

Search query (2): [SP]: [0001] the invention relates to a multiple glazing comprising at least two substrates, of the glass substrate type, which are held together by a frame structure, said glazing providing a separation between an external space and an internal space, wherein at least one intermediate gas-filled space is positioned between the two substrates.[0002] in a known manner, one of the substrates may be coated on an inner face in contact with the intermediate gas-filled space with a thin-films stack having reflection properties in the infrared and/or in solar radiation comprising a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, said coatings each comprising at least one dielectric layer, said functional layer being positioned between the two antireflection coatings.[0003] the invention relates more particularly to the use of such substrates for manufacturing thermal insulation and/or solar protection glazing. this glazing may be intended for equipping buildings, especially with a view to reducing air-conditioning load and/or preventing excessive overheating (called "solar control" glazing) and/or reducing the amount of energy dissipated to the outside (called "low-emissivity" glazing) driven by the ever increasing size of glazed surfaces in buildings.[0004] this glazing may furthermore be integrated into glazing having particular functionalities, such as for example heated glazing or electrochromic glazing. [0005] one type of stack known for giving substrates such properties comprises a metallic functional layer having reflection properties in the infrared and/or in solar radiation, in particular a metallic functional layer, based on silver or on a metal alloy containing silver.[0006] in this type of stack, the functional layer is thus positioned between two antireflection coatings each comprising, in general, several layers which are each made of a dielectric material of the nitride type, and in particular silicon nitride or alumina nitride, or of the oxide type. from an optical point of view, the purpose of these coatings which flank the metallic functional layer is to "antireflect" this metallic functional layer.[0007] a blocker coating is however inserted sometimes between one or each antireflection coating and the metallic functional layer the blocker coating positioned beneath the functional layer in the direction of the substrate protects it during an optional high-temperature heat treatment, of the bending and/or tempering type, and the blocker coating positioned on the functional layer on the opposite side from the substrate protects this layer from any degradation during the deposition of the upper dielectric coating and during an optional high-temperature heat treatment, of the bending and tempering type.[0008] the invention relates more particularly to the use of an intermediate layer within the stack, and to the implementation of a treatment of the complete thin-films stack using a source that produces radiation, and in particular infrared radiation.[0009] it is known, in particular from international patent application wo 2010/142926, to provide an absorbent intermediate layer of a stack and to apply a treatment after the deposition of a stack in order to reduce the emissivity, or to improve the optical properties, of low-emissivity stacks. the treatment makes it possible to improve the quality of the metallic functional layer and therefore to reduce the emissivity (which is directly linked to the sheet resistance) and the use of an absorbent intermediate layer makes it possible to increase the absorption of the stack during the treatment so that it is short but effective. as the absorbent intermediate layer becomes transparent during the treatment, the optical characteristics of the stack after treatment are advantageous (a high light transmission may in particular be obtained).[0010] however, this solution is not completely satisfactory since it is desired that the quality of the metallic functional layer be further improved and that therefore the sheet resistance be further reduced.[0011] the objective of the invention is to succeed in overcoming the drawbacks of the prior art, by developing a novel type of stack with a single functional layer, which stack has, after treatment, an even lower sheet resistance (and therefore an even lower emissivity).[0012] thus, one subject of the invention is, in its broadest sense, a substrate coated on one face with a thin-films stack having reflection properties in the infrared and/or in solar radiation as claimed in claim 1. this stack comprises a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, said coatings each comprising at least one dielectric layer, said functional layer being positioned between the two antireflection coatings.[0013] according to the invention, at least one of said antireflection coatings comprises an intermediate layer comprising zinc oxide ZnO_{1+x} with $0.05 \leq x \leq 0.3$ and having a physical thickness of between 0.5 nm and 20 nm, or between 2.5 nm and 10 nm, or else between 2.5 nm and 4 nm.[0014] indeed, it has been discovered that an intermediate layer based on superstoichiometric zinc oxide makes it possible to obtain, after treatment using a radiation source, an even lower sheet resistance.[0015] the term "coating" should be understood in the present invention to mean that there may be a single layer or several layers of different materials within the coating.[0016] as is customary, the term "dielectric layer" should be understood in the present invention to mean that, from the point of view of its nature, the material of the layer is "nonmetallic", i.e. is not a metal. in the context of the invention, this term denotes a material having an n/k ratio over the entire visible wavelength range (from 380 nm to 780 nm) equal to or greater than 5.[0017] the refractive index values indicated in the present document are the values measured as is customary at the wavelength of 550 nm.[0018] the expression "layer based on..." should be understood in the present invention to mean that the layer comprises the material mentioned at more than 50 at percent.[0019] said intermediate layer preferably comprises zinc oxide ZnO_{1+x} with $0.1 \leq x \leq 0.3$, or else with $0.15 \leq x \leq 0.25$. [0020] in one particular version, said intermediate layer consists of zinc oxide ZnO_{1+x} and does not comprise any other element.[0021] in one particular version of the invention, said intermediate layer is located in the antireflection coating superjacent to the functional layer, preferably directly on an overblocker coating located directly on said functional layer, considered starting from the substrate.[0022] it is particularly surprising that an intermediate layer located in the antireflection coating superjacent to the functional layer can have a beneficial effect on the quality of this functional layer, and thus on the sheet resistance of the stack, since this functional layer is located underneath in the direction of the substrate.[0023] in another particular version of the invention, said intermediate layer is located in said dielectric coating positioned beneath said metallic functional layer, preferably directly underneath said functional layer.[0024] irrespective of the version above, said intermediate layer is located, preferably, on another face, directly in contact with a nitride-based dielectric layer having a physical thickness of between 10 and 50 nm, this layer being preferably based on silicon nitride Si_3N_4 . [0025] said antireflection coating positioned beneath said metallic functional layer preferably comprises a high-index layer made of a material having a refractive index between 2.3 and 2.7, this layer being preferably based on oxide.[0026] this high-index layer makes it possible to maximize the high light transmission of the stack in the visible and has a favorable action on obtaining neutral colors, both in transmission and in reflection.[0027] this high-index layer preferably has a physical thickness of between 5 and 25 nm.[0028] in another particular version of the invention, the last layer of the subjacent dielectric coating, the one furthest from the substrate, is based on oxide, deposited preferably substoichiometrically, and in particular is based on titanium oxide (TiO_x). [0029] the stack may thus comprise a final layer ("overcoat"), i.e. a protective layer, deposited preferably substoichiometrically. this layer is oxidized for the most part stoichiometrically in the stack after the deposition.[0030] it is also possible to make provision for the use of a layer according to the invention comprising zinc oxide ZnO_{1+x} with $0.05 \leq x \leq 0.3$ and having a physical thickness of between 0.5 nm and 20 nm, or else between 2.5 nm and 10 nm, or even between 2.5 nm and 4 nm as intermediate layer in an antireflection coating of thin-films stack having a single functional layer.[0031] the invention also relates to a process for obtaining a substrate coated on one face with a thin-films stack having reflection properties in the infrared and/or in solar radiation comprising a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, comprising the following steps, in the order:[0032] the deposition on one face of said substrate of a thin-films stack having reflection properties in the infrared and/or in solar radiation according to

Results: 5

Search history

Search PN=(WO2016051066) (Results 1)

1:

Search [SP]: [0001] the invention relates to a multiple glazing comprising at least two substrates, of the glass substrate type, which are held together by a frame structure, said glazing providing a separation between an external space and an internal space, wherein at least one intermediate gas-filled space is positioned between the two substrates.[0002] in a known manner, one of the substrates may be coated on an inner face in contact with the intermediate gas-filled space with a thin-films stack having reflection properties in the infrared and/or in solar radiation comprising a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, said coatings each comprising at least one dielectric layer, said functional layer being positioned between the two antireflection coatings.[0003] the invention relates more particularly to the use of such substrates for manufacturing thermal insulation and/or solar protection glazing. this glazing may be intended for equipping buildings, especially with a view to reducing air-conditioning load and/or preventing excessive overheating (called "solar control" glazing) and/or reducing the amount of energy dissipated to the outside (called "low-emissivity" glazing) driven by the ever increasing size of glazed surfaces in buildings.[0004] this glazing may furthermore be integrated into glazing having particular functionalities, such as for example heated glazing or electrochromic glazing.[0005] one type of stack known for giving substrates such properties comprises a metallic functional layer having reflection properties in the infrared and/or in solar radiation, in particular a metallic functional layer, based on silver or on a metal alloy containing silver.[0006] in this type of stack, the functional layer is thus positioned between two antireflection coatings each comprising, in general, several layers which are each made of a dielectric material of the nitride type, and in particular silicon nitride or alumina nitride, or of the oxide type. from an optical point of view, the purpose of these coatings which flank the metallic functional layer is to "antireflect" this metallic functional layer.[0007] a blocker coating is however inserted sometimes between one or each antireflection coating and the metallic functional layer the blocker coating positioned beneath the functional layer in the direction of the substrate protects it during an optional high-temperature heat treatment, of the bending and/or tempering type, and the blocker coating positioned on the functional layer on the opposite side from the substrate protects this layer from any degradation during the deposition of the upper dielectric coating and during an optional high-temperature heat treatment, of the bending and tempering type.[0008] the invention relates more particularly to the use of an intermediate layer within the stack, and to the implementation of a treatment of the complete thin-films stack using a source that produces radiation, and in particular infrared radiation.[0009] it is known, in particular from international patent application wo 2010/142926, to provide an absorbent

intermediate layer of a stack and to apply a treatment after the deposition of a stack in order to reduce the emissivity, or to improve the optical properties, of low-emissivity stacks. the treatment makes it possible to improve the quality of the metallic functional layer and therefore to reduce the emissivity (which is directly linked to the sheet resistance) and the use of an absorbent intermediate layer makes it possible to increase the absorption of the stack during the treatment so that it is short but effective. as the absorbent intermediate layer becomes transparent during the treatment, the optical characteristics of the stack after treatment are advantageous (a high light transmission may in particular be obtained).[0010] however, this solution is not completely satisfactory since it is desired that the quality of the metallic functional layer be further improved and that therefore the sheet resistance be further reduced.[0011] the objective of the invention is to succeed in overcoming the drawbacks of the prior art, by developing a novel type of stack with a single functional layer, which stack has, after treatment, an even lower sheet resistance (and therefore an even lower emissivity).