PCC GROUP

Silane Terminated Polyether Polymer

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- STP Polymer Introduction
- Typical Products
- Advantages of STP Polymer
- Market Status

PCC GROUP

- PCC is the first manufacturer of silane terminated polyether(STP) polymers in China.
- The customers we target are the sealant, adhesive and surface coating manufacturers who wish to replace the polyurethane and silicone products with the safer and in many cases easier to make silane crosslinked products.
- The elimination of free NCO, residual TDI and MDI monomer is essential to protect ourselves and the environment from hazardous chemicals.
- Our technical Group have many years of experience and professional research in STP resin, we can provide technical support and furmula suggestions to help our cilents with unique sealants and adhesives.

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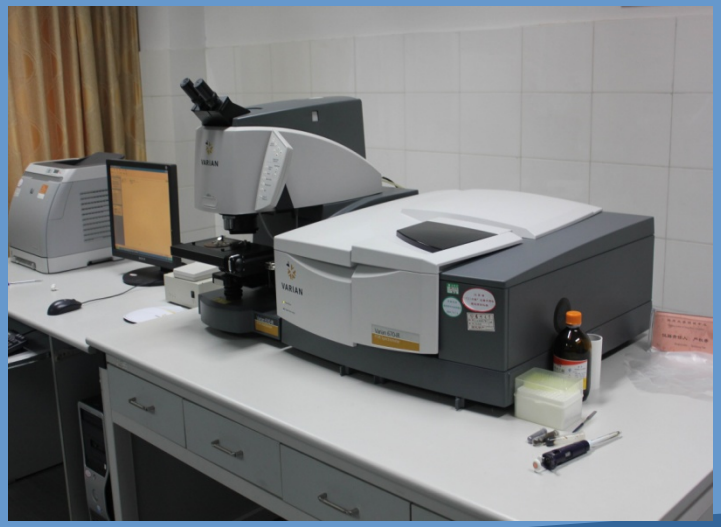
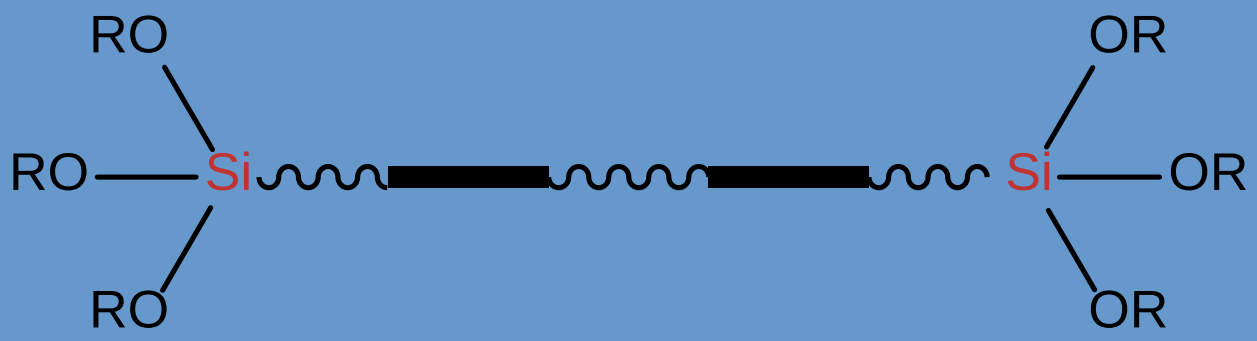
Production

