Claims

[1] A substrate storage container comprising: a container body for storing substrates; a door element to be fitted to the opening of the container body; and a compressively deformable gasket for sealing between the container body and the door element, characterized in that

a gasket fitting portion is formed on either the inner periphery of the opening of the container body or the door element while a sealing surface for the gasket is formed on the other so that the difference between the maximum and the minimum of the flatness is specified to be less than 0.50 mm, and

the gasket includes: a base to be fitted to the fitting portion; a flexible sealing part extended from the base toward the sealing surface; and a contact portion that is formed in the sealing part and contacts the sealing surface.

[2] The substrate storage container according to Claim 1, wherein the compressive force necessary to compress and deform the gasket when the door element is fitted into the opening of the container body is specified to range from 35 to 100 N.

[3] The substrate storage container according to Claim 1 or 2, wherein the substrates are semiconductor wafers having a diameter of 300 mm or greater, the container body is constructed of a front open box for storing semiconductor

wafers of 300 mm or greater in diameter, with its front side formed as the opening, and a plurality of ribs are formed near the rim of the opening.

[4] The substrate storage container according to Claim 3, wherein engaging ribs are formed on both sides of the rim of the opening of the container body while the door element has engaging pieces pivotally supported on both sides thereof to be engaged with the engaging ribs of the container body.

[5] The substrate storage container according to any one of Claims 1 through 4, wherein the distal end of the sealing part is formed to be the contact portion, and the width W from the proximal end of the sealing part to the distal end of the contact portion is specified to range from 5 to 10 mm.

[6] The substrate storage container according to Claim 5, wherein the ratio (W/FL) of the width W(mm) from the proximal end of the sealing part to the distal end of the contact portion to the flexed length FL(mm) when the gasket seals between the container body and the door element is specified to range from 1.5 to 4.

[7] The substrate storage container according to any one of Claims 1 through 6, wherein the gasket is formed in an approximately frame-like shape, and the sealing part has a different length in a partial section of, at least, one side from the length of the remaining part, the sealing part in

the partial section being extended more than the sealing part in the remaining part.

[8] The substrate storage container according to Claim 7, wherein the sealing part in the partial section is positioned in the area where the sealing surface flatness becomes maximum or minimum, or is positioned in the area on the sealing surface most distant from the engaging pieces of the door element.

[9] A substrate storage container comprising: a container body molded of molding material in a front open box type for storing substrates; a door element to be fitted to the opening at the front of the container body; and a compressively deformable gasket for sealing between the container body and the door element, characterized in that

the opening of the container body is projected sidewards and outwards forming a rim portion, a sealing surface for the gasket is formed on the inner surface of the rim portion, the container body is formed with a reinforcing rib directed toward the rim portion, and the opposing portion of the reinforcing rib that opposes the rim portion of the container body is reduced in thickness so as to prevent a depression from forming in the sealing surface of the rim portion during molding the container body.

[10] The substrate storage container according to Claim 9, wherein the opposing portion of the reinforcing rib is formed to be discontinuous to the rim portion of the container body

so as to reduce the thickness of the opposing portion of the reinforcing rib.

[11] The substrate storage container according to Claim 9, wherein the opposing portion of the reinforcing rib is joined continuously to the rim portion of the container body, and a through hole is formed in the opposing portion of the reinforcing rib so as to reduce the thickness of the opposing portion of the reinforcing rib.

[12] The substrate storage container according to Claim 9, wherein the opposing portion of the reinforcing rib is joined continuously to the rim portion of the container body, and the opposing portion of the reinforcing rib is reduced in thickness so that the thickness of the opposing portion of the reinforcing rib is less than two-thirds or less of the thickness of the proximal portion.

[13] The substrate storage container according to any one of Claims 9 through 12, wherein a plurality of reinforcing ribs directed in the front-to-rear direction of the container body is formed in the bottom surface at the bottom of the container body and the front part of the each reinforcing rib is formed to be the opposing portion.

[14] The substrate storage container according to any one of Claims 9 through 12, wherein bottom rails for transportation are formed on the both sides at the bottom of the container body by means of reinforcing ribs, and the front part of each

reinforcing rib is formed to be the opposing portion.

[15] The substrate storage container according to claim 8, wherein the sealing part in the partial section is positioned in the area where the flatness of the sealing surface varies.

[16] The substrate storage container according to claim 1, wherein the fitting portion comprises a first group of projections that project from one peripheral side of the base and a second group of projections that project from the other peripheral side of the base.

[17] The substrate storage container according to claim 16, wherein the first and second groups of projections are formed to be gradually shorter from the exposed portion of the peripheral surface of the base toward the interior bottom of the peripheral surface.

Claims

1. A substrate storage container comprising:

a container body for storing substrates;

a door element fitted to an opening of the container body; and

a compressively deformable gasket for sealing between the container body and the door element;

wherein a gasket fitting portion is formed on one of an inner periphery of the opening of the container body or the door element while a sealing surface for the gasket is formed on an opposing one of the door element or the inner periphery of the opening of the container body such that a difference between a maximum and a minimum of a flatness of the sealing surface is less than 0.50 mm,

wherein the gasket comprises:

a base fitted to the fitting portion;

a flexible sealing part extended from the base toward the sealing surface; and

a contact portion formed in the sealing part and contacts the sealing surface,

wherein the gasket is formed in a frame shape,

wherein the sealing part is approximately in a shape of a rectangular cylinder; wherein the sealing part comprises: a first group of tapered projections on an outer peripheral side and a second group of tapered projections on an inner peripheral side, wherein each of the first and second groups of tapered projections includes at least two projections having a substantively same shape but a different size from one another, and

wherein the sealing part is molded of thermoplastic elastomer or rubber.

2. The substrate storage container according to claim 1, wherein a compressive force necessary to compress and deform the gasket when the door element is fitted into the opening of the container body is specified to range from 35 to 100 N.

3. The substrate storage container according to claim 1, wherein

the substrates are semiconductor wafers having a diameter of 300 mm or greater, the container body is constructed of a front open box for storing semiconductor wafers of 300 mm or greater in diameter, with its front side formed as the opening, and a plurality of ribs are formed near a rim of the opening.

4. The substrate storage container according to claim 3, wherein engaging ribs are formed on both sides of the rim of the opening of the container body while the door element has engaging pieces pivotally supported on both sides thereof to be engaged with the engaging ribs of the container body.

5. The substrate storage container according to claim 1, wherein a distal end of the sealing part is formed to be the contact portion, and a width W from a proximal end of the sealing part to the distal end of the contact portion is specified to range from 5 to 10 mm.

6. The substrate storage container according to claim 5, wherein a ratio (W/FL) of the width W (mm) from the proximal end of the sealing part to the distal end of the contact portion to a flexed length FL (mm) when the gasket seals between the container body and the door element is specified to range from 1.5 to 4.

7. The substrate storage container according to claim 1, wherein the sealing part in the partial section is positioned in an area where the sealing surface flatness becomes maximum or minimum, or in a center portion, or in an area on the sealing surface most distant from engaging pieces of the door element.

8. The substrate storage container according to claim 7, wherein the sealing part in the partial section is positioned in the area where the flatness of the sealing surface varies.