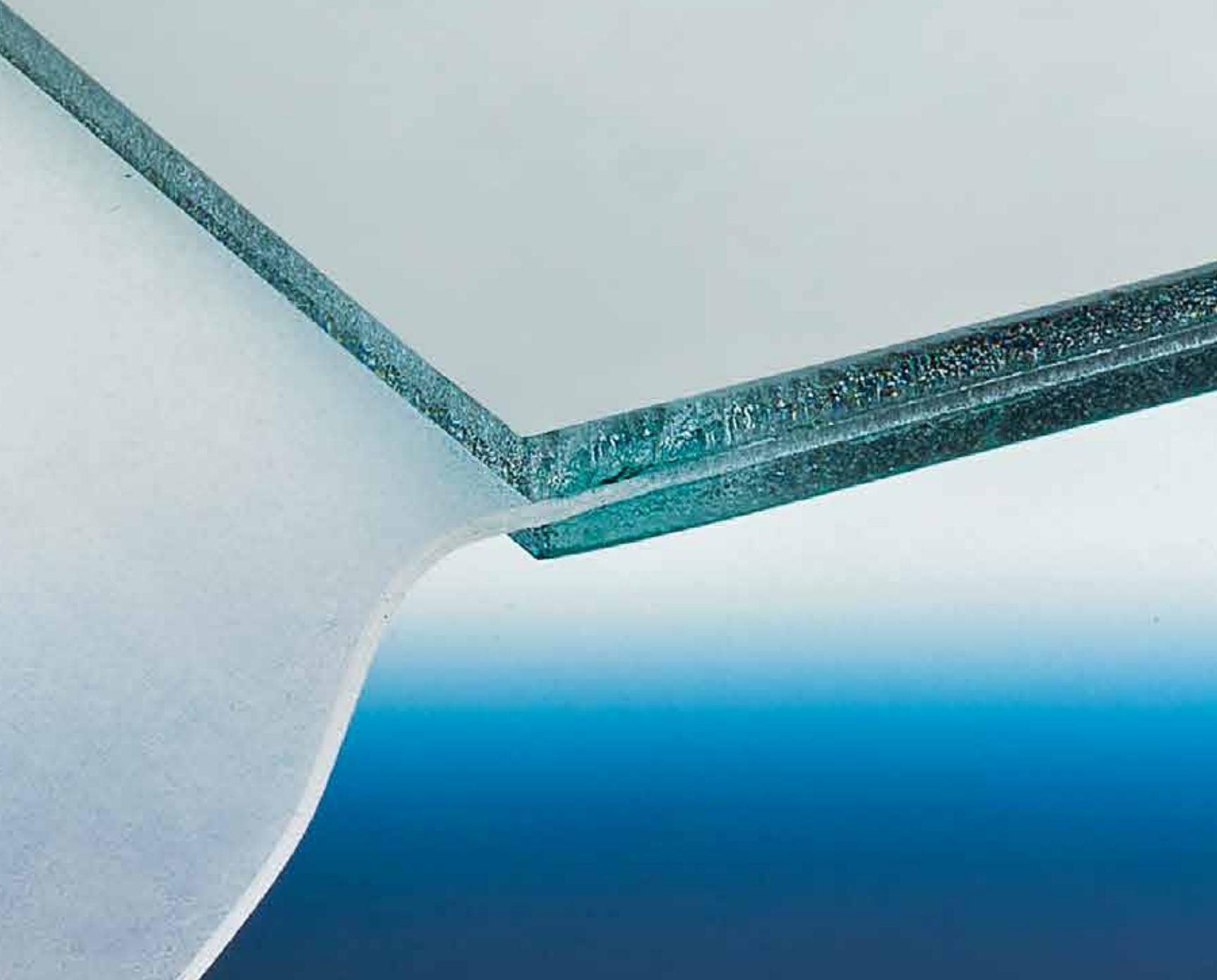




Leading technology, leading the way



FEATURES



Safety, security and UV protection.
S-LEC™ Clear Film

SAFETY

Tempered glass tends to shatter into fragments on impact. In laminated glass with S-LEC™ Film, fragments will adhere to the film to minimize injuries to passengers. Because the laminated glass doesn't shatter into small pieces, a degree of visibility is maintained for driver safety.



