[0004] As will be appreciated by one skilled in the architectural art, glass is used typically in either a tempered form or a non-tempered (annealed) form, depending upon the desired final use of the glass. For annealed glass, the glass is heated to the annealing point of the glass and then allowed to slowly cool to below the strain point of the glass. The annealed glass can be cut to desired final dimensions, such as for a door, window, and the like. For even stronger glass, tempering is used. In tempering, glass is heated above the annealing point of the glass and then rapidly cooled, such as by directing a cooling medium at the glass, to provide the glass with an exterior compressive force and an interior tensile force. Tempered glass is much stronger than annealed glass and is used where safety is an important factor. However, unlike annealed glass, tempered glass cannot be cut or it will shatter. Therefore, where tempered glass is desired, the glass must be cut to the desired final dimensions before tempering.

[0005] A conventional building may require both annealed (non-tempered) and tempered glass pieces with solar control coatings. For example, annealed glass with a solar control coating may be used on the lower floors while tempered glass with a solar control coating is used on the upper floors for increased safety. Both the coated annealed glass and the coated tempered glass should have the same or very similar optical characteristics so that the building maintains the same overall aesthetic appearance. This causes a problem for coated glass manufacturers. Tempering the coated glass pieces can result in the tempered products having different color or optical characteristics than the original annealed products due to changes in the coating caused by the extra heating and rapid cooling steps required to temper the glass. This difference in color or other optical properties, such as transmittance or reflectance, between the coated tempered glass and the coated annealed glass is not desirable if the annealed and tempered products are to be used in the same building.

[0006] Matching glass aesthetics is difficult. As a consequence, it would be desirable to have a method of treating coated glass sheets in a manner that alters aesthetics of the glass to match that of tempered glass sheets, permitting two types of glass to be used in the same building without significant differences in aesthetics between the two types of glass.

SUMMARY

[0007] The present disclosure refers to a method of producing a coated transparency. The method comprises depositing a stack of thin layers on

a transparent substrate, the stack comprising a first dielectric layer over at least a portion of the substrate; a first discontinuous metal layer over at least a portion of the first dielectric layer; and a first primer layer over at least a portion of the first discontinuous metal layer; and flashing the transparency at a temperature ranging from 10ºC to 50ºC or ranging from 20ºC to 30ºC, with a single flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm2 to 7 J/cm2 for a pulse length of up to 10 ms, thereby increasing visible light transmittance of the transparency.

[0007a] In one aspect, the present disclosure refers to A method of producing a coated transparency, comprising

a. depositing a stack of thin layers on a transparent substrate, the stack comprising a first dielectric layer over at least a portion of the substrate; a first discontinuous metal layer over at least a portion of the first dielectric layer; and a first primer layer over at least a portion of the first discontinuous metal layer, thereby forming the coated transparency; and
b. flashing the coated transparency of the depositing step at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance of the coated transparency.

[0008] According to another example of the disclosure, a method of flash annealing a transparency is provided wherein, the transparency comprises: a transparent substrate, a first dielectric layer over at least a portion of the substrate, a first continuous metal layer over at least a portion of the first dielectric layer, a first primer layer over at least a portion of the first metal layer, a second dielectric layer over at least a portion of the first primer layer, a second continuous metal layer over at least a portion of the second dielectric layer, and a second primer over at least a portion of the second metal layer, comprising, flashing the transparency at a temperature ranging from 10ºC to 50ºC or ranging from 20ºC to 30ºC, with a flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of up to 10 ms, thereby increasing visible light transmittance or decreasing emissivity of the transparency.

[0008a] In another aspect, the present disclosure refers to a method of flash annealing a transparency, the transparency comprising: a transparent substrate, a first dielectric layer over at least a portion of the substrate, a first metal layer over at least a portion of the first dielectric layer, a first primer layer over at least a portion of the first metal layer, a second dielectric layer over at least a portion of the first primer layer, a second metal layer over at least a portion of the

second dielectric layer, and a second primer over at least a portion of the second metal layer, comprising, flashing the transparency at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance or decreasing emissivity of the transparency.

[0008b] In another aspect, the present disclosure refers to a method of flash annealing a transparency, the transparency comprising: a transparent substrate, a first dielectric layer over at least a portion of the substrate, a first metal layer over at least a portion of the first dielectric layer, a first primer layer over at least a portion of the first metal layer, a second dielectric layer over at least a portion of the first primer layer, a second metal layer over at least a portion of the second dielectric layer, a second primer layer over at least portion of the second metal layer, a third dielectric layer over at least a portion of the second primer layer, a third metal layer over at least a portion of the third dielectric layer, a third primer layer over at least a portion of the third metal layer, a fourth dielectric layer over at least a portion of the third primer layer, a fourth metal layer over at least a portion of the fourth dielectric layer, a fourth primer layer over at least a portion of the fourth metal layer, and a protective layer over at least a portion of the fourth primer layer; wherein the second or third metal layer is a discontinuous metal layer, comprising, flashing the transparency at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance or decreasing emissivity of the transparency.

