



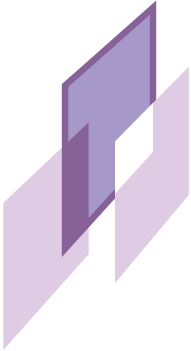
S-LEC™ Sound and Solar Film

Interlayer Film for Automobiles



Leading technology, leading the way

A laminated glass with a flexible and intense sheet of interlayer film, with performance that surpasses the qualities of a conventional mono-layer glass. This glass has become essential in today's highly advanced car models. SEKISUI S-LEC™ Film is a polyvinyl butyral film (PVB) resin with superior transparency and adhesive quality, perfect for realizing the various functions required for automotive glass. In addition to safety, crime prevention and UV filtering, the film features many different functions to enhance the interior environment, helping to create comfortable and efficient car models. SEKISUI S-LEC™ Film - industry leader in automotive interlayer films.



S-LEC™ Film Key Performance



Safety

Keeps all shattered bits in one

Broken glass shatters into pieces, flying in all directions. The same is true for tempered glass. When accidents occur, drivers lose visibility with a smashed windshield. However, damage could become extremely serious if occupants crash through a windshield. S-LEC™ Film, with high impenetrability, will protect the glass from shattering, saving visibility by minimizing the crash to only a spider web-like crack on the windshield. As a result, even if glass does break, fragments adhere to the interlayer film, preventing the shattering, and minimizing the likelihood of occupant injury.



Security

S-LEC™ versus Hammers



Glass is fragile. Even tempered glass could break easily. Car thieves can break glass in an instant. However, tremendous intensity is added with S-LEC™ Film between the two sheets of glass. Thieves cannot break the glass easily when laminated glass with S-LEC™ Film is used.



UV-Filtering

Sun screen glass

Sunbeams contain ultraviolet rays which can cause sunburns and color fade for car interiors. The rays can also cause skin cancer and retinal damage. With the growing hole in the ozone layer, the threat towards ultraviolet rays is becoming increasingly alarming than ever before. S-LEC™ Film filters out more than 99% of these harmful ultraviolet rays. S-LEC™ Film is the key to maintaining the beauty of both passengers and the car interior.

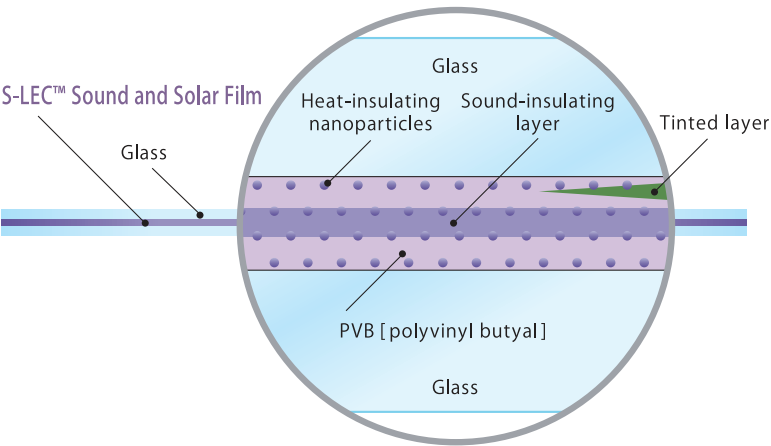


Protecting your car from noise and heat.
Accelerating the level of comfort and eco-friendliness.
S-LEC™ Sound and Solar Film
is a multifunctional interlayer film that makes all dreams come true.

Window size, comfort, security, and eco performance.
These are the aspects in need of further improvement
in today's car models. The role of glass has become
more important than ever before.

The new Sound and Solar Film from S-LEC™, leading brand of automotive interlayer films will control
noise and temperature, creating a comfortable interior environment.

S-LEC™ Sound and Solar Film is a must for passengers and for reducing various burdens on your car.



S-LEC™ Sound and Solar Film,
made from multiple layer and
microparticle technology of SEKISUI.

S-LEC™ Sound and Solar Film is a sound-insulating plastic layer inserted between sheets of PVB. Heat-insulating microparticles are dispersed evenly within this multi layered structure. Only technology developed by SEKISUI, an established leader in automotive interlayer film, can realize dispersion of microparticles by creating multiple layers within an ultra-thin interlayer film.

