



Ceramics

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Recently, ceramics have gained attention for their diverse applications and historical significance. Derived from the **Greek word 'keramos'** meaning '**potter's clay**,' ceramics have been integral to human civilization for over 25,000 years, with ancient artefacts found in the [Indus Valley](#) and **Keezhadi, Tamil Nadu**.

- **A ceramic is neither metallic nor organic;** it is a **hard, chemically non-reactive material** that may be crystalline, glassy or both, and can be formed or densified with heat.
- Ceramics are known for their ability to withstand high temperatures, **resist chemical erosion, and their hardness**, but they are also brittle and susceptible to shattering under shear stress.
 - The study of ceramics' microscopic properties is known as ceramography.
 - The discovery of high-temperature superconductivity in **ceramics won the 1987 Physics Nobel Prize**.
- Gujarat's Morbi district is home to the **world's second-largest ceramic production cluster** (China is the leading ceramic tile manufacturer) with over 1,000 units, an annual turnover of Rs 50,000 crore, and exports exceeding Rs 12,000 crore in 2022-23, contributing significantly to the state's rapid economic growth.
 - In 2013, India exported 55 million square metres of tiles. By 2023, exports had soared to 589.5 million sqm, with over half shipped outside Asia, making **India the 2nd largest exporter worldwide**.
- **Modern Applications:** Used in space shuttles as heat shields during atmospheric reentry, employed in microwave furnaces for generating heat, utilised as abrasives and in the production of varistors and semiconductors, used as nuclear fuel and in fighter aircraft windows and it is essential in tomographic scanners.

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