SEKISUI

Sekisui functional resins open the doors to new product development

S-LEC® Polyvinyl Acetal Resin

The "Key" That Developers Have Been Looking for

The key to open the doors to new and unique product development... S-LEC may be the one.

Development of a new product is an unrelenting challenge for engineers. Engineers all know that even a small technical issue can shut the doors to immense possibilities. Engineers in your company have most likely faced such a dilemma at one time or another. Sekisui S-LEC has served as a unique "key" to breakthrough solutions, thus contributing significantly to the development of a plethora of new products.

Need to Make a Material Tough, Adhesive and Dispersible?

Sekisui S-LEC can provide solutions.

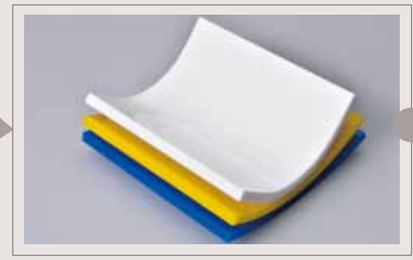
S-LEC can provide various effects by controlling bonding and releasing at the molecular level. That is one of its main features.

Materials that are hard and brittle... Toughen for supple strength.

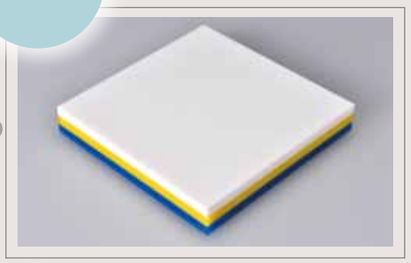
With S-LEC

For details, see page 5.

Materials that are easy to separate... Bond strongly.



With S-LEC



For details, see page 6.

Materials that tend to clump... Disperse uniformly.

With S-LEC

For details, see page 7.

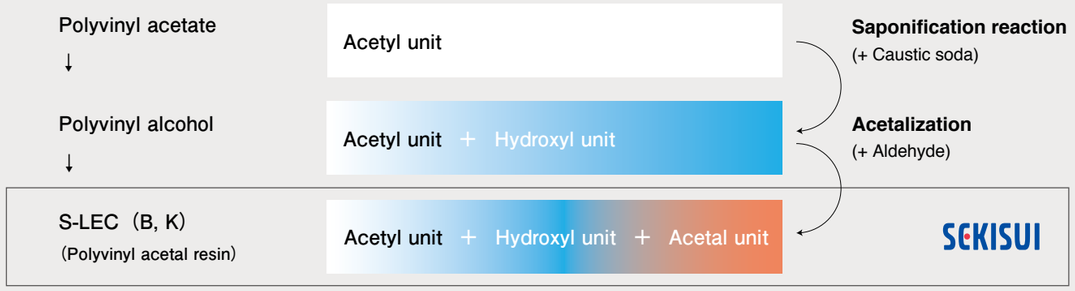
Other features

In addition to the three main benefits of "toughness," "adhesiveness" and "dispersibility," S-LEC provides a variety of other advantages to solve issues in new product development, such as "leveling properties" to achieve smooth and flat material surfaces and "moldability" to create strong and flexible molded products.

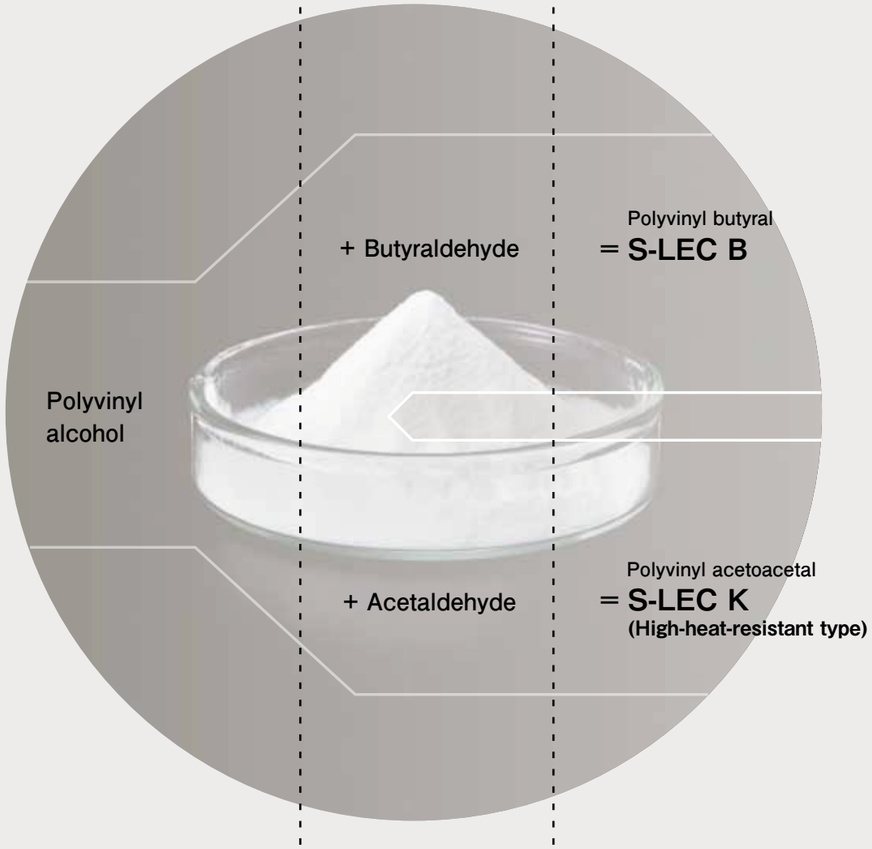
For details, see page 8.

S-LEC is a polyvinyl acetal resin comprised of three chemical units: acetyl unit, hydroxyl unit and acetal unit.

The raw material of S-LEC is a polyvinyl alcohol, which is made by adding caustic soda and other substances to polyvinyl acetate, a resin commonly used as a base material of gum.
This raw material reacts with aldehyde to produce a polyvinyl acetal resin, Sekisui S-LEC.



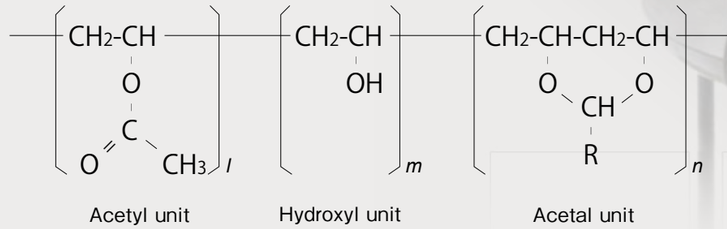
Polyvinyl alcohol + **Aldehyde** = **Polyvinyl acetal resin**
(Polyvinyl butyral/Polyvinyl acetoacetal)



