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XenRes™

Product Guide

2025

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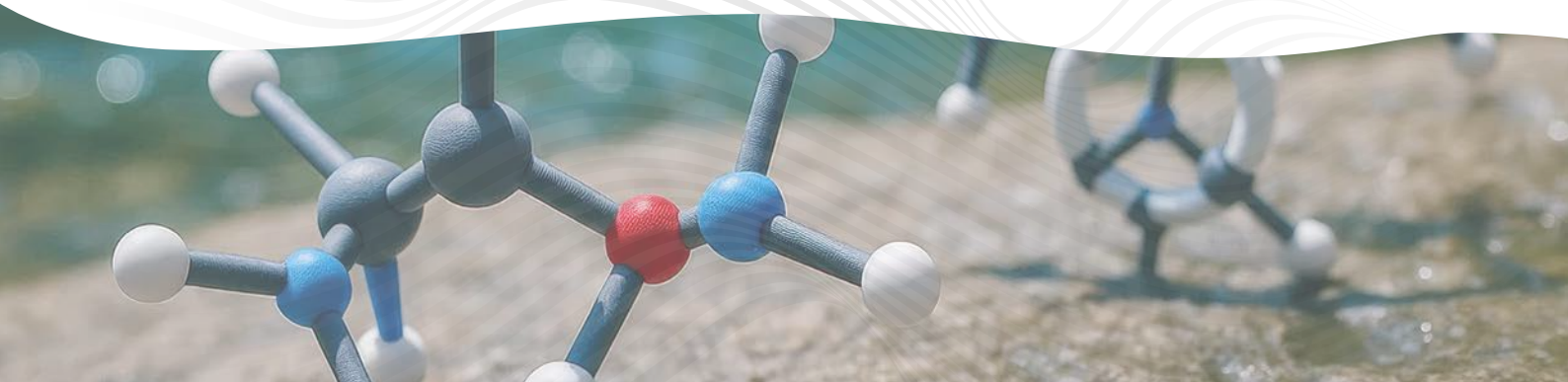
WE BUILD
MOLECULES
SO YOU CAN
BUILD THE
FUTURE
DISCOVER
SILOXENE'S
SILANE-HYBRID
TECHNOLOGY

CONTENTS



XenRes™ Technology Benefits

Performance enhancing hybrid resins

XenRes™ products are **reactive blends** of functional **Q-T polysiloxanes** with standard **commodity resins**. They provide easy integration into standard binder chemistry formulations by providing a drop-in replacement, as well as the ability to be formulated with dual or multicure systems. XenRes™ Hybrid resins offer a wide range of performance improvements including:

- **Higher bond strength**
- **Improved fatigue resistance**
- **Surface-scratch resistance**
- **Extended pot life**
- **Dual & multi-cure options**
- **Faster curing speed**
- **Adhesion on various substrates**
- **Customizable formulation**
- **Compatibility with wide range of binders and fillers**
- **Superior wetting**
- **Improved weathering resistance**
- **Compoundable with pigments, matting agents, flame retardants**

SILOXENE MATERIALS ARE

- SOLVENT FREE
- NON-FLAMMABLE
- LABEL FREE
- TRANSITION METAL FREE
- NANO MATERIALS FREE
- USABLE IN BOTH AQUEOUS AND ORGANIC FORMULATIONS

SILOXENE MATERIALS OFFER

- IMPROVED PROCESS SAFETY
- ENHANCED PRODUCT PROPERTIES
- TIME AND ENERGY SAVINGS
- CIRCULAR ECONOMY BENEFITS
- TAILORABLE PRODUCT FEATURES
- SIMPLIFIED TRANSPORTATION AND LOGISTICS

PROCESSING BENEFITS

XenRes™ products **seamlessly integrate with existing commercial resin** solutions, requiring no additional process modifications when incorporating siloxene products as substitutes or additives. The polysiloxane component dovetails with the base resin to **synergistically enhance performance** without increasing formulation or process complexity. This leads to cost savings without the need for new production equipment or altering existing manufacturing protocols.

