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Understanding UV Resistance

by Russ Corsi

AS WE, THE DRIVING PUBLIC, spend more and more time in our motor vehicles, the question of the amount of ultraviolet (UV) protection that is provided by glass comes up more frequently.

Before we address this question, it's appropriate to give the reader a little background on UV rays.

UV rays are invisible light rays and make up about 10 percent of sunshine; the shorter the wavelength, the increased probability of skin damage.

UV radiation falls into three wavelength categories:

- UVA (longest wavelength);
- UVB; and
- UVC (shortest wavelength)

Filtering UV Rays

As long as we are able to maintain an ozone layer in the atmosphere, the UVC rays will be filtered out before they reach the earth. Although both UVA and UVB rays are present in the sunlight, UVB rays are 1,000 times more damaging to the skin than UVA rays (i.e., sunburning, freckling, aging and cancer).

The good news is that UVB rays are nearly totally filtered out by glass (about 99 percent of them, that is). Although it would take many hours of continuous sunlight, even the limited amount of UVA rays that get through the glass can cause sunburn.¹

As automotive glass substrates have evolved from clear to tinted to solar products, the amount of UVA rays en-

tering our vehicles has been reduced dramatically. For example, a single ply of 4.0-mm tinted, tempered glass blocks 48 percent of the UVA rays. As we progress through the various levels of "newer" products, solar green blocks 65 percent, while solar privacy products typically block 92 percent of the UVA rays.

Laminated glass products also provide a high level of protection from UVA rays. A tinted, laminated windshield of a nominal 5.4-mm thickness blocks 84 percent while a solar green product blocks 86 percent.²

Interestingly, the current trends in both types of vehicles offered and automotive glass construction preferences are providing more vehicles that are reducing the amount of UVA rays that enter the occupants' space. More and more vehicles are in the van, SUV and pick-up truck categories that are permitted to offer privacy glazing in all glass behind the front seat, clocking 92 percent of UVA rays. In addition, there is a growing trend of offering laminated sidelites (UVA blocking would duplicate windshields at about 86 percent) (see related story on page 18). Other positive attributes of the laminated sidelites are: noise level reduction and a barrier of resistance to smash-and-grab break-ins. ■

Russ Corsi retired as manager of technical services from PPG Industries' Automotive Replacement Glass business unit after 31 years in the glass industry. He now serves as a consultant to the industry. Mr. Corsi's opinions are solely his own and not necessarily those of this magazine.

1 Reference: white paper, "Ultraviolet Radiation," May 1985, Dr. G. Sienkiewicz.

2 Reference: "PPG Automotive Products" brochures, 2114E-8/93, 2139E-12/94.



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