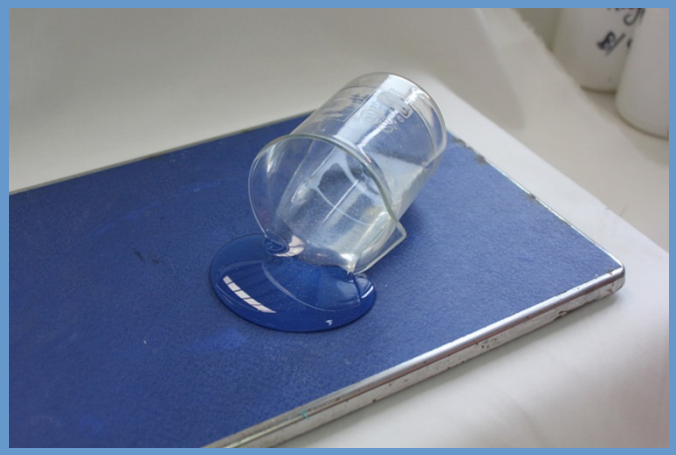


Structure of Silane Modified Polyether

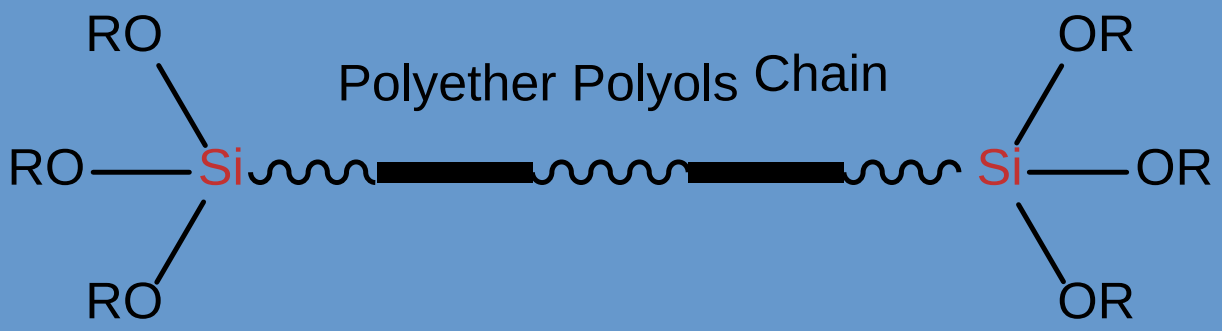


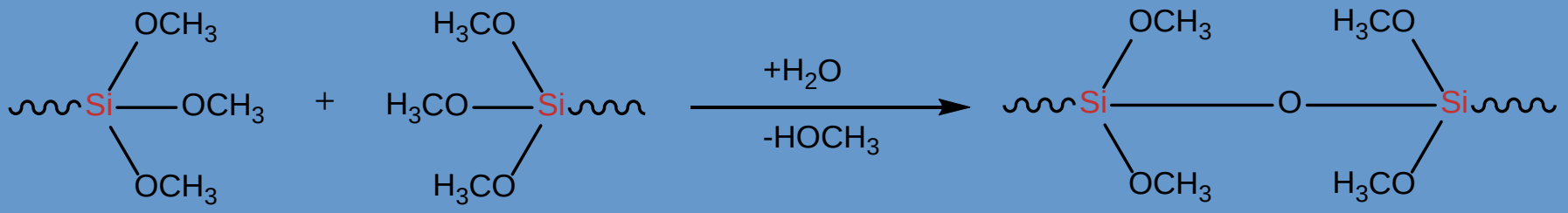
- The middle section of the Polymer is Polyether Polyols which provides the basic physical properties;
- The active groups of both end are terminated by siloxane coupling agent which provides the basic adhesion propeties.

STP POLYMERS are based on the new generation polyether polyols, that are the same used for PU sealants and capped with reactive silanes that are the same as used by silicone sealants, and this is where the Hybird Sealants come from.

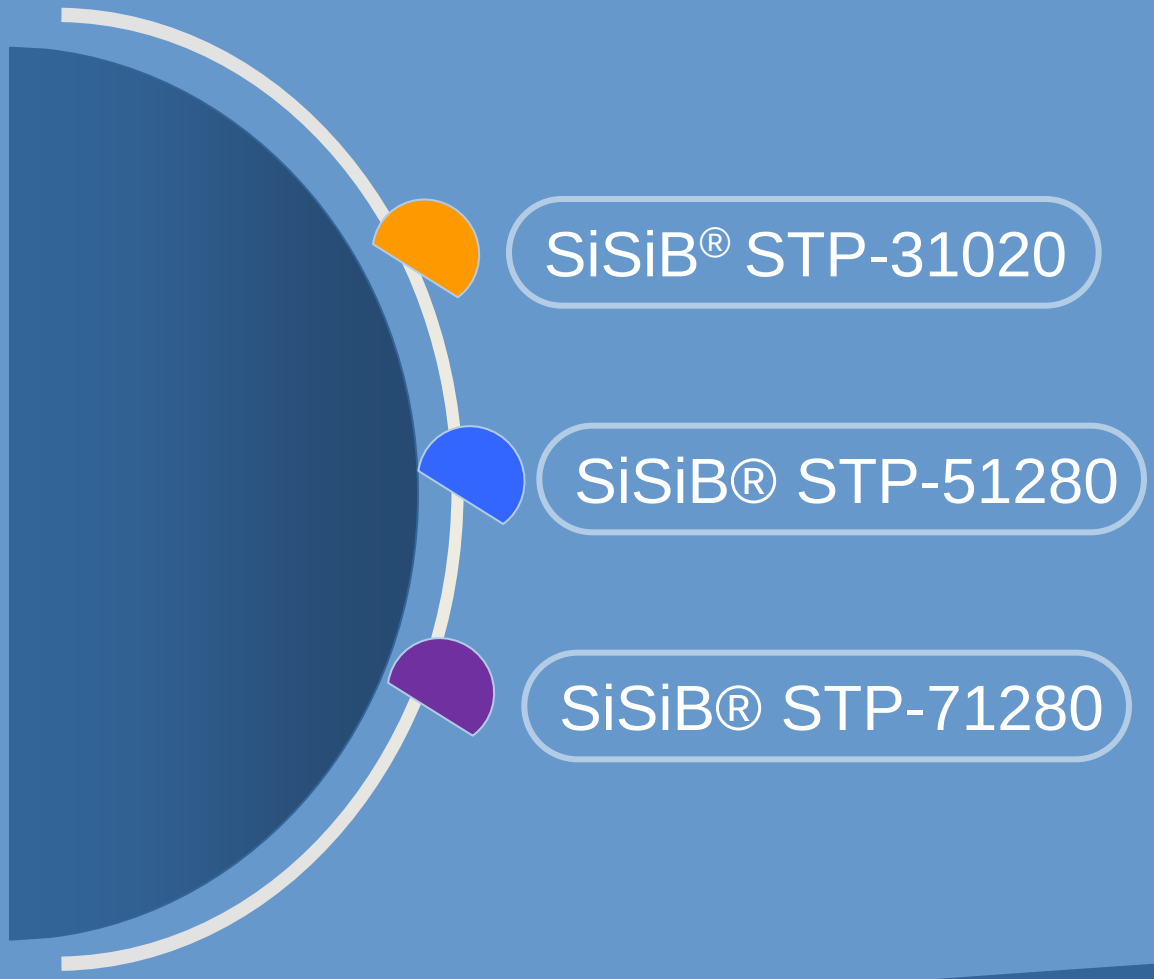


Polymer's Curing Mechanism





Typical Products



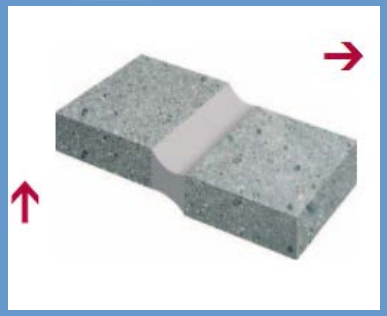
SiSiB® STP-31020 in Construction Application

Properties:

- Based on 20000-25000MW polyether
- Trimethoxysilane capped
- Viscosity is 36000-42000mPa.s at 25°C
- 0.5-1.0% organic tin catalyst or tin-free catalyst
- Sealants Shore A hardness 30-45
- Sealants tensile strength 1.0-1.5MPa
- Sealants elongation at break 400-600%
- Polymer specific gravity 1.005
- CAS No.:216597-12-5

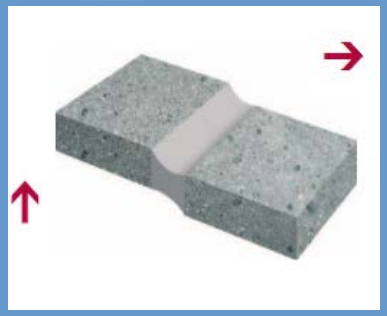
The parameters listed above is based on our lab starting formulation.
Sealant properties may vary due to different formulations.

SiSiB® STP-31020 Basic Formulation for White Colour Sealant



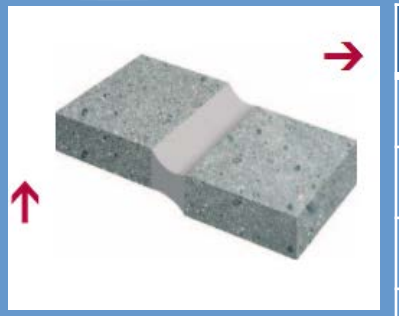
Item		Parts by weight
Polymer	SiSiB® STP-31020	32%
Plasticiser	DIDP	12%
Filler	PCC	38.25%
Filler	GCC	14%
Drying Agent	SiSiB® PC6110	1.2%
Silane Coupling Agent	SiSiB® PC1200	0.4%
Catalyst	PowerCat™ DBTDL	0.15%

SiSiB® STP-31020 Based White Colour Sealant Properties



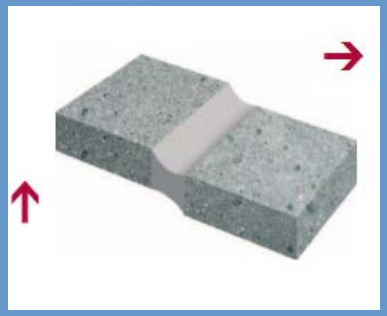
Item		Results
Hardness	Shore A	42
Tensile Strength	Mpa	2.4
100% Strength	Mpa	0.8
Elongation	%	570
Tack Free Time	Min	15

SiSiB® STP-31020 Formulation for Construction Sealants



Item		Parts by weight
Polymer	SiSiB® STP-31020	100
Plasticiser	DIDP or 2000MW Diol	70
Filler	Omyacarb 2T	170
Pigment	TiO2	20
Drying Agent	SiSiB® PC6110	5
Thixotropic Agent	Aerosil R 972	10
Stabilizer and UV inhibitor	PowerStab™ 292 PowerNox™ 1076	2
Adhesion Promotor	SiSiB® PC1200	2
Catalyst	DBTDL or DOTL	0.5

SiSiB® STP-31020 Based Construction Sealants Properties



Item		Results
Hardness	Shore A	34
Tensile Strength	Mpa	1.2
Elongation	%	320
Tack Free Time	Min	60

Applications of Sealants Based on SiSiB® STP-31020

Stones

Wooden Flooring

Sports Ground Floors

Sauna Rooms

Advantages of Sealants Based on SiSiB® STP-31020

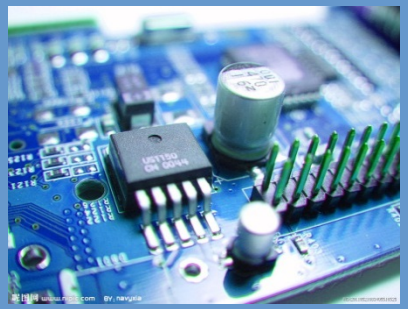
- Low viscosity
- Good adhesion to damp or dry, porous and non-porous substrates
- Primerless adhesion to different substrates like aluminum, glass and concreat
- No isocyanate or solvent
- Low modulus even at low temperature
- High tear resistance
- Bubble free Curing
- Excellent weatherability and UV resistance with no chalking
- High colour stability and paintability
- Resistance to cleaning procedures
- Good dust and pollution resistance
- Can make transparent sealants

