

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

Balapur P.O., Hyderabad – 500005, Telangana, India



Development of Transparent Ceramics

Overview

Transparent ceramics, a new class of advanced functional materials, find diverse applications in strategic and civilian sectors owing to the unique combination of mechanical and transmission properties. Technological advancements in ceramic powder synthesis, shaping and sintering have made it possible to tailor the microstructural, mechanical and optical property relationships in case of advanced transparent ceramic materials. Transparent ceramic materials are classified broadly as visible, mid wave and long wave infrared regions.

Key Features

- Capability to fabricate polycrystalline transparent ceramic specimens of transparent alumina, aluminium oxynitride (AlON), spinel ($MgAl_2O_4$) through slip casting and Hot Isostatic Pressing
- Capability to fabricate transparent zinc sulphide (ZnS) ceramics through Chemical Vapour Deposition (CVD)
- Specific parameters depends on ceramic formulation

Potential Applications

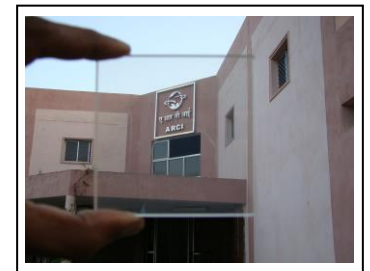
- Dental Ceramics and Artificial Gem Stones
- Solar Absorber Tubes and Lamp Envelops
- IR sensor envelops
- High temperature Furnace windows

Intellectual Property Development Indices (IPDI)

- Process steps optimised to achieve theoretical transmissions
- IPDI level
 - ZnS: 10
 - Magnesium aluminate spinel: 10



Digital photograph of Hot Isostatic Press



Transparent spinel blank

Status	1	2	3	4	5	6	7	8	9	10
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Major Publications

1. Optical and mechanical properties of compaction and slip cast processed transparent polycrystalline spinel ceramics, *Ceramics International* 40 (2014) 5575–5581

Centre for Ceramic Processing (CER)

ARCI, Balapur PO., Hyderabad 500005, Telangana, India

Tel : +91 40 24452439 / 24452306 / 24443169; Fax : +91 40 24442699

Email: papiya [at] arci [dot] res [dot] in / royjohnson [at] arci [dot] res [dot] in