


NOISE AND ODOURS

The site's activities must not generate noise or odour issues for its neighbourhood



	DIRECTIVE	ISO 14001 8.1
	<i>Noise and Odours</i>	EN_01 Rev.A

REQUIREMENTS SUMMARY

Requirements
The regulatory requirements are known and respected.
The site's environmental analysis takes into account the noise and odours issues.
The main noise and odours sources are identified.
The site has a complaint book to record the complaints from the neighbourhood as well as the ones from the authorities.
Complaints are treated in the best delays.
After the implementation of noise or odours mitigation measures, the site verifies their efficiency.



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1. SCOPE OF THE DOCUMENT

The present Directive discusses the noise and odours environmental nuisances generated by a site during its industrial activities (by the Valeo personnel or not).

2. ASSOCIATED DOCUMENTATION

Reference	Title
EN_01-Noises&Odours_SIR	Self Inspection Report
EN-01-Noises&Odours_Complaints	Complaints register form
HS_02-Noise_Directive	Noise at Work Directive


3. DEFINITIONS

Noise: In the present Directive, the term “noise” concerns the noise pollution generated by the site that can disturb the site’s neighbours (to be differentiated with the “Noise at Work” Directive which deals with employees’ safety).

Sound emergence: in the present Directive, the term “sound emergence” represents the additional noise contribution from the site to the ambient noise level. Concretely, the noise emergence at a measurement point is equal to the difference between the noise level measured when the site is operating and the noise level measured when the site is shut down. The emergence characterizes the site’s perception level (it differs or not from the background noise). Thus, for an equivalent noise level, the sound emergence of site will be low in a noisy environment (highway, industrial park, etc.) and high in a quiet environment (land for example).

Odour: In the present Directive, the term « odours » concerns the site’s atmospheric emissions discernible by the human smell.

Volatile Organic Compounds (VOC): according the EU, a VOC has a vapour pressure of 0.01 kPa or more at a temperature of 293,15 K, or has a corresponding volatility in specific using conditions.

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4. REQUIREMENTS

4.1. Compliance with applicable regulatory requirements

The site implements an organization which guarantees compliance with applicable regulatory requirements regarding noise and odours.

4.2. General principle

The site makes sure that it does not generate noise or olfactory pollution disturbing its neighbourhood.

In order to do so, the site:

- Identifies its noise and odours sources,
- Makes sure that its emissions are compliant with the applicable regulatory requirements,
- Makes sure that its noise and odours emissions are not a nuisance for its neighbourhood.
- Implements a procedure to treat complaints.

4.3. Environmental Analysis

Through its environmental analysis (ISO 14001), the site assesses the sound and olfactory impact generated by its activities on its neighbourhood. It identifies if the noise or the odours can be a site's significant impact.

The environmental analysis takes into account the sensitivity of the site's neighbourhood (industrial, residential, commercial, others). In addition to the regular update due to ISO 14001, the environmental analysis is updated regarding the noise and odours issues, for the following cases:


- o Installation/ removal of equipments ;
- o Movement of equipment on site ;
- o Complaints from the neighbourhood ;
- o Development of the neighbourhood.

4.3.1. Noise sources

In the framework of its environmental analysis, the site identifies its main noise sources and, particularly the ones generating a noticeable emergence.

In the Group, the main noise sources that could generate nuisance for the neighbourhood are:

- The ventilation or air filtration systems installed on the roof or on the buildings' walls,
- The air compressors or refrigerated unit (air conditioning) located outdoor,
- The delivering trucks,
- The outdoor operations of handling equipments,
- The waste compactor installations.

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In a residential environment, the residents perceive the site as unpleasant when its noise emergence is over:

- o 5 dB during the day,
- o 3 dB at night.

In the absence of local regulation, the site will retain these values to identify a significant emergence if it is in a residential environment.

If it is located in an industrial environment, it will retain:

- o 8 dB during the day,
- o 5 dB at night.

4.3.2. Odours sources

In the framework of its environmental analysis, the site identifies its main sources of olfactory nuisances.

An odour perception results in the presence in the environment of gaseous compounds, in particular Volatile Organic Compounds (VOC) with a small molecular mass (below to 100 g/mol).

The main olfactory compounds belong to the following chemical groups: sulphur, nitrogen, acetaldehyde and volatile fatty acids, to which hydrogen sulphide and ammonia must be added (see table below).


On the Valeo sites, the olfactory emissions usually result from:

- The use of solvents, thinners and other paints containing VOC,
- The production of VOC during chemical reactions (mix of compounds)
- The heating of some products (plastics, etc...) which are producing VOC.

The table below presents, for your information, some olfactory compounds and their perception thresholds.

	Compounds	Formula	Odour Characteristics	Olfactory thresholds ($\mu\text{g} / \text{m}^3$)
Sulphur	Hydrogen sulphide	H ₂ S	Addled egg	1 à 5
	Methyl mercaptan	CH ₃ SH	cabbage, garlic	4 à 50
	Ethylmercaptan	C ₂ H ₅ SH	cabbage	0,3 à 3
	Diméthylsulfure	(CH ₃) ₂ SH	decomposing vegetables	3 à 30
	Diméthyldisulfure	(CH ₃) ₂ S ₂	putride	≈ 50
Nitrogen	Ammonia	NH ₃	pungent, irritating	5 000
	Methylamine	CH ₃ NH ₂	decomposing fish	30 à 300
	Dimethylamine	C ₂ H ₆ NH	rotten fish	40 à 100
	Trimethylamine	C ₃ H ₉ N	rotten fish	≈ 0,5
	Propylamine	C ₂ H ₅ NH ₂		≈ 20
	Butylamine	C ₃ H ₇ NH ₂		≈ 500
	Aniline	C ₆ H ₅ NH ₂		50 à 1000
Acetaldehyde	Formaldehyde	HCHO	acid	65 à 1200
	Acetaldehyde	CH ₃ CHO	fruit, apple	50 à 300
	Propionaldehyde	C ₂ H ₅ CHO	rancid	≈ 20
	N-butylaldehyde	C ₃ H ₇ CHO	apple	20 à 50
	Valeraldehyde	C ₄ H ₉ CHO		20 à 70
Volatile fatty acids	Acetogenic	CH ₃ COOH	vinegar	≈ 900
	Propionique	C ₂ H ₅ COOH		≈ 80
	Butyrique	C ₃ H ₇ COOH	rancid butter	4 à 50
	Valérique	C ₄ H ₉ COOH	sweat	≈ 5