SiSiB® STP-51280 in Industrial Application-Parameter

- Based on 10000-15000MW polyether
- Dimethoxy and Triethoxy silane capped
- Viscosity is 28000-32000mPa.s at 25°C
- Catalyze with Tib Kat 226(KRA-1) type tin diketonate catalyst combined with a secondary amino silane such as SiSiB PC1200
- Sealants Shore A hardness 40-65
- Sealants tensile strength 3.4-6.0MPa
- Sealants elongation at break 150-300%
- Polymer specific gravity 1.005
- CAS No.: 1497417-11-4

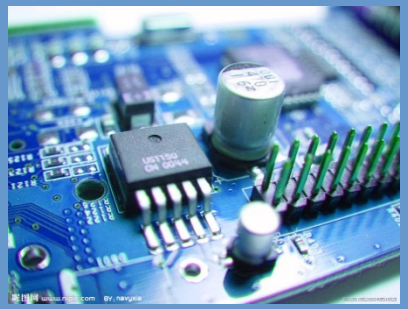
The parameters listed above is based on our lab starting formulation. Sealant properties may vary due to different formulations.

SiSiB® STP-51280 Basic Formulation for White Colour Sealant



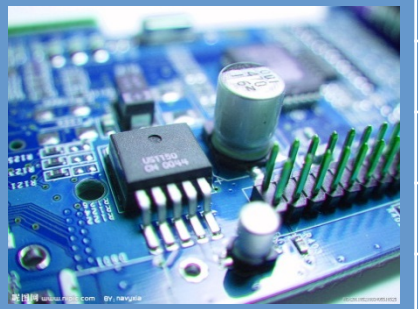
Item		Parts by weight
Polymer	12000DS	37%
Plasticiser	DINP	6%
Filler	PCC	54%
Drying Agent	SiSiB® PC6110	1.5%
Silane Coupling Agent	SiSiB® PC1200	0.7%
Thixotropic Agent	Aerosil R 972	0.2%
Stabilizer	PowerStab™ 292	0.2%
Catalyst	KRA-1	0.4%

SiSiB® STP-51280 Based White Colour Sealant Properties



Item		Results
Hardness	Shore A	57
Tensile Strength	Mpa	3.2
100% Strength	Mpa	0.77
Elongation	%	550
Tack Free Time	Min	20

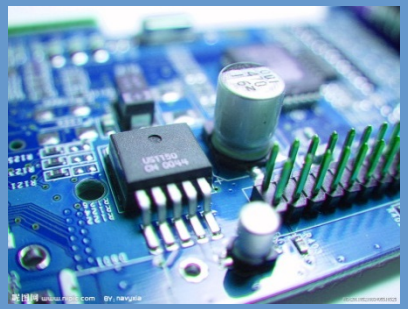
SiSiB® STP-51280 Based Industral Adhesive (Black) Formulation



