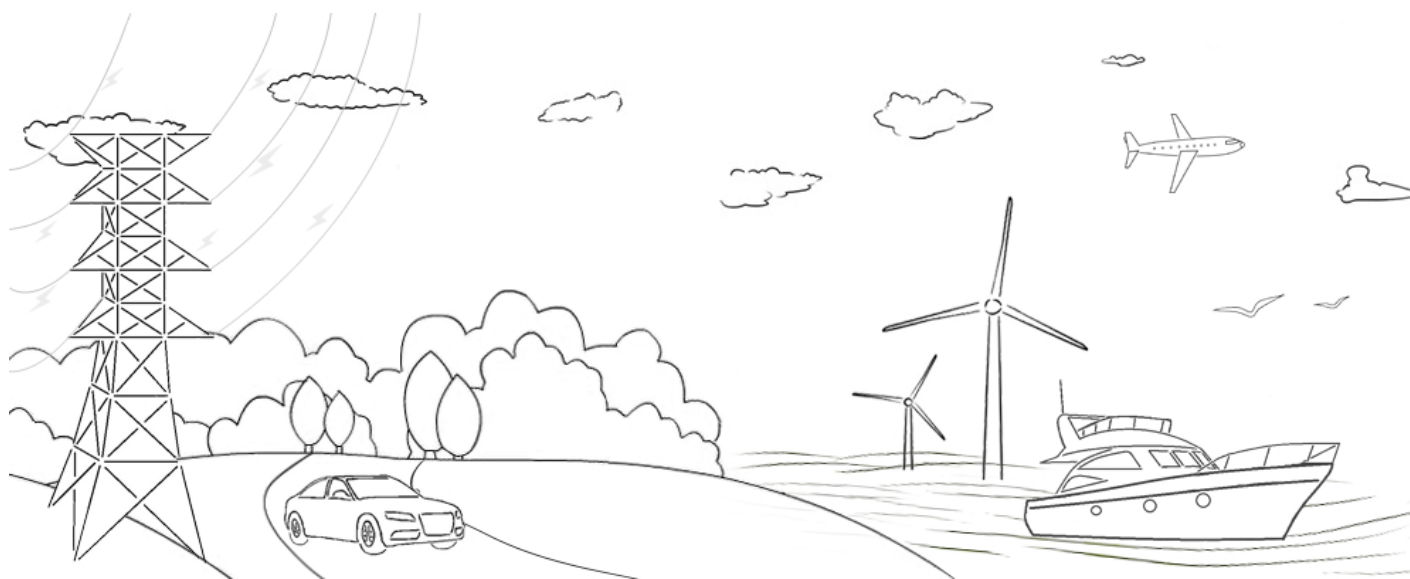


File Number: WAMTIR013990

Version Number: 10

WP-R1312 (Winter Type)

Standard Prepreg Epoxy Resin System



Wells Advanced Materials (Shanghai) Co., Ltd.

Creating Partners.

Introduction

WP-R1312 (winter type) produced by WAM is a cured epoxy resin at 125°C, which achieves best balance of static (flexural/compressive strength and elasticity) and dynamic (impact strength, fatigue) physical properties. It is widely used in manufacturing bicycle, hockey sticks, tennis rackets, golf clubs and other high performance sporting goods. Its stickiness and viscosity are very suitable for prepreg processing. There is few difference in properties (viscosity and flexibility) along with temperature changes. WP-R1312's storage period is 4 weeks under room temperature and 1 year under -18°C.

Features and Advantages

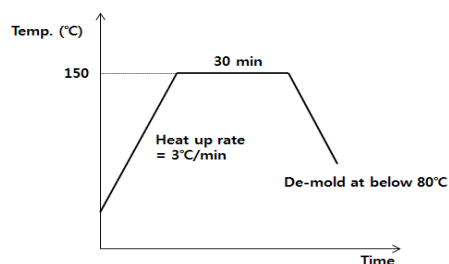
- Suitable for various molding processes and roll-forming processes.
- The best balance of static and dynamic physical properties: high impact strength and high flexural strength.
- Hot-melt resin/solvent-free: excellent working environment; products with minimize porosity and high quality.
- The best operability of prepreg processing: good viscosity, stickiness and flexibility.
- Reasonable price and good quality.
- Long storage life: Store for 4 weeks under 25°C and the humidity is not higher than 65%.

Recommended processing and applications

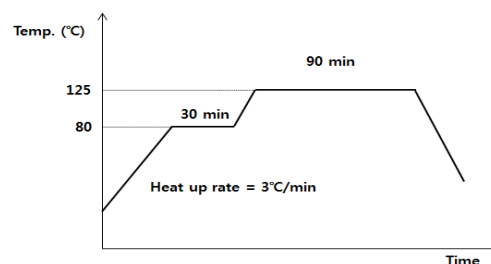
- Molding process (inflation autoclave, autoclave, hot press plate)
: boats and ships, helmet, machinery part, etc.
- Roll-forming process: fishing rods, golf clubs, arrow poles, camera tripods, etc.

Recommended Curing Condition

- Curing conditions of molding process: 90 mins~30 mins (120~150°C)
 - Curing conditions of roll-forming: 30mins × 80°C + 90min × 125°C
- * Curing condition: required mending according to product size, transfusion, and molding method.**



Example of curing condition for molding process



Standard curing condition for roll-forming process

Storage

The resin system should be stored in cool and dry place or cold storage. After taking out the resin from cold storage, place the resin to room temperature, and then open the PE sealing bag to prevent condensation.

Storage period	Temperature (°C)	Humidity (%)	Storage Period
	25	≤65	4 Weeks
	0	≤65	3 Months
	-18	-	1 Year

Prepreg Processing

1. Melting Condition

- Oven temperature: 70°C-80°C×30-80 mins.
- Required time varies with different temperature and amount of melting.

2. Coating Condition

- Temperature between 73°C-80°C.
- Increase the temperature properly if the coating quantity is low to get better surface.

3. Impregnation Condition

- Temperature between 80-100°C. Increase the temperature properly if the impregnation is NOT sufficient. The temperature varies with different production speed and product thickness.
- Note that the resin is easy to cure above 100°C
- Adjust the tension, gap, pressure and other conditions according to the fiber and weight per unit area.

Resin Properties

– Viscosity

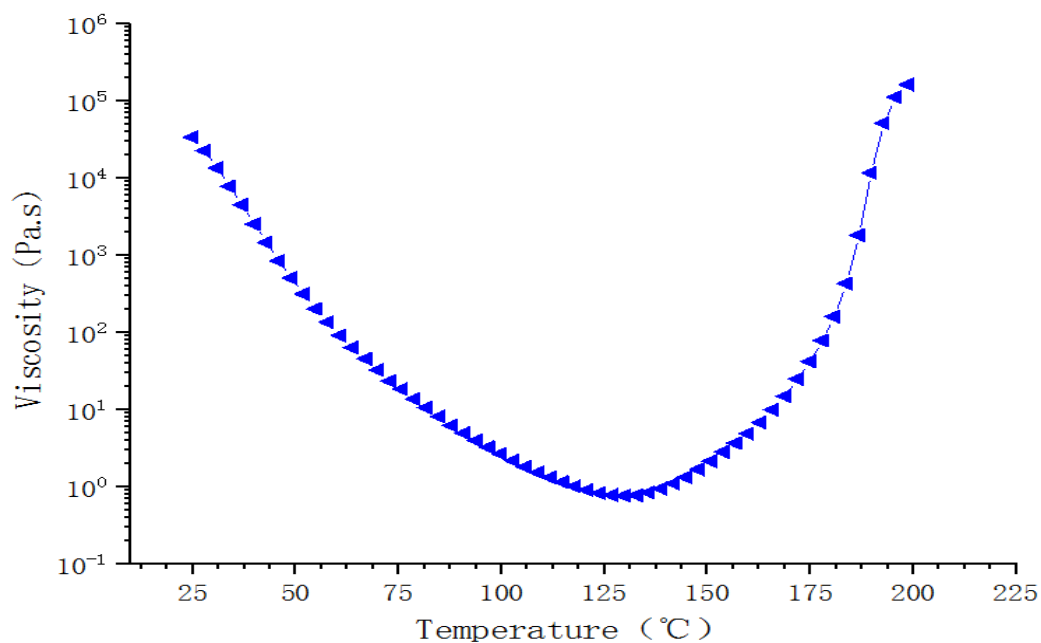
	Viscosity (mPa.s, @70°C)	Fluidity
WP-R1312 (winter type)	11,000-21,000	Medium