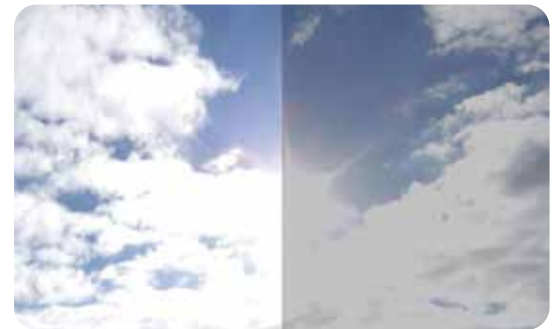
SECURITY

Windows are traditionally an easy entry point for break-ins and vandalism. While tempered glass can be broken quite easily to gain access, laminated glass window systems require more effort to penetrate.



UV FILTERING

S-LEC Film filters out more than 99% of the sun's harmful ultraviolet rays. This contributes to the reduction of skin damage to passengers, as well as the discoloration and deterioration of the automobile interior.



See
See
See
See

Hear
Hear
Hear
Hear

Feel
Feel
Feel
Feel

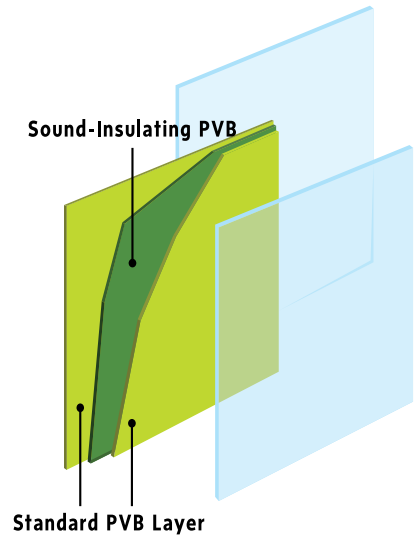
Experience

the possibilities of glass

MULTI-LAYER FILM TECHNOLOGY FOR A QUIET, COMFORTABLE CABIN

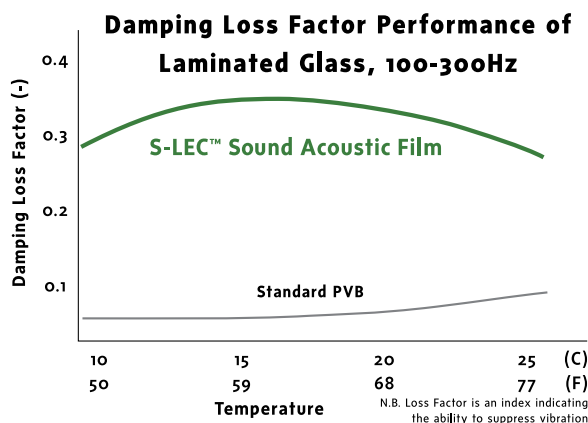
The hum of the engine and the shrill of the wind have subsided, and your ears adjust to the softer environment. This is the moment when drivers realize how much noise truly penetrates into the vehicle. S-LEC™ Sound Acoustic Film enables a quieter environment for passengers by dramatically reducing noise coming through the glass.

S-LEC™ Sound Acoustic Film with Sekisui three-layer extrusion technology can improve sound transmission loss by 10dB. The outer layers provide mechanical strength and enable adhesion to the glass. The inner layer absorbs unwanted sound frequencies. With this technology, the sound insulation performance is improved, and still maintains the functionality of standard interlayer film.



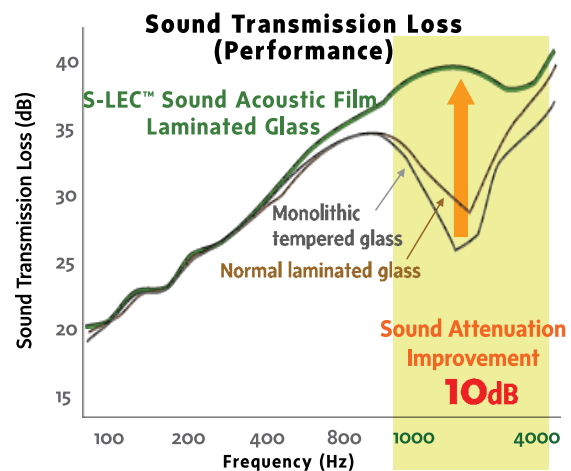
VIBRO-ACOUSTIC

S-LEC film's superior damping performance controls low frequency vibration energy. A 100-500 Hz vibration generated by the engine causes car body components to produce low frequency sounds. These vibrations resonate across the windshield and sidelights. S-LEC™ Sound Acoustic Film cuts noise and vibration more effectively than standard PVB film.



