FR5 Laminate is a glass fabric reinforcement in a high temperature epoxy resin binder. The natural color is typically yellow-green-tan blend. This grade is similar to G10/FR4 but has a higher operating temperature and superior mechanical properties at elevated temperatures. It maintains good properties at both dry and humid conditions. It certifies to NEMA FR5. Expansion coefficient of FR5 laminate in the xy plane is approximately 14 ppm/°C (25°C to 130°C). The expansion coefficient of epoxy resin in the z axis is approximately 4% at a range of 50°C to 288°C. The glass transition temperature (Tg) of FR5 is typically between 170-180°C. Continuous operating temperature for FR5 is typically 140 degrees C. High Tg laminate is best suitable for multilayer PCB with higher layer count. Automotive producers also considered FR5 glass epoxy laminate to be the best material due to its improved Tg glass transition temperature for automotive applications.

Benefits
- Extremely high mechanical strength at elevated temperatures
- Good dielectric loss
- Good electric strength in dry and humid conditions
- Good chemical resistance
- Low moisture absorption

Applications
- Electrical Equipment
- Antennal Isolators
- Circuit Board Holders
- Aerospace
- Test Boards
- End Plates
- Solder Frames

FR5 Typical Properties Values
- Specific Gravity/Density 1.85 g/cm³
- Water Absorption -.125" < .10 %
- Temperature Index 180 °C \ 356 °F
- Rockwell Hardness 115 M scale
- Bond Strength > 2,200 \ 1,000 lbs \ kgs
- Flexural Strength-LW-A-.125" > 75,000 \ 520 PSI \ MPa
- Flexural Strength-LW-E 1/150 > 40,000 \ 280 PSI \ MPa
- Izod Impact Strength-LW > 10 ft-lbs/in
- Izod Impact Strength-CW > 8 ft-lbs/in
- Compressive Strength-Flatwise > 65,000 \ 448 PSI \ MPa
- Dielectric Breakdown-A > 50 kV
- Dielectric Breakdown-D48/50 > 50 kV
- Permittivity-A 4.8
- Permativity-D24/23 4.8
- Dissipation Factor-A 0.017
- Dissipation Factor-D24/23 0.018