

Predominantly glass

Metal ceramic restorations have been available for more than three decades. This type of restoration has gained popularity from its predictable performance and reasonable esthetics. Despite its success, the demand for improved esthetics and the concerns regarding the biocompatibility of the metal has led to the introduction of **all-ceramic restorations**.

Two concepts help in simplifying the understanding of dental ceramics: **First**, ceramics fall into three main composition categories:

- Predominantly glass
- Particle –filled glass
- Polycrystalline

Second, ceramics can be considered as a composite material, in which the matrix is a glass that is lightly or heavily filled with crystalline or glass particles.

Predominantly glass: have a high content of glass making this type of dental ceramic highly esthetic. This type is the best in mimicking the optical properties of enamel and dentin. Optical effects are controlled by manufactures by adding small amount of filler particles.

Particle-filled glass: filler particles are added to the glass matrix to improve the mechanical properties. Fillers can be crystalline particles of high-melting glasses.

Polycrystalline: this type of ceramic contains no glass. Atoms are packed into regular crystalline arrangement making it tougher and less susceptible to crack propagation. It is important to understand the fact that highly esthetic ceramics are predominately glass, and ceramics that exhibit high strength are generally crystalline.