AIRBORNE NOISE

Unwanted audible sound and noise disturbances experienced within the automotive cabin, such as traffic and wind, are located in the 1,000 to 4,000 Hz range. S-LEC™ Sound Acoustic Film improves sound transmission loss of these noises by 10dB compared to standard PVB interlayer film. The reduction in noise is even greater when compared to monolithic tempered glass.



COMPARISON OF ACOUSTICAL PERFORMANCE

Composition	ISO 717-1 Rw (C, Ctr)	ASTM E413 STC	JIS A 4706 Ts-class
•Clear Glass 4mm	30 (-2; -3)	27	25
•Clear Glass 2mm / Regular PVB 0.76mm / Clear Glass 2mm	31 (-1; -3)	31	25
•Clear Glass 2mm / S-LEC™ Sound Acoustic Film 0.76mm / Clear Glass 2mm	32 (-1; -4)	32	30

PRODUCT SPECIFICATION

Product	Thickness (mm)	Standard Lengths (m)
• S-LEC™ Sound Acoustic Film	0.76 (30mil)	250, 510

Available in both Clear and Shade. Width/Length/Thickness : Please visit s-lec.us for more information.
Data tested by SEKISUI. SEKISUI is not responsible for the data or any damage related to the figures above.

FILM TECHNOLOGY PROVIDES RELIEF FROM INTENSE HEAT, IMPROVING FUEL EFFICIENCY

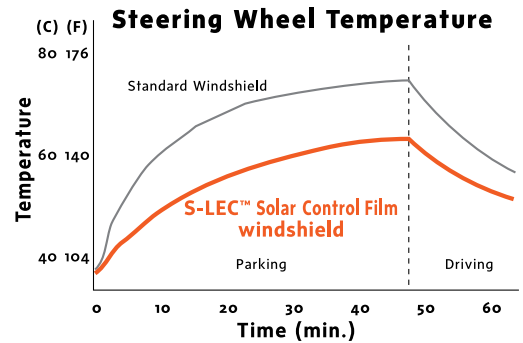
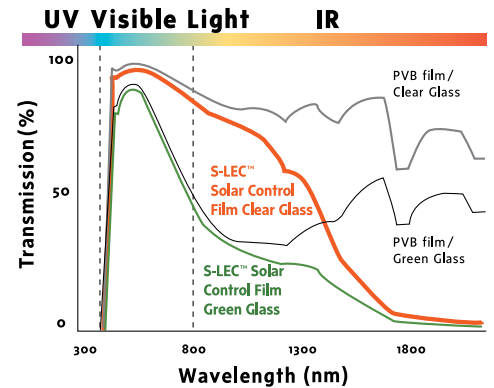
That's how hot your car can get on a sunny, 60 degree day. On a 100 degree day internal temperatures can rise to over 170 degrees. As the trend for more glass in automobiles grows, it yields more acute windshield angles and increased glass surfaces. This creates additional challenges in mitigating heat in the vehicle. With Sekisui's patented fine particle dispersion technology, S-LEC™ Solar Control Film reduces the transmission of infrared rays through glass, without offsetting transparency.

HEAT

S-LEC™ Solar Control Film quenches many of the sun's mid-infrared rays between 1,500 and 2,100 nm. As demonstrated in the graph, the effectiveness of S-LEC™ Solar Control Film surpasses heat absorbing green glass. Vehicle tests have shown that laminated windshields with S-LEC™ Solar Control Film reduce the surface temperature of the steering wheel by approximately 10 degrees Celsius.

FUEL ECONOMY

By reducing internal vehicle temperatures, the burden on the HVAC system to cool the vehicle is reduced, and fuel economy is improved. S-LEC™ Solar Control Film incorporated into compact cars have demonstrated a 3% increase in fuel economy while using the air conditioning during a traffic jam.* Better fuel economy benefits the automotive industry, increases consumer approval, and helps the environment.