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 / Sound and Solar Film / Clear Glass 2mm	32 (-1 ; -4)	32	30

Comparison of Heat-Insulating Products

● Heat Cut-off Method	Heat Reflective Glass	Heat Reflective PET	Sound and Solar Film
● Composition	Heat Reflective Glass / PVB film / Glass	Glass / PVB film / Heat Reflective PET / PVB film / Glass	Glass / 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 / Sound and Solar Film / Clear Glass	87	65
● Green Glass / Sound and Solar Film / Green Glass	77	47

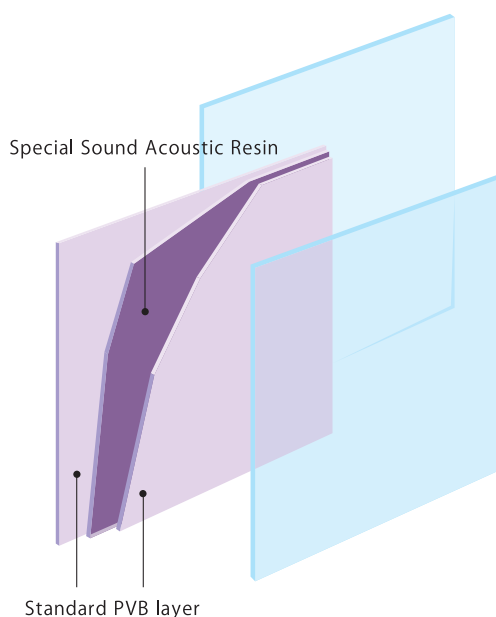
Product Specification

Product	Thickness (mm)
● S-LEC™ Sound and Solar Film	0.76 (30mil)

Color : Available in both Clear and Shade. Width : Available upon request. Length/Thickness : Please consult your SEKISUI Sales Representative.
Data tested by SEKISUI. SEKISUI is not responsible for the data or any damage related to the figures above.

Cutting irritation down to one-third.

Sound Acoustic



Car noises travels through glass.

Ever turned off the engine and sighed with relief after a long drive? This is the moment when many drivers realize how much noise penetrates into a car when driving.

S-LEC™ Sound and Solar Film brings peace and calmness to the interior of a car by dramatically reducing all noises coming through the glass; including unpleasant engine and wind noise. S-LEC™ Sound Acoustic Film, with SEKISUI multi layer extrusion

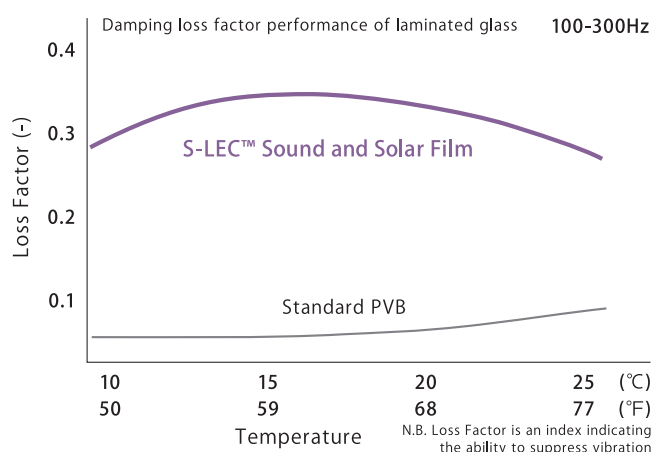
technology, has succeeded by improving the level of sound acoustic performance by adding an extra layer of special polyvinyl butyral (PVB) resin between standard S-LEC™ interlayer films. Maintaining intensity, and ability to prevent glass from shattering to pieces as standard interlayer films, S-LEC™ Sound and Solar Film is a multifunctional interlayer film which brings safety and peace to your car.

Vibration

Minimizing vibration sounds from engine compartments.



Vibration generates sound. In case of cars, the engine compartment generates most of the sound. A 100-500Hz vibration causes car body components, including glass on all sides of your car, to generate low-frequency sounds. As the graph indicates, vibration-suppressing S-LEC™ Sound and Solar Film cuts this noise and vibration more effectively than any other conventional interlayer film.