[0012] thus, one subject of the invention is, in its broadest sense, a substrate coated on one face with a thin-films stack having reflection properties in the infrared and/or in solar radiation as claimed in claim 1. this stack comprises a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, said coatings each comprising at least one dielectric layer, said functional layer being positioned between the two antireflection coatings. [0013] according to the invention, at least one of said antireflection coatings comprises an intermediate layer comprising zinc oxide $\text{Zn}_{1.01+x}$ with 0.05×0.3 and having a physical thickness of between 0.5 nm and 20 nm, or between 2.5 nm and 10 nm, or else between 2.5 nm and 4 nm. [0014] indeed, it has been discovered that an intermediate layer based on superstoichiometric zinc oxide makes it possible to obtain, after treatment using a radiation source, an even lower sheet resistance.[0015] the term "coating" should be understood in the present invention to mean that there may be a single layer or several layers of different materials within the coating.[0016] as is customary, the term "dielectric layer" should be understood in the present invention to mean that, from the point of view of its nature, the material of the layer is "nonmetallic", i.e. is not a metal. in the context of the invention, this term denotes a material having an n/k ratio over the entire visible wavelength range (from 380 nm to 780 nm) equal to or greater than 5.[0017] the refractive index values indicated in the present document are the values measured as is customary at the wavelength of 550 nm.[0018] the expression "layer based on..." should be understood in the present invention to mean that the layer comprises the material mentioned at more than 50 at percent.[0019] said intermediate layer preferably comprises zinc oxide $\text{Zn}_{1.01+x}$ with 0.1 $\times$ 0.3, or else with 0.15 $\times$ 0.25.[0020] in one particular version, said intermediate layer consists of zinc oxide $\text{Zn}_{1.01+x}$ and does not comprise any other element.[0021] in one particular version of the invention, said intermediate layer is located in the antireflection coating superjacent to the functional layer, preferably directly on an overblocker coating located directly on said functional layer, considered starting from the substrate.[0022] it is particularly surprising that an intermediate layer located in the antireflection coating superjacent to the functional layer can have a beneficial effect on the quality of this functional layer, and thus on the sheet resistance of the stack, since this functional layer is located underneath in the direction of the substrate.[0023] in another particular version of the invention, said intermediate layer is located in said dielectric coating positioned beneath said metallic functional layer, preferably directly underneath said functional layer.[0024] irrespective of the version above, said intermediate layer is located, preferably, on another face, directly in contact with a nitride-based dielectric layer having a physical thickness of between 10 and 50 nm, this layer being preferably based on silicon nitride Si_3N_4 . [0025] said antireflection coating positioned beneath said metallic functional layer preferably comprises a high-index layer made of a material having a refractive index between 2.3 and 2.7, this layer being preferably based on oxide.[0026] this high-index layer makes it possible to maximize the high light transmission of the stack in the visible and has a favorable action on obtaining neutral colors, both in transmission and in reflection.[0027] this high-index layer preferably has a physical thickness of between 5 and 25 nm.[0028] in another particular version of the invention, the last layer of the subjacent dielectric coating, the one furthest from the substrate, is based on oxide, deposited preferably substoichiometrically, and in particular is based on titanium oxide (tiox).[0029] the stack may thus comprise a final layer ("overcoat"), i.e. a protective layer, deposited preferably substoichiometrically. this layer is oxidized for the most part stoichiometrically in the stack after the deposition.[0030] it is also possible to make provision for the use of a layer according to the invention comprising zinc oxide $\text{Zn}_{1.01+x}$ with 0.05×0.3 and having a physical thickness of between 0.5 nm and 20 nm, or else between 2.5 nm and 10 nm, or even between 2.5 nm and 4 nm as intermediate layer in an antireflection coating of thin-films stack having a single functional layer.[0031] the invention also relates to a process for obtaining a substrate coated on one face with a thin-films stack having reflection properties in the infrared and/or in solar radiation comprising a single metallic functional layer, in particular based on silver or on a metal alloy containing silver, and two antireflection coatings, comprising the following steps, in the order:[0032] the deposition on one face of said substrate of a thin-films stack having reflection properties in the infrared and/or in solar radiation according to (Results 5)

