DEVELOPMENT OF COMPLAINT GLASS SEALS FOR HIGH TEMPERATURE APPLICATIONS

Centre for Engineered Coatings

International Advanced Research Centre for Powder Metallurgy and New Materials

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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^{o}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^{o}C application. Additionally silica, stainless and silicon carbide flange also demonstrated.

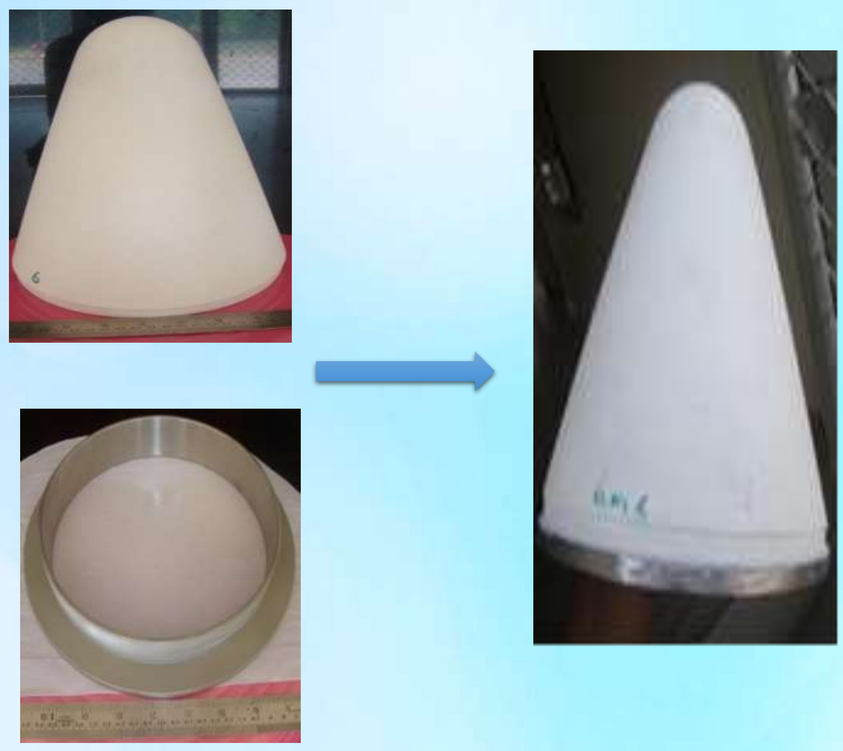
Key Features

- **Sealant can be made available in form of powder and liquid**
- **As per requirement, one can make paste prior to application**
- **Brush, spatula, or dispenser can do application**
- **Low curing temperature in the order of 150^{o}C**
- **Binder : Inorganic (Silicate base)**
- **Filler : Alumina or clay based**
- **Process :Sol-gel based**
- **Service Temp. : Upto 800^{0}C**
- **Shear strength :1.4-1.8 MPa (RT)**

Sealants in Powder and Resin Form

Applications

- **Possible high temperature seal for diesel engine turbochargers**
- **Refractory brick joining**
- **Thermal protective layer**
- **Sealant for solid oxide fuel cells**
- **High temperature sodium batteries**



Joining of the parts by Sealants

Technology Status

Transfer of the know-how to RCI, Hyderabad

Intellectual Property Development Indices

IPDI	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Activities	Basic concepts and understanding of underlying scientific principles	Shortlisting possible applications	Research to prove technical feasibility for targeted application	Coupon level testing in stimulated conditions	Check repeatability/ consistency at coupon level	Prototype testing in real-life conditions	Check repeatability/ consistency at prototype level	Reassessing feasibility (IP, competition technology, commercial)	Initiate technology transfer	Support in stabilizing production
Status										

PEM Fuel Cell Stack Developed at ARCI