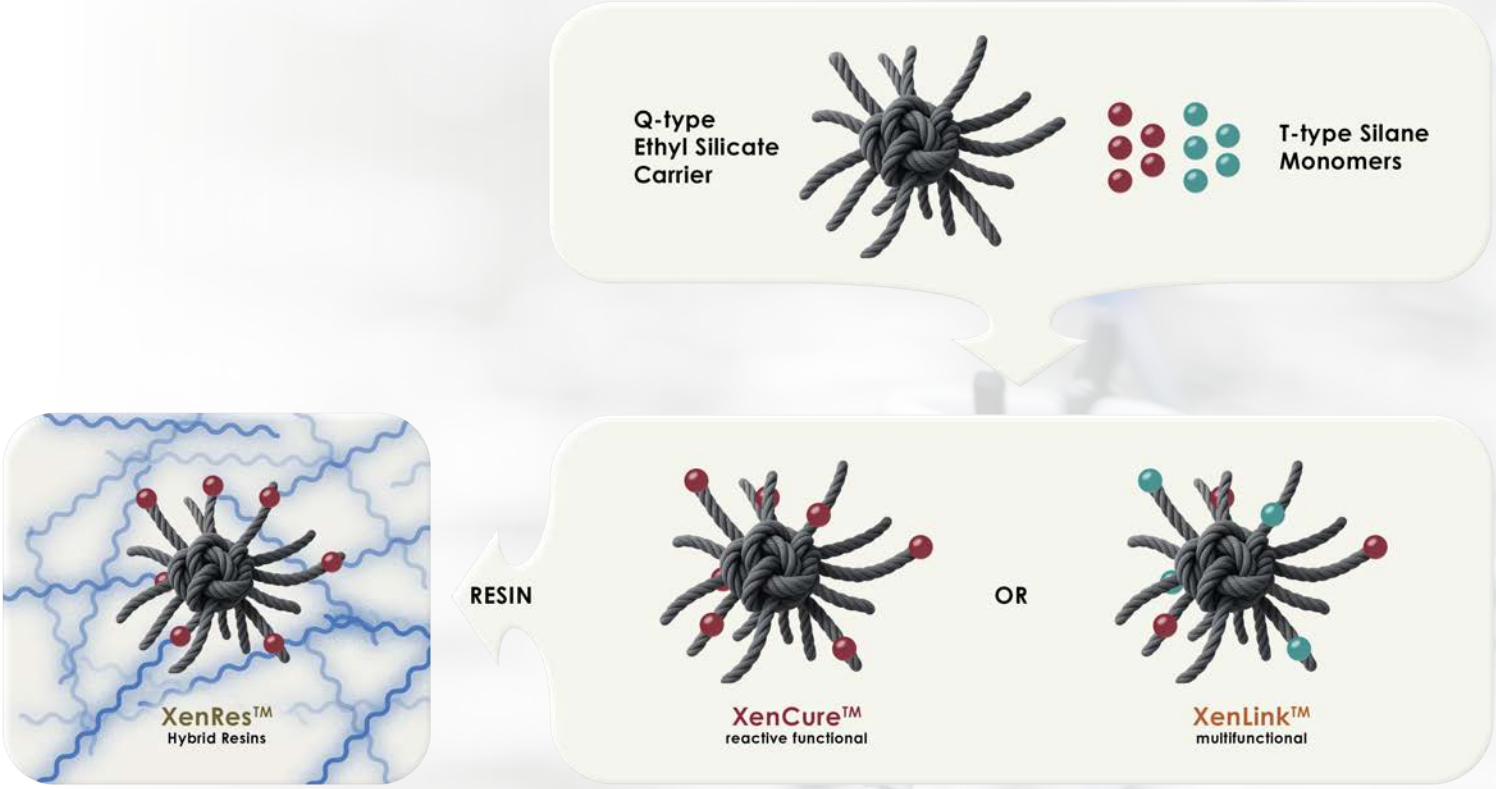
Discover XenRes™

Q-T polysiloxane hybrid resins

STRUCTURAL ADVANTAGES

XenRes™ Hybrid resins consist of our grafted organo-functional polysiloxanes, namely XenCure™ or XenLink™ products, which are modified via reactive blending with standard commodity-type organic resins.

This approach enables XenRes™ materials to preserve the inherent properties of the base resin while also integrating all the benefits associated with Q-T polysiloxanes. The synergistic combination of these chemistries expands the application boundaries and redefines possibilities across a range of industries and use-cases.



BEYOND STANDARD RESINS

Our technology enables the preparation of XenRes™ products – a new class of organic-inorganic hybrids - with precisely customized attributes, including resin choice, loading and selection of single or multiple functional groups, condensation degree and size of ethyl silicate carrier. This results in **complete control and customization** over the reactivity of the final product.

This versatile platform offers customers a broad range of XenRes™ options beyond our standard XenCure™ / XenSlick™ / XenLink™ / XenBlu™ product families, while maintaining easy formulation integration.

Cannot find what you are looking for? Our technical team is ready to help craft a solution precisely tailored to your needs. We look forward to supporting your next product innovation.

XenRes™ Product Grades and Applications

Performance resins designed for easy formulation integration

NOVEL SILOXANE RESIN TECHNOLOGY

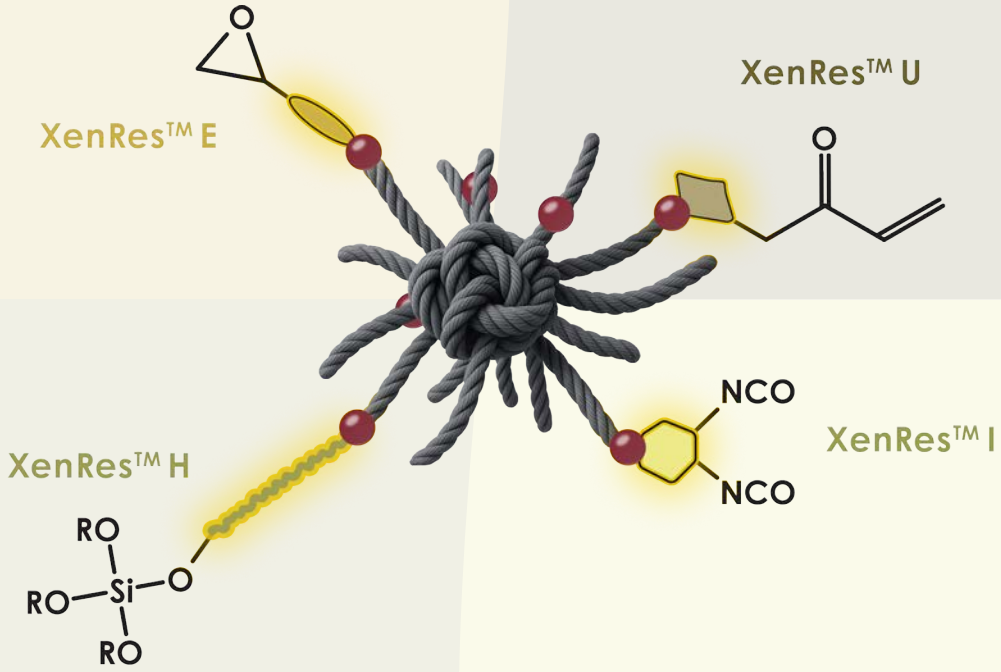
Siloxene's XenRes™ technology unites the unique properties of polysiloxanes with various resin matrices, including epoxy-, acrylate-, silicone- and isocyanate-based resins as well as silane terminated polymers (STPs). Our approach introduces a synergistic effect between these distinct chemical components. This way new possibilities open, giving rise to hybrid materials that possess superior performance, versatility and tailored attributes. Their ability to enhance adhesion and customize mechanical properties while providing various functional benefits make siloxene-based solutions an exciting avenue for innovative engineering across diverse applications.

Epoxy resins

Epoxies are well known for their strong adhesive and bonding properties. They are widely used in the manufacturing and construction industries for gluing, laminating and coating applications. Furthermore, epoxy resins are commonly employed in paints, adhesives, composites (as carbon fiber and glass fiber reinforcements) and electronics due to their exceptional durability and resistance to chemicals and heat.

UV curables

Acrylates offer fast curing, excellent adhesion and resistance to weathering. Well-known for their strength and flexibility in use, they are utilized in industries like printing, paints, adhesives, coatings, construction and personal care products.



Silane terminated polymers

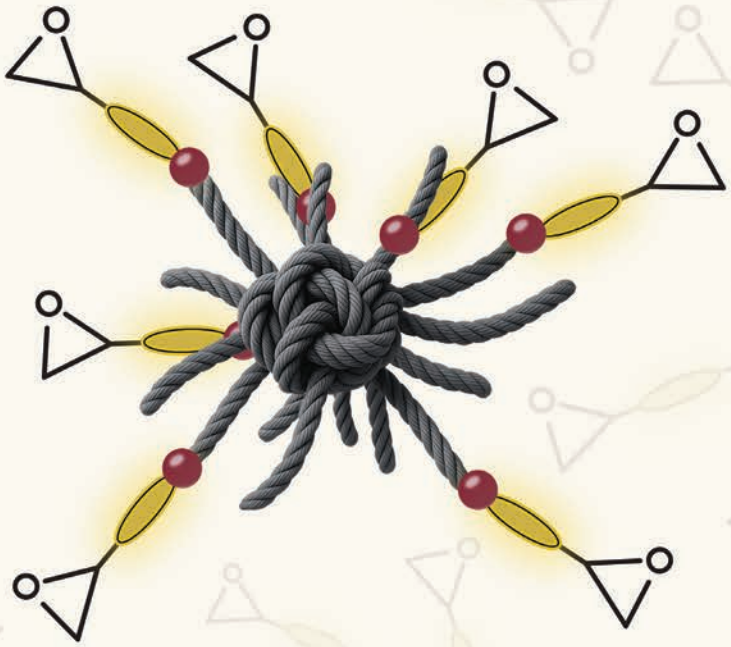
Silane-terminated polymers are a modern class of polymer resins comprising inorganic alkoxysilane terminus attached to an organic polyurethane or polyether backbone. They are widely used in the coating, adhesive and sealants industry, enabling non-toxic and moisture curing binder systems. They provide excellent adhesion, weather resistance, as well as tunable flexibility and hardness.

