Establishing Metrology Standards in Microfluidic Devices

Newsletter 3

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Welcome

We are delighted to share the latest edition of our newsletter with you! In these pages, you will find an inside look at the project's current progress, a showcase of recent achievements, and highlights from the exciting work underway across the consortium.

Over the past six months, our teams have made significant advances in developing new calibration setups for a range of metrological quantities, while also launching the first round of measurement activities. A particularly exciting milestone is the availability of new glass chips, which are now ready for use by partners in their experiments. At the same time, development of the new microfluidic platform has progressed rapidly, and the final layout has been successfully completed.

Collaboration and knowledge exchange remain at the heart of our project. We are proud to have hosted two highly successful workshops, one in Glasgow, UK, and the other in Tokyo, Japan, bringing together experts and fostering valuable discussions and new connections.

Our consortium members continue to play an active role in shaping the field, contributing to ISO/TC 48/WG 3 (now SC10) and ISO/TC 276/SC 2, and driving the development and revision of key international standards. In parallel, our results have been widely shared at both international and national conferences, helping expand our reach and impact.

We also invite you to explore our project website: https://mfmet.eu/. With an average of 1,800 visits per month and more than 100,000 visits overall, it has become a vibrant hub for information and a clear sign of the growing interest in our research.

We hope this newsletter offers valuable insights and inspiration. Whether you are a stakeholder, collaborator, or simply curious about our progress, we warmly encourage you to stay connected, and we look forward to welcoming you to our growing project community.

Elsa Batista

Coordinator of MFMET II Project

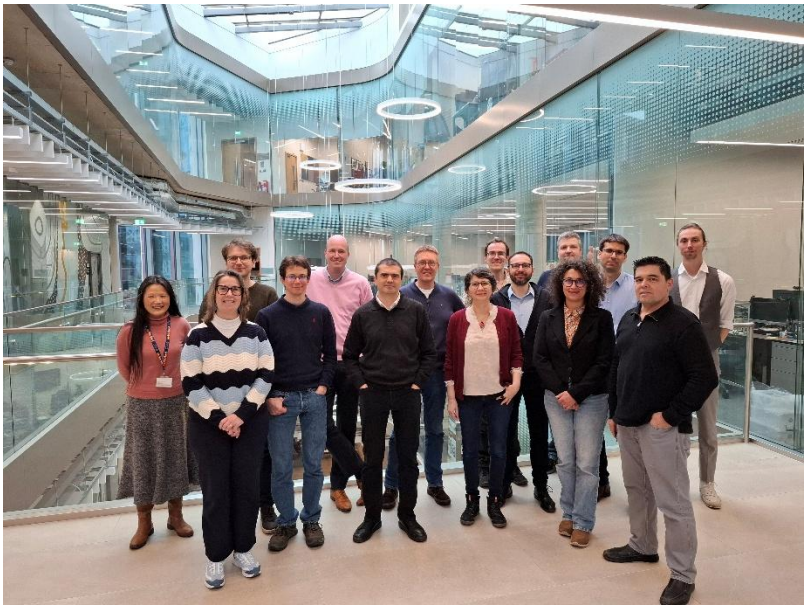
News and facts

• The project collaborated with the Microfluidic Association to organise two workshops:

One at University of Glasgow on the 27th of February 2026, titled “Challenges to translation in microfluidics and organ-on-chip”. 70 participants from industry, academia, and government organizations attended the 4 sessions with 13 presentations, 15 posters, 5 exhibitors, and a round table.

The second was held in Tokyo on the 11th and 12th of May 2026, with the support of JAMAC. Workshop Microfluidics Symposium: Innovations in Sensors, Materials, and Smart Microsystems with 60 participants, 5 sessions with 15 presentations, 10 posters, and 2 exhibitors.

- We had our M9 meeting in Glasgow, UK, on the 26th of February, where we held an internal onsite training on basic concepts of organ-on-chip technology for MFMET II Partners. Our M9 report was approved by the MSU.



- We now have the support of 47 stakeholders, with The Microfluidics Association as our chief stakeholder.

- TNO joined the project as a collaborator and will supply additional chips for the consortium to test.
- The project consortium established a liaison category C with ISO TC276/SC2/WG1 and ISO TC276/SC2/JWG4 in January 2026.
- Our next workshops will be held at the following location:
    - 10 of September 2026, Kaunas, Lithuania. More information and registration at the general ENTRUST conference website

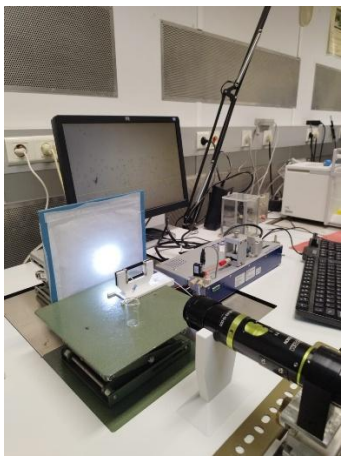
- The website of MFMET is www.mfmet.eu

Highlights from the work packages

The major achievements by work package are as follows:

WP1 - Establishment of standard procedures to metrologically assess and characterise microfluidic devices

This WP has focused on the development of new methods for measuring different quantities, such as flow velocity, shear stress, dead volume, and hydrodynamic resistance. Glass chips are now available for partners to test these new methods.

