

ST1: Protocol for measurement of ambient concentrations of Ultrafine (=nano)-Particle Number Size Distributions (UFP-PNSD), with recommendations on the instrumentation, the request of the size ranges to be measured, the operational conditions and data management, including near-real-time (NRT) data access for UFP-PNSD. This will provide UFP concentrations in different size ranges that can be used for evaluating their source contributions.

The linked resources for this ST include:

- 1) RI-URBANS general guideline document on non-regulated air pollutants: Deliverable 1 (D1.1) Guidelines, datasets of non-regulated pollutants incl. metadata, methods https://riurbans.eu/wp-content/uploads/2022/10/RI-URBANS_D1_D1_1.pdf. **Particularly section 2.**
- 2) ACTRIS (The Aerosol, Clouds and Trace Gases Research Infrastructure) & GAW (Global Atmosphere Watch) program recommendation documentation, which include guidelines for aerosol sampling, inlet design and selection of instrumentation: <https://www.actris-ecac.eu/actris-gaw-recommendation-documents.html>
- 3) Guideline for the aerosol size distribution measurements, sampling and instrumentation can be found through ACTRIS calibration center for aerosol in-situ: <https://www.actris-ecac.eu/pnsd-10-to-800nm.html>. The recommendations support instrument setup, tackling size-dependent loss-corrections and elaborate on the standard operation procedures for ensuring harmonized observations across the network.
- 4) Milestone M3 (M1.3): NRT aerosol number size distribution ST for RI-URBANS. The milestone summarizes the process of NRT aerosol NSD data delivery (using the software developed by CAMS21a): https://riurbans.eu/wp-content/uploads/2022/02/RI-URBANS_MS3.pdf
- 5) Milestone M19 (M4.3): Aerosol number size distribution measurements. The milestone summarizes the pilot examples for the NRT size distribution data delivery: https://riurbans.eu/wp-content/uploads/2022/10/RI-URBANS_M19.pdf

Scientifically this ST1 links Trechera et al. (2022): <https://www.sciencedirect.com/science/article/pii/S016041202300017X>, which summarizes the current state-of-the-art and provides scientific interpretation of the recent aerosol size distribution measurements in urban European environments. Liu et al (2023a): <https://doi.org/10.1016/j.scitotenv.2023.165466>, on ambient air particulate total lung deposited surface area (LDSA) levels in urban Europe.