STP

Silane Terminated Polyether Polymer

SiSiB SILICONES – A part of SINOPCC group.

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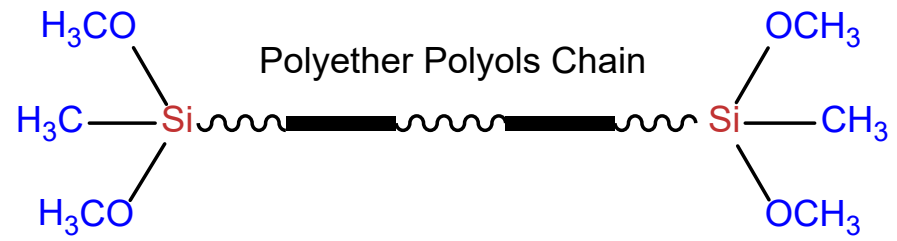
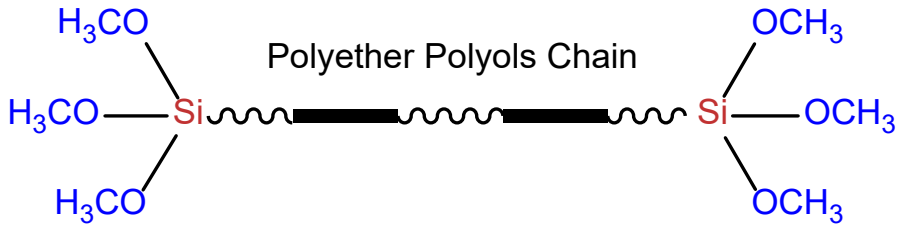
STP - Silane Terminated Polyether

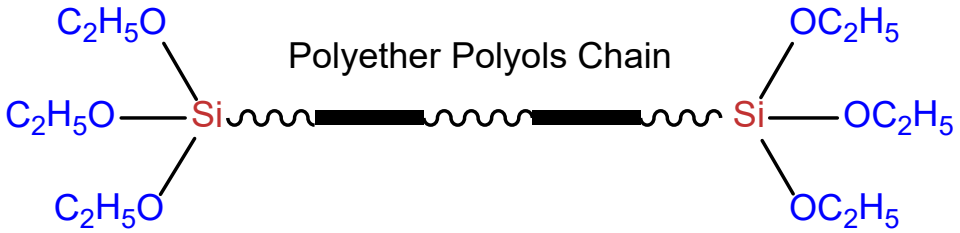
- STP Polymer Introduction
  - Properties of STP
  - STP Curing Mechanism
  - Advantage of STP Sealant
  - STP Sealant Production Process

- Our Typical STP Polymer and Sealant Formulation
  - SiSiB® STP-31020
  - SiSiB® STP-51280
  - SiSiB® STP-71280

Structure of Silane Terminated Polyether



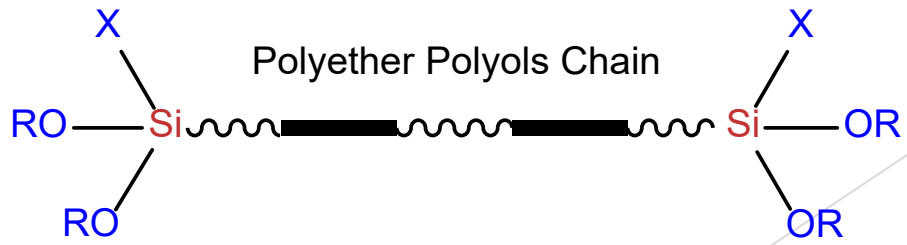




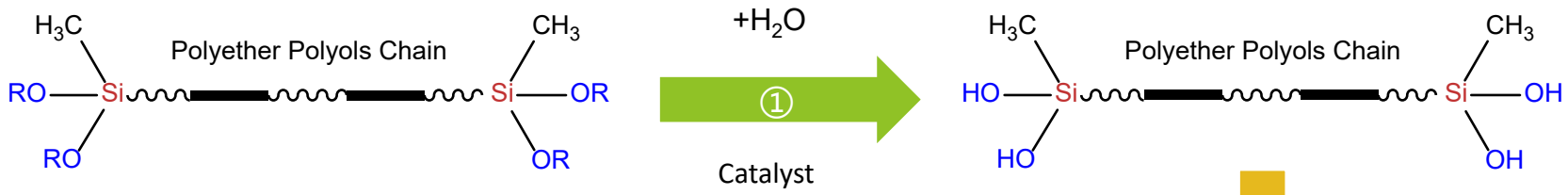
- X: OR / CH_3
- STP Polyether Polymers are endblocked with either di- or trialkoxysilyl groups, depending on the type of endblocking reaction used.
- The alkoxy functionality in a trialkoxysilyl group is more reactive than in the di-substituted group, and methoxy groups are more reactive than ethoxy groups.