* Air conditioned light cars in traffic jams can expect approx. 3% improvement in fuel economy. (Reference: Society of Automotive Engineers of Japan, Tested by Asahi Glass Ltd., /Mitsubishi Automotive Engineering Co., Ltd.)

ELECTROMAGNETIC TRANSMISSION

S-LEC™ Solar Control Film allows most radio frequency bands to pass freely, unlike traditional heat-reflecting glass with a metallic coating. S-LEC™ Solar Control Film with absorbing features allow drivers and passengers to remain connected while on the go. These technologies also enable the convenient use of Electronic Toll Collection (ETC) devices without any interference.

Electronic Toll Collection (ETC) Is Possible Using S-LEC™ Solar Control Film



COMPARISON OF HEAT INSULATING PRODUCTS

Heat Cut-off Method	Heat Reflective Glass	Heat Reflective PET	S-LEC™ Solar Control Film
•Composition	Heat Reflective Glass / PVB Film / Glass	Glass / PVB Film / Heat Reflective PET / PVB Film / Glass	Glass / S-LEC™ Solar Control Film / Glass
•Heat Insulation	OK	OK	OK
•EM Transmission	N.G.	N.G.	OK

COMPARISON OF HEAT INSULATING PERFORMANCE

Composition	Visible Light Transmission(TV) (%)	Direct Solar Transmission(TS) (%)
•Clear Glass / PVB Film / Clear Glass	89	77
•Clear Glass / S-LEC™ Solar Control Film / Clear Glass	87	65
•Green Glass / S-LEC™ Solar Control Film / Green Glass	77	47

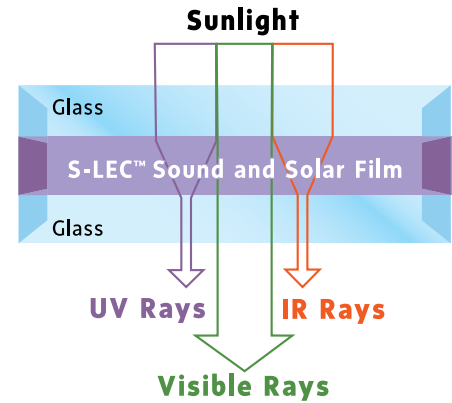
PRODUCT SPECIFICATION

Product	Thickness (mm)	Standard Lengths (m)
•S-LEC™ Solar Control Film	0.76 (30mil)	250, 510

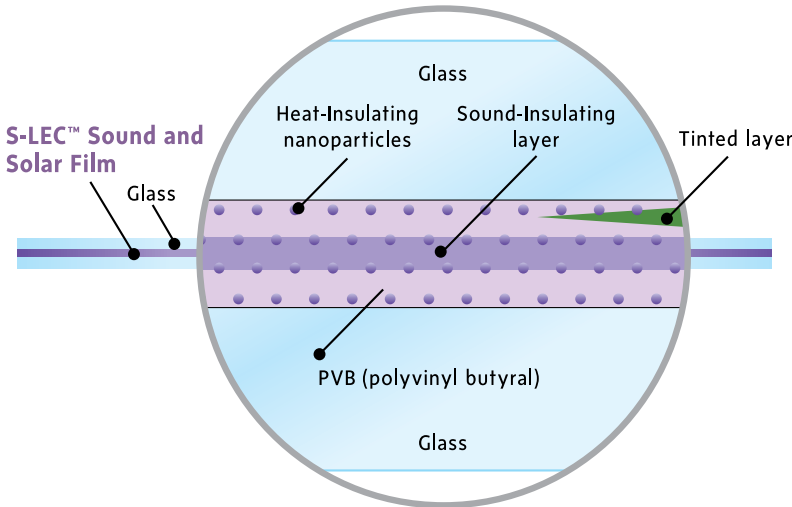
Available in both Clear and Shade. Width/Length/Thickness : Please visit s-lec.us for more information. Data tested by SEKISUI. SEKISUI is not responsible for the data or any damage related to the figures above.

THE COMPLETE STANDARD FOR LUXURY VEHICLES: SAFETY, SECURITY, AND COMFORT.

