In one study, GFRC formulation based on polycarbonate matrix and *E*-glass fibers was prepared and tested for flexural strength and compression modulus, the values obtained were 297–426 and 965 MPa, respectively. It was also reported that the quantity of fibers is increased, and the flexural strength is also increased, that is, 339 versus 300 MPa (Alander et al., 2005). Moreover, the higher the degree of polymerization, the better the strength and hardness (Ylä-Soininmäki et al., 2013).

#### *17.1.6.2 Thermal Properties*

Orientation of glass fibers affects linear coefficient of thermal expansion (LCTE). There are two coefficients of thermal expansion of unidirectional glass fibers. The glass fibers exert mechanical restraints in their direction and thus gives lower value of LCTE while in the direction perpendicular to glass fibers, a high value of LCTE is observed. The rigid glass fibers expand more in the transverse direction than in the longitudinal direction (Tezvergil et al., 2003).

#### *17.1.6.3 Biocompatibility*

It is reported that bacterial adhesion to GFRC was significantly lower as compared to enamel and dentin. It is also reported in another study that incorporation of hydrophobic resins further reduces microbial adhesion on surface of GFRC filling (Murphy, 1998). Furthermore, glass fibers also promote attachment of *Candida albicans* or yeast on surface. Ballo evaluated the biocompatibility of GFRC and found cell proliferation and differentiation on bis-GMA/TEGDMA reinforced with *E*-glass fibers. In one study of GFRC as an oral implant, the new bone apposition was observed between the implant threads, which suggests good biocompatibility of the FRC implants (Assif et al., 1993; Waltimo et al., 1999).

### 17.1.7 Dental Application

#### *17.1.7.1 Prosthodontics Application*

Glass fibers were used initially in 1960 and investigated for fabrication of denture in dentistry. Various bioactive glass fibers were evaluated in medical field to obtain significant and adequate strength for dentures (van Dijken et al., 1989). Bonding of polymer with denture-based polymers was initially investigated in 1998 and polymers mixed with several types of bioactive glass fibers such as aramide, carbon, polyethylene (PE). Results represented that glass fibers demonstrated better results in terms of esthetics and ease of bonding to the polymer matrix (Freilich et al., 1998; Ekstrand et al., 1987). Also, some dentures demonstrated increased fatigue resistance compared with metals. In this regards, high rigidity of the material is needed (Karmaker et al., 1997). In vitro studies proved that bioactive fiber glass increases the fracture strength