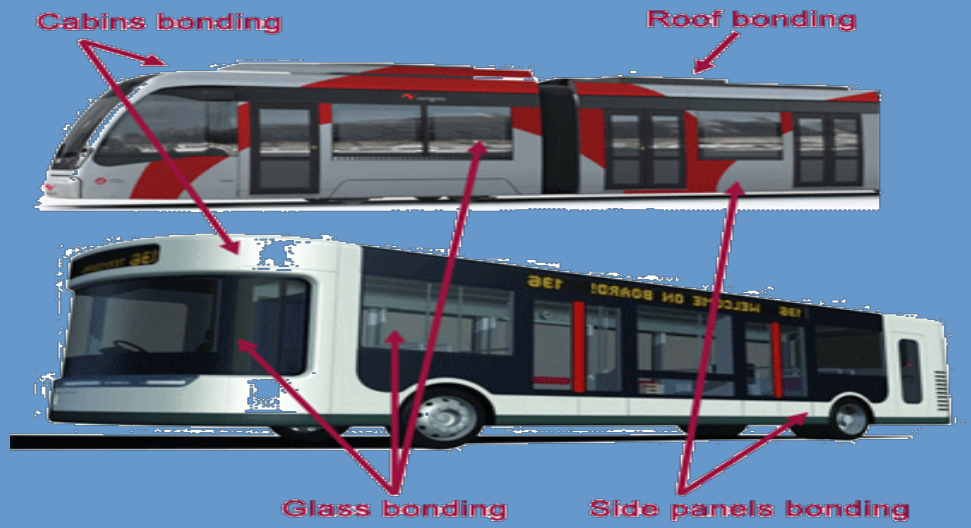
Item		Parts by weight
Polymer	SiSiB® STP51280	1800
Reinforcing filler	Precipitated calcium	1800
Pigment	Carbon black or titanium	120
Chemical drier	SiSiB® PC6110	30
Antioxidant	PowerNox™ 1076	15
Thixotropic Agent	Polyamide wax or urea	10
UV inhibitor	PowerStab™ 292	15
Adhesion Promotor	SiSiB® PC1200	20
Catalyst	dibutyl tin diacetylacetonate, KRA-1	20
Moisture scavenger	SiSiB® PC6110	20

SiSiB® STP-51280 Based Industral Adhesive (Black) Properties

Item		Results
Hardness	Shore A	55
Tensile Strength	Mpa	3.2
Elongation	%	250
Tack Free Time	Min	10



Applications of Sealants Based on SiSiB® STP-51280



Advantages of Sealants Based on SiSiB® STP-51280

- No isocyanates and solvents
- Curing speed can be adjusted
- Bubble free curing at normal temperature & humidity
- Excellent weatherability, UV resistance and chemical resistance
- Excellent adhesion to different substances as glass, cement, metal, wood,etc.
- Sealants can be thickened with cheaper urea thickeners as carbon black, polyamide wax, etc.

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SiSiB® STP71280

- Based on 10000-15000MW polyether
- Dimethoxy and Triethoxy silane capped
- Viscosity is 7000-10000mPa.s at 25°C
- Catalyze with Tib Kat 226(KRA-1) type tin diketonate catalyst combined with a secondary amino silane such as SiSiB® PC1200
- Sealants Shore A hardness 45-65
- Sealants tensile strength 1.9-3.0MPa
- Sealants elongation at break 200-340%
- Polymer specific gravity 1.005
- CAS No.: 1497417-11-4

The parameters listed above is based on our lab starting formulation.
Sealant properties may vary due to different formulations.

SiSiB® STP-71280 Formulation for Industral Adhesive With High Hardness

Item		Parts by weight
Polymer	120K	30%
Filler	PCC	69%
Drying Agent	SiSiB® PC6110	0.4%
Silane Coupling Agent	SiSiB® PC1200	0.25%
Catalyst	KRA-1	0.35%

SiSiB® STP-71280 Based Industral Adhesive With High Hardness Properties

Item		Results
Hardness	Shore A	75
Tensile Strength	Mpa	2.9
100% Strength	Mpa	2.9
Elongation	%	102
Tack Free Time	Min	20

