# POLYMER FUEL CELL STACK BASED ON SULFONIC ACID MEMBRANES WITH EXTENDED OPERATING TEMPERATURE RANGE UP TO 120 °C

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# Outline

- Introduction and motivation
- Stack design
- Results:
  - Stack performance
  - Thermal cycles 90–120 °C
  - Long-term test: 1000 h
- Summary

# Summary

- stack development:
  - ✓30 cell stack with 2.5 $kW_{el}$ nominal power
  - ✓components developed and benchmarked
  - ✓optimized concept for WTR conditions
- 30-cells stack results
  - ✓20 thermal cycles at 90–120 °C:
    - ✓-21 % reversible power loss within a cycle
    - ✓6-times higher degradation rate: -714 µV $h^{-1}$ $cell^{-1}$
  - ✓adequate long-term behavior at constant load:
    - ✓-16 % P loss in 1000 h
    - ✓degradation rate: -113 µV $h^{-1}$ $cell^{-1}$
    - ✓water management issues and membrane degradation during constant load
    - ✓catalyst growth during air starvation (compressor malfunction)

**Successful proof-of-concept**

# Acknowledgments


- M. Schulze
- S. Graf
- I. Komninakis
- S. Anderle


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## Thank you for your attention!

Questions?


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