

DESCRIPTION

ADHESIVE SHEET AND USAGE METHOD THEREFOR

TECHNICAL FIELD

[0001]

5 The present invention relates to an adhesive sheet and a method of using the same.

BACKGROUND ART

[0002]

10 An adhesive sheet needs to allow a cutout step to be stably performed (work stability). In particular, after the cutout step of an adhesive layer, a work stability is required for removing the remnant (waste) of the adhesive layer not forming a cutout (a waste-removal step). More specifically, a process including the cutout step, the waste-removal step and a sticking step to an object needs to be performed on the adhesive sheet by an in-line system without causing unintentional
15 breakage of the adhesive layer (hereinafter occasionally referred to as waste-removal failure) during the removal of the waste after the adhesive layer is cut out.

20 To solve the above problem, for instance, Patent Literature 1 suggests an adhesive sheet including a facestock, an adhesive, and a release liner. In the adhesive sheet of Patent Literature 1, a release force (180 degrees) for the facestock and the adhesive to be separated from the release liner is adjusted to fall within a predetermined range.

CITATION LIST

PATENT LITERATURE(S)

[0003]

25 Patent Literature 1 JP 11-181364 A

SUMMARY OF THE INVENTION

PROBLEM(S) TO BE SOLVED BY THE INVENTION

[0004]

30 Unfortunately, the adhesive sheet of Patent Literature 1 is not capable of sufficiently reducing waste-removal failure.

 Accordingly, an object of the invention is to provide an adhesive sheet capable of sufficiently reducing waste-removal failure, and a method of using the

adhesive sheet. More specifically, an object of the invention is to provide an adhesive sheet capable of sufficiently reducing waste-removal failure during a process including a cutout step, a waste-removal step, and a sticking step to an object performed on the adhesive sheet by an in-line system, and a method of using the adhesive sheet.

MEANS FOR SOLVING THE PROBLEM(S)

[0005]

According to an aspect of the invention, an elongated adhesive sheet includes: an adhesive layer; and first sheet and second sheet on both surfaces of the adhesive layer, in which respective first cut lines are formed in the first sheet near and along lateral ends of the first sheet in a width direction in a plan view, and when a release force for the first sheet to be peeled from the adhesive layer is denoted by F_1 and a release force for the second sheet to be peeled from the adhesive layer is denoted by F_2 , F_1 and F_2 satisfy conditions represented by a formula (F1) below.

$$F_2 < F_1 \dots (F1)$$

[0006]

In the above aspect, it is preferable that the first sheet is provided with a first release layer, the adhesive layer and the first sheet are laminated on each other via the first release layer, the second sheet is provided with a second release layer, and the adhesive layer and the second sheet are laminated on each other via the second release layer.

In the above aspect, it is preferable that the first cut lines are formed from the first sheet of the adhesive sheet and reach the adhesive layer through the first sheet.

In the above aspect, it is preferable that the first cut lines are continuous in a length direction of the first sheet in the plan view.

In the above aspect, it is preferable that a void, which is absent of an adhesive, is formed on the adhesive layer in the plan view.

[0007]

According to another aspect of the invention, a method of using the adhesive sheet includes: half-cutting the adhesive sheet to form a second cut line in

the adhesive layer and the second sheet such that the adhesive layer is divided into a cutout and the remnant of the adhesive layer in a form of a continuous waste; and removing the continuous waste from the adhesive sheet.

[0008]

5 According to still another aspect of the invention, a method of using an elongated adhesive sheet, the adhesive sheet including: an adhesive layer; and first sheet and second sheet on both surfaces of the adhesive layer, the method includes: half-cutting the adhesive sheet to form respective first cut lines in the first sheet near and along lateral ends of the first sheet in a width direction in a plan
10 view to manufacture the adhesive sheet of the above aspect; half-cutting the manufactured adhesive sheet to form a second cut line in the adhesive layer and the second sheet such that the adhesive layer is divided into a cutout and the remnant of the adhesive layer in a form of a continuous waste; and removing the continuous waste from the manufactured adhesive sheet.

