COMPOSITE RESIN COMPOSITION AND ELECTRONIC COMPONENT MOLDED FORMED FROM COMPOSITE RESIN COMPOSITION

TECHNICAL FIELD

The present invention relates to a composite resin composition and an electronic component molded from the composite resin composition.

BACKGROUND ART

Liquid crystal polymers are thermoplastic resins having, for example, high dimensional accuracy and excellent fluidity. Because of such characteristics, the liquid crystal polymers have been conventionally used as materials for various electronic components.

In particular, due to demands in the present age associated with improvement in performance of electronic equipment in recent years, i.e., demands for connectors to be more heat resistant (for an increase in productivity by developing mounting technology), more dense (for employment of multi-core), and smaller in size, liquid crystal polymer components utilizing the above-described characteristics of liquid crystal polymers and reinforced with glass fiber have been used as connector materials.

Recently, however, connectors have been further miniaturized, which causes a lack of rigidity due to the insufficient thickness of a molded article or internal stress due to insertion of a metal terminal. As a result, warping

has a highly complicated shape.

Such asymmetric electronic components not having symmetry have a limitation in reduction of warping deformation from the aspect of the molding procedure, unlike ordinary connectors (symmetric electronic components) having symmetry with respect to any of the XY, YZ, and XZ axial planes of the molded article. In a case of an asymmetric electronic component having a complicated shape, the orientation of the resin and the filler in a molded article is complicated, higher fluidity is needed, and inhibition of warping deformation is more difficult.

As technologies for solving these problems, for example, Patent Document 1 discloses an asymmetric electronic component not having symmetry with respect to any of the XY, YZ, and XZ axial planes of the molded article molded from a liquid crystal polymer composition including a specific fibrous filler and a specific plate-shaped filler at a specific blending ratio.

Patent Document 1: PCT International Publication No. WO2008/023839

DISCLOSURE

Unfortunately, it has been revealed that there are cases that cannot be dealt with using the known liquid crystal polymer compositions, such as those disclosed in Patent Document 1, because of changes in shape associated with, for

molded articles having blister resistance. Fundamental resolution of blister occurring needs improving of the quality of liquid crystal polyester amides themselves. Neither known liquid crystal polyester amides nor methods using the same are sufficient to resolve the problem of blister occurring.

The present invention has been made in view of the foregoing circumstances, and an object of the present invention is to provide a composite resin composition that can provide an electronic component being excellent in heat resistance and having suppressed warping distortion and suppressed blister occurring, and an electronic component molded from the composite resin composition.

Embodiments provide combining a liquid crystal polymer containing predetermined amounts of specific constitutional units, a fibrous filler, and a plate-shaped filler and by setting a weight average fiber length of the fibrous filler to 250 μm or higher. Specifically, the present disclosure provides the following:

(1) A composite resin composition comprising a liquid crystalline polymer (A), a fibrous filler (B), and a plate-shaped filler (C), wherein

the liquid crystalline polymer (A) is a wholly aromatic polyester amide that exhibits optical anisotropy when melted, the wholly aromatic polyester amide consisting only of the following constituent units (I) to (VI) as essential

unit (VI), or a mole number of a total of the constituent unit (V) and the constituent unit (VI) is 1 to 1.1 times a mole number of a total of the constituent unit (III) and the constituent unit (IV).

(3) The composite resin composition according to (1) or (2), wherein the fibrous filler (B) is a glass fiber.

(4) The composite resin composition according to any one of (1) to (3), wherein the plate-shaped filler (C) is talc.

(5) An electronic component

molded from the composite resin composition according to any one of (1) to (4) and

having a total product length of 30 mm or more and a product height of 5 mm or more.

(6) The electronic component according to (5), wherein the electronic component is an asymmetric electronic component having no symmetry with respect to any of the axial planes of the XY axial plane, YZ axial plane, and XZ axial plane of a molded article.

(7) The electronic component according to (5) or (6), wherein

the electronic component is a connector for a memory module, and

the connector has a distance between pitches of 0.6 mm or less, a total product length of 60.0 mm or more, a product height of 10.0 mm or less, and a pole number of 200 poles or more.

The present disclosure can provide a composite resin composition that can provide an electronic component being excellent in heat resistance and having suppressed warping distortion and suppressed blister occurring, and an electronic component molded from the composite resin composition.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram illustrating a DDR-DIMM connector molded in Examples. It is noted that A indicates the position of a gate.

FIG. 2 is a diagram indicating the points of measurement of warp in a DDR-DIMM connector performed in Examples.

PREFERRED MODE FOR CARRYING OUT THE INVENTION

Embodiments of the present invention will now be specifically described.

[Composite resin composition]

The composite resin composition of the present invention contains a specific liquid crystal polymer, a fibrous filler, and a plate-shaped filler in predetermined amounts, wherein a weight average fiber length of the fibrous filler is 250 μm or higher. Each component of the composite resin composition according to the present invention will now be described.

