ExxonMobil

Model formula for light truck tire innerliner 100 PHR Exxon™ bromobutyl 2222

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

Material	Units	Amount
Exxon bromobutyl 2222	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	Typical values (2)
Mooney viscosity ML (1+4) at 100°C	ASTM D1646	MU, 100°C	56.0
Mooney scorch (tested at 125°C)	ASTM D1646		
Minimum viscosity	ASTM D1646	MU	22.9
Time to 5pt rise	ASTM D1646	minutes	34.0
Time to 10pt rise	ASTM D1646	minutes	41.0
Time to 20pt rise	ASTM D1646	minutes	49.0
MDR rheometer	ASTM D5289	160°C; 30 minutes; 0.5 deg. arc	
M_l (minimum torque)	ASTM D5289	dNm	1.3
M_h (maximum torque)	ASTM D5289	dNm	4.8
M_h - M_l (delta torque)	ASTM D5289	dNm	3.5
Tc_{10} (time to 10% torque increase)	ASTM D5289	minutes	2.2
Tc_{50} (time to 50% torque increase)	ASTM D5289	minutes	5.8
Tc_{90} (time to 90% torque increase)	ASTM D5289	minutes	12.8
Cure rate (peak rate)	ASTM D5289	dNm/min	0.5

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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	1.1
M_h (maximum torque)	ASTM D5289	dNm	4.3
M_h - M_l (delta torque)	ASTM D5289	dNm	3.2
Tc_{10} (time to 10% torque increase)	ASTM D5289	minutes	1.0
Tc_{50} (time to 50% torque increase)	ASTM D5289	minutes	2.3
Tc_{90} (time to 90% torque increase)	ASTM D5289	minutes	3.9
Cure rate (peak rate)	ASTM D5289	dNm/min	1.4
Stress strain properties		cure time[3] 25 minutes at 160°C	
Tensile strength	ASTM D412	MPa	9.6
Elongation at break		%	837
Modulus 100%		MPa	1.1
Modulus 200%		MPa	2.1
Modulus 300%		MPa	3.3
Energy to break		joules	11.6
Tear strength (die B) peak load	ASTM D624	KN/m	92.4
Tear strength (die B) mean		KN/m	53.8
Hardness	ASTM D2240	shore A	46.9
Rebound	DIN 53512	%, 23 °C	10.0
Fatigue to failure (cycles)	ASTM 4482	cycles at 136% strain	336159
Mocon oxygen permeability Coefficient	ExxonMobil method	cc*mm (m^2-day-mmHg) at 60° C	0.78
ARES dynamic properties at 0 °C	ExxonMobil method	1% strain, 10.0 Hz.	
G'		MPa	11.32
G"		MPa	6.17
Tan_delta			0.55
ARES dynamic properties at 60 °C		1% strain, 10.0 Hz.	
G'		MPa	3.55
G"		MPa	0.80
Tan_delta			0.23

1. Parts per hundred rubber.
2. Values given are typical and should not be interpreted as a specification.
3. Samples cured Tc 90 + 2 at 160°C.

Contact your ExxonMobil Chemical representative for more information:
butylrubber.com

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