CLAIMS

~~What is claimed is:~~

1. A resin film product comprising:

a b-staged resin base layer having a first planar surface and a second planar surface, wherein the base layer has a thickness of 25.4µm (1 mil) to 254µm (10 mils);

a first protective layer disposed on the first planar surface of the base layer; and

a second protective layer disposed on the second planar surface of the base layer;

wherein ~~the base layer has a thickness of about 1 mil to about 10 mils~~ the first protective layer and the second protective layer are comprised of a biaxially oriented polyethylene terephthalate with a thickness of 25.4µm (1 mil) to 127µm (5 mils) and are configured to be separable from the base layer.

~~2. The resin film product of claim 1, wherein the base layer is made from resin selected from the group consisting of an epoxy resin, a filled resin, an unfilled resin, a high Tg resin, a mid Tg resin, a thermally conductive resin, a halogen-substituted resin, a non-halogenated resin, or mixtures thereof.~~

~~3~~2. The resin film product of claim 1, wherein the base layer is made from resin that includes a toughener.

~~4~~3. The resin film product of ~~claim 1~~ any preceding claim, wherein the base layer has a thickness of ~~about 2 mil~~ 25.4µm (1 mil) to ~~about~~ 76.2µm (3 mils).

~~5. The resin film product of claim 1, wherein the base layer has a thickness of about 1 mil to about 2 mils.~~

~~6~~4. The resin film product of ~~claim 1~~ any preceding claim, wherein the base layer is made from resin that includes a filler material.

~~7~~5. The resin film product of claim ~~7~~4~~,~~ wherein the filler material is talc.

~~8. The resin film product of claim 1, wherein the first protective layer and the second protective layer are the same material.~~

~~9. The resin film product of claim 1, wherein the first protective layer and the second protective layer are different materials.~~

~~10. The resin film product of claim 1, wherein the first protective layer, the second protective layer, or each of the first protective layer and the second protective layer, is selected from the group consisting of a polyester film, a metal foil, and a reinforced fabric that is pre-impregnated with a resin system (prepreg).~~

~~11~~6. A method comprising the steps including:

providing a resin film product according to claim 1 ~~comprising:~~

~~a b-staged resin base layer having a first planar surface and a second planar surface; and a protective layer disposed on the first planar surface of the base layer, wherein the base layer has a thickness of about 1 mil to about 10 mils~~;

heating an exposed innerlayer material surface of a printed circuit board substrate;

removing the second protective layer from the second planar surface of the base layer;

applying the ~~unprotected~~ second planar surface of the base layer against the heated exposed innerlayer material surface of the printed circuit board substrate to form a printed circuit board layup; and

cooling the printed circuit board layup.

~~12~~7. The method of claim ~~11~~6, further comprising the step of removing the first protective layer disposed on the first planar surface of the base layer after

applying the second planar surface of the base layer against the heated exposed innerlayer material surface of the printed circuit board substrate.

~~13~~8. The method of claim ~~12~~7, further comprising the step of adhering a bonding sheet to the first planar surface after applying the unprotected second planar surface of the base layer to the heated exposed innerlayer material surface of the printed circuit board substrate.

9. The method of claim 8 wherein the bonding sheet is a prepreg material.

~~14. The method of claim 11, further comprising the step of fully curing the resin film to a "C" staged condition.~~

~~15~~10. The method of claim ~~11~~6, wherein the innerlayer material surface of the printed circuit board substrate is heated to a temperature ranging from ~~about~~ 40°C to ~~about~~ 90°C~~.~~

~~16. The method of claim 11, wherein the innerlayer material surface of the printed circuit board substrate is heated to a temperature ranging from about~~ or 50°C to ~~about~~ 60°C.

~~17~~11. The method of claim ~~11~~6, wherein the application of the second planar surface of the base layer to the heated exposed innerlayer material surface of the printed circuit board substrate is performed using pressure.

~~18~~12. The method of claim ~~11~~6, further comprising the step of filling at least one gap located in the printed circuit board substrate with the base layer, wherein the step of filling at least one gap occurs after applying the uncovered second planar surface of the base layer to the heated innerlayer material surface of the printed circuit board substrate.

13. The method of claim 6, further comprising the step of fully curing the resin film to a "C" staged condition.

~~19. The method of claim 18, wherein the at least one gap is substantially filled with the base layer.~~

~~20. A method comprising the steps including:~~

~~providing a resin film product comprising:~~

~~a b-staged resin base layer having a first planar surface and a second planar surface;~~

~~a first protective layer disposed on the first planar surface of the base layer; and~~

~~a second protective layer disposed on the second planar surface of the base layer, wherein the base layer has a thickness of about 1 mil to about 10 mils;~~

~~heating an exposed innerlayer material surface of a printed circuit board substrate;~~

~~removing the second protective layer from the second planar surface of the base layer;~~

~~applying the second planar surface of the base layer against the heated exposed innerlayer material surface of the printed circuit board substrate to form a printed circuit board layup; and~~

~~cooling the printed circuit board layup.~~

~~21. The method of claim 20, further comprising the step of removing the first protective layer disposed on the first planar surface of the base layer after applying the second planar surface of the base layer against the heated exposed innerlayer material surface of the printed circuit board substrate.~~

~~22. The method of claim 21, further comprising the step of adhering a bonding sheet to the first planar surface after removing the first protective layer disposed on the first planar surface of the base layer.~~

~~23. The method of claim 22, wherein the bonding sheet is a prepreg material.~~

~~24. The method of claim 20, wherein the innerlayer material surface of the printed circuit board substrate is heated to a temperature from about 40°C to about 90°C.~~

~~25. The method of claim 20, wherein the innerlayer material surface of the printed circuit board substrate is heated to a temperature from about 50°C to about 60°C.~~

~~26. The method of claim 20, wherein the application of the second planar surface of the base layer to the heated exposed innerlayer material surface of the printed circuit board substrate is performed using pressure.~~

~~27. The method of claim 20, further comprising the step of filling at least one gap located in the printed circuit board substrate with the base layer, wherein the step of filling at least one gap occurs after applying the uncovered second planar surface of the base layer to the heated innerlayer material surface of the printed circuit board substrate.~~

~~28. The method of claim 20, wherein the at least one gap is substantially filled with the base layer.~~