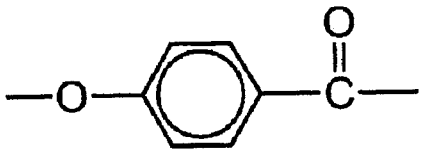
(Liquid crystal polymer)

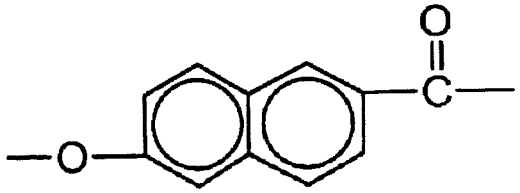
The composite resin composition in the present invention contains a liquid crystal polymer which is the above wholly aromatic polyester amide. The wholly aromatic polyester amide

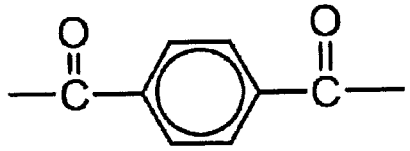
CLAIMS

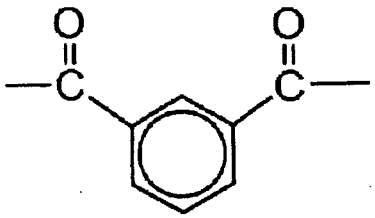
1. A composite resin composition comprising a liquid crystalline polymer (A), a fibrous filler (B), and a plate-shaped filler (C), wherein

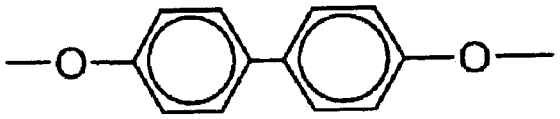
the liquid crystalline polymer (A) is a wholly aromatic polyester amide that exhibits optical anisotropy when melted, the wholly aromatic polyester amide consisting only of the following constituent units (I) to (VI) as essential constitutional components:

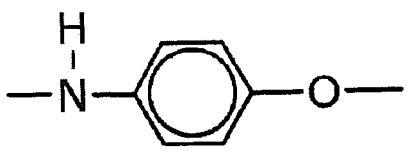
(I) 

(II) 

(III) 

(IV) 

(V) 

(VI) 

a content of the constituent unit (I) is 50 to 70 mol%

with respect to all of the constituent units;

a content of the constituent unit (II) is 0.5 mol% or higher and lower than 4.5 mol% with respect to all of the constituent units;

a content of the constituent unit (III) is 10.25 to 22.25 mol% with respect to all of the constituent units;

a content of the constituent unit (IV) is 0.5 mol% or higher and lower than 4.5 mol% with respect to all of the constituent units;

a content of the constituent unit (V) is 5.75 to 23.75 mol% with respect to all of the constituent units;

a content of the constituent unit (VI) is 1 to 7 mol% with respect to all of the constituent units;

a content of a total of the constituent unit (II) and the constituent unit (IV) is 1 mol% or higher and lower than 5 mol% with respect to all of the constituent units;

a content of a total of the constituent units (I) to (VI) is 100 mol% with respect to all of the constituent units;

a molar ratio of the constituent unit (VI) to a total of the constituent unit (V) and the constituent unit (VI) is 0.04 to 0.37;

a weight average fiber length of the fibrous filler (B) is 250 μm or higher;

the liquid crystalline polymer (A) is 37.5 to 82.5% by mass with respect to the total composite resin composition;

the fibrous filler (B) is 2.5 to 17.5% by mass with respect to the total composite resin composition;

the plate-shaped filler (C) is 15 to 45% by mass with respect to the total composite resin composition; and

a total amount of the fibrous filler (B) and the plate-shaped filler (C) is 17.5 to 62.5% by mass with respect to the total composite resin composition.

2. The composite resin composition according to claim 1, wherein a mole number of a total of the constituent unit (III) and the constituent unit (IV) is 1 to 1.1 times a mole number of a total of the constituent unit (V) and the constituent unit (VI), or a mole number of a total of the constituent unit (V) and the constituent unit (VI) is 1 to 1.1 times a mole number of a total of the constituent unit (III) and the constituent unit (IV).

3. The composite resin composition according to claim 1 or 2, wherein the fibrous filler (B) is a glass fiber.

4. The composite resin composition according to any one of claims 1 to 3, wherein the plate-shaped filler (C) is talc.

5. An electronic component

molded from the composite resin composition according to any one of claims 1 to 4 and

having a total product length of 30 mm or more and a product height of 5 mm or more.

6. The electronic component according to claim 5, wherein the electronic component is an asymmetric electronic component having no symmetry with respect to any of the axial planes of the XY axial plane, YZ axial plane, and XZ axial plane of a molded article.

7. The electronic component according to claim 5 or 6, wherein

the electronic component is a connector for a memory module, and

the connector has a distance between pitches of 0.6 mm or less, a total product length of 60.0 mm or more, a product height of 10.0 mm or less, and a pole number of 200 poles or more.