– Gel time

	Gel time (s, @120°C)
WP-R1312 (winter type)	700-900

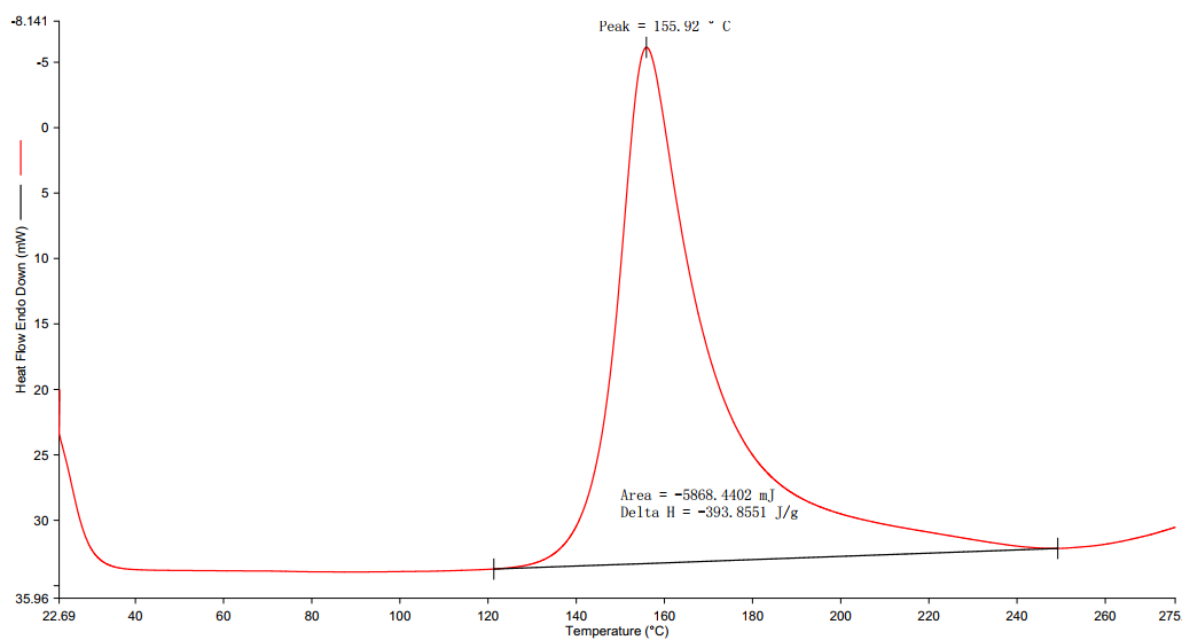
Temperature & Viscosity Curve

— Heating Rate (3°C/min)



