

Is It A Defect ?

Glass Standards In the Renovation Industry

You just spent a significant chunk of cash on upgrading your windows. Expectations are high and they should be! However glass isn't perfect. It's a topic worth talking about because we need to understand it before we can conquer the myth. Glass industry standards are governed by the ASTM American Society for Testing & Materials. ASTM glass standards cover a wide variety of glass issues and it can be difficult to crack the code that is technical information. Of course the official version will be longer but we've included a brief summary in this article of some key parts of the ASTM. Keep in mind there are different types of defects with different inspection rules. For the purpose of this article we are primarily concerning ourselves with "visual defects". The larger the piece of glass, the less perfect it is allowed to be.

So Here is the BIG Question: When is a defect not a defect?

Quick Answer:

1. Move away from the glass.
2. Stand back 10 feet.
3. Face the glass straight-on at 90 degrees.
4. View in daylight but not direct sunlight.
5. Inspect the central 80% portion of the glass.

Under these conditions, if you can't see it from 10 feet - it isn't a defect. That's the short version.

Glass is NOT intended to be inspected under close-up scrutiny or held under direct sunlight, as these conditions will almost always reveal tiny glass imperfections that would otherwise be considered acceptable within industry standards.

Glass Is Like A Butterfly

A butterfly rests on a flower across the yard. Its a delicate creature of beauty, adding to the panorama of the landscape. It enhances and is part of the visual experience.

If you walk up close to that butterfly, stick your face right into his face, the perception changes. Up close is different than from further away - same goes for glass.



Anyone can find imperfections in glass if they look close enough and hard enough. The important thing to remember is that **glass is meant to be looked through, not at.**

Before pointing out defects and imperfections, understanding ASTM inspection criteria is very important. It outlines things such as inspection distance, lighting requirements, inspection times etc.

Examples of Visual Inspection Criteria:

- Glass shall be inspected in the central (see illustration and categories below) area and in transmission at a distance of 5 feet from the observer, and in reflection at a distance of 10 feet from the observer.
- Glass shall be inspected in the border area in transmission and reflection at a distance of 10ft from the observer.
- Glass must be inspected using a viewing angle of 90 degrees from the glass with suitable background light (daylight without direct sunlight or a range of 500 - 1000 foot lamberts.) If a lighting box is used as a light source, the diffusing plate shall be parallel to and at a distance of 10ft from the glass.
- Inspection should not exceed viewing of more than 5 seconds for lites up to 6 square feet, 10 seconds for lites up to 35 square feet, either in transmission or reflection.
- If defects are visible beyond what is allowable as listed by sizes (square feet) below using the inspection criteria, the glass may be rejected.

Allowable Defects

Single (individual) lites up to 6 square feet.

1. Scratches - Viewable as stated above must be 1" or less. No more than 1 is allowed per lite.
2. Debris, Dirt, Spots - Viewable as stated above, must be 1/16" or less. No more than 1 is allowed per lite.
3. Seeds, Bubbles, Knots, Stones - Viewable as stated above, must be 1/16" or less. No more than 1 is allowed per lite.
4. No more than 1 total viewable defect as described above is allowed per lite.
5. Shells - No more than 1/4" from edge less than 1/2 the thickness of the lite. No more than 1 per side.
6. Chips - No more than 1/8" from the edge. No more than 1 per side. (see illustration for chips.)
7. Coating - Must be uniform on the lite inspected when viewed in transmission using the inspection criteria previously stated above.
8. The border area is comprised of 2 inches plus 1/2" from each edge of the lite. All other are is the central area (see illustration.)

Single (individual) lites 6 fa % square feet.

1. Scratches - Viewable as stated above must be 1" or less. No more than 2 is allowed per lite and must be separated by a minimum of 24 inches.
2. Debris, Dirt, Spots - Viewable as stated above, must be 1/16" or less. No more than 2 is allowed per lite and must be separated by a minimum of 24 inches.
3. Seeds, Bubbles, Knots, Stones - Viewable as stated above, must be 1/16" or less. No more than 2 is allowed per lite and must be separated by a minimum of 24 inches.
4. No more than 2 total viewable defect as described above is allowed per lite.
5. Shells - No more than 1/4" from edge less than 1/2 the thickness of the lite. No more than 1 per side.
6. Chips - No more than 1/8" from the edge. No more than 1 per side. (see illustration for chips.)
7. Coating - Must be uniform on the lite inspected when viewed in transmission using the inspection criteria previously stated above.
8. The border area is comprised of 4 inches plus 1/2" from each edge of the lite. All other are is the central area (see illustration.)

Single (individual) lites over % square feet.

1. Scratches - Viewable as stated above must be 1" or less. No more than 3 is allowed per lite and must be separated by a minimum of 24 inches.
2. Debris, Dirt, Spots - Viewable as stated above, must be 1/16" or less. No more than 3 is allowed per lite and must be separated by a minimum of 24 inches.
3. Seeds, Bubbles, Knots, Stones - Viewable as stated above, must be 1/16" or less. No more than 3 is allowed per lite and must be separated by a minimum of 24 inches.
4. No more than 3 total viewable defect as described above is allowed per lite.
5. Shells - No more than 1/4" from edge less than 1/2 the thickness of the lite. No more than 1 per side.
6. Chips - No more than 1/8" from the edge. No more than 1 per side. (see illustration for chips.)
7. Coating - Must be uniform on the lite inspected when viewed in transmission using the inspection criteria previously stated above.
8. The border area is comprised of 6 inches plus 1/2" from each edge of the lite. All other area is the central area (see illustration.)

Inspection Criteria Visual Aid

Diagram 1

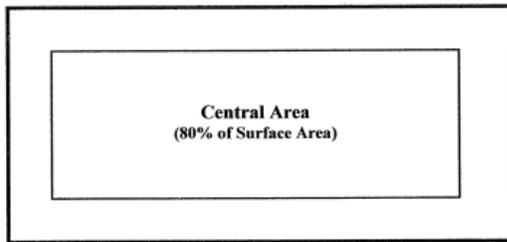
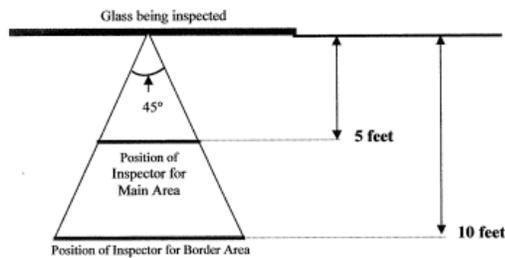
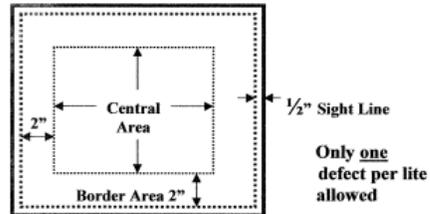


Diagram 2

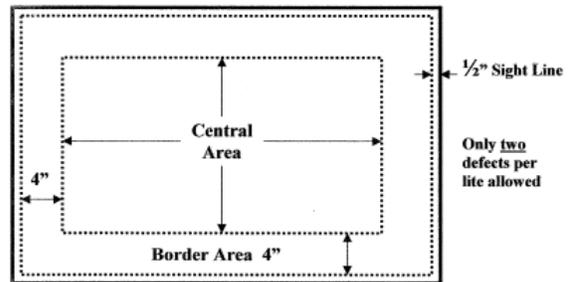


Allowable Defects Visual Aid

Lites up to 6 square feet



Lites 6 to 35 square feet



Lites greater than 35 square feet

