

## INTRODUCTION

Phthalonitrile resins are **advanced thermosetting materials** renowned for their unprecedented **thermal stability, high glass transition temperature, flame retardancy**, and **superior mechanical strength**. These unique properties make them ideal for demanding **high-temperature applications** in industries such as aerospace, defense, marine, automotive, and electronics, where **performance** and **reliability** under **extreme conditions** are critical.

**SP-3718\_A** is a **single-component phthalonitrile resin** specifically engineered for advanced **manufacturing processes** such as **vacuum infusion and Resin Transfer Molding (RTM)**. This formulation delivers **enhanced thermal performance** ( $T_g$ ), an extended **pot life**, and incorporates approximately **50 % biobased carbon content**, aligning with **sustainability goals** without compromising on high-performance standards.



## KEY FEATURES

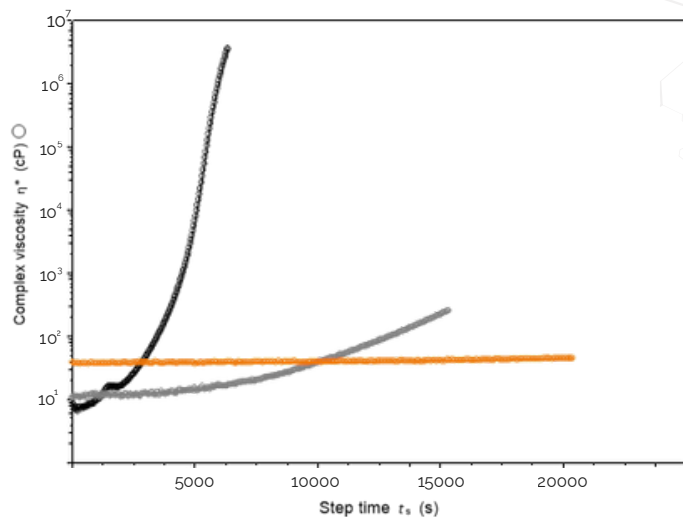
1. 50 % of Biobased Carbon Content
2. One-part crystalline-free system with indefinite shelf life at room temperature
3. Epoxy-like processability
4. Safety - Low reaction enthalpy
5. Non-combustible or self-extinguishing material with high char yield formation
6. Decomposition temperature onset > 490 °C

## NEAT RESIN CHARACTERISTICS

	CHARACTERISTICS	DATA
Post-Cured 320 °C	$T_g$ (dry) (DMA - 3 Points Bending)	390 - 410 °C
	$T_g$ (wet) (DMA - 3 Points Bending)	390 °C
	Decomposition temperature ( $T_{d5\%}$ )	490 - 500 °C
	Char yield (at 900 °C) (TGA - under nitrogen)	75 %
	Moisture absorption (15 days at 70 °C in water)	3.6 - 4.0 %
	Density	1.23 - 1.24 g/cm <sup>3</sup>
Uncured	Dry extract	100 %
	Density at 25 °C (modeled)	1.1 - 1.15 g/cm <sup>3</sup>
	Polymerization onset	230-250 °C
	Polymerization enthalpy	150-250 J/g



### VISCOSITY PROFILES AND DATA

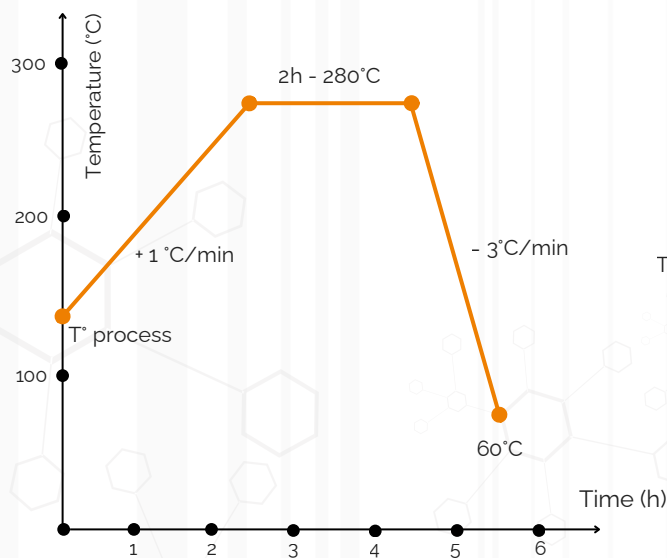


TEMPERATURE	100°C	110°C	120°C	130°C	140°C	150°C	180°C
MIX VISCOSITY (cP)	6450	2140	860	400	200	/	/
POT LIFE	/	/	/	> 5 h 40	/	2 h 10	0 h 20
GEL TIME	/	/	/	/	/	> 4 h 15	1 h 30

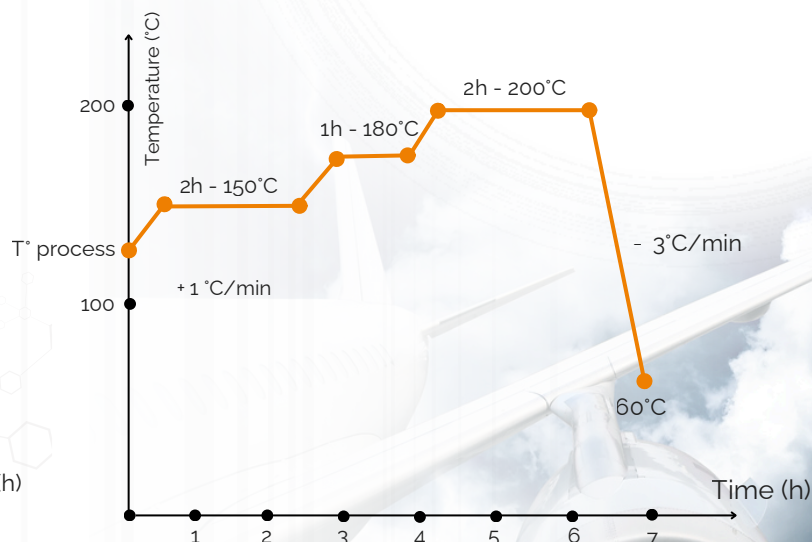
### PROCESSING PARAMETERS

It is advised to degas the formulation before use at 110°C and 10 mbar for 30 min. The formulation can be cured according to the following cycles :

#### Curing Cycle 1 - 280°C



#### Curing Cycle 2 - 200°C



Post-cure can be performed out of mold using the following steps:

1. Increase the temperature from room temperature to 320°C at a rate of 2°C/min
2. Hold at 320°C for 3 h
3. Before removing, cool down the mold until the temperature reaches at least 60°C at a rate not exceeding 3°C/min

