ICCE 2023 VENICE

OP/POS XX

Pollutant Emissions From Wood-Fired Pizza Ovens

A. Bergomi[1]*, S. Chiavarini[2], C. Morreale[3], S. Bertagna[3], P. Fermo[1], T. La Torretta[4], A. Malaguti[4], M. Stracquadanio[2] and G. Migliavacca[3]

[1] University of Milan, Department of Chemistry, Via Golgi 19, 20133, Milan, Italy
[2] ENEA, Division Protection and Enhancement of the Natural Capital, Via Anguillarese, 30100123, Santa Maria di Galeria (RM), Italy
[3] Innovhub Stazioni Sperimentali per l'Industria, Area Combustibili, Via Galilei 1, 20097, San Donato Milanese (MI) , Italy
[4] ENEA, Atmospheric Pollution Laboratory, Via Martiri di Monte Sole 4, 40129, Bologna, Italy

andrea.bergomi@unimi.it

Recent studies estimate that a non-negligible percentage of atmospheric particulate matter (PM) collected (sampled) in urban areas can be attributed to emissions deriving from the combustion of solid biomass for uses other than heating [1]. One of the activities that could be responsible for these emissions are pizzerias with wood-burning ovens, which are active all the year and are highly concentrated in Italian large cities. However, measurements of the emission factors of these devices have never been performed in practice. In this study, experimental tests were carried out on a traditional wood-fired oven using two different fuels (beechwood logs and briquettes) in order to determine the pollutant emissions of the device. The sampling system employed (Fig. 1) was constructed by referring to the UNI EN 16510-1:2019 technical standard, and enabled the simultaneous measurement of pollutants and other substances on the hot and cold flue gases. The pollutants measured during the tests were: carbon monoxide (CO), nitrogen oxides (NOx), organic gaseous carbon (OGC), PM, and polycyclic aromatic hydrocarbon (PAHs). A sampling protocol and appropriate combustion cycles were established in order to simulate, as far as possible, the real-life operating conditions of an oven within a public establishment. The results show that the pollutant emissions of the wood-fired oven fall within the wide range of values observed in literature for other wood-burning appliances, such as stoves and fireplaces [2], indicating these devices as relevant air pollution sources in urban areas.

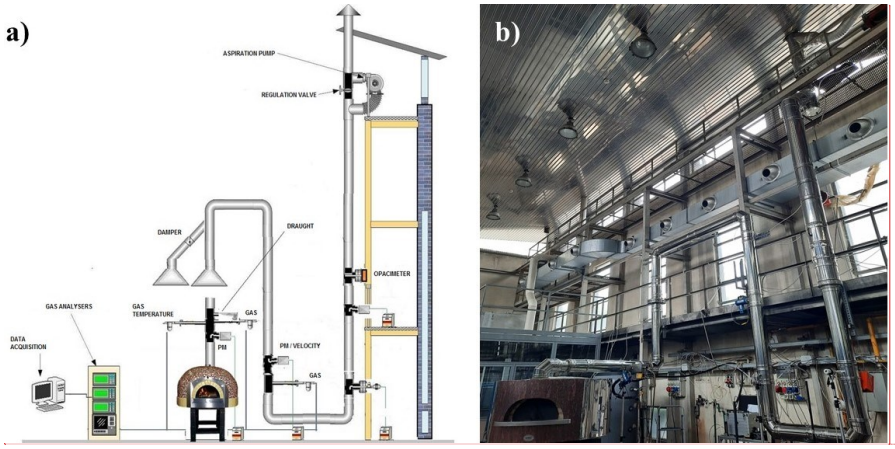

Figure 1. a) Sampling system scheme (not to scale) [3]; b) Real-life sampling system.

References

[1] Hugony F. (2020) 'Progetto Metropizza', Seminar, Città metropolitana di Milano – ENEA, Milano, IT.
[2] Tomlin A. S. (2021) 'Air Quality and Climate Impacts of Biomass Use as an Energy Source: A Review', Energy & Fuels, 35, p. 14213–14240. https://doi.org/10.1021/acs.energyfuels.1c01523.
[3] Bergomi, A. et al. (2022) 'Determination of pollutants emissions from wood-fired pizza ovens', Chemical Engineering Transactions, 92, p. 499-504. DOI:10.3303/CET2292084.

Commentato [CL1]: Please do not remove the instructions in the comments

This document should not exceed a length of 1 page

Commentato [CL2]: Authorship format:
M. Rossi[1]*, F. Bianchi[2] and G. Verdi[3]
(* for presenting/corresponding authors -must coincide)

Commentato [CL3]: One affiliation per line.
Format:
[1]Institution, Department, Address (i.e. Street and number, ZIP code, City, Nation)

[1]Ca'Foscary University of Venice, Department of Environmental Sciences, Via Torino 155, 30172, Venice Mestre, Italy

Commentato [CL4]: To add a figure click on the symbol in the center of this box

Commentato [CL5]: Please use Cite Them Right 11th Edition - Harvard style:

Smith, J. *et al.* (1900) 'Title', *Journal*, Issue, p. 00. doi: .