15 [0009]

In the above aspect, it is preferable that the cutout is located between the first cut lines in the plan view.

In the above aspect, it is preferable that when the adhesive layer has a void, which is absent of an adhesive, the cutout is formed such that the void overlaps the
20 continuous waste in the plan view.

In the above aspect, it is preferable that the method of using the adhesive sheet further includes forming a void, which is absent of an adhesive, on the adhesive layer in the plan view and the cutout is formed such that the void overlaps the continuous waste in the plan view.

25 [0010]

According to the above aspects of the invention, an adhesive sheet capable of sufficiently reducing waste-removal failure and a method of using the adhesive sheet can be provided.

BRIEF DESCRIPTION OF DRAWING(S)

30 [0011]

Fig. 1 schematically shows an adhesive sheet according to a first exemplary embodiment of the invention.

Fig. 2 shows a cross section viewed along arrows II-II in Fig. 1.

Fig. 3 schematically shows that an auxiliary tape is attached to the adhesive sheet according to the first exemplary embodiment of the invention, which has been provided with a cutout.

5 Fig. 4 shows a cross section viewed along arrows IV-IV in Fig. 3.

Fig. 5 schematically shows that a continuous waste is removed from the adhesive sheet according to the first exemplary embodiment of the invention.

Fig. 6 shows a cross section viewed along arrows VI-VI in Fig. 5.

10 Fig. 7 schematically shows an adhesive sheet according to a second exemplary embodiment of the invention.

DESCRIPTION OF EMBODIMENT(S)

[0012]

First Exemplary Embodiment

15 The invention is explained below through an exemplary embodiment(s) with reference to the attached drawings. The invention is not limited to the contents of the exemplary embodiment(s). It should be noted that the drawings show some parts on an increased scale or a reduced scale for the convenience of explanation.

[0013]

Adhesive Sheet

20 Description is first made on an adhesive sheet according to a first exemplary embodiment.

25 As shown in Fig. 1, an adhesive sheet 100 according to the first exemplary embodiment is elongated (belt-shaped) and includes a first sheet 1, a second sheet 2, and an adhesive layer 3. The first sheet 1 and the second sheet 2 are on both surfaces of the adhesive layer 3.

30 The first sheet 1 includes a first base sheet 11 and a first release layer 12. The first sheet 1 and the adhesive layer 3 are laminated on each other via the first release layer 12. The second sheet 2 includes a second base sheet 21 and a second release layer 22. The second sheet 2 and the adhesive layer 3 are laminated on each other via the second release layer 22.

As shown in Figs. 1 and 2, respective first cut lines 41 are formed in the first sheet 1 near and along lateral ends thereof in a width direction in a plan view. The

first cut lines 41 are continuous in a length direction of the first sheet 1 in the plan view. The first cut lines 41 are formed from the first sheet 1 of the adhesive sheet 100 and reach the adhesive layer 3 through the first sheet 1. The first cut lines 41 are only required to reach at least an interface between the first sheet 1 and the adhesive layer 3.

[0014]

When F_1 denotes a release force for the first sheet 1 to be peeled from the adhesive layer 3 and F_2 denotes a release force for the second sheet 2 to be peeled from the adhesive layer 3, the adhesive sheet 100 of the first exemplary embodiment satisfies conditions represented by a numerical expression (F1) below.

$$F_2 < F_1 \dots (F1)$$

If the conditions of the numerical expression (F1) are not satisfied, a cutout 31 would be easily peeled from the first sheet 1 and thus unlikely to remain on the first sheet 1 during a waste-removal step.

[0015]

The release force F_1 and the release force F_2 may be measured by fixing a sample (width: 100 mm, length: 100 mm) including a sheet being peeled (the first sheet 1 or the second sheet 2) and the adhesive layer 3, pulling the sheet being peeled in a 180-degree direction at a rate of 300 mm/min using a tensile tester, and measuring a release force applied to an interface between the sheet being peeled and the adhesive layer 3 (unit: mN/100mm).

