

# ETHACURE® 90

 ALBEMARLE®

HIGH-PERFORMANCE ALIPHATIC AMINE CURATIVE



# Introducing ETHACURE® 90 curative, the slow-curing, high-performance aliphatic amine curative

The scarcity of new commercial curatives has created a real market need for greater cure-rate control and enhanced processing flexibility. To fill that need, Albemarle R&D teams have spent the last several years developing and customer-testing a product now proven to greatly improve the processability of polyurea and polyurethane spray elastomer coating systems. **That breakthrough—ETHACURE® 90 curative—is now U.S. EPA-approved and available for commercial sales.**

## A powerful new solution

ETHACURE® 90 curative is a unique new aliphatic diamine chain extender for aliphatic and aromatic B-side formulations in sprayed and hand-applied coatings. Its low reactivity and high compatibility diamine chemistry provide formulators with improved cure-rate control in a wide range of aliphatic systems, as well as aromatic systems (see Figure 4).

## Cure-rate flexibility with color-fast assurance

ETHACURE® 90 curative can be used as the sole curative or can be blended with faster aliphatic curatives like IPDA (isophoronediamine) or other other Albemarle ETHACURE® curatives to obtain the desired cure speed and properties (see Figure 2). Applicators will appreciate the way it improves pot life—and they'll like the ease of application. Thicker, more consistent coatings are easier to create, as are the soft elastomers used in caulks and sealants. And because ETHACURE® 90 curative is a clear liquid, it doesn't degrade the appearance of color-critical coatings. You can recommend it with confidence, even for demanding outdoor applications.

## Smoother finishes, better adherence

Systems containing ETHACURE® 90 curatives have relatively low viscosity and higher flow rates, allowing sprayed coatings to adhere more closely to rough surfaces and penetrate areas where thicker coatings might tend to bridge. Coating finishes are smoother and more attractive, without that undesirable "orange peel" effect.

## Stronger, more elastic coatings

ETHACURE® 90-cured coatings provide applicators with better performance in a number of areas—including greatly improved tensile strength—compared to coatings formulated with another common aliphatic curative (see Figure 3). Other physical properties of ETHACURE® 90-based aliphatic spray coatings are fairly insensitive to index variations in the range of 1.01-1.15 (see Figure 1) and suggest that its formulations may last longer and perform better in severe-service applications such as containment barriers, floors, parking garages and bridges.

FIGURE 2: ETHACURE® 90 Starter Formulations

Use ETHACURE® 90 as the sole curative or blend it with faster aliphatic curatives to obtain the desired cure speed and properties.

Formulation	1	2	3	4	5
<b>'A' Side</b>					
15% NCO IPDI					
Index =	1.05	1.05	1.05	1.05	1.05
<b>'B' Side</b>					
D-2000	42.2	47.6	48.9	49.8	51.0
T-5000	10.0	10.1	10.0	10.0	10.0
ETHACURE 90	47.7	36.8	34.3	32.4	30.1
IPDA	-	5.5	6.8	7.8	9.0
Eq. Ratio					
(IPDA: ETHACURE 90)	100% E90	1:4	1:3	1:2.5	1:2
<b>Properties</b>					
Hardness (D)	46/41	49/45	49/45	46/40	47/44
Tensile Strength (psi)	2,120	2,920	2,910	2,220	2,410
Elongation (%)	440	430	430	330	360
Modulus (psi)	33,990	35,320	33,830	28,930	30,900
Mod. (100%)	1,000	1,190	1,190	1,150	1,220
Mod. (300%)	1,500	2,020	2,050	2,020	2,080
Tear Strength (pli)	510	500	500	470	500
Gel Time (sec, est.)	48	22	22	15	13
Tackfree Time (sec)	340	160	160	110	90

Coatings produced with static mixer using 32 or 48 mixing units

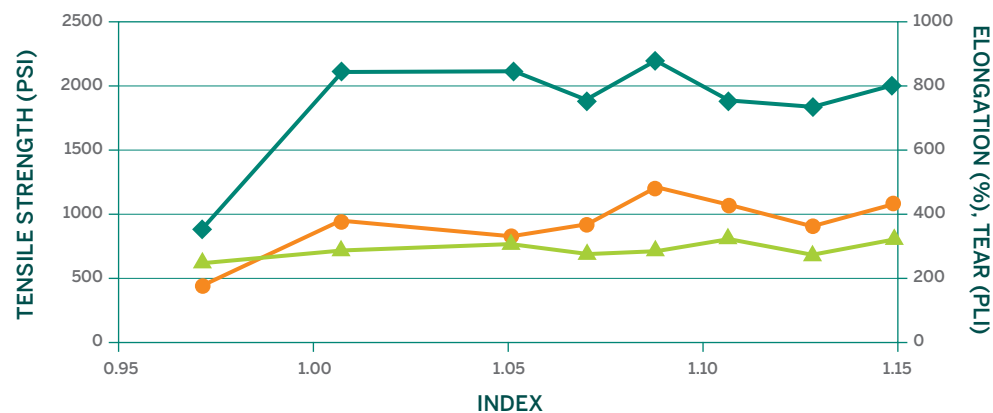
FIGURE 3: ETHACURE® 90 Performance vs. Aliphatic Curative C\*

Formulation	1	2	3	4
<b>'A' Side</b>				
15% NCO IPDI				
Index =	1.05	1.05	1.05	1.05
<b>'B' Side</b>				
ETHACURE® 90	-	-	34.92	29.05
Aliphatic Curative C	56.03	48.73	-	-
IPDA	-	3.48	7.13	10.24
D-2000	39.81	43.24	52.81	55.60
T-5000	4.16	4.55	5.14	5.11
Eq. Ratio (IPDA:CX)	100% CX	12:88	25:75	37:63
<b>Properties</b>				
Gel Time (sec)	22	11	26	12+
Hardness (A)	95	92	95	92
Tensile Strength (psi)	1064	1026	1797	1625
M-100 (psi)	1010	950	909	858
M-300 (psi)	-	-	1575	1487
Elongation (%)	142 <sup>2</sup>	169	346	337
Die C Tear (pli)	344	334	344	304

\* Hydrogenated Butyl-MDA

Performance of ETHACURE® 90 - based aliphatic spray coatings shows that the system is robust, and final properties are fairly insensitive to variations for index in the range of 1.01-1.15. (A Side:15% IPDI prepolymer; B Side: 60:40 E90:IPDA [equiv.]

FIGURE 1: ETHACURE® 90 Index Study



## ETHACURE® 90 A superior solution for:

- TRUCK BED LINERS
- BRIDGE COATINGS
- CONCRETE COATINGS
- CONTAINMENT LINERS
- PIPE COATINGS AND LINERS
- TANK COATINGS AND LINERS
- ROOFING COATINGS
- FLOORING COATINGS
- SEALANTS AND CAULKS
- RIM APPLICATIONS



### Typical Properties of ETHACURE® 90

Appearance	Clear, colorless liquid
Viscosity (cSt @ 20° C)	14.1
Specific Gravity	0.82
Bulk Density (lb/gal)	6.88
Amine Equivalent Weight (g/eq)	142.3
Water (wt %)	<0.08
Solubility (wt %, @ 25° C)	
Acetone	miscible
Methanol	miscible
Toluene	miscible

These properties are typical but do not constitute a specification either in part or as a whole. Specification data is available on request from sales, customer service or customer technical service.

Get the full ETHACURE 90 story at [curatives.com](http://curatives.com).

### FIGURE 4: Cure Rate Control of Aromatic Polyurea Systems

In addition to aliphatic systems, ETHACURE® 90 can effectively modify the cure rate of aromatic systems.

Formulation	1	2	3	4
<b>'A' Side</b>				
RUBINATE® 9480	100	100	100	100
<b>'B' Side</b>				
ETHACURE® 100	28.1	18.26	14.52	11.66
ETHACURE® 90	-	16.90	23.14	27.83
D-2000	66.1	58.72	56.22	54.47
T-5000	5.8	6.12	6.11	6.03
Eq. Ratio (E100:E90)	100% E100	3.4:1	2:1	4:3
<b>Properties</b>				
Gel Time (sec)	< 2	7	10	14
Hardness (A)	90	90	90	90
Tensile Strength (psi)	2310	1916	1804	2146
M-100 (psi)	1300	990	1051	1069
M-300 (psi)	2030	1809	1558	1911
Elongation (%)	370	322	353	346
Die C Tear (pli)	460	339	367	390

All formulations at 1.05 isocyanate index and 1:1 volume ratio

### What this means for you.

The benefits of cure-rate control are numerous. By including ETHACURE 90® in your mix, you'll be able to create high-performance coatings with:

- Outstanding UV and color stability
- Flexible gel times to match applications
- Even, consistent flow through spray equipment
- Excellent adhesion and durability
- Smooth, high-gloss finishes
- Improved flexibility and elongation

To learn more about ETHACURE® 90 or our entire ETHACURE product line, please contact your nearest Albemarle Polymer Solutions representative.

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