The Effects of Hydrophilic and Hydrophobic Rear-Window Treatments on Visual Performance

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This study consisted of a survey and a field experiment to evaluate the potential benefits of hydrophilic treatments for motor vehicle glazing. The survey examined the subjective assessments of 15 drivers whose vehicles had a portion of the rear window and one of the side windows treated with a hydrophilic coating. The field experiment evaluated the effects of hydrophilic and hydrophobic treatments, relative to an untreated condition, on driver visual acuity under simulated wind and rain conditions, both during the day and during the night. Additional independent variables included whether headwind was present, rain rate, and age.

The results of the survey show that drivers did not report a benefit of hydrophilic treated areas compared to untreated areas of the side or rear windows. Consistent with the survey results, the field experiment showed that hydrophilic treatment did not improve visual performance. However, significant improvements in visual performance were associated with hydrophobic treatment of the rear window.

The findings from the field experiment support previous research that showed significant improvements in visual acuity associated with hydrophobic treatment of the windshield. On the other hand, the present study found no subjective or objective benefits of applying hydrophilic treatments to rear or side windows.

Key Words: acuity, age, backlight, glazing, hydrophilic, hydrophobic, rain, vision

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