Fraunhofer ICT

Announcement and Call for Papers

Flow Battery Day 2027

Advanced Characterization and Testing for Flow Batteries

Electrochemical methods | Operando diagnostics
Accelerated testing | Degradation diagnostics
Benchmarking

March 9, 2027
Fraunhofer ICT, Pfinztal, Germany

PREDICTOR spacer

»Advanced Characterization and Testing for Flow Batteries«

It is my pleasure to welcome you to the first Fraunhofer ICT **»Flow Battery Day«** on 9 March 2027 at our site in Pfinztal.

Redox flow batteries are attracting increasing attention as a technology for stationary and long-duration energy storage. Alongside the development of new electrolytes, electrodes, membranes and cell concepts, the ability to characterize these materials and systems reliably is ever more important. Meaningful comparison of results requires advanced experimental methods and a clear understanding of measurement conditions, degradation mechanisms, uncertainty and reproducibility.

The meeting will bring together researchers from academia, research institutes and industry to discuss electrochemical characterization methods, advanced in-situ and operando diagnostics, accelerated testing and lifetime assessment, degradation and failure analysis, as well as approaches toward improved benchmarking and reproducibility.

The scope extends from fundamental material and electrolyte characterization to the testing and validation of electrodes, membranes, cells, stacks and complete systems. By bringing these perspectives together, we aim to encourage discussion not only about how flow batteries perform, but also about how that performance is measured, interpreted and compared.

A distinctive feature of this conference is that it is organized entirely by the doctoral researchers in the Fraunhofer ICT flow battery group.

The program will provide opportunities for poster discussions and scientific exchange across different levels of flow battery development. We hope to stimulate new collaborations, identify common challenges and advance characterization and testing practices.
On behalf of Fraunhofer ICT and the organizing committee, I warmly invite you to join us in Pfinztal for a day of scientific discussion, exchange and collaboration.

Dr. Jens Noack | Conference Chair
Fraunhofer Institute for Chemical Technology ICT

In 2027, Fraunhofer ICT will launch an annual conference for the redox flow battery community. The first edition will focus on how flow batteries are characterised, tested, diagnosed and benchmarked.

Main topics

A | Electrochemical Characterization
CV, EIS, CA, CP, kinetics, diffusion, reference electrodes, SOC-dependent measurements, calibration, measurement artefacts and uncertainty.

B | Operando and In-Situ Diagnostics
Spectroscopy, imaging, tomography, spatially resolved measurements, sensors and online monitoring.

C | Degradation, Lifetime and Failure Analysis
Electrolyte decomposition, electrode ageing, membrane degradation, crossover, precipitation and capacity fade.

D | Accelerated Testing and Lifetime Prediction
Accelerated ageing, stress testing, cycling protocols, temperature/SOC/current effects, application-relevant duty cycles, lifetime modelling and correlation with real-world ageing.

E | Benchmarking, Reproducibility and Standardization
Testing protocols, round-robin testing, uncertainty, KPIs, minimum reporting requirements, metadata, reference conditions and data comparability between laboratories.

F | Electrolytes and Redox-Active Materials
Organic/inorganic electrolytes, vanadium, iron, bromine and hybrid systems, stability, kinetics and transport.

G | Electrodes, Membranes and Cell Components
Surface characterization, porosity, wettability, crossover, component ageing and structure–performance relationships.

H | Cell, Stack and System Testing
Single cells, stacks, flow effects, pressure drop, shunt currents, thermal behavior and pilot/system validation.

I | Modelling and Data-Driven Diagnostics
Equivalent-circuit and physics-based modelling, parameter identification, digital twins, diagnostic data analysis and state estimation.

Please note the following information regarding submission format, conference language, and deadlines.

Presentation

Contributions to the conference may take the form of oral-presentations (20 minutes including discussion) or posters. Please submit an abstract of no more than 300 words, with optional figures and tables. We require the exact title, the name(s) of the author(s), as well as their institution, town and country.

To help us categorise your submission, please specify the topic identifier (A to I) and indicate whether you wish to submit a oral presentation or a poster, or if you are open to either. **Please use the template for your submission.**

The presentation slides and posters together with an optional extended abstract will be made available for download. Please submit your presentation slides and posters as a PDF for this purpose.

Conference language

English

Deadlines

January 15, 2027
Abstracts due (submit to sritama.chakraborty@ict.fraunhofer.de)
January 29, 2027
Confirmation of abstract acceptance
February 26, 2027
Presentation slides and posters due

The program will be published in February 2027.

Conference Management

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Please visit the symposium website for more details.