

New Guidelines in Italy for the Regulation of Odour Emissions

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An Executive Decree was published in Italy on 28 June 2023 by which the Ministry of the Environment and Energy Security (MASE) adopted the guidelines for the management of odorous emissions from industrial plants and activities. The document provides a framework to be used in the investigation and decision-making procedures of the authorities responsible for environmental authorisations and for the future development of regional and state legislation.

The guidelines contain criteria and detailed rules for the application of Article 272 bis of Legislative Decree 152/2006, the Italian Environmental Code. After a brief overview of the concept of channelled emissions, diffuse emissions and technically conveyable emissions, with a particular focus on odorous emissions, this paper aims to analyse, from a technical and legal point of view, the main contents of these guidelines.

1. Introduction

Odour is a pollutant that can have a significant negative impact on quality of life and economic activity, by, for instance, affecting property values or tourism revenues (Invernizzi et al. 2016; Bogalecka et al., 2023).

For this reason, the regulation of industrial odour emissions has been an issue in industrialized nations for several decades, in particular since increasing population density in some regions resulted in either the building of new residential areas alongside existing industrial facility or, vice versa, new plants in already settled areas (Sironi et al., 2012; Brancher et al., 2017).

Nowadays odour issues are a major contributor to environmental annoyances around the globe and, in some nations, they regularly account for the majority of environmental complaints to regulatory authorities. Many countries have environmental legislation covering most types of common air pollutants. From having little to no specific mention in environmental legislation to extensive and rigid detailing in odour source testing, dispersion modeling, ambient odour monitoring, setback distances, process operations, and odour control procedures, odour legislation tends to be much more varied and varies across a wide spectrum. In other words, the odour legislation can be very different from one jurisdiction to another (Bokowa et al., 2021).

In Italy, the legislation relating to odour emissions has been lacking for many years and, only recently, a series of new concepts relating to odour emissions have been included in Legislative Decree 152/06. The introduction of specific articles concerning conveyed or diffused emissions having effects of an odour nature has helped to fill that gap and give concrete and clear answers. More effective interventions for measures for the prevention and limitation of odour emissions can be achieved by updating these elements (Settimo et al., 2024).

Odours were only introduced into Italian environmental legislation in 2017 (Legislative Decree 183/2017) when a provision dedicated to odour emissions was introduced in the Environmental Code, which defines them as conveyed or diffuse emissions having odour effects (Invernizzi et al. 2020; Tagliaferri et al. 2021, 2022).

Under Article 272 bis of Legislative Decree 152/2006, regional legislation or authorizations may provide for measures for the prevention and limitation of odour emissions from installations.

Among the measures are:

- a) emission limit values expressed in volumetric concentration for odorous substances (quantity over one mg/Nm³volume);
- b) plant and management requirements and location criteria for installations and activities with a potential odour impact, including the obligation to implement containment plans;
- c) procedures to define, as part of the authorization procedure, localization criteria according to the presence of sensitive receptors around the installation;
- d) criteria and procedures to define, as part of the authorization procedure, maximum flow rates or maximum concentrations of odorous emission expressed in odorimetric units (ou_E/m³ or ou_E/s) for the sources of odorous emissions of the plant;
- e) specific maximum flow rates (expressed as quantities over time ou_E/s) or maximum concentrations of odour emission expressed in odorimetric units (ou_E/m³) for the plant's odorous emission sources.

This rule introduces a specific power for regional legislation and for the competent authorities to provide for prevention and limitation measures specifically defined for odorous emissions.

At the same time, article 272 bis paragraph 2 provides for the possibility of unifying the various regional regulations, entrusting this harmonization project to the Coordinating Body between the Ministry, Regions and Authorities responsible for air, established by the Ministry of the Environment. The role of the Coordination is to develop guidelines in relation to measures to prevent and limit odorous emissions.

2. The guidelines of the Ministry: scope and legal basis

Expected from 2017, the guidelines for the application of art. 272 bis of Legislative Decree 152/2006 in the field of odorous emissions of plants and activities were finally adopted in the Ministerial Decree of 28 June 2023 "*Guidelines for the application of article 272-bis of Legislative Decree 152/2006 on odorous emissions of plants and activities*" (MASE, 2023).

The Ministry clarifies that the guidelines will apply directly to the establishments covered by the fifth part of Legislative Decree 152/2006 (subject to a single environmental permit, emission permit or authorization schemes in derogation) and, indirectly, as a protection criterion to be used in the permit investigation, installations subject to integrated environmental authorization or other verification procedures and/or environmental authorizations that consider emissions into the atmosphere.

