Australian/New Zealand Standard™

Stationary source emissions

Method 4: Area source sampling—Flux chamber technique

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EV-007, Methods for the Examination of Air.

It is Part 4 in a series of Standards that provides methods for the sampling and analysis of stationary source emissions. The objective of this Standard is to provide parties interested in the sampling and monitoring of stationary source emissions with a flux chamber sampling technique for the determination of atmospheric contaminant emission rates from area sources, in particular, the determination of odour and hazardous air pollutants.

Area sources include:

(a) Landfill surfaces (e.g. working face, soil/compost/synthetic cover, clay capped and revegetated) of various ages.

(b) Sewage treatment plant surfaces (e.g. inlet channels, primary sedimentation tanks, aeration tanks, activated sludge tanks, clarifiers, sludge lagoons, sludge drying beds, facultative lagoons, anaerobic lagoons and dissolved air flotation tanks).

(c) Composting surfaces (e.g. raw material stockpiles, compost windrows and final product stockpiles).

(d) Sub-surface contaminated groundwater sources (e.g. floating petroleum layer affecting surface emissions).

(e) Industrial sources (e.g. waste storage/disposal, sumps, surface spills, wastewater treatment plant surfaces and effluent disposal areas).

(f) Agricultural sources (e.g. feed lots, animal waste containments, crop preparation and residual crop treatment).

(g) Contaminated remediation sites.

The assessment of environmental impacts associated with area sources relies on the ability to accurately measure the rate of atmospheric contaminants emitted from various liquid and solid surfaces.

For odour impact assessments, these sources have historically been difficult to quantify, partly due to the variability in odour analysis techniques (dynamic dilution olfactometry) used, prior to the publication of AS/NZS 4323.3, *Stationary source emissions*, Part 3: *Determination of odour concentration by dynamic olfactometry*, and, more importantly, due to the range of sampling methods used in determining the area source emission rate. Techniques have included emission isolation flux chambers, wind tunnels, 'witches hats', source enclosures and downwind sampling/modelling techniques.

AS/NZS 4323.3, while confirming the importance of odour sampling methodology, especially for area sources, excluded consideration of sampling, hence the need for a separate Standard.

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The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

METHOD

1 SCOPE

This Standard sets out area source sampling protocols to be followed when using a flux chamber for the determination of odour or other atmospheric contaminants. The method provides a measure of area source odour and atmospheric contaminant flux emission rate, in units of ou.m³/m².s and g/m².s, respectively.

NOTE: Some indirect measurement techniques are described in Appendix A, however, they are for information only and do not form part of this Standard.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

ISO
Guide to the expression of uncertainty in measurement (ISO/GUM)

NATA
Technical Note 8—In-situ calibration of barometers

Technical Note 19—Liquid-in-glass thermometers—Selection, use and calibration checks

US EPA
Measurement of gaseous emission rates from land surfaces using an emission-isolation flux chamber. User's guide, EPA Contract No. 68-02-3889, Radian Corporation, February 1986

3 DEFINITIONS

For the purpose of this Standard, the following definitions apply:

3.1 Area source

A liquid or solid surface which emits odour or other inorganic or organic atmospheric contaminants.

3.2 Flux chamber

An enclosure device consisting of an open cylindrical base, a sweep air supply line, perforated sweep air distribution system, outlet line and flotation device (for liquid surfaces), as a minimum.

3.3 Flux emission rate

The atmospheric contaminant emission rate per unit surface area.

3.4 Odour

Organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances.