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August 16, 2017

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APPLICATION NUMBER: 62/440,453
FILING DATE: *December 30, 2016*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US62/440,453



Certified by

Nichelle K. Lee

Under Secretary of Commerce
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and Director of the United States
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LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE

Field of invention

The present invention relates generally to the field of automotive glass laminate comprising a chemically tempered layer.

Abstract

Working with the traditional soda lime float glass, there is a limit on how thin an automotive laminate can be while still meeting all of the functional and safety requirements. By using alternate glass compositions and chemical tempering, a thinner lightweight automotive laminate, which meets all requirements, and with high resistance to stone chips, has been produced.

Background of the invention

In response to the regulatory requirements for increased automotive fuel efficiency as well as the growing public awareness and demand for environmentally friendly products, automotive original equipment manufacturers, around the world, have been working to improve the efficiency of their vehicles.

One of the key elements of this strategy to improve efficiency has been the concept of light weighting. Often times, more traditional, less expensive, conventional materials and processes are being replaced by innovative new materials and processes which while sometime being more expensive, still have higher utility than the materials and processes being replaced due to their lower weight and the corresponding increase in fuel efficiency. Sometimes, the new materials and processes bring with them added functionality as well in addition to their lighter weight. Vehicle glazing has been no exception.

For many years, the standard automotive windshield had a thickness of 5.4 mm. In more recent years, we have seen the thickness decrease to 4.75 mm. While a reduction of 0.65 mm may not seem significant, at a density of 2600 kg per cubic meter for the typical standard soda lime float glass, each millimeter that the thickness is reduced, decreases the weight by 2.6 kg per square meter. The weight of a typical 1.2 square meter windshield going from 5.4 mm to 4.75 mm is reduced by a little over 2 kg. On a vehicle with a total of 6 square meters of glass, a 1 mm reduction on all of the windows translates into a savings of 15.6 kg.

In addition to the weight saved by reducing the glazing thickness, the glazed area of vehicles has been steadily increasing and in the process displacing other heavier materials for further savings. The popular large glass panoramic roofs are just one example of this trend.

However there are limits as to how thin the glazing can be with an annealed soda lime glass construction. The windshield must have sufficient strength to hold up under the stress induced by wind load. With the trend towards increasing the size of windshields in particular, even more strength is needed. Glass is also becoming a structural element in more and more vehicles. The glazing now contributes to the stiffness and strength of the car. Fixed glass, once bonded with a relatively soft curing poly-urethane, is being mounted with higher modulus adhesives. As a result, the glass, once isolated by rubber gaskets and soft buty adhesives, is now much more subject to loading from the bumps in the road and vehicle torsion.

Today, windshields with a 2.1 mm outer ply **12**, a 1.6 mm inner ply **14** and a 0.76 mm plastic interlayer **10** totaling just under 4.5 mm in total thickness are becoming common (Figure 1). This may be close to the limit of what can be done with conventional annealed soda lime glass.

Annealed glass is glass that has been slowly cooled from the bending temperature through the glass transition range. This is done to relieve stress in the glass. Annealed glass breaks into large shards with sharp edges. In a laminate, two sheets of annealed glass are glued together using a sheet of thermo plastic. If the laminated glass should break, the plastic layer holds the shards of glass together, helping to maintain the structural integrity of the glass. The shards of broken glass tend to interlock much like the pieces of a jigsaw puzzle. A vehicle with a broken windshield can still be operated, often for an extended period if the damage is not in the vision

zones or too extensive. On impact, the plastic layer **10** also helps to prevent penetration by the occupant in the event of a collision or by objects striking the laminate from the exterior of the vehicle.

To make a thinner windshield, the glass needs to be stronger. Two processes can be used to increase the strength of glass. They are heat treating, in which the temperature of hot glass is rapidly cooled and chemical tempering which achieves the same effect through a chemical treatment.

Heat strengthened, full temper soda lime float glass, with a compressive strength in the range of at least 70 Mpa, can be used in all vehicle positions other than the windshield. Heat strengthened (tempered) glass has a layer of high compression on the outside surfaces of the glass, balanced by tension on the inside of the glass which is produced by the rapid cooling of the hot softened glass. When tempered glass breaks, the tension and compression are no longer in balance and the glass breaks into small beads with dull edges. Tempered glass is much stronger than annealed laminated glass. The thickness limits of the typical automotive heat strengthening process are in the 3.2mm to 3.6 mm range. This is due to the rapid heat transfer that is required. It is not possible to achieve the high surface compression needed with thinner glass using the typical blower type low pressure air quenching systems.

