

# PNR phthalonitrile resin

PARAMETER	UNIT	VALUE	REFERENCES
<b>GENERAL</b>			
Common name	-	phthalonitrile resin	
Acronym	-	PNR	
<b>HISTORY</b>			
Person to discover	-	Keller, T M; US Navy Laboratory	Keller, T M, US Patent 4,410,676, US Navy Laboratory, Oct 18, 1983
Date	-	1983	
<b>SYNTHESIS</b>			
Method of synthesis	-	phthalonitrile resin is obtained by heating a phenol with a diphthalonitrile monomer at a elevated temperature	Keller, T M, US Patent 4,410,676, US Navy Laboratory, Oct 18, 1983.
Temperature of polymerization	°C	200 (cure)	Laskowski, M; Shear, M B; Neal, A; Dominguez, D D; Ricks-Laskoski, H L; Hervey, J; Keller, T M, Polymer, 67, 185-91, 2015.
<b>COMMERCIAL POLYMERS</b>			
Some manufacturers	-	Akron Polymer Systems; Maverick Corp.	
<b>PHYSICAL PROPERTIES</b>			
Glass transition temperature	°C	300	Derradji, M; Ramdani, N; Zhang, T; Wang, J; Lin, Z-w; Yang, M; Xu, X-d; Liu, W-b, Mater. Lett., 149, 81-4, 2015.
Maximum service temperature	°C	290 (still strong at 500); 375 (thermooxidative stability)	
Long term service temperature	°C	>250	
<b>MECHANICAL &amp; RHEOLOGICAL PROPERTIES</b>			
Flexural strength	MPa	1,400	
Shear strength	MPa	90	
<b>FLAMMABILITY</b>			
Peak heat release	kW m <sup>-2</sup>	118	
<b>PROCESSING</b>			
Typical processing methods	-	resin transfer molding, resin infusion molding, filament winding, prepreg consolidation	