

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

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Development of Complaint Glass Seals for High Temperature Applications

Overview

Joining of metals ceramic parts for high temperature application by complaint (using glue) is prime requirement in the field of solid oxide fuel cell (SOFC), oxygen sensors, thermocouples, high temperature thread lock etc., Development of such high temperature glue are in progress. Sodium silicate/alumina based glue are successfully developed for 800°C applications. The developed paste was demonstrated by using some of the in-house repair work. Further, successfully join silica and Invar-36 for 800°C application. Additionally silica, stainless and silicon carbide flange also demonstrated.

Key Features

- Sealant is in powder and liquid form.
- As per requirement, one can make past prior to application.
- Brush, spatula, or dispenser can do application.
- Low curing temperature in the order of 150°C.



Fig: 800 °C 30 min lab test

Potential Applications

- Electrical such as heater and lamps.
- High temperature sodium batteries
- Sealant for solid oxide fuel cells.
- Temperature probes bonding to the required surface.
- Refractory insulations.

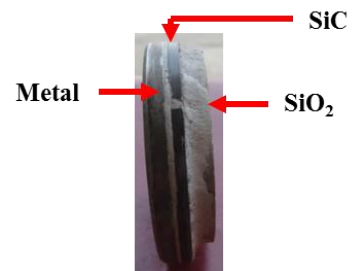


Fig: Feasibility trial samples

Technology Readiness Level (TRL)

- Feasibility studies on SS/SiC/SiO₂ was done.
- Repair on broken porcelain flange was done as in-house work.
- Silica dome and Invar flange was successfully join for another government sector company.

Major Patents / Publications

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Fig: Porcaline In-house repair

IPDI : Intellectual Property Development Indices

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