Isocyanates

Isocyanates are highly reactive compounds used in the production of polyurethane foams, coatings, adhesives and elastomers. They are valued for their ability to create extremely tough and durable materials with a wide range of properties. Isocyanates react with polyols to form polyurethane polymers, making them essential in industries such as automotive, construction, adhesives and coating.

XenRes™ E

Q-T polysiloxane epoxy hybrid resins



PRODUCT FEATURES

XenRes™ E is a hybrid co-resin formulation that combines our innovative polysiloxane technology with standard epoxy resins. This product family offers outstanding performance across several key areas:

- Good crosslinking ability with accelerated curing speed
- Improved mechanical properties and high toughening effect (increase in ductility and impact resistance)
- Superior adhesion to a wide range of substrates
- Easy integration into traditional epoxy systems and processes
- Enhanced wetting and compatibilization
- Available in water-dispersible or pre-dispersed forms

PRODUCT RANGE

XenRes™ E hybrids offer a variety of options by integrating different resin types, such as bisphenol-A diglycidyl ether (BADGE), bisphenol-F diglycidyl ether, Novolac resins, cycloaliphatic resins and epoxidized vegetable oils.

BADGE-based XenRes™ E resins are part of the standard commercially available product lineup, while the other resin types are available upon request.

All the XenRes™ E products are compatible with conventional epoxy systems as an additive as well as standard epoxy hardeners such as amines, anhydrides and thiols. They can be integrated into existing processes without the need for further optimization.

APPLICATIONS

The development of XenRes™ E aims to drive further innovation within the traditional epoxy resin industry. Siloxene offers this advanced polysiloxane-epoxy chemistry to address key material challenges and to contribute meaningfully to society's needs across sectors such as transportation and infrastructure, energy, electronics, aerospace, art applications and more.

We recommend the use of XenRes™ E in all the traditional epoxy resin applications, especially in:

- Paints and coatings
- Marine and watercraft
- Adhesives
- Electronics
- Composites
- Fiber sizings
- Construction
- Art and crafts

XenRes™ E Use Cases

Selected application examples

MAINTENANCE, REPAIR AND OVERHAUL (MRO) COATINGS

Epoxy resins are widely used in protective coatings, providing hardness on substrates like metal and concrete. They are employed across diverse sectors, including sewerage and wastewater treatments, chemical processing plants, exposed marine jetties, piers and more.

Incorporating XenRes™ E enhances durability while delivering superior gloss and clarity. Additional benefits include:

- Strong adhesion and surface wetting
- High chemical and scratch resistance
- Better corrosion protection
- Good UV stability
- Fast ambient curing

ADHESIVES

Standard epoxy resins cure by forming a highly crosslinked network with strong mechanical integrity. XenRes™ E combines this mechanism with polysiloxane crosslinking resulting in enhanced mechanics and increased compatibility with various substrates.

By incorporating polysiloxane segments into epoxy adhesives, the hybrid polymer network contributes to improved surface wetting, enhanced resistance to temperature fluctuations, moisture, chemicals and improved coefficient of friction. As a result, adhesives maintain their strength across different substrates even under demanding conditions.

COMPOSITES

XenRes™ E provides versatile options for the composites industry. Its unique epoxy-siloxane hybrid composition boosts performance and durability, making it suitable for automotive, marine industry, renewable energy (e.g., wind turbines), high-performance equipment, industrial assemblies and more.

Compared to standard epoxy resins, XenRes™ E offers:

- Faster curing
- Resistance to moisture, chemicals and UV
- Better thermal stability
- Excellent adhesion
- Corrosion resistance
- Greater flexibility without loss of stiffness

XenRes™ E in Water-Based Applications

The full potential of epoxy-polysiloxanes unleashed in a water dispersible form

WATERBORNE XenRes™ E

The shift towards water-based systems aligns with global sustainability goals. Waterborne epoxy resins reduce VOCs while preserving their inherent chemistry. They also enable thinner films, easier application and improved handling.

Siloxene offers its trend-setting hybrid epoxy resins also in different water-based formulations. Water-dispersible XenRes™ E products deliver the same high reactivity, curing speed, adhesion and mechanical strength. They are also available as neat, surfactant-free dispersions, therefore simplifying formulation and preventing surfactant leaching or property loss over time.

WATER-BASED PAINTS

In paints, the epoxy element adds toughness and impact resistance, preventing damage from physical stressors. The siloxane component improves adhesion and imparts water repellency and UV resistance, safeguarding against moisture damage and color fading caused by prolonged exposure to sunlight. The lower viscosity of these blends facilitates smoother application and quicker drying times, promoting efficiency and reducing labor costs.

GLASS-FIBER SIZING AND TEXTILE FINISHING

Glass fiber sizing is essential for reinforcing functionalized glass fiber composites. XenRes™ E hybrid epoxy-siloxane film formers deliver outstanding performance in both fiber sizing and textile finishing.

They provide strong bonding to native and functionalized glass fibers, enhancing load transfer, structural integrity and reducing filament breakage during weaving and processing. The siloxane component improves adhesion, coverage and wetting, boosting composite strength. It also adds heat resistance, reducing thermal degradation and ensuring reliable high-temperature performance.

XenRes™ E technical data

Properties	E560	E570	E675
Resin backbone	*BADGE based	*BADGE	Aliphatic epoxy
Physical state	Liquid	Liquid	Liquid
Epoxy equivalent weight [g/Eq]	172 - 179	191 - 197	~ 450
Viscosity [cPs]	~ 2000	~ 12000	~ 250
Density [g/cm³]	~ 1.18	~ 1.18	~ 1.01
Flash point [°C]	> 90	> 90	> 30
Solids content [%]**	~ 95	~ 95	~ 80
Gardner color	≤ 3	≤ 3	6

Cured film properties ***			
Skin formation time [h]	1	1	2
Full cure time [h]	8	7	56
Shear lap strength, Al / Al [N/mm²]	16	17	-
Elongation at break [%]	17	16	-

These values provide general information and are not part of the product specification.

