following configuration and have accomplished the present invention.

[0012]

That is, the present invention has the following configurations.

[1] A release film for forming a resin sheet, comprising a polyester film as a substrate and a release layer,

wherein the polyester film includes a surface layer A substantially containing no inorganic particles,

the release layer is provided on the surface layer A,

the release layer is a layer obtained by curing a release layer forming composition,

the release layer forming composition contains a cationically curable polydimethylsiloxane (a),

the release layer has an average area surface roughness (Sa) of 2 nm or less, and

the number of protrusions having a height of 10 nm or more present on a surface of the release layer is 200 protrusions/mm^2 or less.

[2] In one embodiment, the release layer has a maximum protrusion height (Sp) of 20 nm or less, and a total of the number of protrusions having a height of 5 nm or more and less than 10 nm and the number of protrusions having a height of 10 nm or more present on the surface of

Hereinafter, the present invention will be described in detail.

The present invention relates to a release film for forming a resin sheet, including a polyester film as a substrate and a release layer. The polyester film includes a surface layer A substantially containing no inorganic particles. The release layer is provided on the surface layer A. The release layer is a layer obtained by curing a release layer forming composition. The release layer forming composition contains a cationically curable polydimethylsiloxane (a). The release layer has an average area surface roughness (Sa) of 2 nm or less. The number of protrusions having a height of 10 nm or more present on a surface of the release layer is 200 protrusions/mm^2 or less.

[0015]

Since the release layer is excellent in smoothness and peelability in the present invention having such a configuration, for example, a uniform thickness can be provided without defects for a resin sheet having a thickness of 0.2 μm to 1.0 μm, and drawbacks such as pinholes can be suppressed.

The present invention can exhibit the following effects. In the present invention, the release layer is provided on the substrate film having sufficient

treatment or the like. It is preferable that, when the coat layer is provided on the surface layer A, the coat layer substantially contains no particles.

[0036]

(Release layer)

In the present invention, the release layer is laminated on the surface layer A. In the present invention, the release layer is a layer obtained by curing a release layer forming composition. The release layer and the release layer forming composition contain at least a cationically curable polydimethylsiloxane (a). The release layer has an average area surface roughness (Sa) of 2 nm or less. The number of protrusions having a height of 10 nm or more present on the surface of the release layer is 200 protrusions /mm^2 or less.

When the release layer has such a characteristic, it is possible to suppress the occurrence of pinholes in an ultrathin film resin sheet required to have high smoothness, for example, a ceramic green sheet, and to form a resin sheet having a uniform film thickness.

More specifically, in the present invention, in the release layer, curing failure due to oxygen inhibition can be suppressed, and high crosslinking of the release layer can be exhibited. The present invention exhibiting such an effect can improve, for example, the solvent resistance of

more so as not to cause defects in the ceramic sheet to be applied and formed thereon.

When the average area surface roughness (Sa) is 2 nm or less and the number of protrusions having a height of 10 nm or more is 200 protrusions/mm^2 or less, drawbacks such as pinholes do not occur in the ceramic sheet when the ceramic green sheet is formed, and the yield is good, which is preferable.

More preferably, the average area surface roughness (Sa) is 1.7 nm or less, for example, 1.6 nm or less, and may be 1.5 nm or less. In one aspect, the average area surface roughness (Sa) is 1.3 nm or less. The average area surface roughness (Sa) may be 0.1 nm or more, or 0.2 nm or more.

Meanwhile, in one aspect, the number of protrusions having a height of 10 nm or more is 180 protrusions/mm^2 or less, for example, 170 protrusions/mm^2 or less, and may be 160 protrusions/mm^2 or less. In one aspect, the number of protrusions having a height of 10 nm or more may be 120 protrusions/mm^2 or less, or 100 protrusions/mm^2 or less. The number of protrusions having a height of 10 nm or more may be 1 protrusion/mm^2 or more, and may be, for example, 10 protrusion/mm^2 or more.

When the number of protrusions having a height of 10 nm or more is within the above range, drawbacks such as pinholes do not occur in the ceramic sheet, and excellent

releasability can also be achieved in a well-balanced manner.

More preferably, the average area surface roughness (Sa) is 1.0 nm or less, and the number of protrusions having a height of 10 nm or more is 100 protrusions/mm^2 or less.

The release layer having the average area surface roughness (Sa) and the number of protrusions according to the present invention can exhibit extremely excellent smoothness.

[0038]

In one aspect, the maximum protrusion height (Sp) of the release layer is 20 nm or less. When the maximum protrusion height is in such a range, defects in the ceramic sheet can be further suppressed. More preferably, the maximum protrusion height (Sp) is 15 nm or less, and still more preferably 10 nm or less.

In one aspect, the total of the number of protrusions having a height of 5 nm or more and less than 10 nm and the number of protrusions having a height of 10 nm or more present on the surface of the release layer is 1500 protrusions/mm^2 or less. When the total of the number of protrusions having a height of 5 nm or more and less than 10 nm and the number of protrusions having a height of 10 nm or more present on the release layer is 1500 protrusions mm^2 or less, defects in the ceramic sheet can be further

an applying unit to a first drying furnace, and a processing speed was adopted.