It should be noted that the release force F_1 and the release force F_2 may be measured in a manner different from the above. This is because an excessively large or small release force cannot be measured by the above method. In such a case, the measurement conditions for the release force (e.g., the size of the sample and speed) may be adjusted as appropriate to determine a magnitude relationship between the release force F_1 and the release force F_2 . For instance, when a release force is too large to measure, a sample requiring such a large release force is determined to be larger than another sample requiring a measurable release force.

[0016]

The release force F_1 and the release force F_2 may be adjusted by changing

the respective compositions or thicknesses of the release layers on the first sheet 1 and the second sheet 2, or changing the respective types or thicknesses of the first sheet 1 and the second sheet 2.

[0017]

5 First Sheet and Second Sheet

The first sheet 1 according to the first exemplary embodiment includes the first base sheet 11 and the first release layer 12. The second sheet 2 according to the first exemplary embodiment includes the second base sheet 21 and the second release layer 22.

10 A thickness of the first sheet 1 usually ranges, but not limited to, from 20 μm to 250 μm , preferably from 38 μm to 100 μm .

A thickness of the second sheet 2 usually ranges, but not limited to, from 20 μm to 250 μm , preferably from 25 μm to 75 μm , more preferably from 25 μm to 50 μm .

15 [0018]

Examples of the first base sheet 11 and the second base sheet 21 include a resin film and paper. Examples of a resin for the resin film include polyethylene terephthalate, polyethylene, polypropylene, polybutene, polybutadiene, polymethylpentene, polyvinyl chloride, vinyl chloride copolymer, polybutylene terephthalate, polyurethane, ethylene-vinyl acetate copolymer, ionomer resin, ethylene(meta)acrylate copolymer, polystyrene, polycarbonate, fluorine resin, low-density polyethylene, linear low-density polyethylene, and triacetylcellulose. Examples of the paper include high-quality paper, coat paper, glassine paper, and laminated paper. One of the above may be used alone or two or more thereof may be used in combination. Among the above, a polyethylene terephthalate film is preferable since it is inexpensive and stiff (less bendable).

[0019]

The first release layer 12 and the second release layer 22 may each be formed from a releasing agent.

30 Examples of the releasing agent include a silicone resin, a fluorine resin, and a long-chain alkyl resin. One of the above may be used alone or two or more thereof may be used in combination. Among these resins, a silicone resin is

preferable since it is inexpensive and provides stable properties.

A thickness of each of the first release layer 12 and the second release layer 22 preferably ranges from 0.01 μm to 2.0 μm , more preferably from 0.05 μm to 0.5 μm .

5 [0020]

Adhesive Layer

The adhesive layer 3 according to the first exemplary embodiment may be formed from a known adhesive. Examples of the adhesive include, but not limited to, acrylic adhesive, rubber adhesive, silicone adhesive, polyurethane adhesive, polyester adhesive, epoxy adhesive, and polyimide adhesive. One of the above
10 may be used alone or two or more thereof may be used in combination. Suitable one(s) of these adhesives may be selected depending on the intended use of the adhesive sheet. These adhesives may contain a cure accelerator, an energy ray curable component, and other resin components as needed.

15 When the adhesive sheet is used as, for instance, a film adhesive for die-bonding a chip or an underfill sheet for flipchip mounting, an epoxy adhesive or a polyimide adhesive are suitably usable.

When the adhesive sheet is used as a dicing die bonding film intended to not only fix a wafer during a dicing process but also bond a die during a die-bonding
20 process, an adhesive containing a binder component such as an acrylic copolymer and an epoxy adhesive is preferable. Such an adhesive may further contain, for instance, an energy ray curable compound, an energy ray curable polymer, and/or a cure accelerator as needed.