These are the most sought after expectations of consumers for new vehicles today. The evolution of S-LEC™ Sound and Solar Film offers more functionality to contribute to the reduction of these elements: Carbon emissions (CO₂), road and wind noise, and Infra-red heat (IR), all while maintaining the level of safety, security and protection of standard interlayer PVB film.



MULTI-LAYER EXTRUSION AND FINE PARTICLE TECHNOLOGY



S-LEC™ Sound and Solar Film is constructed from Sekisui's patented three-layer extrusion technology. The outer layers provide mechanical strength and enable adhesion to the glass. The inner layer absorbs unwanted sound frequencies. Sekisui's solar control particles are then evenly distributed throughout the multi-layer structure. This combination of technologies enables sound dampening and heat control in one complete product.

COMPARISON OF ACOUSTICAL PERFORMANCE

Composition	ISO 717-1	ASTM E413	JIS A 4706
	Rw (C, Ctr)	STC	Ts-class
•Clear Glass 4mm	30 (-2;-3)	27	25
•Clear Glass 2mm / Regular PVB 0.76mm / Clear Glass 2mm	31 (-1;-3)	31	25
•Clear Glass 2mm / S-LEC™ Sound and Solar Film / Clear Glass 2mm	3 (-1 ; -4)	32	30

COMPARISON OF HEAT-INSULATING PRODUCTS

Heat Cut-off Method	Heat Reflective Glass	Heat Reflective PET	S-LEC™ Sound and Solar Film
•Composition	Heat Reflective Glass / PVB film / Glass	Glass / PVB film / Heat Reflective PET / PVB film / Glass	Glass / S-LEC™ Sound and Solar Film / Glass
•Heat Insulation	OK	OK	OK
•EM Transmission	N.G.	N.G.	OK

COMPARISON OF HEAT-INSULATING PERFORMANCE

Composition	Visible Light Transmission(TV) (%)	Direct Solar Transmission(TS) (%)
•Clear Glass / PVB film / Clear Glass	89	77
•Clear Glass / S-LEC™ Sound and Solar Film / Clear Glass	87	65
•Green Glass / S-LEC™ Sound and Solar Film / Green Glass	77	47

PRODUCT SPECIFICATION

Product	Thickness (mm)	Standard Lengths (m)
• S-LEC™ Sound and Solar Film	0.76 (30mil)	250, 510

Available in both Clear and Shade. Width/Length/Thickness : Please visit s-lec.us for more information.
 Data tested by SEKISUI. SEKISUI is not responsible for the data or any damage related to the figures above.

WEDGE FILM FOR HEAD UP DISPLAY



Added comfort for the conventional HUD front windshield.
S-LEC™ Sound and Solar Film-W

S-LEC™ WEDGE FILM FOR HUD KEEPS HEAD UP, EYES FORWARD

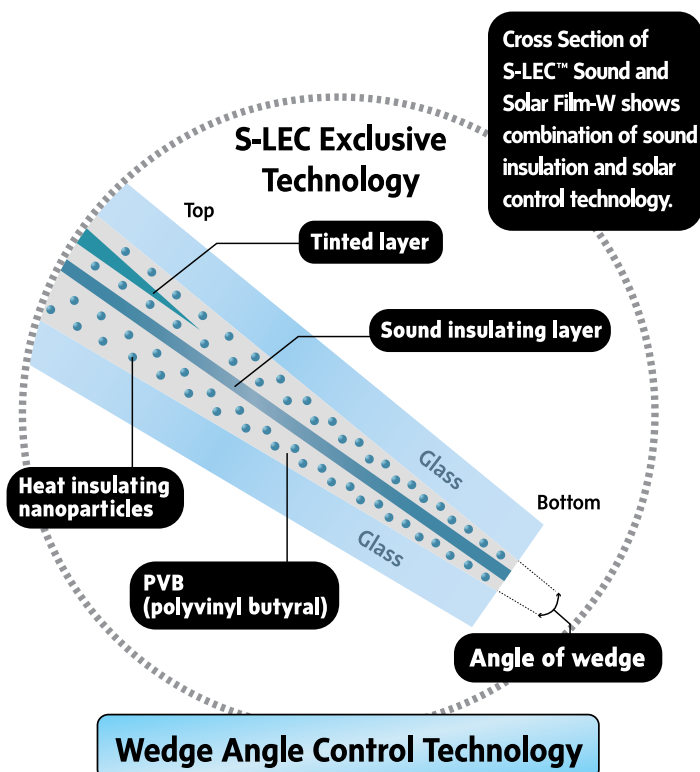
Head Up Display (HUD) presents the driver with real time vehicle data projected directly on the windshield, thus eliminating the need to shift the driver's line of vision. S-LEC™ Wedge Film for HUD is a leading technology and the latest solution, integrating newer technologies and providing a safer and more comfortable experience. Sekisui's interlayer PVB Wedge films are available in the following options: Clear, Sound Acoustic, Solar Control, and Sound and Solar.

