THIATE® EF-2 Accelerator

For Denka™ Neoprene Compounds

THIATE EF-2 is an excellent accelerator in Neoprene compounds requiring maximum compression set resistance. **THIATE EF-2** is also an excellent direct ETU replacement, providing very similar heat-aged retention along with improved compression set resistance. ETU is on the SIN (Substitute it Now!) List and on the regulatory lists of many countries. ETU is a "Substance of Very High Concern" and **THIATE EF-2** is a safer alternative to this hazardous chemical.

THIATE EF-2 can be a fast accelerator and epoxy resin has been found to be an effective retarder to the crosslinking system. Cure times are lengthened while maintaining all physical properties including, the improved compression set. The cure system can be further modified for scorch safety, cure rate, and cure state by adjusting the epoxy resin and/or the **THIATE EF-2** levels (1-2 phr is suggested for each).

THIATE EF-2:

- Maximum compression set resistance
- Effectively replaces ETU on the SIN List
- Retarded by epoxy resin

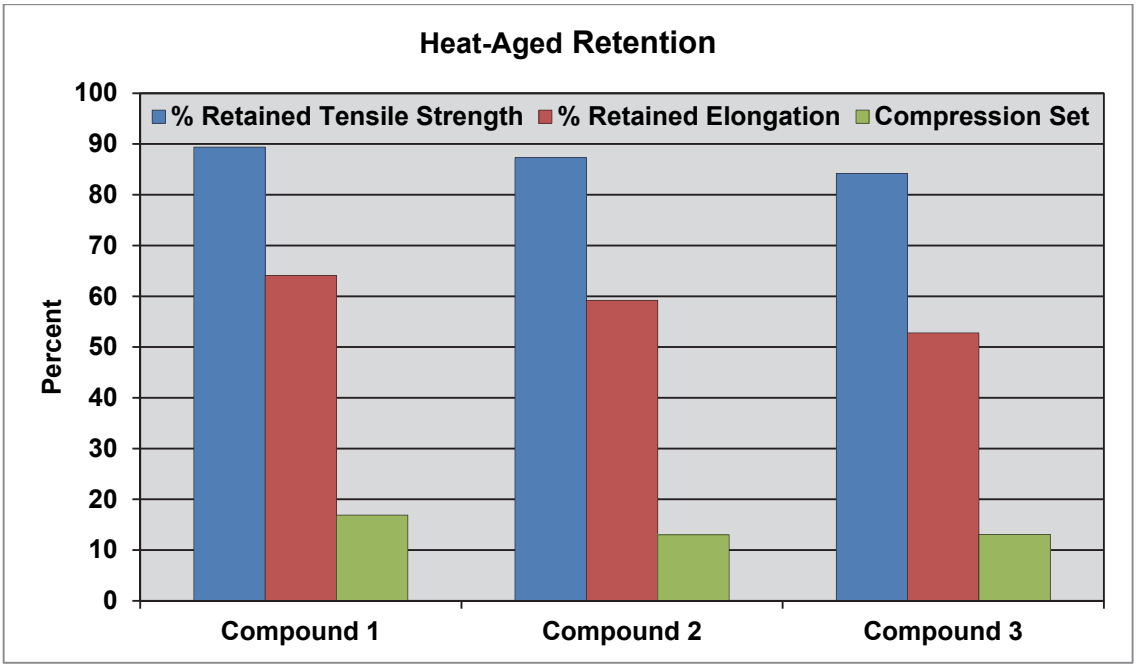

Figure 1: Heat- Aged Retention

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THIATE® EF-2 Accelerator in a Denka™ Neoprene Compound

Ingredients	Compounds (phr)		
	1	2	3
Neoprene W	100.00	100.00	100.00
N774 Carbon Black	60.00	60.00	60.00
Naphthenic Process Oil	5.00	5.00	5.00
VANPLAST® PL Plasticizer	5.00	5.00	5.00
AGERITE® STALITE® S Antioxidant	2.00	2.00	2.00
Stearic Acid	0.50	0.50	0.50
Magnesium Oxide	4.00	4.00	4.00
Zinc Oxide	5.00	5.00	5.00
ETU-75, Ethylene Thiourea (75% MB)	1.00	-	-
THIATE® EF-2 Accelerator	-	1.00	1.15
Epoxy Resin, Epon™ 828 DLC®-A	-	-	1.50
Totals	182.50	182.50	184.15

MOONEY SCORCH @ 121°C

Minimum Viscosity, mu	37.1	33.4	33.3
t_5, minutes	7.2	11.0	11.4

MDR @ 160°C, 0.5° Arc

Min. Torque, ML, dN-m	1.36	1.12	1.19
Max Torque, MH, dN-m	21.85	22.60	22.72
t_s1, minutes	1.16	1.45	1.77
t'90, minutes	16.03	5.80	9.99

PHYSICAL PROPERTIES

Press Cured t'90 + 2 min. @ 160°C

100% Modulus, MPa	6.1	5.6	5.8
Tensile Strength, MPa	22.1	21.2	22.5
Elongation, %	248	245	269
Hardness, Shore A	68	67	67

OVEN AGED 168 HOURS @ 121°C

Aged Tensile Strength, MPa	19.7	18.5	19.0
Aged Elongation, %	159	145	142
Aged Durometer, Shore A	84	86	87

COMPRESSION SET – METHOD B – 70 HOURS @ 100°C

Set, %	17	13	13

10/4/2016