Thiokol introduces new plasticizer

The Chemical Division of Thiokol Chemical Corporation has developed a new plasticizer, named TP-680, for use in compounding both natural and synthetic rubbers.

A medium-viscosity, nonreactive polymeric plasticizer, TP-680 provides exceptional softness to various types of elastomers. It is especially recommended for use with polysulfide, nitrile, natural rubber (smoked sheets), neoprene, SBR and polyurethane polymers. Results of field and laboratory tests show that TP-680 plasticizer exhibits low volatile loss, permits rapid introduction of fillers, aids processing and serves as a mild lubricant and improves resiliency of the stocks. The plasticizer is recommended for use in elastomers used in the manufacture of hose, belts, gaskets, seals and other mechanical goods.

Typical properties of TP-680 are as follows:

Appearance	Clear liquid
Color, Gardner, 1963 (ASTM D1544)	2.5
Specific Gravity, 25C	1.03
Volatility, % 2 hours 311F (155C)	0.55
Volatility, % 4 hours 311F (155C) (ASTM D2288)	1.29
Flash point, F(C), C.O.C.	300 (149) minimun
Fire point, F (C), C.O.C.	350 (177) minimun
Pour point, F (C)	50 (10)

Test results for natural rubber, SBR and NBR compounds are shown in the following table:

	NR1	NR2	SBR1	SBR2	NBR1
Natural rubber (smoked sheets)	100	100	....	....	....
SBR 1502	....	....	100	100	....
NBR (Hycar 1002)	....	....	....	....	100
Zinc oxide	5	5	3	3	5
Stearic acid	3	3	2	2	1.5
Philblack A	50	50	....	....	....
HAF Black (N-330)	....	....	50	50	....
SRF Black (N-761)	....	....	....	....	60
Thermoflex A	1	1	....	....	....
BLE Powder	....	....	1	1	....
Sulfur	2.5	2.5	1.75	1.75	1.5
Santocure	0.4	0.4	....	....	....
DPG	....	....	0.6	0.6	....
MBTS	....	....	0.5	0.5	1.5
TP-680 plasticizer	5	10	10	20	30
Cure: Minutes	10	10	20	20	30
Temperature	307F (153C)	307F (153C)	307F (153C)	307F (153C)	310F (154C)
Tensile strength, psi (kg/cm²)	2380 (167.3)	2380 (167.3)	3350 (249.6)	3300 (232.0)	2540 (178.6)
200% Modulus, psi (kg/cm²)	530 (37.3)	470 (33.0)	700 (49.2)	530 (37.3)	480 (33.8)
Elongation, %	490	490	630	660	640
Hardness, Shore A	56	57	63	61	56
Compression Set, %					
22 hours at 158F (70C)	75	77	49	63	40
70 hours at 158F (70C)	38	37	19	26	....
70 hours at 212F (100C)	....	....	....	....	11
Oven Aging—70 hours at 158F (70C)					
Tensile strength, psi (kg/cm²)	3150 (231.5)	3120 (219.4)	3720 (261.5)	3630 (255.2)	2850 (200.4)
200% Modulus, psi (kg/cm²)	1030 (72.4)	900 (63.3)	1300 (91.4)	830 (58.4)	1150 (80.9)
Elongation, %	450	470	430	540	400
Hardness, Shore A	64	62	73	[illegible]	5

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