

# QUALITY PROTECTS.

## Urethane Prepolymers and Components

for liquid applied protective coatings  
and waterproofing formulations

**X** **Trixene**<sup>®</sup>  
Urethane Prepolymers

QUALITY **WORKS.**

**LANXESS**  
Energizing Chemistry

# LANXESS IS A LEADING INNOVATOR IN POLYURETHANE SYSTEMS

LANXESS Urethane Systems is a world leader in polyurethane systems for elastomers, coatings, adhesives and sealants, with a special focus on low free (LF) isocyanate, solvent-free, water-based and blocked systems.

Combining our elastomer and coating expertise with a comprehensive portfolio of Trixene prepolymers and components, formulators can manufacture 1K and 2K liquid-applied protective coatings and waterproofing systems that meet their customers' highest expectations.

LANXESS offers a full portfolio of conventional prepolymers and components, and is on the forefront of low free (LF) isocyanate prepolymer technology that makes our products easy to use, with improved industrial hygiene for both you and your customers, and excellent performance in use.

## Benefits of Trixene® urethane prepolymers

- Improved industrial hygiene
- Easy processing
- Excellent performance

### Improved industrial hygiene

Trixene® urethane prepolymers have free isocyanate content as low as <0.1% for TDI prepolymers and <0.5% for IPDI and HDI prepolymers and provide improved industrial hygiene during handling and use. These urethane prepolymers protect formulators and end-users from potential exposure to residual isocyanate, minimize the EH&S workload, and enable the formulator to achieve final formulations with reduced hazard classifications. This portfolio also includes water-based and high solids prepolymers for reduced VOC content, which minimizes toxicity and flammability risks for contractors and building owners.

### Easy processing

Trixene® urethane prepolymers and components are used to formulate 1K and 2K protective coatings that are field applied, with low viscosity for ambient temperature application. These products result in final formulations that eliminate the requirement for flame and heat often required during traditional waterproofing installations where sheet materials are used, and facilitate application onto complex design features, such as railings and support columns. They can be applied using brush, roller, or spray, and even wet-on-wet application to reduce installation costs. Formulators can design their final products to achieve required reactivity and curing profiles for use in all seasons and environmental conditions.

### Excellent performance

Trixene® prepolymers and components are critical ingredients for 1K and 2K urethane liquid applied systems that result in continuous and seamless protective coatings and waterproofing membranes and can be used across roofing applications, including flat roofs, warm or cold roofs, inverted roofs, and green roofs. These products offer formulators the ability to deliver excellent UV stability, strong adhesion to multiple substrates, and durable mechanical properties while resisting environmental stresses.

# BROAD RANGE OF TRIXENE PREPOLYMERS AND COMPONENTS FOR HIGH PERFORMANCE PROTECTIVE COATINGS

Trixene® prepolymers and components offer versatility for the formulator, with low free (LF) isocyanate technology, high solids, low odor, and low VOC, enabling them to produce 1K and 2K liquid-applied polyurethane (PU), polyurethane methacrylate (PUMA) and silyl polyurethane (SPUR) protective and waterproofing coatings that meet the challenges and demands of high performance construction materials.

## Trixene® prepolymers for 1K polyurethane construction coatings

Trixene® prepolymers offer a range of characteristics that can be used to design specific formulations for liquid-applied waterproofing systems and protective coatings.

- Conventional and low free isocyanate prepolymers for improved industrial hygiene for both formulators and end-users
- Aromatic (TDI, MDI) prepolymers for durability and cost effectiveness
- Aliphatic (IPDI, HDI) prepolymers for performance and enhanced light stability
- Acrylate-terminated urethane prepolymers (PUMA) for bridge deck coatings that provide the advantages of polyurethane without exposure to free isocyanate
- Water-based (PUD) dispersions and 100% solids prepolymers to meet low VOC requirements
- 100% solids and low-odor solvented prepolymers with low viscosity at room temperature
- Products suitable for formulation of both clear and pigmented coatings



## Additives for use in 1K and 2K urethane waterproofing formulations

LANXESS offers a range of additives that can improve formulations for liquid applied waterproofing systems.

- Trixene® AS and ASF are used as moisture scavengers in 1K moisture-cured systems to prevent pinhole defects in coating surfaces, and to improve the stability of formulated systems
- Quasilan® polyol resin blends are used in 2K formulated systems

# BREAKTHROUGH INNOVATION WITH <0.1% FREE ISOCYANATE PREPOLYMERS IMPROVES INDUSTRIAL HYGIENE

## Unsurpassed industrial hygiene

**Trixene®** prepolymers have low free isocyanate content, <0.1%, for improved industrial hygiene during handling and processing. In coatings, **Trixene®** prepolymers enable formulators to eliminate the use of solvents and achieve final formulations with reduced hazard classifications.

- Urethane prepolymers available with levels of free isocyanate below 0.1% to address regulatory concerns
- Protects workers and users from potential exposure to free isocyanates
- Minimizes EH&S workload, and eliminates the handling of raw materials containing elevated levels of hazardous isocyanates
- Enables design of coating systems with reduced hazard classifications



**HEALTH**



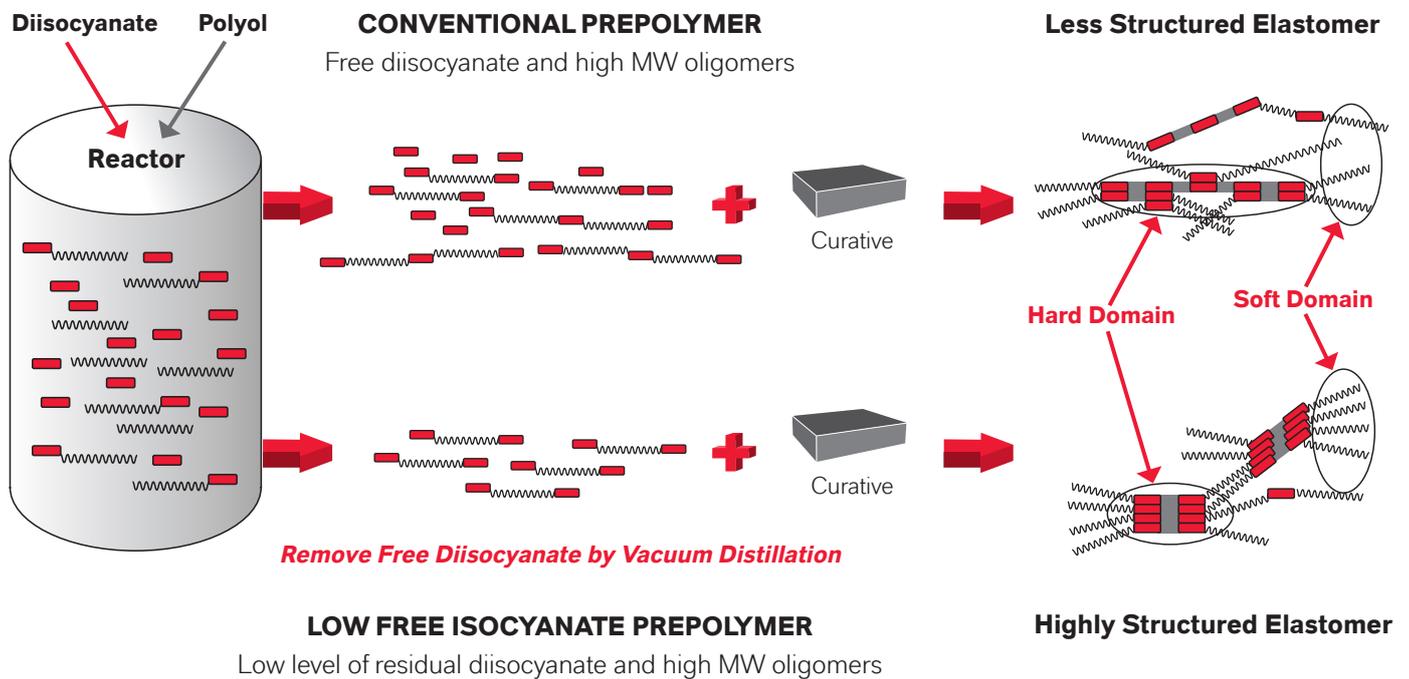
**SAFETY FIRST**



**REGULATIONS**



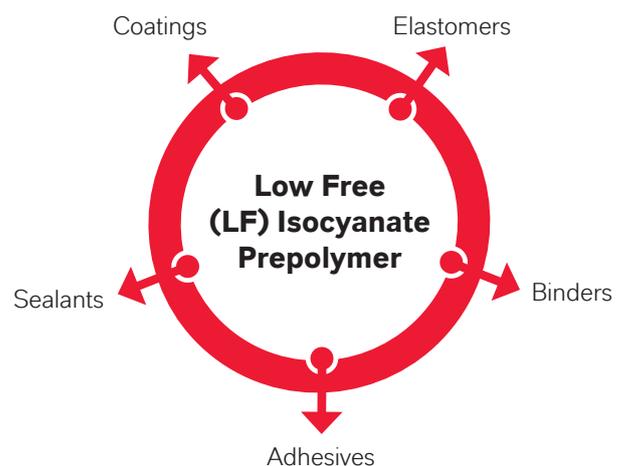
# LOW FREE (LF) ISOCYANATE PREPOLYMERS PRODUCE HIGHLY STRUCTURED ELASTOMERIC COATINGS FOR IMPROVED PERFORMANCE



Trixene® low free isocyanate prepolymers are chemically structured to provide superior performance, including excellent toughness, fatigue resistance, and longer lifetimes when exposed to extreme conditions of temperature and chemicals. They are used in a diverse range of coatings, adhesives, and sealants.

- Highly structured prepolymers can achieve **narrow molecular weight distribution** for control of viscosity and processing
- A **virtual crosslinked network** is formed – crystalline groups called hard domains form due to physical interactions from hydrogen bonding between the highly polar urethane and/or urea groups
- More **defined phase segregation** between hard and soft domains translates to better physical properties, indicated by tensile and tear strength, due to increased orientation and alignment under stress

**LANXESS' portfolio of low free isocyanate prepolymers are diverse building blocks**



# TRIXENE® URETHANE PREPOLYMERS AND COMPONENTS FOR A RANGE OF WATERPROOFING APPLICATIONS FOR THE CONSTRUCTION INDUSTRY

With a full portfolio of conventional and low free (LF) isocyanate prepolymers and components, Trixene® products enable you to design and manufacture waterproofing and protective coatings for a wide range of applications, including new, repair and remediation, that extend the lifetime of protected structures.

- Flat roof coatings
- Roofing overlay systems for roof refurbishment
- Balcony coatings
- Bridge decks
- Under tile coatings for wet rooms
- Primers and sealers

Products	Flat roof coatings	Roofing overlay systems	Balcony coatings	Bridge decks	Under tile coatings (wet rooms)	Primers and sealers
Trixene® aromatic prepolymers	●	●	●	●	●	●
Trixene® aliphatic prepolymers	●	●	●			
Quasilan® CT series prepolymers	●	●	●			●
Trixene® PUMA prepolymers				●		
Quasilan® polyol blends	●	●				
Trixene® AS and ASF moisture scavengers	●	●	●		●	



## Typical uses of waterproofing coatings

- Liquid coatings that provide continuous and seamless waterproofing membranes for flat and pitched roofing for new and refurbishment projects
- Liquid coatings that facilitate application onto complex designs, such as railings and support columns
- Used for many roofing needs: warm/cold roofing, inverted roofing, green roofing
- Field applied under ambient conditions by brush, roller, or spray, and even wet-on-wet to reduce installation costs
- Eliminates the need for flame and heat required during traditional sheet-based roofing installations

## Formulators benefit from Trixene® urethane prepolymers and components

- Low free isocyanate prepolymers enable final formulations with reduced hazard classifications, especially for consumer and contractor uses
- Low volatile organic solvent content reduces toxicity and flammability risks for contractors and building owners
- Compatibility with low odor solvents reduces the nuisance to building users
- Formulations can be designed for specific reactivity and cure profiles
- Prepolymers can be formulated as 1K or 2K systems for use in all seasons to provide excellent mechanical properties and UV stability, even when exposed to the environment

# LANXESS URETHANE SYSTEMS IS LEADING WITH TECHNOLOGY AND INNOVATION

We provide formulators with decades of urethane chemistry know-how, comprehensive application expertise, and deep manufacturing experience. With strong capabilities in product development and analytical testing, including accelerated weathering, LANXESS scientists can provide tailored prepolymers and components – talk with us about your requirements.

In addition to **Trixene**<sup>®</sup> urethane prepolymers for protective coatings, LANXESS also offers **Witcobond**<sup>®</sup> polyurethane dispersions, **Trixene**<sup>®</sup> and **Adiprene**<sup>®</sup> blocked prepolymers, **Trixene**<sup>®</sup> BI and **Trixene**<sup>®</sup> Aqua blocked isocyanates, and **Adiprene**<sup>®</sup> LF and **Trixene**<sup>®</sup> prepolymers, which are innovative Low Free (LF) isocyanate prepolymer systems for a range of elastomers, coatings, adhesives and sealants.



**Specialized provider of urethane systems, tailored to meet specific customer needs**



**Truly global and diverse coverage, offering quick and flexible responses to customer needs**



**Strong focus on sustainability with a broad portfolio providing performance, processing, and EH&S advantages**



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