

Proposals for NORMAN Joint Programme of Activities 2025

Title	Workshop and Feasibility Study: NORMAN Database for (FT)IR Spectra for Micro Plastic Analysis
Type of activity	Workshop and feasibility study
Leader	Ralf Kaegi (Eawag) and Bert van Bavel (NIVA)
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>The particle-based quantification of microplastic particles (MP) in or extracted from complex matrices (including for example soils, sediments and sewage sludge) relies on an accurate assignment of experimental spectra to available spectra of well-characterized (reference) spectra. Establishing such a database with reference spectra from different polymer types and differently aged variants would be beneficial to many researchers on this research field. Currently no central database exists, and information is fragmented and limited to different data treatment software or instrument makers. Different databases for infrared (IR) absorption spectra (Fourier Transform (FT) IR or direct IR) may not be compatible with each other due to variations in spectral resolution, data formats, and the range of materials included. This can lead to inconsistencies in identifying microplastics.</p> <p>Many databases have a limited number of reference spectra, which can hinder the identification of less common or novel microplastic types. The quality of spectra in databases can vary significantly. Factors such as particle size, shape, and surface contamination can affect the spectra, leading to misidentification. Additionally, environmental degradation of plastics can alter their spectral characteristics. Manual comparison of spectra is time-consuming and prone to human error. Automated analysis requires well-designed algorithms, but the performance of these algorithms is only as good as the databases they rely on.</p> <p>In addition, there is a lack of standardization in how spectra are collected and processed. Differences in instrumentation, measurement techniques, and data processing methods can lead to discrepancies between databases. Furthermore, databases need to be regularly updated to include new types of plastics. Addressing all issues involves developing more comprehensive and standardized databases, improving data quality, and enhancing automated analysis techniques to reduce human error and increase efficiency.</p> <p>All this was clearly seen in the data reported by different laboratories as seen in the ILC studies organised by NORMAN.</p> <p>WG4 therefore plan to organise a workshop to assess the current needs from instrument and software providers and from end users for establishing such a database. We thus plan to organise a workshop addressing the following questions:</p> <ul style="list-style-type: none"> • Which databases are already available and for which instruments and software applications? • What is needed, required (from the perspective of the instrument providers, software developer's and researchers (end users))? • How could such a platform be integrated into and maintained by the NORMAN network? <p>Description of the proposed activity and expected outcomes for 2025:</p> <p>For the workshop representative from industry (instrument providers, software developers) as well as researchers representing the end-users. The workshop will be organised as a hybrid allowing the staff to participate remotely.</p> <p>Based on the feedback and the interest of the workshop participants and complemented by an assessment of the feasibility of a MP FT(IR) database within the NORMAN data system, a report will be presented to decide to what extent the idea of establishing an (FT) IR database within the NORMAN network should be pursued further.</p> <p>Added value / Link with other NORMAN activities and / or other projects:</p> <p>NORMAN is well-known for its activities for its core activities creating databases to ensure method harmonization on POPs. The activity is well aligned with NORMANs mission to enhance the exchange of information and collection of data on a new emerging environmental pollutant, micro and nano plastics. The JPA will strengthen the quality of monitoring of micro and nano plastics for the marine environment (WG8) but also of important for the indoor environment (WG6) and terrestrial environment (WG7).</p> <p>Workshop 2025 Q1 Feasibility report 2025 Q3</p>
Participants	NIVA, Eawag, UVA, EI
Proposed in-kind contribution	NIVA: 4'500 € in collaboration with PlasticTrace
Contribution needed	7'500 €



from NORMAN
Association¹

¹ Please, provide here a transparent justification of the requested resources and of the in-kind contribution, thereby distinguishing between the costs associated with “person-months” for the organisation, the “travelling costs” for invited speakers and the costs for the logistics (e.g. meals, room rental etc.)