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"The Leader in Glass Fabrication"[™]

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Warp & Bow

Example of ASTM C-1048 tolerances for Maximum Bow and Warp, compared to the Viracon tolerance:

Edge =	36"	36"	36"	72"	72"	72"	96"	96"	96"
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Overall Bow and Warp

Glass Thick.	Viracon	97b	<97b	Viracon	97b	<97b	Viracon	97b	<97b
1/8"	0.09"	0.20"	0.28"	0.19"	0.47"	0.62"	0.25"	0.67"	0.88"
1/4"	0.09"	0.16"	0.19"	0.19"	0.35"	0.50"	0.25"	0.55"	0.75"
5/16"	0.09"	0.12"	0.16"	0.19"	0.24"	0.34"	0.25"	0.39"	0.56"

Viracon numbers are what Viracon will meet, 97b are tolerances from C-1048-97b, and <97b are for ASTM C-1048 prior to the 97b version published in February '98.

Viracon's tolerance for **localized warp** is 1/32" over any 12" span or 50% of the ASTM C-1048 standard of 1/16" over any 12" span. (The ASTM C-1048 tolerance for localized warp has not changed.)

The maximum 1/32" localized warp extended over any given glass edge length is what overall bow and warp Viracon will meet.

As one can see from the above table comparing a few lengths, Viracon's tolerance for overall bow and warp was typically also 50% of the ASTM standard until the 97b printing. (There were a few exceptions such as 5/16" glass at lengths of 36" and 72" for example.)

However since ASTM has reduced the tolerances for overall bow and warp there are now more glass thickness' and lengths where Viracon's tolerances is not 50% of ASTM.

Viracon's localized warp is 50% of the ASTM C-1048 standard of 1/16", and our tolerance for overall bow and warp exceeds the ASTM C-1048 standard.

I think also that we have promoted that our localized warp tolerances are 50% of ASTM C-1048, and not necessarily that the overall bow and warp was always 50% of ASTM.

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However once one says 50% of part of a standard that begins to be construed that it means all of a standard.

The fact is that Viracon's glass is flat as that made by anyone, and typically is flatter than that made by most heat-treated glass fabricators. Viracon's overall bow and warp does not always run at 1/32" per foot, but is often less so we may still be 50% of the ASTM standard. However we do not want to be held to that, as it may not always be true.

Please call with any questions.

Sincerely,

Brian Dawley
Viracon Technical Services