GUIDE TO ODOR MANAGEMENT

For schools, care homes, offices and any commercial organisation.
Environments such as factories, toilets, care homes, healthcare establishments and schools can all suffer from problems with malodours.

Offensive smells are not only off-putting for your employees, they are also unpleasant for your customers. Failure to remove unpleasant odours can have a negative effect on productivity, profitability and the reputation of your business.

Elimination of odours is often seen as an impossible problem, or incurable, or needing highly specialised equipment. This guide explains how, using appropriate tools and solutions, most odours – including stubborn and persistent odours – can be eliminated.
What is Odour?

An odour or fragrance is caused by one or more volatilized chemical compounds, generally at a very low concentration, that humans or other animals perceive by the sense of olfaction. The terms fragrance and aroma are used primarily by the food and cosmetic industry to describe a pleasant odour, and are sometimes used to refer to perfumes. In contrast, malodour, stench, reek, and stink are used specifically to describe unpleasant odour.

The main concern with odour is its ability to cause a response in individuals that is considered to be objectionable or offensive. Odours have the potential to trigger strong reactions for good reason. Pleasant odours can provide enjoyment and prompt responses such as those associated with appetite. Equally, unpleasant odours can be useful indicators to protect us from harm such as the ingestion of rotten food. These protective mechanisms are learnt throughout our lives.

Unpleasant odours can have a negative effect on productivity, profitability and the reputation of your business.

Whilst there is often agreement about what constitutes pleasant and unpleasant odours, there is a wide variation between individuals as to what is deemed unacceptable and what affects our quality of life.

Typically, odours are detected at very low concentrations of chemicals and compounds in air. The human nose is very sensitive with, on average, over 5 million scent receptors. Humans can detect concentrations as low as a few parts per billion (ppb), or less in air. Small changes in the chemical composition of an odour can change the smell perceived by the receptor.
From first detection, the need to describe odours is essential and this requires reference to a number of different attributes of smell:

**Frequency** indicates how often a person is exposed to an odour. Even an odour with pleasant hedonic tone can be perceived as a nuisance if exposure is too frequent. At low concentrations a rapidly fluctuating odour is more noticeable than a steady background odour, therefore a high frequency is an aggravating factor.

**Intensity** - The “intensity” of an odour is also relevant. Intensity refers to the perceived strength of an odour when described by a recipient. Low concentrations of some compounds in a sample are capable of being perceived as having a high intensity even when close to threshold concentrations. These compounds are common in naturally unpleasant odours such as hydrogen sulphide (rotten eggs) and faeces.

**Odour Intensity Scale**

<table>
<thead>
<tr>
<th>Score</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No odour</td>
</tr>
<tr>
<td>1</td>
<td>Very faint odour</td>
</tr>
<tr>
<td>2</td>
<td>Faint odour</td>
</tr>
<tr>
<td>3</td>
<td>Distinct odour</td>
</tr>
<tr>
<td>4</td>
<td>Strong odour</td>
</tr>
<tr>
<td>5</td>
<td>Very strong odour</td>
</tr>
<tr>
<td>6</td>
<td>Extremely strong odour</td>
</tr>
</tbody>
</table>

*German Standard VDI 3882, Part 14*

Using a scale of very faint to extremely strong, the perceived intensity or magnitude of perception of an odour increases as concentration increases. However, changes in concentration do not always produce a corresponding proportional change in the odour strength as perceived by the human nose. This can be important for purposes of control where an odour has a strong intensity at low concentration, since even a low residual odour may cause odour problems.
Our method of measuring intensity is derived from the German Standard VDI 3882, Part 14. We use a qualitative score for an odour sample compared to an intensity scale.

**Duration** indicates the time length of an odour episode or if it is continuous and/or persistent.

**Offensiveness** is a mixture of odour character and hedonic tone at a given odour concentration. Some odours are universally considered offensive, such as decaying animal matter or rotten eggs. Other odours may be offensive only to those who suffer unwanted exposure in the residential intimacy, for example coffee roasting odour.

Importantly, the hedonic tone (pleasantness or unpleasantness of an odour) can be responsible for the perception leading to complaint. Here the relative pleasantness or unpleasantness of the odour alongside the association of its source, or the context in which it is received, are relevant to investigating odour complaints. This judgement on the relative pleasantness or unpleasantness of an odour forms our common language when reporting unpleasant odours.

Our method for measuring hedonic tone is derived from the German guideline VDI 3882, Part 25.

**Location** indicates the type of use and nature of activities in the vicinity of an odour source, for example a bedroom or waste/bin area or male washroom.

