

# ADIPRENE<sup>®</sup> LF 950A

## Low Free TDI-Terminated Polyether Prepolymer

### Description

**ADIPRENE<sup>®</sup>** Low Free (LF) TDI prepolymers are available in polyether, polyester, and polycaprolactone compositions. These prepolymers are used in cast elastomer applications and can be cured with a variety of curatives that result in elastomers with unique performance. In comparison to conventional TDI prepolymers, the level of Free TDI is significantly reduced to less than 0.1%.

### Benefits of ADIPRENE<sup>®</sup> LF TDI Prepolymers:

- Improved Industrial Hygiene
- Superior Processing
- Excellent Toughness

### Improved Industrial Hygiene

Conventional TDI-based prepolymers contain unreacted TDI monomer up to 5% by weight, with high hardness materials generally having the highest level of free TDI. **ADIPRENE<sup>®</sup>** LF TDI prepolymers have less than 0.1% free TDI, which can be beneficial in the management and control of worker exposure to TDI.

### Superior Processing

Relative to conventional TDI-based prepolymers of equal hardness, **ADIPRENE<sup>®</sup>** LF TDI prepolymers have lower viscosity, which allows them to be processed at reduced temperatures for improved heat stability and longer pot life. These qualities can improve the performance of a casting operation by reducing scrap, particularly in difficult/intricate parts and molds that require longer times to fill.

### Excellent Toughness

The excellent toughness of **ADIPRENE<sup>®</sup>** LF TDI prepolymers makes them suitable for a wide variety of applications subject to significant wear, tear and abrasion. This is especially true when comparing to alternate materials such as rubber.



## Processing Guidance

### Prepolymer Meltdown Procedure

ADIPRENE<sup>®</sup> LF TDI prepolymers must be pre-heated for processing. Devices such as melting ovens, thermostatically controlled warming blankets or drum heaters can be used to pre-heat these prepolymers. Band heaters should not be used as they promote localized hot spots. See data tables for approximate pre-heat times and temperatures.

Prepolymer exposed to temperatures lower than 24°C during shipment and/or storage may require longer meltdown times. Containers of prepolymer should be rolled for 15-30 minutes prior to use to ensure homogeneity.

Note: Do not loosen the pail or drum to relieve the pressure. This will allow moisture into the prepolymer which can damage the material.

### Heat Stability

The NCO content of ADIPRENE<sup>®</sup> LF TDI prepolymers decreases with time upon exposure to heat. Prolonged heat exposure will result in higher prepolymer viscosity and lower than expected final hardness and physical properties of the cured elastomer. Maximum recommended heating times as a function of temperature are shown below.

Temperature	Duration
70°C (158°F)	3 Days
85°C (176°F)	24 Hours
100°C (212°F)	8 Hours

### Curing Process

ADIPRENE<sup>®</sup> LF TDI prepolymers can be cured with a range curatives, including VIBRACURE<sup>®</sup> A 134 and VIBRACURE<sup>®</sup> 2107. This data sheet includes data for prepolymers cured with VIBRACURE<sup>®</sup> A 134, which is 4,4'-methylene-bis-(2-chloroaniline), commonly called MbOCA. See data tables for specific curative properties and recommended processing conditions. For predictable durometer, avoid cure and post cure temperatures above 100°C (212°F). Higher temperatures result in lower durometer.

Curative Properties	Unit	VIBRACURE <sup>®</sup> A 134
Equivalent Weight		133.5
Appearance at Room Temperature		Yellow cylinders
Melting Point	°C (°F)	100-110 (212-230)
Processing Temperature	°C (°F)	110-125 (230-257)

### Industrial Hygiene

For detailed industrial hygiene information for ADIPRENE<sup>®</sup> LF TDI prepolymers and VIBRACURE<sup>®</sup> curatives included in this document, please refer to the relevant Safety Data Sheet (SDS).



## Technical Data

Prepolymer Properties	Unit	Typical Value
Nominal NCO Content	%	6.05
Brookfield Viscosity @ 30°C (86°F)	Centipoise	6000
Brookfield Viscosity @ 50°C (122°F)	Centipoise	1820
Brookfield Viscosity @ 70°C (158°F)	Centipoise	500
Brookfield Viscosity @ 100°C (212°F)	Centipoise	150
Density @ 70°C (158°F)	g/cm <sup>3</sup>	1.03
Density @ 100°C (212°F)	g/cm <sup>3</sup>	1.01
Appearance @ 23°C (73°F)		Clear to hazy liquid
Color	Gardner Scale	< 3
Prepolymer Meltdown Conditions (20.4 kg / 5 gal pail)	Hours / °C (°F)	12-16 / 70 (158)
Prepolymer Meltdown Conditions (204 kg / 55 gal drum)	Hours / °C (°F)	24-36 / 70 (158)

Processing Conditions	Unit	Typical Value
Curative: VIBRACURE® A 134 MbOCA, 95% Theory	pph <sup>1</sup> per prepolymer	18.30
Prepolymer Temperature	°C (°F)	66 (150)
Curative Temperature	°C (°F)	116 (240)
Mold Temperature	°C (°F)	100 (212)
Pot Life <sup>2</sup> to 10,000 cP	Minutes	7.3
Nominal Demold Time <sup>3</sup>	Minutes	25
Post Cure Conditions	Hours / °C (°F)	16 / 100 (212)

<sup>1</sup> Curative amount (pph) is based on nominal NCO value

<sup>2</sup> Pot life determined using Brookfield Viscosity method, 350g sample, spindle #7 at 50 rpm.

<sup>3</sup> Demold time is dependent on catalyst dosage, part shape and volume; demolding can occur when part has built sufficient green strength

Physical Properties	ASTM Standard	Unit	Typical Value
Hardness	D2240	Shore A or D	95-97A
100% Modulus	D412 / ISO 037 II	psi (MPa)	2200 (15.2)
300% Modulus	D412 / ISO 037 II	psi (MPa)	4100 (28.3)
Stress at Break	D412 / ISO 037 II	psi (MPa)	5500 (37.9)
Strain at Break	D412 / ISO 037 II	%	350
Tear Strength, Split	D470	pli (kN/m)	125 (21.9)
Tear Strength, Die C	D624 Die C	pli (kN/m)	500 (87.6)
Rebound Resilience (Bayshore)	D2632	%	42
Compression Set @ 70°C, 22 hrs	D395, Method B	%	32
Specific Gravity	D792		1.13

Physical Property Testing: The stated data has been generated in a laboratory environment and is considered typical.



## Technical Data, continued

Physical Properties	ASTM Standard	Unit	Typical Value
Compression Modulus, 5%	D575	psi (MPa)	500 (3.4)
Compression Modulus, 10%	D575	psi (MPa)	840 (5.8)
Compression Modulus, 15%	D575	psi (MPa)	1200 (8.3)
Compression Modulus, 20%	D575	psi (MPa)	1650 (11.4)
Compression Modulus, 25%	D575	psi (MPa)	2100 (14.5)

Physical Property Testing: The stated data has been generated in a laboratory environment and is considered typical.



This information and our technical advice – whether verbal, in writing or by way of trials – is subject to change without notice and given in good faith but without warranty or guarantee, express or implied, including any warranty of merchantability or fitness for particular purpose, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.

©2018 LANXESS. Adiprene, Vibracure, Vibracat, LANXESS and the LANXESS Logo are trademarks of LANXESS Deutschland GmbH or its affiliates. All trademarks are registered in many countries in the world.

Unless specified to the contrary, the values given have been established on standardized test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that the results refer exclusively to the specimens tested. Under certain conditions, the test results established can be affected to a considerable extent by the processing conditions and manufacturing process.

181023

Customers in the USA are kindly requested to refer to:

**LANXESS Deutschland GmbH**  
 Business Unit Urethane Systems  
 Kennedyplatz 1  
 50569 Cologne  
 Germany

**LANXESS Solutions US Inc.**  
 Business Unit Urethane Systems  
 2 Armstrong Road  
 Shelton, CT 06484  
 USA

