

# odour molecules

During the production of pet food a small amount of odour molecules are released which cause a large amount of odour. Aerox has introduced a modern method of controlling odour: low temperature oxidation using the Aerox Injector.

## Vobra

Vobra had decided from the very beginning that the Aerox-Injector was the only solution for them to control odour at the new Vobra pet food plant in Veghel (NL). They had achieved excellent results at their existing plant in Loosbroek (NL), located in the middle of the town, using the 5 and 7.5 kW Aerox installations that had been installed. That experience was the deciding factor for the decision to install a 20 kW Aerox-Injector in the new-build plant. As a result of the continuous technical development this was the latest XG type, with improved efficiency. When Dinnissen expanded its plant with a second extruder line in 2006/2007 the second 20 kW Aerox-Injector was installed. The result here was a measured odour reduction in excess of 90 percent.

As far back as the start of the industrial revolution attempts were already being made to reduce the concentration of unpleasant substances. Initially it was the high chimneys that offered a solution. High-rise emission outlets are still used today in order to reduce odour nuisance. Growth and expansion make this a less and less attractive option, as a result of which other techniques are emerging. Aerox from Vleuten (see box) has, amongst other things, the Aerox-Injector to control odour nuisance.

## Oxidation

The Aerox-Injector controls odour using low temperature oxidation. The principle relies on the fact that by oxidising odour molecules an additional oxygen

atom binds itself to the molecule as a result of which the odour can no longer be detected in the environment. Of the two systems that use this principle, gas washing and the Aerox-Injector, the latter is the most recent innovation in this field. "Around 1995, in conjunction with Cargill and others, this Dutch cold plasma technology was developed and made operational for the pet food industry", says Pieter Leenders from Aerox. It uses modules that are built from conductive plates that are separated from each other by special non-conductive ceramic plates. The electrical field that is created by the 2.5 to 3kV voltage difference between the conductive plates is, however, allowed to pass through the ceramic plates. "The air that is fed between these plates becomes radicalised, which means that oxygen and water molecules become separated, ultimately creating a highly reactive gas with unstable oxygen atoms, radicals, etc. This gas is fed into the outgoing air flow from the production process where it causes a rapid oxidation of the odour molecules."

## Pet food

The system is also used in the pet food sector. "One of the features of the system is that it does not interfere with the production process in any way at all. The Oxygen radicals are added at the end of the outgoing air flow and require less than 1 metre of pipe for the oxidation. We do not add any substances and we remain completely remote from the process technology that is used. Actually, the only thing we need is power." The maximum capa-

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city of one Aerox unit is approximately 100,000 m<sup>3</sup>/h, therefore, when combined it is possible to treat very substantial gas flows. In practice an effective reduction in odour of 90 percent can be achieved. The technique is used worldwide. For example, a factory in Korea with several production lines is using nine Aerox-Injectors. "The pet food sector is faced with the problem that a small amount of odour molecules causes a large amount of odour. Our equipment is ideal for dealing with that." A system was recently installed in a pet food plant in Germany, in the middle of the town. "This was a low-rise situation and therefore represented a considerable nuisance for immediate surroundings. For optimum efficiency the Injector at this plant was supplemented with

the Aerox Polishing Sieve, fitted with a thin layer of zeolite to provide a final filtering stage."

## Leasing

One of the features of the installations is that the modules are leased out by Aerox and are replaced after 8000 service hours. To do this the people in Vleuten use the latest GSM technology to monitor the service hours of all installations. After being returned the modules are recycled by Aerox. The same system is used to monitor the operation of the installation and help is available if a problem arises. Leenders sees numerous possibilities for the Aerox technology in the future. "There is turning out to be a market for our products in more and more industries. We started in the pet food industry, then the related processes came along, such as the production of fish meal and then the processing of oily seeds, for example for bio-fuels.

We are now also active in the rubber industry, the drying of tobacco leaves, in the chemical industry and in the processing of offal." Aerox has its own specialised test equipment with which

## Controlling odour

The following processes are typical for the modern control of odour:

- Low temperature oxidation, as used by the Aerox Injector. This achieves a rapid oxidation reaction using unstable oxygen atoms.
- The bio-filter, a biological process whereby the odour particles are removed by micro-organisms. This system requires continuous load in order to maintain the process and requires a large surface area.
- Basic oxidative gas washer, or 'scrubber', whereby the odour molecules are oxidised using an oxidant such as NaOCl (sodium hypochloride) or H<sub>2</sub>O<sub>2</sub> (hydrogen peroxide) so that the odour molecules are no longer active.
- Burning or incineration, which is mainly used for higher loads containing odour particles and is characterised by high energy consumption.

the efficiency can be determined and guaranteed in advance. Leenders also sees possibilities for using a range of techniques in one project. "By combining the possibilities in complex projects we can prevent the need to run one specific technique at full load, whereby the last few percent of efficiency costs a relatively large amount of energy. In such a situation, two combined technologies can result in a high-quality solution for less energy. ■

► The complete Aerox installation consists of an intake fan which feeds the air, via a filter and an air drier, to a housing containing the Aerox modules.



Aerox is located in Vleuten, where its founder, Verder, established the firm in 1959 which has since developed into the Verder Group. Since 2008 this group is made up of three divisions: Liquids, Process and Laboratory. Aerox is part of the Process Division, together with Jongerius Verder, Govatec Verder (B), Prominent Verder and Van Wijk & Boerema Pompen, amongst others.