

TABLE 1. Primary lead-free issues for base material components.

COMPONENT	LEAD-FREE ASSEMBLY IMPACT	POTENTIAL SOLUTIONS	RELATED CONSIDERATIONS
Resin System	1. Peak assembly temperatures can reach point where resin decomposition begins.	1. Formulate resin system with higher decomposition temperatures.	1. Reformulation can adversely affect electrical properties and manufacturability.
	2. Higher temperatures result in increased thermal expansion and stress on plated holes as a result.	2. Formulate for lower coefficients of thermal expansion.	2. Can also impact mechanical properties and manufacturability.
	3. Vapor pressure of absorbed moisture much higher at lead-free assembly temperatures; can lead to blistering/delamination.	3. Evaluate materials for moisture absorption/release characteristics; drying processes in PCB fabrication and/or assembly.	3. PCB storage conditions prior to assembly are much more important, especially humidity conditions.
	4. "Phenolic" lead-free compatible materials often not as good for electrical performance, especially Df.	4. Evaluate non-dicy/non-phenolic laminate materials.	4. New lead-free compatible material now available with improved electrical performance and attractive cost/performance.
Fiberglass Cloth	Thermal & mechanical stress on resin-to-glass bond.	Cleanliness and choice of proper coupling agent more important.	Loss of resin-to-glass adhesion through thermal cycling could impact CAF resistance.
Copper Foil	Thermal & mechanical stress on resin-to-copper bond.	Copper nodularization and treatments for improved adhesion.	May impact conductor losses, especially at high frequencies .