3. The key principles: installations and activities with potential odour impacts and applications for emission permits

In the light of the legal basis of the guidelines and the concepts of emissions into the atmosphere and odour emissions, the authors of the document propose two fundamental principles:

- a) the permit for emissions into the atmosphere and, consequently, the AUA (Unified Environmental Authorization), are entitled, in the case of installations and activities with a potential odour impact, to regulate odour emissions;
- b) applications for air emissions permits and AUA applications for establishments with installations/activities having a potential odour impact must therefore contain a description and an assessment of the odour emissions.

In the light of these principles, the document also contains:

- a) the identification of plants and activities with a potential odour impact;
- b) the choice of the content of the investigation that must characterize the application for authorization and the authorization procedure.

The acceptability values of the olfactory impact at the sensitive receptor are also included in the application for authorization.

Here lies an important feature of the document produced by the definition of national acceptability thresholds (refer to Table 1, reporting Table 3 of the ministerial guidelines) defined based on receptor sensitivity classes based on homogeneous spatial zones defined by regional planning.

These olfactory impact acceptability values at the sensitive receptor vary between 1 and 5 ou_E/m³.

Table 1. Table 3 of ministerial guidelines containing sensitivity classes and acceptability values at the sensitive receptor

Receptor sensitivity class	Description of sensitivity class	Acceptability value of the odour impact at the receptor
First	Areas in inhabited centers mainly for residential use. Buildings in inhabited centers intended for collective use and with a high concentration of people. Excluding commercial and tertiary uses.	1 ou _E /m ³
Second	Buildings or open spaces in inhabited centers intended for continuous collective, commercial, tertiary or tourist use.	2 ou _E /m ³
Third	Buildings or open spaces in inhabited centers intended for non-continuous collective, scattered houses.	3 ou _E /m ³
Fourth	Areas predominantly used for agriculture, industrial, artisanal and livestock farming.	4 ou _E /m ³
Fifth	Areas where the presence of people is not expected (agricultural land, uninhabited areas).	5 ou _E /m ³

The main technical characteristics of the authorization procedures for new and existing plants considered critical from an olfactory impact point of view are discussed in the following paragraphs.

3.1 Authorization procedure for new installations

In the case of an extended authorization procedure, the application for authorization for the evaluation of odour emissions shall contain:

- a) a description of the production cycle;
- b) the classification of the territory on which the establishment insists that defines the "sensitivity" of the receptors. These information are useful to define the characteristics of the territory are the official classification of the localities, the use of the area and the index of territorial manufacturability, the land use map, the urban use of the area;
- c) the identification of specific sources of odorous emissions (conveyed, diffuse and fugitive) including time and duration of operation;
- d) the chemical and/or olfactory characterization of odorous emissions to associate to these sources a value expressed in odour concentration (ou_E/m³) and odour flow (ou_E /s) according to UNI EN 13725. The chemical characterization (described in Annex A.4 to the ministerial guidelines) is aimed at detecting odour tracers. Sources with an odour flow of more than 500 ou_E /s are considered significant, with the exception of sources with a concentration below 80 ou_E/m³. The exclusion of such "non-significant" sources from the modelling calculation can be implemented only if the set of non-significant sources can be considered negligible or has an emission rate of less than 10% of the total odour of the plant. In any case, the possibility of the competent authority to request the inclusion in the modelling of sources below the threshold of significance remains unchanged;
- e) the assessment of impacts by means of a dispersion model, the specific requirements of which are set out in Annex A.1. to the ministerial guidelines (Tagliaferri et al. 2022);
- f) the identification of the necessary actions on the sources of odorous emissions (containment, treatment) in order to comply with the acceptable values.

3.2 Procedure for existing "critical" plants (resulting from reports, inspections, etc.)

In relation to existing installations for which critical issues related to the olfactory impact emerge, a special investigation procedure is envisaged, in which local and territorial bodies and the authorities and technical agencies competent in environmental and health matters also participate, called upon to evaluate the need to activate the review or update of the authorization.

The guidelines identify the following phases of the procedure:

- Phase A: phase of approach to the critical situation. If the olfactory disturbance is not caused by exceptional events or contingent technical anomalies, the guidelines provide for the organization of systematic monitoring of the perception of the disturbance among the resident population with the methods set out in Annex A.3. If the hours of odour perception validated in the area are greater than 2% of the entire monitoring period, it will be necessary to continue with phase B. The alternative envisaged is the direct start of the authorization review/update process.
- Phase B: phase of verifying the olfactory impact. This verification involves the olfactometric characterization of the odour sources (Annex A.2), the analytical determination of the chemical species (Annex A.4) and the application of modeling (Annex A.1). Other methodologies for the detection of odors may be used "on completion" (Annex A.3 and Annex A.5). If, following the outcome of the verification, the acceptability limits for the receptors in Table 3 of the ministerial document are respected, the competent authority will update the authorization by prescribing the plant-management solutions that have proven to ensure compliance limits of acceptability. Otherwise, it will activate the authorization review process.
- Phase C: authorization review phase. The review will take place on the basis of the preliminary material collected in the preceding phases and of an odour management plan containing the mitigation interventions, the times and methods of adapting the odour sources.
- Phase D: phase following the adaptation for the continuous improvement of performance.

