



Quality Specifications

QS 23.105

**INNOVIA BLINDS BETWEEN
GLASS (BBG) Final Assembly**

**Page 1 of 11 Revision 2
Issue Date: 01/29/19**

A. Purpose

The purpose of this document is to define the quality specifications of Blinds Between Glass (BBG) units.

B. Description

Venetian Blinds Between Glass units are classified as either Tilt Only or Lift and Tilt. In this document BBG refers to Venetian Blinds Between Glass units. Blinds manufactured by Intigral are manufactured and sold as Sun Shading Devices, not Privacy Blinds. This means that in daylight, when the blind is closed, a small amount of light will be able to be seen around the blind, edges/slats or through the ladder holes. They are not complete room darkening blinds. Conversely, when viewing from the outside, they will not completely block vision when in close proximity to the BBG unit and when looking at the same angle as the slats are tilted or through ladder holes.

Tilt Only BBG is a blind system that uses an externally mounted magnetic control to adjust the tilt angle of the blind slats.

Lift and Tilt BBG is a BBG system that allows the blinds to not only be opened and closed for viewing or sun shading but adds the ability to raise and lower the blind. An externally mounted magnet controls the blind held in place by a belt driven loop tensioner. The belt rotates a gear driven shaft, which allows for lift and tilt operation. Moving the magnet down on the right or left side of the outer operator magnet assembly will respectively raise the blind. Moving the magnet up on the right or left side of the outer operator magnet assembly will respectively lower the blind. Blind tilting is accomplished with initial outer operator magnet assembly movement.

C. Scope

These specifications apply to BBG's manufactured by Intigral.

D. Responsibility

It is the responsibility of the Quality Manager to maintain these specifications and update as necessary. It is the responsibility of the Sales Manager to assure that Intigral's customers review these specifications when developing new sales contracts.

E. Specifications

1. Overall Units Size (W x H)

Overall IG unit size may vary from the exact ordered size by the following amounts:

GL Thickness	Size Variance
1/8" – 3 mm	± 1/8"
5/32" – 4 mm	± 1/8"

2. Glass Alignment (Offset)

Alignment of the component pieces of glass must be aligned within 1/8", i.e., must not cause the length or width of a unit to increase by more than 1/8".



Unacceptable Alignment > 1/8"



Acceptable Alignment ≤ 1/8"

3. Overall Unit Thickness Tolerance

Overall unit thickness tolerance for both annealed and tempered units is -0.030, + 0.030.

4. Bowed Spacer – Out

The stainless-steel metal spacer must not extend beyond the edges of the glass anywhere, even if covered by sealant.

5. Sealant Squeeze-Out



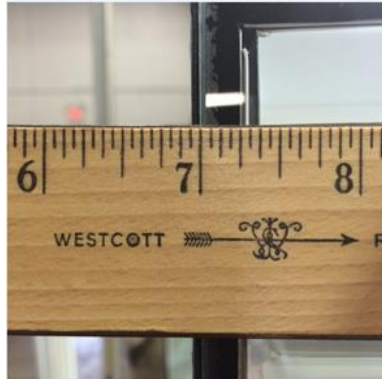
Acceptable Squeeze-out ≤ 1/16"



Unacceptable Squeeze-out > 1/16"

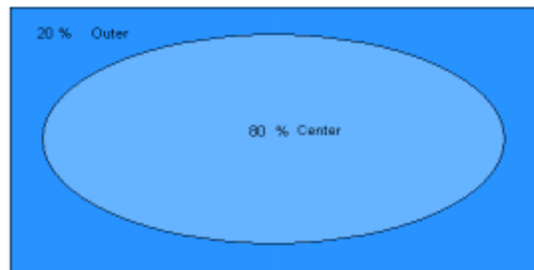
Sealant that extends past the edge of the IGU is called squeeze-out. Excessive amounts of squeeze-out can make it very difficult to insert the IG unit into the sash.

A 1/16" squeeze-out is allowable if it does not increase the overall unit size by more than allowed in table E1.



