Thus, a method of using a sheet-like resin layer in which a fluorescent material is uniformly distributed in advance is proposed (for example, Patent Documents 3 and 4). A phosphor to be arranged on each LED chip can be constant and quality of the LED can be improved by forming a material in which a fluorescent material is uniformly dispersed in advance into a sheet having a uniform thickness by coating, cutting the resulting sheet into a small piece, and bonding it to an LED chip.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0006]

PATENT DOCUMENT 1: Japanese Patent Laid-open Publication No. 5-152609

PATENT DOCUMENT 2: Japanese Patent Laid-open Publication No. 7-99345

PATENT DOCUMENT 3: Japanese Patent Publication No. 4146406

PATENT DOCUMENT 4: Japanese Patent Laid-open Publication No. 2000-156528

SUMMARY ~~OF THE INVENTION~~

PROBLEMS TO BE SOLVED ~~BY THE INVENTION~~

[0007]

It is necessary to supply LEDs having small color irregularities of emission color stably for widely adapting the

consequently the present inventors found that in order to improve all these characteristics, a machining method and a configuration of the phosphor-containing resin sheet are very important.

SOLUTIONS TO THE PROBLEMS

[0011]

The present ~~invention~~disclosure enables to enhance the productivity of an LED chip with a phosphor-containing resin sheet while improving the uniformity of luminance and color of an LED, a color of which is converted by a phosphor, by previously providing a predetermined configuration for the phosphor-containing resin sheet, and specifically, the present ~~invention~~disclosure is characterized by any of the following constitutions.

(1) In a first aspect, there is provided a~~A~~ resin sheet laminate provided with a phosphor-containing resin sheet on a base material, wherein the phosphor-containing resin sheet is divided into a plurality of sections.

(2) The resin sheet laminate according to the above-mentioned paragraph (1), wherein the base material is continuous in-plane direction throughout the plurality of sections of the phosphor-containing resin sheet.

(3) The resin sheet laminate according to the above-mentioned paragraph (1) or (2), wherein the base material has a concave portion at the same position as the position of

a boundary dividing a phosphor-containing resin sheet.

(4) The resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (3), wherein a release agent is present between the base material and the phosphor-containing resin sheet.

(5) The resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (3), wherein an adhesive layer is laminated on the phosphor-containing resin sheet.

(6) The resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (5), wherein the base material having the phosphor-containing resin sheet laminated thereon is a resin film.

(7) The resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (6), wherein in the sections in the phosphor-containing resin sheet, its configuration at the time when viewed from a direction perpendicular to in-plane direction of the sheet is a regularly repeated pattern.

(8) The resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (7), wherein the phosphor-containing resin sheet is bonded to an emission surface of an LED.

(9) In a second aspect, there is provided a~~A~~ method for manufacturing the resin sheet laminate according to any one of the above-mentioned paragraphs (1) to (8), which forms a phosphor-containing resin sheet divided into a plurality of sections on a base material to manufacture a resin

sheet laminate, wherein a step of dividing the phosphor-containing resin sheet into a plurality of sections is performed by at least one method among etching by chemicals, patterning by screen printing, punching by a die, machining by a laser beam and cutting by a blade.

(10) In a third aspect, there is provided a~~A~~ method for manufacturing an LED chip with a phosphor-containing resin sheet, comprising the steps of: (A) bonding an emission surface of the LED chip to the divided phosphor-containing resin sheet in the resin sheet laminate according to any one of the above paragraphs (1) to (8), and (B) peeling the phosphor-containing resin sheet bonded to the emission surface of the LED chip from the base material.

(11) The method for manufacturing an LED chip with a phosphor-containing resin sheet according to the above paragraph (10), wherein in the step (A), the emission surfaces of a plurality of LED chips arranged so as to correspond to an arrangement of a plurality of sections of the phosphor-containing resin sheet are collectively bonded to the phosphor-containing resin sheet.

EFFECTS ~~OF THE INVENTION~~

[0012]

In accordance with the present ~~invention~~disclosure, the LED chip with a phosphor-containing resin sheet having uniform luminance and color can be manufactured by an easy process.

BRIEF DESCRIPTION OF THE DRAWINGS