Through the above procedure setting, the legislature sets a tolerance margin to the citizen (2% of the entire monitoring period). Only if the tolerance margin is exceeded, is the plant required to proceed with olfactometric characterization, odor flux estimation, and olfactory impact assessment. Finally, only if the limits are exceeded is the plant required to adopt emission containment procedures and new characterization and modeling of impacts.

4. Odour concentration values and emission limit values: sanctioning prospects

In light of the procedures identified above, the ministerial document specifies that during the monitoring period following the authorization application, a provisional authorization is issued. In this transitional phase, the odour concentration values (ou_E/m^3) and odour flow rate (ou_E/s) are only functional references for the identification of interventions and monitoring: their exceeding is therefore a prerequisite for modifying the interventions, without being subject to sanctions under the law.

At the end of the monitoring period, the Authority updates, if necessary, the contents of the authorization. The odour concentration (ou_E/m^3) and odour flow (ou_E/s) values thus modified or confirmed become prescriptive for the installation and their exceeding is therefore subject to a sanction. Specifically, this is the administrative sanction provided for by Article 279, paragraph 2 *bis*, of Legislative Decree 152/2006 provided for the violation of the authorization provisions (Art. 279, bis).

According to the now prevailing opinion, criminal consequences are not excluded if the emissions and consequent harassment are produced in the performance of an authorized activity. That is, odorous emissions constitute a crime even when they come from an industry whose activity has been authorized since the existence of an administrative authorization is sufficient to remove a limit to the entrepreneur's activity, but does not exempt the latter from the duty to adopt all measures recommended by experience and technique suitable for avoiding harm to public health.

This orientation distinguishes two hypotheses (Cass. pen ., Sec. III, 2018):

- a) if the authorization is missing, the criminal relevance of the odorous emissions must be assessed on the basis of "strict tolerability";
- b) if the authorization has been granted, the impact of such emissions, in the absence of a state law that sets the limits, must be assessed in the same way as "normal tolerability": the crime is integrated if it is proven that the company has not adopted those technical measures that can reasonably be used to reduce the odour impact on the outside. In this sense, the *Best Available Techniques* (BAT) become an essential reference.

Now that a national directive exists, the distinction may no longer have any reason to exist: in the presence of authorization, the impact of emissions will have to be assessed in the same way as what is contained in the authorization itself. In other words, the permit limit can reasonably be assumed by the Prosecutor's Office and the Courts as a tolerance limit. This therefore implies that the odour concentration will become the scientific starting point for evaluating whether normal tolerability has been exceeded.

5. Adjustment times and cogency of the guidelines

Not having a regulatory nature and therefore the status of a secondary source, nor the nature of a state law and therefore the status of a primary source, the guidelines adopted by the Ministry of the Environment regarding odour emissions are not directly binding.

According to the Constitutional Court, the rules contained in ministerial decrees can be considered technical rules, attributable to the exercise of the technical coordination function, if they are "*prescriptions that are generally developed on the basis of principles deduced from the so-called 'exact sciences'*".

At present, therefore, the odour concentration values (ouE/m^3) and odour flow rate (ouE/s) can be said to be binding only to the extent that they flow into the authorization requirements regarding odour emissions.

However, this does not imply that plants and establishments that produce emissions can simply wait for the Authority to start the authorization procedure or carry out checks in case of critical issues. It seems prudent, in fact, to immediately activate an analysis of the emission points and of the extent of odour emissions in order to preventively evaluate their compatibility with the new guidelines.

6. Conclusions

The need, perceived by many as urgent, to give uniform regulation to the issue of odour emissions has finally found implementation in the guidelines adopted by the Ministry of the Environment and Energy Security with Directorial Decree of 28 June 2023.

Through the establishment of a virtuous circle described in the ministerial guidelines, it is possible to protect citizens from industrial odour emissions without exceeding overly cautious prescriptions for plants.

Having therefore achieved the hoped-for standardization of regulations, through the identification of national acceptability thresholds, it must still be considered that, on the basis of art. 272 *bis* of Legislative Decree 152/2006, the Regions retain the power to regulate odour emissions, increasing the standard of environmental protection. This regulatory power, however, is not without constraints but must fit within the perimeter outlined by national legislation, according to the clarifications offered by the Constitutional Court with ruling 178/2019.

We can therefore expect a completion or update of the regional legislation on the basis of ministerial guidelines and, above all, important innovations in the area of authorization and control procedures, in view of which it seems appropriate to take spontaneous action now for the technological adaptation of the activities production with certain or potential odour impacts.

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