or an insulation short circuit. In addition, using an adhesive film requires a technique for applying the adhesive film with positional accuracy.

[0009]

The method using a mask disclosed in Patent Document 3 is highly versatile because it is able to deal with changes, for example, in design of a wiring substrate by changing mask design. However, level difference between parts covered by the mask and parts not covered and deformation of the mask itself can cause variation in application position, which is problematic. In addition, when a larger mask is used, processing error or bending of the mask itself may occur, and, therefore, the method is not suitable for mass-producing a single design.

The usual half-cutting methods disclosed in Patent Documents 4, 5, and 6 are designed for a material comprising a tough adhesive layer, which alone is able to withstand tension, conveyance, and the like, and cannot be applied to a material comprising a brittle adhesive layer, which alone cannot withstand tension, conveyance, or the like.

[0010]

Embodiments of~~In view of the problems above,~~ the present invention relates to a process for producing an adhesive sheet comprising a singulated adhesive layer disposed at a specific position. In particular, embodiments of the present invention provides an effective method for producing an adhesive sheet comprising a brittle adhesive layer.

MEANS FOR SOLVING THE PROBLEMS

[0011]

The following are the aspects of the present invention defining~~To solve the problems described above,~~ the process for producing an adhesive sheet having a singulated adhesive layer~~ of the present invention has the following constitution:~~.

According to a first aspect of the present invention, there is provided a process for producing an adhesive sheet having a singulated adhesive layer (b) on a carrier film (a), comprising the following steps in the order mentioned:

Step A: cutting an adhesive film having a carrier film (a), an adhesive layer (b), and a cover film (c) in the order mentioned locally only at the adhesive layer (b) and the cover film (c) by means of local half-cutting;

Step B: peeling only the cover film (c) at unwanted parts of the adhesive film;

Step C: applying adhesive tape to the side of the cover film (c) of the adhesive film; and

Step D: peeling the adhesive layer (b) at unwanted parts and the cover film (c) at desired parts of the adhesive film together with the adhesive tape.

The term "unwanted parts" herein refers to parts that will be peeled off and not remain finally in the adhesive sheet.

[0012]

According to a second aspect, there is provided a~~The~~ process for producing a wiring substrate comprising ~~using the adhesive sheet of the present invention has the following constitution:~~

~~A process for producing a wiring substrate, comprising:~~ aligning the surface on the side of an adhesive layer (b) of an adhesive sheet obtained by the above production process with the surface on the side of wiring of a wiring substrate, forming a laminate comprising the adhesive sheet and the wiring substrate by vacuum lamination or vacuum press, and then removing an carrier film (a) of the adhesive sheet.

[0013]

~~The method of manufacturing semiconductor equipment of the present invention has the following constitution:~~

According to a third aspect, there is provided a method of manufacturing semiconductor equipment, comprising mounting a semiconductor device on a wiring substrate obtained by the process for producing a wiring substrate described above.

[0014]

According to a fourth aspect, there is provided an~~The equipment for producing an adhesive sheet of the present invention has~~

~~the following constitution:~~

~~E~~equipment for producing an adhesive sheet comprising a half-cutting apparatus, a cover film peeling apparatus, an adhesive tape applying apparatus, and an adhesive tape peeling apparatus in the order mentioned.

In an embodiment, in the process for producing an adhesive sheet having a singulated adhesive layer of the present invention, the carrier film (a) preferably has a two-layer structure that can be peeled at the lamination interface.

In an embodiment, in the process for producing an adhesive sheet having a singulated adhesive layer of the present invention, the adhesive tape preferably has a carrier film (a') and an adhesive layer (b'), the carrier film (a') being made of a polyolefin.

In an embodiment, in the process for producing an adhesive sheet having a singulated adhesive layer of the present invention, the adhesive tape preferably has a thickness of 10 to 40 μm.

In an embodiment, in the process for producing an adhesive sheet having a singulated adhesive layer of the present invention, in the peeling of the step D, a bending angle of the adhesive tape (θ_1) and a bending angle of the carrier film (a) (θ_2) preferably satisfy the following expressions (I) and (II):

$|\theta_1| < |\theta_2|$ (I)

$|\theta_1| + |\theta_2| < 60°$ (II).

EFFECTS OF THE INVENTION

[0015]

According to embodiments of the production method of the present invention, an adhesive sheet comprising a singulated adhesive layer disposed at a specific position can be produced. In particular, embodiments of the production method of the present invention are~~is~~ suitable for producing an adhesive sheet that comprises a brittle adhesive layer and requires support by a carrier.

BRIEF DESCRIPTION OF THE DRAWINGS