IMPREGNATION AND JOINING TECHNOLOGY

Application-Oriented Permeability Measurement for LCM Processes

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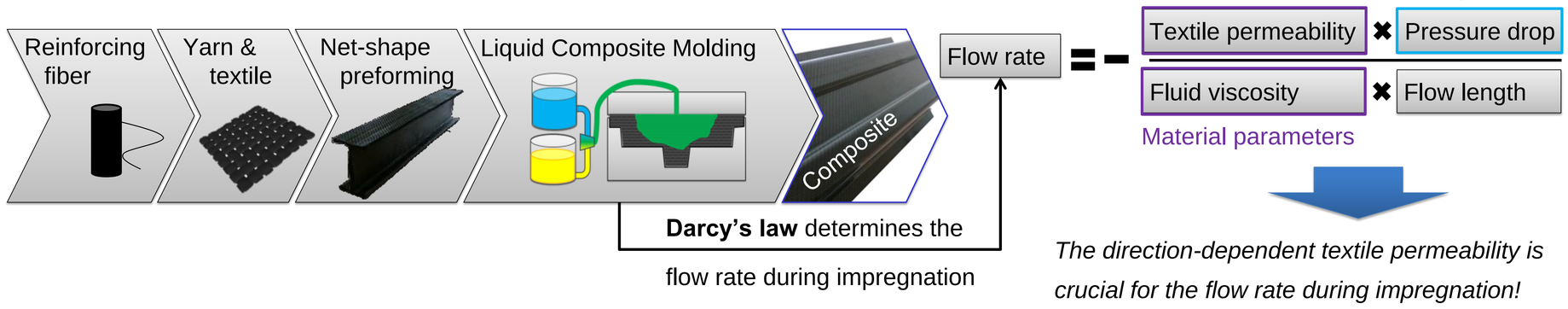
OBJECTIVES

Main Target:
Efficient Liquid Composite Molding (LCM) with fast and reproducible impregnation of the preform.

Approach:
Accurate measurement of preform permeability → test equipment tailored to the manufacturing process and the application of the permeability data.

