Policy
https://standards.ieee.org/ipr/copyright-materials.html
Per standard IEEE-SA WG meeting practice, the Chair reviewed the required policy regarding copyrights. There were no questions or concerns.

5. Technical Presentation(s) and Discussion

a. *Presentation by Michael McGinley:*

Michael McGinley, P.E. is Lab Director at St. Croix Sensory, Inc. He holds a B.S. in Chemical Engineering from the University of Minnesota and a Masters in Environmental Health Engineering from the Johns Hopkins School of Public Health. He has his P.E. in Minnesota. Mr. McGinley has extensive experience in olfactory measurement, more than 25 years, of environmental odours, sensory training, material odour testing, and olfactory art and design. He is a developer of lab, field, and stationary olfactometers. Mr. McGinley's company has created scents for various applications. He is involved with ASCM sensory evaluation and standards development. He also assisted in the review and revision of the ASCM 6079 Olfactory Standard and has served on many technical committees. Mr. McGinley is presently the leader of the Personal Care and Household Evaluation Committee for ASCM. Mr. McGinley's contact information is: mike@fivesenses.com
He also has a blog: stcroixsensory.blog

Mr. McGinley's presentation provided insight into the design and operation of olfactometers as well as evaluation criteria and theory. The development of olfactometers and enhancements to and innovations in the technology over the past 30 years were provided. The criteria for human panel participation were discussed and the difficulty in capturing perception of an odour and defining detection criteria for both the human panel and machine olfactometry were explained. The complexity of the interaction of independent odorants within an odor was presented and the difficulty of determining the chemical interactions between odorants required to extricate which odorants are most important to control in order to manage detection was presented. The challenge in establishing meaningful threshold ranges and

criteria to ensure data shared across systems will render useful results was explained. Data resources for odor threshold investigation were provided. Threshold values were explained to be only one component of detection recognition and the challenges in determining the relationship between measure and published values described. Algorithms used to determine and analyze threshold values were presented and the relationship between intensity level and perceived strength explained.

Key parameters for analysis discussed in the presentation included thresholds (the difference between detection and recognition), odor characterization, odor intensity, and odor persistency (dose to response). Regulation efforts and criteria in Europe were discussed and field olfactometry systems and techniques reviewed. The use of dilution to obtain information about odor concentration and intensity was explained.

During the Q&A, Mr. McGinley explained that those using olfactory measurement systems include municipalities and others concerned about environmental effects, sewer district engineering firms doing studies for their employers, and, most prominently, waste water treatment plants. Others using olfactory measurement systems include cannabis plants, landfills, and food production plants. Parties interested in having odors manufactured for testing include smaller and larger manufacturers of items such as odor neutralizers.

An update was provided during the Q&A that revisions to the EN1375 ASTM standard will be published within the month and may become an ISO standard. In response to question about limits required for procurement, Mr. McGinley responded that odour-controlled performance is an issue and ASCM limits are used as a determinant during procurement. ISO 7205 was mentioned as a standard some agencies see as a way for labs to express their commitment to data control. The fact that there are no pass-fail criteria was discussed and the reliance on the testing method to establish that odour controls are being met was explained. Mr. McGinley provided insight into what is being done within the ASTM Consumer Home Care Committee and the benefits that may be obtained by ASTM and IEEE working together on developments. He has offered to act as a liaison between organizations.

During a short discussion about the direction of olfactometry 10 to 20 years in the future, the role of innovation in making machine olfactometry more effective and comparable to human panel analysis was probed. Sensor responsiveness and reliability as well as the use of biosensors and advanced technology and analysis methods were predicted to have a positive effect on machine olfactometry.

Brainwave monitoring was suggested as a method that may be used in the future to better understand human panel analysis and the data collected used to improve machine olfactometry.

b. General discussion:

After the presentation, the group entered a general discussion period.

During the general discussion, the information presented in Mr. McGinty's presentation and its relationship to WG goals was provided. The role of production of synthetic odors to test systems was explained. A request was made to attendees to provide a few outdoor odours that could be used as standards and whether we have chromatic samples of these odours and/or where such synthetic mixtures might be obtained. I response, waste water and the challenges involved in related odour analysis were suggested. Landfill and cannabis odours were suggested. Odours from animal facilities, especially in rural areas, were presented as an area for review. It was explained that there are multiple facets to the odours from animal facilities depending on the processing involved (meat processing, packaging, and rendering, cleaning with heat and fire). It was also explained that the facilities are often located in close proximity and the nature of the odours may change depending on what processes are being conducted at any given time and what weather phenomena may be occurring concurrently. Leather tanning was also suggested in chat as an area in need of study.

An announcement regarding the P2520.3.1 WG meeting beginning at 11:00 AM ET was made.

6. Agenda and Previous Meeting Minutes Approved

The Meeting agenda was approved without objection to unanimous consent after quorum was achieved. The number of voting members in attendance required for quorum was 19. There were 20 voting members in attendance. The minutes for the WG meeting held on July 12, 2021 were unavailable for review prior to the meeting on September 13, 2021 and will be made available for approval at the WG meeting scheduled for October 11, 2021.

7. Unfinished Business/Action Item Review

The Vice-Chair has requested comments and additional information regarding odours the WG should investigate and any sources which may be able to manufacture synthetic versions of the related odours for test.

8. New Business

There was no new business.

9. Future Meetings

The next meetings of the WG will take place at 10 AM ET on October 11, 2021 and on November 8, 2021. They will immediately precede the P2520.3.1 WG meeting. An attempt will be made to keep both meetings to one hour in length although one or both meetings may be longer than one hour in order to ensure all relevant points within the agenda are addressed.

10. Adjourn

The WG Vice-Chair asked for a motion to adjourn. Troy Nagle made the motion and Cynthia Burham seconded. Without objection to unanimous consent, the Vice-Chair adjourned the meeting at 10:57 AM ET.

Attachment A: Meeting Participants (25)

Last Name	First Name	Affiliation
Sagar	A S M Sharifuzzaman	Sejong university, South Korea
Schiffman	Susan	North Carolina State University
Nagle	Troy	ECE, NC State University
Burham	Cynthia	University of Texas at Austin
Leccesse	Fabio	Science Department - Università degli Studi "Roma Tre"
Covington	James	Professor, School of Engineering, University of Warwick
Saffell	John	Alphasense Ltd.
WONG	KO CHUNG	Oxford Technology /FRSA
Carneiro	Magnovaldo	Self
Reimringer	Wolfhard	3S - Sensors, Signal Processing, Systems GmbH
Bernardini	Sandrine	Aix-Marseille University
Guillot	Jean-Michel	IMT Mines Ales
De Vito	Saverio	ENEA - Agency for New Technology, Energy and Sustainable Economic Environment
Palma	Susana	NOVA university of Lisbon
Subramaniam	Ravi	IEEE (Conformity Assessment)
Kishore	Kuna	Honeywell Technology Solutions
Izquierdo	Cyntia	Olores.org website
Potyrailo	Radislav	GE Research
Manikandan	M Sabarimalai	Indian Institute of Technology Bhubaneswar
Staerz	Anna F	Massachusetts Institute of Technology (not first meeting)
McGinley	Mike	St. Croix Sensory, Inc./Speaker
Peaslee	David	SPEC Sensors, LLC
Massera	Ettore	ENEA
Lozano	Jesus	Universidad de Extremadura
Li	HY	Huazhong University of Science and Technology