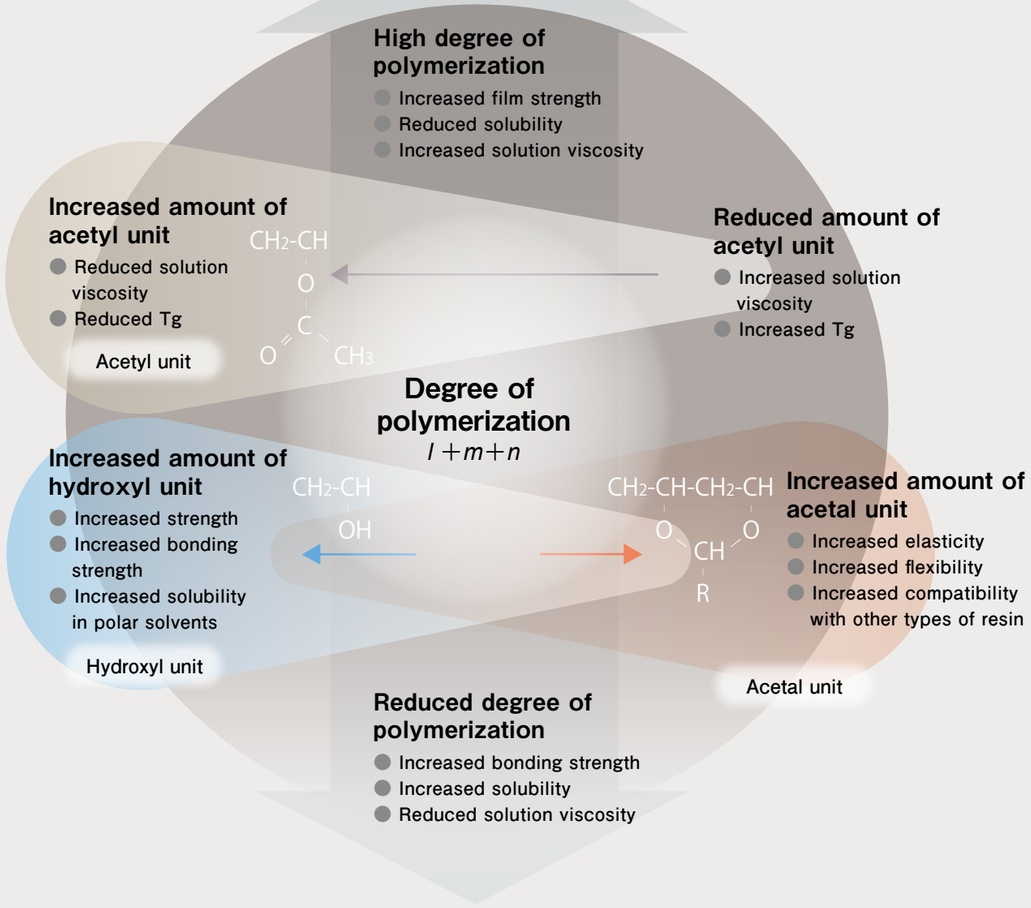
The chemical and physical properties of S-LEC can be controlled by altering the chemical units and polymerization.

The weight ratio of the three chemical units and the degree of their polymerization can be changed to alter the chemical and physical properties of S-LEC, such as strength, viscosity, adhesiveness, solubility and flexibility.

Molecular structure of S-LEC



R= (CH_3 : Polyvinyl acetoacetal resin
C_3H_7 : Polyvinyl butyral resin)



Toughness

S-LEC performance balancing

Strength × Suppleness

S-LEC can be used to modify resins that are hard but brittle or resins that are soft but weak to strong and elastic materials.

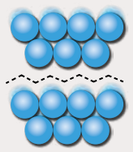
S-LEC has not only a "pulling" characteristic (hydroxyl unit) but also a "non-pulling" characteristic. Therefore, it can be used to create tough materials that have an appropriate strength as well as elasticity to receive external impacts softly.

S-LEC advantages

Hard but brittle

Strong and elastic

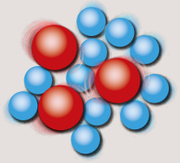
Soft but weak



Molecules pull each other with a strong force.

Pulling

Hydroxyl unit



Molecules pull each other with a moderate force.

Non-pulling

Acetal unit

Molecules do not pull each other.

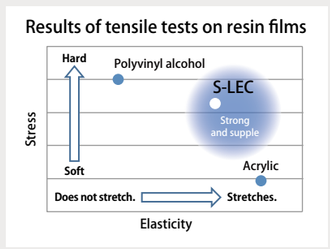
Molecules are stuck together with a strong force, so they cannot move. A resin in this condition is hard but brittle and thus weak with regard to impact.

In the molecules of S-LEC, the hydroxyl unit with a "pulling" characteristic and the acetal unit with a "non-pulling" characteristic exist in a balanced manner. As a result, strength and elasticity, which are conflicting properties, can be realized at the same time.

Since the molecules do not have a pulling force, the material is soft but weak. As a result, it can break easily when an external impact is applied.

S-LEC's properties of strength and elasticity are utilized in flexible printed circuit boards and other items.

The toughness of S-LEC is clearly verified in tensile test results (see the graph at the right).
This property is utilized in various types of film materials and binders (bonding agents) for ceramic sheet forming.



Bonding strength

S-LEC performance balancing

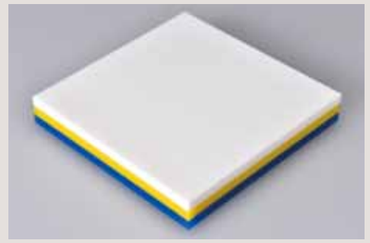
Adhesiveness × Peel resistance

S-LEC realizes ideal bonding properties - easy to adhere and resistant to peeling. It ensures firm bonding of films to metals, glass, ceramics and other materials.

S-LEC is effective not only for producing highly functional materials, but also for improving adhesive strength. Because the molecules of S-LEC have both a "pulling" characteristic (hydroxyl unit) and a "non-pulling" characteristic, S-LEC provides an ideal bonding condition that is flexible and resistant to breakage and peeling.

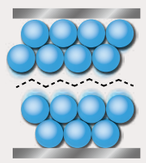
S-LEC advantages

Bonded sections are prone to damage.



Flexible bonding

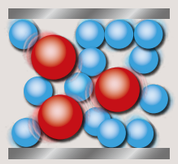
Does not adhere easily.



Molecules bond strongly to the base material.

Pulling

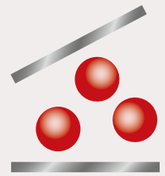
Hydroxyl unit



Molecules bond to the base material with an appropriate strength.

Non-pulling

Acetal unit



Molecules do not bond to the base material.

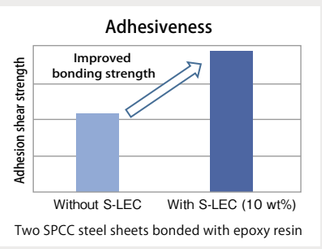
The adhesive strength is high, but the bonded section becomes hard and lacks flexibility. As a result, the bonded section breaks when strong external force is applied, resulting in the separation of the base material.

While the hydroxyl unit provides excellent adhesion, the acetal unit gives flexibility. Thus, S-LEC achieves stable bonding performance.

Because there is no component that bonds to the base material, an adhesive effect cannot be easily achieved.

The superb bonding properties are utilized in adhesives, ink binders and others.

The graph at the right shows the adhesive strength of two SPCC steel sheets bonded together with epoxy resin. It indicates that S-LEC provides superb bonding performance even when it is added to another adhesive material.



Two SPCC steel sheets bonded with epoxy resin

Dispersibility

S-LEC performance balancing

No aggregation × No separation

S-LEC achieves uniform dispersion in easy-to-aggregate materials at the molecular level and ensures uniform distribution of components in liquids.

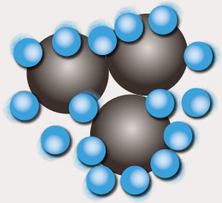
The part (hydroxyl unit) of S-LEC that has a pulling characteristic adsorbs to each and every powder particle, and the part (acetal unit) without a pulling characteristic maintains a certain distance between particles.
As a result, S-LEC achieves uniform dispersion of powder particles in liquids.

S-LEC advantages

Powder aggregates in a liquid.

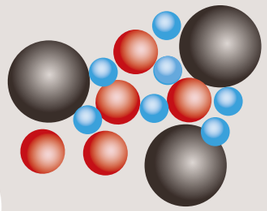
Powder particles disperse uniformly.

Powder and liquid separate into two layers.