When the adhesive sheet is used as a back protective film for semiconductor wafers, an adhesive containing a binding component such as an
25 acrylic polymer, an epoxy adhesive, and a cure accelerator is preferable. Such an adhesive may further contain, for instance, an energy ray curable compound, an energy ray curable polymer, a filler, and/or a coloring agent as needed.

[0021]

30 A thickness of the adhesive layer 3, which varies depending on the intended use, preferably ranges from 1 μm to 300 μm in terms of workability in the cutout step, more preferably from 5 μm to 200 μm , further preferably from 10 μm to

100 μm .

[0022]

Method of Manufacturing Adhesive Sheet

The adhesive sheet 100 according to the first exemplary embodiment may
5 be manufactured by a method including the following cutting step.

In the cutting step, an adhesive sheet without the first cut lines 41 (not shown) is half-cut to form the first cut lines 41 in the first sheet 1. The respective first cut lines 41 are thus formed near and along the lateral ends of the first sheet 1 in the width direction in the plan view to manufacture the adhesive sheet 100.

10 The half-cutting for the cutting step means forming the first cut lines 41 in a manner not to cut through the adhesive sheet 100. With the first cut lines 41 being formed, the first sheet 1 is cut through, whereas the adhesive layer 3 and the second sheet 2 are not cut through.

The above half-cutting may be performed using a suitable known cutter.

15 [0023]

Method of Using Adhesive Sheet

Description is first made on a method of using an adhesive sheet according to the first exemplary embodiment.

The method of using the adhesive sheet according to the first exemplary
20 embodiment, i.e., a method of using the adhesive sheet 100 according to the first exemplary embodiment, includes later-described cutout step and waste-removal step.

[0024]

In the cutout step, the adhesive sheet 100 is half-cut to form a second cut
25 line 42 in the adhesive layer 3 and the second sheet 2 such that the adhesive layer 3 is divided into the cutout 31 and the remnant in a form of a continuous waste 32 (i.e., a portion not forming the cutout 31) as shown in Figs. 3 and 4.

As shown in Fig. 3, the cutout 31 is preferably located between the first cut lines 41 in the plan view. Specifically, cutouts 31 are formed at a plurality of
30 positions in a length direction of the adhesive sheet 100.

The half-cutting for the cutout step means forming the second cut line 42 in a manner not to cut through the adhesive sheet 100. With the second cut line 42

being formed, the adhesive layer 3 and the second sheet 2 are cut through, whereas the first sheet 1 is not cut through. The second cut line 42 is formed from the second sheet 2 of the adhesive sheet 100 and reaches the first sheet 1 through the second sheet 2 and the adhesive layer 3. The second cut line 42, which is only
5 required to reach at least an interface between the adhesive layer 3 and the first sheet 1, preferably enters a surface of the first sheet 1 completely through the adhesive layer 3.

The above half-cutting may be performed using a suitable known cutter.

In the cutout step, the cutouts 31 are formed by half-cutting the entire
10 circumference of each of the cutouts 31.

The remnant not forming the cutouts 31 is defined as the continuous waste 32, which is peeled together as the second sheet 2 is peeled from the adhesive sheet 100.

[0025]

After the cutout step, an auxiliary tape 5 may be attached to a surface of the
15 second sheet 2 of the adhesive sheet 100 (an auxiliary-tape attaching step) as shown in Figs. 3 and 4.

By attaching the auxiliary tape 5 across in the length direction, the second sheet 2 having been provided with the second cut line 42 can be united.
20 Consequently, the second sheet 2 can be peeled from a surface of the adhesive layer 3 in the later-described waste-removal step.

The auxiliary tape 5 may be a known adhesive tape.

[0026]

In the waste-removal step, the continuous waste 32 is peeled from the first
25 sheet 1 to be removed from the adhesive sheet 100 as shown in Figs. 5 and 6.

The continuous waste 32 is removed along with the second sheet 2, a part 1a (i.e., lateral margins on the outside of the first cut lines 41) of the first sheet 1, and the auxiliary tape 5. By removing the continuous waste 32 from the adhesive sheet 100, adhesive films in the shape of the cutouts 31 are obtained as shown in
30 Fig. 5.

