CLAIMS

[Claim 1]

A dimming laminate comprising: a single dimming substrate in which a dimming function material is provided between two first transparent substrates; and a second transparent substrate that is bonded to one first transparent substrate of the two first transparent substrates through an adhesive layer, each of the first transparent substrates having a different average thermal expansion coefficient at 50-350°C from that of the second transparent substrate,

wherein a third transparent substrate is bonded to the other first transparent substrate of the two first transparent substrates through an adhesive layer, and a difference in average thermal expansion coefficient at 50-350°C between the third transparent substrate and the second transparent substrate is not higher than 20×10^{-7}/°C,

wherein the dimming function material is a material whose optical property can be changed reversibly, and which is an electochromic function material, an SPD (Suspended Particle Device) material, a liquid crystal material, a polymer dispersed liquid crystal material, a photochromic material, or a thermochromic material, and

wherein the alkali metal oxide content of each of the first transparent substrates is not higher than 3% in terms of mol% on the basis of oxides.

[Claim 2]

A dimming laminate comprising: a dimming substrate unit in which at least two dimming substrates each including a dimming function material provided between two first transparent substrates are laminated; and a second transparent substrate that is bonded through an adhesive layer to one first transparent substrate of two first transparent substrates located on an external side of the dimming substrate unit, each of the first transparent substrates having a different average thermal expansion coefficient at 50-350°C from that of the second transparent substrate,

wherein a third transparent substrate is bonded through an adhesive layer to the other first transparent substrate of the two first transparent substrates located on the external side of the dimming substrate unit, and a difference in average thermal expansion coefficient at 50-350°C between the third transparent substrate and the second transparent substrate is not higher than 20×10^{-7} /°C,

wherein the dimming function material is a material whose optical property can be changed reversibly, and which is an electochromic function material, an SPD (Suspended Particle Device) material, a liquid crystal material, a polymer dispersed liquid crystal material, a photochromic material, or a thermochromic material, and

wherein the alkali metal oxide content of each of the first transparent substrates is not higher than 3% in terms of mol% on the basis of oxides.

[Claim 3]

The dimming laminate according to claim 1 or 2, wherein the average thermal expansion coefficient at 50-350°C is equal between the third transparent substrate and the second transparent substrate.

[Claim 4]

The dimming laminate according to claim 3, wherein the average thermal expansion coefficient at 50-350°C in each of the third transparent substrate and the second transparent substrate is higher than the average thermal expansion coefficient at 50-350°C in each of the first transparent substrates.

[Claim 5]

A dimming laminate comprising: a single dimming substrate in which a dimming function material is provided between two first transparent substrates; and a second transparent substrate that is bonded to one first transparent substrate of the two first transparent substrates through an adhesive layer, each of the first transparent substrates having a different average thermal expansion coefficient at 50-350°C from that of the second transparent substrate,

wherein a third transparent substrate is bonded to the second transparent substrate through an adhesive layer, and a difference in average thermal expansion coefficient at 50-350°C between the third transparent substrate and each of the first transparent substrates is not higher than 10×10^{-7}/°C,

wherein the dimming function material is a material whose optical property can be changed reversibly, and which is an electochromic function material, an SPD (Suspended Particle Device) material, a liquid crystal material, a polymer dispersed liquid crystal material, a photochromic material, or a thermochromic material, and

wherein the alkali metal oxide content of each of the first transparent substrates is not higher than 3% in terms of mol% on the basis of oxides.

[Claim 6]

A dimming laminate comprising: a dimming substrate unit in which at least two dimming substrates each including a dimming function material provided between two first transparent substrates are laminated; and a second transparent substrate that is bonded through an adhesive layer to one first transparent substrate of two first transparent substrates located on an external side of the dimming substrate unit, each of the first transparent substrates having a different average thermal expansion coefficient at 50-350°C from that of the second transparent substrate,

wherein a third transparent substrate is bonded to the second transparent substrate through an adhesive layer, and a difference in average thermal expansion coefficient at 50-350°C between the third transparent substrate and each of the first transparent substrates is not higher than 10×10^{-7}/°C,

wherein the dimming function material is a material whose optical property can be changed reversibly, and which is an electochromic function material, an SPD (Suspended Particle Device) material, a liquid crystal material, a polymer dispersed liquid crystal material, a photochromic material, or a thermochromic material, and

wherein the alkali metal oxide content of each of the first transparent substrates is not higher than 3% in terms of mol% on the basis of oxides.

[Claim 7]
The dimming laminate according to claim 5 or 6, wherein the average thermal expansion coefficient at 50-350°C is equal between the third transparent substrate and each of the first transparent substrates.

[Claim 8]
The dimming laminate according to claim 7, wherein the average thermal expansion coefficient at 50-350°C in the second transparent substrate is higher than the average thermal expansion coefficient at 50-350°C in each of the first transparent substrates and the third transparent substrate.

[Claim 9]
The dimming laminate according to any one of claims 1 to 8, wherein a difference in average thermal expansion coefficient at 50-350°C between the two first transparent substrates is not higher than 10×10^{-7}/°C.

[Claim 10]
The dimming laminate according to any one of claims 1 to 9, wherein the average thermal expansion coefficient at 50-350°C is equal between the two first transparent substrates.

[Claim 11]
A multiple glass in which two glass plates are put separately from each other through a spacer, and circumferential edge portions of the two glass plates are sealed with a seal material,
wherein at least one glass plate of the two glass plates is the dimming laminate according to any one of claims 1 to 10.

[Claim 12]
The dimming laminate according to any one of claims 1 to 4, wherein each of the first transparent substrates has an average thermal expansion coefficient at 50-350°C of not higher than 45×10^{-7}/°C.

[Claim 13]
The dimming laminate according to any one of claims 1 to 4, wherein each of the second transparent substrate and the third transparent substrate has an average thermal expansion coefficient at 50-350°C of 60×10^{-7}/°C to 100×10^{-7}/°C.

[Claim 14]
The dimming laminate according to any one of claims 1 to 4, wherein each of the first transparent substrates has a thickness of 0.1-2.0 mm.

[Claim 15]
The dimming laminate according to any one of claims 1 to 4, wherein each of the second transparent substrate and the third transparent substrate has a thickness of 1.0-12.0 mm.

[Claim 16]
The dimming laminate according to any one of claims 1 to 4, wherein each of the second transparent substrate and the third transparent substrate is a soda lime glass.

[Claim 17]
The dimming laminate according to any one of claims 1 to 4, wherein each of the adhesive layers is sheet-like member and has a thickness of 0.1-2.0 mm.

[Claim 18]
The dimming laminate according to any one of claims 1 to 4, wherein a difference in thickness between the two first transparent substrates is 1 mm or less, and a difference in thickness between the second transparent substrate and the third transparent substrate is 1 mm or less.