CLAIMS

1. A protective coating-forming sheet comprising a first support sheet and a protective coating formation film laminated to a first surface side of the first support sheet, wherein

the protective coating formation film is formed from a curable material, and

the protective coating formation film has characteristics described below:

when the protective coating formation film is cured to form a protective coating, the protective coating has a breaking strain at 50°C of not more than 20%, and a loss tangent peak temperature T1 within a range from 25°C to 60°C, and

the protective coating has a storage modulus at 25°C of 3.0×10^9 Pa or greater.

2. The protective coating-forming sheet according to Claim 1, wherein the protective coating formation film also has a characteristic described below:

the protective coating has a loss tangent at 25°C of 0.4 or less.

3. The protective coating-forming sheet according to Claim 1 or 2, wherein the protective coating formation film also has a characteristic described below:

the protective coating has a light transmittance at a wavelength of 1,064 nm of 40% or greater.

4. A method for manufacturing a chip with an attached protective coating, the method comprising:

a bonding step of exposing a surface of the protective coating formation film provided in the protective coating-forming sheet according to any one of Claims 1 to 3,

the exposed surface being opposite a surface facing the first support sheet, and affixing the exposed surface to one surface of a workpiece to obtain a first laminate comprising the protective coating-forming sheet and the workpiece;

a first curing step of curing the protective coating formation film in the first laminate to obtain the protective coating;

a first dividing step of expanding the first support sheet with a temperature T2 of the protective coating in the first laminate that has undergone the first curing step held within a range from 40°C to 70°C, and dividing the protective coating together with the workpiece, thus obtaining a second laminate in which a plurality of chips with an attached protective coating, formed as a result of dividing the laminate of the workpiece and the protective coating such that cut sections occur in a thickness direction, are arranged on one surface of the first support sheet; and

a first pickup step of separating, from the first support sheet, each of the plurality of chips with an attached protective coating provided in the second laminate, thereby obtaining each of the chips with an attached protective coating as a processed product,

the method also comprising, prior to starting the first dividing step, a modified layer formation step of irradiating an infrared laser light in a manner that focuses the laser light on a focus point set within an interior of the workpiece, thereby forming a modified layer inside the workpiece.

5. The method for manufacturing a chip with an attached protective coating according to Claim 4, wherein the temperature T2 is equal to or greater than the temperature T1.

6. A method for manufacturing a chip with an attached protective coating, the method comprising:

a lamination step of exposing a surface of the protective coating formation film provided in the protective coating-forming sheet according to any one of Claims 1 to 3, the exposed surface being opposite a surface facing the first support sheet, affixing the exposed surface to one surface of a workpiece, and peeling the first support sheet of the protective coating-forming sheet from the protective coating formation film to obtain a third laminate comprising the workpiece and the protective coating formation film;

a second curing step of curing the protective coating formation film of the third laminate to obtain the protective coating;

a second bonding step of affixing a surface of a third pressure-sensitive adhesive layer of a process sheet, comprising a third substrate and the third pressure-sensitive adhesive layer laminated to one surface of the third substrate, to a surface of the protective coating of the third laminate that has undergone the second curing step, thus obtaining a fourth laminate comprising the process sheet and the third laminate;

a second dividing step of expanding the process sheet of the fourth laminate with a temperature T3 of the protective coating provided on the fourth laminate held within a range from 40°C to 70°C, and dividing the protective coating together with the workpiece, thus obtaining a fifth laminate in which a plurality of chips with an attached protective coating, formed as a result of dividing the laminate of the workpiece and the protective coating such that cut sections occur in a thickness direction, are arranged on one surface of the process sheet; and

a second pickup step of separating, from the process sheet, each of the plurality of chips with an attached protective coating provided on the fifth laminate, thereby obtaining each of the chips with an attached protective coating as a processed product,

the method also comprising, prior to starting the second dividing step, a modified layer formation step of irradiating an infrared laser light in a manner that focuses the laser light on a focus point set within an interior of the workpiece, thereby forming a modified layer inside the workpiece.

7. The method for manufacturing a chip with an attached protective coating according to Claim 6, wherein the temperature T3 is equal to or greater than the temperature T1.