Acceptable $\leq 1/16''$

6. Visual Quality of Clear and Coated Glass



All glass has discontinuities; including both clear and Low-E coated products. For evaluation of acceptability, the glass should be inspected using daylight, without direct sunlight, or background lighting suitable for observing each type of blemish. Final inspection should be uniform in lighting, looking through, not at the glass. Direct sunlight should be avoided. Viewing for Tilt Only BBG should be open and for Lift and Tilt BBG should be down and open. For double strength glass initial inspection distance for blemish identification and assessment should be approximately 36" for the center area* and 72" for the outer area. For Glass greater than 5/32", units should be viewed at 72" and 120" respectively. Inspection should be performed perpendicular to or no less than 45 degrees to the lite of glass.

- a. The center area is defined as an "oval or circle centered on the lite whose axes or diameters do not exceed 80% of the overall dimensions". The remaining area is to be considered the outer

Discontinuity	Notes	Double-Strength (1/8" - 3.0mm)		5/32" - 4.0mm (or Greater)	
		Center	Outer	Center	Outer
Gaseous inclusion	1	1/32"	1/16"	1/16"	1/16"
Surface Debris	2	1/32"	1/16"	1/16"	1/16"

Notes:

- 1) *Gaseous Inclusions: Includes all flaws internal to the glass (i.e. seeds)*

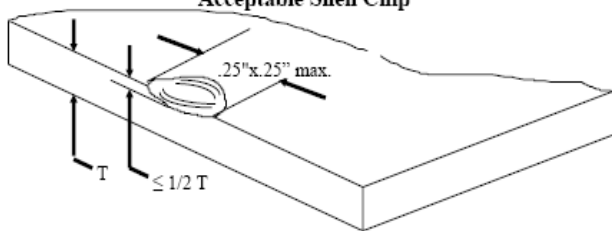
7. Overall Bow and Warp Tolerances – Units

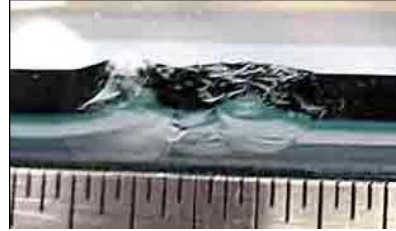
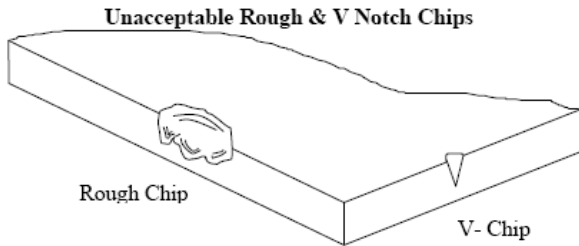
Glass Thickness	Length						
	0 – 20"	21 – 35"	36 – 47"	48 – 59"	60 – 71"	72 – 80"	81 – 90"
3 mm 1/8"	3.0 mm	4.0 mm	5.0 mm	6.0 mm	8.0 mm	11.0 mm	-
4 mm 5/32"	3.0 mm	4.0 mm	5.0 mm	6.0 mm	8.0 mm	11.0 mm	13.0 mm

8. Glass Edge Quality

- a) Flake Chips
 - Definition: Smooth shallow, shell like chip at the edges less than .016 inch (1/64") in depth and width
 - Requirement: No Limitation.
- b) Shell Chips
 - Definition: Smooth, shell like chip at edge less than one half (1/2) the glass thickness, and 0.25" (1/4") wide maximum.
 - Requirement:
 - 3.2mm glass or greater: Minimum distance between chips 2 in.
- c) Rough Chips
 - Definition: Chips deeper than one half (1/2) the glass thickness, V-notched chips or chips with rough surfaces.
 - Requirement: None allowed

Acceptable Shell Chip





9. Blinds – between – Glass: Overall Straightness

Inspection technique:

Blinds are to be inspected visually first. Any blind that appears to be out of alignment shall then be measured using a tape measure. Blinds out of alignment are indicated by the location of the glass in regards to how straight the sides are and how level the top is. Two measurements shall be taken for each blind slat that is questionable. Take measurements from the edge of glass to both ends of the blind slat in question.