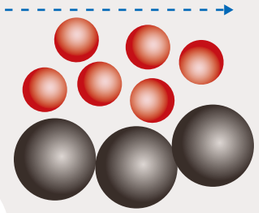
Molecules and powder particles attract each other with a strong force and coagulate.

Pulling → ← Hydroxyl unit



Molecules adsorb to powder particles in moderation.

Non-pulling Acetal unit



Molecules do not adsorb to powder particles.

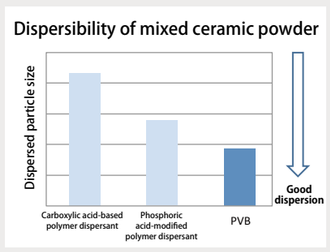
Since there is a very large amount of the component that adsorbs to powder, the powder particles aggregate and form large lumps in the liquid.

The hydroxyl unit adsorbs to powder particles in moderation and the acetal unit maintains a certain distance between particles, thus resulting in a uniformly dispersed liquid.

Due to the absence of the component that adsorbs to powder particles, there is no dispersion effect. As a result, the powder and liquid separate into two vertical layers.

S-LEC is widely used in inks, paints and other products that require uniform dispersion of components.

S-LEC can achieve uniform dispersion of fine powders, such as pigments, so it helps to improve the quality of products requiring a high level of homogeneity.
The graph at the right shows the dispersibility of inorganic powder. It clearly indicates that the use of S-LEC achieves thorough and even dispersion of powder particles.



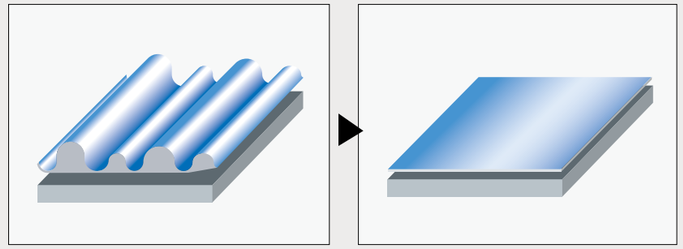
And More

S-LEC also offers excellent leveling properties and moldability for product development in a wide range of industrial fields.

The leveling properties and moldability described here are just some of the superb features of S-LEC.
S-LEC offers immense possibilities for solving various issues in product development.
Let S-LEC help your new product development.

Leveling properties

Inks produced with S-LEC achieve very flat and smooth surfaces after application and drying. S-LEC distributes the components in the liquid evenly, thus providing a leveling (smoothing) effect to the ink after drying. S-LEC provides a lustrous and high-precision finish for printed matter.



In a liquid, components are usually distributed in an irregular manner, so when it dries, the surface becomes irregular.

S-LEC distributes the components uniformly in the liquid, thus resulting in a smooth surface finish.

Moldability

Molded products of various shapes can be produced by mixing S-LEC and inorganic powder and using a hot melt molding process, or by coating the powder surface with S-LEC and using a compression molding process.
By adding a very small amount of S-LEC, the finishing quality can be noticeably improved.

Electronics and IT Field

S-LEC is utilized in the manufacture of IT and key electronic devices, such as LCD displays, substrates and semiconductors.
Sekisui products help to improve product performance and reliability as functional materials.

Ceramic chips

S-LEC is used as a binder for inner dielectric layers. Its toughness, adhesiveness and dispersibility enable the production of ultra-thin ceramic sheets.

Ceramic substrates

Thanks to the excellent dispersibility and dimensional stability in sintering, S-LEC allows the manufacture of uniform and high-precision ceramic substrates.

Life Science Field

Sekisui produces products for such fields as inspection, drug development support, and pharmaceutical and conducts business on a global scale.
Our products accurately respond to a wide range of needs in these fields.

Silver halide (X-ray photos)

The transparency and dispersibility of S-LEC is utilized in film binders.

S-LEC Functions and Applications

Toughness

S-LEC offers toughness, adhesiveness and dispersibility. These functions can be utilized to create solutions to various issues in product development.
S-LEC is widely used in a diversity of industrial fields.

Adhesiveness

Dispersibility

Sublimation dyes (ID photos and others)

The dye dispersibility, heat resistance and adhesiveness of S-LEC are used in ink ribbon binders and receiving layer binders to enhance the brightness of prints.

Automotive Field

Sekisui provides a variety of products that enhance the safety and comfort of automobiles, such as lamination glass interlayer film and interior materials.

Adhesives

When S-LEC is mixed with a thermo-setting resin, it adds flexibility and adhesiveness to the resin, so the resin can be used as an adhesive. Compatibility with other types of resin is also an excellent S-LEC advantage.

Inks

Since S-LEC dissolves in alcohol, low-viscosity grades of S-LEC are used in flexographic and gravure printing inks.

Paints

S-LEC dispersibility is maximized in products that require high levels of homogeneity, such as inks, paints and dyes, thus helping to improve product quality.

Living Environment and Infrastructure Field

Sekisui products play important roles in the living environment and infrastructure field as a raw material for heat-resistant pipes and fireproof walls used in houses, factories and other buildings.

FAQ

Since S-LEC was released to the market more than 50 years ago, it has been used by many companies over time.
If you have any questions, please do not hesitate to contact our company.
The following questions are often asked by customers who use S-LEC for the first time.

Q What form does S-LEC come in?

A S-LEC is a powder resin that has properties such as toughness, high adhesiveness and excellent dispersibility. S-LEC is also non-toxic, odorless, colorless and transparent. It can be dissolved in solvents or formed into film, so it is processed by various methods in a wide range of fields.

Q What form does S-LEC come in?

A S-LEC is a white powder in standard form, but it is also available in granulated form (granules) and in liquid form. The availability of S-LEC in those forms varies depending on the grade. For details, please contact our company.

Q How is S-LEC used?

A Most commonly, S-LEC is dissolved in organic solvents and mixed with powders of various kinds, such as inorganic powders and pigments. It can also be melted by heating. Using a heating process, S-LEC can be formed into sheets or used as a raw material for adhesives.

Q What kind of solvent does S-LEC dissolve in?

A S-LEC dissolves in a wide range of solvents, such as alcohol, ester, ketones and aromatic solvents. The types of solvent in which S-LEC dissolves vary depending on the grade. For details, see page 15.

Q What kind of effect does the use of S-LEC provide?

A S-LEC improves the toughness of coating films, adds adhesiveness to other materials, and achieves uniform dispersion in solutions (like slurries and inks). It also adds a variety of unique effects that contribute to product development.

Q What are the products in which S-LEC is used?

A S-LEC is used as a laminated glass interlayer film, as a ceramic binder and adhesive for printed circuit boards, as well as in paints, inks, and many other products. For details of S-LEC applications, see pages 9 and 10.

Q How does S-LEC differ from other resins?

A S-LEC's biggest feature is that both a polar group and a non-polar group exist in the resin. This unique structure realizes desired processing results according to the customers' applications.

What kind of "key" are you looking for to solve your problems? Examine the features and advantages of S-LEC.

We want excellent solubility in various solvents.
S-LEC dissolves in a wide range of solvents. Solubility can be further improved by using a mixed solvent. (See page 15.)

We want to use an environmentally friendly resin.
S-LEC can be dissolved using only alcohol. Water-soluble S-LEC is also available. Customers can select the processing method in consideration of environmental impact.

We want to manufacture tough films.
The main feature of S-LEC is its toughness. Addition of a small amount of S-LEC improves toughness significantly.

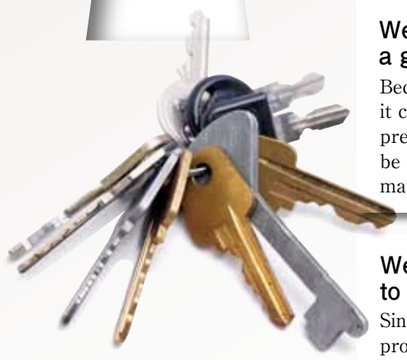
We want both hydrophilicity and water resistance.
Since S-LEC has both a polar group and a non-polar group, it has unique characteristics of being both hydrophilic and water resistant.

We want to use S-LEC as a coating.
S-LEC dissolves in solvents, adheres to base materials, and provides excellent leveling performance. It can be used to coat various base materials.

We want to adjust ink viscosity (a dispersing liquid).
We offer the most variations in the industry. You can select and use grades with different degrees of polymerization, compositions, etc., to adjust the viscosity. (See pages 17 and 18.)

We want to use S-LEC in printing.
S-LEC has excellent dispersibility, stable viscosity and adhesiveness, so it is commonly used as a printing binder. The S-LEC SV Series offers improved printability.

We want to produce molded products without using a solvent.
S-LEC and a plasticizer can be heated and mixed, and then molded. S-LEC is suitable for producing thick films and molded products.



We want to produce a gel using S-LEC.
Because S-LEC has a hydroxyl unit, it can be formed into a gel in the presence of boron or the like. It can be used to create unique gel materials.

We want to improve dispersibility.
S-LEC adsorbs easily to various types of powder and improves their dispersibility. We offer many grades with different polarities, so customers can select the most suitable grade for the powder used.

We want to add strength to molded products.
Since S-LEC has excellent binding properties, it bonds powder particles tightly, thus adding strength to molded products.

We want to ultimately burn off S-LEC.
Sintering leaves only a small amount of residual S-LEC. (See page 21.)

We want to mix S-LEC with a different resin.
S-LEC is highly compatible with thermosetting resins, such as epoxy. Addition of a small amount of S-LEC improves flexibility and bonding strength.

We want to add anti-fogging properties.
The grades with a large content of hydroxyl unit are very hydrophilic and provide excellent anti-fogging characteristics when coated on glass and other materials.

Technical Data

Solubility

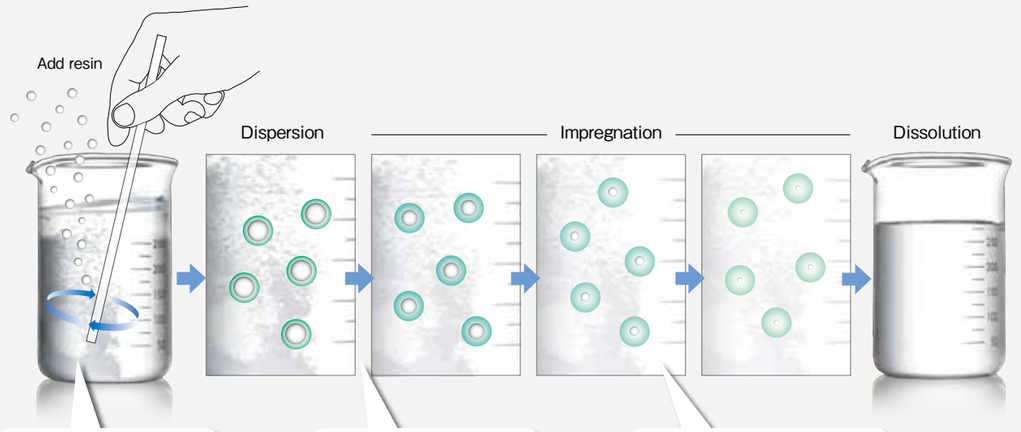
S-LEC B/K dissolves in a wide range of organic solvents, such as alcohols, esters, ketones and aromatic solvents. Although S-LEC dissolves well in a single-component solvent, the use of a mixed solvent tends to further reduce the solution viscosity and minimize the change of viscosity during storage. We recommend mixed solvents, such as alcohol-based solvents, aromatic solvents, ketone-based solvents and ester-based solvents for use with S-LEC.

	Grade	BL-1	BL-2H	BL-5Z	BL-10	BM-1	BM-2(Z)	BM-5(Z)	BH-3(Z)	BH-A	BX-L	BX-5(Z)	KS-6Z	KS-10
Alcohol	Methanol	S	S	I	S	S	S	I	S	S	S	S	S	S
	Ethanol	S	S	S	S	S	S	S	S	S	S	S	I	S
	1-Propanol	S	S	S	S	S	S	S	S	S	S	S	S	S
	2-Propanol	S	S	S	S	S	S	S	PS	S	S	I	I	I
	1-Butanol	S	S	S	S	S	S	S	S	S	S	S	S	S
	1-Octanol	S	S	S	S	S	S	S	PS	S	S	S	I	S
	Ethylene glycol	I	I	I	I	I	I	I	I	I	I	I	I	I
Ketone	Acetone	S	S	S	S	I	S	S	I	S	S	PS	S	S
	Methyl ethyl ketone	S	S	S	S	S	S	S	PS	S	S	S	S	S
	Methyl isobutyl ketone	I	I	S	S	I	I	S	I	S	I	I	I	I
	Cyclohexanone	S	S	S	S	S	S	S	PS	S	S	S	S	S
Amide	Dimethylacetamide	S	S	S	S	S	S	S	S	S	S	S	S	S
	NN,N-Dimethylformamide	S	S	S	S	S	S	S	S	S	S	S	S	S
	N-Methylpyrrolidone	S	S	S	S	S	S	S	S	S	S	S	S	S
Ester	Methyl acetate	I	S	S	S	I	S	S	I	S	S	S	S	S
	Ethyl acetate	I	S	S	S	I	S	S	I	S	PS	S	S	S
	n-Butyl acetate	I	I	S	S	I	I	S	I	S	PS	PS	PS	S
	1,3-Butylene glycol diacetate	I	I	S	S	I	I	S	I	PS	I	PS	PS	S
Ether	1,4-Dioxane	S	S	S	S	S	S	S	PS	S	S	S	S	S
	Tetrahydrofuran	S	S	S	S	S	S	S	S	S	S	S	S	S
Hydrocarbon	Toluene	I	I	S	S	I	I	S	I	I	I	I	I	I
	Xylene	I	I	S	I	I	I	I	I	I	I	I	I	I
	Hexane	I	I	I	I	I	I	I	I	I	I	I	I	I
Others	Ethylcellosolve	S	S	S	S	S	S	S	S	S	S	S	S	S
	Dimethyl sulfoxide	S	S	PS	S	S	S	PS	S	S	S	S	S	S
	Acetic acid	S	S	S	S	S	S	S	S	S	S	S	S	S
	Terpineol	S	S	S	S	S	S	S	PS	S	PS	S	I	S
	Butyl carbitol	S	S	S	S	S	S	S	PS	S	S	S	S	S
	Butyl carbitol acetate	I	PS	S	S	I	I	S	I	PS	I	PS	PS	S

* Resin concentration : 5 wt%
* Solubility: S (Soluble), PS (Partially Soluble), I (Insoluble)

Dissolving method

S-LEC dissolves easier in a solvent when resin is added gradually while being stirred. Although S-LEC dissolves at room temperature, quicker dissolving can be achieved by heating. In that case, however, heating immediately after the addition of resin can result in the formation of blocks. Therefore, heat should be applied after the resin swells sufficiently. Also, pay heed to the volatilization of the solvent during heating.
If a mixed solvent is used, first, let S-LEC swell sufficiently in a solvent in which S-LEC does not dissolve easily (such as an aromatic solvent, ester, ketone or chlorinated hydrocarbon), and then add an alcohol solvent to achieve a better dissolving effect.



Point 1
Disperse the resin uniformly.

1. Increase the stirring speed.
2. Reduce the resin pouring speed.
3. Lower the resin concentration.

Point 2
Do not let the resin precipitate.