* BADGE - Bisphenol A Diglycidyl ether-based epoxy resin

** Note that all XenRes™ E products are neat resins, containing no solvent. However, these materials contain chemically bonded alcohol which is released during the curing step

*** 0.6 mm film wet film, 10% by wt in BADGE – diamine hardener system

XenRes™ E Water Dispersible Grade Technical Data

Properties	E565	E567	E585	E587
Resin backbone	*BADGE based	*BADGE based	*BADGE	*BADGE
Physical state	Solid	Solid	Solid	Solid
Epoxy equivalent weight [g/Eq]	260 - 268	295 - 304	239 - 246	323 - 333
Viscosity at 70°C [cPs]	~ 4000	~ 4000	~ 4000	~ 4000
Density [g/cm3]	~ 1.15	~ 1.15	~ 1.15	~ 1.15
Flash point [°C]	> 90	> 90	> 90	> 90
Solids content [%]#	100	100	100	100
Gardner color	≤ 3	≤ 3	≤ 3	≤ 3

Water dispersion (40wt% epoxy; 7.5wt.% acid)				
Non-volatile content [%]	40	40	40	40
Density [g/cm3]	~ 1.00	~ 1.00	~ 1.00	~ 1.00
Viscosity [cPs]	~ 300	~ 200	~ 1000	~ 800
pH	4 - 5	4 - 5	4 - 5	4 - 5
Opacity	Transparent	Transparent	Transparent	Transparent
Particle size [nm]	50 - 100	30 - 80	50 - 100	30 - 80

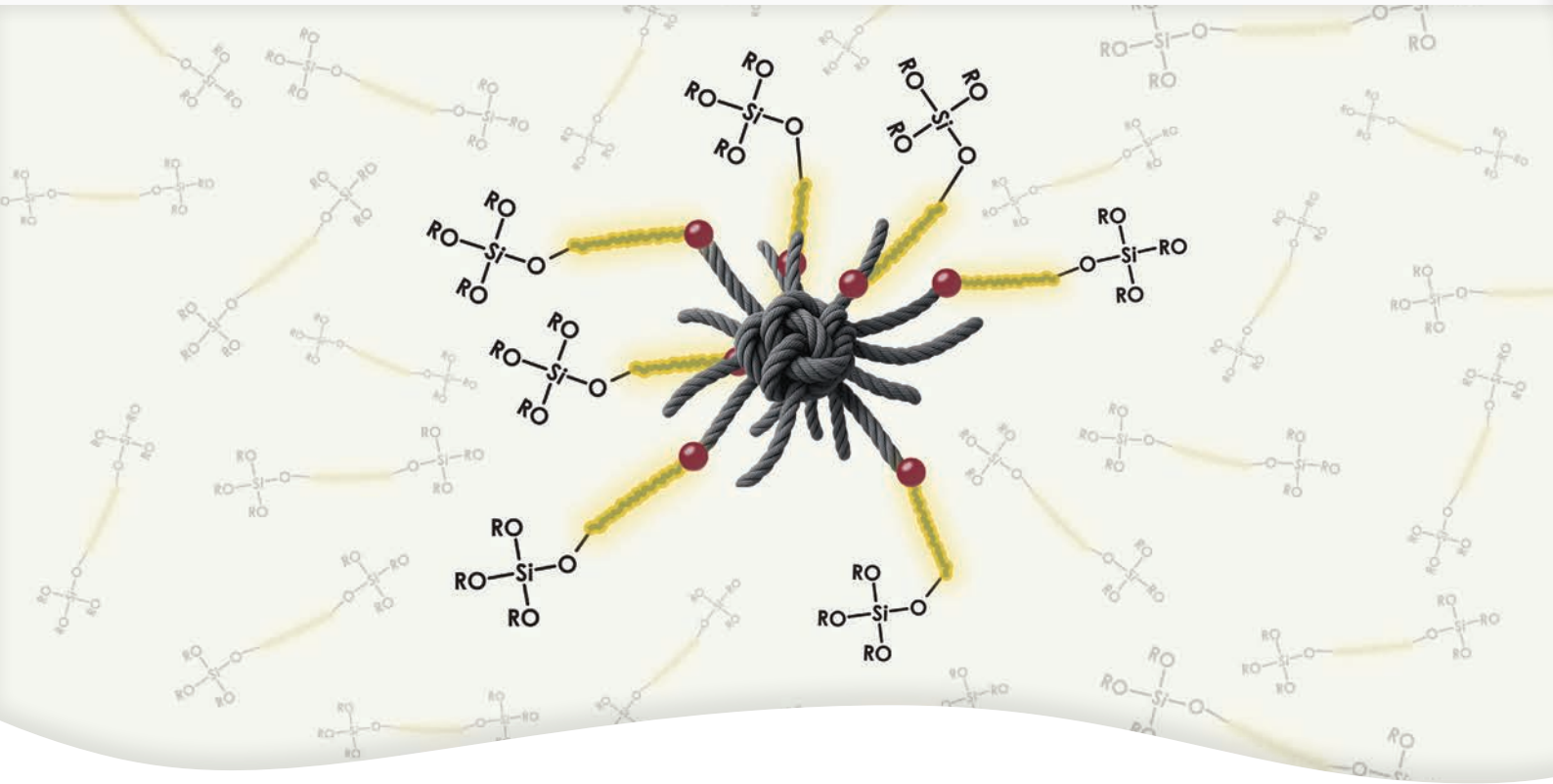
These values provide general information and are not part of the product specification.

* BADGE = Bisphenol A Diglycidyl ether-based epoxy resin,

#Sold as ready to disperse form. Can be obtained in the dispersed form as well on request. Solids content ~40wt.%

XenRes™ H

Hybrid silane terminated polysiloxanes



PRODUCT FEATURES

XenRes™ H are multifunctional hybrids combining Q-T polysiloxane dendrimer, typically with amino functionality (XenCure™ A) and a silane-terminated polymer (STP).

This unique combination results in a resin with exceptional properties, offering a wide range of possibilities due to its characteristics:

- 1K ultrafast moisture curing
- High toughness and scratch resistance
- Superior adhesion through formation of strong bonds on metal, mineral and various polymer substrates (e.g. PET, PVC, PMMA, polycarbonate, steel and aluminum)
- Solvent-free, organotin-free and label-free composition
- Tailorable hardness / toughness

PRODUCT RANGE

XenRes™ H products are offered as polyether-based or polyurethane-based STP hybrids, with varying molecular weights and viscosities, providing a broad range of tailored solutions for different applications.

Thanks to their versatile composition, the curing speed can be adjusted as needed, which means that formulations can be designed to cure faster for efficient production or slower for applications requiring longer working times.

