Environmental odour management
Product and material testing
Olfactometry - odour measurement equipment
Calibration, Proficiency, Testing, Reference Material
Presentation of Odournet services

P&M sectors
The Odournet Group

• is the largest specialist consultancy exclusively dedicated to environmental odour management & odour assessment

• has developed a portfolio of thousands of studies over 30 years in all odour relevant sectors of the economy

• employs over 70 sensory specialists, operates 6 accredited olfactometry laboratories, one high resolution GC-MS laboratory and a dedicated facility for testing odours of products and materials
Fields of Activities

>>> GREEN: Enviromental odour management
emission and immission measurement of environmental odours

>>> ORANGE: Product and material testing
interbranch activities of product and material testing (automotive, consumer goods, deodorant, hygiene products, textile etc.)

>>> BLUE: Instruments
development, production and distribution of olfactometer and devices for sampling and data collection

>>> SILVER: QA/QC services
service for odour laboratories to increase quality (calibration, proficiency tests and training of panels)
Sensory Expertise delivered worldwide

Spain Odournet SL • United Kingdom Odournet UK Ltd • France Odournet France
Mexico Odournet Mexico S.A. de C.V. India Odournet Holding India Pvt Ltd
Brazil Odournet Brasil Ltda.
We answer your questions

- How is the odor of my product perceived?
- How does my product perform over time?
- Does my product enhance odor perception?
- How can I prove my product works?
- Does my product reduce / mask malodour?
- How does my product perform in benchmark test?

Is there an odor problem?
An international team dedicated

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Odournet capabilities

- 4 accredited olfactometry laboratories
- 1 Molecular evaluation laboratory equipped with a GC-TofMS and a GC-Sniffing
- Testing facilities for body care tests
- Testing room and chambers
- Sensory cabins
- A global panel of more than 200 persons allowing intercultural sensory test
- Each country offers around 30-40 experienced sniffers for odour evaluation
Services
Sensory analysis: Odour concentration

Measurement of odour concentration according EN 13 725

• 4 to 6 selected and trained sniffers
• 2 to 3 repetition per measurement
• Result in unit odour: 1 UO is the amount of odourant that, when evaporated into one cubic metre of neutral gas at standard conditions, is detected by 50% of the sniffers.
Sensory analysis: **Odour Intensity**

Selection and training according EN 13725, VDI 3882 part 1 and ASTM E1207-14

<table>
<thead>
<tr>
<th>Odour intensity</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strong</td>
<td>5</td>
</tr>
<tr>
<td>Strong</td>
<td>4</td>
</tr>
<tr>
<td>Medium</td>
<td>3</td>
</tr>
<tr>
<td>Weak</td>
<td>2</td>
</tr>
<tr>
<td>Very weak</td>
<td>1</td>
</tr>
<tr>
<td>Not perceptible</td>
<td>0</td>
</tr>
</tbody>
</table>
Sensory analysis: **Hedonic tone**

According to VDI 3882 part 2

<table>
<thead>
<tr>
<th>Hedonic tone</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely pleasant</td>
<td>4</td>
</tr>
<tr>
<td>Very pleasant</td>
<td>3</td>
</tr>
<tr>
<td>Pleasant</td>
<td>2</td>
</tr>
<tr>
<td>Weakly pleasant</td>
<td>1</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
</tr>
<tr>
<td>Weakly unpleasant</td>
<td>-1</td>
</tr>
<tr>
<td>Unpleasant</td>
<td>-2</td>
</tr>
<tr>
<td>Very unpleasant</td>
<td>-3</td>
</tr>
<tr>
<td>Extremely unpleasant</td>
<td>-4</td>
</tr>
</tbody>
</table>
Sensory analysis: Odour description

Selected panelists are trained according a referential which contains about 50 odorous compounds of different families (sulfured, amine, fatty, woody, fruity...), placed in visual structure. Our methodology allows an odor characterization with objective terms as we use molecule names of referents.
Molecular analysis: GC TofMS

Used to:

• determine the chemical composition of the headspace of gas, liquid or solid product,
• measure the specific gas concentration of odorous compounds,
• measure compound in law concentration sub ppt (a factor 10 to 100 lower than conventional GC-MS)

The odor potential of the compounds is characterized by using our Odournet Library odor thresholds, based on the literature review and on internal odor thresholds.
Molecular analysis: GC Sniffing

combines high end separation techniques, with the human nose as detector. GC Sniffing adds a dimension to the technique of GC-TofMS: the odour description of the single components of a complex mixture.
Molecular analysis: GC-IMS

