

## Section 6 Odour Control

Odour can be described as the sensation that results when olfactory receptors in the nose are stimulated by particular chemicals in gaseous form. The human olfactory sense organs are generally considered to be the oldest in evolutionary development and the importance of odours at low concentrations in human terms is related primarily to the psychological stress they produce rather than the harm they do in the body.

There are a broad range of human perceptions and responses to a variety of fragrances, aromas, neutral odours and malodours. The concentration with which an odour becomes a nuisance depends not only on its characteristic smell but also on factors which can influence the nose, such as social, regional factors, air temperature and humidity. Odour perception varies from human to human. Some will perceive a certain type of smell to be unpleasant whereas others will find it to be neutral or even attractive. A strong persistent positive odour can quickly become annoying inducing a negative response. After prolonged exposure humans can become de-sensitised to certain odours, e.g. workers at oil refineries often become de-sensitised to the smell of hydrogen sulphide.

Once a negative response is associated with a particular process, it is often difficult to change this perception. Indeed, where an organisation significantly reduces odour emissions, they still receive odour complaints.

Every odour sensation comprises a number of attributes. These attributes can be summarised as (Valentine and North, 1980):

- Hedonic tone or quality - pleasantness and unpleasantness.
- Intensity (or strength) - faint to strong.
- Recognition - reference can be made to characteristics odour descriptions and it may be possible to identify key odour components.

There are a number of anomalies with the above attributes. For example:-

- An odour may be pleasant when weak, unpleasant when strong. An odour may have one quality when first perceived, but another if persistent.

The concept of detectability is used to take account of these anomalies. The unit of detectability is the dilution to threshold value (i.e. the dilution at which there is a 50% probability of odour detection). This is typically described as an odour unit or as the Threshold Odour Number (TON). IPC license requirements relating to odour reflect local circumstances and are often presented as a generic condition:

“The licensee shall ensure that all operations on-site shall be carried out in a manner such that air emissions and/or odours do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.”

What is clear is that odours can be generated on a site and molecules of these chemicals have the potential to travel and cause offence to receptors. The first stage of odour management is to identify sources of all generated odours and then draw up a plan of action to counteract the perceived nuisance. This may be elimination or destruction at source (chlorine dioxide, Eco-San), oxidisation (Bio Activator), biological conversion or digestion (Bio Treat AB and Bio Treat OC), chemical precipitation and conversion (Bio Odour Control and AR1) or masking with fragrances (Bio Scent).