Glass can also be chemically tempered. In this process, ions in and near the outside surface of the glass are exchanged with ions from the bath that are larger. This places the outer layer of glass in compression. Compressive strengths of up to 1,000 Mpa are possible.

Chemical tempering is performed by immersing the glass in a bath of molten potassium nitrate. During the process, potassium ions replace ions of smaller elements in the glass surface creating a compression layer. The tempered strength is a function of the time that the glass is treated, the temperature of the bath, and the glass composition. The strength correlates to the depth of the compression layer. Typical parameters for chemical tempering are treatment at a temperature ranging from 350 °C to 475 °C for a period from 2 to 24 hours.

Unlike heat tempered glass, chemically tempered glass breaks into shards rather than the small bead typical of heat treated glass. This property allows for its use in windshields. However, in standard windshield glass thicknesses of 2.0 mm or greater, chemically strengthened glass would actually be too strong. In the event of a crash and a head impact, the windshield must break, absorbing the energy of the impact rather than the head of the occupant. Therefore, depending upon the tempered strength, thicknesses of 1.0 mm or less must be used in windshields.

In the bullet resistant glazing market, two glass compositions commonly used are borosilicate glass and aluminosilicate glass.

Borosilicate glass is a type of glass that contains boric oxide. It has a low coefficient of thermal expansion and a high resistance to corrosive chemical. It is commonly used to make light bulbs, laboratory glassware, and cooking utensils.

Aluminosilicate glass is made with aluminum oxide. It is even more resistant to chemicals than borosilicate glass and it can withstand higher temperatures. Chemically tempered Aluminosilicate glass is widely used for displays on smart phones and other electronic devices.

In an attempt to reduce weight beyond what is possible with soda lime glass, hybrid glazings have been produced using a chemically tempered aluminosilicate ply of thin glass for the inner layer **12** and an annealed soda-lime glass layer **14** for the outer layer. The aluminosilicate, while having the potential for up to 1000 Mpa at 0.7 mm thickness, does not hold up well to stone impacts. As a result, it must be used for the inner layer **14**. The soda lime glass outer layer **12** is no stronger or durable than the outer ply of an ordinary windshield. Due to the flexibility of the thin inner layer **14**. However, stone chip resistance is improved by a factor of 2. Upon impact, the surface of glass will flex more so than an ordinary windshield, partially absorbing some of the energy of impact.

Another problem faced when transitioning to the thinner soda-lime glass alternatives is that they are typically only available in a clear color. This is in contrast to the hundreds of variations in compositions and coatings that are available in standard windshield thickness soda lime

glass. The soda lime variations are primarily targeted at solar load control but also serve an aesthetic function. Thus we are faced with the loss of the solar performance when designing with thinner glass.

It would be advantageous to be able to produce an even thinner laminate, with greater resistance to breakage and enhanced solar performance.

Description of the Figures

Figure 1 is a laminate cross section;

Figure 2 is a laminate cross section with coatings on surfaces 1, 2 and 4;

Figure 3 is a laminate cross section with laminated film and coatings on surfaces 1 and 4;

Figure 4 is a laminate cross section with coatings on surfaces 1, 3 and 4.

Key to the Drawing Numerals

1	Surface 1
2	Surface 2
3	Surface 3
4	Surface 4
5	Plastic Interlayer
12	Outer glass layer
14	Inner glass layer
20	Coating
22	Coating
24	Coating
26	Coating
28	Film

Detailed description of the invention

The laminate of the invention utilizes an inner ply of glass having a thickness of less than or equal to 1 mm, an aluminosilicate composition and chemically tempered with a depth of layer

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of at least 20 μm . This provides for a flexible yet strong substrate that can provide the support needed to hold up under wind load but yield under occupant impact.

