



# IIT MADRAS

Indian Institute of Technology Madras

Technology Transfer Office  
TTO - IPM Cell



## Industrial Consultancy & Sponsored Research (IC&SR)

### HARD PARTICLES MIXED ACTIVE SILVER BASED FILLER MATERIALS FOR BRAZING CUBIC BORON NITRIDE (CBN) WITH METAL SUBSTRATES

#### IITM Technology Available for Licensing

##### Problem Statement

- Existing brazing filler materials lack the mechanical properties required for superabrasive cBN tools, resulting in poor wear resistance and premature tool failure.
- There is a need for brazing filler materials that offer good wetting properties for cBN while also improving wear resistance. The current invention addresses this need by incorporating small percentages of hard ceramics into Ag-Cu alloys.

##### Technology Category/ Market

**Category** – Advanced Materials Science and Manufacturing Technology

**Applications** – Manufacturing/ chemical

**Industry** – Advanced materials, Extraction & mining

**Market** -Advanced materials is likely to be a US\$10 billion market in India by 2028. Advanced materials market was valued at US\$5 billion in 2021 and is expected to grow at a **CAGR of about 10-12%**.

##### Key Features / Value Proposition

###### Technical Perspective:

**Enhanced Brazing Material:** The invention improves the technical aspects of brazing materials by incorporating hard ceramics into Ag-Cu alloys, resulting in superior wear resistance and joint strength.

###### User Perspective:

**Prolonged Tool Life:** Users in the grinding and polishing industries benefit from tools manufactured with this technology, as they experience longer tool lifespans and reduced downtime due to premature tool failure.

##### TRL (Technology Readiness Level)

TRL-,4 Technology validated in lab.

##### Research Lab

Prof. Amitava Ghosh

Dept. of Mechanical Engineering

##### Intellectual Property

- IITM IDF Ref. 1709
- IN 440001 (PATENT GRANTED)

##### Technology

###### Novel Formulation:

The invention introduces a novel formulation of brazing filler alloy, comprising Silver (Ag), Copper (Cu), an active element (Titanium), and micro ceramic particles (TiN, TiB<sub>2</sub>, or Alumina) as reinforcement.

###### Improved Mechanical Properties:

The technology enhances the mechanical properties of the filler alloy, addressing the wear resistance and strength needed for superabrasive tools.

###### Customizable Composition:

The alloy composition allows independent addition of various ceramic particles, offering flexibility to tailor the alloy for specific applications.

###### Enhanced Wetting:

The alloy maintains good wetting properties on cubic boron nitride (cBN) while improving its overall wear resistance.

###### Extended Applicability:

The technology can be applied not only to cBN brazing but also to the brazing of other ceramics to metal substrates, expanding its utility.

#### CONTACT US

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