WHAT IS CLAIMED IS:

1. A building material plate, comprising:

a transparent substrate, wherein the transparent substrate has a total light transmittance of 85-99%; and

a light diffusion layer located on at least one surface of the transparent substrate, wherein a ratio of a thickness of the light diffusion layer to a thickness of the transparent substrate is 0.05-0.7, the light diffusion layer has the thickness of 100-3000μm, the light diffusion layer comprises:

an optical material;

a plurality of first light diffusion particles having an average particle size of 6-100 micrometers (μm); and

a plurality of second light diffusion particles having an average particle size of 0.5-5 micrometers (μm),

wherein a ten-point mean roughness (Rz) of the light diffusion layer is 11-28μm, the first light diffusion particles are present in an amount of 10-30 weight parts based on 100 weight parts of the optical material, the second light diffusion particles are present in an amount of larger than 0 weight part and less than or equal to 5 weight parts based on 100 weight parts of the optical material, the building material plate has a transmittance of 77-95%.

2. The building material plate according to claim 1, wherein the first light diffusion particles and the second light diffusion particles are formed of different materials.

3. The building material plate according to claim 1, wherein the second light diffusion particles comprise a crosslinked siloxane group silicone resin.

4. The building material plate according to claim 1, wherein at least one of the first light diffusion particles and the second light diffusion particles comprise a crosslinked polymer.

5. The building material plate according to claim 4, wherein the crosslinked polymer comprises at least one of polysiloxane, polymethylmethacrylate (PMMA), methyl methacrylate-styrene copolymer (MS) and polystyrene (PS).

6. The building material plate according to claim 1, wherein the first light diffusion particles comprise a crosslinked polymer selected from a group consisting of polystyrene, polymethylmethacrylate and methylmethacrylate-styrene copolymer.

7. The building material plate according to claim 1, wherein the transparent substrate and the optical material are separately and independently

formed of a material selected from a group consisting of methyl methacrylate-styrene copolymer (MS), polymethylmethacrylate (PMMA), polystyrene (PS), acrylonitrile-styrene (AS), cyclo-olefin copolymer, polyolefin copolymers, polyester, polyethylene, polypropylene, polyvinyl chloride, ionomer and polycarbonate (PC).

8. The building material plate according to claim 7, wherein the transparent substrate is formed of a material selected from a group consisting of polycarbonate (PC), polystyrene (PS), polymethylmethacrylate (PMMA) and methyl methacrylate-styrene copolymer (MS).

9. The building material plate according to any one of claims 1-8, wherein an interface between the light diffusion layer and the transparent substrate is a planar surface or a curved surface.

10. The building material plate according to any one of claims 1-8, wherein the transparent substrate has a surface, the surface is opposite to an interface between the transparent substrate and the light diffusion layer, and the surface of the transparent substrate has a surface roughness of 0.002-0.5μm.

11. The building material plate according to any one of claims 1-8, wherein the light diffusion layer is located on two opposite surfaces of the transparent substrate.

12. The building material plate according to any one of claims 1-8, wherein the building material plate has a haze of 70-99%.

13. The building material plate according to any one of claims 1-8, wherein the building material plate has a thickness between 1-20 millimeters (mm).

14. The building material plate according to any one of claims 1-8, wherein the light diffusion layer has a surface average roughness of 1.5-5.5μm.

15. A building material plate, comprising:

a transparent substrate, wherein the transparent substrate has a total light transmittance of 85-99%; and

a light diffusion layer located on at least one surface of the transparent substrate, wherein a ratio of a thickness of the light diffusion layer to a thickness of the transparent substrate is 0.05-0.7, the light diffusion layer has the thickness of 100-3000μm, the light diffusion layer comprises:

an optical material;

a plurality of first light diffusion particles having an average particle size of 6-100 micrometers (μm); and

a plurality of second light diffusion particles having an average particle size of 0.5-5 micrometers (μm), wherein a surface average roughness of the light diffusion layer is 1.5-5.5μm, the first light diffusion particles are present in an

amount of 10-30 weight parts based on 100 weight parts of the optical material, the second light diffusion particles are present in an amount of larger than 0 weight part and less than or equal to 5 weight parts based on 100 weight parts of the optical material, the building material plate has a transmittance of 77-95%.

16. A bathroom door-plate, comprising a building material plate as claimed in any one of claims 1-15.

17. A door sheet structure, comprising:

a frame; and

a sheet plate disposed inside the frame, the sheet plate comprises a building material plate as claimed in any one of claims 1-15.

18. A kitchen door-plate, comprising a door sheet structure according to claim 17.

19. A bedroom door-plate, comprising a door sheet structure according to claim 17.

20. A conference room door-plate, comprising a door sheet structure according to claim 17.

21. A office partition, comprising a door sheet structure according to claim 17.

22. A manufacturing method of a building material plate, comprising:

providing a first transparent thermoplastic resin;

providing a light diffusion layer material, the light diffusion layer material comprising:

a second transparent thermoplastic resin;

a plurality of first light diffusion particles having an average particle size of 6-100 micrometers (μm) ; and

a plurality of second light diffusion particles having an average particle size of 0.5-5 micrometers (μm); and

performing a co-extrusion process to co-extrude the first the thermoplastic resin and the light diffusion layer material for forming a transparent substrate and a light diffusion layer of a building material plate respectively, wherein a ratio of a thickness of the light diffusion layer to a thickness of the transparent substrate is 0.05-0.7, the light diffusion layer has the thickness of 100-3000μm, a ten-point mean roughness (Rz) of the light diffusion layer is 11-28μm, the transparent substrate has a total light transmittance of 85-99%, the light diffusion layer comprises an optical material, the first light diffusion particles are present in an amount of 10-30 weight parts based on 100 weight parts of the optical material, the second light diffusion particles are present in an amount of

larger than 0 weight part and less than or equal to 5 weight parts based on 100 weight parts of the optical material, the building material plate has a transmittance of 77-95%.

23. The manufacturing method of the building material plate according to claim 22, wherein the light diffusion layer of the building material plate formed of the light diffusion layer material is located on two opposite surfaces of the transparent substrate.

24. The manufacturing method of the building material plate according to claim 22, further comprising providing two of the light diffusion layer materials, wherein the two light diffusion layer materials and the first transparent thermoplastic resin are co-extruded by performing the co-extrusion process for forming the transparent substrate of the building material plate and the light diffusion layer located on two opposite surfaces of the transparent substrate.

25. The manufacturing method of the building material plate according to any one of claims 22-24, wherein the first transparent thermoplastic resin and the second transparent thermoplastic resin are formed of the same material.

26. The manufacturing method of the building material plate according to any one of claims 22-24, wherein the first transparent thermoplastic resin and the second transparent thermoplastic resin are formed of different materials.