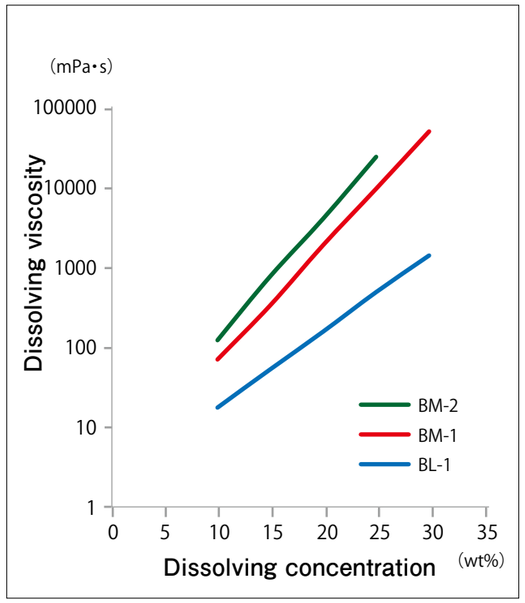
Point 3
Increase the dissolving speed.

1. Increase the dissolving temperature.
2. Increase the stirring speed.
3. Increase the stirring efficiency.

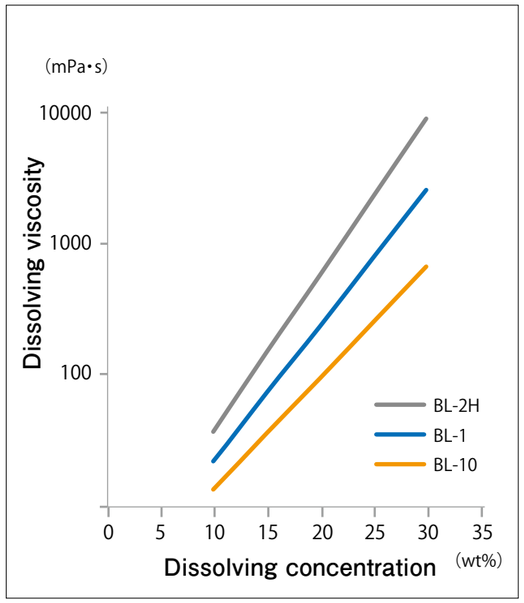
Solution Viscosity

S-LEC is generally dissolved in a solvent for use; thus, the viscosity characteristic of the solution is a very important factor when using S-LEC. The main factors that affect solution viscosity are (1) degree of polymerization and (2) composition. S-LEC tends to form into blocks when it dissolves, so use caution. By adding the resin gradually while stirring the solvent, a better dissolving effect can be achieved..