APPLICATIONS

XenRes™ H products are designed to offer improved adhesion, toughening and crosslinking properties in organic resins and polymer systems.
The versatility of XenRes™ H proves to be a gamechanger, especially in the following applications:

- Hardcoats and thin films
- Ambient curing binders and primers
- Adhesives and sealants
- Composite materials

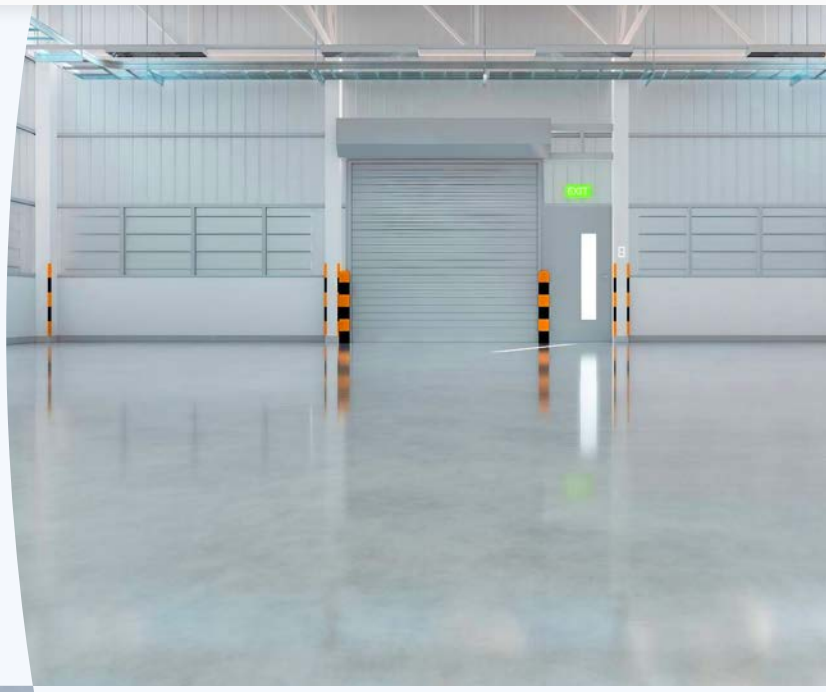
XenRes™ H Use Cases

Selected application examples

PROTECTIVE COATING AND THIN FILMS

XenRes™ H coatings and thin films are engineered to create protective or functional layers on various surfaces (wood, steel, plastics or cement). These coatings and films offer performance enhancements, in industries such as electronics, automotive, aerospace, construction or in medical devices.

The XenRes™ H technology enables tailored surface characteristics, including better adhesion, water repellence, anticorrosion and mechanical resistance. XenRes™ H contributes to extending the lifespan of products and delivers significant functional benefits.



AMBIENT CURING BINDERS AND PRIMERS

Ambient curing binders and primers based on XenRes™ H are designed to cure and adhere at room temperature, eliminating the need for additional heat, specialized curing conditions or external catalysts. This makes them highly energy-efficient, cost-effective and easier to apply across a wide range of environments.

Their versatility enables use in coatings, adhesives, aerogels, paints and construction materials, where reliable adhesion and strong performance are essential. In addition, XenRes™ H binders and primers provide excellent durability, surface protection and long-term stability, making them well-suited for demanding industrial and architectural applications.

LAMINATING RESIN FOR COMPOSITE MATERIALS

XenRes™ H finds a perfect fit within composite materials due to its versatile attributes. With its ability to adhere to various substrates, this product can be effectively employed as a reinforcement or adhesive in different materials. By integrating XenRes™ H, composites can achieve improved bonding between the reinforcement and matrix, resulting in overall enhanced performance.

Industries can use XenRes™ H to develop lightweight yet robust composite components, where the demand for strength, durability and weight reduction is crucial.

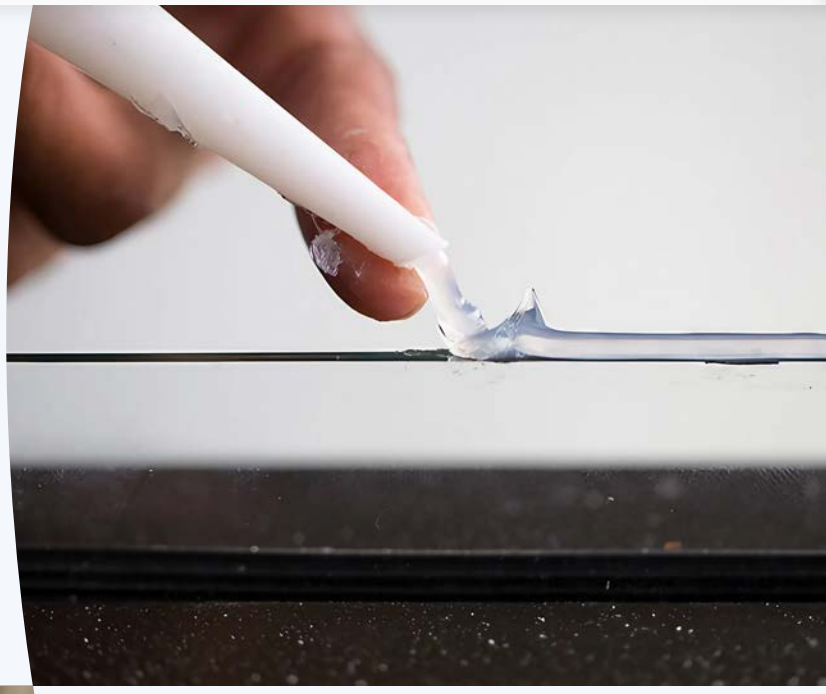
XenRes™ H Use Cases

Selected application examples

BONDING TO SELECTED POLYMERS & PLASTICS

XenRes™ H exhibits exceptional adhesion to a wide range of plastic materials, including polyvinyl chloride (PVC), polyethylene terephthalate (PET), fiber-reinforced plastic (FRP), polycarbonate (PC), polystyrene (PS), polymethyl methacrylate (PMMA), polyamide (PA) and acrylonitrile butadiene styrene (ABS).

Its unique chemical structure and composition enable strong, reliable bonding with these materials.



1K MOISTURE CURING WOOD ADHESIVE

Although the existing wood adhesives offer excellent mechanical properties, their primary drawback lies in the hazardous nature of the raw materials used in their production. The market is searching for a non-toxic alternative that can deliver mechanical properties comparable to those of PU adhesives.

XenRes™ H circumvents the safety concerns often associated with the state-of-the-art wood adhesives based on isocyanates while maintaining good adhesion strength with less precaution regarding handling and storage.

CO-RESIN FOR MULTICURE SYSTEMS

XenRes™ H can serve as an exceptional co-resin in multicure systems. These systems are designed to offer flexibility in curing methods, allowing manufacturers to adapt to various production conditions and requirements. XenRes™ H's good compatibility makes it a valuable candidate for this role in epoxy, STP, polyurethane, silicone systems as well as other diverse types of formulations.

Incorporating XenRes™ H into other resin systems leads to accelerated curing speed, adhesion promotion, boosted bond strength and other desirable properties. Are you looking for some of the benefits of STPs in your resin systems? Don't hesitate to contact us and we can craft a tailored solution for you.

