

Technology for manufacturing new ZTA ceramic based femoral head and cup (alumina ceramic or PE) for total hip replacement (THR)

IPR STATUS

Patented

APPLICATION/ USES

Healthcare; Total hip replacement (THR) implants based on new ZTA ceramic head and new ZTA ceramic/ polymer acetabular cup

SALIENT FEATURES

New zirconia toughened alumina (ZTA) ceramic composition for modular femoral head with matching similar composite cups (liners) of different diameters to suit commercially available hip stems for total hip replacement (THR). Optionally, commercially available highly-cross linked ultra-high molecular polyethylene liner/ acetabular cups can be used. Presently, the technology is at TRL 5. Superior toughness and tribological properties; State-of-the-art and affordable technology (indigenous)

Patented Composition

Hardness: Upto 2100 HV

Fracture toughness: Upto 10 MPav/m

- Affordable and state-of-the-art healthcare solution.
- Range of new compositions of ZTA with tailored mechanical properties and enhanced fracture toughness without compromising other mechanical properties, such as, hardness.
- Due to surface wettability characteristics, it provides low coefficient of friction and therefore squeaking is expected to be reduced post implantation.
- New ZTA composite composition enhances interaction with physiological environment forming lubricious tribofilm leading to low coefficient of friction.
- The composite composition helps in effective sintering without grain growth and form high aspect ratio phases that can improve fracture resistance.

LEVEL/ SCALE OF DEVELOPMENT

Commercialized through industry partner

LINE MINISTRY MAPPING/ USER SECTOR

Ministry of Health & Family Welfare

