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Guidance for the SGCC Certification of Laminated Glass

(Updated 10/5/2022)

Summary

The concept for the SGCC Certification of laminated Glass is that initial testing must be performed on each nominal thickness, as defined by ASTM C1036, of at least one brand of each generic category of interlayer material for which SGCC certification is desired. Ongoing certification shall be by two thickness classes (S = Standard, H = Heavy) and per generic category of interlayer. A list of accepted interlayer brands per generic category shall be maintained, and certification to one brand within the generic category will allow switching to other brands within the generic category on the list.

Despite thickness or generic class of interlayer, a product can only be certified to the performance requirements that it will consistently meet. Therefore, as illustrated in the sample Certified Products Directory (CPD) to follow, product AAAA (6mm LTG (b)(0.015) (CI) (B)) which will only pass Category I of CPSC and impact class B of ANSI, will need to be certified separately from product BBBB (6mm LTG (b)(0.030) (CII)(A)) which will pass Category II of CPSC and impact class A of ANSI.

SGCC List of Accepted Interlayer's:

SGCC shall maintain a list of accepted interlayers per generic category. For a specific model of interlayer to be placed on the accepted list, weathering data and impact data to the applicable reference standard (ANSI Z97.1 and/or CPSC 16CFR 1201) must be submitted to SGCC. Guideline L.10 shall apply for weathering data. Impact test reports must be provided by an SGCC licensee or by an interlayer supplier for testing done at an SGCC Approved Testing Laboratory. The SGCC Accepted Interlayer list can be found on the SGCC website (www.sgcc.org).

Generic Interlayer Categories:

<u>Generic Code</u>	<u>Description</u>
(b)	Polyvinyl Butyral
(ip)	Ionoplast
(lc)	Liquid Resin-Multi Component
(lu)	Liquid Resin – UV Cure
(p)	Polyethylene Terephthalate
(f)	Fluorinated Ethylene Propylene
(u)	Polyurethane
(el)	Epoxy-Liquid Crystal Polymer
(ev)	Ethylene-vinyl Acetate
(su)	Solid Resin UV Cure

Nominal Thickness:

Nominal thickness (overall thickness) is defined as the thickness of the final product (glass + interlayer + glass). Nominal thickness for laminated glass has been expanded from the standard ASTM C1036 tolerance ranges to eliminate “gaps”.

<u>mm</u>	<u>Range (mm)</u>	<u>Traditional (in)</u>	<u>Range (in)</u>
3.0	2.92-3.78	1/8	0.115-0.148
4.0	3.79-4.57	5/32	0.149-0.179
5.0	4.58-5.56	3/16	0.180-0.218
6.0	5.57-7.41	1/4	0.219-0.291
8.0	7.42-9.01	5/16	0.292-0.354
10.0	9.02-11.91	3/8	0.355-0.468
12.0	11.92-15.11	1/2	0.469-0.594
16.0	15.12- and greater	5/8	0.595- and greater

Testing of 5/8 covers all thicker laminates. This guideline is in recognition that 1) such products are typically used for applications which require strength characteristics beyond normal human impact safety glazing and 2) SGCC testing has historically shown consistent compliance of such products.

When a laminated glass is certified, other laminated glasses of the same nominal thickness having a greater thickness of interlayer will be included in the certification. For example, if you are certified for a nominal thickness of 8mm LTG (0.030) you are able to make this product using a thicker interlayer but it’s nominal thickness must still fall within the above thickness tolerance (4mm glass/0.030in interlayer/4mm glass measure approximately 0.345in; 3mm glass/0.060in interlayer/3mm glass measure approximately 0.296in both still fall within the 8mm (5/16in) nominal thickness range 0.292-0.354in).

Initial Testing:

Initial testing for certification of laminated glass at each fabrication facility will be with the thinnest interlayer for each nominal thickness and each generic category of interlayer for which certification is desired.

A product can only be certified to the performance requirements it will consistently meet, for example, an 0.015 interlayer ANSI Class B will need to be certified separately from 0.030 and greater interlayer ANSI Class A for each nominal thickness and each generic category of interlayer for which certification is desired.

Glass Kind: Laminated glass is also certified by its base glass Kind (strength) or heat treatment (AN= annealed, HS= heat-strengthened, FT= tempered, CS= chemical strengthened). Certification with AN glass will cover HS, FT, and CS. Testing to HS will only cover HS and FT. Testing to FT will only cover FT. Testing to CS will only cover CS. Figure 2 and Table 5 are provided to help visualize and quickly determine if a change in glass Kind requires testing.

Table 5 – Reference table for testing requirements for a change in glass Kind.