XenRes™ H Technical Data

Properties	H235	H281	H375	H629
Resin type	Polyether-based STP	Polyether-based STP	Polyether-based STP	Polyether-based STP
Physical state	Liquid	Liquid	Liquid	Liquid
Functional group	Amine	Amine	Amine	Amine
Viscosity [cPs]	3400 - 3600	900 - 1100	180 - 250	3400 - 3600
Density [g/cm³]	~ 1.0	~ 1.0	~ 1.0	~ 1.0
Flash point [°C]	> 80	> 80	> 80	> 80
SiO_2 content [% w/w]	20 - 22	29 - 31	18 - 20	14 - 16
Solids content [%]**	~ 93	~ 85	~ 93	~ 95
Gardner color	≤ 4	≤ 4	≤ 4	≤ 4

Cured film properties *				
Skin formation time [min]	0.5	1	15	5
Tack free time [min]	1	2	20	10
Tensile strength [N/mm²]	10	-	-	15
Elongation at break [%]	10	-	-	50

These values provide general information and are not part of the product specification.

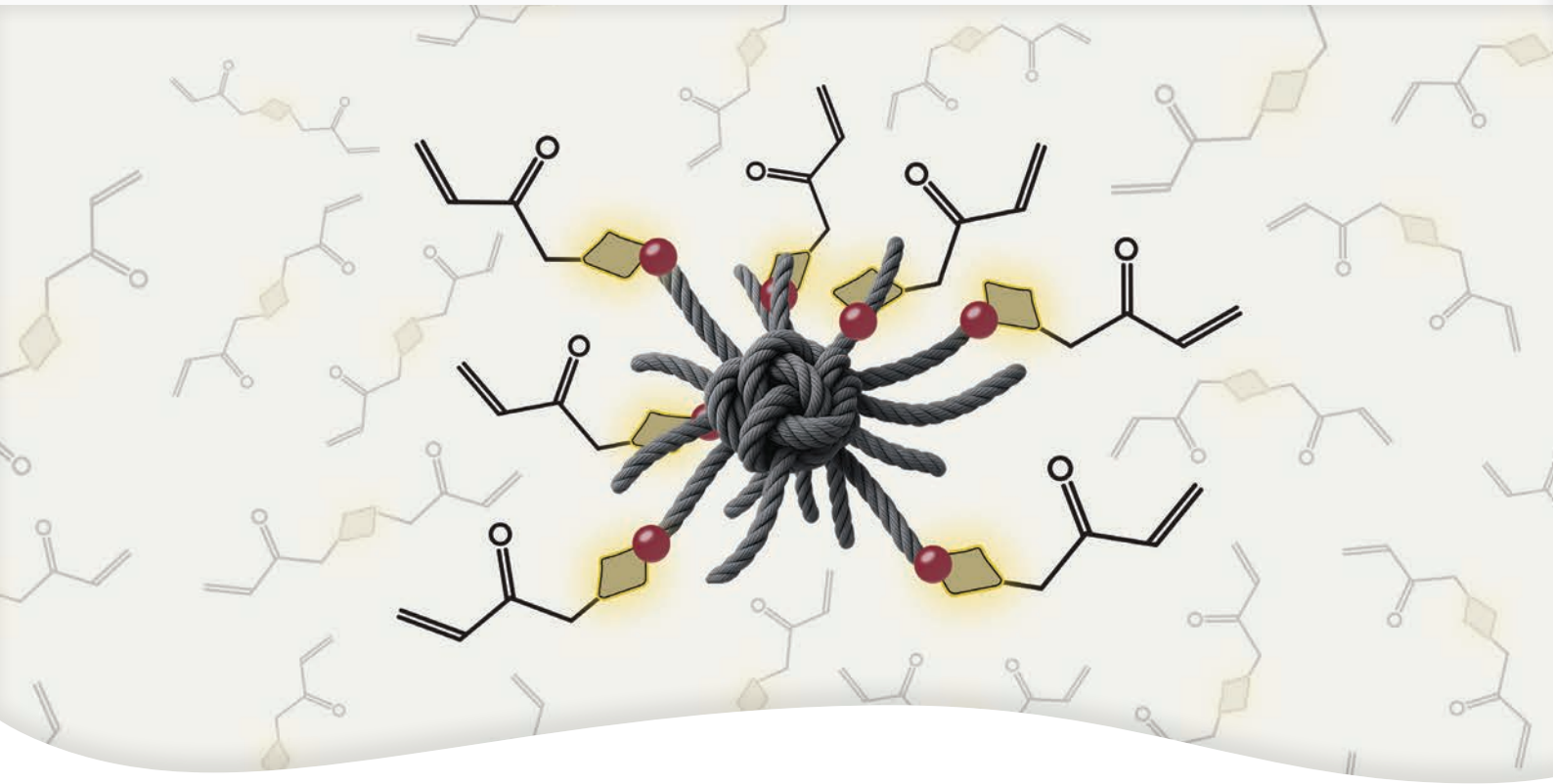
* 1 mm wet film 23°C; 50% RH

** Note that all XenRes™ H products are neat resins, containing no solvent. However, the polysiloxane backbone contains chemically bonded alcohol which is released during curing.

Due to the brittle nature of films made from XenRes™ H281 and XenRes™ H375, no data for tensile strength or elongation at break were obtained.

XenRes™ U

Q-T polysiloxane acrylate resins



PRODUCT FEATURES

XenRes™ U is a hybrid material consisting of acrylate functional group of choice grafted onto a Q-T polysiloxane carrier. These materials demonstrate exceptional performance in the following areas:

- Excellent crosslinking ability
- Cure speed improvement in polymerizable binder chemistries
- Improved water and weather resistance
- Enhanced mechanical properties
- Improved substrate adhesion
- Compatibilization between polymer resin and inorganic substrate or filler matrix

PRODUCT RANGE

XenRes™ U hybrids offer a wide spectrum of options by incorporating various types of acrylates. This includes resins like hexanedioldiacrylate (HDDA), dipropyleneglycol diacrylate (DPGDA), trimethylolpropane ethoxylated triacrylate (TMP(EO)-3TA), trimethylolpropane propoxylated triacrylate (TMP(PO)3TA) or propylidynetrimethyl trimethacrylate (TMPTMA).

Whether you are seeking enhanced characteristics for a particular application or aiming to meet precise performance benchmarks, our XenRes™ U hybrids can be precisely engineered to your specific needs by using many other acrylate types, adjusting the size of ethyl silicate "core", loading of functional silane as well as SiO_2 content of the final product.

APPLICATIONS

XenRes™ U is recommended for use in the following applications:

- Formulation ingredient in
  - Flexo and Inkjet printing inks
  - UV light curable photopolymers
  - 3D printable resins
  - Paints, coatings, lacquers
  - Adhesives
- Interface compatibilizer in mineral filled unsaturated polyester resins
- Electronics

XenRes™ U Use Cases

Selected application examples

UV CURABLE COATINGS AND ADHESIVES

Our novel hybrid UV curing resins are engineered to enhance bond strength and adhesion, ensuring unparalleled performance on many substrates from metal and mineral to plastics. XenRes™ U further facilitates improved coupling to fillers, thus boosting formulation stability and flexibility.

The resins offer versatility for dual and multi-cure systems, providing additional options for developing bonding and protective coating formulations.