Title: SUBSTRATE PROVIDED WITH A STACK HAVING THERMAL PROPERTIES AND A SUPERSTOICHIOMETRIC INTERMEDIATE LAYER

Abstract: A substrate is coated on one face with a thin-films stack having reflection properties in the infrared and/or in solar radiation including a single metallic functional layer, based on silver or on a metal alloy containing silver, and two antireflection coatings. The coatings each include at least one dielectric layer. The functional layer is positioned between the two antireflection coatings. At least one of the antireflection coatings includes an intermediate layer including zinc oxide $\text{Zn}_1\text{O}_{1+x}$ with $0.05 < x < 0.3$ and having a physical thickness of between 0.5 nm and 20 nm, or between 2.5 nm and 10 nm.

Classifications:

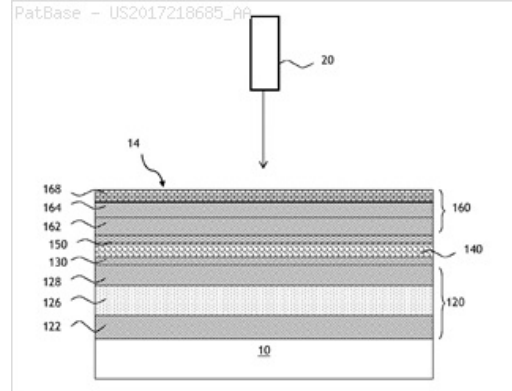
International (IPC 8-9): B32B15/04 B32B9/00 C03C17/36 C03C27/06

E06B3/66 E06B3/67 (Advanced/Invention)

CPC: C03C2218/154 E06B3/6715 C03C2217/212 C03C2217/216

C03C2217/281 C03C2217/256 C03C2217/73 C03C17/36 C03C17/3626

C03C17/3644 C03C17/3652 C03C17/366 C03C17/3681



Family:

Publication number	Publication date	Application number	Application date
BR112017006220 A2	20180313	BR20171106220	20150929
CN106715351 A	20170524	CN201580053115	20150929
CO20170004368 A2	20170920	CO20170004368	20170428
EA201790761 A1	20170929	EA20170090761	20150929
EP3201152 A1	20170809	EP20150787258	20150929
FR3026403 A1	20160401	FR20140059255	20140930
FR3026403 B1	20161125	FR20140059255	20140930
IN201717011425 A	20170915	IN201717011425	20170330
JP2017537044 T2	20171214	JP20170517090T	20150929
KR20170063706 A	20170608	KR20177009867	20150929
MX2017004159 A1	20170530	MX20170004159	20150929
US2017218685 AA	20170803	US20150515354	20150929
WO16051066 A1	20160407	WO2015FR52587	20150929

Priority:

FR20140059255 20140930 WO2015FR52587 20150929

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

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Agent(s): MARGARITA CASTELLANOS ABONDANO; SAINT GOBAIN RECHERCHE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: GLAZING PROVIDED WITH STACKED THIN LAYERS REFLECTING INFRARED RAYS AND/OR SOLAR RADIATION

Abstract: The invention relates to glazing that comprises at least one transparent substrate S provided with a stack of thin layers comprising an alternation of n functional layers A having reflection properties in the infrared and/or in solar radiation, especially metal layers, and (n+1) coatings B made of a dielectric, where n greater than or equal to 1. The stack satisfies the following criteria: at least one functional layer A is (i) directly in contact with the dielectric coating B placed on top of it and (ii) in contact with the dielectric B placed beneath it via a layer C that absorbs at least in the visible, of the metallic, optionally nitride, type.

Classifications:

International (IPC 8-9): B32B15/04 B32B17/06 B32B7/02 C03C17/36 (Advanced/Invention);

B32B15/04 (Advanced/Non-invention);

B32B15/04 B32B17/06 B32B7/02 C03C17/36 (Core/Invention)

International (IPC 1-7): B32B15/04 B32B7/02 B60J1/02 B60J1/08 C03C17/36

CPC: Y10T428/24942 C03C17/3618 B32B17/10036 B32B17/10174 B32B17/10761 C03C17/36 C03C17/3626 C03C17/3639 C03C17/3644 C03C17/3652 C03C17/366 C03C17/3673

European: B32B17/10C4 B32B17/10E10 B32B17/10G28 C03C17/36 C03C17/36B320 C03C17/36B332 C03C17/36B339 C03C17/36B342 C03C17/36B346 C03C17/36B352L C03C17/36B354H

US: 428/212 428/432

Family:

Publication number	Publication date	Application number	Application date
AU2002341016 AA	20030217	AU20020341016	20020725
AU2002341016 BB	20080807	AU20020341016	20020725
AU2002341016 BI	20090122	AU20020341016	20020725
BRPI0211421 A	20040817	BR2002PI11421	20020725
BRPI0211421 B1	20120904	BR2002PI11421	20020725
CA2453925 AA	20040115	CA20022453925	20020725
CN100369845 C	20080220	CN20028014663	20020725
CN1535254 A	20041006	CN20028014663	20020725
EP1412300 A1	20040428	EP20020774837	20020725
FR2827855 A1	20030131	FR20010009900	20010725
FR2827855 B1	20040702	FR20010009900	20010725
IN01679KN2003 A	20060310	IN2003KN01679	20031230
IN223376 B	20080912	IN2003KN01679	20031230
JP2004536013 T2	20041202	JP20030515465T	20020725
JP4490096 B2	20100623	JP20030515465T	20020725
KR101051777 B1	20110726	KR20047000876	20020725
KR20040017336 A	20040226	KR20047000876	20020725
MXPA04000687 A1	20040405	MX2004PA00687	20020725
PL201811 B1	20090529	PL20020365032	20020725
PL365032 A1	20041227	PL20020365032	20020725
US2004241406 AA	20041202	US20040483989	20040630
US2006222863 AA	20061005	US20060399471	20060407
WO03010105 A1	20030206	WO2002FR02674	20020725

Priority:

FR20010009900 20010725 WO2002FR02674 20020725 US20040483989 20040630
US20060399471 20060407

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): BILLERT ULRICH ; NADAUD NICOLAS ; SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA ; SCHUETT JUERGEN ; YU LI MING

