CLAIMS

1. A mold release film to be disposed on a surface of a mold which is to be in contact with a curable resin, in a process for producing a semiconductor package by disposing a semiconductor element in the mold, and sealing it with the curable resin to form a resin sealed portion, characterized by comprising

a first thermoplastic resin layer to be in contact with the curable resin at the time of forming the resin sealed portion, a second thermoplastic resin layer to be in contact with the mold at the time of forming the resin sealed portion, and an interlayer disposed between the first thermoplastic resin layer and the second thermoplastic resin layer, wherein

the first thermoplastic resin layer and the second thermoplastic resin layer have a storage elastic modulus at 180°C of from 10 to 40 MPa, respectively, the difference in storage elastic modulus at 25°C between them is at most 1,200 MPa, and their thicknesses are from 12 to 50 μm, and

the interlayer includes: a layer containing a polymeric antistatic agent and having a thickness of 0.03 to 0.5 μm; and a non-antistatic adhesive layer.

2. The mold release film according to Claim 1, wherein both the first thermoplastic resin layer and the second thermoplastic resin layer do not contain an inorganic additive.

3. The mold release film according to Claim 1, wherein the peel strength between the first thermoplastic resin layer and the second thermoplastic resin as measured at 180°C in accordance with JIS K6854-2, is at least 0.3 N/cm.

4. The mold release film according to Claim 1, wherein the surface resistance of the layer containing a polymeric antistatic agent is at most 10^{10} Ω/□.

5. The mold release film according to Claim 4, wherein the surface resistance of the layer containing a polymeric antistatic agent is at most 10^{10} Ω/□.

6. The mold release film according to Claim 1, wherein the curl as measured by the following measuring method is at most 1cm:

(Method for measuring the curl)

At from 20 to 25°C, a square-shaped mold release film of 10 cm × 10 cm is left to stand still on a flat metal plate for 30 seconds, whereby the maximum height (cm) of the portion lifted

from the metal plate, of the mold release film, is measured, and the measured value is adopted as the curl.

7. The mold release film according to Claim 4, wherein the curl as measured by the following measuring method is at most 1cm:
(Method for measuring the curl)

at from 20 to 25°C, a square-shaped mold release film of 10 cm × 10 cm is left to stand still on a flat metal plate for 30 seconds, whereby the maximum height (cm) of the portion lifted from the metal plate, of the mold release film, is measured, and the measured value is adopted as the curl.

8. A process for producing a semiconductor package having a semiconductor element and a resin sealed portion formed from a curable resin for sealing the semiconductor element, characterized by comprising

a step of disposing a mold release film as defined in any one of Claims 1 and 3 to 8 on a surface of a mold which is to be in contact with a curable resin,

a step of disposing a substrate having a semiconductor element mounted thereon, in the mold, and filling a curable resin in a space in the mold, followed by curing to form a resin sealed portion, thereby to obtain a sealed body having the substrate, the semiconductor element and the resin sealed portion, and

a step of releasing the sealed body from the mold.

9. The process for producing a semiconductor package according to claim 9, wherein in the step of obtaining a sealed body, a part of the semiconductor element is in direct contact with the release film.

10. A process for producing the mold release film of Claim 1, comprising a step of dry laminating a first film for forming a first thermoplastic resin layer and a second film for forming a second thermoplastic resin layer, by using an adhesive, characterized in that

the storage elastic modulus E_1' (MPa), the thickness T_1 (μm), the width W_1 (mm) and the tensile force F_1 (N) exerted thereon, at the dry lamination temperature t (°C), of one of the first film and the second film, and the storage modulus E_2' (MPa), the thickness T_2 (μm), the width W_2 (mm) and the tensile force F_2 (N) exerted thereon at the dry lamination temperature t (°C), of the other film, satisfy the following formula (I),

$$0.8 \leqq \{(E_1' \times T_1 \times W_1) \times F_2\} / \{(E_2' \times T_2 \times W_2) \times F_1\} \leqq 1.2 \qquad (I)$$

wherein the storage elastic modulus E_1' (180) and E_2' (180) at 180°C are from 10 to 40 MPa, the difference in storage elastic modulus at 25°C i.e. $|E_1'(25) - E_2'(25)|$ is at most 1,200 MPa, and T_1 and T_2 are, respectively, from 12 to 50 (μm).