21st INTERNATIONAL **METROLOGY** CONGRESS

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Trescal

| CALIBRATION SOLUTIONS TO IMPROVE YOUR PERFORMANCE |

Olfactometry (Environmental Odour Pollution). Calibration of Olfactometers for detection according to EN 13725.

INTRODUCTION

Odour pollution has become one of the most relevant environmental problems in cities and urban environments. In this sense, it is necessary to determine a methodology that allows to quantify the environmental impact produced and, likewise, to provide criteria to elaborate the possible corrective measures plan.

Environmental impact studies for odours

In order to approach an environmental impact study for odours, there are two alternatives for carrying out this type of study. The first approach, and the most commonly used, are studies based on emission measurements using the methodology described in the EN 13725 standard (Determination of odour concentration by dynamic olfactometry) and secondly, studies based on emission measurements.

To perform the studies described, olfactometer calibration is fundamental since quality criteria must be maintained and in order to comply with EN 13725 according to section 5.4.2, and are defined on the basis of parameters describing accuracy and precision. These quality requirements are formulated identically to those of other analytical, chemical or physical methods. In order to meet these requirements, reference materials (RM) that are covered by calibration laboratories (EN ISO/IEC 17025:2017) are used, as well as the calibration laboratory itself that performs the calibration being covered under this accreditation.

The calibration of the dilution equipment, the olfactometer must be performed regularly (at least once a year) using a suitable tracer material e.g. carbon monoxide and an expanded uncertainty of less than 3% and a physico-chemical analysis method, e.g. continuous infrared. For each of the dilutions offered by the equipment, the accuracy, precision and instability are determined.

CALIBRATION OF THE DILUTION EQUIPMENT, OLFACTOMETER ACCORDING TO SECTION 6.5.5. AND ANNEX C OF THE EN-13725 STANDARD

INTRODUCTION & CALIBRATION

The olfactometer calibration test consists of determining the precision and instability with the data obtained and verifying that these meet the two parameters indicated below:

- Ad < 0,20 (Accuracy)
- Id < 5 % (Instability)

CALIBRATION PROCEDURE

1 Bags are filled with known concentrations of CO (Reference Mixtures).

2 Different dilutions are carried out in the olfactometer by connecting the known concentrations of CO (filled bags) to the olfactometer and using air as a diluent to carry out the dilutions.

3 In order to check the concentration of the dilutions obtained, a CO analyzer Calibrated) is placed at one of the olfactometer outputs to compare the data obtained in the dilutions with those that should really be obtained according to the theoretical dilution carried out. These data are used to check whether the data obtained in the previous paragraph meet the requirements.

REQUIREMENTS EN 13725:2022

Parameter	Tolerance	Comments
Tracer Material (Reference Gas)	< 3 %	Carbon monoxide can be used (Reference Gas Bottles)
Tracer Material (Equipment)	< 3 %	Continuous infrared meter
Calibration Interval	≤ 1 year	The recommended calibration interval is at least one year or less.
Dilutions offered by the equipment	-	Accuracy and instability are to be determined.

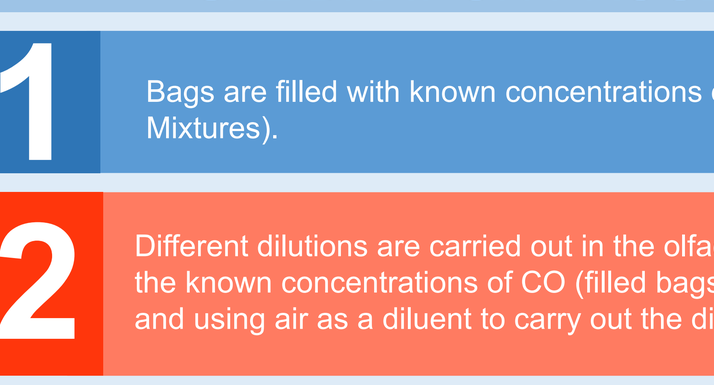
ACCREDITATION SCOPE

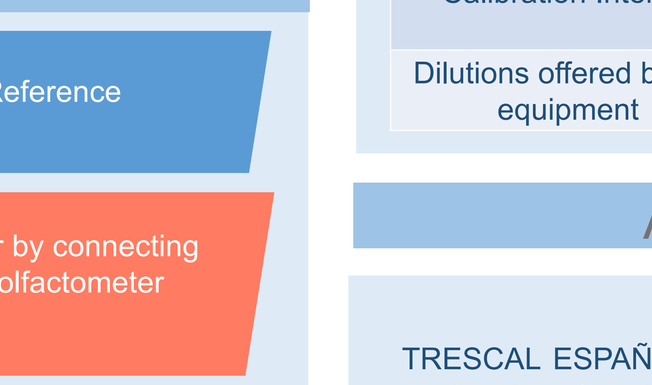
TRESCAL ESPAÑA in Madrid is accredited for the conformity of a dilution apparatus (olfactometers) according to EN 13725:2022 Section 5.4.2 for laboratory and on site:

https://www.enac.es/documents/7020/a699427e-1c65-4e0c-99f6-c6d09099632e

Dilution apparatus for olfactometry Dilution ratio: (1:100000)

OLFACTOMETER CALIBRATION



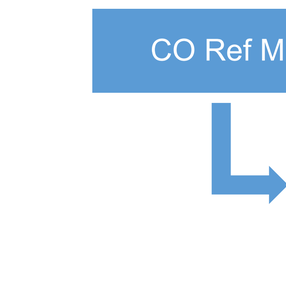


OLFACTOMETER USE

CONCLUSION

Odours generated by various sources represent an environmental problem and are the source of numerous complaints among the population. Even if the odorous substances emitted do not have any harmful effect on health, the nuisance caused by odours can constitute a serious problem that needs to be evaluated, its causes investigated and solved in order to respond to the complaints of society.

For this, one of the elements that intervene to be able to quantify them are the olfactometers and the need for their calibration according to the requirements of Standard EN13725:2022, and thus to have the possibility of developing control and monitoring programs on this matter based on Standard EN-13725:2022 "Air Quality", determination of odour by dynamic olfactometry", for the sampling of odours in emissions and their subsequent analysis".



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REFERENCES

- EN 13725:2022 Stationary source emissions. Determination of odour concentration by dynamic olfactometry and odour emission rate