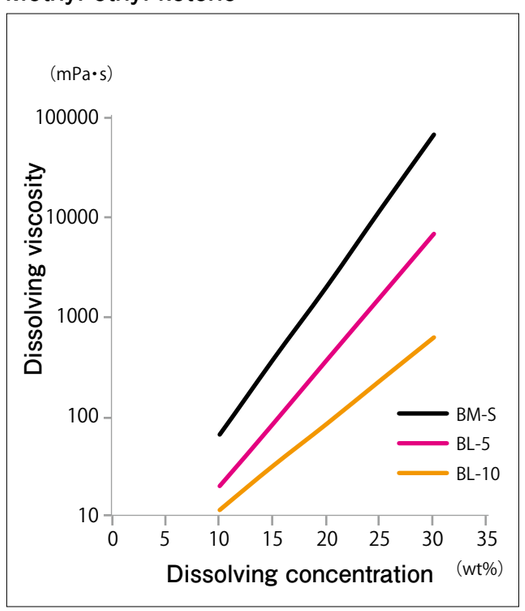
Ethanol/toluene = 1/1



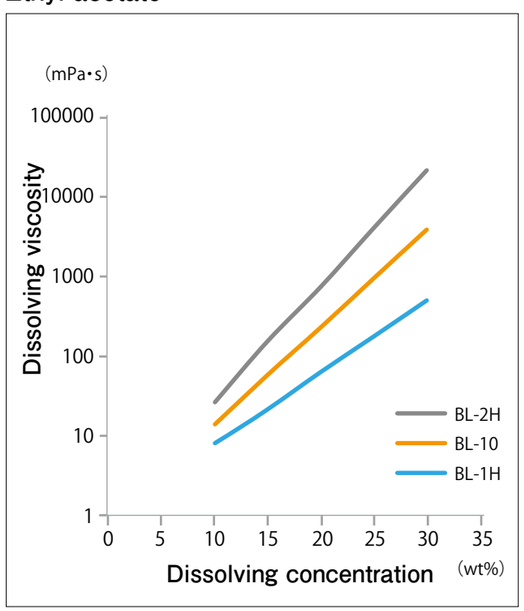
Ethanol



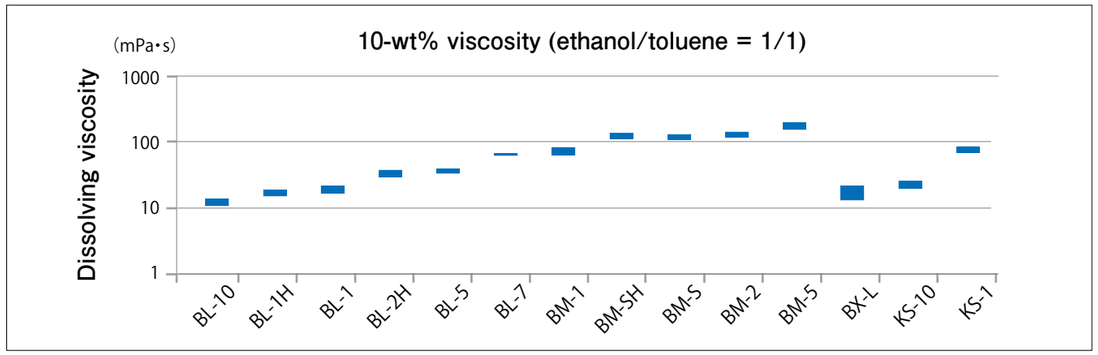
Methyl ethyl ketone

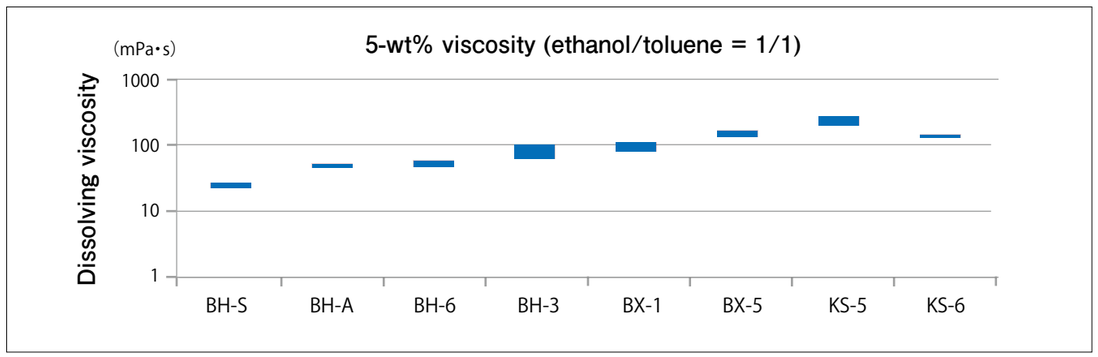


Ethyl acetate

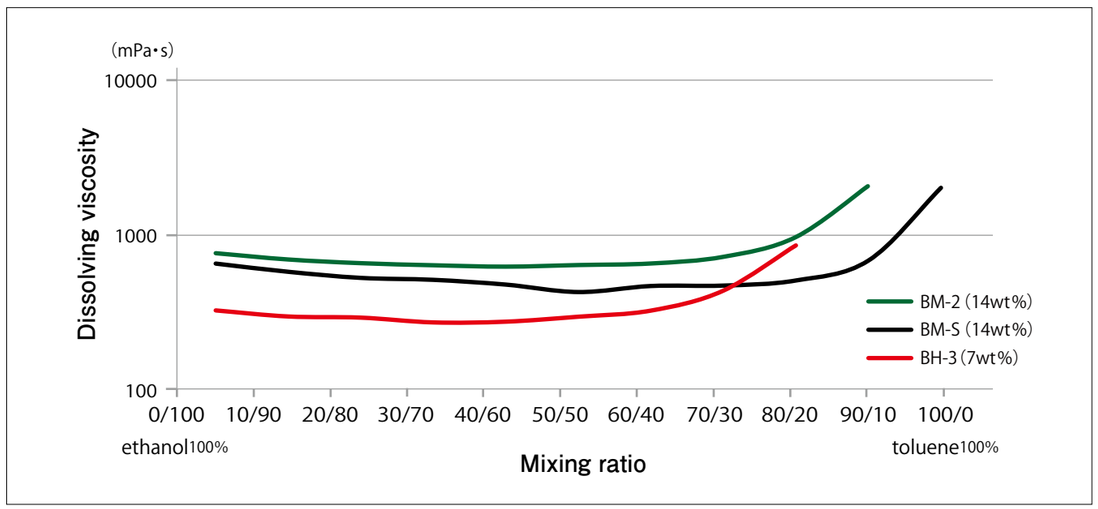


Comparison of solution viscosities of different product grades





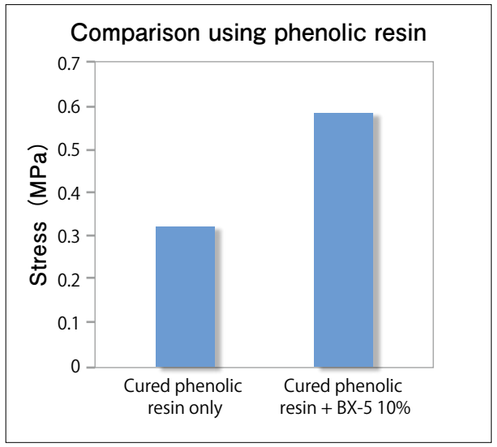
Relationship between ethanol/toluene mixing ratio and solution viscosity

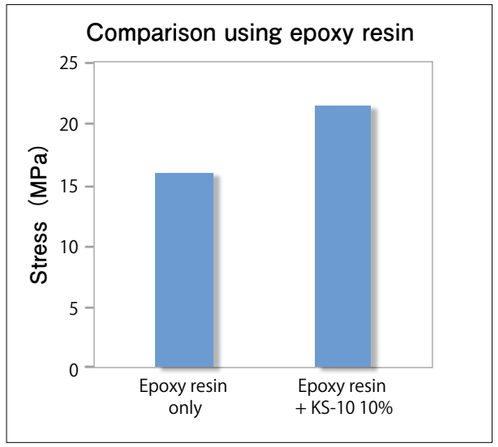


Adhesiveness

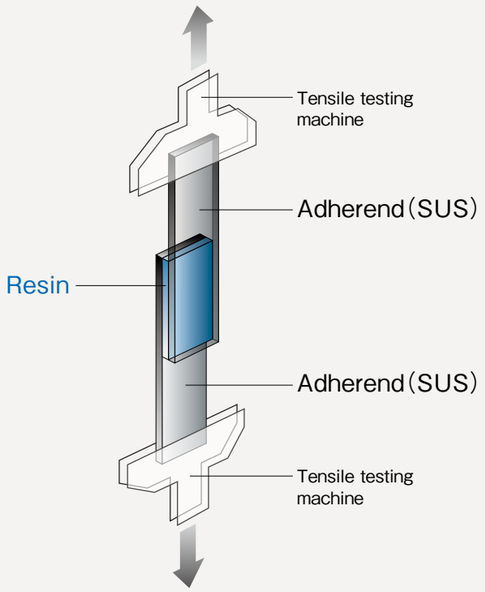
S-LEC can be used to improve the adhesiveness of epoxy resins, phenol resins and other thermosetting resins as well as various other resins. One of the benefits of S-LEC is that only a very small amount of S-LEC is required to produce the effect. S-LEC can increase bonding strength without causing any major change to the characteristics of the main material.

Comparison of adhesive strengths



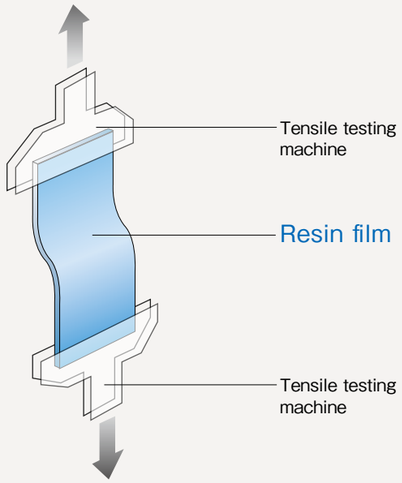


■Bonding strength testing method



Adherends were bonded with the resin, and the bonding strength was measured using a tensile testing machine.

■Strength measuring method

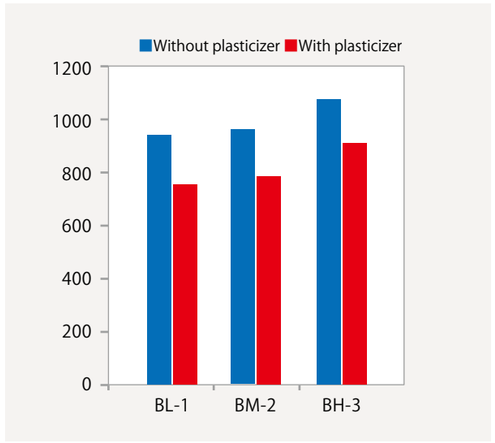


The strength of the resin film was measured using a tensile testing machine.

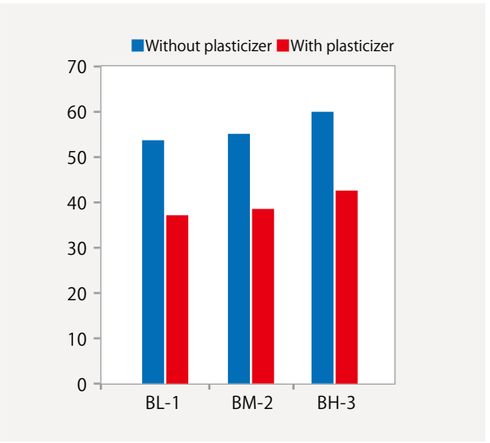
Strength

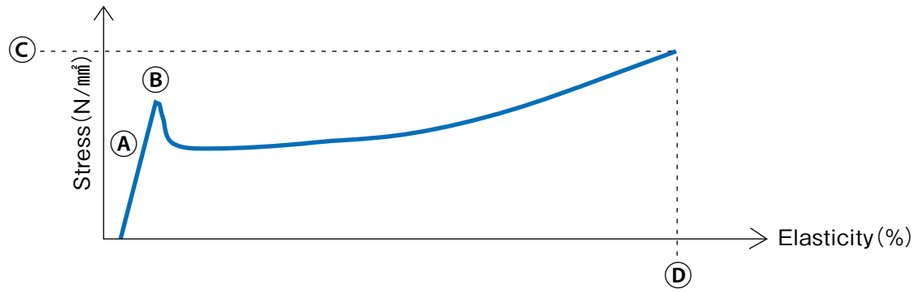
S-LEC boasts excellent film forming properties so it creates tough coating films. The film strength varies depending on the degree of polymerization, degree of acetalization and the type of acetal unit. Addition of a plasticizer results in a flexible coating film.

