DOVERPHOS®
LIQUID ORGANOPHOSPHITES

Doverphos LP-09 Bulletin — Stabilizer for Rubber Applications

Doverphos LP-09 is an alkyl C_{13} substituted bisphenolic diphosphite. Doverphos® LP-09 is a stabilizer for many types of rubber which can be used in combination with hindered phenol antioxidants to give outstanding color stability and Mooney viscosity stability during processing and heat aging. Typical use levels range from 0.05% to 0.40%.

Key properties of DP-LP-09 compared to TNPP

- DP-LP-09 offers excellent process stability even when used at 1/3 the level of TNPP
- DP-LP-09 offers superior color stability during oven aging
- DP LP-09 has excellent resistance to hydrolysis: after 72 hours of humid aging DP LP-09 had an acid number of 0.06 compared with an acid number of 56 for TNPP

CAS Registry Number 13003-12-8

TYPICAL PROPERTIES	
Appearance	Clear Liquid
% Phosphorus	4.79
Density, Lb./gal.	7.8
Weight Loss (TGA onset temp °C)	318

PARAMETER	TYPICAL	TEST METHOD
Color, APHA	150 Max.	ASTM D1209
Acid Number, mg KOH/gm	0.1 Max.	ASTM D3242
Refractive Index, 25°C	1.4945	ASTM D1218
Specific Gravity, 25°C/15.5°C	0.945	ASTM D1298

For more information, visit us at www.doverchem.com

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DOVERPHOS LP-09

PERFORMANCE

Evaluation of four stabilizers in a non-stabilized polybutadiene rubber.

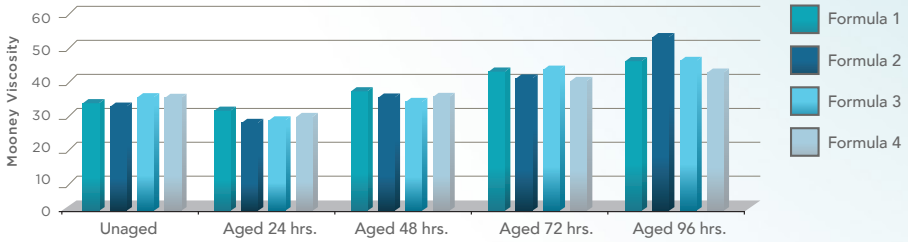
The formulations for the four stabilizers are given in the table:

	PERCENT			
Formula	**1**	**2**	**3**	**4**
TNPP	0.5	—	—	—
DP-LP-09	—	0.1	0.25	0.35
DN-76	0.3	0.3	0.3	0.3

The stabilized rubber formulations were then oven heat aged at 88°C for up to 96 hours. Mooney viscosities and colors were determined initially, after 24, 48, 72 and 96 hours. The charts that follow give the results of the oven aging test.

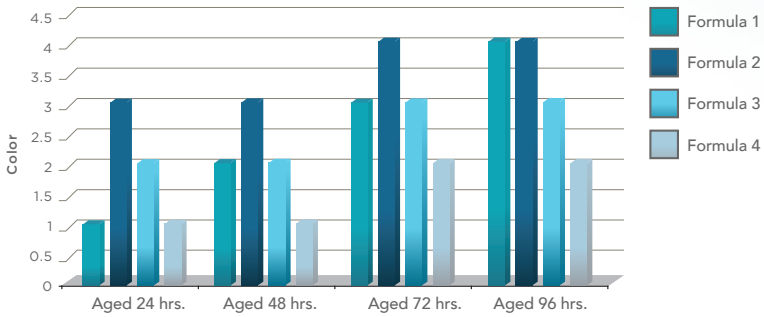
MOONEY VISCOSITIES

Readings after compounding then aging at 24, 48, 72 and 96 hours @88°C



COLOR

Readings after aging at 24, 48, 72 and 96 hours @88°C



SUMMARY

DOVERPHOS LP-09 offers:

- Excellent thermal stability and low volatility
- Outstanding color stability during heat aging
- Excellent Mooney viscosity stability during heat aging
- Can replace TNPP at 1/3 the loading level
- Superior resistance to hydrolysis

More Information on DOVERPHOS LP-09:

- Visit us at **www.doverchem.com** for additional information on Dover's line of phosphite stabilizers.
- Toxicity and handling information are found on the Material Safety Data Sheet (available upon request)

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