

(a) 15-45% by weight of an epoxy component;

(b) 20-40% by weight of thermally conductive material, wherein the thermally conductive materials is selected from boron nitride, aluminium trihydrate (ATH) or combinations thereof;

(c) 0.5-4% by weight of a photoinitiator, wherein the photoinitiator comprises a mixture of triarylsulfonium hexafluorophosphate salts;

(d) 5-25% by weight of a thermoplastic polymer;

(e) 1-5% by weight of a hydroxyl-functional component; and

(f) 1-25% by weight of a halogen-free flame retardant.

Another embodiment provides a thermally conductive pressure-sensitive adhesive tape, comprising:

(i) a backing layer; and

(ii) a thermally conductive pressure-sensitive adhesive layer provided on at least one side of the backing layer, based on the total weight of the adhesive layer, comprising:

(a) 5-70% by weight of an epoxy component;

(b) 5-60% by weight of thermally conductive material;

(c) 0.001-10% by weight of a photoinitiator;

(d) 0-40% by weight of a thermoplastic polymer;

(e) 0-50% by weight of a hydroxyl-functional component; and

(f) 0-50% by weight of a halogen-free flame retardant.

Another aspect provides a thermally conductive pressure-sensitive adhesive tape, comprising:

a backing layer; and

a first thermally conductive adhesive layer disposed on one side of the backing layer and comprising the composition as defined herein.

The above and other features and advantages of the present invention will become apparent from the following detailed description of embodiments and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is further described with reference to the accompanying figures, wherein:

Figure 1 is a cross-sectional view of an adhesive film tape in one embodiment;

Figure 2 is a cross-sectional view of a double coated adhesive tape in another embodiment; and

Claims:

1. A thermally conductive adhesive composition, based on the total weight of the composition, comprising:

- (a) 15-45% by weight of an epoxy component;
- (b) 20-40% by weight of thermally conductive material, wherein the thermally conductive materials is selected from boron nitride, aluminium trihydrate (ATH) or combinations thereof;
- (c) 0.5-4% by weight of a photoinitiator, wherein the photoinitiator comprises a mixture of triarylsulfonium hexafluorophosphate salts;
- (d) 5-25% by weight of a thermoplastic polymer;
- (e) 1-5% by weight of a hydroxyl-functional component; and
- (f) 1-25% by weight of a halogen-free flame retardant.

2. The adhesive composition of claim 1, wherein the epoxy component comprises one or more epoxy resins and/or monomers.

3. The adhesive composition of claim 1, wherein the thermally conductive material has a thermal conductivity of 100 W/m·K or more.

4. The adhesive composition of claim 1, wherein the thermoplastic

polymer comprises one of an ethylene vinyl acetate copolymer component, an acrylic polymer resin, or an epoxy modified acrylic polymer resin.

5. The adhesive composition of claim 4, wherein the ethylene vinyl acetate copolymer component comprises one or more kinds of ethylene vinyl acetate copolymers.

6. The adhesive composition of claim 1, wherein the hydroxyl-functional component comprises one or more hydroxyl-containing compounds having a hydroxyl functionality of at least one.

7. The adhesive composition of claim 1, wherein the halogen-free flame retardant is selected from a group consisting of phosphorus containing compounds, ammonium polyphosphates, metal borates and graphite materials.

8. The thermally conductive adhesive composition of claim 1, further comprising 0-5% by weight of an additive, wherein the additive is one or more selected from tackifiers, antioxidants, coupling agents, thickeners, auxiliary flame retardant agents, anti-foaming agents, pigments, surfactants, and surface-modifiers.

9. A thermally conductive pressure-sensitive adhesive tape, comprising:
a backing layer; and
a first thermally conductive adhesive layer disposed on one side of the backing layer and comprising the composition of claim 1.

10. The adhesive tape of claim 9, further comprising:
a second thermally conductive adhesive layer, disposed on another side of the backing layer and comprising the composition of claim 1; and
a release liner disposed on one side of the first thermally conductive adhesive layer opposite to the backing layer.

11. The adhesive tape of claim 9, further comprising:
a release liner disposed on one side of the first thermally conductive adhesive layer opposite to the backing layer.

12. The adhesive tape of claim 9, wherein the backing layer is selected from PI film, PET film, or glass fibre mesh.

13. The adhesive tape of claim 11, wherein the backing layer comprises a super thin plastic film, or insulating woven or nonwoven material.