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**Hedonic Tone Scale**

<table>
<thead>
<tr>
<th>Score</th>
<th>Perceived Hedonic Tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Very pleasant</td>
</tr>
<tr>
<td>1</td>
<td>Pleasant</td>
</tr>
<tr>
<td>2</td>
<td>Moderately pleasant</td>
</tr>
<tr>
<td>3</td>
<td>Mildly pleasant</td>
</tr>
<tr>
<td>4</td>
<td>Neutral odour / no odour</td>
</tr>
<tr>
<td>5</td>
<td>Mildly unpleasant</td>
</tr>
<tr>
<td>6</td>
<td>Moderately unpleasant</td>
</tr>
<tr>
<td>7</td>
<td>Unpleasant</td>
</tr>
<tr>
<td>8</td>
<td>Very unpleasant</td>
</tr>
</tbody>
</table>

*The German guideline VDI 3882, Part 25*
Individual responses to odour vary greatly and not all unpleasant odours are considered offensive at all times. Examples of this are well established where communities have become accustomed to ‘healthy farmyard odours’ or ‘comforting coal fire smells’. Equally these same odours can trigger complaints and can impact upon people’s daily lives where exposure to ‘manure odours’ or ‘soot’ is perceived as unwanted and objectionable.

A feature of these differences amongst humans is the phenomenal range of choice in foods, perfumes and products linked to olfaction that are available and continue to be developed. When an individual exposed to odour perceives this as unwanted, it is argued that the following factors are the main determinants:

- Offensiveness of the odour
- Intensity of the odour
- Duration of exposure to the odour
- Frequency of the odour exposure
- Tolerance and expectation of the exposed subjects.

The human sense of smell is an important early warning mechanism, as well as a means for us to assess our environment,
food and each other. Unpleasant odours are difficult to ignore particularly where these are strong or evoke a negative or harmful view of our surroundings. Our reactions to odour can be short-term or prolonged, and intense or mild in the same way as the exposure and unpleasantness of the sensation. Studies of communities exposed to unwanted odours show that exposure can lead to evidence of stress-induced symptoms such as:

- Sleep disorders
- Headaches
- Respiratory problems
- Nausea
- Anxiety

When exposed to bad odours, the individual requires some form of coping behaviour to respond and adjust. Reviews of the physiological, psychological and sociological mechanisms highlight two main types of coping strategy:

**Problem focussed coping** – this leads to attempts to control the problem by developing active behaviour aimed at removing the cause of stress, e.g. closing windows, calling authorities or operators to complain, keeping diaries and submitting complaints etc.

**Emotion focussed coping** – this is not aimed at changing the environment by removing the unpleasant stimulus, but consists of modulating the emotional response that is the result of the appraisal, e.g. denial, seeking distractions, reducing one’s mental focus on the problem, making a positive choice to ignore the stressor, etc.

Memory of periods of heightened or intense exposures alongside other unwanted outcomes, such as the disturbance to well-being or lack of influence, are all important. These appear to dominate the overall perception of the odour impact and perceived history of the complaint. Studies to define
predictors of annoyance/nuisance have highlighted a number of factors which are difficult to relate to each other but recognised to be influential, as follows:

- **Perceived health status** – individuals with health complaints have a higher probability of experiencing nuisance/annoyance than healthier people, at the same exposure level

- **Anxiety** – Individuals who feel anxiety that odour is related to health risks have a higher probability of experiencing odour-induced annoyance

- **Coping strategy** – Individuals who employ ‘problem-focussed’ coping are more likely to experience odour annoyance/nuisance than those employing emotion-focussed coping

- **Personality** – Individuals who believe themselves to have the focus of control over their environment may, in some circumstances, be more likely to experience annoyance/nuisance

- **Age** – the probability of experiencing odour-induced annoyance/nuisance decreases with age

- **Residential satisfaction** – The more satisfied an individual is with their residential situation the lower the probability of experiencing odour induced annoyance/nuisance

- **History of exposure and annoyance** – individuals with a history of odour-induced annoyance/nuisance have a long term, heightened sensitivity to exposure.

Summarising these sensory, cognitive and behavioural processes in such a way inadequately reflects both the complexity of the process being considered, as well as our limited understanding of the true mechanisms taking place. Evidently exposure to unwanted odour for prolonged periods can detrimentally affect the well-being of individuals. This can sensitise individuals within a community. Where this is allowed to continue for sustained periods the perception of impact continues beyond the direct period of exposure.
It is important to undertake good working practises and understand that workplace odours are unacceptable and treatable.
Opportunities to control odour can be categorised into three components:

- **Source**
- **Pathway**
- **Receptor**

All three of these components must be present and connected at the time of the event to result in exposure to odour. If the chain is broken, either because one component is missing, or because it is not connected at the time to the next component, then exposure cannot occur and there will be no odour impact. To prevent exposure, one of the components in the chain needs to be removed or the connectivity of the chain needs to be broken, e.g. the source of the odour is removed.

To reduce exposure (and therefore the impact), control measures are used to reduce the importance of one or more of these components. Naturally, the first and most important step in any odour-control strategy is to try to eliminate the source. Microbiological agents, and detergents, such as Zybax Ultra, are the first and best strategy because these products can remove the material causing the unpleasant smells. Not all malodours can be fully controlled by cleaning and digesting alone. In such cases, the second line of defence is odour-control products to break the pathway.

There are basically three generations of odour-control products: air fresheners, odour neutralisers, and odour-eliminating products.