FLEXO, INK JET AND OFFSET PRINTING

In the world of UV curable flexo, inkjet and offset printing, XenRes™ U brings unprecedented performance benefits. Our products allow for up to 30% higher printing media throughput due to the higher cure speed and improved surface cure. This product family provides consistent control over LED curing efficiency while maintaining high print quality.

XenRes™ U hybrid resins deliver improved scratch resistance and heightened gloss for prints that stand out.

3D PRINTING RESIN

SLA, DLP and LCD/MSLA are vat-photopolymerization 3D-printing processes that cure successive 2D layers from a vat of liquid photopolymer resin. XenRes™ U opens new formulation options for SLA/DLP/LCD resins, delivering combined gains in strength, toughness and flexibility in printed parts.

Just as importantly, XenRes™ U can lower resin viscosity to speed printing and reduce material cost. This streamlines process and material parameters for end users, increasing throughput and the quality of printed parts.

XenRes™ U technical data

Properties	U241	U251	U286	U296	U361
Resin type	*HDDA	**DPGDA	****TMP(PO)3TA	****TMP(PO)3TA	*****TMPTMA
Physical state	Liquid	Liquid	Liquid	Liquid	Liquid
Viscosity [cPs]	~ 150	~ 150	~ 150	~ 150	~ 80
Density [g/cm3]	~ 1.08	~ 1.18	~ 1.00	~ 1.00	~ 0.94
(Meth)acrylate equivalent weight [g/Eq]	~ 536	~ 549	~ 402	~ 412	~ 429
Refractive index	~ 1.433	~ 1.429	~ 1.441	~ 1.435	~ 1.438
Flash point [°C]	> 61	> 61	> 61	> 61	> 61
SiO_2 content [% w/w]	~ 27	~ 26	~ 19	~ 26	~ 25
Solids content [%] ******	~ 92	~ 92	~ 92	~ 92	~ 92
Gardner color	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4

These values provide general information and are not part of the product specification.

*HDDA - hexanedioldiacrylate

**DPGDA - dipropyleneglycol diacrylate

***TMP(EO)3TA - trimethylolpropane ethoxylated triacrylate

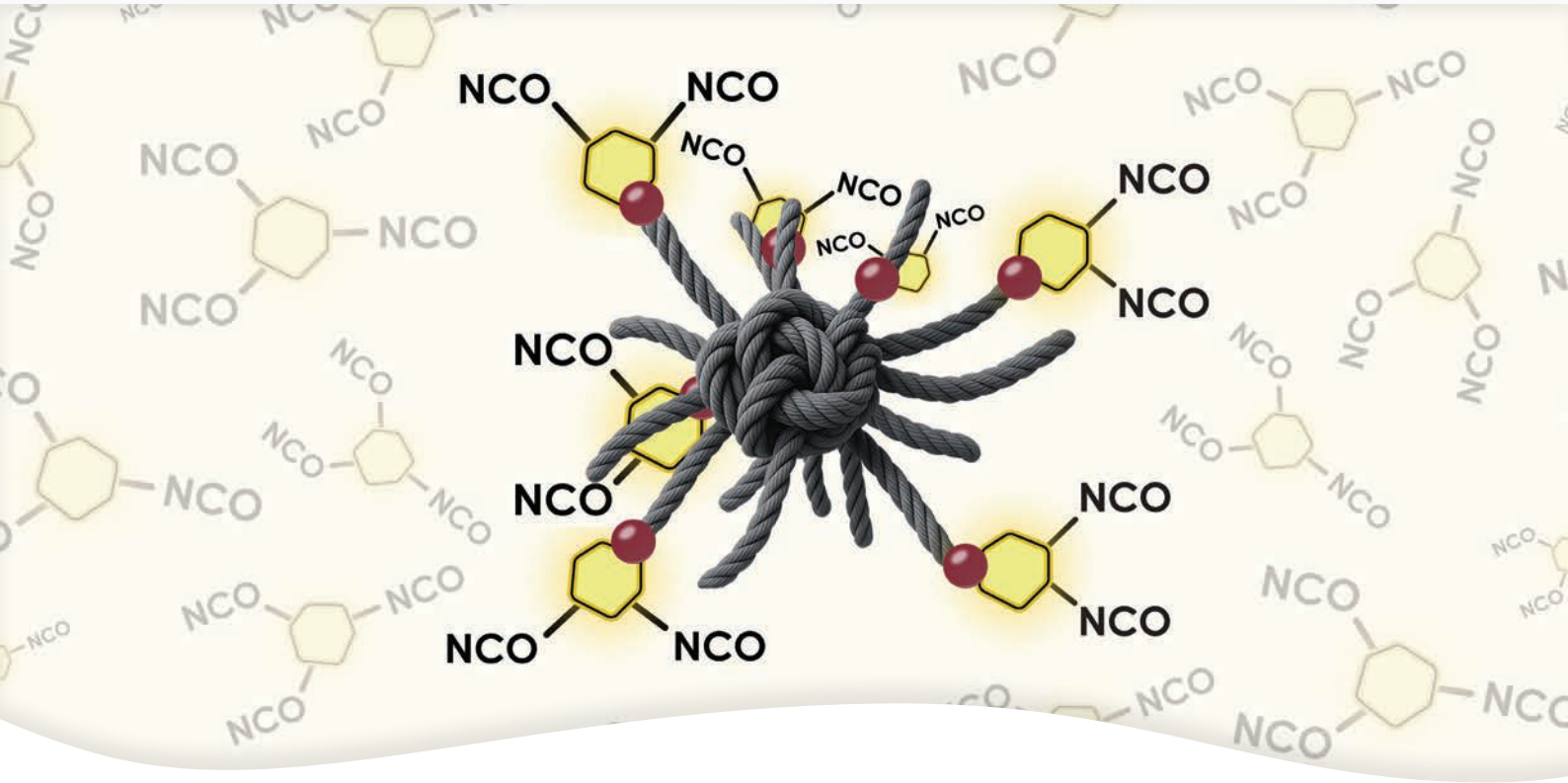
****TMP(PO)3TA - trimethylolpropane propoxylated triacrylate

*****TMPTMA – propylidynetrimethyl trimethacrylate

****** Note that all XenRes™ U products are neat resins, containing no solvent. the polysiloxane backbone contains chemically bonded alcohol which is released during curing.

XenRes™ I

Polysiloxane-isocyanate resin for polyurethane applications



PRODUCT FEATURES

XenRes™ I family is a novel class of materials that combines the unique characteristics of both silanes and isocyanates. Q-T polysiloxanes exhibit impressive adhesion-promoting properties, enhancing the bonding capability to a wide variety of substrates. On the other hand, isocyanates are highly reactive compounds used in the synthesis of polyurethane materials with exceptional strength and flexibility.

XenRes™ I products excel in the following aspects:

- Fast moisture curing
- Good adhesion on various substrates
- High toughness and good scratch resistance
- Exceptional UV and weathering resistance
- High gloss retention and surface finish
- Solvent-free and organotin-free formulation
- Compatibility with standard isocyanates for various PU applications
- Low isocyanate monomer content (< 0.1 % by wt.)

