NORYL™ RESIN HVN922

DESCRIPTION

NORYL HVN922 resin is a 10% glass reinforced polyphenylene ether (PPE) + polystyrene (PS). This injection moldable grade carries a CTI 2 and UL94 flame rating of HB at 1.0mm for thin-wall molding capability. NORYL HVN922 exhibits high heat resistance, high flow, high impact resistance, dimensional stability, hydrolytic stability, strong electrical performance, very low moisture absorption and specific gravity. The target applications are electric vehicle (EV) high voltage electric components and battery management unit enclosures.

GENERAL INFORMATION	
Features	Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Dimensional stability, High stiffness/Strength, High temperature resistance
Fillers	Glass Fiber
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Electrical and Electronics	Electrical Components and Infrastructure
Hydrocarbon and Energy	Electric Vehicle, Energy Storage

TYPICAL PROPERTY VALUES

Revision 20240416

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	85	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	83	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	3	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	4	%	ASTM D638
Tensile Modulus, 5 mm/min	4120	MPa	ASTM D638
Flexural Strength, 1.3 mm/min, 50 mm span	135	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	3880	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	88	MPa	ISO 527
Tensile Stress, break, 5 mm/min	88	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	3	%	ISO 527
Tensile Strain, break, 5 mm/min	3	%	ISO 527
Tensile Modulus, 1 mm/min	4400	MPa	ISO 527
Flexural Strength, 2 mm/min	136	MPa	ISO 178
Flexural Modulus, 2 mm/min	3970	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	78	J/m	ASTM D256
Izod Impact, notched, -30°C	51	J/m	ASTM D256
Izod Impact, unnotched, 23°C	455	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	470	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	7	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	5	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	31	kJ/m²	ISO 180/1U

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, unnotched 80*10*4 -30°C	35	kJ/m²	ISO 180/1U
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	8	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	38	kJ/m²	ISO 179/1eU
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	163	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	150	°C	ASTM D648
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	160	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	150	°C	ISO 75/Af
CTE			
-40°C to 120°C, flow	3.6E-05	°C	ASTM E831
-40°C to 120°C, xflow	6.5E-05	°C	ASTM E831
-40°C to 120°C, flow	3.6E-05	°C	ISO 11359-2
-40°C to 120°C, xflow	6.5E-05	°C	ISO 11359-2
Vicat Softening Temp, Rate B/50	162	°C	ASTM D1525
Vicat Softening Temp, Rate B/120	165	°C	ASTM D1525
Vicat Softening Temp, Rate B/50	161	°C	ISO 306
Vicat Softening Temp, Rate B/120	164	°C	ISO 306
Relative Temp Index, Elec [2]	65	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	65	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	65	°C	UL 746B
PHYSICAL [1]			
Specific Gravity	1.18	-	ASTM D792
Density	1.18	g/cm³	ISO 1183
Melt Flow Rate, 300°C/5.0 kgf	23	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 280°C/10.0 kg	20	cm³/10 min	ISO 1133
Water Absorption, (23°C/24hrs)	0.13	%	ISO 62-1
Moisture Absorption, (23°C/50% RH/24hrs)	0.05	%	ISO 62-4
Mold Shrinkage, flow [3]	0.40 – 0.60	%	SABIC method
Mold Shrinkage, xflow [3]	0.65 – 0.85	%	SABIC method
ELECTRICAL [1]			
Surface Resistivity	1.6E+17	Ω	ASTM D257
Volume Resistivity	1.0E+18	Ω.cm	ASTM D257
Comparative Tracking Index (UL) {PLC} [2]	2	PLC Code	UL 746A
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E207780-104669888	-	-
UL Recognized, 94HB Flame Class Rating	≥1.0	mm	UL 94
INJECTION MOLDING [4]			
Drying Temperature	105 – 110	°C	
Drying Time	3 – 4	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	280 – 320	°C	
Nozzle Temperature	280 – 320	°C	
Front - Zone 3 Temperature	270 – 320	°C	
Middle - Zone 2 Temperature	260 – 315	°C	
Rear - Zone 1 Temperature	250 – 310	°C	

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Mold Temperature	75 – 105	°C	
Back Pressure	0.3 – 0.7	MPa	
Screw Speed	20 – 100	rpm	
Shot to Cylinder Size	30 – 70	%	

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.

(2) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses, colors and regions. For details, please see the UL Yellow Card.

(3) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(4) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

DISCLAIMER