[0104]

(Average area surface roughness Sa, maximum protrusion height Sp)

The average area surface roughness and the maximum protrusion height were measured under the following conditions using a noncontact surface profilometer system (VertScan R550H-M100). For the average area surface roughness (Sa), the average value of five measurements was employed. For the maximum protrusion height (Sp), seven measurements were performed, and the maximum value of five measurements excluding the maximum and minimum values was employed.

(Measurement conditions)

- Measurement mode: WAVE mode
- Objective lens: 50 times
- 0.5 × Tube lens
- Measurement area 187 μm × 139 μm

(Analysis conditions)

- Surface correction: 4th order correction
- Interpolation processing: complete interpolation

[0105]

(Number of protrusions having height of 10 nm or more, number of protrusions having height of 5 nm or more)

Particle analysis was performed using measurement data indicating a center value among a total of the seven measurements

in which the maximum protrusion height was measured. The particle analysis was obtained under the following conditions using analysis software of Vertscan R550H-M100. Particle analysis was performed with the average area surface roughness and the same measurement area as that of the measurement of the maximum protrusion height, and the number of protrusions having a maximum degree of 10 nm or more or the number of protrusions having a maximum degree of 5 nm or more was calculated. As the number of protrusions, a value converted per 1 mm^2 was adopted.

(Particle analysis conditions)

- Surface correction: 4th order correction
- Interpolation processing: Complete interpolation
- Convex analysis
- Reference height: zero surface

[0106]

(Peeling force of ceramic sheet)

A slurry composition I composed of materials shown below was stirred and mixed for 10 minutes, and dispersed for 10 minutes with zirconia beads having a diameter of 0.5 mm using a bead mill to obtain a primary dispersion. Thereafter, a slurry composition II composed of materials shown below was added to the primary dispersion at a ratio of (slurry composition I):(slurry composition II)=3.4:1.0, followed by secondarily dispersing for 10 minutes with

CLAIMS

1. A release film for forming a resin sheet, comprising a polyester film as a substrate and a release layer,

wherein the polyester film includes a surface layer A substantially containing no inorganic particles,

the release layer is provided on the surface layer A,

the substrate has a surface layer B opposite to the surface layer A,

an average area surface roughness (Sa) of the surface layer A is 0.1 nm or more and 7 nm or less,

an average area surface roughness (Sa) of the surface layer B is 1 nm or more and 40 nm or less,

the release layer is a layer obtained by curing a release layer forming composition,

the release layer forming composition contains a cationically curable polydimethylsiloxane (a),

a content of the cationically curable polydimethylsiloxane (a) contained in the release layer is 90 mg/m^2 or less,

the release layer has an average area surface roughness (Sa) of 2 nm or less, and

the number of protrusions having a height of 10 nm or more present on a surface of the release layer is 200 protrusions/mm^2 or less.

2. The release film for forming a resin sheet according to claim 1, wherein the release layer has a maximum protrusion height (Sp) of 20 nm or less, and a total of the number of protrusions having a height of 5 nm or more and less than 10 nm and the number of protrusions having a height of 10 nm or more present on the surface of the release layer is 1500 protrusions/mm^2 or less.

3. The release film for forming a resin sheet according to claim 1 or 2, wherein the cationically curable polydimethylsiloxane (a) has at least one functional group selected from a vinyl ether group, an oxetanyl group, an epoxy group, and an alicyclic epoxy group.

4. The release film for forming a resin sheet according to any one of claims 1 to 3, wherein

the release layer forming composition further contains a cationically curable compound (b-1) having no silicone skeleton,

the cationically curable compound (b-1) has two or more alicyclic epoxy groups in the molecule, and

a content of the cationically curable compound (b-1) is 80% by mass or more based on a total of 100 parts by mass of the cationically curable polydimethylsiloxane (a) and the cationically curable compound (b-1).

5. The release film for forming a resin sheet according to any one of claims 1 to 4, wherein

the release layer forming composition further contains a cyclic siloxane compound (b-2) having an alicyclic epoxy group,

the cyclic siloxane compound (b-2) has two or more alicyclic epoxy groups in the molecule, and

a content of the cyclic siloxane compound (b-2) is 80% by mass or more based on a total of 100 parts by mass of the cationically curable polydimethylsiloxane (a) and the cyclic siloxane compound (b-2).

6. The release film for forming a resin sheet according to any one of claims 1 to 5, wherein

the release layer forming composition contains an organic solvent having an SP value (δ) of 14 or more and 17 or less, and

the release layer forming composition contains the organic solvent having an SP value (δ) of 14 or more and 17 or less in an amount of 10% by mass or more based on 100 parts by mass of a total weight of the release layer forming composition.

7. The release film for forming a resin sheet according to any one of claims 1 to 6, wherein the release film is a release film for producing a resin sheet containing an inorganic compound.

8. The release film for forming a resin sheet according to claim 7, wherein the resin sheet containing an inorganic compound is a ceramic green sheet.

9. The release film for forming a resin sheet according to any one of claims 1 to 8, wherein the release film is a release film for forming a resin sheet having a thickness of 0.2 μm or more and 1.0 μm or less.