



**Subject:
Curved-
Bonded
Windshields
An Advanced
Design.**

**Carolina Thomas Bus Buzz
#29 is sharing information
with you about curved-
bonded windshields.**



Curved Bonded Windshields Versus Roped-In Flat Glass Windshields

It has come to my attention that there may be some confusion in your garages about windshields and how they are designed and installed. In this addition of the *Carolina Thomas Bus Buzz*, I'd like to clear up any confusion on the subject.

Curved bonded windshields are the way of the future. Older buses did not have this feature. New buses without this feature just means that the engineering investment has not yet been made on that product for this technologically advanced feature, or the bus provider may be hanging on to the past. I understand change is tough sometimes and that there use to be a feeling that the old style windshields could be replaced more quickly. But there is a better way and here is why I say this:

School bus windshields have been plagued for years with stress cracks and rock pits. Customers verify this everyday by the number of windshields they replace. Stress cracks start from the seal area for no apparent reason and move across the glass. Rock chips are self-explanatory.





Left to Right: Saf-T-Liner C2, HDX Activity Bus, Minotour Activity Bus on GM chassis. All units have advanced design bonded curved windshields. They are nearly 4x more durable than the flat windshields in bead seal.

Question and Answer About Windshields

Q- Why are there so many stress cracks and rock pits on a school bus windshield when my personal vehicle can be driven for years without needing to replace the windshield (and never needs to be replaced due to a stress crack in the glass?)

A- The answer most of the time is because many school buses still continue to use flat-glass with “roped-in” windshields. “Roped in” just means it is held in with a bead seal. With a “roped-in” windshield, the weight of the glass is supported at the bottom of the windshield continuously stressing the glass at the bottom in the seal area. Every bump or twist and turn of the bus is transmitted through the seal to the glass across a small area creating these stress cracks. And flat “roped-in” glass also absorbs all of the energy from rocks as a result of the design. The surface is flat and does not do the best job in deflecting rocks, therefore, you have more broken windshields with these older designs. Are they so easy to install that you are willing to buy and install 4 times as many? Statistically, that is what is going to happen.



Is there a better answer?

Yes there is. A curved bonded windshield is the answer. Here is why I say that: First of all, curved glass is stronger because of the nature of its curved design. Curved glass does a much better job deflecting road debris. The “bonded windshield” means that the entire perimeter of the windshield is bonded to the windshield frame (versus just sitting in a seal with all the weight pounding up and down on the bottom of the glass.) With bonded the entire windshield supports its weight, not just the bottom. Automobiles actually use their bonded windshields to improve rollover strength since this design adds so much to the vehicle’s structure.

Thomas Built Buses has been successfully using curved bonded windshield in their rear engine transit buses since September 2000 and the Saf-T-Liner C2 since 2004 and GM and Ford Minotours since the 1980’s. They have proof that customers replace a small fraction (approximately ¼) of the bonded curved windshields as compared with flat roped-in glass. Curved/bonded glass works! Cars and pickups have been using them since the 70’s.

Curved/bonded windshields provide additional passenger safety as well. Quoting directly from NHTSA’s (National Highway Traffic Safety Administration) web site, bonded windshields achieved a “long-term 50% reduction” in windshields separating from the vehicle in a crash and “reduced the risk of ejection through the windshield portal by 50%.” Finally, the same research states that, “adhesive bonding saves 15% of the deaths and serious injuries of windshield ejectees.” More facts about vehicle ejections and windshields coming out in accidents can be researched at

<http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/806693.html>.

(Sorry, about all these big words as that is not my style, but I wanted you to have the facts.)

If people are telling you that curved bonded windshields are more expensive, they are misleading you by having you look at only the one-time replacement cost and not the life-cycle cost of the windshield and its design. Replacing 3-4 flat glass windshields to every 1 bonded curved windshields, does not make good financial sense from a dollar or downtime standpoint.



One last question we've been asked is "What about the bonding sealer and how long will the bus be down if the windshield needs to be replaced? I went down to the assembly line to answer this question for you. I asked myself, "Buzz, how can they install a bonded windshield in a bus on a moving assembly line if it takes so long?" Folks, it is all about the sealer. (The bus can be put into service by the time you put your tools away.) For more information on this topic, please visit the following website. www.sika-industry.com/cmi-automotive/cmi-automotive-prod-index.htm.

So as you can see, most of the "information" floating around out there about bonded curved windshields is really misinformation. Look at some of the advantages of the Saf-T-Liner C2 Bonded Curved Windshield:

- They are replaced less often.
- They offer easy replacement when necessary.
- They add to the structural integrity of the bus.
- They reduce the life-cycle cost of the bus.
- They provide increased passenger safety (per NHTSA's test report.)
- They provide better visibility with no impairment from roped-in windshield rubber seals.

Please do not hesitate to call my friends at Carolina Thomas if you have any questions. They look forward to helping you. Phil can be reached at 336-692-1257 and Roy at 336-402-7878.

Sincerely,

"Buzz"

