**TABLE 2.** Summary of Restorative Materials, Microstructures, and Generic Composites

<table>
<thead>
<tr>
<th>Restorative Material (Categories)</th>
<th>D = Dispersed Phase, C = Continuous Phase (Volume fractions vary)</th>
</tr>
</thead>
</table>
| **COMPOSITE**
  - MicroFil
  - Flowable
  - Packable
  - Bi-Hybrid
  - Tri-Hybrid | • D = Alumino silicate glass; C = Polymerized difunctional monomers
  • Same as above
  • Same as above
  • Same as above
  • Same as above |
| **GLASS IONOMER**
  - Glass ionomer cement (GIC)
  - Metal-Modified
  - Resin-Modified
  - Compomer
  - Giomer | • D = Alumino silicate glass; C = Crosslinked polyacrylic acid
  • GIC + amalgam alloy particles
  • GIC modified with polymerizable monomers
  • Composite modified with fluoride releasing glass
  • Same as above admixed with larger pre-cured glass ionomer islands |
| **TEMPORARY**
  - Polymethyl methacrylate (PMMA)
  - Bis-Acrylates | • D = PMMA beads; C = PMMA matrix
  • D = Alumino silicate glass; C = Polymerized difunctional monomers |
| **AMALGAM**
  - Lath-Cut
  - Spherical | • D = Unreacted Ag₃Sn; C = Ag₂Hg₃, Sn₆-7Hg, Cu₅-6Sn, Cu₃Sn
  • Same as above |
| **INFLTRANT**
  - Composite | • C = Polymerized acrylate monomers |
| **CERAMIC**
  - Feldspathic Porcelains
  - Aluminous Porcelains
  - Glass ceramics
  - Infiltrated ceramics
  - Alumina, zirconia | • D = Ceramic phases; C = Ceramic glass
  • Same as above
  • Same as above
  • C= Two interpenetrating continuous phases
  • Grains (crystals); one or two phases |
| **CEMENT**
  - Acid-base
  - Composite | • D = Ceramic filler; C = Acid-base products
  • D = Alumino silicate glass; C = Polymerized difunctional monomers |
| **DENTURE BASE**
  - PMMA Acrylic | • D = PMMA beads; C = PMMA matrix |
| **CAST METALS**
  - Gold and alloys
  - Porcelain-fused-to-metal alloys
  - Titanium | • Grains (crystals) of one or two different phases
  • Same as above
  • Same as above |
| **BONDING AGENTS**
  - Direct etching
  - Self-etching system | • D= Minor amounts of silica; C = Polymerized monomers
  • Same as above |

* A composite (continuous and dispersed phases) type of structure.

† Not composite structure.

1. Dental composites may be classified by the typical particle size (eg, macrofill, midfill, minifill, microfill, or nanofill) or viscosity, such as flowable or packable. Most composites are mixtures of particle sizes and classified as bi-hybrids or tri-hybrids.

2. Most amalgams have spherical particles.

3. Most recent dental cements are composites but earlier versions included zinc phosphate, reinforced zinc oxide eugenol, and polycarboxylate.

4. Bonding systems for enamel and dentin rely on direct etching with phosphoric acid or self-etching with acids associated with the bonding agent.