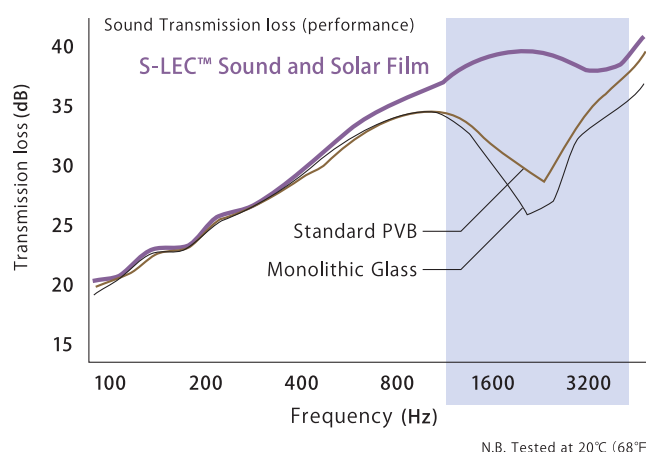


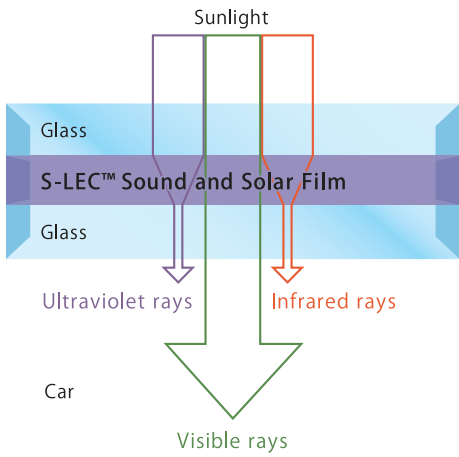
Noise

Wind noise intruding through glass.



A major source of noise during high-speed driving is wind noise. Most noise pass through glass to the inside of your car. The sound frequency of wind, between 1000-5000Hz is the most sensitive sound range to humans. The graph indicates that the S-LEC™ Sound and Solar Film excels at shielding noise, particularly in the frequency range just mentioned.





Blocking out the scorching rays.

Being able to dress in your favorite outfit, looking your best regardless of the scorching heat. Cars must be able to fulfill such passengers’ wishes. S-LEC™ Sound and Solar Film has the ability to block infrared and ultraviolet rays. Infrared rays could irritate your skin and extremely increase the car temperature. S-LEC™ Sound and Solar Film blocks these rays, minimizing the negative factors for the skin and the increase of temperature in the car. With S-LEC™ Sound and Solar Film, you can continue looking your best even under the scorching hot sun. Especially during the summer, windshield equipped with S-LEC™ Sound and Solar Film will block sunrays, reducing approximately 10 degrees on steering wheels compared to those under standard windshields. This is realized by S-LEC™ Sound and Solar Film technology which effectively controls the transmission of infrared rays (wavelength 1500 - 2100nm).

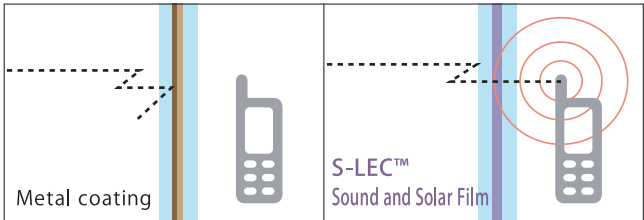
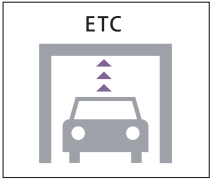
Electromagnetic wave transmission



Balancing communication and coolness.

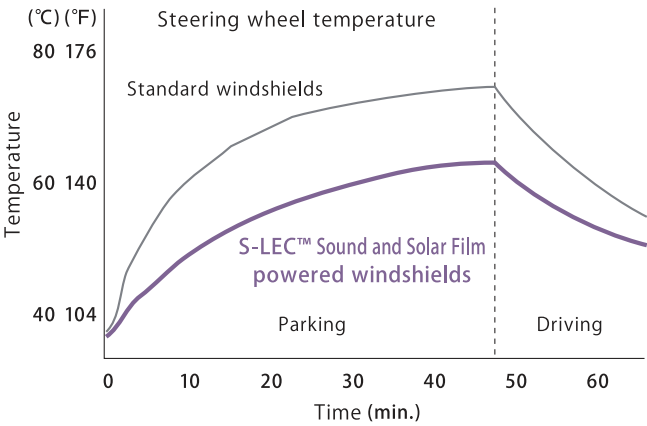
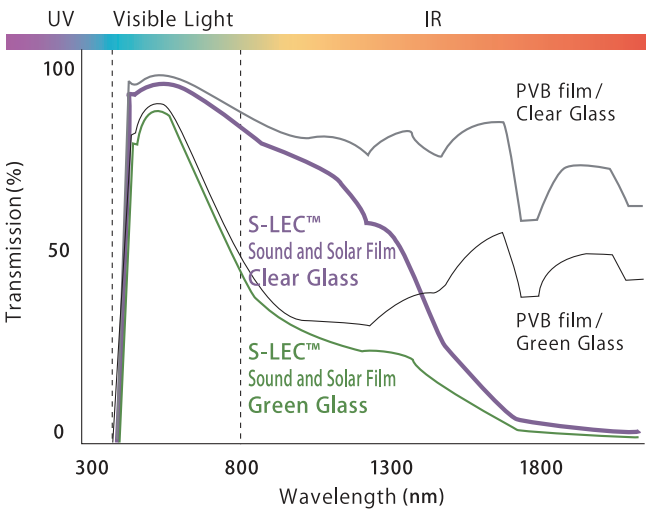
Today mobile communication is a necessity for business and pleasure. However, standard heat reflecting glass with metal coating reflects radio waves, which makes it difficult for mobile phones to receive waves. S-LEC™ Sound and Solar Film allows major radio waves of all frequencies to transmit through glass, while blocking the harmful rays. S-LEC™ Sound and Solar Film is also compatible with the recent expanding Electronic Toll Collection (ETC) system on freeways, unlike other heat reflecting glass with metal coating.

