

# Evaluating the performance of low-cost Alphasense OPC-N3 in an indoor environment

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Air pollution is associated with an increased health risk and estimated to cause millions of premature deaths worldwide every year. The chemical and optical analysers needed to monitor air pollution, while providing accurate measurements, require a considerable investment, constant calibration and maintenance and are thus restricted to a limited number of applications, resulting in an inadequate spatial and temporal coverage. The development of low-cost sensors can enable the acquisition of high-resolution air quality data and the creation of a larger network, thus helping the characterization of pollutant emissions and the assessment of real-time exposure. In this context, a measuring campaign was conducted at the National Research Council (CNR) site in Portici (Naples, Italy), a pilot facility of the BIOMAT project, aimed to assess the potential occupational exposure to harmful particulate matter (PM), during the production process of nano-enabled PUR foams. For this purpose, four low-cost optical particle counters (Alphasense, OPC-N3) were deployed alongside two reference instruments (OPC Grimm 1.107). The data obtained shows good agreement between the overall trends for the OPC-N3 and the reference instrument, while highlighting the inability of the low-cost sensors to correctly estimate the absolute value of PM10 concentrations. This first campaign showed how the exposure of the facility workers was mainly attributable to the coarse fraction of particulate matter.