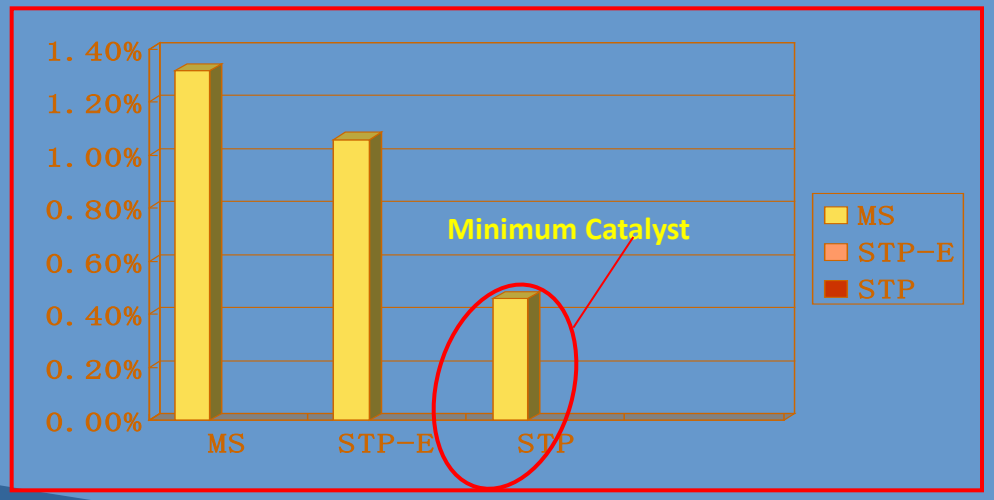
Advantages of Sealants Based on SiSiB® STP-71280

- Low viscosity and easy processing
- Low activity, good storage stability
- Easy to make sealant with higher hardness
- Paintability
- Primer-less
- Strong adhesion strength
- Excellent adhesion to different substances
- Eco-friendly, solvent free, no VOC, no isocyanates