For the outer ply or layer, annealed borosilicate glass, having a thickness equal to or less than 2.1 mm is used. Borosilicate was selected for its extreme hardness and resistance to breakage. Ordinary borosilicate, for the same thickness, is 5 times as resistance to stone chips as ordinary soda-lime glass. Combined with an aluminosilicate inner ply, the stone resistance is as high as 10 times that of soda-lime glass windshields.

With a 0.38 plastic layer, a maximum total thickness of 3.48 is achieved. Even thinner compositions are possible. It should also be noted that the density of borosilicate glass is less than that of soda-lime glass. Borosilicate is 12% lighter for an additional weight savings.

Compared to the 4.5 mm windshield discussed earlier, the windshield of this cross section is close to 3 kg lighter per square meter. Going to a 1.6 mm borosilicate outer layer increases the weight savings to 3.6 kg per square meter.

The typical stone impact leaves a defect in the glass that is on average 20-30 μm deep. To further improve upon the stone chip resistance a hard coat can be applied to the outside surface **1** of the outer ply **12**. Such coatings are well known in the art. They can be applied by vacuum sputtering, spray coating, dip coating or by any other sufficient means of coating known in the art. A sol-gel is a preferred method as the coating can be easily applied by spray or dip coating and the coating can be cured during the bending process. The hard coat serves to absorb additional energy from the impact and further limit the depth of the defect preventing failure of the glass layer under all but the most severe cases.

To add solar properties, surfaces 1, 2, 3 or 4 can be coated with a coating that reflects or absorbs heat or that functions in some combination of the two, can be added. Again, any means known in the art can be used such as a vacuum sputtered metallic coating, a pyrolytic, a sol-gel or others. Alternately, a performance film layer, which reflects or absorbs heat or functions in some combination of the two, can be added to the laminate.

To further increase the utility to the final customer, additional coatings can be included on the surface 4 of the inner ply of glass. This include but are not limited to anti-reflective, easy clean, finger print resistance and self-cleaning. Again, any means know in the art can be used such as a vacuum sputtered metallic coating, a pyrolytic, a sol-gel or others as appropriate for the type of coating selected. Any such coating however, must be done after the glass has been bent and chemically tempered. Most coatings will interfere with or be damaged by the chemical tempering process.

Embodiment 1

Outer Ply

Borosilicate glass 2.1 mm with scratch resistance coating on surface 1 and with IR coating on surface 2

Plastic layer

0.76 mm PVB

Inner Ply

Aluminosilicate glass 0.7 mm with anti-reflective coating, anti-fingerprints and easy to clean on surface 4

Embodiment 2

Borosilicate glass 1.75 mm with scratch resistance coating on surface1 and with IR coating on surface 2

Plastic layer

0.76 mm PVB

Inner Ply

Aluminosilicate 0.55mm with anti-reflective coating, anti-fingerprints and easy to clean on surface 4

Embodiment 3

Borosilicate glass 1.6 mm with scratch resistance coating on surface1 and with IR coating on surface 2

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Plastic layer

0.38 mm PVB

Inner Ply

Aluminosilicate 0.3mm with anti-reflective coating, anti-fingerprints and easy to clean on surface 4

Embodiment 4

Borosilicate glass 1.75 mm with scratch resistance coating on surface1 and with IR coating on surface 2

Plastic layer

0.76 mm PVB

Inner Ply

Aluminosilicate 0.55mm with anti-reflective coating, anti-fingerprints and easy to clean on surface 4

The forms of the invention shown and described in this specification represent illustrative preferred embodiments and it is understood that various changes may be made without departing from the spirit of the invention as defined in the following claimed subject matter.

Claims

1. A laminate comprising
 - a. Two glass layers
 - b. An inner layer of less than or equal to 1 mm
 - i. Fabricated from aluminosilicate glass
 - ii. And chemically tempered
 - c. An outer layer having a thickness of less than or equal to 2.1 mm
 - i. Fabricated from borosilicate glass
 - d. At least one plastic layer
 - e. Said plastic layer situated between the major faces of said glass layers and serving to bond said glass layers to each other.
2. The laminate of claim 1 further comprising an outer ply of glass having a protective hard coat.
3. The laminate of claim 1 further comprising an outer ply of glass having an anti-reflective coating.
4. The laminate of claim 1 further comprising a heat reflecting coating.
5. The laminate of claim 1 further comprising a heat absorbing coating.
6. The laminate of claim 1 further comprising a heat reflecting film.
7. The laminate of claim 1 further comprising a heat absorbing film.
8. The laminate of claim 1 further comprising an inner ply having a hard coat on surface 4 of the inner ply.
9. The laminate of claim 1 further comprising an inner ply having a hard coat on surface 4 of the inner ply.
10. The laminate of claim 1 further comprising an inner ply having an anti-reflective coating on surface 4 of the inner ply.
11. The laminate of claim 1 further comprising an inner ply having an easy to clean coating on surface 4 of the inner ply.
12. The laminate of claim 1 further comprising an inner ply having a finger print resistance coating on surface 4 of the inner ply.
13. The laminate of claim 1 further comprising a chemically tempered outer ply.

