[0004] However, in the conventional thermally conductive compositions, when inorganic particles with a small specific surface area are added to improve the thermal conductive properties, interfacial debonding may occur between the inorganic particles and the polymer due to stress.

To solve the above conventional problems, the present disclosure provides a thermally conductive composition that has high thermal conductive properties, a high compression repulsive force, and less interfacial debonding resulting from stress, and also provides a method for producing the thermally conductive composition.

Means for Solving Problem

[0004a] In an aspect, there is provided a thermally conductive composition comprising:

a base polymer, an adhesive polymer, and thermally conductive particles,

wherein the base polymer is a silicon polymer,

a thermal conductivity of the thermally conductive composition is 0.3 W/m·K or more,

the thermally conductive particles include inorganic particles (a) with a specific surface area of 1 m^2/g or less,

the inorganic particles (a) are coated with the adhesive polymer, and

the adhesive polymer contains a methyl hydrogen polysiloxane, an epoxy group-containing alkyltrialkoxysilane, and a cyclic polysiloxane oligomer.

[0004b] In another aspect, there is provided a method of producing the thermally conductive composition as defined above, comprising:

a first mixing process of mixing the adhesive polymer and the inorganic particles (a) with a specific surface area of 1 m^2/g or less so that the inorganic particles (a) are coated with the adhesive polymer;

a second mixing process of adding and mixing the base polymer; and

a curing process.

[0005] A thermally conductive composition of the present disclosure contains a base polymer, an adhesive polymer, and thermally conductive particles. A thermal conductivity of the thermally conductive composition is 0.3 W/m·K or more. The thermally conductive particles include inorganic particles (a) with a specific surface area of 1 m^2/g or less. The inorganic particles (a) are coated with the adhesive polymer.

CLAIMS

[1] A thermally conductive composition comprising:

a base polymer, an adhesive polymer, and thermally conductive particles,

wherein the base polymer is a silicone polymer,

a thermal conductivity of the thermally conductive composition is 0.3 W/m·K or more,

the thermally conductive particles include inorganic particles (a) with a specific surface area of 1 m^2/g or less,

the inorganic particles (a) are coated with the adhesive polymer, and

the adhesive polymer contains a methyl hydrogen polysiloxane, an epoxy group-containing alkyltrialkoxysilane, and a cyclic polysiloxane oligomer.

[2] The thermally conducive composition according to claim 1, wherein a tensile lap-shear strength of the adhesive polymer with respect to an aluminum plate is 50 N/cm^2 or more.

[3] The thermally conductive composition according to claim 1 or 2, wherein the base polymer is an addition curable silicone polymer.

[4] The thermally conductive composition according to any one of claims 1 to 3, further comprising a silicone oil.

[5] The thermally conductive composition according to any one of claims 1 to 4, wherein the thermally conductive particles are composed of at least one selected from a metal oxide, a metal hydroxide, a metal nitride, and silica.

[6] The thermally conductive composition according to any one of claims 1 to 5, further comprising inorganic particles (b) with a specific surface area of more than 1 m^2/g.

[7] The thermally conductive composition according to claim 6, wherein the inorganic particles (b) are surface treated with a silane compound, a titanate compound, an aluminate compound, or partial hydrolysates thereof.

[8] The thermally conductive composition according to any one of claims 1 to 7, wherein the thermally conductive composition is in the form of a sheet.

[9] The thermally conductive composition according to any one of claims 1 to 8, wherein an amount of the adhesive polymer is 5 to 35 parts by weight with respect to 100 parts by weight of the base polymer.

[10] A method of producing the thermally conductive composition according to any one of claims 1 to 9, comprising:

a first mixing process of mixing the adhesive polymer and the inorganic particles (a) with a specific surface area of 1 m^2/g or less so that the inorganic particles (a) are coated with the adhesive polymer;

a second mixing process of adding and mixing the base polymer; and

a curing process.

[11] The method according to claim 10, wherein the inorganic particles (b) with a specific surface area of more than 1 m^2/g are added in the second mixing process.