A shape of the cutouts 31 in a plan view is not limited but may be varied depending on the intended use. Examples of the shape of the cutouts 31 in the plan

view include polygons (e.g., triangle, rectangle and pentagon), circle, oval, and star.

[0027]

The thus-obtained adhesive film can be used for a variety of purposes, such as a film adhesive for die-bonding a chip, a dicing die bonding film, an underfill sheet, and a back protective film for semiconductor wafers.

It should be noted that the method of using the adhesive sheet according to the first exemplary embodiment may further include sticking each of the cutouts 31 to an object after the waste-removal step. In such a sticking step, the first sheet 1 is peeled and only the cutout 31 is stuck to the object.

Further, in the method of using the adhesive sheet according to the first exemplary embodiment, the cutout step, the waste-removal step, and the sticking step are preferably sequentially performed by an in-line system.

[0028]

Advantage(s) of First Exemplary Embodiment

The first exemplary embodiment can achieve the following advantages (1) to (3).

(1) Removing the continuous waste 32 along with the second sheet 2 and the part 1a (the lateral margins on the outside of the first cut lines 41) of the first sheet 1 reduces an area of the first sheet 1 being peeled from the adhesive layer 3 in the waste-removal step. Consequently, the portion of the adhesive layer 3 forming the continuous waste 32 can be prevented from remaining on the first sheet 1 in the waste-removal step. Further, the continuous waste 32 is sandwiched between the second sheet 2 and the part 1a of the first sheet 1. The continuous waste 32 is thus held between the second sheet 2 and the part 1a of the first sheet 1 during the waste-removal step. This arrangement can sufficiently reduce waste-removal failure.

(2) The release force F_1 for the first sheet 1 to be peeled from the adhesive layer 3 is larger than the release force F_2 for the second sheet 2 to be peeled from the adhesive layer 3. The cutouts 31 can thus remain on the first sheet 1 in the waste-removal step.

(3) In the first exemplary embodiment, the cutout step, the waste-removal step, and the sticking step are preferably sequentially performed by an in-line system. Sequentially performing a set of steps allows the adhesive sheet 100 to be

efficiently used, thus improving work efficiency and productivity.

[0029]

Second Exemplary Embodiment

Next, description is made on a second exemplary embodiment of the
5 invention with reference to the drawing(s).

It should be noted that the second exemplary embodiment is the same as the first exemplary embodiment except that the adhesive sheet 100 is replaced with an adhesive sheet 100A, so that description is made only on the adhesive sheet 100A, a method of manufacturing the same, and a method of using the same.

10 As shown in Fig. 7, the adhesive sheet 100A according to the second exemplary embodiment is elongated and includes the first sheet 1, the second sheet 2, and the adhesive layer 3. The first sheet 1 and the second sheet 2 are on both surfaces of the adhesive layer 3.

A void 3a, which is absent of the adhesive, is formed on the adhesive layer
15 3 in the plan view as shown in Fig. 7. More specifically, voids 3a are located between adjacent ones of the plurality of cutouts 31.

Further, the respective first cut lines 41 are formed in the first sheet 1 near and along the lateral ends thereof in the width direction in the plan view in the same manner as in the first exemplary embodiment.

20 [0030]

The adhesive sheet 100A according to the second exemplary embodiment may be manufactured by one of the following methods (i) and (ii).

Method (i): The adhesive layer 3 is formed by applying the adhesive on the first sheet 1 or the second sheet 2, with the voids 3a being formed. The first sheet 1 or
25 the second sheet 2 is then laminated on the adhesive layer 3 to manufacture the adhesive sheet without the first cut lines 41. The first cut lines 41 are then formed by the cutting step to manufacture the adhesive sheet 100A.

