part of the phosphor-containing resin layer corresponding to the different part.

[0010]

The present inventors made earnest investigations concerning the uniformity of color or luminance of a semiconductor light-emitting element having a phosphor-containing resin sheet bonded thereon, the ease of production of the element, the degree of freedom in design thereof, and so on, and consequently the present inventors found that in order to improve all these characteristics, a machining shape and arrangement of the phosphor-containing resin sheet on a base material are very important.

[Solution to Problem]

[0011]

~~According to a first aspect of the present invention, there is provided a resin sheet laminate having a resin sheet containing a phosphor and a resin on or over a long base material, wherein subdivisions of the resin sheet are repeatedly arranged in a lengthwise direction of the long base material.~~

~~According to a second aspect of the present invention, there is provided a method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet using the resin sheet laminate according to any one of claims 1 to 9, comprising at least: an alignment step of opposing one subdivision of the phosphor-containing resin sheet on the long base material to an emission surface of one semiconductor light-emitting element, and an adhering step of adhering the one subdivision of the phosphor-containing resin sheet to the emission surface of the one semiconductor light-emitting element by pressing with a pressure tool, wherein adhesion of the phosphor-containing resin sheet to the semiconductor light-emitting element is sequentially performed by performing the steps (A) and (B) repeatedly.~~

According to an aspect of the present invention, there is provided a method for producing a semiconductor light-emitting element having an electrode on an emission surface side with a phosphor-containing resin sheet using a resin sheet laminate, the resin sheet laminate having a resin sheet containing a phosphor and a resin on or over a long base material, wherein subdivisions of the resin sheet are repeatedly arranged in a lengthwise direction of the long base material, the method comprising the steps of: A) an alignment step of opposing one subdivision of the phosphor-containing resin sheet on the long base material to an emission surface of one semiconductor light-emitting element, and (B) an adhering step of adhering the one subdivision of the phosphor-containing resin sheet to the emission surface of the one semiconductor light-emitting element avoiding the electrode joint portion by pressing with a pressure tool, wherein adhesion of the phosphor-containing resin sheet to the semiconductor light-emitting element is sequentially performed by performing the steps (A) and (B) repeatedly.

[Advantageous Effects of Invention]

[0012]

In accordance with embodiments of the present invention, an LED having uniform luminance and color can be produced by an easy process.

[Brief Description of Drawings]

[0013]

~~[CLAIMS]~~ CLAIMS

~~[Claim 1]~~

1. A method for producing a semiconductor light-emitting element having an electrode on an emission surface side with a phosphor-containing resin sheet using a resin sheet laminate, the resin sheet laminate having a resin sheet containing a phosphor and a resin on or over a long base material, wherein subdivisions of the resin sheet are repeatedly arranged in a lengthwise direction of the long base material, the method comprising the steps of:

(A) an alignment step of opposing one subdivision of the phosphor-containing resin sheet on the long base material to an emission surface of one semiconductor light-emitting element, and

(B) an adhering step of adhering the one subdivision of the phosphor-containing resin sheet to the emission surface of the one semiconductor light-emitting element avoiding the electrode joint portion by pressing with a pressure tool,

wherein adhesion of the phosphor-containing resin sheet to the semiconductor light-emitting element is sequentially performed by performing the steps (A) and (B) repeatedly.

~~[Claim 2]~~

2. The ~~resin sheet laminate~~ method according to claim 1, wherein the thickness of the resin sheet is 200 μm or less.

~~[Claim 3]~~

3. The ~~resin sheet laminate~~ method according to claim 1 or 2, wherein a plurality of lines of the resin sheets are arranged in a widthwise direction of the long base material.

~~[Claim 4]~~

4. The ~~resin sheet laminate~~ method according to any one of claims 1 to 3, wherein conveyance holes are formed in the long base material.

~~[Claim 5]~~

5. The ~~resin sheet laminate~~ method according to any one of claims 1 to 4, wherein the resin sheet laminate has a release layer between the long base material and the resin sheet.

