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# a d v i s o r y

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## IHS members only

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# a d v i s o r y

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*Second time around on this issue*

## **WINDSHIELD REPAIR PROCEDURES DON'T CREATE AN INJURY RISK**

A new report prepared for the International Glass Association (IGA) claims to shed light on whether auto windshield repair procedures pose a safety risk to vehicle occupants in subsequent, noncollision impacts. The report was prepared for IGA by Solutia, Inc., a manufacturer of windshield interlayers.

This isn't the first time the issue has cropped up. The National Glass Association (NGA) previously raised a similar concern, arguing that damaged windshields exposed to atmospheric conditions are more likely to dislodge, or spall, glass inside the occupant compartment when the damaged area subsequently is struck by gravel or other road debris. In 1998 the Insurance Institute for Highway Safety responded by reviewing injury literature, interviewing medical personnel, and conducting a study to investigate the purported hazards. We identified no cases in which dislodged glass resulted in injury. Investigation of the effects of moisture on damaged windshield glass indicated no increase in the risk of glass spalling. In short, the Institute found no hazards that might occur from typical windshield repairs (Advisory No. 24, Sept. 1998).

In response to the more recent concerns raised by IGA, the Institute again finds no evidence of added injury risk from spalling after windshields are repaired. The Solutia report on which IGA based its concerns is fundamentally flawed and useless.

### ***Basis of IGA and NGA claims***

Auto windshields are made of high-penetration-resistant glass, a laminated assembly of two glass layers with a polyvinyl butyral interlayer. If the outer glass layer sustains minor damage, it often can be repaired by injecting clear resin into the cracks. The crux of the claims raised by both IGA and NGA is that moisture reaching the interlayer through the damaged outer layer of glass before repairs are made could compromise adhesion and create an injury risk if shards of glass subsequently are dislodged.

*IGA admits a factor that compromises the Solutia report — the possibility of bias. Solutia “has some stake in the matter,” IGA admits. In fact, Solutia makes polyvinyl butyral interlayers.*

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The Insurance Institute for Highway Safety and the Highway Loss Data Institute are independent, nonprofit scientific and educational organizations dedicated to reducing the losses — deaths, injuries, and property damage — from crashes on the nation's highways. This work is wholly supported by automobile insurers. Of special interest to insurers, advisories are published for member companies.

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Solutia tested seven previously damaged windshields, measuring interlayer moisture content and conducting pummel tests to rate glass adhesion (the tests involve striking the glass with a hammer and then rating on a scale of 0 to 9 how well glass adhered to the interlayer). In its report on these tests, “Evaluation of Windshield Repairs” (June 2003), Solutia concluded that moisture infusion into the interlayer of a broken windshield “was shown to reduce the adhesion between the glass and the [polyvinyl butyral interlayer] in that region, thereby adding risk of injury from glass spalling during subsequent impacts.”

Institute researchers have reviewed this report, finding major flaws in Solutia’s testing. The resulting conclusions lack substantiation.

### ***Solutia report is flawed and doesn’t support its stated conclusions***

The testing reflects a number of flaws. One is that pummel tests may measure how well glass adheres to the interlayer of a windshield when tested to destruction. But destroying a windshield with a hammer isn’t representative of what happens when debris on a road strikes a repaired windshield. Thus, Solutia testing offers no useful information about whether windshield repairs subsequently might increase spalling in real-world driving.

Solutia also failed to correlate interlayer moisture with reduced glass adhesion. For example, one of the windshields with the worst score (0) in the pummel test had a very low moisture level. That is, very little moisture had penetrated to the interlayer of this previously damaged windshield. Therefore, moisture wasn’t what caused the low score in the pummel test. Numerous other factors could have influenced the scores of all seven windshields — stress and twisting of the windshields during transit (the windshields had been removed from vehicles), location of the pummeling and age of the windshields (interlayer degradation is known to occur near the edges of windshields as they age), etc. The absence of correlation between moisture levels and pummel test scores undercuts Solutia’s conclusions concerning the effects of moisture from minor windshield damage on glass adhesion and subsequent safety risks.

IGA admits another factor that compromises the Solutia report — the possibility of bias. The Institute notes that the pummel test is somewhat subjective because whoever conducts it decides how long and how hard to pound the glass. Solutia, which conducted the tests, “has some stake in the matter,” IGA admits. In fact, Solutia is a manufacturer of polyvinyl butyral interlayers. The company would benefit financially if fewer damaged windshields were repaired and more were replaced.

For these and other reasons, Solutia’s report adds nothing to current knowledge about the relationship between windshield repairs and safety in subsequent noncollision impacts from roadside debris. The report fails to document any injury risk from windshield spalling under any noncollision circumstances. Therefore, the Institute’s response to the question posed by IGA — “How safe is windshield repair?” — is to repeat what we reported in 1998: Evidence is lacking that repairs compromise safety.

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