

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-3414_A is a **mono-component phthalonitrile resin** specifically tailored for use in processes like **vacuum infusion** and **RTM** (Resin Transfer Molding).



KEY FEATURES

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

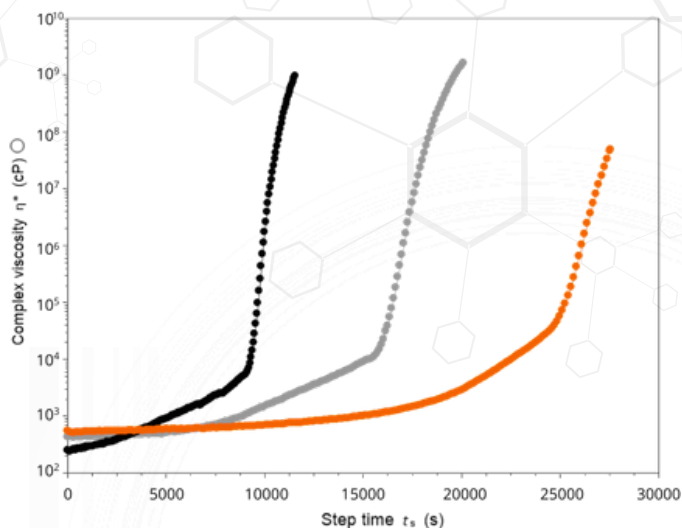


NEAT RESIN CHARACTERISTICS

	CHARACTERISTICS	DATA
Post cured 320°C	T _α (dry) (DMA - 3 Points Bending)	340 - 360°C
	T _α (wet) (DMA - 3 Points Bending)	310 - 330°C
	Decomposition temperature (Td5%)	490 - 495°C
	Char yield (at 900 °C) (TGA - under nitrogen)	71 %
	Moisture absorption (15 days at 70 °C in water)	4.3 - 4.6 %
Uncured	Density	1.27 - 1.29 g/cm ³
	Dry extract	100 %
	Density at 25 °C	1.1 - 1.15 g/cm ³
	Polymerization onset	250-270°C
	Polymerization enthalpy	190-250 J/g

* with post-curing at 320°C

VISCOSITY PROFILES AND DATA

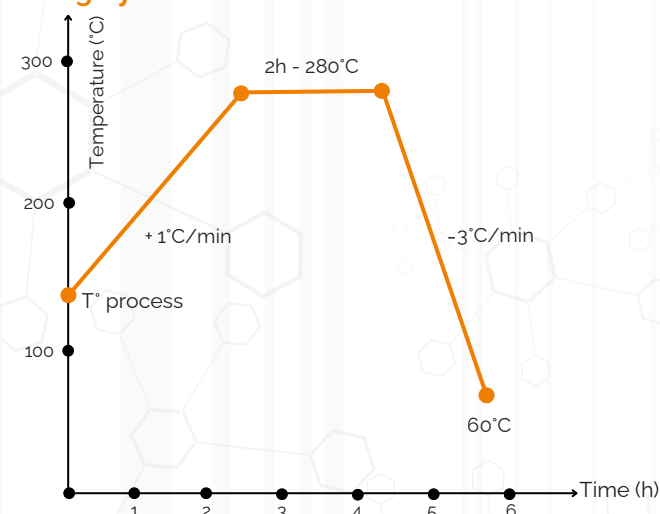


TEMPERATURE	INITIAL MIX VISCOSITY (cP)	GEL TIME	POT LIFE
130°C	370	> 7 h 30	4 h
140°C	200	5 h 30	2 h 30
150°C	120	3 h	1 h

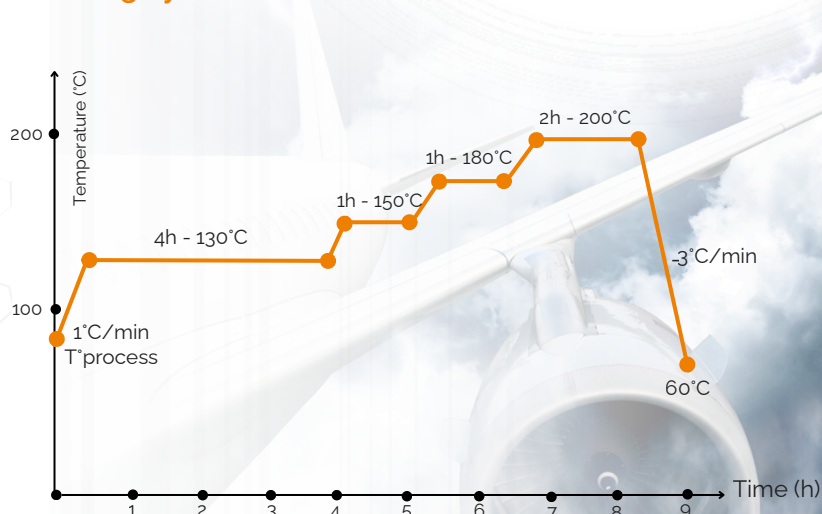
PROCESSING PARAMETERS

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 cycle:

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