Ⓐ Modulus of elasticity (MPa)

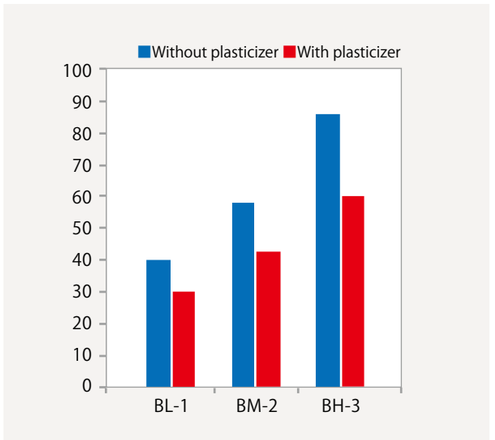


Ⓑ Stress at upper yield point (MPa)

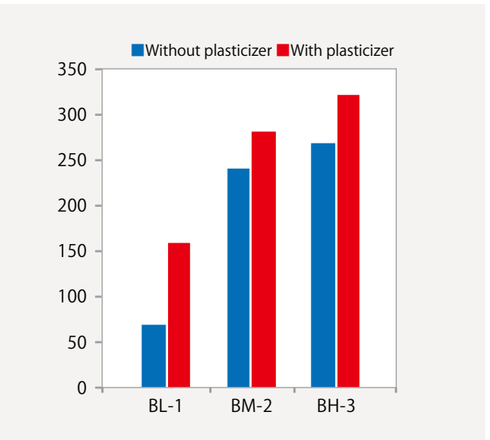




Ⓒ Stress at breaking point (MPa)

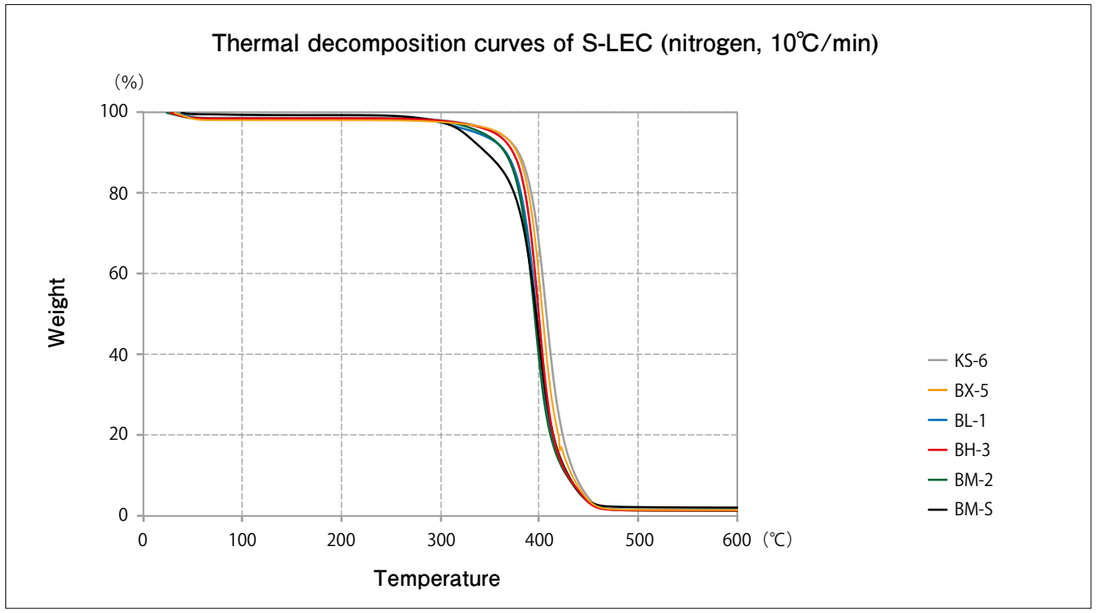


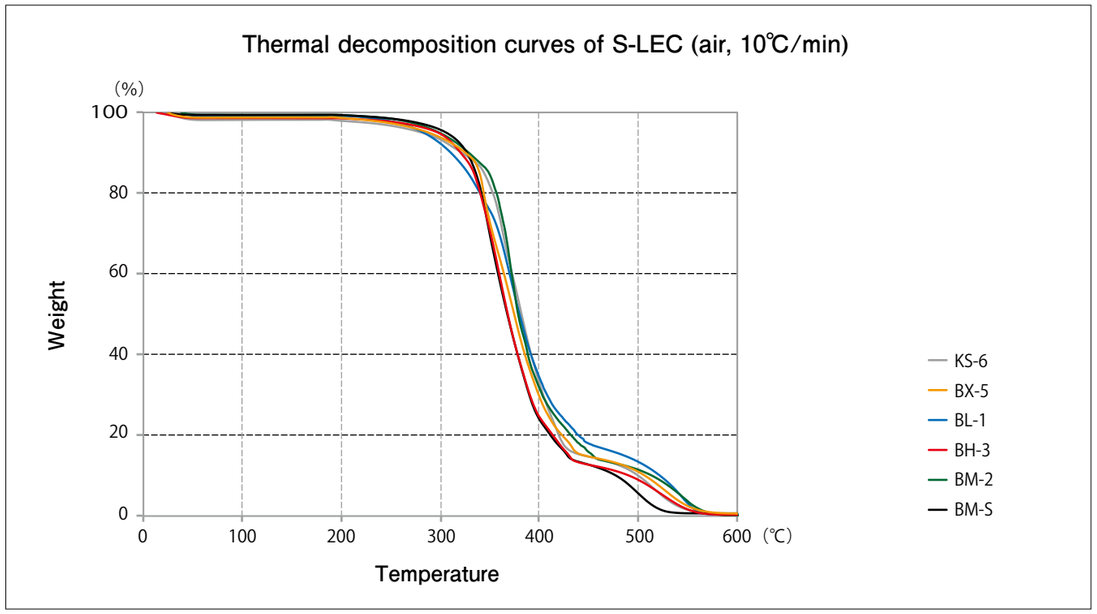
Ⓓ Elasticity at breaking point (%)



Pyrolytic properties

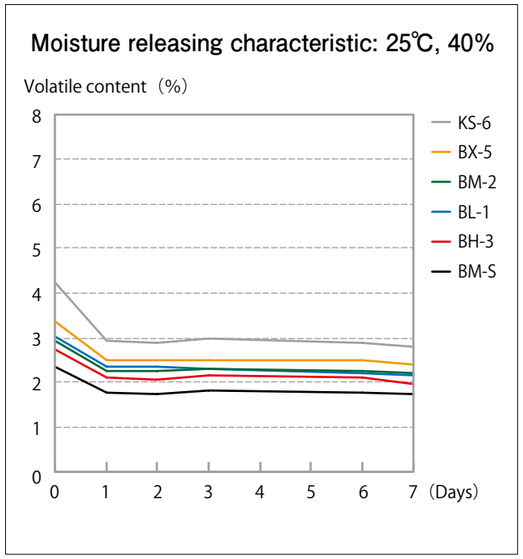
S-LEC decomposes completely at approximately 450℃ under a nitrogen atmosphere and at approximately 550℃ in the air. The following shows the thermal decomposition curves of different product grades.