Method (ii): The adhesive layer 3 is formed by applying the adhesive on one of the first sheet 1 and the second sheet 2. Then, the adhesive layer 3 is, for instance, cut
30 out to form the voids 3a and, subsequently, the other of the first sheet 1 and the second sheet 2 is laminated on the adhesive layer 3 to manufacture the adhesive sheet without the first cut lines 41. The first cut lines 41 are formed by the cutting

step to manufacture the adhesive sheet 100A.

[0031]

In the cutout step for the method of using the adhesive sheet according to the second exemplary embodiment, the cutouts 31 are formed such that the voids 3a overlap the continuous waste 32 in the plan view. This arrangement prevents the cutouts 31 from having a portion without the adhesive, so that adhesive films in the shape of the cutouts can be obtained through the waste-removal step. Further, in the cutout step, the second cut line 42 is preferably aligned with the boundary of each of the voids 3a in the plan view.

[0032]

Advantage(s) of Second Exemplary Embodiment

The second exemplary embodiment can achieve the following advantage (4) in addition to the advantages (1) to (3) of the first exemplary embodiment.

(4) Since the voids 3a are absent of the adhesive, the area of the first sheet 1 being peeled from the adhesive layer 3 is reduced by an amount corresponding to the area of the voids 3a. Further, since the voids 3a are located between adjacent ones of the plurality of cutouts 31, only the continuous waste 32 on the lateral ends is reeled off in the waste-removal step. The portion of the adhesive layer 3 forming the continuous waste 32 can thus be prevented from remaining on the first sheet 1 with further reliability in the waste-removal step.

[0033]

Third Exemplary Embodiment

Next, description is made on a third exemplary embodiment of the invention.

A method of using an adhesive sheet according to the third exemplary embodiment, i.e., a method of using an elongated adhesive sheet, includes: half-cutting an adhesive sheet without the first cut lines 41 (not shown) to form the first cut lines 41 in the first sheet 1 near and along the lateral ends of the first sheet 1 in the width direction in a plan view to manufacture the adhesive sheet 100 according to the first exemplary embodiment (see Figs. 1 and 2); and the cutout step and waste-removal step according to the first exemplary embodiment.

In the third exemplary embodiment, the adhesive sheet 100 may be manufactured by the same method as the method of manufacturing the adhesive

sheet according to the first exemplary embodiment.

[0034]

Advantage(s) of Third Exemplary Embodiment

The third exemplary embodiment can achieve the following advantage (5) in addition to the advantages (1) to (3) of the first exemplary embodiment.

(5) The step for manufacturing the adhesive sheet 100 can be performed successively to the cutout step and the waste-removal step. Thus, the method of using the adhesive sheet can achieve the advantages (1) to (3) of the first exemplary embodiment even though the adhesive sheet being used has not been provided with the first cut lines 41.

[0035]

Fourth Exemplary Embodiment

Next, description is made on a fourth exemplary embodiment of the invention.

A method of using an adhesive sheet according to the fourth exemplary embodiment further includes forming the voids 3a, which are absent of the adhesive, on the adhesive layer 3 in a plan view in addition to the steps of the method of using the adhesive sheet according to the first exemplary embodiment. Specifically, the cutouts 31 are formed such that the voids 3a overlap the continuous waste 32 in the plan view.

In such a void-forming step, the voids 3a may be formed by half-cutting the adhesive sheet 100 to form a third cut line (not shown) in the adhesive layer 3 and the second sheet 2, and then partly removing the adhesive layer 3 and the second sheet 2 to form the voids 3a on the adhesive layer 3.

In the cutout step for the method of using the adhesive sheet according to the fourth exemplary embodiment, the cutouts 31 are formed such that the voids 3a overlap the continuous waste 32 in the plan view in the same manner as in the cutout step according to the second exemplary embodiment.

[0036]

Advantage(s) of Fourth Exemplary Embodiment

The fourth exemplary embodiment can achieve the following advantage (6) in addition to the advantages (1) to (3) of the first exemplary embodiment.