Measurements shall always be taken beginning at the edge of the glass to the slats, not from slat to slat. The maximum differences between the two measurements given above shall be: 0.063" (1/16") for slats less than 12 inches long, 0.093" (3/32") for slats greater than 12 inches long.



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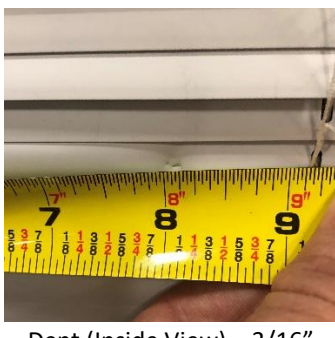


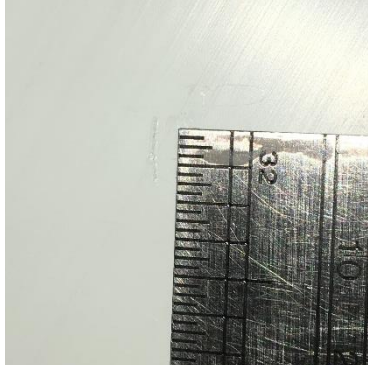
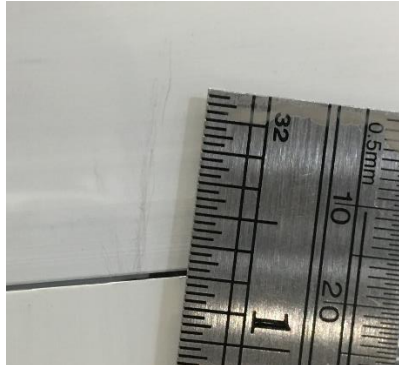
10. Blind Appearance Criteria - General*

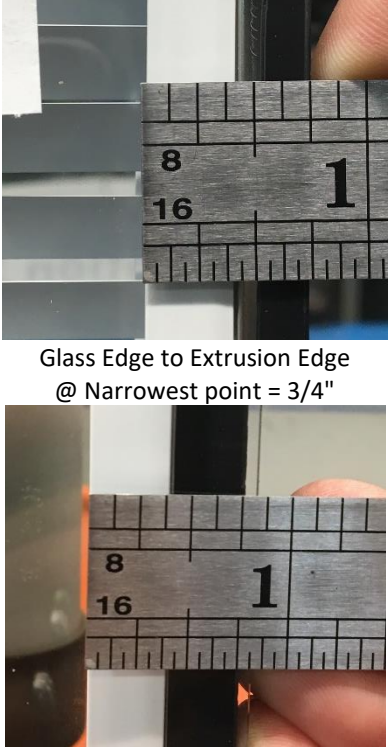

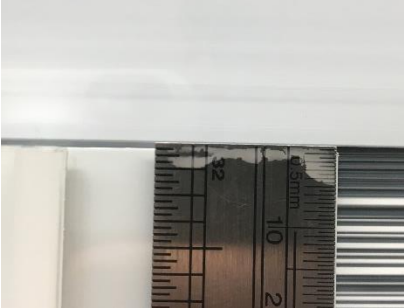
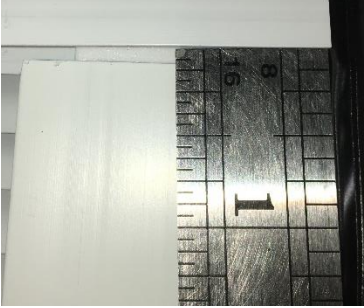
Visual inspection from the front side of the unit (operator side) must take place from 3' away for the center area and 6' away for the outer area. All visual inspection from the backside of the unit (non-operator side) must take place from 6' away. Inspections shall be completed for Tilt Only BBG in the open position and Lift and Tilt BBG in the down and open slat position.

