PRODUCT BULLETIN

June 2021

STYPOL® LHP Series

High Performance Laminating Resins

DESCRIPTION

Polynt Composites' STYPOL® LHP Series high performance laminating resins are designed for open mold processes where hand lay-up and spray-up applications are used with neat resin. They provide superior toughness in the field combined with world-class cosmetics. They are ideal for production environments where compromises are not an option.

All STYPOL® LHP Series resins meet the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reinforced Plastic Composites Production. The following STYPOL® LHP Series resins also meet the EPA NESHAP for Boat Manufacturing and California's SCAQMD Rule 1162: A-C, G-I, J and L.

BENEFITS & FEATURES

- Excellent cosmetic stability
- Superior handling characteristics for short cycle times and user-friendly applications
- High elongation for tough durable laminates
- Meets burn-rate requirements under FMVSS 302 Flammability of Interior Materials - Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

STYPOL® LHP Series is a low-profile system that demonstrates superior resistance to heat as well as excellent flexural and tensile properties. Along with these qualities, these resins are characterized by process friendly handling characteristics, superior cosmetics, and excellent durability.

PROPERTIES – LIQUID

A. Viscosity Properties

STYPOL® LHP Series resins are available in three viscosity grades: regular, low, and high.

Regular Viscosity	Low Viscosity	High Viscosity
• Standard lamination with good wet-out	• Superior wet-out • Maximum fiber wetting with high glass content	• For lamination of large vertical surfaces • High ambient temperature application

Values for Viscosity Classification (A-L)

Type	Viscosity	% Styrene	Thixotropic Index
Regular (A-C)	500 cps	< 35%	2.8
Low (D-F)	400 cps	38%	3.2
High (G-I)	600 cps	< 35%	3.5
Regular (J)	700 cps	-	3.7 minimum
Regular (L)	500 cps	-	2.6 minimum

B. Cure Properties

STYPOL® LHP Series resins are available with four cure profiles depending on laminate thickness and trimming requirements.

Cure Profile	Characteristics
Regular Cure (125-180 mils) (A, D, G)	• Moderate cure time • Single stage or multi-pass lamination • Moderate exotherm
Thin Cure (< 125 mils) (B, E, H)	• Quickest cure • Designed for multi-pass applications • Quick Barcol development • Made for high glass content applications
Thick Cure (> 180 mils) (C, F, I)	• Slower cure than regular • Single stage lamination • Reduced exotherm
Trim Cure (J, L)	• Slower cure and reduced exotherm compared to regular profile for longer trim time • Faster Barcol development than thick cure • More uniform cure with laminate thickness variations

Choose the desired gel time for your specific product. Gel times are available for products A-L. Mid-range values are shown.

		Gel Time per Cure Type							
Cure Type		**12**	**17**	**22**	**27**	**32**	**37**	**42**	**45**
Regular Cure	Gel to Peak (minutes)	9.0	9.0	9.5	9.5	10	11	12	12
	Peak Exotherm (°F)	320	320	315	315	306	300	295	295
Thin Cure	Gel to Peak (minutes)	8.5	8.5	10.2	10.2	10.5	10.5	14	14
	Peak Exotherm (°F)	345	345	338	338	327	323	320	320
Thick Cure	Gel to Peak (minutes)	10	10	10.6	10.6	11.8	12.4	14	14
	Peak Exotherm (°F)	315	315	311	309	303	299	290	290

1) 100 g resin mass with 1.25% by weight MEKP catalyst
2) Brookfield Viscometer RVT #2 Spindle @ 50 rpm

PROPERTIES – PHYSICAL

Property[1]	Unit	Neat Resin Casting	Laminate[2]	Test Method
Tensile Strength	psi	8,000	14,000	ASTM D 638
Tensile Modulus	psi	530,000	1,160,000	ASTM D 638
Tensile Elongation	%	2.3	1.7	ASTM D 638
Flexure Strength	psi	13,000	22,000	ASTM D 790
Flexure Modulus	psi	530,000	930,000	ASTM D 790
Heat Deflection Temperature	°C/°F	91/196	-	ASTM D 648

1) Physical properties were determined using internal Polynt test methods that are similar to those listed above.
2) Laminate – The laminate schedule was two plies of 1.5-ounce chopped strand mat.

PROPERTIES - OTHER

Flammability Test Data

Flammability test results for STYPOL® LHP laminates are provided below. Test results for actual parts will vary depending on their structure and conditions of use. Each fabricator should verify the performance of STYPOL® LHP resin in their specific application to ensure compliance with applicable industry codes and insurance standards.

Test	Application	Results
FMVSS 302: Flammability of Interior Materials - Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses	Transportation	Burn Rate (mm/min.) = 0 (specimen did not ignite)

3) Laminate consisted of STYPOL® LHPD resin matrix, reinforced with 35% 1.5% oz CSM glass, initiated by 1.25% DPM-9, room temperature cure.

APPLICATION

Application Characteristics

Type	Viscosity	Cure
A	Regular	Regular
B	Regular	Thin
C	Regular	Thick
D	Low	Regular
E	Low	Thin
F	Low	Thick
G	High	Regular
H	High	Thin
I	High	Thick
J	Regular	Trim
L	Regular	Trim

An AAP catalyst (also known as 2,4-Pentanedione Peroxide) such as United Initiators Norox® Azox or Arkema Luperox® 224 should be considered if your fabrication process requires building thin laminates using regular or thick cure STYPOL® LHP resins. AAP type catalyst should not be used with thin or trim cure STYPOL® LHP resins.

A MEKP/CHP blended catalyst such as United Initiators Norox® MCP-75 can be used to control exotherm if your fabrication process requires building thick laminates with thin or regular cure STYPOL® LHP Series resins. The use of a MEKP/CHP blended catalyst is not recommended for thin sections, during cool weather conditions, or with thick cure STYPOL® LHP Series resins. The use of a MEKP/CHP catalyst under these conditions can result in an inadequate cure. The use of straight CHP catalyst is not recommended.

Refer to Polynt's Composites Applications Guide ("Cookbook") for equipment and application recommendations. Each user must determine the suitability of this product to his/her particular mode of operation and intended end-use application. A Polynt representative will be available to assist in the proper selection of all Polynt-Reichhold products available for commercial use.

SHELF LIFE & STORAGE

The shelf life of STYPOL® LHP Series resins is 120 days from the date of manufacture from Polynt. To maximize usage life and maintain optimum properties, resins and gel coats should be stored in the original closed container at temperatures below 23°C/73°F and away from ignition sources and sunlight. Keep containers sealed to prevent moisture pick-up and monomer loss.

RELATED LITERATURE

MB-334 Recommended Initiators for Polynt Composites STYPOL® L-Series and ArmorStar® Series Laminating Resins

SAFETY & WARRANTY

To receive a copy of our safety and warranty information, please email safetyandwarranty@polynt.com.