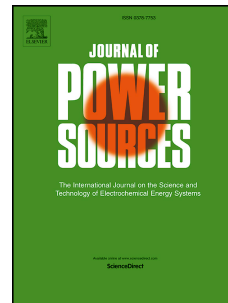


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Effects of the first heat up procedure on mechanical properties of solid oxide fuel cell sealing materials

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Abstract

SOFC stack seals need to be correctly dimensioned to achieve a gas tight stack with low electrical contact resistances. Mechanical properties of SOFC stack sealing materials are presented for three assembly and first heat up procedures: applying full compressive stress at room temperature before first heat up (1), applying no compressive stress before first heat up and applying the full compressive stress at operating temperature (2), applying partial compressive stress at room temperature and full compressive stress at operating temperature after first heat up (3). The behaviour of the glass seal (Schott GM31107) is not affected significantly by compressive force during heat up. Compressibility of both compressible sealing material (Thermiculite CL87) and hybrid sealing material (Thermiculite CL87LS) was found to be about 40% (between 0.1-0.9 MPa) at room temperature but only about 4% (between 0.1-0.9 MPa) at 700 °C. Therefore it is beneficial to carry out as much of the compression as possible at room temperature before first heat up. This allows for maximum amount of deformability in

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