Inventor(s): (std): BILLERT U ; BILLERT ULRICH ; J SCHUTT ; N NADAUD ; NADAUD N ; NADAUD NICOLAS ; SCHUETT JUERGEN ; SCHUTT J ; SCHUTT JURGEN ; TT J RGEN SCH ; U BILLERT ; ULRICH BILLERT ; YU LI MING ; SCHUTT JUERGEN

Inventor(s): J RGEN SCH TT ; NICOLAS NADAUD ; SCH TT J RGEN ; J³RGEN SCH³TT ; JUERGEN SCHUETT ; JURGEN SCHUTT ; LI MING YU

Agent(s): GRIFFITH HACK ; GOUDREAU GAGE DUBUC ; SAINT GOBAIN RECHERCHE ; C IRVIN MCCLELLAND OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT PC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW

Title: SUBSTRATE PROVIDED WITH A STACK HAVING THERMAL PROPERTIES

Abstract: The invention relates to a glass substrate (10) provided on a main face with a stack of thin layers comprising a metallic functional layer (40) with reflective properties in the infrared and/or in solar radiation, based notably on silver or a metal alloy containing silver, and two antireflective coatings (20, 60), each of said coatings having at least one dielectric layer (22, 64) based on silicon nitride, optionally doped with at least one other element, such as aluminum, said functional layer (40) being disposed between the two antireflective coatings (20, 60), characterized in that the optical thickness e_{60} in nm of the overlying antireflective coating (60) is: $e_{60} = 5 \times e_{40} + a$, where e_{40} is the geometric thickness in nm of the functional layer (40) such that $13?e_{40} \geq 25$, and preferably $14?e_{40} \geq 18$, and where a is a number $= 25$ plus or minus 15.

Classifications:

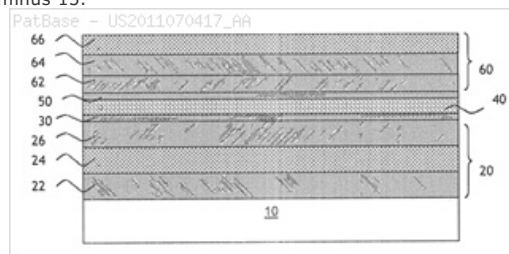
International (IPC 8-9): B05D5/06 B32B17/00 B32B17/06 B32B37/00 B32B7/02 C03C C03C17/34 C03C17/36 G02B1/11 (Advanced/Invention); B32B17/06 C03C17/34 C03C17/36 G02B1/11 (Advanced/Non-invention); B32B17/06 C03C17/36 (Core/Invention)

CPC: Y10T428/2495 C03C17/3618 C03C17/3626 C03C17/3644 C03C17/3652 C03C17/366 C03C17/36

European: C03C17/36 C03C17/36B320 C03C17/36B332

C03C17/36B342 C03C17/36B346 C03C17/36B352L

US: 156/278 156/278S 427/160 427/160S 428/213 428/213P

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Publication number	Publication date	Application number	Application date
BRPI0908713 A2	20150728	BR2009PI08713	20090317
CA2717921 AA	20091008	CA20092717921	20090317
CN102036930 A	20110427	CN200980117939	20090317
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EA201071085 A1	20110429	EA20100071085	20090317
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FR2928913 A1	20090925	FR20080051731	20080318
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IN03417KN2010 A	20111125	IN2010KN03417	20100916
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KR20100123875 A	20101125	KR20107020797	20090317
MX2010010100 A1	20101004	MX20100010100	20090317
US2011070417 AA	20110324	US20090933240	20090317
WO09122090 A2	20091008	WO2009FR50444	20090317
WO09122090 A3	20091210	WO2009FR50444	20090317
ZA201006614 A	20110525	ZA20100006614	20100915

Priority:

FR20080051731 20080318 WO2009FR50444 20090317

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; GERARDIN HADIA ; REUTLER PASCAL ; SAINT GOBAIN SA

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Inventor(s): (std): GERARDIN HADIA ; HADIA GERARDIN ; PASCAL REUTLER ; REUTLER PASCAL