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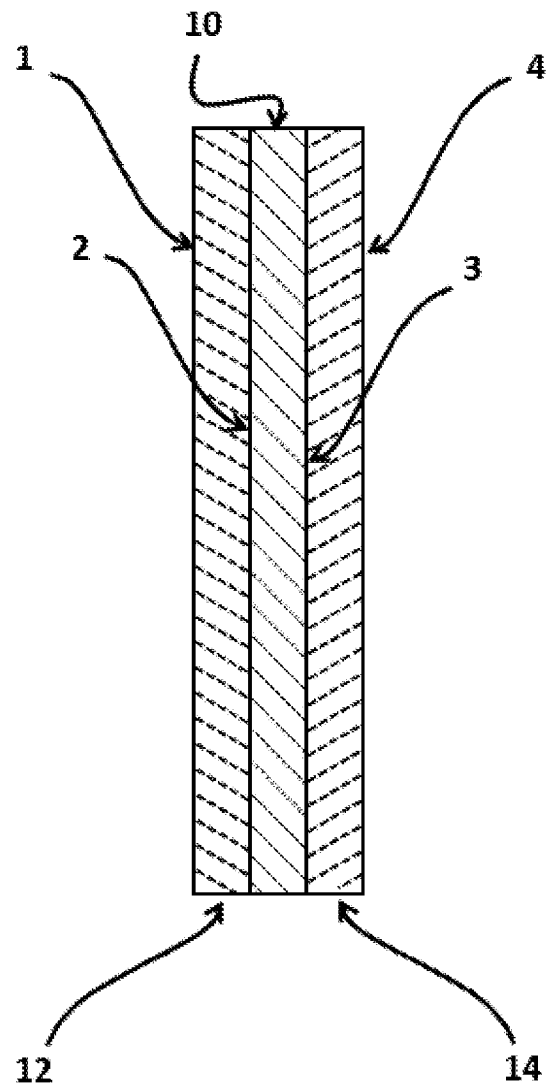


