ALNOVOL® PN 160

Technical Datasheet

TYPE

Non-self curing resin, modified phenol novolac

USES

Reinforcing rubber

FORM OF DELIVERY (f.o.d.)

Pastilles

PRODUCT DATA

The data are determined by our quality control for each batch (lot) before release.

Determined per batch:

Colour / Appearance		
colour		yellow-brown
HPLC PM 279		
content (content of free phenol)	[%]	<= 1.0
Softening Point		
Softening point Mettler Index ASTM D 6090 (80°C; 1,0°C/min; 19 mm; 50%)	[°C]	90 - 110

SOLUBILITY

Soluble in the commonly used alcohols, glycol ethers, esters, ketones and in partially chlorinated hydrocarbons. Insoluble in aliphatic and aromatic hydrocarbons.

PROPERTIES AND USES

ALNOVOL PN160 is suitable for reinforcing natural rubber, styrene-butadiene rubber or nitrile rubber. In case of EPDM the reinforcing effect should be checked in advance. ALNOVOL PN 160 is absorbed by the rubber mix easily and show a strong plasticizing effect at the green compound. After vulcanization the reinforcing effect is seen as increase of tensile strength and modulus as well as by increased hardness levels.

PROCESSING

ALNOVOL PN 160 should be dosed at a level of 10 to 20 pts by wt to 100 pts by wt rubber. Higher additions are possible. ALNOVOL PN 160 should be added together with second dosage of filler, zinc oxide or antioxidants. For better dispersion of the resin, the temperature after adding the resin should reach 120°C minimum. For curing hexa methylene tetramine (HMT) or another methylene group donors such as hexa methoxy methyl melamine (HMMM) like CYREZ® 963 or 964 LF, is required. For proper curing a resin to hardener ratio of 7 : 3 in the case of HMMM is recommended. If HMT is used the ratio should be 9 : 1. The dosage and ratio of the crosslinker depends on the required effect and it should be added together with the vulcanizing system in the final mixing step. The reinforced vulcanizate has a higher modulus, increased hardness and an increased tear resistance.

STORAGE

At temperatures up to 25°C storage stability packed in original containers amounts to at least 365 days.
The expiration date may be extended and COA updated after QC testing of retained samples, only for material in allnex possession.

TYPICAL COMPOUNDS

Natural rubber compound

Typical formulation	**Pts by wt**	**Pts by wt**
Natural rubber (RSS)	100.0	100.0
HAF carbon black	80.0	80.0
Stearic acid	1.5	1.5
Zinc oxide RS	5.0	5.0
Antioxidants	2.0	2.0
ALNOVOL PN 160	-	9.0
Hexamethylenetetramine	-	1.0
Sulphur	2.5	2.5
Benzothiazyl-2-cyclohexylsulfenamide	0.9	0.9
Tetramethylthiurammonosulfide	0.3	0.3

Test values before vulcanization			
	Unit	**Value**	**Value**
Mooney L1+4 (100°C)	[ME]	67	64
Test values after vulcanization	**(20 min. at 145°C)**		
Tensile strength	[MPa]	19	18
Elongation at break	[%]	167	164
Modulus at 10% elongation	[MPa]	1.9	3,3
Modulus at 50% elongation	[MPa]	4.7	6,1
Modulus at 100% elongation	[MPa]	10.4	11,6
Hardness Shore A	[°]	82	92
Resilience	[%]	38	36