N.B. Use of mobile phones while driving is prohibited by law in certain areas.



Blocking out rays and fuel overuse.

Solar Control



Ecology



‘Eco-friendly’ is ‘People-friendly’

The higher the temperature, the more air conditioning we use. This puts burden on the engine, resulting in more fuel use. Not only does S-LEC™ Sound and Solar Film prevent the increase of the car temperature, it also helps in reducing fuel consumption and carbon dioxide emission by decreasing the overuse of air conditioners. Tests have clearly shown how temperatures can control fuel consumption*. Imagine how much fuel could be saved if all cars are equipped with S-LEC™ Sound and Solar Film. Car manufacturing has now shifted to the same direction as global warming prevention and economy of petroleum resources.

*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.)

EUROPE

The Netherlands

SEKISUI S-LEC B.V. Metaalweg 5, 6045 JB Roermond, The Netherlands TEL:+31-(0)475-349900 FAX:+31-(0)475-349999

AMERICA

USA

SEKISUI S-LEC AMERICA, LLC. 1200 Rolling Hills Lane, Winchester, KENTUCKY 40391, USA

TEL:+1-(0)859-745-4676 FAX:+1-(0)859-745-4677

Mexico

SEKISUI S-LEC MEXICO S.A. de C.V. Calle 21E, No.524 Civac, 62500, Cuernavaca, Morelos, Mexico TEL:+52-777-329-06-01 FAX:+52-777-319-06-75

ASIA

Japan

SEKISUI CHEMICAL CO., LTD. Tokyo Sales Office, Toranomon 2-Chome Tower, 2-3-17 Toranomon, Minato-ku, Tokyo 105-8450, Japan

TEL:+81-(0)3-5521-0675 FAX:+81-(0)3-5521-0676

Korea

SEKISUI KOREA CO., LTD. Rm 1405, Soonhwa Bldg., 5-2 Soonhwa-Dong, Chung-Gu, Seoul 100-130, Korea

TEL:+82-(0)2-319-9471 FAX:+82-(0)2-319-9475

China / Suzhou

SEKISUI S-LEC (SUZHOU) CO., LTD. No.25 Taishan Rd., Suzhou New District, Suzhou, Jiangsu Province, 215219, China

TEL:+86-(0)512-6661-8181 FAX:+86-(0)512-6661-8383

China / Shanghai

SEKISUI S-LEC (SUZHOU) CO., LTD. Shanghai Office, Room 701, City Gateway, No.398 Caoxibei Road,

Shanghai, China TEL:+86-(0)21-6426-8877 FAX:+86-(0)21-6426-7318

Taiwan

SEKISUI CHEMICAL (TAIWAN) CO., LTD. Room A. 10F, No.2, Sec.2, Nanjing E. Rd., Taipei,

Taiwan, R.O.C. TEL:+886-(0)2-2523-5335 FAX:+886-(0)2-2523-5336

Thailand

SEKISUI S-LEC (THAILAND) CO., LTD. 64/31 Moo4 Eastern Seaboard

Industrial Estate, T. Pluakdaeng A. Pluakdaeng Rayong 21140, Thailand

TEL:+66-(0)38-955-430 FAX:+66-(0)38-955-427

www.s-lecfilm.com (AMERICA.ASIA)

www.s-lec.eu (EUROPE)



Leading technology, leading the way