

FUNCTIONAL PRODUCTS INC.
Innovative Chemistry for Lubricants

Biobased and EAL Additives



**Ecolabel LuSC
Registered**

Grow your brand with sustainable lubrication.

Select components for biobased and EAL products depending on your base fluid, goals, and application:

- Viscosity • Tack • Pour Point • AW/EP • Hydraulic
- Gear • Forestry • Ecolabel / EAL • *and More*

Explore more options at functionalproducts.com

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Many Paths to Sustainability

The wide range of Environmentally Acceptable Lubricant base fluids is best categorized by ISO 6743:

- **TG:** Triglyceride, including natural esters
- **ES:** Synthetic ester
- **PG:** Polyalkylene glycol
- **PR:** Polyalphaolefin and related – may include aromatic-free Group III and white oils

Functional Products Inc. strives to provide formulators across all four categories with innovative chemistries to enable robust and cost-effective products as the dynamic EAL market continues to grow. We tailor our approach to your specific requirements for biobased and/or biodegradable content.

Viscosity Modifiers

Each viscosity modifier has several variants available at different handling viscosities and in alternative base stocks: contact us to discuss your development project's needs.

The top viscosity modifiers to start any new formulation project are:

FUNCTIONAL V-515

Economical and Tacky VM

- Bar & chain oils, saw guide oils
- Rock drill and pneumatic oil
- Total loss lubricants and greases



FUNCTIONAL V-515 is the most efficient viscosity modifier for building viscosity in light-duty and total loss applications. The high molecular weight also provides tack and anti-misting.

FUNCTIONAL V-508M

Versatile High-Temperature VM

- NSF H1 incidental food contact
- Oven oils, smokeless oils, metalworking
- Synthetic ester and PAG oils



FUNCTIONAL V-508M is the most compatible viscosity modifier for biobased and synthetic esters. This chemistry offers excellent thermal/oxidative stability and meets NSF HX-1 and Ecolabel LuSC.

FUNCTIONAL PD-585

Low-Temperature VM & Biobased PPD

- HETG and HEES hydraulics
- Mobile equipment, municipal vehicles
- Extended low temperature exposure



FUNCTIONAL PD-585 is a multi-functional polymethacrylate (PMA) used as both a viscosity modifier at 2-10wt% and an effective pour point depressant for natural vegetable oils at 0.5-1.0wt%.

Typical Properties

Product	Viscosity, at 100°C	PSSI, D6278	PSSI, 20 hr KRL	Chemistry	Base Oil	Thickening Efficiency, 10wt%	Ecolabel LuSC?	NSF HX-1?
V-515	8000	50	N/A	Proprietary	Veg Oil	83.6 cSt	Yes	No
V-508M	2500	29	N/A	Proprietary	Veg Oil	71.9 cSt	Yes	Yes
PD-585	1200	4	56	PMA	Ester	80.3 cSt	Yes	No

Tackifiers

Tackifiers provide anti-fling and anti-mist performance to high speed lubricants like bar & chain oils or saws. See the **Tackifiers** brochure from Functional Products Inc. for more options.

Product	Viscosity, @ 100°C, cSt	Compatibility	Chemistry	Base Oil	String Length, Ductless Siphon	Ecolabel LuSC?	NSF HX-1?
V-584	2500 @ 40°C	Veg Oil, Esters	Proprietary	Veg Oil	10	Yes	Yes
V-572	7500	Veg Oil, Esters	Proprietary	Veg Oil	5	No	No
V-188P2	9250	PAO, Petro. Oil	OCP	PAO	20	Yes	Yes

FUNCTIONAL V-584 is the primary tackifier for veg oil and synthetic esters.

FUNCTIONAL V-572 is a concentrated tackifier for conveniently building viscosity and tack in greases and heavy-duty biobased lubricants.

FUNCTIONAL V-188P2 tackifies biodegradable polyalphaolefins and other biodegradable hydrocarbons for environmentally acceptable lubricants and eco-friendly products.

Pour Point Depressants

Pour point depressants (or “cold flow improvers”) are critical for improving the low temperature fluidity and preventing gelation during slow cooling during storage in cold weather. Different vegetable oils or fats respond differently so it advised to try several PPDs.

FUNCTIONAL PD-500 Series pour point depressants target waxy long chain fatty acids or inhibit the crystallization of certain synthetic base stocks.

Product	Viscosity, at 100°C	Chemistry	Use With	Ecolabel LuSC?	NSF HX-1?
PD-585	1200	PMA	Vegetable oils	Yes	No
PD-555C	300	PMA	Vegetable oils and veg/petroleum blends	No	No
PD-562	N/A	Proprietary	Low viscosity estolides	No	No
PD-564	950	Proprietary	Med-high visc. estolides; biobased PAO	Yes	No
PD-571	N/A	Proprietary	Methyl esters / FAME / biodiesel	No	No
PD-574	N/A	Proprietary	Biobased H1 lubricants	No	Yes

FUNCTIONAL PD-585 is a highly concentrated PMA pour point depressant which can also perform as a shear stable viscosity modifier. Listed on both European Ecolabel LuSC list and US EPA Cleangredients.

FUNCTIONAL PD-555C is an easy to handle, low treat PPD for biobased lubricants. This product performs well with blends of vegetable oil with white oil or Group III.

FUNCTIONAL PD-574 is suitable for NSF H1 vegetable-based lubricants.

“Eco-Friendly” Packages and Components

For Lower Impact on the Environment

“Eco-friendly” packages are available as a better, lower impact alternative to standard zinc or hazard labeled industrial packages for petroleum oil. These additives, as concentrates, may carry some hazard labeling.

Product	Treat Rate, wt%	Application	Ecolabel LuSC?	NSF HX-1?
BC-15	1.5%	Bar & chain oil package	No	No
GA-400	0.55 – 1.1%	Hydraulic and light-duty gear oil package	No	Yes
HF-580	1.5 – 2.5%	Antiwear HF package (variable treat)	No	No
RD-540	2.2%	Rock drill and air tool package (emulsifying)	No	No
RD-540CP	2.4%	Rock drill and air tool package (demulsifying); gear oil	No	No
SGP-567	1.5%	Saw guide oil (emulsifying), forestry package	No	No
TF-50	3%	Package for biobased dielectric fluids and transformer oils.	No	No
WA-60SF	1.5%	Saw guide oil (demulsifying)	No	No

Environmentally Acceptable Lubricant (EAL)

For Registered EAL Programs and Marine Lubricant (US VGP) Use

These EAL options are registered on the European Ecolabel Lubricant Substance Classification (LuSC) list. These products meet all hazard labeling, biodegradability, and bio-accumulative requirements.

Product	Treat Rate, wt%	Application	Ecolabel LuSC?	NSF HX-1?
DF-400	0.1 – 1%	Defoamer for PAO, petroleum	Yes	Yes
DF-500	0.1 – 1%	Defoamer for veg oil, fatty ester	Yes	No
DM-400	0.1 – 1%	Demulsifier	Yes	Yes
GA-533	4%	Rock drill, gear, industrial EP lubricants	Yes	No
HF-595	2.2%	R&O, AW HF, HVI HF	Yes	No
SGP-563	1.5%	Bar & chain, saw guide oil	Yes	No

High Viscosity Synthetic Base Stocks

See our **Viscosity Modifiers & Base Stocks Brochure** for options including the **FUNCTIONAL V-5000 Portfolio** of biobased and/or biodegradable base stocks.

Not finding exactly what you need?
We can help you navigate your options –
sales@functionalproducts.com