

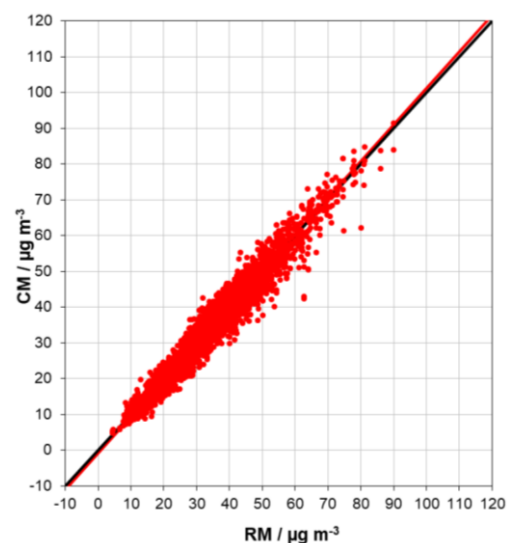
# Demonstration of Equivalence for NO<sub>2</sub> Diffusion Tubes

passam info

last updated: 2024

## Introduction

The NO<sub>2</sub> diffusion tubes from passam are characterized by high accuracy. Long-term comparative studies with the EU reference method, i.e., chemiluminescence according to EN 14211 [1], as per the EU Directive 2008/50/EC [2], serve as evidence of this accuracy. Although this method has been established as the reference by the EU, alternative methods for monitoring air quality are permissible, provided their equivalence can be demonstrated. The criteria for this proof are strict and are detailed in the 'Guide to Demonstrating the Equivalence of Ambient Air Monitoring Methods' [3]. The passive samplers from passam have successfully proven their equivalence for determining annual mean values [4], monthly [5], and biweekly measurements [6]. The empirically determined measurement uncertainty for nitrogen dioxide at the annual limit value of 40 µg/m<sup>3</sup> is ≤ 15% as illustrated in the Figure [5]. Consequently, these samplers can be used for fixed-site measurements, as required by the EU Directive [2].



## References

- [1] EN 14211:2012, Ambient air — Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence
- [2] EU Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
- [3] Guide to the Demonstration of Equivalence of Ambient Air monitoring Methods, version January 2010. Available at [https://joint-research-centre.ec.europa.eu/system/files/2016-10/aquila-guide\\_equivalence.pdf](https://joint-research-centre.ec.europa.eu/system/files/2016-10/aquila-guide_equivalence.pdf)
- [4] Pfeffer, U., Zang, T., Rumpf, E.-M., & Zang, S. Calibration of diffusive samplers for nitrogen dioxide using the referencemethod – Evaluation of measurement uncertainty; Gefahrstoffe - Reinhaltung der Luft, 70,11/12, 500-506, 2010.
- [5] Zang, Thorsten (2021) Messen von Stickstoffdioxid in der Aussenluft: Nachweis der Gleichwertigkeit von Passivsammlern. Landesamt für Natur, Umwelt und Verbraucherschutz NRW. Recklinghausen (LANUV-Fachbericht, 108). [https://www.lanuv.nrw.de/fileadmin/lanuvpubl/3\\_fachberichte/Fachbericht\\_108\\_Stickstoffdioxid\\_Aussenluft.pdf](https://www.lanuv.nrw.de/fileadmin/lanuvpubl/3_fachberichte/Fachbericht_108_Stickstoffdioxid_Aussenluft.pdf)
- [6] Preuss, M., Clemen, S., Grunow, K., Kaupp, H. NO<sub>2</sub>-ÄQUIVALENZNACHWEIS für die im Berliner Luftgütemessnetz eingesetzten Passivsammler für das Jahr 2021, Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz Berlin. Berlin 2022. [https://www.berlin.de/sen/uvk/\\_assets/umwelt/luft/luftqualitaet/luftdaten-archiv/monats-und-jahresberichte/no2-aequinachweis\\_berlin\\_2021.pdf](https://www.berlin.de/sen/uvk/_assets/umwelt/luft/luftqualitaet/luftdaten-archiv/monats-und-jahresberichte/no2-aequinachweis_berlin_2021.pdf)