From	To	Acceptance
AN	HS	Automatic
AN	FT	Automatic
AN	CS	Automatic
HS	AN	TEST
HS	FT	Automatic
HS	CS	TEST
FT	AN	TEST
FT	HS	TEST
FT	CS	TEST
CS	FT	TEST
CS	HS	TEST
CS	AN	TEST

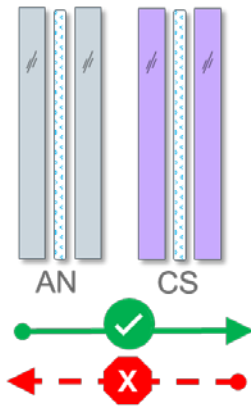


Figure 2: Diagram showing testing needs to change glass Kind for CS glass

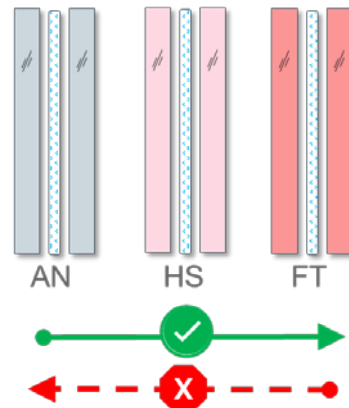


Figure 3: Diagram showing testing needs to change glass Kind for AN, HS and FT.

Glass changes other than glass Kind can also be modified without the need to test, provided a base configuration has been tested and meets the initial requirements. Figure 4 illustrates the configurations that are acceptable without additional weathering and impact.

Acceptable Modifications to Glass are the following: See diagram below for further guidance.

- Glass Metalized Coating: any change from uncoated to Low-e, reflective, sputtered (soft coat), pyrolytic (hard coat). The coatings are either toward the interlayer or on the exterior surfaces of the laminate.
- Decorative Coatings: Decorative coatings and prints which are inorganic and chemically bonded (fused) to glass (ceramic enamels) and within a laminated glass product, do not need additional testing and are included in certification if the base testing passes. Decorative coatings and prints which are organic or not chemically

bonded (fused) to glass (elastomeric coatings, surface applied films or tapes) within a laminated glass product will require weathering and impact testing.

- Glass Color change.
- Glass texture change (external to interlayer orientation only). This must be towards the exterior of the laminate and not in contact with the interlayer.

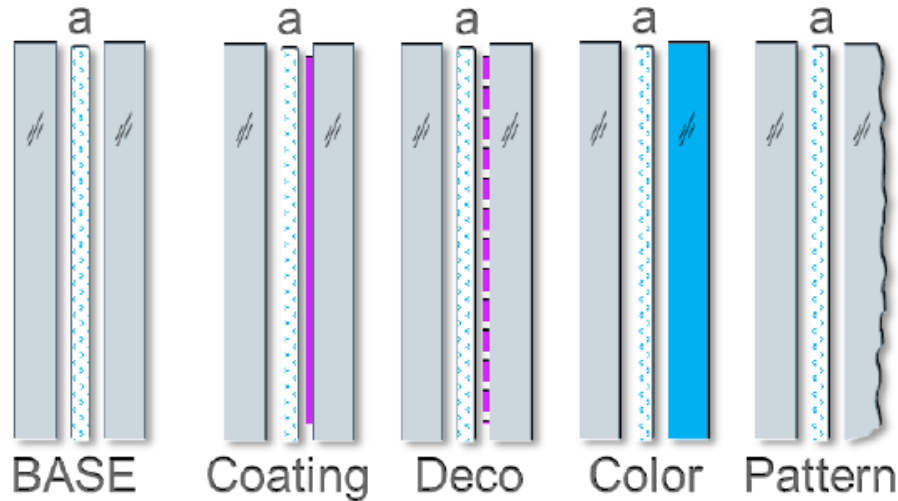
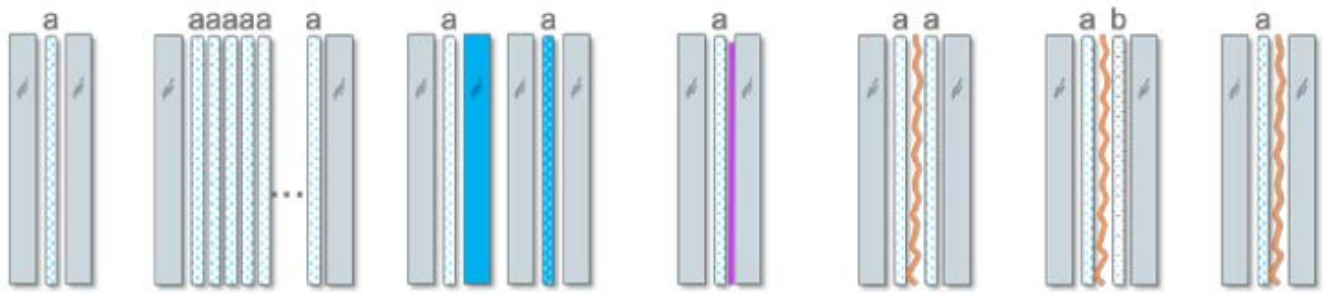


Figure 4: Allowable changes in or on glass without the need for additional weathering or additional impact.

