Vamac® Ultra IP

Ethylene Acrylic Elastomer

DuPont Performance Elastomers

Message:

The latest manufacturing technology allows polymerization of AEM grades with optimized structure and chemical composition, which provides significant improvements over the existing standard DuPont ™ Vamac® elastomers. These grades, designated and sold as Vamac® Ultra, provide true step-change improvement in processability, performance and customer value for targeted applications.
Vamac® Ultra IP (developmental name VMX-3040) is the first of the Ultra family products to be commercialized. During the development phase, a goal was to identify a product having improved performance in injection molding processes compared to Vamac® G to reduce the frequency of mold cleaning. The high viscosity of Vamac® Ultra IP compared to standard AEM grades results in better mixing as well as increased green strength of compounds, and helps to avoid collapse during extrusion processes. The optimized polymer structure ensures gains in physical properties resulting in improved performance of rubber parts such as seals, dampers and extruded hoses. Low abrasion values may allow extended use of Vamac® Ultra IP in dynamic seals.
The best physical properties of Vamac® Ultra IP are obtained in rubber parts having a hardness range between 50 and 90 Shore A. Extensions of this hardness range may be more easily achieved with Vamac® Ultra IP than standard AEM using appropriate compounding.
Vamac® Ultra IP combines dry heat resistance of 175 °C over a period of 1000 h (six weeks) with very good resistance to automotive lubricants. Exposure of peak temperatures of 200 °C are possible for up to four days. At the same time, the Tg of -31 °C provides very good low temperature flexibility.
Good compression set and compressive stress relaxation properties make Vamac® Ultra IP an excellent choice for sealing applications. Good resistance to Blow-By (hot air, acids, oil and petrol fumes), present in automotive crankcase venting systems and air ducts combined with increased dynamic resistance are additional attributes of Vamac® Ultra IP.
Like every other grade of Vamac® , Vamac® Ultra IP is halogen-free.

General Information			
Features	Good Abrasion Resistance Good Chemical Resistance Halogen Free High Hardness High Heat Resistance High Viscosity Low Temperature Flexibility		
Uses	Automotive Applications Seals Tubing		
Appearance	Clear/Transparent		
Forms	Bale		
Processing Method	Compounding		
Physical	**Nominal Value**	**Unit**	**Test Method**
	67		
Mooney Viscosity (ML 1+4, 100°C)	25 to 33	MU	ASTM D1646
Hardness	**Nominal Value**	**Unit**	**Test Method**
Durometer Hardness			ASTM D2240

Shore A	79		
Shore A, 1 sec, 6.00 mm [1]	59		
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Abrasion Resistance - Sandpaper	132	mm^3	ISO 4649
MDR [2]			ASTM D5289
MH : 180°C	16.7	dNm	
ML : 180°C	0.820	dNm	
Peak Rate : 180°C	4.70	dNm/min	
tc10 : 180°C	43.8	sec	
tc50 : 180°C	144.0	sec	
tc90 : 180°C	426.0	sec	
Ts2 : 180°C	48.6	sec	
Mooney Scorch - T5 (121°C)	9.2	min	ASTM D1646
Resilience	44	%	ISO 4662
Volatiles	< 0.6	wt%	Internal Method
Elastomers	**Nominal Value**	**Unit**	**Test Method**
Tensile Stress			ASTM D412
100% Strain [3]	2.60	MPa	
100% Strain	7.10	MPa	
100% Strain, 150°C [4]	2.60	MPa	
100% Strain, 160°C [5]	2.20	MPa	
Tensile Strength			ASTM D412
Yield [6]	15.5	MPa	
Yield	18.1	MPa	
Tensile Elongation			ASTM D412
Break [7]	380	%	
Break	260	%	
Tear Strength			ISO 34-1
--	24	kN/m	
--	6.3	kN/m	
Compression Set			
23°C, 94 hr	30	%	VW PV3307
150°C, 70 hr [8]	15	%	ASTM D395
150°C, 94 hr	49	%	VW PV3307
150°C, 168 hr [9]	26	%	ASTM D395
150°C, 168 hr [10]	17	%	ASTM D395
175°C, 70 hr [11]	25	%	ASTM D395
175°C, 70 hr [12]	17	%	ASTM D395
175°C, 1008 hr [13]	54	%	ASTM D395
190°C, 70 hr [14]	30	%	ASTM D395
Aging	**Nominal Value**	**Unit**	**Test Method**
Change in Tensile Strength in Air			ASTM D573

175°C, 504 hr	-21	%	
100% Strain, 175°C, 504 hr	13	%	
190°C, 168 hr	-21	%	
100% Strain, 190°C, 168 hr	6.0	%	
Change in Ultimate Elongation in Air			ASTM D573
175°C, 504 hr	-20	%	
190°C, 168 hr	-24	%	
Change in Durometer Hardness in Air			ASTM D573
Shore A, 175°C, 504 hr	0.0		
Shore A, 190°C, 168 hr	-1.0		
Change in Tensile Strength			ASTM D471
150°C, 168 hr, in Dexron® VI	-25	%	
160°C, 504 hr, in Lubrizol OS 206304, 5W40	-34	%	
Change in Ultimate Elongation			ASTM D471
150°C, 168 hr, in Dexron® VI	-43	%	
160°C, 504 hr, in Lubrizol OS 206304, 5W40	-30	%	
Change in Durometer Hardness			ASTM D471
Shore A, 150°C, 168 hr, in Dexron® VI	-6.0		
Shore A, 160°C, 504 hr, in Lubrizol OS 206304, 5W40	-8.0		
Change in Mass			ASTM D471
150°C, 168 hr, in Dexron® VI	16	%	
160°C, 504 hr, in Lubrizol OS 206304, 5W40	17	%	
Change in Volume			ASTM D471
150°C, 168 hr, in Dexron® VI	22	%	
160°C, 504 hr, in Lubrizol OS 206304, 5W40	23	%	

Thermal	Nominal Value	Unit	Test Method
Glass Transition Temperature	-37.0	°C	ASTM D7426

NOTE	
1.	Results on Heat Ageing of Three 60 Shore A Compounds
2.	0.5deg / 12 min
3.	Results on Heat Ageing of Three 60 Shore A Compounds
4.	168 hrs, Ageing in Petro Canada Dexron® VI
5.	504 hrs, Ageing in Lubrizol® OS 206304 , 5W40
6.	Results on Heat Ageing of Three 60 Shore A Compounds
7.	Results on Heat Ageing of Three 60 Shore A Compounds

8.	12 mm molded disks
9.	Results on Heat Ageing of Three 60 Shore A Compounds
10.	12 mm molded disks
11.	12 mm molded disks
12.	Results on Heat Ageing of Three 60 Shore A Compounds
13.	12 mm molded disks
14.	12 mm molded disks

Recommended distributors for this material

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