**SECA CTP Stack Fixture Testing**


**Objectives:** to develop a “standard” stack test fixture to validate SOFC materials, and processing development

“Button” cells offer a quick tool to assess basic SOFC materials processing and behavior; however, the cell geometry/size, gas flow, sealing systems, contact materials, current collectors etc are far from the real cells in a stack.

**Assembled view of a 3-cell test in the furnace**

**Materials for stack testing**
1. commercial 2”x2” NiO/YSZ supported YSZ cell with LSM cathode of 16 cm² active area
2. LSM20 and Ni paste +Ni mesh as contact
3. (Mn,Co) spinel coating and aluminization
4. AISI441 interconnect and window frame
5. Refractory glass seal for WF and double seal (composite glass and hybrid mica) for perimeter seal
6. Compressive loading applied
7. Final sealing at 930°C/2h the tested at 800°C

**3-cells test #01**

**3-cells test #02**

**3-cells test #03**

**Summary and Conclusion**
1. 2nd generation stack test fixture was developed.
2. Three 3-cells stack tests were conducted.
3. Cause of no performance of cell #3 for stack test #01 and #02 was identified and fixed.
4. Stack test #03 showed success for the current stack test fixture.
5. Current seal systems worked fine, and performance is very dependent on gas flow, insensitive to leaks.
6. Preliminary results showed lower performance at higher fuel utilization.

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