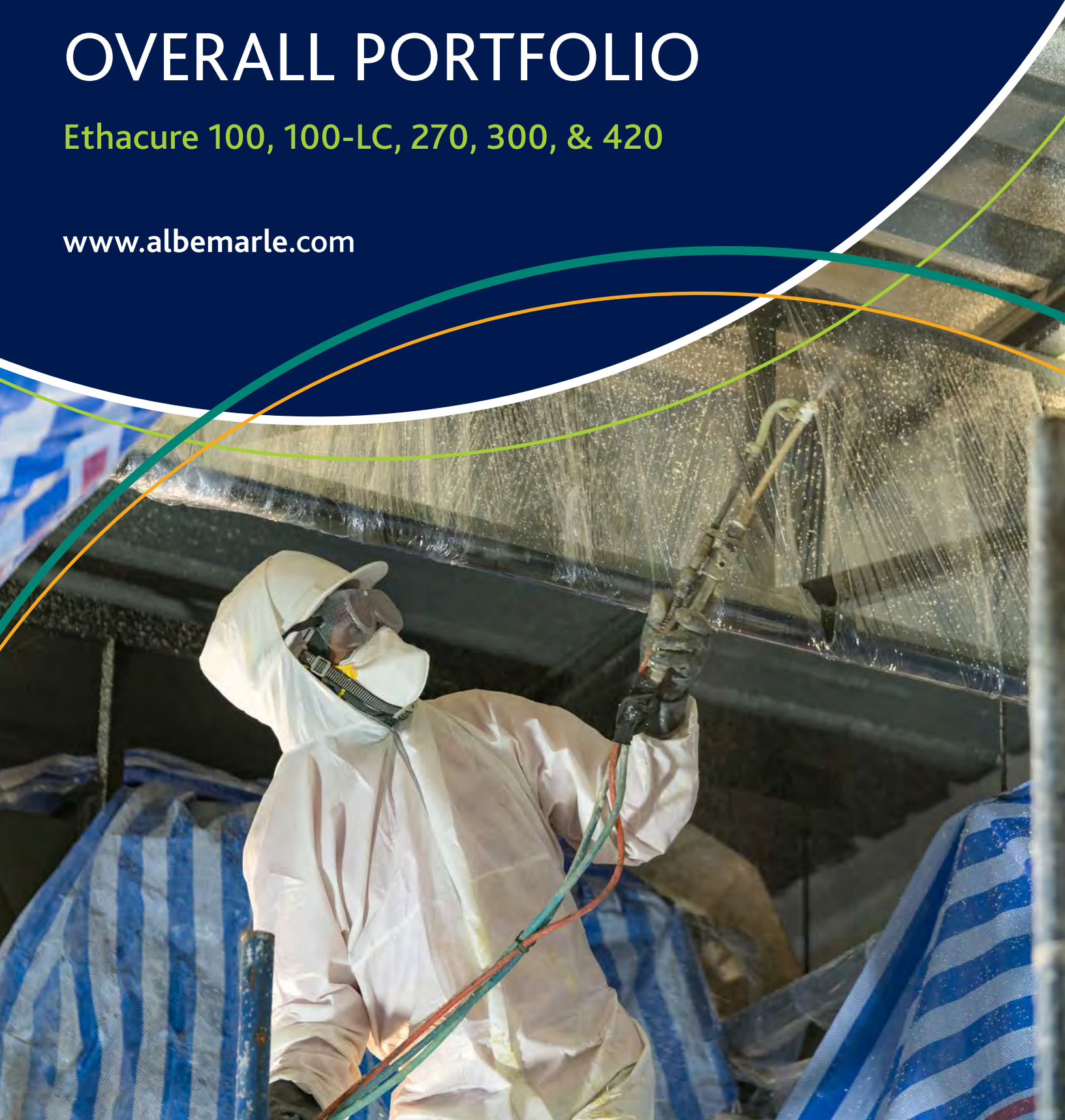




CURATIVES OVERALL PORTFOLIO

Ethacure 100, 100-LC, 270, 300, & 420

www.albemarle.com



ETHACURE 100

Value in Polyurea Applications:

Ethacure 100 is the workhorse curative for polyurea and polyurethane applications particularly, spray applications.

It is a high quality, liquid product that delivers exceptional product benefits such as:

- Adjustable reaction times
- Outstanding mechanical performance
- Ease of processing
- Zero dust exposure

Integrating E100 in polyurea coating engineering equips formulators and end-users with increased versatility, adjustability, and dynamic performance advantages.