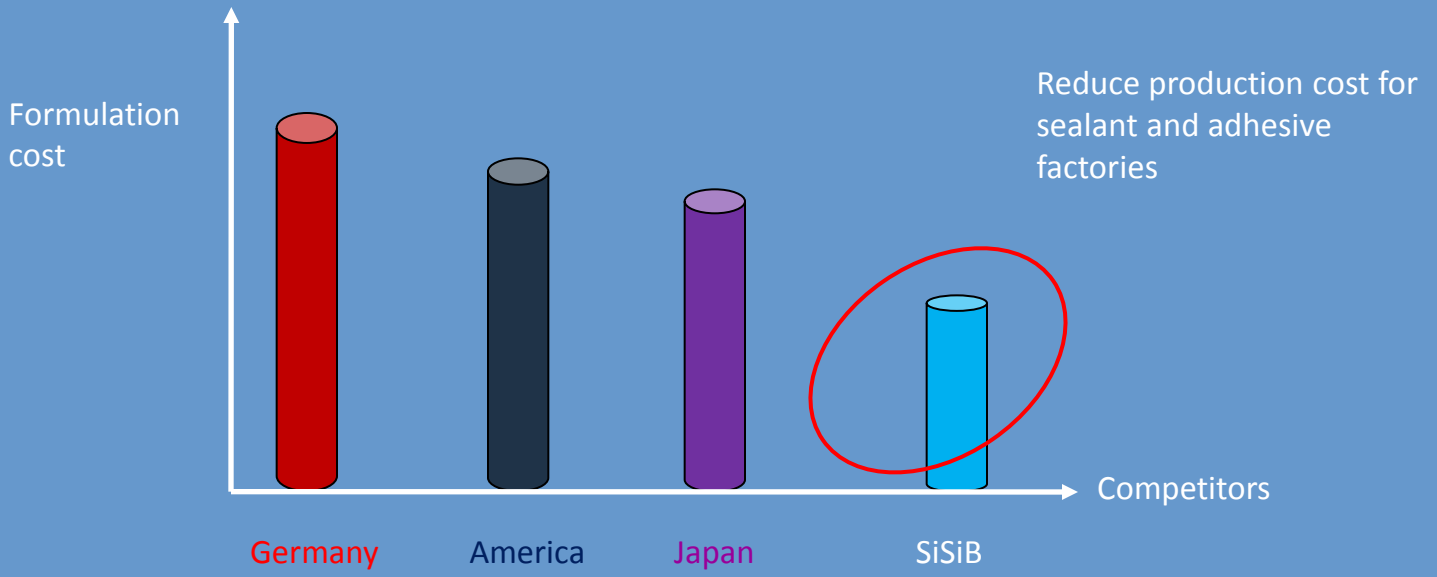
Advantages of STP Polymer

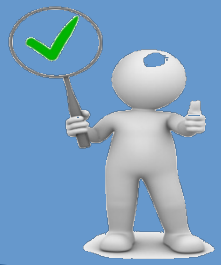
1.Free NCO and solvent as TDI/MDI, safe and environmental friendly

2.Only a little tin catalyst or none, safe and environmental friendly



3.Cost advantage of sealant formulations

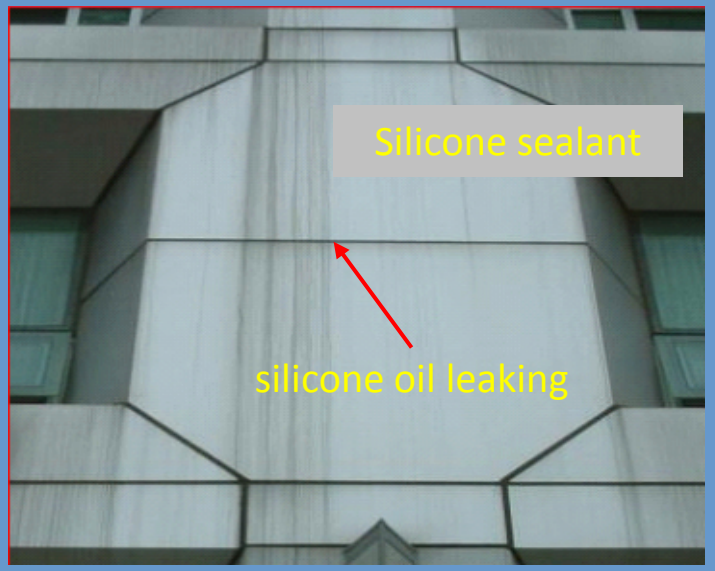




Compared with other modified silane polymers, using SiSiB STP polymer, we can add more plasticizer and reduce resin itself in the formulations to lower the cost for factories.

Advantages of STP Polymer

4. Good weather resistance, excellent UV & chemical resistance
5. Fast curing and unlike PU, no bubble generated
6.No surface tack or leaking on constrction exterior



7. Adhesion to alumium primerless and paintablity

no primer

paint with any color

8.Excellent Physical properties and strong adhesion

STP Sealants' basic good physical adhesion

STP Sealants Shore A hardness 20- 60

STP Sealants tensile strenght 1.0-6.0Mpa

STP Sealants elongation at break 200%-600%

Construction

Household

Industrial

Coating

Market Status

- As we know that MS Polymer was first lanuched in Japan and therefor it conquered the largest share in Japanese market(more than 55%-60%). For America and European countries, Silicone sealants and PU sealants are still the best sellers, but MS sealants market is in the rapid growth.
- Nowadays, in Asia, MS sealants are just making its debut, the polymers used for MS sealants are mainly imported from Japan. But PCC is changing the situation. Thanks to the excellent adhesion and environmentally sound, STP sealants will take more market occupied by Silicone sealant and PU sealants as they both pollute the environment and have adhesion problems.
- In the meanwhile, western countries have realized the huge advantage and its potential of increasing market share. Asian market will inevitably integrate with global market, and STP sealant will take more than 30% market share in the near future.
- In summary, STP Polymer is very promising and will lead the trend of the sealant market.

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Thank you!

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a part of PCC GROUP

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