Properties of Silane Terminated Polyether

- Polyether backbone provides low viscosity, low Tg, flexibility over a wide temperature range.
- Good compatibility with various additives.
- Low color and odor.
- Can be used to produce versatile sealants and adhesives.
- Linear STP polymers produce very soft, low modulus sealant with superior workability and adhesion.
- Slightly branched structures provide a higher modulus, with fast and uniform cure.
- Active silane functional group provide superior adhesion to a wide variety of materials without primer.
- Good storage stability without catalyst and water.
- Excellent elastic behavior and durability.
- Great mechanical properties.
- Fast moisture cure with no bubbling.

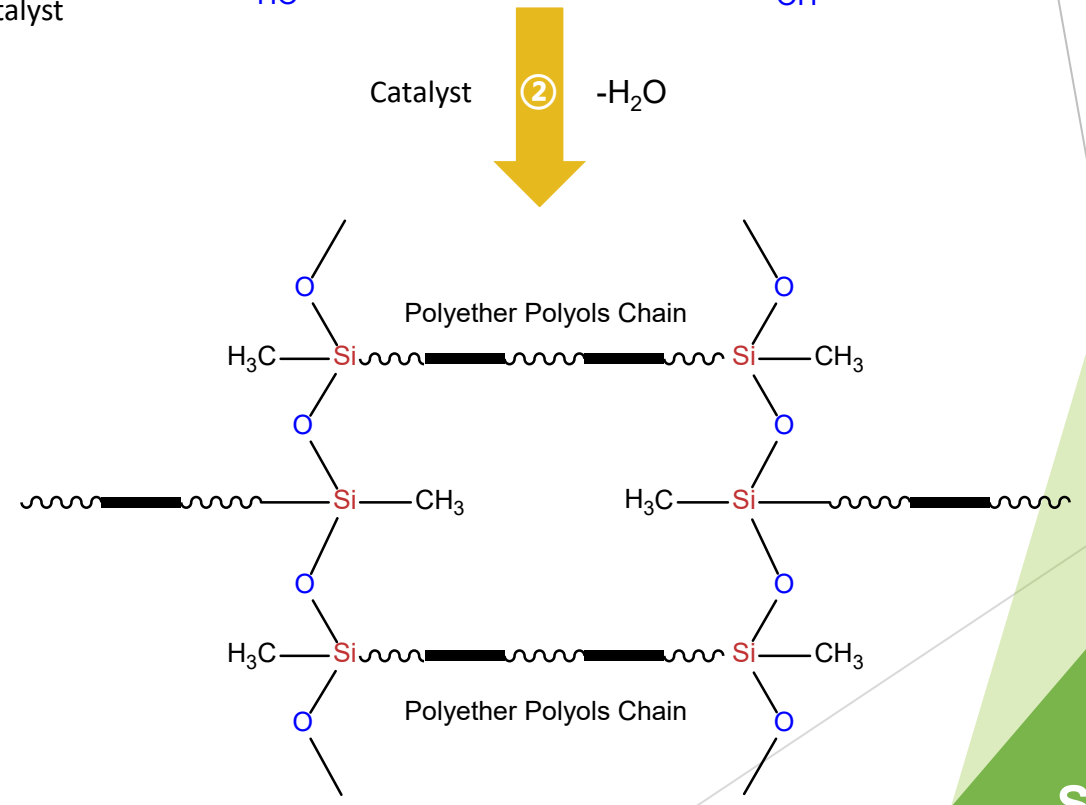


STP Curing Mechanism

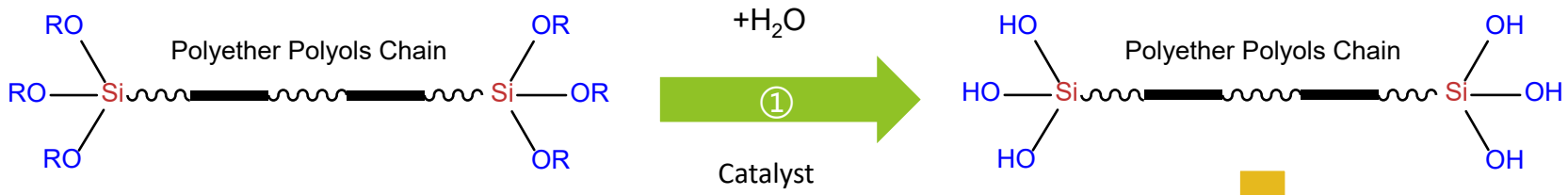


① Hydrolysis of alkoxysilyl with moisture in environment and initiated by catalyst, to form silanol group.

② Condensation of silanol with other silanol or alkoxysilyl groups to form a crosslinked structure.



STP Curing Mechanism



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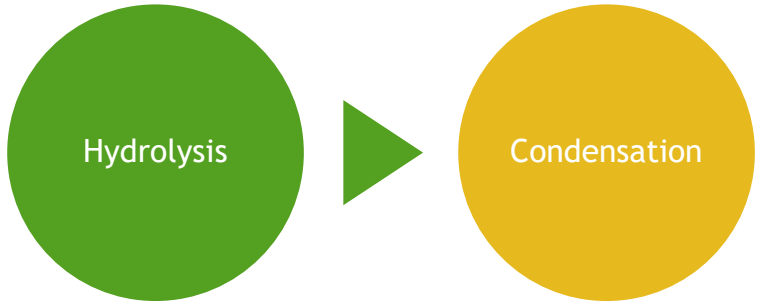
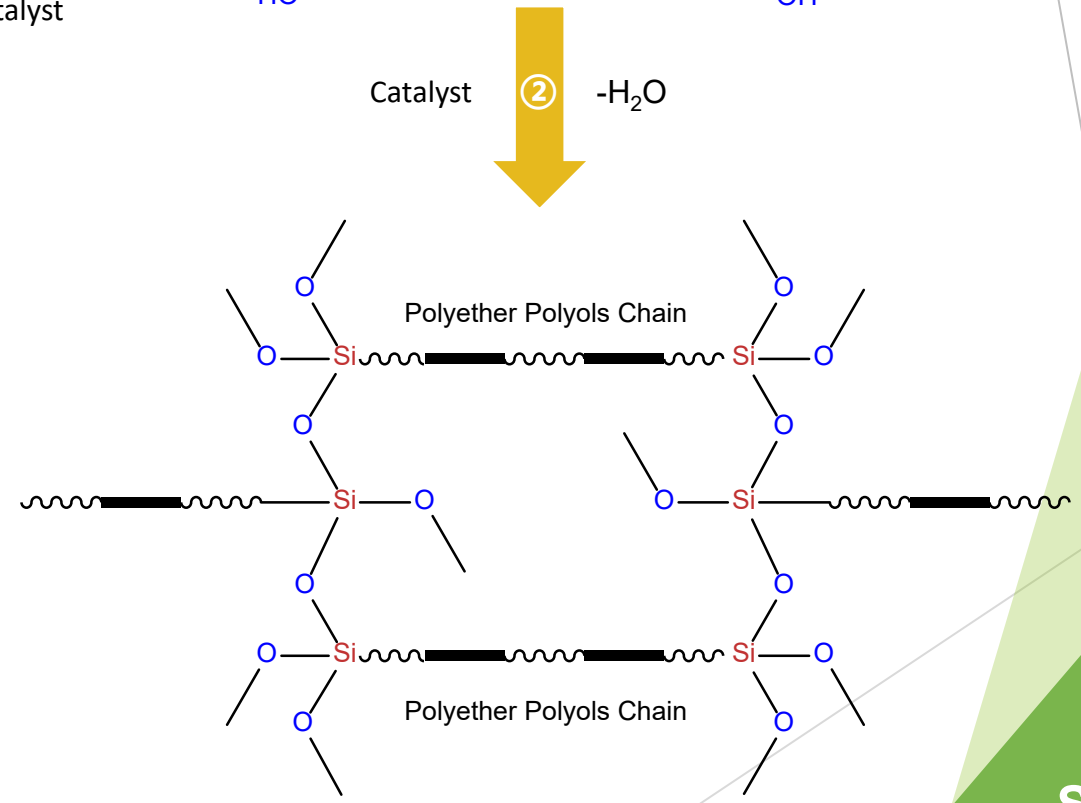