[0009] According to yet another example of the disclosure, a non-tempered transparency is provided, the method comprises

a. a float glass substrate;
b. a first dielectric layer over at least a portion of the glass substrate;
c. a first silver layer over at least a portion of the first dielectric layer;
d. a first titanium layer over at least a portion of the first silver layer and having a thickness ranging from 1 to 2 nm;
e. a second dielectric layer over at least a portion of the first titanium layer;
f. a second silver layer over at least a portion of the second dielectric layer;
g. a second titanium layer over at least a portion of the second silver layer and having a thickness ranging from 1 to 2 nm; a first dielectric layer over at least a portion of the glass substrate;
h. a third dielectric layer over at least a portion of the second titanium layer;
i. a third silver layer over at least a portion of the third dielectric layer;

We claim

1. A method of producing a coated transparency, comprising
   a. depositing a stack of thin layers on a transparent substrate, the stack comprising a first dielectric layer over at least a portion of the substrate; a first discontinuous metal layer over at least a portion of the first dielectric layer; and a first primer layer over at least a portion of the first discontinuous metal layer, thereby forming the coated transparency; and
   b. flashing the coated transparency of the depositing step at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance of the coated transparency.
2. The method of claim 1, wherein a primer layer has a thickness ranging from 1 nm to 2 nm.
3. The method of claim 1, wherein the non-coherent light source is a xenon flash lamp.
4. The method of claim 1, wherein the flash pulse ranges from 0.2ms to 2ms.
5. The method of claim 1, wherein the first primer comprises metallic titanium, an austenitic nickel-chromium alloy, or a cobalt-chromium alloy.
6. A method of flash annealing a transparency, the transparency comprising: a transparent substrate, a first dielectric layer over at least a portion of the substrate, a first metal layer over at least a portion of the first dielectric layer, a first primer layer over at least a portion of the first metal layer, a second dielectric layer over at least a portion of the first primer layer, a second metal layer over at least a portion of the second dielectric layer, and a second primer over at least a portion of the second metal layer, comprising, flashing the transparency at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance or decreasing emissivity of the transparency.
7. The method of claim 6, wherein the transparency the transparency further comprises: a third dielectric layer over at least a portion of the second primer layer; a third metal layer over at least a portion of the third dielectric layer; a third primer layer over at least a portion of the third metal layer; and a protective layer over at least a portion of the third primer layer.
8. The method of claim 6, wherein the first metal layer and the second metal layer comprise silver.
9. The method of claim 7, wherein the transparent substrate is a float glass substrate; wherein the first metal layer comprises silver; wherein the first primer layer comprises titanium having a thickness ranging from 1 nm to 2 nm; wherein the second metal layer comprises silver;

wherein the second primer layer comprises titanium having a thickness ranging from 1 to 2 nm; wherein the third metal layer comprises silver; and wherein the third primer layer comprises titanium having a thickness ranging from 1 to 2 nm.

10. The method of claim 6, further comprising placing a mask between the source of the more than one flash of non-coherent light and the transparency such that at least a portion of each flash of the more than one flash is mased such that the non-coherent light from each flash of the more than one flash is partially blocked by the mask from reaching the transparency, and reaches only a portion of the transparency, thereby producing a pattern of reflected color, transmitted color, differential sheet resistance, and/or emissivity in the transparency.

11. A method of flash annealing a transparency, the transparency comprising: a transparent substrate, a first dielectric layer over at least a portion of the substrate, a first metal layer over at least a portion of the first dielectric layer, a first primer layer over at least a portion of the first metal layer, a second dielectric layer over at least a portion of the first primer layer, a second metal layer over at least a portion of the second dielectric layer, a second primer layer over at least portion of the second metal layer, a third dielectric layer over at least a portion of the second primer layer, a third metal layer over at least a portion of the third dielectric layer, a third primer layer over at least a portion of the third metal layer, a fourth dielectric layer over at least a portion of the third primer layer, a fourth metal layer over at least a portion of the fourth dielectric layer, a fourth primer layer over at least a portion of the fourth metal layer, and a protective layer over at least a portion of the fourth primer layer; wherein the second or third metal layer is a discontinuous metal layer, comprising, flashing the transparency at room temperature, with more than one flash of non-coherent light in the visible spectrum with an intensity ranging from 1 J/cm^2 to 7 J/cm^2 for a pulse length of above 0 ms and up to 10 ms, thereby increasing visible light transmittance or decreasing emissivity of the transparency.

12. The method of claim 1, wherein the coated transparency has a sheet resistance which is decreased to 2 Ω/□ or less after flashing.