Agent(s): JAMET VINCENT; SAINT GOBAIN RECHERCHE; AOKI ATSUSHI; ISHIDA TAKASHI; KOGA TETSUJI

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: SUBSTRATE PROVIDED WITH A MULTILAYER COATING HAVING THERMAL PROPERTIES, WHICH INCLUDES HIGH-REFRACTIVE-INDEX LAYERS

Abstract: A transparent glass substrate including on a main face a thin-film multilayer coating including a metallic functional layer having reflection properties in the infrared and/or in solar radiation, for example based on silver or a metal alloy containing silver, and two antireflection films. The films each include at least two dielectric layers, the functional layer being placed between the two antireflection films. Each antireflection film includes at least one high-refractive-index dielectric layer located in contact with or close to the functional layer.

Classifications:

International (IPC 8-9): B32B17/06 B32B17/10 B32B7/02 C03C17/36

G02B1/11 G02B5/26 G02B5/28 (Advanced/Invention);

G02B5/28 (Advanced/Non-invention);

B32B17/06 C03C17/36 (Core/Invention)

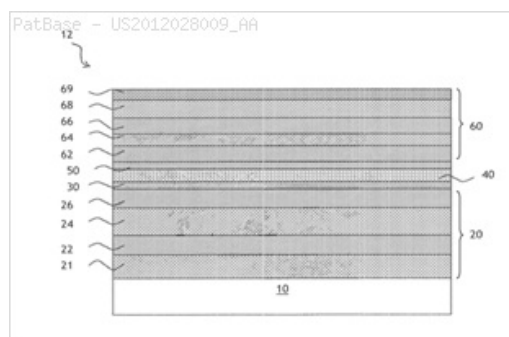
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C03C17/3626 C03C17/3644 C03C17/366 C03C2217/73 Y10T428/24942

European: C03C17/36 C03C17/36B332 C03C17/36B342

C03C17/36B352L M03C217/730

US: 428/212 428/212P



Family:

Publication number	Publication date	Application number	Application date
CA2753842 AA	20100916	CA20102753842	20100308
CA2753842 C	20170815	CA20102753842	20100308
CN102421720 A	20120418	CN201080020382	20100308
CN102421720 B	20140903	CN201080020382	20100308
DK2406197 T3	20180813	DK20100714927T	20100308
EA021230 B1	20150529	EA20110071111	20100308
EA201171111 A1	20120430	EA20110071111	20100308
EG26958 A	20150201	EG20110081433	20110828
EP2406197 A1	20120118	EP20100714927	20100308
EP2406197 B1	20180516	EP20100714927	20100308
ES2683900 T3	20180928	ES20100714927T	20100308
FR2942794 A1	20100910	FR20090051458	20090309
FR2942794 B1	20110218	FR20090051458	20090309
IN03582KN2011 A	20120420	IN2011KN03582	20110829
JP2012519648 T2	20120830	JP20110553491T	20100308
JP5711158 B2	20150430	JP20110553491T	20100308
KR101677572 B1	20161118	KR20117020546	20100308
KR20110128285 A	20111129	KR20117020546	20100308
TR201811072 T4	20180921	TR20180011072T	20100308
US2012028009 AA	20120202	US20100254513	20100308
US9708215 BB	20170718	US20100254513	20100308
WO10103224 A1	20100916	WO2010FR50391	20100308

Priority:

FR20090051458 20090309 EP20100714927 20100308 WO2010FR50391 20100308

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): REYMOND VINCENT ; SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA ; GERARDIN HADIA

