FUNCTIONAL PRODUCTS INC.

Innovative Chemistry for Lubricants

Technical Data Sheet

FUNCTIONAL MH-4500

Methacrylate-based Viscosity Index Improver for Hydraulic Fluid and Gear Oil

APPLICATION:

FUNCTIONAL MH-4500 is a liquid-form polyalkylmethacrylate viscosity modifier that offers high thickening efficiency with excellent shear stability. **FUNCTIONAL MH-4500** has been specifically formulated to provide additional VI improvement, demulsibility, and pour point depressancy. The high shear stability also makes **FUNCTIONAL MH-4500** attractive in gear oil formulations.

COMPOSITION:

FUNCTIONAL MH-4500 is a blend of polyalkylmethacrylates and highly refined mineral oil.

Typical Properties	
Lbs per Gallon (ASTM D 1475)	7.8
Specific Gravity	0.93
Kinematic Viscosity (ASTM D 445)	1500 at 100 ˚C
Thickening Efficiency (10% in ISO 32)	12.3 cSt at 100 ˚C
PSSI (5% in 150N, ASTM D 6278)	15%
Sonic Shear (ASTM D5621, 6.4% in 150N)	50%
KRL (20 hours)	65%
Flash Point (ASTM D 92)	>150˚C
Color (ASTM D 1500)	< 2.0

TREATMENT LEVEL:

Typical treatment level for methacrylate-based viscosity modifiers ranges from 5 to 10% for hydraulic fluids and 5% to 20% for gear oils.

6.4wt% **FUNCTIONAL MH-4500** will increase an ISO 32 oil to ISO 46.

Please see the next page for examples of preparing specific ISO viscosity grades from 100N and 150N oil.

MH-4500 Treat Level vs. Viscosity @ 100˚C

wt% Treat	100N Oil (ISO 22)	150N Oil (ISO 32)	200N Oil (ISO 46)	350N Oil (ISO 68)
0%	3.9	5.4	6.5	8.3
10%	9.7	12.1	13.3	16.9

HANDLING:

FUNCTIONAL MH-4500 should be warmed to about 50°C (120°F) to facilitate pumping and handling. The base oil should be heated to 60-80˚C (140-180˚F) during blending to allow for good mixing. Mixing time will vary with equipment but is typically at least one hour. Safe handling precautions are the same as those to be taken with base oil; see the current Safety Data Sheet.

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FUNCTIONAL MH-4500 Treat Levels:*

To obtain specific viscosity grades from a 100N (ISO 22) base oil:

	Treat (wt%)	40˚C Viscosity	100˚C Viscosity	VI
100N (ISO 22)	0.0%	19.4 cSt	3.9 cSt	92
150N (ISO 32)	6.4%	32.3 cSt	7.3 cSt	202
	7.6%	37.0 cSt	8.3 cSt	210
	10.0%	42.9 cSt	9.7 cSt	221

To obtain specific viscosity grades from a 150N (ISO 32) base oil:

	Treat (wt%)	40˚C Viscosity	100˚C Viscosity	VI
150N (ISO 32)	0.0%	30.6 cSt	5.4 cSt	117
200N (ISO 46)	6.4%	46.9 cSt	9.2 cSt	183
	7.6%	50.6 cSt	10.1 cSt	192
	10.0%	59.9 cSt	12.1 cSt	204

* These levels are suggested. Intermediate 40˚C viscosities may be achieved by varying wt% linearly.

Actual treat levels will vary due to base oil composition and other additives.

The oils featured on this page are separate from the ISO 32 oil for 10wt% thickening efficiency on page 1.

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