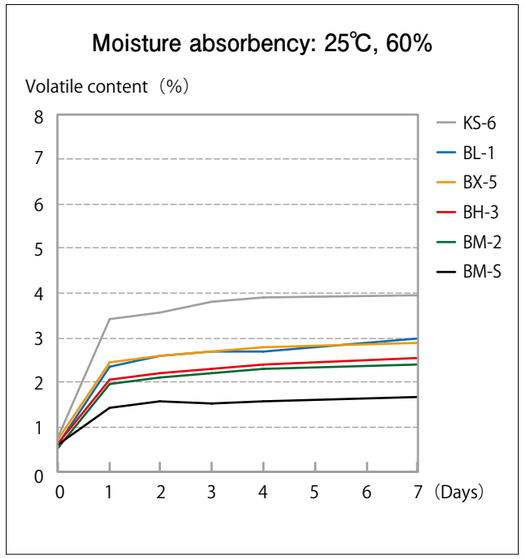


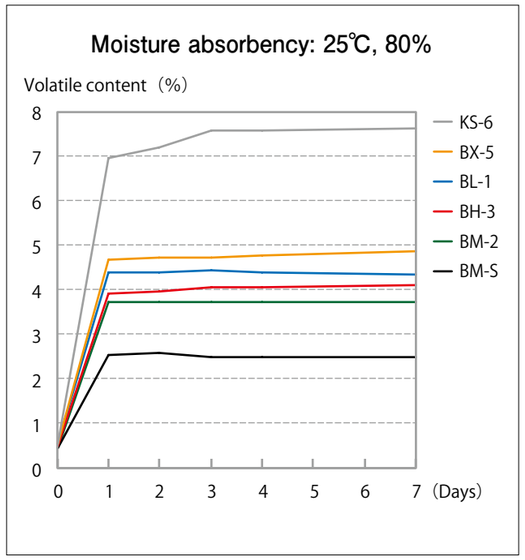


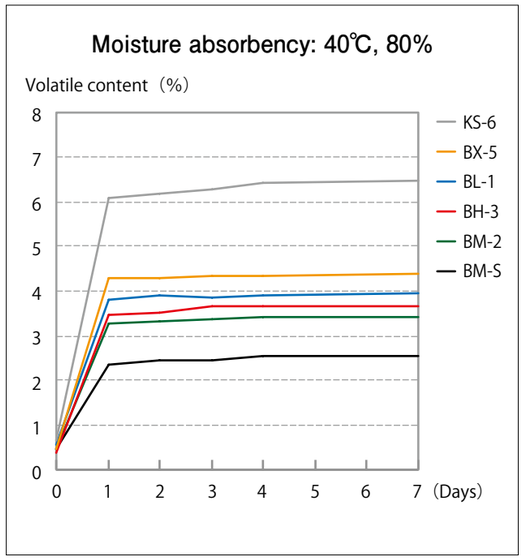
Hygroscopicity

S-LEC absorbs and releases water vapor under certain conditions. Generally, product grades with a larger amount of hydroxyl unit are more moisture-absorbent and absorb a greater amount of water vapor.









1. Safety

	B types	BX/KS types
CAS	No 63148-65-2*	70775-95-0*
EINECS No.	2091833, 2035454	2091833, 2035454
	2046466	2046466, 2008368
GHS	GHS mark not required	
RoHS	Controlled materials not contained	
Halogen	IEC 61249-2-21	
	Less than upper limit	
BGVV	Adapt	—
FDA	175.105 175.300 176.170 176.180	—

Registration status in various countries (as of October 1, 2014)

			B/BX/KS
Australia and Oceania			
	Australia	AIC S	Listed
	New Zealand	N ZIoC	Listed
Asia			
	China	IEC SC	Listed
	Japan	ENCS	Listed
	K orea	ECL	Listed
	Philippines	P ICCS	Listed
	Taiwan		Listed
Europe			
	EU	REACH	Listed
North America			
	Canada	DSL	Listed
	United States	TSCA	Listed

Japanese laws and regulations (as of October 2014)

	B/BX/KS
Chemical Substance Control Law	Class VI, 708
Fire Service Act	Equivalent to designated combustibles (synthetic resins)
Poisonous and Deleterious Substances Control Law	Not applicable
Ordinance on Prevention of Hazards Due to Specified Chemical Substances	Not applicable
Industrial Safety and Health Law	Not applicable

* Designated only in the Japanese versions.

Physical properties of S-LEC B/K

	Property	Unit	Physical value		Measurement method
			S-LEC B	S-LEC K (KS)	
Mechanical properties	True specific gravity	—	1.1	1.1	JIS K-7112
	Refractive index	—	1.48～1.49	1.48 ～ 1.49	ASTM D542
	Elongation	%	5～20	5～20	JIS K-7113
	Modulus of elasticity	10^4kg/ ㎠	1.1～1.4	1.2~1.6	JIS K-7113
	Bending strength	kg/ ㎠	700～750	1000～1200	JIS K-7203
	Flexural modulus	10^4kg/ ㎠	2.2～2.4	3.0～3.3	JIS K-7203
Thermal properties	Specific heat	cal/g・℃	0.44～0.57	0.45	ASTM D2766 (Note1)
	Thermal conductivity	10^{-1}kcal/m.Hr・℃	1.03～1.04	1.03	ASTM C177
Electrical properties	Surface resistance	Ω	10^9～10^{12}	10^9～10^{12}	JIS K-6911
	Volume resistance	Ω・cm	10^{14}～10^{16}	10^{14}～10^{16}	JIS K-6911 (Note2)
	Insulation resistance	Ω	10^8～10^{16}	10^8～10^{16}	JIS K-6911
	Dielectric breakdown voltage	KV	25 以上	25 以上	JIS K-6911
	Dielectric constant 30c/s	—	3.1～4.2	3.1～4.2	JIS K-6911
	Dielectric constant 1000c/s	—	3.1～4.0	3.1～4.0	JIS K-6911
	Dielectric tangent 30c/s	10^{-3}	2.7～7.8	2.7～7.8	JIS K-6911
	Dielectric tangent 1000c/s	10^{-3}	5.0～8.2	5.0～8.2	JIS K-6911

(Note 1) at 100℃
(Note 2) at 30℃, 75% RH
Other than above: at 30℃, 65% RH

Sekisui promises stable quality and responds to a diversity of needs to solve your issues in product development.

Since 1960, Sekisui has been refining the quality of S-LEC by drawing on many years of experience.

Sekisui has been producing S-LEC (polyvinyl acetal resin) continuously since its manufacturing started in 1960 at the Shiga Minakuchi Plant. Production technology accumulated over many years contributes to the manufacture of high-quality products. For example, all factors and properties that determine the product quality, such as minimum quality deviation and low impurity content, are the results of Sekisui technologies and expertise cultivated during a long history of more than a half century.

Minakuchi Factory around the time the company was founded

Armed with a wide product lineup and customization technology, Sekisui provides the most suitable S-LEC products to your company.

Sekisui's continuous product development spanning many years has resulted in a wide-ranging product lineup to respond to a diversity of customer needs. Sekisui S-LEC is available with a broad range of viscosity to meet each customer's product specifications as well as excellent solubility to enable its use with various solvents. Even if you cannot find a product that satisfies your need, we can flexibly customize S-LEC according to your requirements using our original design technology. For further information, please contact our company

S-LEC

Comprehensive technical capabilities in a variety of fields enable Sekisui to make proposals others can't.

Sekisui conducts business in three fields -- housing, urban infrastructure and environmental products, and high-performance plastics. S-LEC was developed based on our extensive technologies and experience accumulated through our business in those wide-ranging fields. S-LEC's functions and quality have been acclaimed by many customers in the long history of more than 60 years. In order to supply high-value-added products to many more customers, we continue to polish our technologies and improve product quality. With the aim of making greater contributions to technological innovations in a broad range of business fields around the world, we promote further development of new applications. If you feel that S-LEC can be useful in your product development, please contact Sekisui.

High-performance plastics business

Environmental and lifeline business

Housing business

SEKISUI CHEMICAL CO., LTD.

HIGH-PERFORMANCE PLASTICS COMPANY
SPECIALTY CHEMICALS DIVISION

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