



Promix[®] 400 with Naphthenic Oil for PAH Compliance



Study Objective and Contents

• Study Objective:

 Illustrate the use of Promix[®] 400 in combination with Naphthenic Oil as a replacement for Aromatic oil in a synthetic/carbon black tread for PAH compliance

• Contents:

- Synthetic/Carbon Black Tread FORMULATION
- Effect on PROCESSING
- Effect on CURE KINETICS
- Effect on CURED PROPERTIES
- Summary Why use Promix[®] 400 for PAH compliance?





Promix[®] 400 for PAH Compliance Synthetic/Carbon Black Tread



FORMULATION – Synthetic/Carbon Black Tread

	Aromatic Oil	Naphthenic Oil	Naphthenic Oil + Promix [®] 400
Budene 1207	30	30	30
Emulsion SBR 1502	70	70	70
N220	70	70	70
Zinc Oxide	1.75	1.75	1.75
Stearic Acid	2	2	2
Paraffin Wax	0.5	0.5	0.5
Microcrystalline Wax	1	1	1
6PPD	2	2	2
Aromatic Oil	40	-	-
Naphthenic oil		40	- 38 or 36 -
Promix [®] 400 *	-	-	- 3 or 6 -
Sulfur	1.5	1.5	1.5
CBS	1.5	1.5	1.5

* 3phr Promix per 2phr replacement ratio used to help maintain modulus at control level



Promix[®] 400 for PAH Compliance

Synthetic/Carbon Black Tread

PROCESSING

PROCESSING – RPA2000 Uncured G'





PROCESSING – RPA2000 Uncured Tan δ





Promix[®] 400 for PAH Compliance Synthetic/Carbon Black Tread

CURE KINETICS



CURE KINETICS – MDR 2000 Rheometer (150 ℃)



Promix[®] 400 for PAH Compliance

Synthetic/Carbon Black Tread

CURED PROPERTIES



CURED PROPERTIES – Tensile



CURED PROPERTIES – RPA2000 G' (60C)





CURED PROPERTIES – RPA2000 Tan δ (60C)





Why Promix[®] 400 for PAH Compliance?

Compared to Naphthenic Oil Alone, Promix[®] 400

- Restores aromatic character
- Improves processing
- Improves tear strength
- Helps maintain tire handling performance (Traction and Handling)
- Provides lower tire rolling resistance than Aromatic Oil
- Provides flexibility to optimize the "aromaticity" of each compound