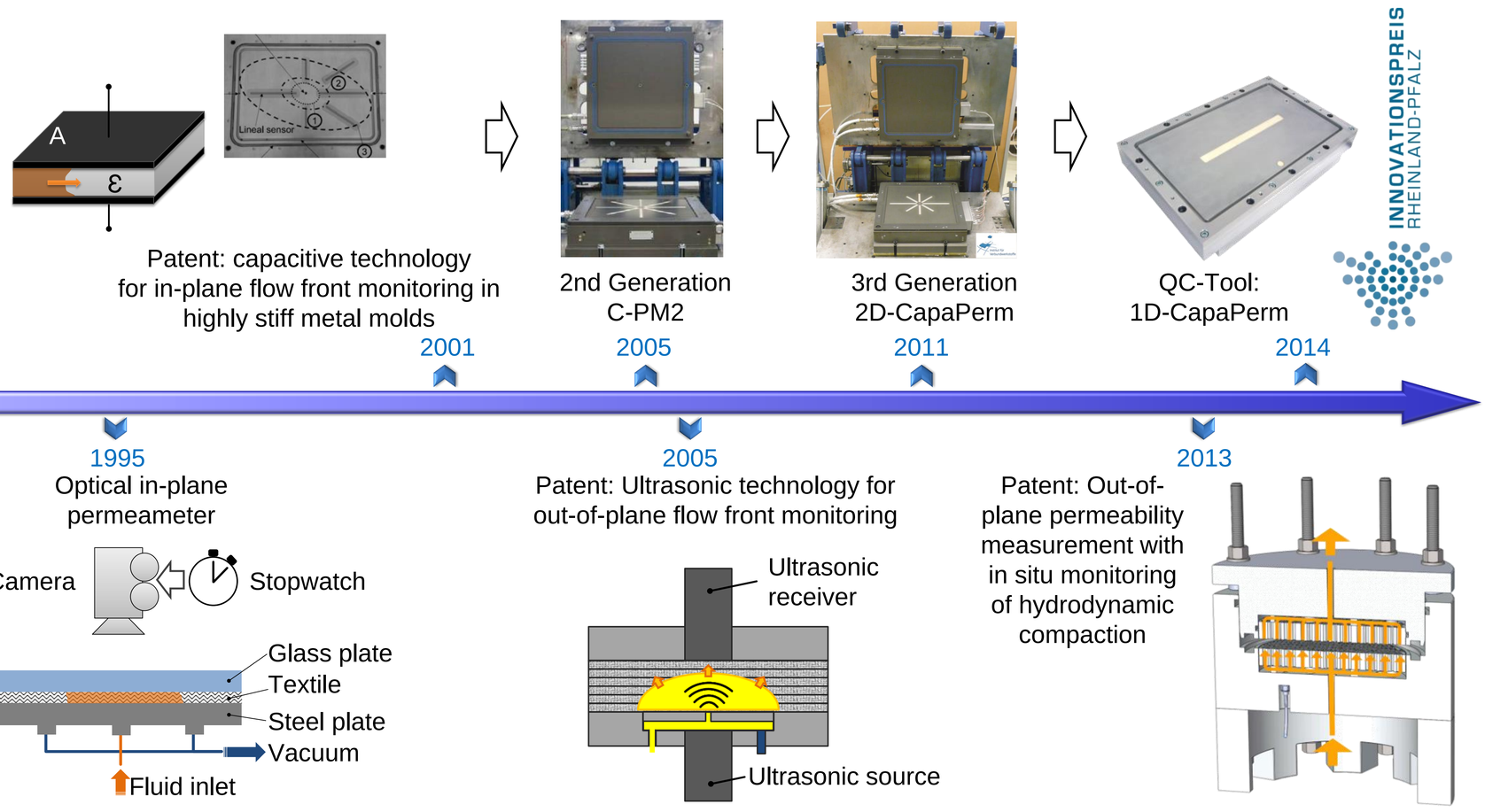
STATE OF THE ART

Relevance of Permeability (Example: Resin Transfer Molding)



CHALLENGES

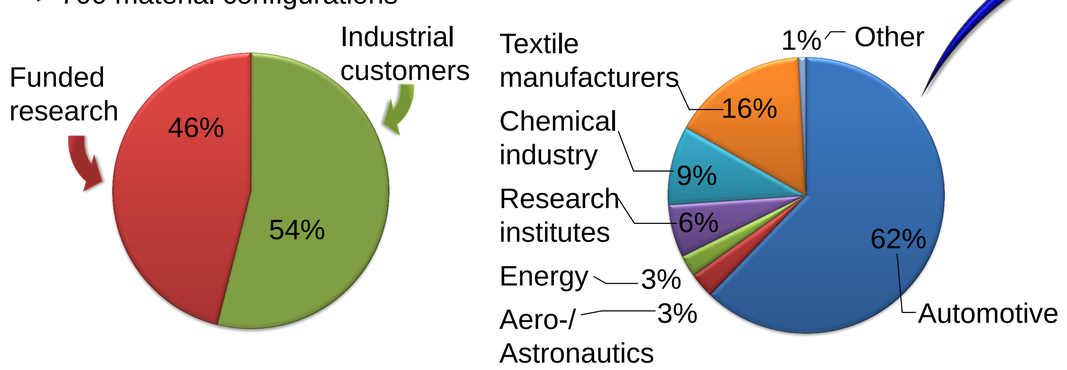
Accurate Permeability Measurement Requires Sophisticated Technology - IVW Offers 25 Years of Experience



RESULTS

Permeability Measurements at IVW 2011 – 2016:

- > 4000 measurements (in-plane and out-of-plane)
- > 700 material configurations



Usage of Permeability Data:

- Permeability-oriented textile selection
- Guidelines for permeability-oriented
  - Textile design
  - Process design
  - Preforming application
- Optimized tool and process design by numerical filling simulation based on reliable permeability data

NEXT STEPS

RTM-Oriented Characterization of the Viscosity of Fast-curing Resin Systems Based on Capacitive Technology

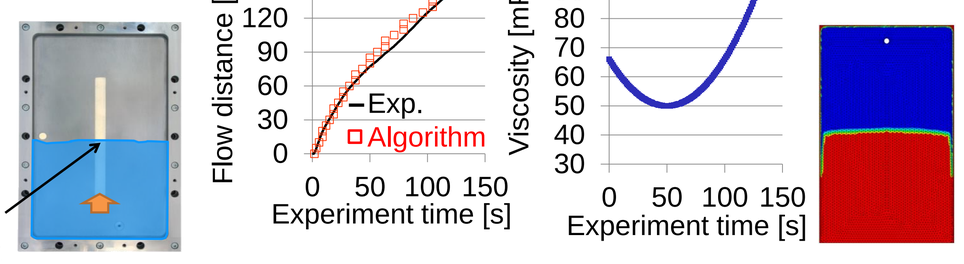
Starting point is **Darcy's law**:

Reference structure with constant permeability

Flow rate = (Textile permeability × Pressure drop) / (Fluid viscosity × Flow length)

Measurement target

Injection of resin in reference structure ⇔ *Algorithm-based viscosity calculation*



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