APPLIED PRECISION TECHNOLOGY, INC.
AND
LIBERTY PLASTICS COMPANY, INC.

IS IT *FR4* OR IS IT *G10???*

Some say "toe-may-toe" some say "toe-ma-toe", but a tomato is a tomato.

Some say "G10", some say "FR4" and we'll answer to both but technically speaking there is a slight difference. Let me attemp to describe it - I'll try to keep it simple so that I will know what I'm "talking" about then, I'll be sure that you will:

1. Both G10 and FR4 are high-pressure industrial laminates made from glass fabric impregnated with epoxy resin.
2. The difference between FR4 and G10 is in the resin.
3. The epoxy resin is a composite of two chemicals: epichlorohydrin and "bis" phenol A.
4. In FR4, a small part of "bis" phenol A is replaced with tetrabromo "bis" phenol A.
5. The purpose of this replacement is to make the resulting laminate more flame retardant hence the name FR (Flame-Retardant) 4.
6. There is very little difference in properties. Bromine with its slightly more complex structure is more stable when heat is applied, yet the "tg" (temperature when thermo decomposition is noted) remains relatively the same.

It is important to note that FR4 is nearly always a suitable substitute for G10 except in rare applications like nuclear reactors and because of its popularity, the resin is more readily available. AT7000™, AT8000™, and AT9000™ are made with FR4 substrates.

Peter DeSimone

Is It FR4 or Is It G10? is available in .pdf format by clicking here