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Technical Data

VANOX[®] CDPA Antioxidant in a Vamac[®] G compound No. 1239

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VANOX[®] CDPA Antioxidant in a Vamac[®] G compound

VANOX CDPA is a high molecular weight diphenylamine antioxidant that has successfully replaced Naugard[®] 445 in natural rubber and most synthetic polymers and compounds. This cost-effective antioxidant was compared to Naugard 445 in a **Vamac G** compound.

Vamac (AEM) ethylene acrylic elastomers are used in applications where flexibility is needed in combination with both heat and oil resistance. Generally 2 phr of diphenylamine are recommended in black formulations. The results of the two compounds are compared below to demonstrate the equivalent performance of **VANOX CDPA** and Naugard 445.

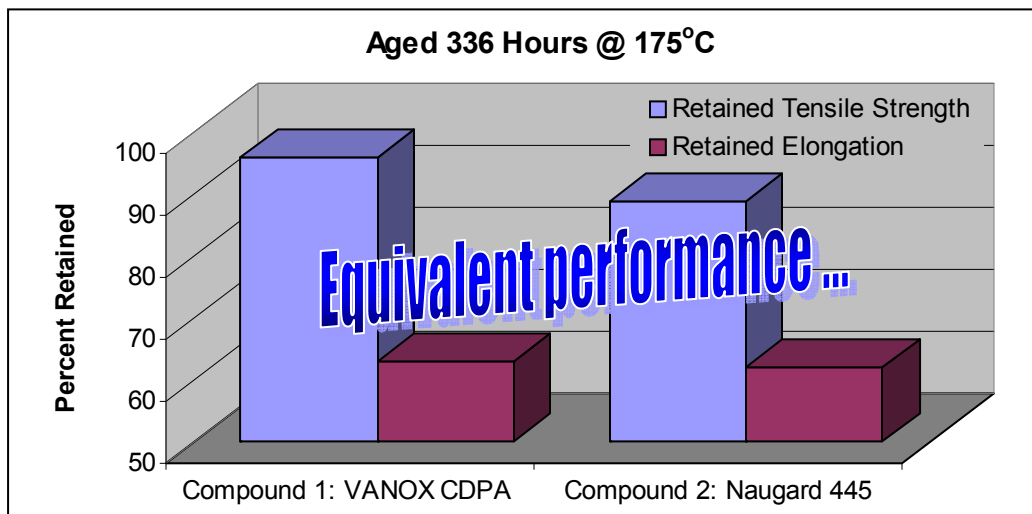


Figure 1: Retained Tensile Strength and Elongation

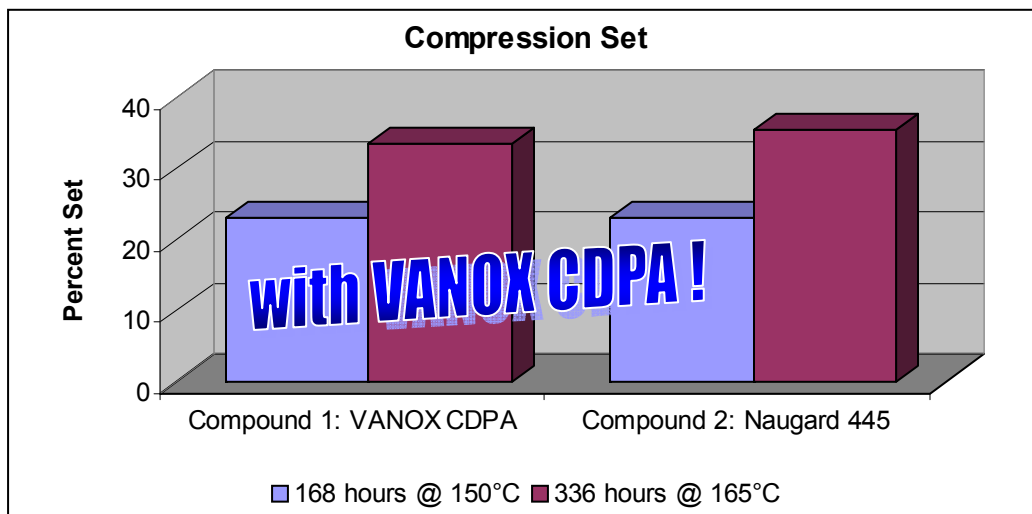


Figure 2: Compression Set Resistance

Ingredients	Compounds (phr)	
	1	2
Vamac[®] G ethylene/acrylic elastomer	100.0	100.0
N774 Carbon Black	65.0	65.0
Stearic Acid	1.5	1.5
VANFRE[®] VAM processing aid	1.0	1.0
Armeen [®] 18D	0.5	0.5
VANOX[®] CDPA antioxidant	2.0	-
Naugard [®] 445	-	2.0
VANAX[®] DOTG accelerator	4.0	4.0
DIAK[®] No. 1 curing agent	1.5	1.5
Totals	175.5	175.5

PHYSICAL PROPERTIES

Press Cured 10 min. @ 177°C (350°F) and Post Cured 4 hrs. @ 175°C (347°F)

100% Modulus, MPa	7.1	7.4
Tensile Strength, MPa	16.1	16.4
Elongation, %	280	259
Hardness, Shore A	70.4	70.9

OVEN AGED 336 HOURS @ 175°C (347°F)

Tensile Retained, %	96.1	89.0
Elongation Retained, %	62.9	62.5
Hardness, Shore A	+5.0	+5.2

COMPRESSION SET – METHOD B – PLIED – 168 HOURS @ 150°C (302°F)

Set, %	23.1	23.2
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COMPRESSION SET – METHOD B – PLIED – 336 HOURS @ 165°C (329°F)

Set, %	33.6	35.5
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MDR, ASTM D 5289 @ 177°C (350°F), 0.5°Arc

Minimum Torque, M _L , dN·m	0.33	0.28
Maximum Torque, M _H , dN·m	14.48	14.63
t _s 1, minutes	0.81	0.82
t _c 90, minutes	6.89	6.81

Vamac is a registered trademark of DuPont and brought to market by DuPont Performance Elastomers.

Armeen is a registered trademark of Akzo Nobel Chemicals B.V.

Naugard is a registered trademark of Chemtura Corporation.

DIAK, VANAX, VANFRE, and VANOX are registered trademarks of R.T. Vanderbilt Company, Inc.

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