

## APPLICATION NOTES

### Laminate Shelf Life

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Questions occasionally arise concerning the shelf life of copper clad laminates utilized for the manufacture of printed wiring boards. The generally recognized laminate specification, IPC-4101, is very specific about shelf life requirements for prepreg and bonding medium, yet it does not reference a shelf life for laminates.

Prepreg utilizes thermosetting B-staged resin. B-staged means that the resin is in a state of intermediate cure. When the prepreg is utilized to manufacture a laminate, or multilayer laminate, the intermediate cure goes to a full cure, C-staged. While the prepreg is in this B-staged condition, the level of cure will advance with age and it is necessary to utilize it within a specified time period.

Laminates, by their nature, are C-staged. As a result, the resin has no stated shelf life because it cannot advance any further. With this in mind, if the laminate is stored in a cool, clean and dry environment, the shelf life of a laminate, (whether it be epoxy, polyimide, or any other fully cured resin system), is virtually endless. As long as the copper foil has not oxidized to a point beyond which it can be cleaned with a standard pre-clean process, the laminate will remain in specification for the intended applications.

Arlon EMD does not control the storage conditions of laminates that are sold to our customers and we cannot guarantee the length of time in which the copper foil will oxidize. As always, it is best to manage your inventory so that laminates are not stored for extended periods of time. However, if a laminate is pulled from inventory after an extended period of time and the copper is not oxidized, the product will perform as designed.

If you have further questions, please contact your local sales representative.

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