~~[Claim 6]~~

6. The ~~resin sheet laminate~~ method according to any one of claims 1 to 5, wherein an adhesion layer or an adhesive layer is provided on a surface of the resin sheet opposite to the long base material.

~~[Claim 7]~~

7. The resin sheet laminate according to any one of claims 1 to 6, wherein the resin sheet has thermal adhesiveness.

~~[Claim 8]~~

8. The ~~resin sheet laminate~~ method according to any one of claims 1 to 7, wherein a groove is provided at a position substantially conforming to the subdivision of the resin sheet in the long base material.

~~[Claim 9]~~

9. The ~~resin sheet laminate~~ method according to any one of claims 1 to 8, wherein the resin sheet is bonded to an emission surface of an LED.

~~[Claim 10]~~

~~A method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet using the resin sheet laminate according to any one of claims 1 to 9, comprising at least:~~

~~(A) an alignment step of opposing one subdivision of the phosphor-containing resin sheet on the long base material to an emission surface of one semiconductor light-emitting element, and~~

~~(B) an adhering step of adhering the one subdivision of the phosphor-containing resin sheet to the emission surface of the one semiconductor light-emitting element by pressing with a pressure tool, wherein~~

~~adhesion of the phosphor-containing resin sheet to the semiconductor light-emitting element is sequentially performed by performing the steps (A) and (B) repeatedly.~~

~~[Claim 11]~~

10. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to claim

~~10~~1, wherein the semiconductor light-emitting elements are repeatedly arranged in one direction on a stage on which the adhering step is performed.

~~[Claim 12]~~

11. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to claim ~~11~~10, wherein an array pitch in a lengthwise direction of the phosphor-containing resin sheet and an array pitch in one direction of the semiconductor light-emitting element are the same.

~~[Claim 13]~~

12. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to claim ~~12~~11, wherein

the step (A) is (C) an alignment step of opposing a plurality of subdivisions of the phosphor-containing resin sheet to a plurality of emission surfaces of the semiconductor light-emitting elements at a time,

the step (B) is (D) an adhering step of adhering sequentially the subdivisions of the phosphor-containing resin sheet to the emission surfaces of the semiconductor light-emitting elements by pressing with a pressure tool, and

adhesion of the phosphor-containing resin sheet to the semiconductor light-emitting element is sequentially performed by performing the steps (C) and (D) repeatedly.

~~[Claim 14]~~

13. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to claim ~~13~~12, wherein by pressing simultaneously two or more subdivisions of the plurality of opposed subdivisions of the phosphor-containing resin sheet in the step (D), the two or more subdivisions of the phosphor-containing resin sheet are adhered to two or more emission surfaces of the semiconductor light-emitting elements.

~~[Claim 15]~~

14. The method for producing a semiconductor light-emitting

element with a phosphor-containing resin sheet according to any one of claims ~~10~~1 to ~~14~~13, wherein the pressure tool presses the phosphor-containing resin sheet from the base material side in the adhering step.

~~[Claim 16]~~

15. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to any one of claims ~~10~~1 to ~~14~~13, wherein the pressure tool performs pressing from the semiconductor light-emitting element side in the adhering step.

~~[Claim 17]~~

16. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to any one of claims ~~10~~1 to ~~16~~15, wherein the base material is peeled off by using a peeling tool different from the pressure tool after the subdivision of the phosphor-containing resin sheet is adhered to the emission surface of the semiconductor light-emitting element.

~~[Claim 18]~~

17. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to any one of claims ~~10~~1 to ~~17~~16, wherein the pressure tool presses a part of the subdivision to be pressed first and presses a different region thereafter in the adhering step.

~~[Claim 19]~~

18. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to claim ~~17~~16, wherein the pressure tool is a pressure roller.

~~[Claim 20]~~

19. The method for producing a semiconductor light-emitting element with a phosphor-containing resin sheet according to any one of claims ~~10~~1 to ~~18~~17, wherein heating is performed together with pressing in the adhering step.