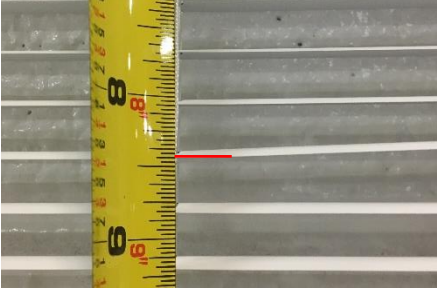


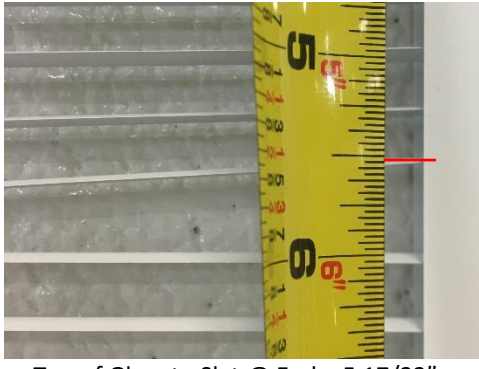
Imperfection	Maximum Allowable Dimensions – Inside Looking Out		Maximum Allowable Dimensions – Outside Looking In	
	Decimal	Fraction	Decimal	Fraction
Dirt/Debris	0.031" X 0.031"	1/32" X 1/32"	0.063" X 0.063"	1/16" X 1/16"
Dent (Dia) & Crease (Length)	0.125"	1/8"	0.125"	1/8"
Vinyl Hairs (≤ 1/64 th)	0.5"	1/2"	1.0"	1"
Scratches, Wide, ≥ .008	0.250"	1/4"	0.5"	1/2"
Extrusions Straightness (See Note 10)	0.125"	1/8"	0.125"	1/8"
Extrusion Gaps	0.063"	1/16"	0.125"	1/8"
Bent Slats (See Note 11)	0.125"	1/8"	0.125"	1/8"

Notes:

1. Unpainted end cuts of the blinds are allowable.
2. Maximum allowable defects in the same vicinity not to exceed 2 within a 1" radius and 3 within a 4" radius.
3. This unit is gear driven. Therefore, it is acceptable to feel the belt during operation.
4. This unit is gear driven. Therefore, it is acceptable to hear the belt during operation.
5. Slat marks on side rail and intercept cap appearing within the reveal are normal occurrences which appear during shipping, units normal operating position is fully down.
6. A small amount of debris in the bottom reveal of the unit from blind operation is normal and acceptable.
7. Linear depressions running along the length of the extrusions are normal and acceptable.
8. Faint gray marks on the slats from production machines are allowable.
9. Imperfections <9/16" from the edge of the glass is allowable as it will be covered by the window sash
10. To measure extrusion straightness, first measure from the edge of the glass to the inside edge of the extrusion at its narrowest point. Next measure from the edge of the glass to the inside edge of the extrusion at its widest point. The difference between these two measurements is how far the extrusion bends.
11. While measuring bent slats, ensure that the blind is level in the open position and that the unit is fully upright. Measure from the top of the glass to the ladder nearest the bend and from the top of the glass to the end of the bent slat. The difference between these measurements is the amount of the bend.

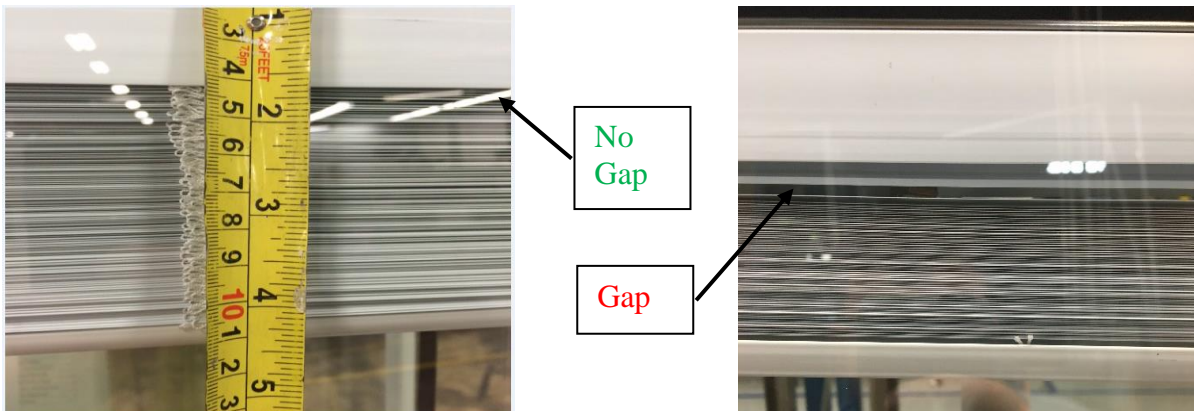
Imperfection	Allowable	Reject
<p>Debris</p> <p>Inside - $\leq 1/32''$</p> <p>Outside - $\leq 1/16''$</p>	 <p>Debris (Inside View) = $1/32''$</p>	 <p>Debris (Inside View) = $1/16''$</p>
<p>Dent</p> <p>Inside - $\leq 1/8''$</p> <p>Outside - $\leq 1/8''$</p>	 <p>Dent (Inside View) = $1/16''$</p>	 <p>Dent (Inside View) = $3/16''$</p>
<p>Vinyl Hairs</p> <p>Inside - $\leq 1/2''$</p> <p>Outside - $\leq 1''$</p>	 <p>Vinyl Hair (Inside View) = $1/4''$</p>	 <p>Vinyl Hair (Inside View) = $2 \frac{1}{4}''$</p>
<p>Scratch, Wide ($>.008$)</p> <p>Inside - $\leq 1/4''$</p> <p>Outside - $\leq 1/2''$</p>	 <p>Scratch (Inside View) = $3/16''$</p>	 <p>Scratch (Inside View) = $3/4''$</p>

