14.00 parts by mass

Oxazoline-based cross-linking agent C-1 (solid content concentration: 10 mass%):

12.00 parts by mass

[0133]

(Example 14)

A release polyester film was obtained in the same manner as in Example 1 except that the thickness of a release layer was changed to 0.035 μm.

[0134]

(Example 15)

A release polyester film was obtained in the same manner as in Example 1 except that the thickness of a release layer was changed to 0.100 μm.

[0135]

(Example 16)

A release polyester film was obtained in the same manner as in Example 1 except that the thickness of a release layer was changed to 0.140 μm.

[0136]

(Reference Example 17)

A release polyester film was obtained in the same manner as in Example 1 except that an acrylic resin (acrylic polyol resin) A-1 (solid content concentration: 20 mass%) in a release coating solution 1 used in Example 1

was changed to an acrylic resin (acrylic polyol resin) A-4 (solid content concentration: 20mass%).

[0137]

(Reference Example 18)

A release polyester film was obtained in the same manner as in Example 1 except that an acrylic resin (acrylic polyol resin) A-1 (solid content concentration: 20 mass%) in a release coating solution 1 used in Example 1 was changed to an acrylic resin (acrylic polyol resin) A-5 (solid content concentration: 20mass%).

[0138]

(Example 19)

A release polyester film was obtained in the same manner as in Example 1 except that PET (II) of a surface layer A of a PET substrate was changed to PET (III).

Here, a PET substrate that does not contain a release layer is taken as Y. The intrinsic viscosity of the obtained PET substrate was 0.59 dl/g. Sa of the surface layer A of the PET substrate Y before the release layer is laminated was 10 nm, and P thereof was 130 nm.

[0139]

(Example 20)

A release polyester film was obtained in the same manner as in Example 1 except that a release coating solution 1 was changed to the following release coating

[Table 2]

| | PET Substrate | Release Coating Solution (Composition Ratio is Represented by Parts by Mass of Each Solid Content) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Applying Solution | Resin | | Cross-Linking Agent or Catalyst | Resin/Cross-Linking Agent or Catalyst Ratio (parts by mass) | Particle | Particle Ratio (parts by mass) | Additive | Additive Ratio (parts by mass) |
| | | | Type | SMA Ratio mol% | | | | | | |
| Example 1 | Z | 1 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 2 | Z | 2 | A-1 | 20 | C-1 | 90/10 | - | - | G-1 | 1.0 |
| Example 3 | Z | 3 | A-1 | 20 | C-1 | 80/20 | - | - | G-1 | 1.0 |
| Example 4 | Z | 4 | A-1 | 20 | C-1 | 50/50 | - | - | G-1 | 1.0 |
| Example 5 | Z | 5 | A-2 | 10 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 6 | Z | 6 | A-1 | 20 | C-2 | 70/30 | - | - | G-1 | 1.0 |
| Example 7 | Z | 7 | A-2 | 10 | C-2 | 70/30 | - | - | G-1 | 1.0 |
| Example 8 | Z | 8 | A-1 | 20 | D-1 | 60/40 | - | - | G-1 | 1.0 |
| Example 9 | Z | 9 | A-1 | 20 | C-1 | 70/30 | F-1 | 5 | G-1 | 1.0 |
| Example 10 | Z | 10 | A-1 | 20 | C-1 | 70/30 | F-1 | 10 | G-1 | 1.0 |
| Example 11 | Z | 11 | A-1 | 20 | C-1 | 70/30 | - | - | G-2 | 1.0 |
| Example 12 | Z | 12 | A-1 | 20 | C-1 | 70/30 | - | - | H-1 | 1.0 |
| Example 13 | Z | 13 | A-1 | 20 | C-1 | 70/30 | - | - | - | - |
| Example 14 | Z | 1 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 15 | Z | 1 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 16 | Z | 1 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Reference Example 17 | Z | 14 | A-4 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Reference Example 18 | Z | 15 | A-5 | 50 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 19 | Y | 1 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Example 20 | Z | 16 | A-1 | 20 | C-1 | 70/30 | - | - | G-1 | 5.0 |
| Example 21 | Z | 17 | A-6 | 30 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Comparative Example 1 | Z | 18 | B-1 | 0 | B-2 | 98/2 | - | - | - | - |
| Comparative Example 2 | Z | 19 | A-3 | 0 | C-1 | 70/30 | - | - | G-1 | 1.0 |
| Comparative Example 3 | Z | 20 | A-1 | 20 | E-1 | 70/30 | - | - | G-1 | 1.0 |
| Comparative Example 4 | Z | 21 | A-1 | 20 | - | 100/0 | - | - | G-1 | 1.0 |

SMA Stearyl Methacrylate

[Table 2] (continued)