Spray Polyurea Formulations

MDI prepolymer 15.5% NCO (has a high 2,4'-isomer content)	100
B-Side Components, %wt.	
ETHACURE 100	18.69
ETHACURE 420	9.35
Polyether amine D-2000	60.75
Polyether amine T-5000	4.67
Pigment	4.67
UV absorber	1.87
Gel time, sec.	12
Physical Properties	
Tensile Strength, psi (Mpa)	2420 (16.7)
Elongation, %	455
Tear Strength, pli (N/mm)	382 (67)

Value in Epoxy Applications:

Ethacure 100 is a viable curative for use in epoxy applications, and as an MDA replacement in the production of filament wound pipe. Cured parts display high-grade benefits such as:

- Good "wetting" characteristics
- High glass transition temperatures (Tgs)
- Exceptional chemical resistance
- Low moisture accumulation

Epoxy Formulation

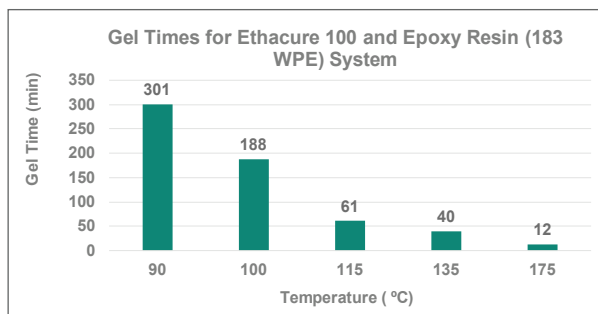
Epoxy Resin (WPE = 183 g/eq)	100
ETHACURE 100, phr.	25.5
Cure Cycle	1.5 hrs. at 175 °C
Physical Properties	
Tensile Strength, Mpsi	11.3
Tensile Modulus, Mpsi.	390
Elongation, %	6.3
Flexural Modulus, Mpsi.	390
Tg, °C	154
Post Cure	30 min. 250°C
Tg, after post, °C	188

Product Market Segmentation

ETHACURE curatives are low-viscosity, pourable liquids that are easy to mix, meter and dispense.

- High purity
- 100% active
- Simple to blend & handle without heating

E100	• Spray Polyurea • PU Cast Elastomers • Epoxy Composites • PU Foam
E100- LC	• Cast Elastomers
E270	• Epoxy Composites
E300	• PU Cast Elastomer • Epoxy Composite • PU Foam • Adhesives
E420	• Spray Polyurea • PU Foam
E500	• Polyurethane Roof Coating



Gel times have been determined at different temperatures as guidance for our potential customers.

Ethacure 100 Applications



Spray Polyurea Coatings

- Truck Bed Liners
 - OEM
 - After Market
- Water Proofing Membrane
 - Amusement park tanks
 - Bridges
 - Pipe coating
 - High speed rail
 - Concrete
- Secondary Containment
 - Oil and Gas



Epoxy Composites

- Filament wound epoxy pipe
- Syntactic foam
- Grinding wheel
- Electrical laminates



Polyurethane Cast Elastomer

Wheels, Belts, Tools, Rollers



PU Foam

Building Insulation,
Roofing



RIM

Vehicle parts

ETHACURE 100-LC

Value in Low Color Applications:

Ethacure 100-LC is the lowest-colored aromatic diamine commonly available. Specialized production techniques and a proprietary, patented stabilizer system produce a curative with extremely low initial color and increased color stability.

Specifying Ethacure 100-LC in formulations results in:

- Lower color in final parts
- Reduced pigment loading
- Easier color matching
- Increased shelf life in epoxy coatings, polyurethane and polyurea spray coatings



Ethacure 100-LC Applications



Polyurea Cast Elastomer

- Optically clear wheels
- Ballistic-proof applications
- Optically clear eye glasses
- Golf balls



ETHACURE 270

Value in Epoxy Applications:

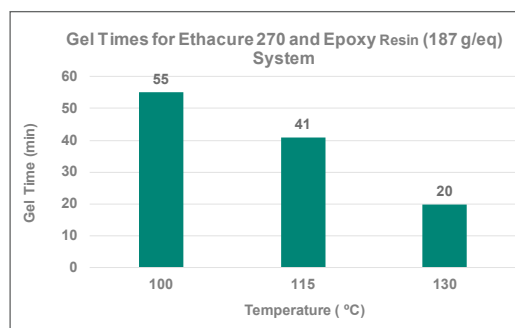
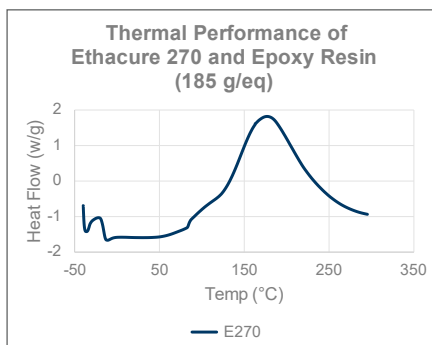
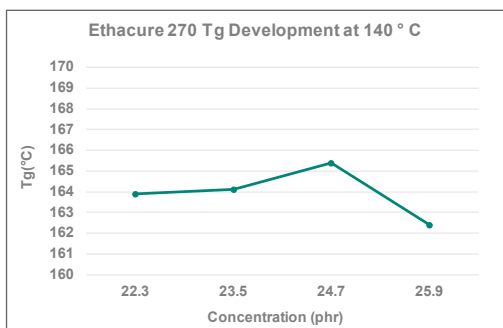
Albemarle's Ethacure 270 curing agent is strategically formulated to provide longer and adjustable reaction times when cured with epoxy resins.

Polymers cured with Ethacure 270 deliver exceptional properties such as high temperature performance, substantial mechanical strength, and good chemical resistance.

These characteristics make it an excellent curative for fiber reinforced pipe and composites.

Concentration & Performance Optimization:

Optimum level for maximum temperature performance is 24.7 phr for resins with WPE's of 187g/eq.



Gel times have been determined at different temperatures as guidance for our potential customers.

Ethacure 270 Applications



Epoxy Composites

- Filament wound epoxy pipe
- Advanced composites for aerospace applications



ETHACURE 300

Value in Cast Elastomer Applications:

Albemarle's Ethacure 300 puts users in control. Incorporating this versatile, easy-to-handle liquid into operations results in immediate benefits:

- A safer solution
- High quality product with reduced odor
- Ability to mix and match prepolymers to fit needs
- Adjustable reaction times
- Eliminated dust exposure and melting
- Reduced costly, inconvenient heating
- Simplified handling and blending
- Reduced exposure to hazardous materials

Exhibiting outstanding physical performance, Ethacure 300 cured polymers compete favorably with competitive alternatives, making it the leading alternative for MOCA replacement.

Cured polymers display excellent strength, hardness, modulus, and elongation at break point.



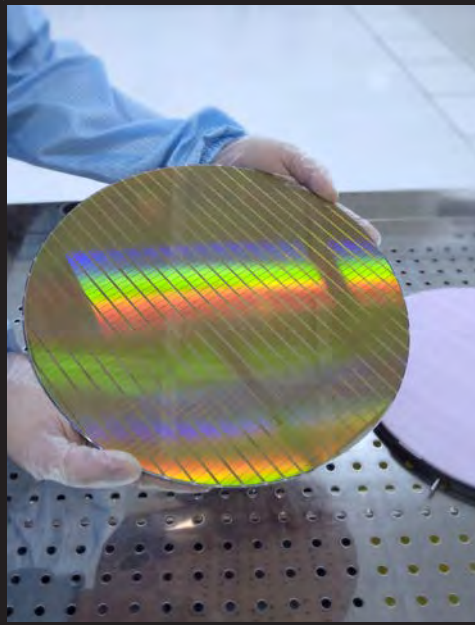
E300 is a liquid curative which allows formulators to fine-tune processing conditions and reaction times.

Utilizing Ethacure 300 in cast elastomer applications gives users reassurance that they will be able to meet application specification requirements when formulating.

Formulation Examples & Performance in Cast Elastomer Applications

Prepolymers Type	PTMEG	PTMEG	PPG
Prepolymer	Adiprene L-100	Adiprene L-100	Vibrathane B-627
Curative	E300	E300	E300
Processing Data			
Prepolymer, % NCO	4.12	9.46	6.20
Prepolymer, temp., °C	80	80	50
Curative, phr.	10.0	22.9	15
Pour time, min	5.0	0.9	7.0
Gel time, min.	6.0	1.3	11
Post-cure, (hrs./100°C)	18	3	18
Curative	E300	E300	E300
Polymer Properties			
Hardness, Shore A	88	--	94
Hardness, Shore D	--	73	--
Tensile, psi	5760	7560	4910
M-100 %, psi	1070	4600	1770
M-300 %, psi	2140	--	3240
Elongation	410	260	350
Die-C tear, pli	260	--	260
Split tear, pli	80	100	60
Compression set, %	31	--	34
Resilience, %	45	51	50

Ethacure 300 Applications



Polyurethane Cast Elastomers (hot)

- Rollers
 - Computer printers
 - Copy machines
 - Boat trailers
- Belts
 - Drive belts
 - Conveyor belts
- Tires
- Wheels
- CMP polishing pads
- Golf balls



Polyurethane Cast Elastomers (cold)

- Athletic surfaces
- Tire fill
- Thermal break



Epoxy Composites (cold)

- Carbon reinforced composite for aerospace applications

ETHACURE 420

Value in Polyurea Applications:

Ethacure 420 increases versatility for polyurea applicators. It is a liquid curative that boosts polymer performance, particularly elasticity, surface finish, and adherence capabilities. Formulators can easily produce the soft elastomers needed in caulks and sealants and appreciate the way Ethacure 420 improves pot-life.

Property performance is enhanced while tailored reaction times maintained.



Ethacure 420 Applications



Spray Polyurea Coatings

- Truck bed liners
- Water proofing membrane
- Secondary containment
- Flooring coatings



Polyurea/Polyurethane

Sealants and Caulks

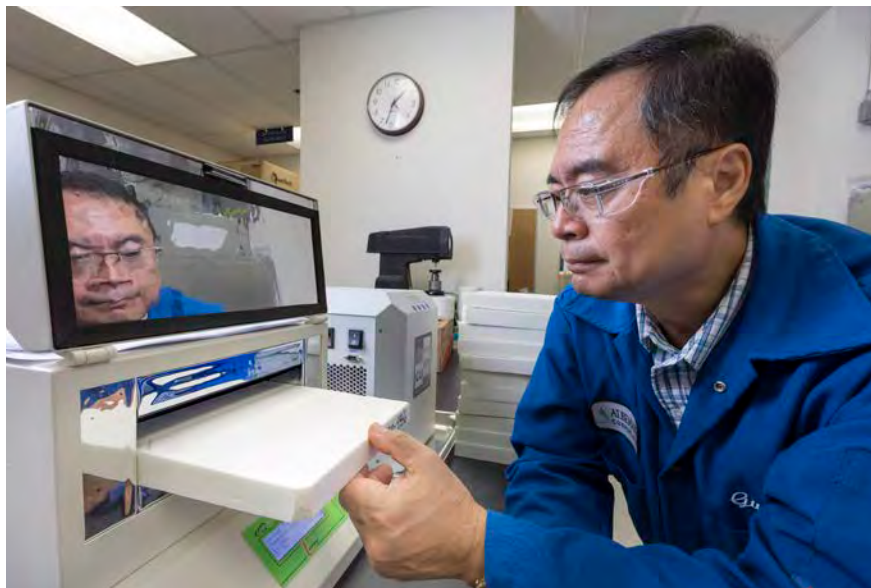


PU Foam

Building insulation and Roofing

Technical Service and Support

Our Technical Service team is committed to offering best-in-class support to our customer networks throughout the development process. We make it a priority to add value for our customers by diligently identifying performance optimization strategies that best suit their individual needs. Our qualified team of professionals share decades of knowledge and experience to support a results-focused approach, ensuring our customers have what they need to create value-added solutions and overcome their most challenging issues.



Core Capabilities and Instrumentation



CAPABILITIES

Largest Ethacure 100 (DETDA) Global Capacity

Albemarle's Ethacure curatives are produced in world-class manufacturing facilities, supported by dedicated and experienced teams who are committed to producing material of the highest quality. Our global capacity of the Ethacure 100 (DETDA) curative and robust production capabilities across our entire product portfolio are unmatched, allowing us to be the reliable and sustainable supplier that our customers deserve. Together, with our customer networks, we are dedicated to supporting continuous innovation and unparalleled growth in the polyurethanes industry.



Locations Around the World

From Charlotte to Shanghai, Albemarle operates sites in many countries around the globe. Our team is comprised of over 5,400 dedicated employees spread across approximately 100 different countries. As a global supplier of specialty chemicals, we strive to benefit the world in which we all live. As a neighbor to the world, we feel it is our responsibility to address diverse social and environmental issues, and we are committed to making a positive contribution to society at large.



Curatives Manufacturing, Technical Service, and Business Sites:

Louisiana | Arkansas | Texas | North Carolina | Belgium | Brazil | China | Japan | Korea

AMERICAS

4250 Congress Street, Suite 900 • Charlotte, NC 28209
Tel: +1 980 299 5700 • Fax: +1 980 299 5511

EUROPE, MIDDLE EAST, AFRICA

Parc Scientifique Einstein, Rue du Bosquet 9, 1348 • Louvain-la-Neuve, Belgium
Tel: +32 10 48 17 11 • Fax: +32 10 48 1717 • EMASales@albemarle.com

ASIA PACIFIC

CHINA Room 3202, No. 757 Mengzi Road, Gopher Center, Huangpu District • Shanghai, PRC. 200023
Tel: 86.21.6103.8666 • Fax: +86 21 6103 8777 • APSales@albemarle.com



www.albemarle.com

ALBEMARLE is a registered trademark of Albemarle Corporation. The information presented herein is believed to be accurate and reliable, but is presented without guarantee or responsibility on the part of Albemarle Corporation and its subsidiaries to ensure the accuracy or reliability of the information. It is the responsibility of the user to comply with all applicable laws and regulations and to provide for a safe workplace. The user should consider all information contained herein only as a guide, and should take precautions that the user considers necessary or prudent to promote a safe work environment, such as considering all applicable health and safety hazards, developing safe work practice procedures and properly instructing employees. Further, nothing contained herein shall be taken as an inducement or recommendation to manufacture or use any of the materials or processes mentioned herein in violation of existing or pending patents.