(≈ : approximately).

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4.4. Complaints management system

The site implements a system to manage complaints regarding noise and olfactory pollution.

This management system includes thirds' party complaints (neighbourhoods,...) as well as complaints from supervisory authorities (administrations, etc....)

Each complaint received by the site is sent to the HSE responsible who records and saves it into a log book. This book can be hand written or computerized and must contain, at minimum, the following information:

- o Date of the complaint reception;
- o Name of complainant;
- o Reason for the complaint;
- o Implemented measures (if applicable);
- o Date of response to the plaintiff.

An example of complaint record format under Excel is given in appendix (cf. chapter 2).

The HSE responsible systematically informs and transmits any new complaint to the Site's Director.

The site's environmental analysis is updated after each new complaint to confirm/ invalidate that the discomfort suffered by the complainant is linked to the site's activities.

The complaints are treated as quickly as possible. Under two weeks, the complainant must be informed of the measures taken or forecasted by the site to take his complaint into account.

After having treated a complaint, an investigation on the complaint treatment will be run with the plaintiff.

The following chapters describe some measures which could be implemented.

4.5. Noise mitigation techniques

Usually, the noise originates from the motion of mechanical surfaces that transmit their movement into the air, generating a sound. These movements are often associated to extraneous vibrations (not wanted), it is the case developed hereafter:

First of all, the noise sources must be identified, therefore, it is recommended to work with an expert.

When the noise has a vibration source, the techniques to reduce the noise are based:

- On the minimization of the vibrations generating the noise,
- On the reduction of the size of the vibrating surfaces,
- On the installation of noise screens.

At these noises reduction techniques can be added organizational measures designed to ensure that noise generated on the site has a minimum emergence by selecting the most suitable time (s) of the day for the activity generating noise.


1. Minimization of the vibration generating noise

Usually the vibration generating the noise is a parasite vibration (excessive friction, poor fixation of a mechanical part ...) which can be reduced by a preventive or adapted curative maintenance (lubrication, etc.).

2. Reduction of the size of the vibrating surfaces

The more important is the vibrating surface, the more powerful is the generated noise.

To minimise the vibration risk of a surface, the basic principle is to avoid the transmission of the vibration between the generator and the surfaces that could vibrate by implementing an "anti-vibration filter" between them.

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The most known example of anti-vibration filter is the silentbloc.



The less noisy equipments are generally equipped with this type of device.

3. Installation of noise screen

In some cases, when measures taken above are not sufficient, noise screens must be installed.

Their implementation must be validated by a noise expert. Indeed, screens often behave as reflectors redirecting the noise in another direction.

The measures indicated above are not exhaustive but allow to treat most of the cases encountered in Valeo sites.

4.6. Odour mitigation techniques

As indicated in the chapter 4.3.2, odours on Valeo sites are usually generated by VOC emissions.

In that case, odour mitigation requires a VOC treatment in order to reduce their emissions. The process to be followed is described below:

1. As VOCs treatment devices can represent significant costs, the site first has to consider the possibility of removing VOCs at source by replacing the product emitting scented VOCs by another product with a lower nuisance.


However, odour does not necessarily mean danger and conversely a lack of odour does not mean there is no risks. The odour is sometimes a good indicator to identify an anomaly (natural gas cannot be scented but mercaptans are added to make it fragrant to signal a possible leak).

2. The implementation of an effective VOC treatment requires a prior cost/advantage study to be conducted by a specialized company. Depending on the flows to be treated, some solutions are ineffective or too expensive, either at investment or during the operating phase.

The main VOC treatment processes are the following:

- o Recuperation processes allowing in some cases to reuse VOCs in the process:
 - Absorption (or washing), consisting in putting the VOC in contact with a liquid in which it is soluble,
 - Adsorption (usually by using activated carbon),
 - Condensation (use of cooling techniques up to cryogenics),
 - Membrane separation.
- o Destructive processes :
 - Thermal oxidation (can allow a valorisation of the generated thermal energy)
 - Catalytic oxidation (can allow a valorisation of the generated thermal energy)
 - By chemical reaction (neutralization reagent)
 - Biological treatment

Warning: destructive processes can generate acid or corrosive gases (e.g. oxidation of halogenated hydrocarbons)

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3. Ultimately, techniques called odours masking consisting is spraying masking products in the air, which :
- either generate a nice odour masking the unpleasant one,
 - or chemically react with the VOCs and mask their odour.

If the scented VOC emissions cannot be reduced, the discomfort can be reduced by increasing the dilution factor of the scented compound into the air, between its discharging point on site and the place where the discomfort is noticed. To do so, the easiest technique is to increase the height of the discharging point (height of a chimney).

For example, if the discharging point is at 5 m high, raising it at 10 m high usually divides by 5 the odour perception on the ground.

The measures indicated above are not exhaustive but allow treating most of the cases encountered by Valeo sites.