**Air-fresheners** have come to be used less and less often as the odour neutralisers and odour eliminators have become more sophisticated. Nevertheless, some facility managers prefer to have a fresh scent in the air to give a good impression, but air-fresheners try to trick the receptors,
the nose, and often leaves a worse combined smell than no action at all.

**Odour neutralisers** are chemical compounds that are paired up with malodourous materials in such a way as to prevent the human olfactory sense from perceiving the malodours. When neutralisers are in use, instead of only smelling the unpleasant odour, people are exposed to two different compounds: the malodour and the chemical matched with it that changes how their noses sense it.

**Odour eliminators**, such as Febreze® and Zybax Odourbond™, are the third generation of odour-control products. They chemically bind with a malodourous compound and change its nature, so that it no longer emits an unpleasant smell. With these products it is sometimes possible to eliminate odours before they are even detectable which, of course, is preferable.

The odour elimination products may be required in places where malodours might have penetrated, such as curtains, carpeting, and furniture (either upholstered or not). These products are designed to penetrate the surface and actually chemically alter the malodourous materials, hence stopping them from smelling bad.

**Microbiological agents and detergents are the first and best strategy**
Carpets can be one of the most expensive items we purchase. So, when considering their cleaning and maintenance, you will want the best for them. Carpets act as a filter and collect all sorts of dust, grit and soil. Whilst vacuuming on a regular basis will alleviate some of this problem, it does not remove those deep down soils that attach themselves to the fibres. Cleaning costs are minimal when you consider the replacement cost of carpets and furnishings, so regular cleaning makes economic sense.

Most do not realise that we are see only a tiny fraction of the soil that a carpet contains. The visible grime we notice is only the tip of the iceberg; up to 85 per cent of the dirt the carpet holds is buried deep within the pile.

Regular vacuuming with a rotary head vacuum cleaner is a necessity to keep your carpets clean and hygienic, and some of you will use other equipment to help maintain and preserve your valuable floor coverings. However most commercial vacuum cleaners, shampooers and steamers, even the more powerful ones, haven’t got what it takes to get rid of that deep-down dirt or residue.

Persisting or stubborn carpet odours

If carpets have a stronger odour after shampooing than before, there could be a nasty residue at the base of the carpet pile.

- Use your carpet shampooer with just water.
- Repeat until the water returns are clear and non-foaming.
- Leave to dry.
- If any odour remains lightly spray with Zybax Ultra (25:1)
If something gets spilled on to your carpet, prompt action is required to prevent odours

• Do not over wet into backing materials
• Always test any solution/detergent on an inconspicuous area of carpet prior to treating a stain
• Always use detergents at recommended dilution ratios
• Scrape up or blot up any excess prior to treatment
• Blot, never rub or scrub
• Do not use inappropriate detergents on carpets or upholstery i.e. (washing up liquid, wash powders, household bleach, and disinfectants)
• Always work from the outside of the spill inward to avoid spreading
• Deal with spills as quickly as possible for increased chances of success

**Alcohol, Liquid Foods**

• Blot up surplus spillage using paper towels
• Use Detergent Vinegar Solution, a little at a time
• Work from the outer edge of the spill inwards
• Frequently blot with dry cloths

**Urine**

• Blot dry with paper towels
• Spray with microbiological cleaner such as Zybax Ultra

**Egg, Ice Cream, Milk and Vomit**

• Scrape up excess with a blunt knife
• Use Zybax Ultra (standard dilution) starting at the outer edge
• Blot dry
• Lightly spray with Zybax Ultra (standard dilution)

**Remember**

Act Quickly. Scrape up solids, blot up liquids. Always work from the outer edge of the spill to the centre. Dab or blot rather than scrub or rub. Only use your carpet shampooer at most weekly – not daily.
A commercial washroom is inevitably going to see a higher level of use than your average bathroom. All fixtures and fittings will come into contact with many hands and the higher footfall will mean that everything will be dirtier. This means and the opportunities for odours to get out-of-hand are significantly greater.

It’s important to remember the urine that will accumulate on all surfaces including walls, doors and ceilings through natural splash and splatter. All surfaces need to be treated with a microbiological cleaner, ideally sprayed with any excess being mopped or wiped off.

Most retro-fitted waterless or flushless urinals have microbiological blocks or gels forming their core and must be cleaned with a microbiological cleaner to ensure odours are kept at a minimum.
Conclusion

Offensive odour can be one of the most difficult areas to manage and control due to its nature: what is offensive to one person may not be offensive to another due to variation in people’s sensitivity.

However it is important to undertake good working practises and an understanding that workplace odours are unacceptable and treatable.

- These solutions are tried and tested but, like all things, some situations are beyond normal. If trouble persists or they don’t work call us on 01484 868 970 or email us at hello@Zybax.co.uk for specialised solutions guaranteed to work.

www.Zybax.co.uk
eco-friendly odour removal

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www.Zybax.co.uk

Sources:
National Carpet Cleaner Association: www.ncca.co.uk