Fig. 1

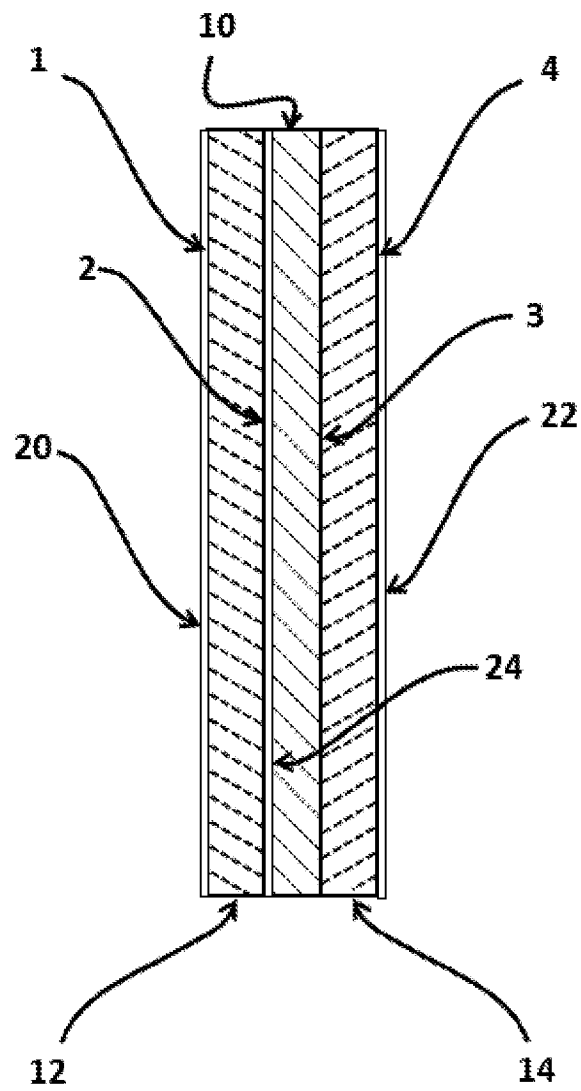


Fig. 2

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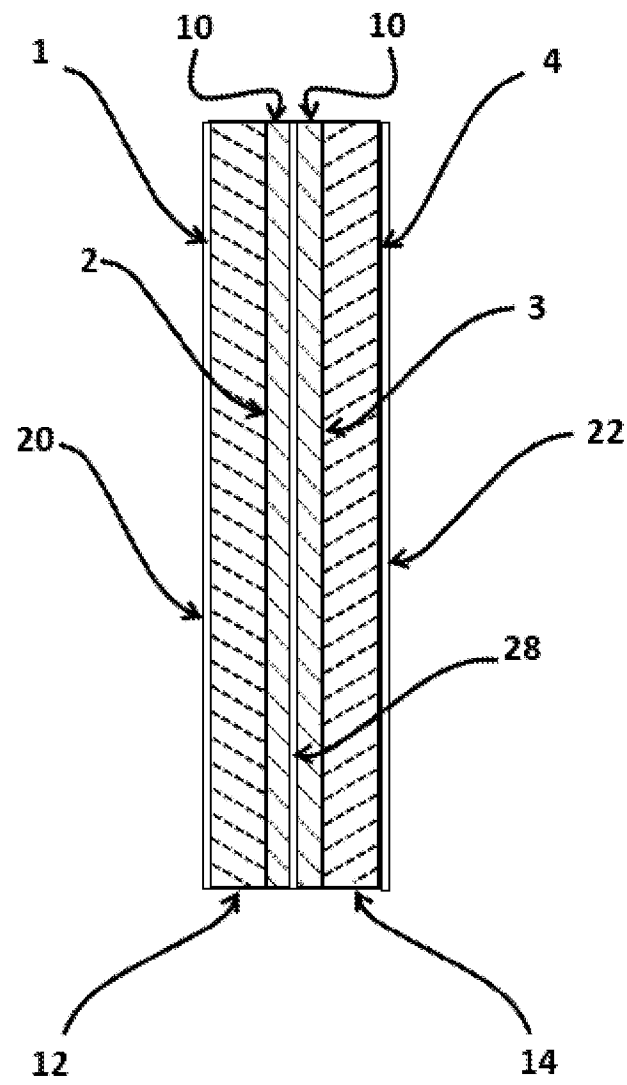


