

# QUALITY PERFORMS.



## **Urethane Systems**

Low Free Isocyanate Prepolymers

**X Adiprene® LF**  
Low Free Prepolymers

**QUALITY WORKS.**

**LANXESS**  
Energizing Chemistry

# LOW-FREE ISOCYANATE PREPOLYMERS AND MbOCA REPLACEMENTS BRINGING UNPARALLELED PERFORMANCE

## Technology

### Adiprene® Low-Free isocyanate prepolymers

As a complement to our portfolio of high-performance, hot-cast urethane prepolymers, LANXESS is a leading innovator in the development of Low-Free (LF) isocyanate urethane technology, which brings unparalleled performance and health and safety benefits to the market. We are the only manufacturer of LF urethane prepolymers across a wide range of chemistries including TDI, MDI, PPDI and HDI, and offer a full range of suitable curatives to make the highest performing cast urethane systems.

Due to environmental, health and safety (EH&S) concerns with regards to free isocyanate monomer content, all isocyanates are highly regulated. To properly protect the employee and the environment, it is necessary to ensure that proper engineering controls and industrial hygiene procedures are in place. A significant contributor to achieving excellent industrial hygiene standards is the introduction of Low-Free monomer prepolymer systems.

LANXESS is highly dedicated to Responsible Care and has developed the Adiprene® LF product range to help cast polyurethane (PU) processors operate with better health and safety standards. Adiprene® LF Prepolymers based on TDI, HDI and PPDI are available with levels of free isocyanate below 0.1%, and prepolymers based upon MDI are available below 1.0%.

LANXESS offers the global market the leading prepolymer technology that enables the PU processor to meet the ever increasing regulatory demands on free isocyanate.

### MbOCA replacement technology

MbOCA is a curative commonly used to react TDI and LF TDI prepolymers. Within the applicable Europe Union (EU) countries, REACH legislation will ban the use of the MbOCA curative after November 22, 2017, unless an authorization is granted. This legislation governs the use of this substance by PU processors in the EU REACH applicable countries. It also governs the import of MbOCA-based PU components with more than 0.1% free MbOCA into the EU REACH applicable countries.

LANXESS offers a complete portfolio of prepolymer systems to replace MbOCA and meet the various needs of processors currently using TDI/MbOCA or LF TDI/MbOCA systems. As a systems house we have the broadest range of available chemistries and have developed unique solutions to meet customers' needs for performance, processing and economic benefit. This range of MbOCA replacement solutions includes Adiprene® LF Prepolymer Systems, which combine EH&S benefits for both the prepolymer and the curative. These systems dramatically improve levels of industrial hygiene for cast PU processing.



## Benefits

Our application expertise and formulation know-how make us the supplier of choice for our customers. Depending upon the choice of prepolymer system, benefits can include:

- Reduced free monomer levels below 0.1% (below 1% for LF MDI)
- Improved industrial hygiene, health and safety
- Robust and easy processing: lower viscosity, longer pot life, faster demolding, with a range of curatives and catalysts
- Excellent toughness
- Dynamic performance: low heat build-up, fatigue resistance
- High-temperature resistance



## Product Range

### Adiprene® Low-Free TDI systems for easy processing and excellent dynamics

Adiprene® LF TDI Prepolymers take conventional TDI technology to the next level of performance and safety. By reducing free TDI levels to below 0.1%, these systems greatly improve workplace industrial hygiene and enable the use of PU prepolymer systems with lower viscosity, longer pot life, faster demolding and lower hysteretic heat build-up. Adiprene® LF TDI systems offer the for a wide range of applications.

### Adiprene® Low-Free MDI systems for excellent performance and easy processing

Adiprene® LF MDI Prepolymers provide significant health and safety advantages due to Low-Free Isocyanate levels and the ability to cure with diols, in addition to a range of other suitable curatives. This ground-breaking innovation enables customers to pour parts with outstanding dynamic performance, excellent retention of properties, outstanding fatigue and abrasion resistance, and high load bearing capabilities. Adiprene® LF MDI demonstrates total improvement in terms of processing, performance and cost-in-use.

### Adiprene® Low-Free PPDI systems for excellent chemical resistance and high-temperature performance

Adiprene® LF PPDI Prepolymers combined with suitable curatives offer systems with very low heat build-up from hysteresis, excellent chemical resistance, and the best high-temperature performance ever seen in commercial polyurethane elastomers. Comparison of properties versus hydrogenated nitrile butadiene rubber (HNBR) at temperatures as high as 150°C (302°F) also shows that LF PPDI can even outperform this established and widely used high-temperature elastomer. Adiprene® LF PPDI enables the processor to make parts with excellence performance in extreme environments.

### Adiprene® Low-Free HDI systems for outstanding weatherability and long pot life

Our aliphatic Adiprene® LF HDI Prepolymers have less than 0.1% free HDI monomer and offer the best physical properties of any aliphatic system. The development of Adiprene® LF HDI technology minimizes volatility issues with HDI, enabling the PU processor to make components which provide excellent physical properties for applications requiring UV stability and weatherability.



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