TABLE 17.2 Types and Properties of Glass Fibers

Types of Glass Fibers	Properties
Glass A	Highly alkaline containing 25% $CaHNaO_2$ Advantages: cheaper, used as filler for plastics, no stringent prerequisites are needed Disadvantages: inadequate strength with high chemical reactivity to water and alkalis
Glass C	Used for engineering purposes Advantages: chemically resistant, cannot be corroded easily Disadvantages: inferior technological properties in molding fibers, inadequate strength and cannot be used for insulating purposes
Glass D	Used as a strengthening material in electronic boards and radar housing Advantages: it has low dielectric permittivity with enhanced electrical properties Disadvantages: inadequate strength and low chemical resistance
Glass S	Advantages: high strength, elastic modulus, better corrosion resistance, low dielectric permittivity Disadvantages: expensive, difficult manipulation, low service life
Glass AR	Advantages: better technological and structural properties, high impact strength and resist crack formation or propagation Disadvantages: high zirconium and high melting points
Glass E	Advantages: low alkaline, better insulating properties, resists reactivity with water, electrical graded Disadvantages: composition has volatile components that can cause environmental pollution

The properties of GFRC are affected by many factors (Garoushi et al., 2012b, 2007a; Behr et al., 2000; Malchev et al., 2010), which include

- Direction and distribution of fibers
- Volume fraction of fibers
- Surface treatment of fibers
- Bonding of organic matrix with fibers
- Water sorption of GFRC

GFRC are low-density composites so, their modulus and strength are higher as compared to metals. The properties are greatly affected with the change of direction of fibers, they are not isotropic. For example, the tensile strength is markedly increased when its measured in longitudinal direction of fibers and