

INDUSTRIAL FLOW CHEMISTRY BOOTCAMP

From Microreactor Fundamentals to Advanced Chemistries & Smart Process Control

Hotel Avasa, Hyderabad, India

AmAm Flow Laboratory - Technology Partner

Flow Chemistry Excellence Workshop: Reactor Characterisation, Mixing Dynamics & Smart Process Optimisation

Industrial Flow Chemistry Bootcamp

09 Sep 2026 - 09 Sep 2026

CONFERENCE PROGRAMME

Wednesday, 9th September 2026

08:00	Registration
09:00	Foundations of Flow Chemistry & Microreactor Technology Core Concepts • Why flow chemistry matters for API and fine chemicals • Microreactor architectures and design principles • Heat & mass transfer intensification • Safety, scalability, and regulatory relevance • Catalysis in flow (homogeneous, heterogeneous, biocatalysis) • Photochemistry in flow (LED reactors, photon flux control) • Electrochemistry in flow (electrode design, ion transport) • Mechanochemistry in continuous systems (emerging field) • Gas-phase and gas-liquid reactions in microreactors
09:45	Mixing in Microreactors: Principles, Characterisation & Measurement Core Concepts • Laminar flow, diffusion-controlled mixing • Micromixing vs macromixing • Impact of mixing on selectivity, impurity formation, and yield • Using the Fourth Bourne Reaction as a quantitative probe • Determining micromixing time • Correlating mixing efficiency with reactor geometry and flow rate - Villermaux-Duschmann 'iodide-iodate' reaction • Why fast/exothermic reactions demand excellent mixing • Avoiding hotspots and runaway conditions • Inline temperature monitoring and heat removal strategies
10:45	Tea Break

11:00	Residence Time, RTD & Reactor Sizing Core Concepts • Calculating residence time • Plug flow vs dispersion • Reactor volume determination for desired throughput • What is Mean Residence Time Distribution (MRTD) • Why RTD matters for: • impurity control • scale-up • telescoped reactions • crystallisation and particle formation • Methods to measure RTD in lab reactors • How to translate RTD data from lab → pilot → plant scale
11:45	Practical Operation of Microreactors Core Concepts • Pump selection and flow control • Temperature and pressure management • Inline quenching, sampling, and analytics • Troubleshooting (clogging, pulsation, fouling) • Particle size distribution and settling • Slurry transport in microchannels • Avoiding clogging: velocity, channel design, ultrasound, oscillatory flow • Inline filtration and continuous solid handling • Case studies: crystallisation, heterogeneous catalysis, metal reductions
12:30	Applications & Case Studies in Flow Synthesis Core Concepts • Nitrations, oxidations, reductions • Photochemical transformations • Electrochemical oxidations/reductions • Gas-liquid reactions (carbonylations, hydrogenations) • Telescoped multi-step sequences • API intermediate examples • How flow improves safety, quality, and sustainability
13:15	Q/A Session
13:30	Lunch
14:30	About the Equipment and Demonstration Demonstration 1+Hands-on: Residence Time Distribution (RTD) Study on MicroFLO™ and SlurryFLO™ platforms Demonstration 2: Mixing Efficiency & Micromixing Time using MicroFLO™ microreactor Demonstration 3: Handling Slurries in Continuous Flow using SlurryFLO™ reactor Demonstration 4: CogniFLO™ Closed-Loop Auto-Optimisation
17:30	Closing Remarks