



August 2016

LR234 Polyester Resin

Low-Profile, Low-Styrene Marine Laminating Resins

DESCRIPTION

LR234 resin is a pre-promoted(*), thixotropic (*), low-profile, unsaturated polyester resins developed for fabricating small to large FRP structures (boat hulls, decks & other marine applications) where high production rates at room temperature are required. LR234 resin can also be used for other, non- boat building applications.

Many of the products in this series have a maximum VOC content of 35 percent or less and comply with California Rule 1162 and Rule 50. These resins are formulated for curing with methyl ethyl ketone peroxide (MEKP) catalyst and may be used for fabrication of general FRP articles using either hand lay-up or spray-up fabrication processes.

Please refer to specific properties for each version under the Typical Liquid Properties section.

FEATURES	BENEFITS
<ul style="list-style-type: none">• Less than 35% weight VOCs	<ul style="list-style-type: none">• Complies with California Rule 1162 and Rule 50 regulating VOC emissions
<ul style="list-style-type: none">• Good handling properties	<ul style="list-style-type: none">• Rapid wetting of reinforcements• Improved turnover and fabrication time• Maintenance of desired resin-to-glass ratio• Reduced air entrapment
<ul style="list-style-type: none">• Improved cosmetics	<ul style="list-style-type: none">• Minimal print-through of reinforcement materials• Low post-cure tendencies
<ul style="list-style-type: none">• Tough	<ul style="list-style-type: none">• Resists impact, thermal, and demolding crack
<ul style="list-style-type: none">• Stable gel time	<ul style="list-style-type: none">• Consistent gel and cure times at various catalyst levels
<ul style="list-style-type: none">• Versatile	<ul style="list-style-type: none">• Suitable for hand lay-up or spray-up applications
<ul style="list-style-type: none">• High heat distortion temperature	<ul style="list-style-type: none">• Mechanical properties maintained at high temperatures
<ul style="list-style-type: none">• No wax additives	<ul style="list-style-type: none">• Good secondary bonding performance
<ul style="list-style-type: none">• SPC/SQC controlled	<ul style="list-style-type: none">• Consistent performance batch to batch



TYPICAL PROPERTIES

TYPICAL NOMIAL LIQUID PROPERTIES ¹ @ 25°C							
VERSION	%HAPS RCI 18-003	VISCOSITY* CPS RCI 18-021	THIX INDEX RCI 18-021	GEL TIME** MINUTES RCI 18-***	GEL TO PEAK RCI 18-***	PEAK EXOTHERM°F / °C RCI 18-***	COLOR, LIQUID RCI 18-043
PROMOTED							
PROMOTED							
LR234	35 Max	450	3.0	21.5	12.5	324/162	Pink Amber / Opaque

* Brookfield RVF, spindle #2 @ 50 rpm for versions 14,18, 22, 23, 24, 26
 Brookfield LVF, spindle #3 @ 60 rpm for versions 01, 03, 25, 30, 31, 35, 36, 37, 38, 40, 43, 44, 45, 50, 58, 75

** with 1.00% by volume HP-90 per 100 gms resin for versions 14,18, 23, 24
 with 1.30% by volume HP-90 per 100 gms resin for version 22
 with 1.50% by volume HP-90 per 100 gms resin for version 26
 with 1.50% by weight HP-90 per 100 gms resin for versions 37, 38, 40
 with 1.50% by weight MEKP-9 per 100 gms resin for versions 25
 with 1.50% by weight DHD-9 per 100 gms resin for version 30
 with 1.50% by weight DDM-9 per 100 gms resin for versions 31, 44
 with 1.50% by volume DDM-9 per 100 gms resin for versions 36, 43, 45, 50,
 with 1.25% by weight DDM-9 per 100 gms resin for version 35, 75
 with 1.25% by weight MEKP-9H per 100 gms resin for version 58
 with 1.10% by weight MEKP 925 per 100 gms resin for versions 01, 03

***RCI 18-068 (Sunshine) for version 25, 35, 37, 38, 40
 RCI 18-050 (Snap-Back) for all versions unless stated

• Total Time to Peak Exotherm

† 0.6 g Promoter 46525-00 / 100 gms Resin

‡ Gel Time ran in air at 77°F (25°C)

Seta Closed Cup Flash Point of all PolyLite® 33234 resin is 31.6 °C (89 °F)

Shelf Life is three months. Minimum shelf life performance refers to product in the original, unopened container. Shelf stability is affected by storage conditions. See the "Storage" section of this bulletin for further details.

¹ Properties reported in this bulletin are typical of those obtained in controlled laboratory tests and may vary.



