KEVLAR®

DUPONT®

KEVLAR® engineered elastomer with Neoprene GW

Merge 1F723

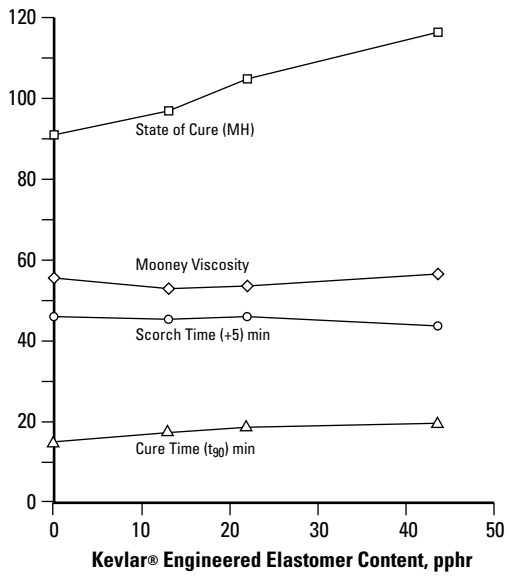
Test compound formulation and properties:

Neoprene GW	100	90.8	84.6	69.2
Engineered elastomer 1F723	0	12	20	40
Magnesia (Maglite D)	4	4	4	4
N772 carbon black	58	58	58	58
Rapeseed oil	10	10	10	10
Stearic acid	2	2	2	2
Octylated diphenylamine (Octamine)	2	2	2	2
Zinc oxide	5	5	5	5

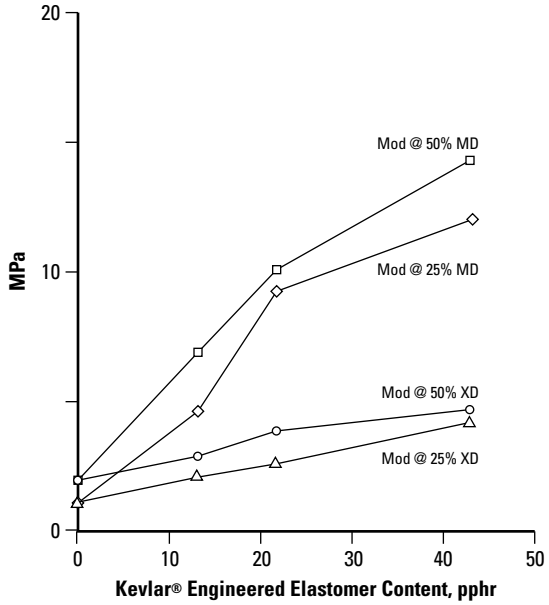
Kevlar® Engineered Elastomer content	pphr	0		12		20		40	
Kevlar® pulp content	pphr	0		2.8		4.6		9.2	
Mooney Viscosity at 100°C									
ML 1 + 4	units	54.8		52.7		53.1		56.8	
Mooney Scorch MS at 121°C									
Time to + 5 units raise	min	46.2		44.9		46.2		43.5	
Time to + 10 units raise	min	53.4		54.1		55.1		54.5	
Minimum	min	22.7		21		21.6		23.2	
ODR 160°C, 30 min, 3° arc									
M_L	dN/m	9.4		9.6		10.3		12	
t_{S2}	min	3.1		2.6		3		2.9	
t_{90}	min	14.7		17		18.5		19.4	
M_H	dN/m	91		97		104		116	
Vulcanizate properties measured on 2 mm sheet									
Cure time	min	15		20		20		20	
Hardness	°IRHD	70		73		77		84	
	°Shore A	71		74		78		85	
Machine and cross direction:		**MD**	**XD**	**MD**	**XD**	**MD**	**XD**	**MD**	**XD**
Tensile strength	MPa	18.7	18.5	17.6	15.3	15.5	14.1	15.1	13.9
Modulus at 10%	MPa	0.6	0.6	1.2	1.1	4.7	1.3	9.4	2.3
Modulus at 15%	MPa	0.8	0.7	2.1	1.4	7.4	1.8	12.1	3.2
Modulus at 25%	MPa	1.1	1.1	4.6	2.1	10.1	2.7	12.2	4.3
Modulus at 30%	MPa	1.2		5.7	2.3	10.5	3.1	12.6	4.8
Modulus at 50%	MPa	1.9	1.9	6.8	2.8	9.2	3.8	14.3	5.6
Modulus at 100%	MPa	3.6	3.5	7.4	4.5	9.4	5.6	14.6	6.3
Modulus at 200%	MPa	9.8	9.3	11.2	8.7	11.7	9.4		9.4
Modulus at 300%	MPa	17.4	16.6	16.7	14.4	16.7	14.6		13.1
Elongation at break	%	390	417	347	344	324	313	179	191
Tear ISO 34C	kN/m	46.5	47.5	50.1	54.5	63.0	65.1	73.2	80.8
Tear ISO 34B	kN/m	63.2	59.5	57.1	66.8	55	69.1	73.2	80.8

Kevlar® Engineered Elastomer content	pphr	0	12	20	40
Kevlar® pulp content	pphr	0	2.8	4.6	9.2
Air Aged 10 days at 120°C					
Hardness	°IRHD	90	89	93	94
Change	°IRHD	20	16	16	10
Tensile strength	MPa	15.2	14.5	13.3	12.1
Change	%	–19	–16	–14	–20
Elongation at break	%	86	104	68	45
Change	%	–78	–70	–78	–75
Compression Set					
24 h at 100°C	%	49.2	52.3	56.2	59.1
72 h at 100°C	%	67.1	69.2	70.4	72.1
Water swell 7 days at 80°C (ASTM D471)					
Weight change	%	7.1	7.8	8.8	9.6
Volume change	%	9.5	10.3	11.4	12.2

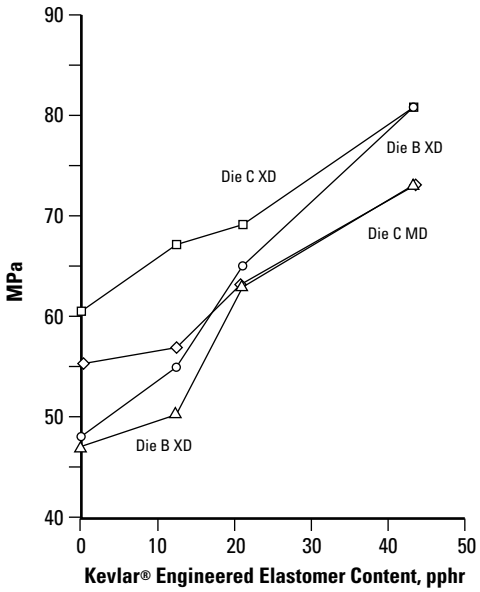
Effect of KEVLAR® Engineered Elastomer Content on Processing



Effect of Orientation of KEVLAR® Engineered Elastomer on Stiffness



Effect of KEVLAR® Engineered Elastomer Content on Tear Strength



- Engineered elastomer merge 1F723 contains:
  - 23 weight percent reinforcement
  - 77 weight percent Neoprene GW
- Specific Gravity is 1.28
- "Nugget" shape product form
- Packaged in 15 kilogram kraft bags with a low melt (<100°C) EVA liner

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