Contract Glass Service, Inc.

Heat Treated Glass Inspection Criteria per ASTM C 1048-04 (abridged)[1]

Terminology:

Bow/warp – curvature across the entire dimension(s) of the lite

Crush – lightly pitted condition with a dull gray appearance

Dig – deep, short scratch

Dirt – small particle of foreign matter embedded in the surface of flat glass

Distortion – Thermally tempered and heat-strengthened glass is made by heating glass in a furnace, the original flatness of the glass is slightly modified by the heat treatment, causing reflected images to be distorted

Gaseous inclusion – round or elongated bubble in glass

Linear blemish – scratches, rubs, digs, and other similar imperfections

Point blemish – crush, knots, dirt, stones, gaseous inclusions, and other similar imperfections

Rub – abrasion of a glass surface producing a frosted appearance

Scratch – damage on a glass surface in the form of a line caused by the movement of an object across and in contact with the glass surface

Strain Pattern – In heat-strengthened and fully tempered glass, a strain pattern, which is not normally visible, may become visible under certain light conditions

Inspection:

- Linear and point blemishes in glass should be evaluated per ASTM C 1036-06
- Coating related defects should be evaluated per ASTM C 1376-03
- Strain pattern, this is considered normal part of the heat treating process and is not considered a defect.
- Distortion, at this time no industry quality standards exist.
- Bow and warm, see below.

[1] Information Provided By: Northwestern Industries, Inc. / Document Q-1003-001

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Quality Criteria:

Maximum Allowed Bow and Warp

- Vertical Method:
- Place glass in a vertical position with glass resting on blocks
- Place a straight edge across the concave surface
- Measure widest gap with a fine scale ruler
- Refer to table to determine maximum allowable bow/warp

Table: Maximum Allowed Bow and Warp

	Edge Dimension, cm (in.)											
	0–50 (0–20)	>50–90 (>20–35)	>90–120 (>35–47)	>120–150 (>47–59)	>150–180 (>59–71)	>180–210 (>71–83)	>210–240 (>83–94)	>240–270 (>94–106)	>270–300 (>106–118)	>300–330 (>118–130)	>330–370 (>130–146)	>370–400 (>146–158)
Glass Thickness, mm (in.)	Maximum Bow and Warp, mm (in.)											
3 (⅛)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	7.0 (0.28)	9.0 (0.35)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)	19.0 (0.75)	...	...	...
3 (⅛) Alternate Method[A]	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	3.0 (0.12)	5.0 (0.20)	6.0 (0.24)	7.0 (0.28)	8.0 (0.31)	10.0 (0.39)	...	...	...
4 (5/32)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	7.0 (0.28)	9.0 (0.35)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)	19.0 (0.75)	...	...	...
5 (3/16)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	7.0 (0.28)	9.0 (0.35)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)	19.0 (0.75)	...	...	...
6 (¼)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	7.0 (0.28)	9.0 (0.35)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)	19.0 (0.75)	21.0 (0.83)	24.0 (0.94)
8 (5/16)	2.0 (0.08)	2.0(0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	8.0 (0.31)	10.0 (0.39)	13.0 (0.51)	15.0 (0.59)	18.0 (0.71)	20.0 (0.79)
10 (⅜)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	7.0 (0.28)	9.0 (0.35)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)	19.0 (0.75)
12–22 (½ –⅞)	1.0 (0.04)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	4.0 (0.16)	5.0 (0.20)	5.0 (0.20)	7.0 (0.28)	10.0 (0.39)	12.0 (0.47)	14.0 (0.55)	17.0 (0.67)

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