Assignee(s): HADIA GERARDIN ; VINCENT REYMOND

Inventor(s): (std): HADIA GERARDIN ; VINCENT REYMOND ; REYMOND VINCENT ; GERARDIN HADIA

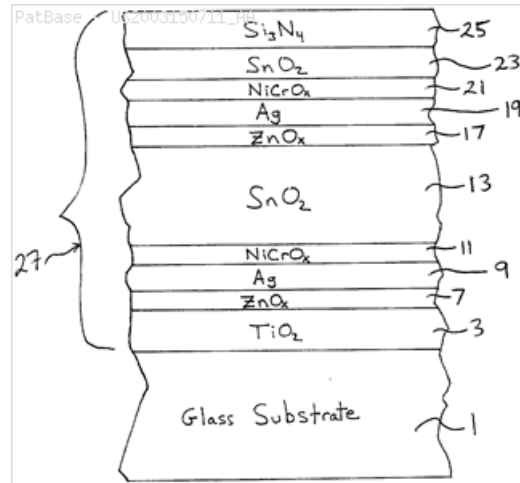
Agent(s): GOUDREAU GAGE DUBUC ; LAVERY DE BILLY LLP; JAMET VINCENT; SAINT GOBAIN RECHERCHE; ELZABURU SLP ELZABURU SLP; FULYA SUEMERALP; OBLON MCCLELLAND MAIER AND NEUSTADT LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: COATED ARTICLE WITH HIGH VISIBLE TRANSMISSION AND LOW EMISSIVITY

Abstract: A coated article that can be used in applications such as insulating glass (IG) units, so that resulting IG units can achieve high visible transmission of at least 70 percent (e.g., when using clear glass substrates from 1.0 to 3.5 mm thick), combined with at least one of: (a) SHGC no greater than about 0.45, more preferably no greater than about 0.40; (b) SC no greater than about 0.49, more preferably no greater than about 0.46; (c) chemical and/or mechanical durability; (d) neutral transmissive color such that transmissive ass is from -5.0 to 0 (more preferably from -3.5 to -1.5), and transmissive bss is from -2.0 to 4.0 (more preferably from 1.0 to 3.0); and (e) neutral reflective color from the exterior of the IG unit (i.e., Rg/Rout) such that reflective ass is from -3.0 to 2.0 (more preferably from -2.0 to 0.5), and reflective bss is from -5.0 to 1.0 (more preferably from -4.0 to -1.0). In certain example non-limiting embodiments, coated articles herein comprise:

substrate/TiO_x/ZnO_x/Ag/NiCrO_x/SnO_x/ZnO_x/Ag/NiCrO_x/SnO_x/SixNy.
Classifications:
International (IPC 8-9): C03C17/36 (Advanced/Invention)
International (IPC 1-7): B32B17/06 C03C17/36 C23C14/32
CPC: C03C17/36 C03C17/3618 C03C17/3626 C03C17/3639
C03C17/3644 C03C2217/78 C03C17/3636 C03C17/366 Y10T428/12896
European: C03C17/36 C03C17/36B320 C03C17/36B332
C03C17/36B339 C03C17/36B342 C03C17/36B352L M03C217/780
US: 204/192.11 204/192.110P 204/192.17 204/192.170S 204/192.21
204/192.210S 428/428 428/432 428/432S 428/448 428/472 428/673
428/697 428/698 428/699 428/699S 428/701 428/702 428/702S

**Family:**

Publication number	Publication date	Application number	Application date
CA2459505 AA	20040226	CA20022459505	20021016
CA2459505 C	20080930	CA20022459505	20021016
EP1441996 A1	20040804	EP20020773759	20021016
PL200138 B1	20081231	PL20020368608	20021016
PL368608 A1	20050404	PL20020368608	20021016
US2003150711 AA	20030814	US20010978184	20011017
US6936347 BB	20050830	US20010978184	20011017
WO03033427 A1	20030424	WO2002US32909	20021016

Priority:

US20010978184 20011017 WO2002US32909 20021016

Probable Assignee: GUARDIAN GLASS LLC

Assignee(s): (std): GUARDIAN IND ; CT LUXEMBOURGEOIS RECH VERRE

Assignee(s): GUARDIAN IND CORP ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE ET LA CERAMIQUE S A C R V C ; GUARDIAN GLASS LLC ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE ET LA CERAMIQUE SARL ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE ET LA CERAMIQUE RL SA ; GUARDIAN EUROPE RL SA ; LAIRD RONALD E ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE EL AL CERAMIZUE (CRVC) SA ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE EL AL CERAMIZUE CRVC SA ; CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE ET LA CERAMIQUE CRVC SA

Inventor(s): (std): KRILTZ UWE ; LAIRD CAROLE ; LAIRD RONALD E

Agent(s): MACPHERSON LESLIE AND TYERMAN LLP; NIXON AND VANDERHYE PC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW