



Custom Formulators



Custom  
Cured In Place Pipe  
Floors  
Infusion  
Seismic Retrofit  
Wind Blades  
Custom Systems  
Cured In Place Pipe  
Floors  
Infusion  
Seismic Retrofit

[ ReBuilding & RePowering America™ ]

**Resin, Hardener  
and System  
Solutions**





## Custom Rhino Epoxy Formulations

- Chemical Resistant Flooring
- Coatings
- Cured In-Place Pipe and Sewer Rehabilitation
- Filament Winding Systems
- Industrial Adhesives
- Infrastructure
- Infused Polyester Replacement Technologies
- Infused Tooling and HLU Tooling Systems
- Pultrusion
- Toll and Private Label Production
- Wind Energy Composites and Adhesives



*The Rhino Epoxy Division is Rebuilding and RePowering America by providing custom formulations and technical assistance that create product-driven system solutions. As an innovative Epoxy Formulator, we have over 70 custom formulations for Resins, Hardeners, Systems and Civil Engineering applications including the development of high performance matrix resins for use in CIPP and carbon fiber applications. Whether you require a bulk trailer or a five gallon pail, Rhino Epoxy has the high quality, consistent product performance solution at a cost-effective price.*





## EPOXY APPLICATIONS

Aircraft	Fuel Tank Sealers	Resin Infusion
Aerospace	Glass Filament Winding	RTM
Adhesives	Golf Shafts	Secondary Containment
Aggregate Extended Mortars	Grout	Seismic Retrofit
Anti-Graffiti Coatings	Hand Lay-up Laminating	Sectional Pipe Repair
Automotive Racing & Repair	Hazardous Waste Storage	Sewer Rehabilitation
Bag Molding / Helmets	High Temperature Systems	Skis & Snowboards
Bonding Compounds	High Strength Composites	Structural Adhesives
Bridge Repair	Infrastructure Retrofit	Structural Reinforcement
Carbon Fiber Filament Winding	Infrastructure Upgrades	Surfboards & Wake Boards
Casting	Infusion Resins	Syntactic Adhesives
Chemically Resistant Flooring	Joint Sealers	Tank Linings
Clear Coatings & Castings	Marine Construction	Tennis Rackets
Composite Parts & Tooling	Military Specifications	Theme Parks & Models
Concrete Repair & Forms	Models	Tooling
Construction Specialties	Motorcycle Fairings	Tool & Die Production
Cored Structures	Motorcycle Helmets	Transfer Molding (VARTM)
Cured In-Place Pipe (CIPP)	Movie Sets	Transportation
Decoupage Coatings	Non-Skid Coatings	Trenchless Pipe Repair
Ductwork	Piers & Pilings	Vacuum Assisted Resin
Epoxy Crack Injection	Pipelines	Vacuum Bagging
Fiberglass Laminating	Polyester Replacement	Vessels
Filament Winding	Potting & Encapsulation	Waste Water Treatment
Fire Retardant Systems	Press Molding	Waterproofing
Flexible Membranes	Pressure Tanks	Wind Energy Rotor Blades
Food Processing	Primers & Sealers	Wind Surfer Boards
FRP Manufacturing	Prosthetics	
Fuel Storage Tanks	Rapid Rehabilitation	



## EPOXY PRODUCTS

The following list represents our best selling resins with suggested hardeners. The most popular applications are listed. Resin viscosity is published neat, hardener viscosities are mixed. Weight per gallon is for each individual component. Mix ratios are by weight unless otherwise noted. Systems are 100% solids, zero VOCs.

**908SC** – Epoxy Surface / Face Coat. Used for both tooling and production laminates. Thixotropic, yet brushes for easy application. (Black or White)

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
908SC	thixotropic	-	10.5 – 11.3	-
<b>Hardener</b>				
w/3102	thixotropic	15	9.0	100:12
w/3103	thixotropic	30	8.4	100:12
w/3136-R1	thixotropic	30	8.2	100:12
w/3137	thixotropic	30	8.3	100:12

**1301** - The standard press mold epoxy system for composite laminates and parts. All listed hardeners cure very quickly at standard process temperatures 160°F – 210°F.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1301	11,000 – 12,000	-	9.6	-
<b>Hardener</b>				
w/3141	2,200	10 – 15	8.5	100:22
w/3176	3,400	25 – 30	8.4	100:22
w/EC-21	4,100	30 – 35	8.2	100:42

**1307LV** - Kit Aircraft Laminating and Adhesive System. System has excellent wet out, low viscosity and high strength.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1307LV	1,160	-	9.5	-
<b>Hardener</b>				
w/3102	900	10 – 15	9.0	100:22
w/3103	500	25 – 30	8.4	100:22
w/3156	1,200	30 – 35	8.6	100:42



**1308NC** - Low viscosity, economical general purpose epoxy resin with low odor. Used for fiberglass laminating and civil engineering applications.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1308NC	500 – 700	-	9.2	-
<b>Hardener</b>				
w/3101	600	55 – 60	8.1	100:35
w/3102	540	12 – 15	9.0	100:22
w/3110	350	8 – 10	8.1	100:43
w/3138	350	65 – 75	8.2	100:22

**1310L-6** - High performance epoxy resin for high strength composites and tooling. All systems cure at a room temperature with >185°F HDT allowing the parts or tools to be used in many elevated service temperature environments. Low mixed viscosity quickly wets thick reinforcements. Convenient 4:1 volumetric mix ratio.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1310L-6	1,100 – 1,400	-	9.4	-
<b>Hardener</b>				
w/3102	1,000	12 – 15	9.0	100:22
w/3103	550	30 – 35	8.4	100:22
w/3138	650	50 – 60	8.2	100:22
w/3155	400	90+	7.9	100:22
w/3179	850	35 – 40	8.2	100:22

**1310T** - Thixotropic version of 1310L-6 used for vertical laminates, tooling or where a non-draining epoxy system is desired.

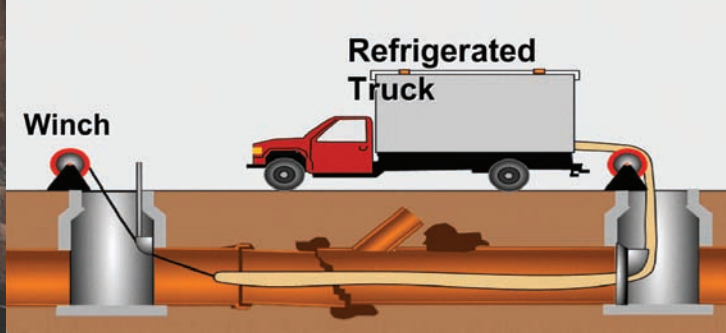
Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1310T	1,500 – 1,600	-	9.4	-
<b>Hardener</b>				
w/3102	2,150	12 – 15	9.0	100:22
w/3103	1,350	30 – 35	8.4	100:20
w/3136-R1	1,250	30	8.2	100:20
w/3138	1,650	50 – 60	8.5	100:22
w/3155	1,200	90+	7.9	100:22
w/3179	1,700	35 – 40	8.2	100:22
w/3191	1,600	60 – 70	8.4	100:43



Old / Corroded Pipe



Inserted liner for repair



(Photos courtesy of North American Society for Trenchless Technology, www.nastt.org)

**1310T-Lt Blue** - 100% solids, non-draining, epoxy system for producing Cured In-Place Pipe. It is tinted transparent blue, and the hardeners are transparent yellow.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1310T-Lt Blue	1,500 – 1,600	-	9.4	-
<b>Hardener</b>				
w/3102 Yellow	2,150	12 – 15	9.0	100:22
w/3103 Yellow	1,350	30 – 35	8.4	100:22
w/3138 Yellow	1,650	50 – 60	8.5	100:22
w/3191 Yellow	1,600	60 – 70	8.4	100:43

**1314** - Used for marine applications such as laminates, adhesives, sealers and fairing compounds. Also used where a low viscosity, quick curing epoxy system is desired. Very low mixed viscosities quickly wet thick reinforcements. Exhibits very low exudation, allowing secondary bonding with minimal preparation.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1314	400 – 500	-	9.3	-
<b>Hardener</b>				
w/3102	550	12 – 15	9.0	100:22
w/3103	350	20 – 25	8.4	100:22
w/3138	400	30 – 35	8.5	100:22
w/3143	450	25 – 30	8.8	100:43
w/3156	550	25 – 30	8.6	100:22

**1319** - Press molding epoxy system, modified for added flexibility and adhesion. All listed hardeners cure very quickly at standard process temperatures (160°F – 210°F).

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1319	4,500 – 4,800	-	9.5	-
<b>Hardener</b>				
w/3141	2,000	10 – 15	8.4	100:22
w/3176	2,700	25 – 30	8.4	100:22
w/EC-21	2,900	30 – 35	8.2	100:42

**1320** - Ultra low viscosity epoxy for infusion. Used for producing composite laminates using injection or vacuum infusion techniques at ambient temperature.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1320	300	-	-	-
<b>Hardener</b>				
w/3103	220	25 – 30	8.4	100:22
w/3138	280	40 – 45	8.5	100:22
w/3141	200	10 – 12	8.5	100:22
w/3154	180	45 – 50	8.1	100:22

**1337** - High temperature Novolac laminating and tooling epoxy. 350°F HDT after post cure.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1337	10,000 – 10,500	-	9.7	-
<b>Hardener</b>				
w/3137	4,000	30 – 35	8.3	100:19

**1379** - Specialty epoxy system used for making large scale parts such as wind turbine rotors. Long working life with quick cure. High Tg without post cure.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1379	-	-	9.4	-
<b>Hardener</b>				
w/3179	750 – 900	37 – 45	8.3	100:22

**1380** - 1:1 medium modulus, semi flexible epoxy system. Extremely tough, durable and crack resistant. Convenient 1:1 volumetric mix ratio.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1380	2,000	-	9.4	-
<b>Hardener</b>				
w/3180	3,300	30 – 45	8.2	1:1 (volume)

**1382** - 1:1 highly flexible epoxy system. Retains flexibility at low temperature. 150% elongation, even when aged. Convenient 1:1 volumetric mix ratio.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1382	-	-	9.2	-
<b>Hardener</b>				
w/3180	3,200	25 – 35	8.1	1:1 (volume)

**1401-21** - Epoxy System for Infusion. Multifunctional epoxy and cycloaliphatic-amine blend hardener for high performance composite parts.

Resin	Viscosity, cps	Gel Time	Lbs. / Gal	Mix Ratio
1401-21	800 – 1,200	-	9.6	100:30
<b>Hardener</b>				
w/4101-21 Slow	20	240 – 300	7.9 – 8.1	100:30
w/4101-21 Fast	50	35 – 40	7.9 – 8.1	100:30



# RESINS

Product	Description	Viscosity	Wt/Gal
908SC	Tooling Epoxy Face and Surface Coat	Thixotropic	10.5 – 11.3
1301	Standard Undiluted Epoxy Resin	10,000 – 13,000	9.7 – 9.8
1303	Medium Viscosity Epoxy Resin for Warmer Environments	4,000 – 5,000	9.6 – 9.7
1304T	Medium Viscosity Thixotropic Epoxy Resin (special order only) See 1310T	2,700 – 3,000	9.5 – 9.6
1306T	Thixotropic Low Viscosity Epoxy Resin (special order only) See 1310T.	1,000 – 1,400	9.3 – 9.4
1307-LV	Epoxy Resin for Kit Aircraft	1,100 – 1,250	9.5
1308NC	Economical Low Viscosity General Purpose Epoxy Resin	500 – 700	9.26
1310L-6	Low Viscosity Epoxy for Laminating and Tooling	1,000 – 1,200	9.4
1310T	Thixotropic (non-draining) Epoxy for Laminating and Tooling	1,350 – 1,550	9.4
1310T-Lt Blue	100% solids, non-draining, epoxy system for producing Cured In-Place Pipe.	1,350 – 1,550	9.4
1311	Intermediate Viscosity Epoxy Resin/Offsets Dow 325, Shell CS 242	2,100 – 2,400	9.4
1314	Marine Laminating, Low Viscosity Epoxy Resin/Offsets:West 105	400 – 500	9.3
1315	Low Viscosity Epoxy Resin/ Offsets: Ciba Geigy 507, Shell 815	600 – 750	9.5
1316	Lightly Filled White Tooling Resin	3,500 – 4,200	9.7 – 9.8
1319	Press Molding Resin Modified for Improved Flexibility and Adhesion	4,000 – 5,000	9.5
1320	Ultra Low Viscosity Epoxy Resin	275 – 325	9.3
1337	High Temperature Epoxy Novolac Tooling Resin	9,500 – 10,500	9.7
1346 Gel	White Thixotropic Gel Epoxy Resin	Gel	9.7 – 9.8
1376L-16	Epoxy Resin for Coatings	1,100 – 1,300	9.3
1379	Laminating and Tooling Epoxy Resin	950 – 1,200	9.4
1380	Medium Modulus Epoxy Resin	1,800 – 2,200	9.4
1381R-1	Thixotropic Tooling Epoxy Resin	1,900 – 2,100	9.4
1382	Low Modulus Flexible Epoxy Resin	950 – 1,200	9.2
9211.5	Thixotropic, High Viscosity Epoxy Resin	21,000 – 22,000	9.8 – 9.9





# HARDENERS

Product	Description	Viscosity	Mix Ratio (minutes)	Work Life	Mixed Wt/Gal
EC-21	Non-Corrosive 2:1 Press Molding Hardener	1,200	100:42	40	8.20
3100	Long Pot Life for Civil Engineering	250	100:50	130	7.90
3101	General Purpose Non-Corrosive Hardener	750	100:35	55	8.10
3102	Fast 4:1 Laminating and Tooling Hardener	1,500	100:22	12	9.00
3103	High Strength Non-Corrosive 4:1 Hardener	150	100:22	30	8.40
3105	Medium Viscosity 4:1 Tooling Hardener	1,200	100:22	30	8.60
3109	General Purpose 4:1 Non-Corrosive Hardener	600	100:22	30	8.50
3110	Fast 2:1 Hardener for Crack Injection/Construction	300	100:43	8	8.00
3120	Gen'l Purpose 2:1 Civil Engineering Hardener	100	100:43	25	8.00
3122-D	1:1 "Decoupage" Coating Hardener	550	1:1 (vol)	30	8.20
3122-D Gel	Gel Version of 3122-D for Vertical Applications	Gel	1:1 (vol)	30	8.20
3136-R1	High Strength Epoxy Hardener	60	100:20	30	8.20
3137	350°F Service Temperature Tooling Hardener	225	100:22	30	8.30
3138	Gen'l Purpose High Temp Laminating & Tooling	175	100:22	65	8.20
3140	Variable Ratio Long Work Life Adhesive Hardener	11,000	100:45	240	8.10
3141	Fast Cure 4:1 Press Molding Hardener	150	100:22	12	8.20
3143	2:1 Chemical resistant Hardener for Coatings	600	100:45	25	8.80
3145	Gen'l Purpose 1:1 Hardener for Patch & Repair	1,400	1:1 (vol)	13	8.10
3146	Gen'l Purpose 1:1 Hardener for Civil Engineering	400	1:1 (vol)	30	8.05
3153	4:1 High Temp Laminating Hardener	165	100:22	25	8.40
3154	4:1 Medium Pot Life Low Viscosity Hardener	55	100:22	65	8.10
3155	4:1 Long Pot Life Low Viscosity Hardener	25	100:22	125	7.90
3156	Slow Version of 3102 Hardener	1,300	100:22	30	8.60
3159	15 Minute 4:1 Press Molding Hardener	75	100:22	25	8.20
3163	2:1 Cycloaliphatic Hardener for Clear Coatings	75	100:43	40	8.00
3176	Non-Corrosive 4:1 Press Molding Hardener	300	100:22	25	8.80
3179	4:1 Non-Corrosive Hardener for Large Parts	275	100:22	50	8.20
3179SR-1	Long Pot Life Version of 3179 Hardener	60	100:22	130	8.00
3180	Rubber Modified 1:1 Medium Modulus Hardener	4,500	1:1 (vol)	30	8.10
3181	Non-Corrosive 3:1 Laminating & Tooling Hardener	450	100:29	30	8.30
3182	1:1 High Strength & Impact Resistant Hardener	10,500	1:1 (vol)	30	8.10
6001LV	Elevated Temp Cure 1:1 Anhydride Hardener	175	100:87	>18 hrs.	10.20

## SPECIALITIES

Product	Description	Viscosity	Mix Ratio	Work Life (minutes)	Mixed Wt/Gal
101	Low Modulus Adhesive and Sealant	Gel	1:1	20	8.65
102	Toughened Structural Adhesive Putty	Paste	2:1	>240	9.42
121	Medium Modulus Structural Adhesive	Paste	1:1	20	9.15
405	Green Thixotropic Gel Epoxy Resin	Thixotropic Gel	2:1	>240	9.43
9601	General Purpose Potting & Encapsulation	Medium	1:1	80	11.35
9700 FCR	Novolac Fuel & Chemical Resistant Coating	Medium	2:1	30	9.70
Black Pigment	Black Epoxy Pigment Concentrate	Paste	n/a	n/a	11.00
White Pigment	White Epoxy Pigment Concentrate	Paste	n/a	n/a	14.00

## CIVIL ENGINEERING PRODUCTS

Product	Description	Viscosity	Mix Ratio	Work Life (minutes)
101	Low Modulus Sealant for Expansion and Control Joints. Also used as a Flexible Membrane or Caulking Material.	Gel	1:1	20
121	Medium Modulus Adhesive for Structural Bonding Repair, "Tack Coats", Coving, Cracking and Small Spall Repairs.	Paste	1:1	20
1308/3110	Fast Epoxy Crack Injection and Repair System. Approved by Caltrans and Many Municipalities. 100% Solids.	Low	2:1	8
1320/3120	Ultra Low Viscosity Crack Injection Epoxy. 100% Solids.	Low	2:1	30
1382/3182	100% Solids. Low Modulus Epoxy System for Flexible Membranes and Intermediate Coats. 150% Elongation.	Med	1:1	30
1500	Water Based Clear Epoxy Primer and Coating.	Low	4:1	>3 hours
1501	Water Based 1:1 Pigmented Epoxy Primer and Coating. Available in 8 (eight) Standard Industrial Colors.	Low	1:1	>3 hours
2000	General Purpose 100% Solids for Mortars, Grouts, Crack Injection, Spall Repair, Pebble Bonding and Adhesives. May also be used as a Concrete Primer, Sealer and Coating.	Low	2:1	30
2200	Premium Cycloaliphatic Epoxy Coating. 100% Solids with Excellent Chemical Resistance for Flooring and Secondary Containment. Available in 8 (eight) Standard Industrial Colors.	Low	2:1	30
2300	Clear Cycloaliphatic 100% Solids Epoxy for Top Coats.	Low	2:1	35
2400	100% Solids Pigmented Epoxy for Textured Coatings, Secondary Containment and Vertical Applications. Available in 8 (eight) Standard Industrial Colors.	Med	2:1	30
5000	Highly Filled Epoxy for Concrete Repair, Filling Holes as a "Fairing" Compound and "Cap" Material. 100% Solids.	Paste	2:1	30
9300	Bis-F Novolac Epoxy Resin.	Low	2:1	30
9700 FCR	Premium Epoxy Novolac Coating for Maximum Chemical and Fuel Resistance. Standard Color is Gray. 100% Solids.	Med	2:1	25

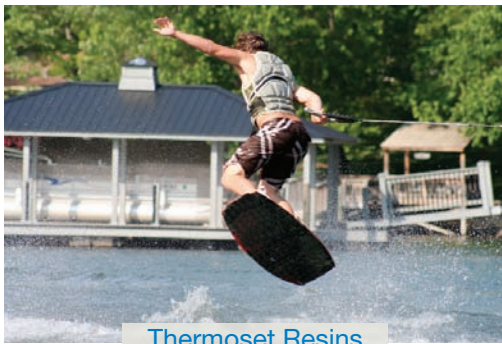
# RHINO EPOXY™

## Resin, Hardener and System Formulations

The Rhino Epoxy Division encompasses a comprehensive knowledge of high volume epoxy formulations. As an innovative Epoxy Formulator, we provide standard and custom formulations for Resins, Hardeners, Systems and Civil Engineering applications including the development of high performance matrix resins for use in CIPP and carbon fiber applications.

### CIPP (Cured In-Place Pipe) - Using no dig technology forming a pipe within a pipe

CIPP (Cured In-Place Pipe) clients start at the grass roots level with several thousand corporate and independent plumbers performing repairs on home size sewer lines using a no dig technology which forms a pipe within a pipe. Large, municipality and utility scale users are also taking advantage of this technology. CIPP now represents about 25% of the non-wind epoxy sales and growing every day.



Thermoset Resins

### Thermoset Resins - Wide range of applications and products

Epoxy Thermoset Resins have a well-established record in a wide range of composite parts, structures and concrete repair. The structure of the resin can be formulated to yield a number of different products with varying levels of

performance. A major benefit of epoxy resins over unsaturated polyester resins is their lower shrinkage. Epoxy resins can also be formulated with different materials or blended with other epoxy resins to achieve specific performance features.

### Composites - Infrastructure retrofits for seismic upgrades

Infrastructure Retrofit is used for seismic upgrade, blast protection and composite repair of conventional concrete/rebar structures that are failing. The infrastructure market segment has grown nearly 100% per year and now represents about 35% of non-wind epoxy sales. An added bonus in this market is that many applications also use Rhino Linings urethane formulations.

### Vacuum Assisted Resin Transfer Molding / Liquid Resin Infusion - Technology for wind energy rotor blades

VARTM / Liquid Infusion is a composite manufacturing process in which the dry fibers are laid on the tool and vacuum sealed and the liquid resin is drawn through with a vacuum pump to create rotor wind blades. Liquid resin technology provides for lower cost and lower cure temperatures.



VARTM



Extensive Selection of Resins, Hardeners and Systems



Custom Formulations for Every Need



High Quality, Consistent Product Solutions



Experienced Technical Assistance and Support



Small or Large Orders



Cost-effective Pricing



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