Fig. 3

4/4

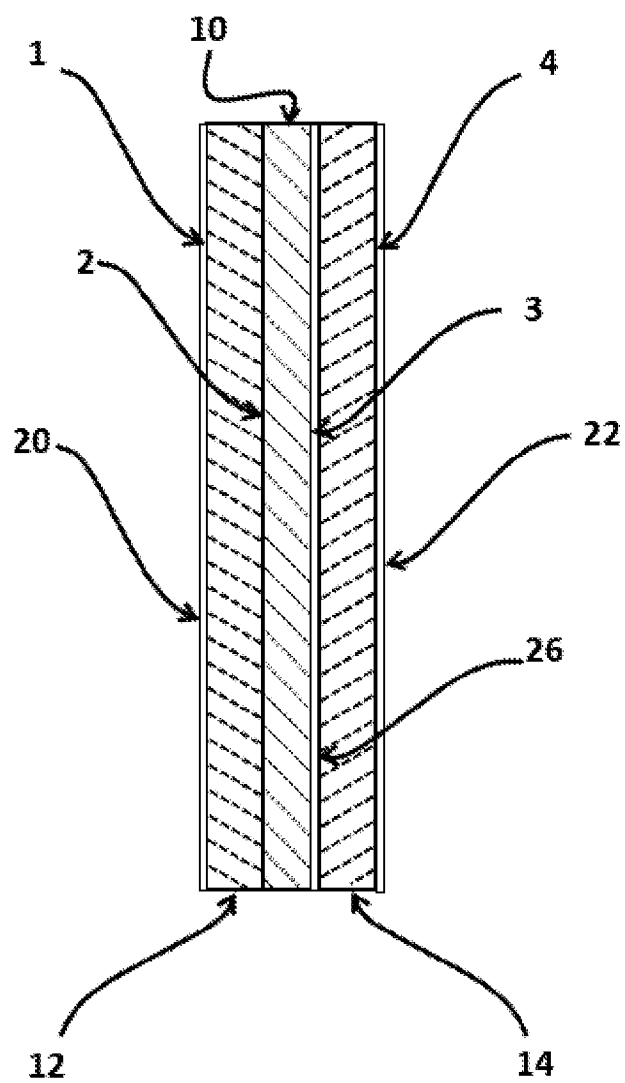


Fig. 4

Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1

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Given Name

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Family Name

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Country j

Mario

Arturo

Mannheim Astete

Lima

PE

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

[Add](#)

Title of Invention

LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE

Attorney Docket Number (if applicable)

1511.20400

Correspondence Address

Direct all correspondence to (select one):

☒ The address corresponding to Customer Number

☐ Firm or Individual Name

Customer Number

130961

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:

Yes, the invention was under a contract with an agency of the United States Government. The name of the U.S. Government agency and Government contract number are:

Entity Status

Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29

- ☐ Applicant asserts small entity status under 37 CFR 1.27
- ☐ Applicant certifies micro entity status under 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
- ☒ No

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Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	Joseph L. Morales/			Date (YYYY-MM-DD)	2016-12-30
First Name	Joseph	Last Name	Morales	Registration Number (If appropriate)	58835

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that : (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name		Suffix	
	Mario	Arturo	Mannheim Astete			
Residence Information (Select One) US Residency ● Non US Residency Active US Military Service						
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Address 2		Cercado de Lima				
City	Lima	State/Province				
Postal Code		Country ⁱ	PE			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add						

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	130961		
Email Address	jmorales@moralesq.com		Add Email Remove Email

Application Information:

Title of the Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		
Attorney Docket Number	1511.20400	Small Entity Status Claimed ☐	
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	130961		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices
--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.		
Applicant	1	Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.		
Clear		
☒ Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		

Name of the Deceased or Legally Incapacitated Inventor :			
If the Applicant is an Organization check here. ☒			
Organization Name	AGP América S.A.		
Mailing Address Information For Applicant:			
Address 1	Calle 15 # 35-39		
Address 2			
City	Bogota	State/Province	
Country	CO	Postal Code	
Phone Number		Fax Number	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.				
Signature	/Joseph L. Morales/		Date (YYYY-MM-DD)	2016-12-30
First Name	Joseph	Last Name	Morales	Registration Number
				58835
Additional Signature may be generated within this form by selecting the Add button.				Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.20400
		Application Number	
Title of Invention	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	27936359
Application Number:	62440453
International Application Number:	
Confirmation Number:	1068
Title of Invention:	LIGHTWEIGHT AUTOMOTIVE LAMINATE WITH HIGH RESISTANCE TO BREAKAGE
First Named Inventor/Applicant Name:	Mario Arturo Mannheim Astete
Customer Number:	130961
Filer:	Joseph L. Morales
Filer Authorized By:	
Attorney Docket Number:	1511.20400
Receipt Date:	30-DEC-2016
Filing Date:	
Time Stamp:	10:17:57
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$260
RAM confirmation Number	123016INTEFSW10183400
Deposit Account	
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	11608.PDF	209360	no	13
			d952c9484afefb733c0862ebc2902b34656dc340		
Warnings:					
Information:					
2	Provisional Cover Sheet (SB16)	11605.PDF	1477195	no	3
			f49b35e2587a70d6022f55da2ffc27647316bf6c		
Warnings:					
Information:					
3	Application Data Sheet	11611.PDF	1819006	no	7
			f3b9b533a612fe4b2d59c33e4606ed4fe795cd7c		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29864	no	2
			673131497904ba7d3a032b8b96332e423c58c7ef		
Warnings:					
Information:					
Total Files Size (in bytes):			3535425		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.