COMFORT WITH A CLEAR VIEW

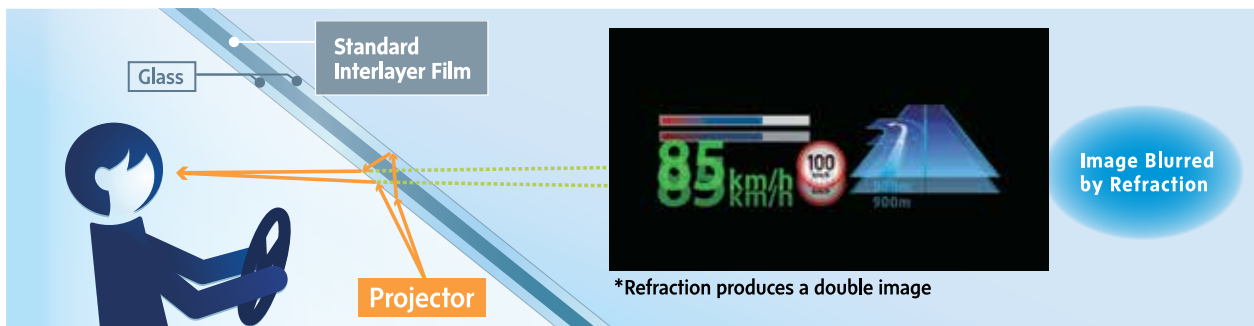
Sekisui S-LEC has successfully developed a wedge-shaped interlayer film for HUD that controls the appearance of double imaging and ghosting, while providing the benefits of sound and solar control. Sekisui's comprehensive technology offerings for multi-layer extrusion, nano-particle dispersion, solar control features, and sound insulation, provides solutions for even the most challenging design and performance applications.

OPTIMAL DISPLAY CLARITY

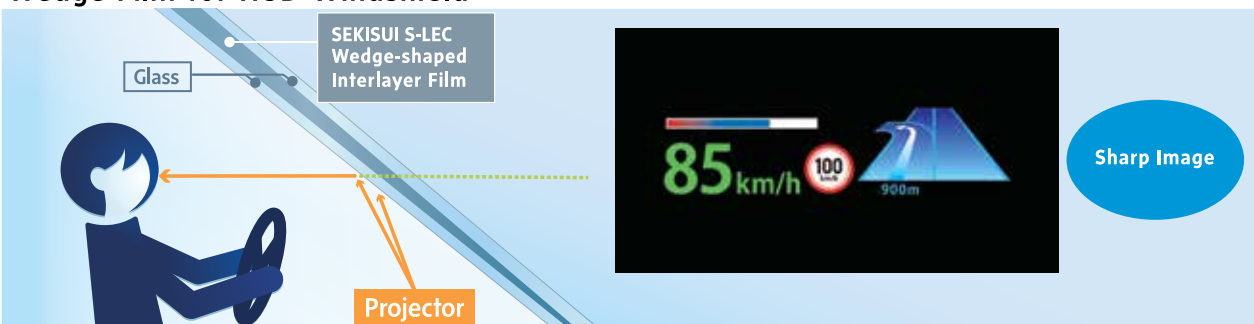
Standard windshields cause projector images to appear as blurry, double images due to the refraction of light. HUD windshields with Sekisui S-LEC engineered wedge angle controls the refraction of light, enabling real time images to be projected clearly. S-LEC™ Wedge Film for HUD enhances visibility and contributes to a more comfortable and safer driving experience for the consumer.



Standard Windshield



Wedge Film for HUD Windshield



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Leading technology, leading the way

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