Technical Information

Made via INSITE™ Technology

Rev 1, June 2002

Nordel® IP hydrocarbon rubber

A Product of DuPont Dow Elastomers

NDR 3722P

Description

NDR 3722P is a semicrystalline, very low diene containing polymer with low viscosity for good processability. The low unsaturation provides excellent long term thermal and UV stability. It is specially designed for medium voltage wire and cable applications. It can also be used in peroxide cured molded and other extruded applications. NDR 3722P is developmental and made via INSITE™ technology.

Storage and Handling

The quality of EPDM products may be affected by exposure to artifical or natural light. This product should be stored indoors in its original packaging and out of direct sunlight.

Typical Polymer Properties*

Property	Value	Test Method
Mooney Viscosity		
ML 1 + 4 at 125°C	20	ASTM D-1646
Composition		
Ethylene, mass%	70.5	ASTM D-3900
Propylene, mass%	29	ASTM D-3900
ENB, mass%	0.5	ASTM D-6047
Molecular Weight Distribution	Medium	DuPont Dow PQ-E-034 and 036
Product Density, g/cc	0.88	ASTM D-297
Residual Transition Metal, ppm	10 max.	DuPont Dow
Ash Content, mass%	0.1 max.	ASTM D-5667
Total Volatiles, mass%	0.4 max.	DuPont Dow PQ-E-007
Product Form	pellets	

*These data are provided for description only and are not intended to serve as sales specifications.

NDR 3722P
Power Cable Insulation

Ingredient	phr
NDR 3722P	100
Low Density Polyethylene, 2.0 MI	5
Zinc Oxide	5
Treated Calcined Clay	60
Paraffin Wax	5
Red Lead, 90% dispersion in EPR	5
Polymerized 1,2 dihydro 2,2,4-trimethylquinoline	1.5
Vinyl Silane	1.0
Dicumyl Peroxide	2.5
Total phr	185

Stock Properties

Mooney Scorch, MS at 121°C

Minimum, MU	9.7
t3, min	>25
t5, min	>25

Oscillating Disk Rheometer at 204°C [400°F], 0.051 rad, 3° arc, 6 min, 1.66 Hz [100 cpm], Microdie, ASTM D2084

Minimum Torque, M_L, dN·m	6.1
Maximum Torque, M_H, dN·m	67.4
Delta Torque, dN·m	61.3
Cure Time, t_c90, min	2.0

Mechanical Properties

Vulcanizate Properties
1.14 mm (0.045 in) Insulation on No. 14 AWG Copper Wire Cured 2 min in 1.72 MPa (245 psi) steam ~200°C)

		IPCEA S-68-516
Original Physicals		
Modulus at 100% Elongation, MPa	3.5	—
Ultimate Tensile, MPa	11.1	4.8 min.
Elongation at Break, %	333	250 min.
Heat Aging/168 hr/121°C		
Tensile Retention, %	100	75% min.
Elongation Retention, %	98.2	75% min.

Electrical Properties

Immersed in Water at 90°C/600 V Continuous Stress

	1575 V/mm [40 V/mil]	3150 V/mm [80 V/mil]
Relative Permittivity		
1 day	2.60	2.60
1 week	2.61	2.61
2 weeks	2.63	2.63
1 month	2.66	2.66
2 month	2.72	2.72
3 month	2.79	2.79
4 month	2.80	2.80
5 month	2.83	2.83
6 month	2.86	2.86
7 month	2.90	2.90
8 month	2.93	2.93
Power Factor at 60 Hz, %		
1 day	0.68	0.74
1 week	0.54	0.59
2 weeks	0.54	0.59
1 month	0.61	0.70
2 month	0.74	0.83
3 month	0.85	0.95
4 month	0.75	0.85
5 month	0.80	0.90
6 month	0.79	0.90
7 month	0.90	0.99
8 month	0.92	1.00

Immersed in Water for 16 hr at 15.6°C [60°F]

Insulation Resistance, MΩ/km [MΩ/1,000 ft]	>22,850 [>75,000]

NDR3722P
General Purpose Peroxide Cured Compounds

Ingredient	phr
NDR 3722P	100
N550	50
Paraffinic Oil	10
DCP 40%	7
Total phr	167

Compound Properties	
Mooney Viscosity, ML 1 + 4, 100°C	42
Mooney Scorch, at 125°C	
Minimum Viscosity	16
5 pt rise, min	>30
10 pt rise, min	>30
MDR at 175°C, 0.5° arc, 30 min cht	
M_L, dN·m	1
M_H, dN·m	16
t_{s1}, min	0.5
t_{s2}, min	0.7
t_{c50}, min	2.0
t_{c90}, min	5.4
t_{c95}, min	6.8
Tan delta at M_L	—
Tan delta at M_H	—
Cure Rate, M_H-M_L/t_{90}-t_2	3.2

Vulcanizate Properties	
Physical Properties at RT	
Press Cured: t_{c95} + 3 min/175°C	
Modulus at 50% Elongation, MPa	2.81
Modulus at 100% Elongation, MPa	3.90
Modulus at 200% Elongation, MPa	7.90
Modulus at 300% Elongation, MPa	12.52
Tensile Strength, MPa	15.62
Elongation, %	396
Hardness, Shore A	90
Tear Strength, die C, kN/m	44.7
Compression Set, Method B, Pellets Cured MDR t_{c95+}	
22 hr at –25°C	94
22 hr at 100°C	20
70 hr at 125°C	26
70 hr at 150°C	31
Temperature Retraction, °C	
TR-10	–23
Gehman Low Temperature Flexibility, °C	
T2	–13
T5	–26
T10	–34
T100	–50
DSC Thermal Properties, °C	
Tg	–43
Tc	25
Tm	42
Zwick Rebound Resilience, ISO 4662, %	61
MTS Dynamic Properties at 23°C	—
Abrasion Resistance, ISO 4649, 3 mm	92
Change in Properties After Aging	
Aged in Air 70 hr at 150°C	
Modulus at 100% Elongation, MPa	3.78
Modulus Change, %	–3.1
Tensile Strength, MPa	13.71
Tensile Change, %	–12.2
Elongation, %	404
Elongation Change, %	2.2
Hardness, Shore A	80
Hardness Change, pt	0

For further information on Nordel® IP or other elastomers please contact one of the addresses below, or visit us at our website at www.dupont-dow.com

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