Furthermore, WP1 has elaborated on the following reports:

- Silverio, V., Daugbjerg, T. S., Batista, E., Ogheard, F., Büker, O., Geršl, J., Laimböck-Wouters, M., Tzannis, A. P., Cinquin, B., & Kronemeijer, A. J. (2026). MFMET II A1.3.1 – Review of methods for measuring and simulating total volume and dead volume. https://doi.org/10.5281/zenodo.20305916
- Büker, O., Ogheard, F., Batista, E., Yin, H., Daugbjerg, T. S., Knotek, S., Silverio, V., Bertašienė, A., & Romieu, K. (2026). MFMET II A1.2.2 – Selection of Methods and Microfluidic Devices for Characterising Pressure Drop and Flow Resistance in Newtonian and Particle-Laden Flows. https://doi.org/10.5281/zenodo.20305905

WP2 - Development of protocols for the integration of elements and material characterisation in microfluidic devices

This WP focused on the development of several reports on sensors and materials, including information on a universal connector.

Furthermore, WP2 has elaborated on the following reports:

- Vrouwe, E., Yıldırım, E., Loessberg-Zahl, J., Batista, E., & Silverio, V. (2026). MFMET II A2.1.4: Guideline describing relevant characteristics for the development of a universal connector for the integration of off-chip sensors and actuators identified in A2.1.1. https://doi.org/10.5281/zenodo.21102761
- Silverio, V., Batista, E., Vrouwe, E., Yildirim, E., den Dulk, R., & Loessberg-Zahl, J. (2026). MFMET II A2.1.3 - Guideline for the Integration of Sensors, Actuators, and Fluidic Components in Microfluidic Devices. https://doi.org/10.5281/zenodo.21102190
- Silverio, V., Batista, E., Loessberg-Zahl, J., Yildirim, E., Zimmermann, S., Vrouwe, E., & den Dulk, R. (2026). MFMET II A2.1.2: State-of-the-art review on integration strategies and performance for sensors, actuators and fluidic components. https://doi.org/10.5281/zenodo.21101345

- Loessberg-Zahl, J., Silverio, V., den Dulk, R., Kaal, J., Batista, E., van Heeren, H., Gumuscu Sefunc, B., & Safai, E. (2026). MFMET II 2026 Revision – Microfluidic devices: Interoperability requirements for dimensions, connections and initial device classification. https://doi.org/10.5281/zenodo.18484396

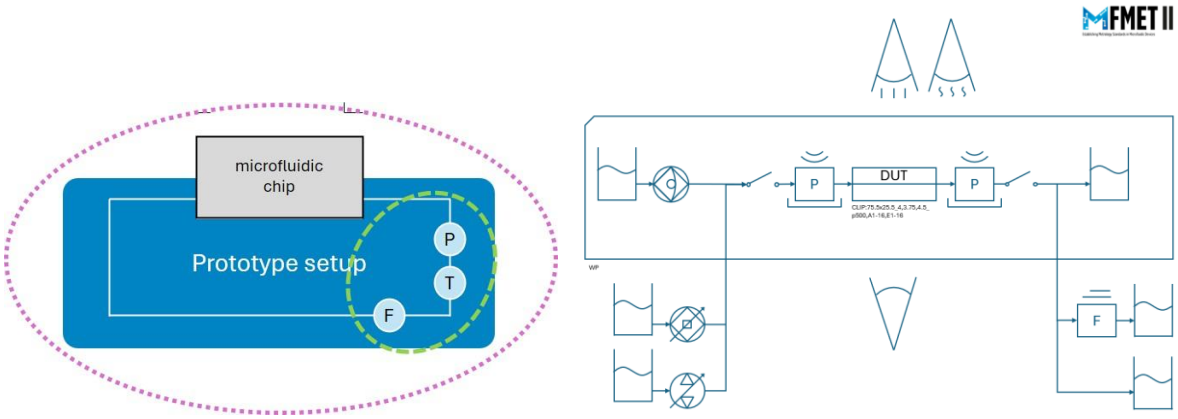
WP3 - General guidelines for quality control, validation and characterisation of microfluidic devices
WP3 focused on developing methods for leakage, bonding strength, and burst pressure in microfluidic devices.

The following documents were also developed:

- Yin, H., Silverio, V., Büker, O., Batista, E., & Bertašienė, A. (2026). MFMET II A3.1.4 – Summary of the outputs of 3.1.1 to A3.1.3. https://doi.org/10.5281/zenodo.19731772

WP4 - Development and characterisation of a new setup and performance evaluation of integrated microfluidic systems

WP4 has focused on the design of a microfluidic prototype setup, with the selection of its main components. The detailed design for the integration of these components is currently underway.



Dissemination of work since June 2025

- We have presented 15 oral presentations and 8 posters at several international conferences. Project partners attended Labsummit 2026 in Coimbra, Portugal on the 7th of May, FLOMEKO 2026 conference in Nara, Japan from 18th to 20th of May 2026 and EUROOCS 2026 from 22-24 of June in Braga, Portugal.

- The project was also presented to ISO/TC 48/WG 3, now SC10, ISO/TC 276/SC 2/WG 1, ISO/TC 276/SC 2/JWG4, at the 5th Biomems from 11th and 12th of June at SUNUM, Sabancı University, Turkey, and in EURAMET TC F 2026 in Lyon, France.

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