Gas chromatography combines with IMS (Ion Mobility Spectrometry) detector allows the detection of compounds in few minutes, to:

- Visualize difference between a reference and samples
- Analyze the evolution of molecular profil by continuous monitoring

<table>
<thead>
<tr>
<th>Time</th>
<th>Intensity</th>
<th>Hedonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:20</td>
<td>4.10</td>
<td>7.10</td>
</tr>
<tr>
<td>10:55</td>
<td>3.50</td>
<td>2</td>
</tr>
<tr>
<td>11:27</td>
<td>3</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Products

TO evolution olfactometers

LiGaVa

Scent sampler

Pure Sniff III
Cases studies
Ingredients

Exemple 1:

Objective : Determine the origin of an off-note in a production of a raw materiel used in cosmetics

Method : Sensory test (intensity and description of the off-note) coupled with GC-Sniffing

Exemple 2:

Objective : Search of ingredient with a neutral odor

Method : Sensory test (intensity, hedonic tone and description of the off-note)
Product aging study

**Exemple:**

**Objective:** Evaluate the apparition of off-note with aging (make-up, body care..)

**Method:**
- Sensory test (Intensity measurement and description of odour) and GC-IMS at specific point time during several months,
- GC-Sniffing at the time when off-note clearly appears.
Hair care: Shampoo

Exemple:

Objective: Determine the longevity of a fragrance in a shampoo

Method:
In-vivo intensity measurement according ASTM E2049-12
- 20 panelistes
- an expert panel of 6 persons
- measurements at specific time points

Ex-vivo continous monitoring
Measurement on strand hair by GC-IMS
**Exemple :**

**Objective :** Sensory and molecular comparison of two fragranced petroleum jellies with a different melting point

**Method :** Sensory test (Intensity measurements) and GC-IMS analysis at 25, 32 and 40 °C
Exemple :

**Objective**: Determination of odour threshold of fragrances

**Method**: Standardized method for preparing fragrances
Odour concentration according EN 13725 with 4 to 6 panelists
Exemple 1:

**Objective:** Benchmark essential oil diffusers

**Method:** Room assessment, intensity, odour concentration each 5 minutes during 1 hour

Exemple 2:

**Objective:** Determination of long lasting time of the perfume of a floor detergent

**Method:** Room assessment, odour concentration each hour until no odour

Exemple 3:

**Objective:** Determination of the odor reduction efficiency of an odour eliminator spray

**Method:** Sampling in chamber according ISO 16000-28, odour concentration
Example 1:

**Objective:** Evaluation of the release of encapsulated perfume on a textile

**Method:** Odour concentration and sensory tests (intensity measurements and odour description) before and after release of capsules (friction) at different specific time points

Exemple 2:

**Objective:** Determination of odour reduction rate of a textile

**Method:** Odour concentration and GC-TofMS
Exemple 1:

Objective: Evaluation of the release of encapsulated perfume on a textile

Method:
1. Intensity measurement of the perfume according ASTM E1207-14
   - 20 panelists
   - an expert panel of 6 persons
2. Measurements at specific time points (4, 24, 48h)
   - Auto-evaluation of the perfume intensity
   - Until 120 panelists
   - Reporting by SMS every 2 hours

Exemple 2:

Objective: Determine the efficiency of an anti-perspirant

Method:
Intensity measurement of sweat according ASTM E1207-14
- 20 panelists
- an expert panel of 6 persons
- Measurements at specific time points (4, 24, 48h)
ODOURNET seal of approval

to attest to the realization of scientific test by an independant lab
Consultancy and training

• Our understanding of analysis techniques for the full range of odour characteristics is our starting point; we then fine-tune our designs based on our knowledge of techniques can be used to improve your specific products and/or demonstrate their effectiveness.

• Flexibility is key to our success. We use a combination of standardized laboratory test methods and target group-specific home-use tests to evaluate specific product characteristics.

• ON methodologies can be performed:
  o In all our labs our methodologies allowing test in local culture or crossed cultural test
  o In all our labs your methodologies
  o In all your laboratories our methodologies (training, consultancy, equipment and devices supply...)

• We purpose a catalog of trainings (intensity, odor description...) to train your teams (QC department, R&D...) on odour characterization
Publications and articles


- Sensory analysis to play increasing role in enabling faster growth of consumer-facing businesses *Chemical weekly, India, March 11, 2014*

- Odour analysis in personal care products *Personnal care, April 2015*

- Tests cliniques: hauts en images *Expression cosmétique N° 32, March / April 2015*
Thank you for your attention

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