terminal and/or a side chain is preferable. A copolymer containing a dialkylsiloxane unit or an alkylphenylsiloxane unit is preferable because it is easy to adjust the amount of alkenyl groups in one molecule while exhibiting peelability. A silicon atom at the terminal preferably contains an alkenyl group, but may have a trialkylsilane structure such as trimethylsilane.

[0071]

Examples of the silicone having a Q unit represented by $SiO_{4/2}$ include a structure represented by the following formula (III).

$$R1_aR2_bSiO_{(4-a-b)/2} \quad \ldots \text{(III)}$$

(In formula (III), R1 represents an alkenyl group having 2 to 8 carbon atoms, R2 represents a monovalent saturated hydrocarbon group having 1 to 16 carbon atoms selected from alkyl groups or aryl groups, a represents an integer of 0 to 3, b represents an integer of 0 to 3, provided that $a + b \leq 3$ is satisfied.)

[0072]

Examples of the alkenyl group having 2 or more and 8 or less carbon atoms represented by R1 include a vinyl group, an allyl group, a butenyl group, a pentenyl group, and a hexenyl group, and among these groups, a vinyl group is particularly preferable. Examples of the alkyl group represented by R2 include a methyl group, an ethyl group, a

to complete the crystal orientation of the substrate film.

[0099]

A heating step in the production method of the present invention preferably further includes the following steps:

a drying step of drying the aqueous coating composition applied to one surface of the polyester film;

a stretching step of stretching the polyester film in a direction perpendicular to a machine direction of the polyester film; and

a heat setting step of subjecting the polyester film to a heat treatment to complete crystal orientation.

[0100]

For example, in the drying step of applying the aqueous coating composition to one surface of the polyester film and then drying the applied film, a drying temperature may be 60°C or higher and 140°C or lower, for example, 60°C or higher and 130°C or lower, and 60°C or higher and 125°C or lower.

When the temperature is 60°C or higher, the composition is sufficiently dried, and there is no possibility that the film is broken when the polyester film is stretched in the stretching step, which is preferable. When the temperature is 140°C or lower, the rapid drying of the composition can be prevented, and the aggregation and gelation of the emulsion can be suppressed, so that the

Using an emulsifier (device name “Ultra planetary mixer” manufactured by N. P. Labo Co., Ltd.) capable of stirring the whole in a container, a raw material composed of 98% by mass of a silicone oil in which a2 in formula (II) was 50 mol%, b2 was 50 mol%, and the number average molecular weight was 5500, and 0.1% by mass of polyoxyethylene alkyl ether (number average molecular weight: 582, boiling point: 283°C) having an alkyl group chain number of 12 and an ethylene oxide number of 9 (structure represented by m=12 and n=9 in formula (IV)) as a surfactant was mechanically emulsified in an aqueous medium to obtain a silicone emulsion I having a solid content of 40% by mass. An emulsion particle size was adjusted to an average particle size of 180 nm by adjusting a stirring speed and a stirring time at the time of the emulsification.

[0138]

The silicone emulsion H, the silicone emulsion I, and water were mixed at a ratio described in Table 1 so that the solid content concentration was 5% to obtain an aqueous coating composition. At this time, the amount of the surfactant contained in the aqueous coating composition was 0.1% by mass when the total amount of the silicone emulsion H and the silicone emulsion I was 100%. 0.02% by mass of a platinum-based catalyst (trade name: CAT-PM-10A

Using an emulsifier (device name “Ultra planetary mixer” manufactured by N. P. Labo Co., Ltd.) capable of stirring the whole in a container, a raw material composed of 91% by mass of a silicone oil in which a2 in formula (II) was 50 mol%, b2 was 50 mol%, and the number average molecular weight was 5500, and 9.0% by mass of polyoxyethylene alkyl ether (number average molecular weight: 362, boiling point: 182°C) having an alkyl group chain number of 12 and an ethylene oxide chain number of 4 (structure represented by m = 12 and n = 4 in formula (IV)) as a surfactant was mechanically emulsified in an aqueous medium to obtain a silicone emulsion K having a solid content of 40% by mass. An emulsion particle size was adjusted to an average particle size of 180 nm by adjusting a stirring speed and a stirring time at the time of the emulsification.

[0141]

The silicone emulsion J, the silicone emulsion K, and water were mixed at a ratio described in Table 1 so that the solid content concentration was 5% to obtain an aqueous coating composition. At this time, the amount of the surfactant contained in the aqueous coating composition was 9.0% by mass when the total amount of the silicone emulsion J and the silicone emulsion K was 100%. 0.02% by mass of a platinum-based catalyst (trade name: CAT-PM-10A

energy calculated from the water sliding angle was low, and the wettability was deteriorated. In Comparative Example 2, the surface tension of the aqueous coating composition was high, so that the application uniformity of the aqueous coating composition was poor, and cissing occurred. Therefore, the applying appearance of the slurry was poor. A peel force after a toluene immersion treatment greatly exceeded 2,000 mN/50 mm, the peelability was also poor.

[0152]

<Reference Examples 1 and 2>

Release films were obtained in the same manner as in Example 1 except that an aqueous coating composition described in Table 2A and the conditions in Table 2B were used. Various physical properties are shown in Table 2B.

[0153]

<Reference Example 3>

The aqueous coating composition prepared in Production Example 1 was coated on one surface of a 25 μm-thick biaxially stretched polyester film (Toyobo ester film E5100 manufactured by Toyobo Co., Ltd.) by an off-line coating method so that the film thickness of a release layer after drying was 0.15 μm, and dried at 140°C for 15 seconds. After drying, the resultant was wound into a roll to obtain a release film.

[0154]

[0160]

[Table 2B]

	Production method						
		Applying step		Heating step			
	Coating method	Surface tension	Liquid temperature of aqueous coating composition	Drying step	Stretching step		Heat setting step
		mN/m	°C	Temperature (°C)	Temperature (°C)	Stretching ratio	Temperature (°C)
Reference Example 1	In-line	37	20	115	145	4	230
Reference Example 2	In-line	37	20	115	145	4.0	230
Reference Example 3	Off-line	31	20	140	-	-	-
Reference Example 4	In-line	31	20	115	145	4	160
Reference Example 5	In-line	31	50	115	145	4.0	230

	Physical properties						
	Thickness	Coating appearance	Wettability			Peelability	
		Application uniformity	Water sliding angle	Adhesion energy E	Applying appearance of slurry	Peeling force after toluene immersion treatment	Peelability of ceramic sheet
	μm		Angle	mJ/m^2		mN/50 mm	
Reference Example 1	0.04	⊙	38	4.8	×	200	○
Reference Example 2	0.04	⊙	47.0	5.7	×	900	⊙
Reference Example 3	0.15	×	Not slide	Uncalculable	×	Unpeelable	×
Reference Example 4	0.04	×	Not slide	Uncalculable	×	Unpeelable	×
Reference Example 5	0.04	×	Not slide	Uncalculable	×	3500	×