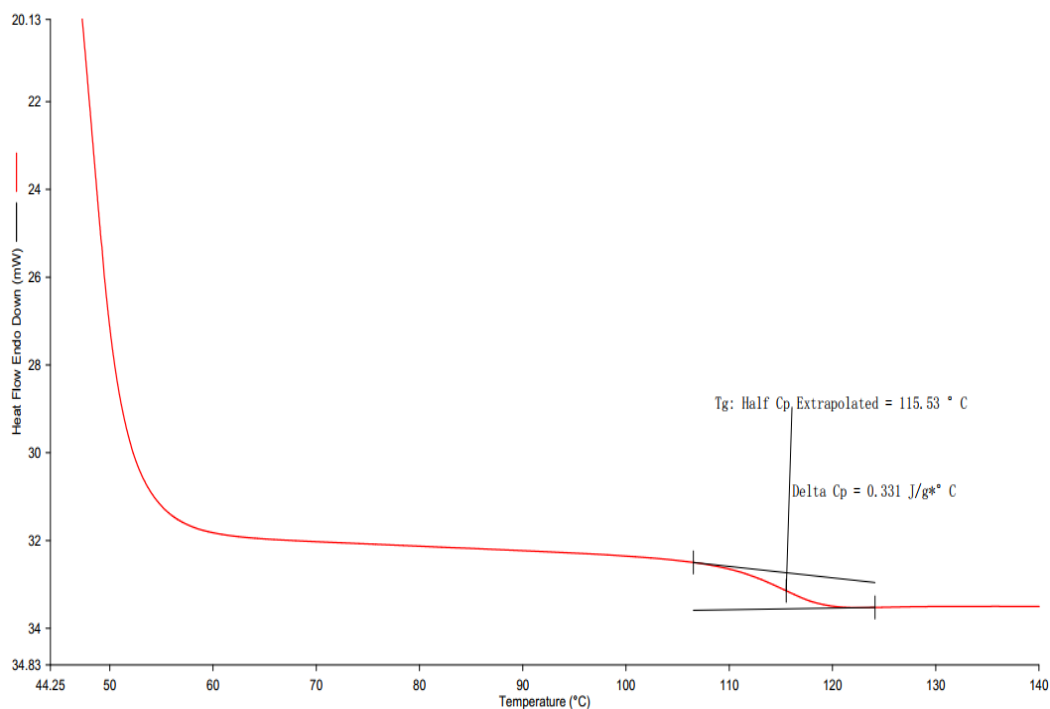
DSC Curve (Curing)

— Heating Rate (10°C/min)



Glass Transition Temperature (T_g)

– By DSC (GB/T 19466.2-2004):115°C



Mechanical Properties

Test	Method	Unit	WP-R1312 (winter type)
Tensile Strength	GB/T 2567	MPa (psi)	83 (1.1 x 10 ⁴)
Tensile Modulus	GB/T 2567	MPa (psi)	3263 (4.2 x 10 ⁵)
Elongation at Break	GB/T 2567	%	3.9
Flexural Strength	GB/T 2567	MPa (psi)	135 (2.0 x 10 ⁴)
Flexural Modulus	GB/T 2567	MPa (psi)	3220 (4.7 x 10 ⁵)
Impact Strength	GB/T 2567 Unnotched Charpy	KJ/m ²	24

Package

Resin

Carton box

25kg/box

Handling Precautions

Personal Protection Equipment...	1.	Wear protection gloves to avoid direct contact with skin.
Respiratory Protection.....	2.	No special protection.
Eyes Protection.....	3.	Chemical anti-spattering goggles and face guard are recommended.
Body Protection.....	4.	Use a protection coat which can be resisted, protection shoes, gloves, coat and emergency shower equipment according to situations.

First aid

Skin.....		Wash with warm soap water for at least 5 minutes or the contaminant removed.
Eyes.....	1.	Contamination of the eyes by resin, hardener or mix should be treated immediately by flushing with clean, running water or physiologic saline for 20 minutes or the contaminant removed.
	2.	A doctor should then be consulted.
Inhalation.....	1.	Anyone taken ill after inhaling vapors should be moved outdoors immediately.
	2.	In all cases of doubt, call for medical assistance.

Important notice:

The data contained in this publication are based on tests in specific condition by Wells Advanced Materials (Shanghai) Co., Ltd. In view of the many factors that may affect processing and applications of our products, these data DO NOT relieve processors from carrying out their own investigations and tests. Nothing herein is to be construed as a warranty. It is the responsibility of the user to determine the applicability of such information and recommendations and the suitability of any product for its own particular purposes.