

FUNCTIONAL V-739

HIGH VISCOSITY BRIGHT STOCK AND POLYBUTENE REPLACEMENT

APPLICATION:

FUNCTIONAL V-739 is a pure liquid viscosity modifier with extremely high thickening efficiency, excellent shear stability, and low temperature fluidity intended to replace or reduce bright stock, polybutenes, and polymethacrylates for improved formula economy.

COMPOSITION:

FUNCTIONAL V-739 is a high viscosity olefin copolymer with no diluent.

Typical Properties	
Appearance, Visual	Clear to Slight Haze Slight Yellow to Orange
Color, ASTM D1500	2.0
Density (lb/gal), ASTM D1475	7.1
Kinematic Viscosity @ 100°C, ASTM D445	Semi-Fluid Polymer in Open Head Drum 62,000 @ 100°C
Flash Point, ASTM D92 COC	>250°C (518°F)
Thickening Efficiency, 10wt% in ISO 32 Group I	30.4 cSt @ 100°C
Shear Stability Index (PSSI), ASTM D6278	< 3 SSI
20hr KRL Shear Stability, CEC L-45-A-99	45 SSI

TREATMENT LEVEL:

Treatment levels of 1 – 10% are typical in industrial lubricants and greases. **FUNCTIONAL V-739** is compatible in most Group I-III paraffinic oils, naphthenic oils, and some low viscosity PAO.

See next page for suggested treat rates for shear-in-grade gear oils.

Full synthetic formulas may require 5-10wt% ester for solubility.

HANDLING:

Dissolving is best accomplished with continuous agitation at temperatures of 104-212°F (40-100°C). **FUNCTIONAL V-739** may be preheated in a hot room or tank at up to 176°F (80°C) to aid in pumping but long term storage should remain below 140°F (60°C).

FUNCTIONAL V-739 is a non-hazardous material; see the current Safety Data Sheet.

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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FUNCTIONAL PRODUCTS INC.

Innovative Chemistry for Lubricants

Technical Data Sheet

FORMULATION GUIDE:

Suggested treat levels for automotive (75W, 80W, 85W) gear oils with greatly reduced bright stock usage with **FUNCTIONAL V-739** viscosity modifier, **FUNCTIONAL GA-614** gear oil package, 110N oil, 600N oil, and 150 bright stock:

SAE XW-90 Viscosity (13.5 – 18.5 cSt @ 100°C)

Initial Base Oil Viscosity @ 100C	9 cSt	10 cSt	11 cSt	12 cSt	13 cSt
Formulate to this finished viscosity range for shear in grade by 20hr KRL	17.6 – 18.5 cSt	16.8 – 18.5 cSt	16.0 – 18.5 cSt	15.2 – 18.5 cSt	14.4 – 18.5 cSt
Estimated Treat Rate of FUNCTIONAL V-739, wt%	4.0 – 4.5%	3.5 – 4.0%	3.1 – 3.6%	2.8 – 3.3%	2.5 – 3.0%
Example Formula	4.0% GA-614 4.0% V-739 18.5% 110N 73.5% 600N	4.0% GA-614 3.5% V-739 9.0% 110N 83.5% 600N	4.0% GA-614 3.1% V-739 1.3% 110N 91.6% 600N	4.0% GA-614 2.8% V-739 93.2% 600N	4.0% GA-614 2.5% V-739 89.5% 600N 4.0% 150BS

Example formulations above are designed to shear to ≥ 13.75 cSt after 20 hour KRL (CEC L-45-A-99).

SAE XW-140 Viscosity (24.0 – 32.5 cSt @ 100°C)

Initial Base Oil Viscosity @ 100C	16 cSt	17 cSt	18 cSt	19 cSt	20 cSt
Formulate to this finished viscosity range for shear in grade by 20hr KRL	31.0 – 32.5 cSt	30.2 – 32.5 cSt	29.4 – 32.5 cSt	28.5 – 32.5 cSt	27.8 – 32.5 cSt
Estimated Treat Rate of FUNCTIONAL V-739, wt%	4.0 – 4.5%	3.7 – 4.2%	3.4 – 3.9%	3.2 – 3.7%	3.0 – 3.5%
Example Formula	4.0% GA-614 4.0% V-739 61.3% 600N 30.7% 150BS	4.0% GA-614 3.7% V-739 54.8% 600N 37.5% 150BS	4.0% GA-614 3.4% V-739 48.6% 600N 44.0% 150BS	4.0% GA-614 3.2% V-739 42.6% 600N 50.2% 150BS	4.0% GA-614 3.0% V-739 37.0% 600N 56.0% 150BS

Example formulations above are designed to shear to ≥ 24.25 cSt after 20 hour KRL (CEC L-45-A-99).

Treat in 4 cSt Group III for Industrial Fluids

ISO VG	22	32	46	68	100	150
wt%	0.0%	2.3%	4.0%	5.9%	7.8%	9.7%
Viscosity Index	122	176	193	199	201	200

FUNCTIONAL PD-610 pour point depressant is recommended in heavy oils (300N+) and **FUNCTIONAL PD-620** is recommended in low viscosity oils (70N-220N) to meet low temperature fluidity requirements.

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