| | Release Layer | | | | | | Ceramic Green Sheet | Resin Sheet |
|---|---|---|---|---|---|---|---|---|
| | Ceramic Peeling Force (mN/mm) | Ceramic Peeling Force Determination | Average Area Surface Roughness Sa (nm) | Maximum Protrusion Height P (nm) | Thickness of Release Coating Layer (nm) | Surface Free Energy γs ($mJ/m^2$) | Pinhole | Pinhole |
| Example 1 | 1.9 | Good | 0.9 | 35.4 | 70 | 34.5 | Good | Good |
| Example 2 | 5.4 | Moderate | 0.9 | 35.6 | 70 | 32.3 | Good | Good |
| Example 3 | 2.5 | Good | 1.0 | 35.9 | 70 | 33.5 | Good | Good |
| Example 4 | 2.0 | Good | 0.9 | 34.7 | 70 | 35.7 | Good | Good |
| Example 5 | 3.2 | Good | 0.9 | 34.2 | 70 | 39.6 | Good | Good |
| Example 6 | 2.5 | Good | 0.9 | 34.5 | 70 | 32.9 | Good | Good |
| Example 7 | 4.3 | Moderate | 0.9 | 34.6 | 70 | 38.5 | Good | Good |
| Example 8 | 3.5 | Good | 1.0 | 37.8 | 70 | 35.8 | Good | Good |
| Example 9 | 1.7 | Good | 2.1 | 46.0 | 70 | 36.8 | Good | Good |
| Example 10 | 1.7 | Good | 2.9 | 48.2 | 70 | 34.8 | Good | Good |
| Example 11 | 2.0 | Good | 0.9 | 35.4 | 70 | 34.7 | Good | Good |
| Example 12 | 1.9 | Good | 1.0 | 38.6 | 70 | 33.2 | Good | Good |
| Example 13 | 2.1 | Good | 1.0 | 36.3 | 70 | 35.7 | Good | Good |
| Example 14 | 2.0 | Good | 0.8 | 30.1 | 35 | 35.5 | Good | Good |
| Example 15 | 2.0 | Good | 1.0 | 38.2 | 100 | 34.1 | Good | Good |
| Example 16 | 2.0 | Good | 1.2 | 39.4 | 140 | 35.1 | Good | Good |
| Reference Example 17 | 1.9 | Good | 4.4 | 70.0 | 70 | 34.6 | Moderate | Moderate |
| Reference Example 18 | 5.1 | Moderate | 0.9 | 34.7 | 70 | 31.2 | Good | Good |
| Example 19 | 1.9 | Good | 10.5 | 152.0 | 70 | 34.5 | Moderate | Moderate |
| Example 20 | 2.1 | Good | 0.9 | 35.5 | 70 | 34.5 | Good | Good |
| Example 21 | 1.7 | Good | 0.9 | 36.7 | 70 | 34.5 | Good | Good |
| Comparative Example 1 | 1.7 | Good | 0.9 | 48.2 | 70 | 18.0 | Poor | Poor |
| Comparative Example 2 | 10.5 | Poor | 0.9 | 32.8 | 70 | 63.2 | Poor | Poor |
| Comparative Example 3 | 8.5 | Poor | 0.9 | 37.2 | 70 | 34.3 | Poor | Poor |
| Comparative Example 4 | No Measurable | Poor | 0.9 | 35.6 | 70 | 31.5 | Poor | Poor |

CLAIMS

1. A release film comprising:

a polyester film; and

a release layer,

wherein the release film includes the release layer provided on at least one surface of the polyester film directly or with other layer therebetween; and

the release layer is obtained by curing a composition containing an acrylic resin having a long-chain alkyl group and at least one cross-linking agent selected from an oxazoline-based cross-linking agent or a carbodiimide-based cross-linking agent, and

wherein the acrylic resin having the long-chain alkyl group has an acid value of 40 mgKOH/g or more and 400 mgKOH/g or less.

2. The release film according to claim 1, wherein

the acrylic resin contains a long-chain alkyl group-containing acrylate monomer; and

a copolymerization ratio of the long-chain alkyl group-containing acrylate monomer in the acrylic resin is 5 mol% or more and 60 mol% or less.

3. The release film according to claim 1 or 2, wherein

the cross-linking agent is the oxazoline-based cross-linking agent; and

the oxazoline-based cross-linking agent contains 3.0 to 9.0 mmol/g of an oxazoline group.

~~4. The release film according to any one of claims 1 to 3, wherein the acrylic resin having the long-chain alkyl group has an acid value of 40 mgKOH/g or more and 400 mgKOH/g or less.~~

4~~5~~. The release film according to any one of claims 1 to 3~~4~~, wherein the release layer has a thickness of 0.001 μm or more and 2 μm or less.

5~~6~~. The release film according to any one of claim 1 to 4~~5~~, wherein the release film is a release film for production of a ceramic green sheet.

6~~7~~. A method for production of a release film comprising a polyester film and a release layer,

wherein the release film includes the release layer provided on at least one surface of the polyester film directly or with other layer therebetween;

the release layer is obtained by curing a composition containing an acrylic resin having a long-chain alkyl group and at least one cross-linking agent selected from an oxazoline-based cross-linking agent or a carbodiimide-based cross-linking agent, and

wherein the acrylic resin having the long-chain alkyl group has an acid value of 40 mgKOH/g or more and 400 mgKOH/g or less; and

the method comprises:

coating a release coating solution on a film being an un-stretched film or a uniaxially stretched film;

then stretching the film in at least a uniaxial direction in which the film is un-stretched; and

heat-treating the film.

78. The method for production of a release film according to claim 67, wherein the method is a method for production of a release film for production of a ceramic green sheet.

8~~9~~. A method for production of a ceramic green sheet, wherein the ceramic green sheet is formed by using the release film for production of a ceramic green sheet according to claim 5~~6~~ or the method for production of a release film for production of a ceramic green sheet according to claim 7~~8~~.

9~~10~~. The method for production of a ceramic green sheet according to claim 8~~9~~, wherein the ceramic green sheet to be produced has a thickness of 0.2 μm or more and 2.0 μm or less.

10~~11~~. A method for production of a ceramic capacitor, wherein the method for production of a ceramic green sheet according to claim 8~~9~~ or 9~~10~~ is employed.