APPLICATIONS

Their versatility and performance make XenRes™ I valuable components in modern materials science, driving advancements in multiple sectors and fostering innovative solutions in adhesive, sealant and coating technologies.

We recommend the use of XenRes™ I in all urethane, urea and amide-based applications, especially in:

- Paints and coatings
- Adhesives
- 1K and 2K polyurethane systems
- Polyurethane foams
- PU based dispersions
- Biomedical products

PRODUCT RANGE

XenRes™ I hybrids provide a diverse range of options, incorporating various resin types like isocyanate biurets, trimers or oligomers based on molecules such as IPDI, HDI, TDI and MDI.

XenRes™ I based on HDI resins are readily available as part of the standard commercial product range, while the rest of the mentioned resins can be acquired upon request.

XenRes™ I Use Cases

Selected application examples

PU ADHESIVES AND SEALANTS

The incorporation of XenRes™ I broadens the already wide range of isocyanate-compatible substrates, while the improved bonding capability contributes to the longevity and reliability of the glued joints. XenRes™ I based adhesives and sealants are recommended in applications such as:

- Construction due to its weather-resistant properties
- Marine industry due to its water-resistant bonding for boat components
- Solar panels assemblies for renewable energy and wind turbine components
- Transportation and aerospace for bonds exposed to extreme conditions

COATING RESINS

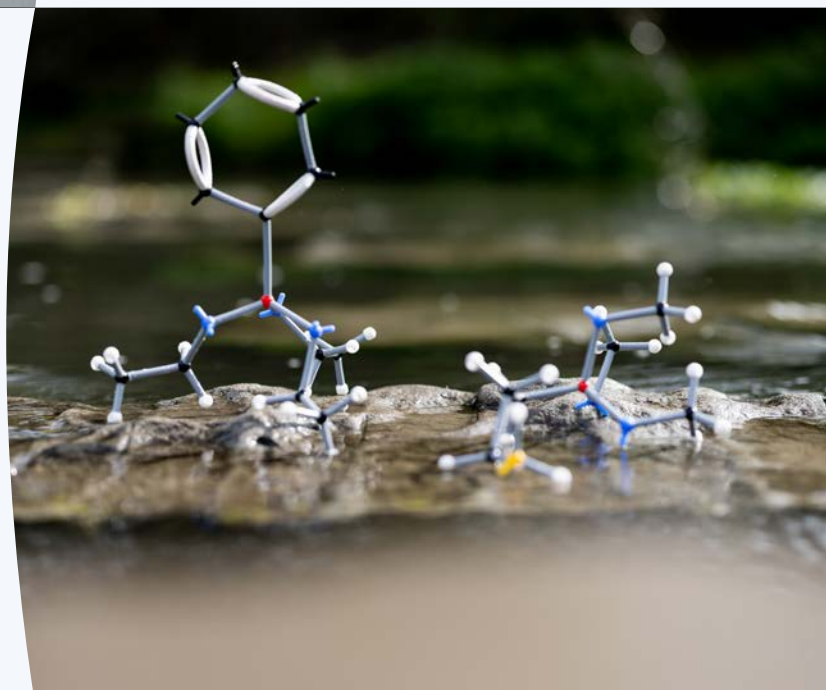
In the realm of protective coatings, the evolution continues with the introduction of 2K PU clear coats based on isocyanate-siloxane blends called XenRes™ I. This material proved to be especially beneficial in applications such as:

- Automotive finishes providing high-gloss protection for vehicle exteriors and other vehicle components
- Wood finishes providing a protective layer while preserving the wood's natural beauty

XenRes™ I contributes to strong adhesion, crystal clear finish, enhanced durability chemical and impact resistance.

CUSTOMIZABLE CROSS-LINKERS

When used as a co-resin, XenRes™ I enables customization of flexibility, hardness, adhesion and resistance to environmental factors in applications such as automotive, aerospace, construction and electronics. They are well-suited for high-performance coatings, sealants and elastomers. A PU backbone enriched with adjustable SiO_2 linkages ensures superior adhesion to metals, plastics and composites. XenRes™ I is also compatible with heat-activated PU systems. These variants respond to temperature changes by initiating cross-linking reactions, which can be advantageous in applications where temperature control is essential.



XenRes™ I Technical Data

Properties	I319	I320	I333
Isocyante type	HDI	HDI	HDI
Physical state	Liquid	Liquid	Liquid
Viscosity [cPs] at 25 °C	~ 2000	~ 1500	~ 1000
Density [g/cm3]	~ 1.15	~ 1.15	~ 1.15
Flash point	> 80	> 80	> 80
NCO content [%]	8 ± 2	11 ± 2	11 ± 2
Free isocyanate monomer [%]	< 0.1	< 0.1	< 0.1
SiO_2 content [% w/w]	18 - 20	12 - 14	12 - 14
Solids content [%]*	~ 72	~ 79	~ 78
Gardner color	≤ 5	≤ 4	≤ 10
Cured film properties (1 mm wet film at RT, 50 % RH)			
Skin formation time [h]	2 - 3	4 - 6	4 - 6
Full cure time [h]	45 - 48	58 - 61	60 - 65
Pot time [h]	5 - 6	7 - 8	7 - 8
Cured film properties (1 mm wet film at 60 °C, 40 % RH)			
Skin formation time [h]	0.5 - 1	2 - 3	2 - 3
Full cure time [h]	20 - 24	25 - 30	25 - 30

These values provide general information and are not part of the product specification.

* Note that all XenRes™ I products are neat resins, containing no solvent. However, the polysiloxane backbone contains chemically bonded alcohol which is released during curing.

XenRes™ Sensitivity and Solubility

Properties	XenRes™ E	XenRes™ H	XenRes™ U	XenRes™ I
Resin type	Epoxy	Silane terminated polymer	(Meth)acrylate	Isocyanate
Moisture sensitivity*	◆◆◆	◆◆◆◆	◆◆	◆◆◆◆
Light sensitivity**	◆	◆	◆◆◆◆	◆◆

Solubility***	XenRes™ E	XenRes™ H	XenRes™ U	XenRes™ I
Alcohols	+	+	◊	◊
Aliphatic hydrocarbons	◊	+	+	◊
Aromatic hydrocarbons	+	+	+	◊
Esters	◊	+	◊	+
Ethers	◊	+	◊	◊
Glycols	◊	◊	◊	◊
Ketones	+	+	+	+
Acetic acid	◊	+	◊	◊
NMP	◊	+	◊	◊
THF	◊	+	+	◊
Pyridine	◊	+	◊	◊
Chloroform	+	+	+	◊
DMSO	+	+	+	◊
Water	◊	◊	◊	◊

* Not sensitive = ◆; High moisture reactivity= ◆◆◆◆

** Not sensitive = ◆; High light reactivity=◆◆◆◆

*** Soluble = +; Incompatible = ◊

The solubility reflects adding solvent to a polysiloxane product in a ratio 1:1 by wt.

Notes

Contact

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