

FUNCTIONAL MG-1500

Polymethacrylate Viscosity Index Improver for Multigrade Gear Oils and Hydraulic Fluids

APPLICATION:

FUNCTIONAL MG-1500 is a liquid-form polyalkylmethacrylate viscosity modifier that offers high thickening efficiency with excellent shear stability. **FUNCTIONAL MG-1500** has been specifically formulated to provide additional VI improvement, demulsibility, and pour point depressancy. The high shear stability and low temperature performance also makes **FUNCTIONAL MG-1500** attractive in multi-grade gear oil formulations.

COMPOSITION:

FUNCTIONAL MG-1500 is a blend of polyalkylmethacrylates and highly refined mineral oil.

Typical Properties	
Lbs per Gallon (ASTM D1475)	7.9
Specific Gravity	0.95
Typical Kinematic Viscosity (ASTM D445)	1200 cSt @ 100 °C
Thickening Efficiency (10% in ISO 32)	9.6 cSt @ 100 °C
PSSI (5% in 150N, ASTM D6278)	0%
20hr KRL (20% in 150N, CEC L-45-99-A)	25-30%
Flash Point (ASTM D 92)	>220°C
Color (ASTM D 1500)	< 1.0

TREATMENT LEVEL:

Typical treatment level for shear stable methacrylate-based viscosity modifiers ranges from 5 - 30% for hydraulic fluids, industrial and automotive gear oils, and more. See next page for sample automotive gear formulations.

Example Viscosities of FUNCTIONAL MG-1500 in Light and Heavy Paraffinic Oils

	4 cSt Group III				600N Group II			
	0wt%	10wt%	20wt%	30wt%	0wt%	5wt%	10wt%	15wt%
KV40, cSt	19.6	30.1	54.5	108.8	110.0	114.1	139.6	170.8
KV100, cSt	4.2	7.3	12.0	20.6	12.2	15.2	18.8	23.3
Viscosity Index	122	220	223	216	101	139	152	165

HANDLING:

FUNCTIONAL MG-1500 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.

SAMPLE AUTOMOTIVE GEAR FORMULAS:

SAE J306 multigrade gear oils for manual transmissions and differentials require a careful balance of base oils, viscosity modifiers, and pour point depressants to achieve viscosity, low temperature, and shear requirements.

SAE 90 multigrade gear oils in paraffinic Group I / II / III

	Gr. I/II 80W90	EGr. III 75W90 A	Gr. III 75W90 B
FUNCTIONAL MG-1500	4.8	8	8
500SN Group I	45.25		
300N Group II	33.9		
150 Bright Stock	11.3		
4 cSt Group III		72	72.5
PB 2500 MW		16	15
GL-5 Gear Oil Package 1	4	4	4
FUNCTIONAL PD-610	0.75		
FUNCTIONAL PD-630			0.5
KV100, cSt	14.6	18.3	17.7
KV40, cSt	109.8	107.9	100.2
Viscosity Index	136	189	195
Brookfield (ASTM D2983), cP	50,800 @ -26C	140,800 @ -40C	118,400 @ -40C
20hr KRL Result (CEC L-45-99-A)	Shear In Grade	Shear In Grade	Shear In Grade
Visual	Clear	Clear	Clear

SAE 90 and 140 multigrade gear oils in PAO

	PAO 75W90	PAO 75W140
FUNCTIONAL MG-1500	6	10
mPAO 100	7	15
PAO 4	50.5	40.5
PB 1000 MW	20	--
PB 2500 MW	--	15
GL-5 Gear Oil Package 2	9.5	9.5
Ditridecyl Adipate Ester	7	10
KV100, cSt	15.1	27.4
KV40, cSt	90.6	180.5
Viscosity Index	176	189
Brookfield (ASTM D2983), cP @ -40C	39,100	98,200
20hr KRL Result (CEC L-45-99-A)	Shear In Grade	Shear In Grade
Visual	Clear	Clear

Consult with Functional Products Inc. to design high performance formulas with your base oils and packages in automotive or industrial applications at your required performance and economics.

This Technical Data Sheet and the Safety Data Sheet contain information believed to be accurate and reliable. No warranty is made, however, to information beyond the control of FUNCTIONAL PRODUCTS INC. The engineering and management personnel of the user are responsible for determining the suitability of this or any product for any specific application, and this information is offered to them for that purpose.

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