A summary of the interlayer or insert changes which either qualify for automatic acceptance or require weathering and/or impact are visually outlined and detailed in Figure 5.



Test Type	Base	Thickness	Color	Coating Print	Encap 1	Encap 2	Insert
Description	Qualified base product	Increase in interlayer thickness	Glass or interlayer color change	Coating or print applied to glass toward interlayer	Insert between qualified interlayers	Insert between qualified and <u>unqualified</u> interlayer	Insert between glass and interlayer
Weathering	Required	Not Required	Not Required	Not Required	Not Required	Required	Required
Impact	Required	Not Required	Not Required	Not Required	Not Required	Required	Required

LEGEND

a = qualified interlayer (min thickness)

b = unqualified interlayer

— = coating or print (continuous or non-continuous)

~ = insert (continuous or non-continuous)

Figure 5: Changes to laminates with regard to interlayer contact to glazing or inserts

In summary, color changes, decorative or metalized coatings on glass such as pyrolytic (hard coat), sputtered (soft coat), ceramic enamels; and acid etch or sandblast (thinnest section no less than thickness qualified), in contact with the interlayer, or inserts are automatically accepted without the need for further testing if the interlayer is already on the SGCC accepted interlayer list with the following exceptions:

- a.) The interlayer on both sides of an insert must be the same or greater thickness than the interlayer qualified as a single laminate without the insert.
- b.) The insert material is placed between an interlayer and the glass, then weathering and impact must be done (even if the interlayer is already accepted).

If an interlayer is not already accepted by SGCC, then weathering and impact must be done.

The fabricator maintains sole responsibility for establishing compatibility, durability, and retention of impact properties for all materials used in any laminated composite or encapsulated interlayer system.

Ongoing Certification:

Ongoing certification of laminated glass shall utilize the following thickness classes:

- S = Standard 4 to 6mm < 0.292*– inch (5/16) (7.4 mm)
- H = Heavy 8mm and greater ≥ 0.292 – inch (5/16) (7.4 mm)

*(*0.292 - inch was chosen as the break point since the “S” class should include all 0.030 interlayer products which utilize glass 1/8-inch, double, 3mm or less.)*

Regular audit sample selection procedures shall apply for laminated glass. For **“Participant”** selected samples, ongoing testing shall be with the thinnest interlayer and the thinnest product certified in each thickness class (S and/or H) and generic interlayer category. For **“Inspector”** selected samples, ongoing testing shall be with any thickness product in the certified thickness class (S and/or H) and generic interlayer category, at the discretion of the SGCC auditor.

Sample Certified Products Directory (CPD) Listing:

SGCC#	TEST STD	INCH	MM	TYPE	MAX SIZE	ANSI CLASS
AAAA	Composite	S	6	LTG (b)(.015)(C1)	U	B
BBBB	Composite	S	4-6	LTG (b) (.030)	U	A
CCCC	Composite	H	≥8	LTG (b) (.030)	U	A
DDDD	Composite	S	4-6	LTG (ip) (.030)	U	A
EEEE	Composite	H	8-12	LTG (ip) (.030)	U	A
FFFF	Composite	S	6	LTG (l) (0.030)	U	A

The inch column in the CPD shall indicate thickness class while the “MM” column shall indicate the range of thickness and any limitations. For example, SGCC EEEE (H) above is only certified up to 12mm.

SGCC Labeling Requirements:

SGCC labeling guidelines shall apply with the addition of the thickness class designation, **“S” or “H”**. As an alternate, the actual thickness may be on the label but either the thickness class and/or the actual thickness must be on the label.

Sample Labels: (Minimum Requirements)

ABC Glass – Plant 1
16 CFR 1201 I
ANSI Z97.1-2015
SGCC AAAA 1/4UB

ABC Glass –Plant 1
16 CFR 1201 II
ANSI Z97.1-2015
SGCC BBBB SUA

ABC Glass – Plant 1
16 CFR 1201 II
ANSI Z97.1-2015
SGCC CCCC HUA

Indoor Use Only Label Requirement:

ABC Glass – Plant 1 16 CFR 1201 I ANSI Z97.1-2015
SGCC AAAA 1/4UB
INDOOR USE ONLY