ExxonMobil

Model formula for truck tire innerliner 100 PHR Exxon™ bromobutyl 2255

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Tire innerliners formulated with 100 PHR Exxon™ bromobutyl maximize the air barrier properties of the innerliner, protecting the the rest of the tire from degradation and ensuring top performance.

Material	Units	Amount
Exxon bromobutyl 2255	PHR (1)	100.00
Carbon black N660	PHR	60.00
Naphthenic oil	PHR	8.00
Aromatic and aliphatic hydrocarbon resin blend	PHR	7.00
Phenolic tackifying resin	PHR	4.00
Magnesium oxide	PHR	0.15
Stearic acid	PHR	2.00
Zinc oxide	PHR	1.00
Sulfur	PHR	0.50
Mercaptobenzothiazyl disulfide (MBTS)	PHR	1.20
Total (PHR)		**183.85**

Properties	Test method based on	Units and conditions (2)	Typical values (3)
Mooney viscosity ML (1+4) at 100°C	ASTM D1646	MU, 100°C	63.6
Mooney scorch (tested at 125°C)	ASTM D1646	at 125°C	
Minimum viscosity		MU	28.6
Time to 5pt rise		minutes	24.5
Time to 10pt rise		minutes	28.3
MDR rheometer	ASTM D5289	160°C; 30 minutes; 0.5 deg. arc	
M_l (minimum torque)	ASTM D5289	dNm	1.7
M_h (maximum torque)	ASTM D5289	dNm	5.2
M_h - M_l (delta torque)	ASTM D5289	dNm	3.5
Tc_{10} (time to 10% torque increase)	ASTM D5289	minutes	2.0
Tc_{50} (time to 50% torque increase)	ASTM D5289	minutes	5.0
Tc_{90} (time to 90% torque increase)	ASTM D5289	minutes	11.9
Cure rate (peak rate)	ASTM D5289	dNm/min	0.6

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Properties	Test method based on	Units and conditions [2]	Typical values [3]
MDR rheometer	ASTM D5289	180°C; 30 minutes; 0.5 deg. arc	
M_l (minimum torque)	ASTM D5289	dNm	1.4
M_h (maximum torque)	ASTM D5289	dNm	4.7
M_h - M_l (delta torque)	ASTM D5289	dNm	3.3
Tc_{10} (time to 10% torque increase)	ASTM D5289	minutes	0.9
Tc_{50} (time to 50% torque increase)	ASTM D5289	minutes	2.1
Tc_{90} (time to 90% torque increase)	ASTM D5289	minutes	3.7
Cure rate (rate at tc50)	ASTM D5289	dNm/min	1.6
Stress strain properties		cure time[3] 25 minutes at 160°C	
Tensile strength	ASTM D412	MPa	10.1
Elongation at break		%	784
Modulus 100%		MPa	1.1
Modulus 200%		MPa	2.2
Modulus 300%		MPa	3.7
Energy to break		joules	12.8
Tear strength (die B) peak load	ASTM D624	N	114.0
Tear strength (die B) mean		KN/m	59.4
Hardness	ASTM D2240	shore A	47.5
Rebound	DIN 53512	%, 23 deg C	9.8
Fatigue to failure (cycles)	ASTM D4482	cycles at 134% strain	236803
Mocon oxygen permeability coefficient	ExxonMobil method	cc*mm (m^2-day-mmHg) at 60° C	0.71
ARES dynamic properties at 0°C	ExxonMobil method	1% strain, 10.0 Hz.	
G'		MPa	6.77
G"		MPa	4.42
Tan_delta			0.65
ARES dynamic properties at 60°C		1% strain, 10.0 Hz.	
G'		MPa	2.12
G"		MPa	0.38
Tan_delta			0.18

1. Parts per hundred rubber.
2. Samples cured 25 minutes at 160°C
3. Values given are typical and should not be interpreted as a specification.

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