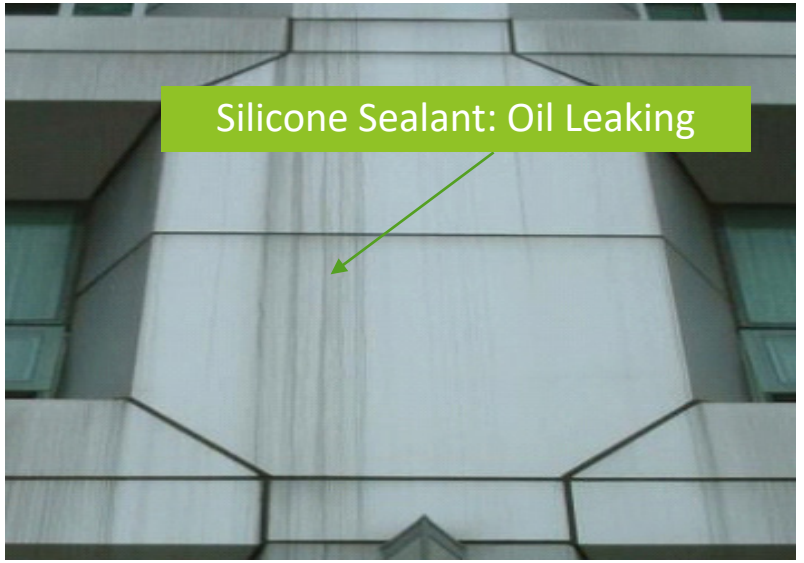


Advantage of STP Adhesive / Sealant

- Superior Durability
- High Elasticity
- Good Adhesion
- Good Paint Ability
- Non-stone Staining
- Quick Cure

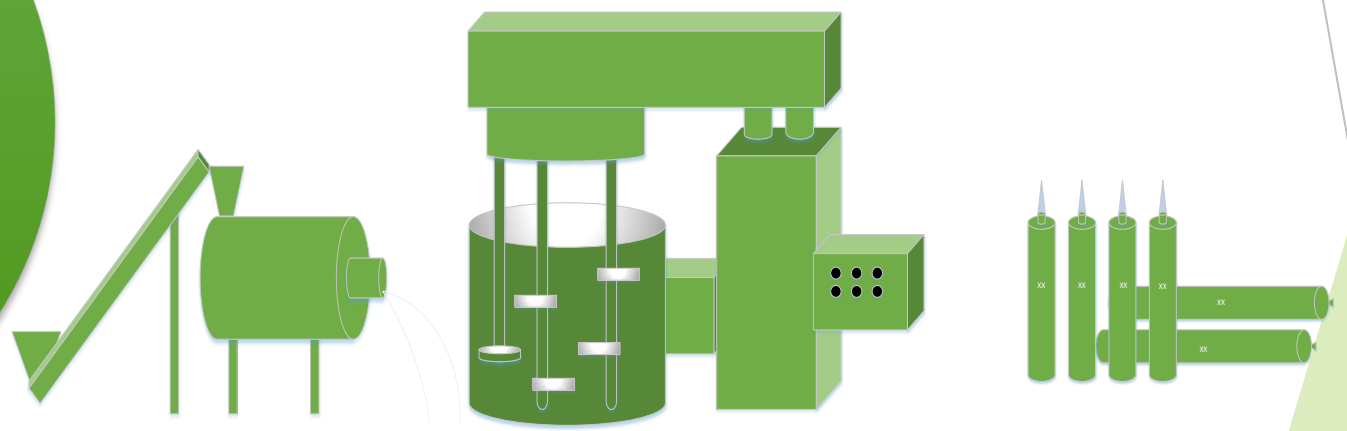
- Easy Handling
- Non-isocyanate
- Solvent Free
- Low VOC
- Low Odor
- Non-Corrosive

Advantage of STP Adhesive / Sealant --- Non-stone Staining



STP Sealant Production Process

- STP Polymer
- Filler
- Plasticizer
- Thixotropic Agents
- Light Stabilizer
- Pigment
- Dehydrator
- Adhesion Promoter
- Catalyst



Raw Materials → Pre-Dry → Mixing → Packaging

STP

Silane Terminated Polyether Polymer

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STP

- SINOPCC is the 1st manufacturer of Silane Terminated Polyether(STP) polymers in China.
- Our target customers 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.