(6) The void-forming step allows manufacturing the adhesive sheet including the adhesive layer 3 provided with the voids 3a. Thus, the method of using the adhesive sheet can achieve the advantage (4) of the second exemplary embodiment even though the adhesive sheet being used includes the adhesive layer 3 without the void 3a.

[0037]

Modification(s) of Exemplary Embodiment(s)

The invention is not limited to the above exemplary embodiments but may include any modifications and improvements not hampering the achievement of an object of the invention.

For instance, in the exemplary embodiment(s), the adhesive film cut out into a predetermined shape is usable as a film adhesive for die-bonding a chip, a dicing die bonding film, an underfill sheet, and a back protective film for semiconductor wafers, but the invention is not limited thereto. Examples of the intended use of the adhesive film cut out into the predetermined shape may include label, sticker and patch.

EXPLANATION OF CODE(S)

[0038]

1...first sheet, 12...first release layer, 2...second sheet, 22...second release layer, 3...adhesive layer, 31...cutout, 32...continuous waste, 3a...void, 41...first cut line, 42...second cut line, 100,100A...adhesive sheet

CLAIM(S)

1. An elongated adhesive sheet comprising:
an adhesive layer; and
first sheet and second sheet on both surfaces of the adhesive layer,

5 wherein

respective first cut lines are formed in the first sheet near and along lateral ends of the first sheet in a width direction in a plan view, and

when a release force for the first sheet to be peeled from the adhesive layer is denoted by F_1 and a release force for the second sheet to be peeled from the adhesive layer is denoted by F_2 , F_1 and F_2 satisfy conditions represented by a
10 formula (F1) below,

$F_2 < F_1 \dots (F1).$

2. The adhesive sheet according to claim 1, wherein

the first sheet is provided with a first release layer,

15 the adhesive layer and the first sheet are laminated on each other via the first release layer,

the second sheet is provided with a second release layer, and

the adhesive layer and the second sheet are laminated on each other via the second release layer.

20 3. The adhesive sheet according to claim 1 or 2, wherein

the first cut lines are formed from the first sheet of the adhesive sheet and reach the adhesive layer through the first sheet.

4. The adhesive sheet according to any one of claims 1 to 3, wherein

25 the first cut lines are continuous in a length direction of the first sheet in the plan view.

5. The adhesive sheet according to any one of claims 1 to 4, wherein

a void, which is absent of an adhesive, is formed on the adhesive layer in the plan view.

6. A method of using the adhesive sheet according to any one of claims 1 to 5,
30 the method comprising:

half-cutting the adhesive sheet to form a second cut line in the adhesive layer and the second sheet such that the adhesive layer is divided into a cutout and

the remnant of the adhesive layer in a form of a continuous waste; and
removing the continuous waste from the adhesive sheet.

7. A method of using an elongated adhesive sheet, the adhesive sheet comprising: an adhesive layer; and first sheet and second sheet on both surfaces of the adhesive layer, the method comprising:

half-cutting the adhesive sheet to form respective first cut lines in the first sheet near and along lateral ends of the first sheet in a width direction in a plan view to manufacture the adhesive sheet according to any one of claims 1 to 5;

half-cutting the manufactured adhesive sheet to form a second cut line in the adhesive layer and the second sheet such that the adhesive layer is divided into a cutout and the remnant of the adhesive layer in a form of a continuous waste; and removing the continuous waste from the manufactured adhesive sheet.

8. The method of using the adhesive sheet according to claim 6 or 7, wherein the cutout is located between the first cut lines in the plan view.

9. The method of using the adhesive sheet according to any one of claims 6 to 8, wherein

when the adhesive layer has a void, which is absent of an adhesive, the cutout is formed such that the void overlaps the continuous waste in the plan view.

10. The method of using the adhesive sheet according to any one of claims 6 to 8, further comprising forming a void, which is absent of an adhesive, on the adhesive layer in the plan view, wherein

the cutout is formed such that the void overlaps the continuous waste in the plan view.