Imperfection	Allowable	Reject
<p>Extrusion Straightness</p> <p>$\leq 1/8''$</p>	 <p>Glass Edge to Extrusion Edge @ Narrowest point = $3/4''$</p> <p>Glass Edge to Extrusion Edge @ Widest Point = $13/16''$ Difference = $1/16''$</p>	 <p>Glass Edge to Extrusion Edge @ Narrowest Point = $3/4''$</p> <p>Glass Edge to Extrusion Edge @ Widest Point = $15/16''$ Difference = $3/16''$</p>
<p>Extrusion Gap</p> <p>$\leq 1/16''$</p>	 <p>Extrusion Gap = $1/16''$</p>	 <p>Extrusion Gap = $1/8''$</p>

Imperfection	Allowable	Reject
Bent Slats ≤ 1/8"	 <p>Top of Glass to Slat @ Ladder = 8 7/16"</p>	 <p>Top of Glass to Slat @ Ladder = 5 23/32"</p>
	 <p>Top of Glass to Slat @ Edge = 8 5/16" Slat Bend = 1/8"</p>	 <p>Top of Glass to Slat @ End = 5 17/32" Slat Bend = 3/16"</p>

11. Blinds Up (Lift and Tilt)

When blinds are fully up, as long as you cannot see between the header and the blind, this is acceptable. Total length from top of glass to top of bottom rail can deviate up to ¼" within an individual unit. For units that are side by side such as in a patio door assembly may vary 3/4" between units.



Note: Ensure that the unit is in the fully vertical position while operating. Cycle the unit all the way up and down multiple times if there is a gap or unevenness. When fully raised it is normal for a small amount of light to be visible between the slats.

12. Bottom Rail – suspended or down

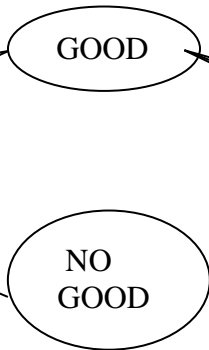
The bottom rail when suspended or fully down may have some bow. Units $\leq 36''$ wide may bow up to $1/8''$ and for units $> 36''$ wide up to $1/4''$.

13. Blinds – Outside Operator Position Up/Down

For same sized units, blind operator up position can deviate up to $1-1/2''$ in location from top of glass to top of operator. Blind operator down position can deviate up to $1-1/2''$ in location from top of glass to top of operator.



Operator Up Position



Operator Down Position



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Change Date	Revision	Description of the change	Written / Revised	Reviewed	Approved
05/02/16	0	Original Issue	M. Hutchinson	D. Smith	J. Thomas
09/27/16	1	Deleted force requirements	M. Hutchinson	D. Smith	J. Thomas
02/06/19	2	Blind Appearance Criteria – Major Revision	R. Lonardo	Justin Thomas	D. Negron