STP

PRODUCTION

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Typical Products

SiSiB® STP-31020	SiSiB® STP-51280	SiSiB® STP-71280
32,000-42,000cSt	18,000-22,000cSt	7,000 - 10,000cSt
Low to medium modulus	Medium to high modulus	High modulus

SiSiB® STP-31020

- CAS No.: 216597-12-5
- Based on 20,000-25,000MW polyether
- Trimethoxysilane capped
- Viscosity is 32,000-42,000 mPa.s at 25°C
- 0.5-1.0% organic tin catalyst or tin-free catalyst
- Balanced tensile strength and elongation at break

Construction Sealant Formulation

SiSiB®
STP-31020

	Item		Parts by weight
Formulation	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
	UV Stabilizer	PowerStab™ 292	2
	Antioxidant	PowerNox™ 1076	
	Adhesion Promotor	SiSiB® PC1200	2
	Catalyst	DBTDL or DOTL	0.5
Properties	Hardness	Shore A	34
	Tensile Strength	Mpa	1.2
	Elongation	%	320
	Tack Free Time	Min	60

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Application of STP-31020

- Gap filling
- Waterproofing
- Glazing

- Window bonding
- Doorframe sealing

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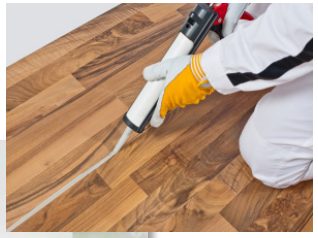
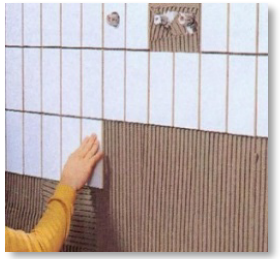
Application of STP-31200



- Parquet adhesive
- Floor sealing
- Consumer DIY



- Ceramic tile bonding
- Shower-room Sealing

SiSiB SILICONES

SiSiB® STP-51280

- CAS No.: 1497417-11-4
- 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
- Polymer specific gravity 1.005

Industrial Sealant Formulation

SiSiB®
STP-51280

	Item		Parts by weight
Formulation	Polymer	SiSiB® STP-51280	37%
	Plasticiser	Diisononyl phthalate (DINP)	6%
	Filler	Precipitated Calcium Carbonate (PCC)	54%
	Drying Agent	SiSiB® PC6110	1.5%
	Adhesion Promoter	SiSiB® PC1200	0.7%
	Thixotropic Agent	Aerosil R 972	0.2%
	Stabilizer	PowerStab™ 292	0.2%
	Catalyst	KRA-1 Dibutyl tin diacetylacetonate	0.4%
Properties	Hardness	Shore A	57
	Tensile Strength	Mpa	3.2
	100% Strength	Mpa	0.77
	Elongation	%	550
	Tack Free Time	Min	20

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Applications of STP-51280

- Automotive Interior Decoration
- Welding Joint Sealing
- Car Glass & Rubber Strips Bonding and Sealing

- Car Plastic Flooring Bonding
- Electronic Components, Filter Elements Bonding
- Car Lighting Bonding

SiSiB® STP-71280

- CAS No.: 1497417-11-4
- Based on 10,000-15,000MW polyether
- Dimethoxy and Triethoxy silane capped
- Viscosity is 7,000-10,000 mPa.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
- Better tensile strength and good elongation at break

Typical Formulation based on STP-51280

Formulation	Item		Parts by weight
	Polymer	SiSiB® STP-71280	30%
	Filler	Precipitated Calcium Carbonate (PCC)	69%
	Drying Agent	SiSiB® PC6110	0.4%
	Silane Coupling Agent	SiSiB® PC1200	0.25%
	Catalyst	KRA-1	0.35%
Properties	Hardness	Shore A	75
	Tensile Strength	Mpa	2.9
	100% Strength	Mpa	2.9
	Elongation	%	102
	Tack Free Time	Min	20

Thank you!

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