FUNCTIONAL PRODUCTS INC.

Innovative Chemistry for Lubricants

Technical Data Sheet

FUNCTIONAL V-515

Economical Thickener/Tackifier for Biobased and Synthetic Ester Lubricants

APPLICATION:

FUNCTIONAL V-515 is an economical thickener and shear stable tackifier for vegetable oil lubricants. It is also used to provide adherence in chain or saw oils and drip resistance in other fluids used in environmentally sensitive locations. **FUNCTIONAL V-515** may also be used to provide tack in cutting oils containing high level of fatty additives.

COMPOSITION:

The active component in **FUNCTIONAL V-515** is a polymer selected for its ability to provide high thickening efficiency and shear stable tack. **FUNCTIONAL V-515** is biodegradable under all widely used standards.

Typical Properties	
Specific Gravity	0.91 – 0.92
Lbs per Gallon	7.6 – 7.65
Flash Point, ASTM D92	150°C (300°F)
Kinematic Viscosity, ASTM D445	7000-9000 cSt at 100°C
Color, ASTM D1500	Yellow (<4 ASTM)
Biodegradable Content, wt%, Approximate	90%
Shear Stability Index (PSSI), ASTM D6278 (10wt% in Canola)	50 SSI
20hr KRL Shear Stability, CEC L-45-A-99 (10wt% in Canola)	88%

TREATMENT LEVEL:

3 – 17wt% **FUNCTIONAL V-515** is used to prepare ISO 46 to 150 bar & chain, rock drill, and saw guide oils in vegetable oil. Higher treats are used to prepare open gear mining oils with excellent adherence and tack. See next page for treat rates. **FUNCTIONAL V-515** is compatible in vegetable oils, most synthetic esters, and low viscosity PAOs which allows **FUNCTIONAL V-515** to operate in a wide range of uses.

HANDLING:

While warming **FUNCTIONAL V-515** to about 65°C (150°F) may facilitate pumping and handling, extended storage of this vegetable oil-derived product at elevated temperatures is not recommended. Safe handling precautions are the same as those to be used with vegetable oils; see the current Safety Data Sheet.

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FORMULATION GUIDE:

FUNCTIONAL V-515 is ideal for economically thickening vegetable oils and synthetic esters to make lubricants with low demand on shear stability, i.e. bar and chain oil, rock drill oil, saw guide oils, wireline, and chain oils. **FUNCTIONAL V-584** tackifier is recommended when additional tack is required.

FUNCTIONAL V-521 Treat Rates in Canola Oil (Starting From ISO 32-36)

ISO VG	46	68	100	150	220	320	460	680	1000	1500	2200	3200	4600
wt%	3	8	12	17	21	26	30	35	39	44	49	54	58

Example rock drill formulations with **FUNCTIONAL RD-540** emulsifying biobased rock drill package:

	ISO 100 Bio Emulsifying	ISO 150 Bio Emulsifying
Canola Oil	86.9%	82.4%
Functional V-515	10.9%	15.4%
Functional RD-540	2.2%	2.2%
Viscosity Index	248	251
Pour Point (D97)	-24°C	-24°C
Water Separability (D1401)	5/25/50	6/25/49
Flash Point (D92, COC)	240°C	245°C
Load Wear Index (D2783)	53	54
4-Ball EP Weld Load (D2783)	315	315
Falex EP Load (D3223)	4502	4534
Timken OK Load (D2782)	70	70
FZG Load Stage	>12	>12

FUNCTIONAL '515' VARIANTS:

- **FUNCTIONAL V-516:** Concentrated, in high oleic vegetable oil, 6000 cSt @ 100°C

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