**TYPICAL
MECHANICAL
PROPERTIES¹ @
25°C**

	ASTM TEST	1/8" CLEAR CASTING
Barcol Hardness	D-2583-75	42
Heat Distortion Temperature, °C {°F}	D-648-72	77 {171}
Tensile Strength, psi	D-638-80	7,500
Tensile Modulus, kpsi	D-638-80	500
Tensile Elongation @ Break, %	D-638-80	1.7
Flexural Strength, psi	D-790-80	13,800
Flexural Modulus, kpsi	D-790-80	500
Compressive Strength @ Yield, psi	D-695-80	17,000
Water Absorption, 24 hrs. @ Room Temperature, %	D-570	0.2179
Water Absorption, 2 hrs. @ 100°C, %	D-570	0.7755

CURE CONDITIONS	Clear casting with 1.50% DDM-9 cured overnight at room temperature, and post cured for 2 hours at 65.5°C (150°F) and then 2 hours at 121°C (250°F). Testing values reported are based upon catalyzation with DDM-9. Selection of another catalyst would require verification of values prior to production use.
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APPLICATION

LR234 resin will induce gel and cure at room temperature with MEKP or MEKP /CHP Blends of catalysts. As with all polyesters, rate and degree of cure are functions of initiator concentration and of temperature. Resin and work area should be between 24°C (75°F) and 35°C (95°F) to ensure satisfactory results. Initiator levels should be within a range of 1.0-2.5% based on weight of resin. The use of initiator levels outside of this range may result in an inadequate cure, with laminates exhibiting moderate to severe post-cure after de-molding.

Certain precautions are required to ensure proper secondary bond performance. Secondary bonding will be adversely affected in resin-rich areas or in laminates that have been exposed to heat or direct sunlight for an extended period of time. Contamination of the primary laminate (e.g., grinding dust, oil, moisture, waxes or release agents, etc.) will also adversely affect secondary bond performance. If any of these conditions occur, or if greater than 48 hours has elapsed, thorough sanding and cleaning of the substrate is recommended prior to secondary laminate application.

The type of glass reinforcement used will also affect secondary bond performance.



STORAGE

To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 24°C/75°F and away from heat ignition sources and sunlight. Resin should be warmed to at least 18°C/65°F prior to use in order to assure proper curing and handling. All storage areas and containers should conform to local fire and building codes. Copper or copper containing alloys should be avoided as containers. Store separate from oxidizing materials, peroxides and metal salts. Keep containers closed when not in use. Inventory levels should be kept to a reasonable minimum with first-in, first-out stock rotation.

Additional information on handling and storing unsaturated polyesters is available in the SDS.

As with any resin, stratification of the resin and its thixotrope may occur in storage. Therefore, the resin should be agitated prior to use. Air bubbling should not be used for mixing.

SHELF LIFE

Shelf life is three months from date of shipment for these resins when stored in-doors in closed, opaque containers at 75°F (24°C) out of direct sunlight. Minimum shelf life performance refers to product in the original, unopened container. Storage conditions at higher temperatures or in direct sunlight will reduce the shelf-life and may also cause the resins to experience gel time and viscosity drift.

SAFETY

READ AND UNDERSTAND THE MATERIAL SAFETY DATA SHEET BEFORE WORKING WITH THIS PRODUCT

Obtain a copy of the material safety data sheet on this product. Such information should be requested from suppliers of all products and understood prior to working with their materials.

DIRECTLY MIXING ANY ORGANIC PEROXIDE WITH A METAL SOAP, AMINE, OR OTHER POLYMERIZATION ACCELERATOR OR PROMOTER WILL RESULT IN VIOLENT DECOMPOSITION. WHEN ADDING ORGANIC PEROXIDES TO A RESIN SOLUTION, PROMPTLY AND THOROUGHLY MIX THE RESULTING PRODUCT. NEVER ADD ORGANIC PEROXIDES TO A HOT DILUENT OR PROCESS. PREVENT CONTAMINATION WITH FOREIGN MATERIALS, INCLUDING WITHOUT LIMITATION, ACCELERATORS (SUCH AS DIMETHYL, ANILINE, OTHER AMINES OR COBALT COMPOUNDS), HEAVY-METAL OXIDES OR SALTS (PARTICULARLY THOSE OF COBALT, IRON AND COPPER), STRONG ACIDS AND SANDING DUSTS. USE CLEAN CONTAINERS MADE OF GLASS, POLYPROPYLENE, TEFLON, POLYETHYLENE, OR CERAMIC TO PREVENT CONTAMINATION OF ORGANIC PEROXIDES DURING ITS HANDLING.



TECHNICAL SUPPORT

Our technical support staff has extensive practical experience with various composites resins, end use performance and manufacturing techniques. Please do not hesitate to request our assistance through your our sales or technical representative.

Each user must determine the suitability of this product to his/her particular mode of operation and intended end use application.

Properties reported in this bulletin are typical of those obtained in controlled laboratory tests and may vary in actual production; therefore, we require our customers to inspect and test our products before using them to satisfy themselves as to contents and suitability. We warrant that our products will meet our written specifications.

Nothing herein shall constitute any other warranty express or implied, including any warranty of merchantability or fitness for a particular purpose, nor is protection from any law or patent to be inferred.

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