

FUNCTIONAL DF-500

Ecolabel LuSC-listed Defoamer for Biobased Ester Lubricants

APPLICATION:

FUNCTIONAL DF-500 is a non-toxic and non-flammable silicone-free defoamer for biobased lubricants. **FUNCTIONAL DF-500** provides excellent foam reduction in natural and synthetic esters based on medium to long chain fatty acids. **FUNCTIONAL DF-500** chemistry performs well in maximizing air release for biobased hydraulic fluids, gear oils, circulating oils, and turbine oils.

FUNCTIONAL DF-500 is a safer alternative to mineral oil defoamers for ecofriendly lubricants. **FUNCTIONAL DF-500** contains no kerosene or petroleum oil and has no health, aspiration, or flammability hazards. Volatile defoamers may flash over when applied in the field to treat problems.

FUNCTIONAL DF-500 is listed on the European Ecolabel LuSC List and is US EPA Vessel General Permit (VGP) compliant.

COMPOSITION:

FUNCTIONAL DF-500 is a concentrated acrylate copolymer in biodegradable synthetic ester.

Typical properties	
Defoamer Chemistry	Acrylate
Appearance	Clear to Light Yellow
Odor	Mild
Density	7.7 lb./gal.
Typical Flash Point (ASTM D92, COC)	220°C / 428°F
Kinematic Viscosity at 40 °C (ASTM D445)	ISO 46
Biodegradability (OECD 301B)	Readily, approx. 70%

TREATMENT LEVEL:

0.25 - 0.5wt% **FUNCTIONAL DF-500** is typically sufficient to eliminate foam. Minor adjustments to foam may require as little as 0.05 - 0.10wt% (0.05 - 0.10 gallons per 100 gallons vegetable oil). See next page for example cases.

HANDLING:

Store at room temperature. The products is a non-hazardous material; see the current Safety Data Sheet. See next page for a safety comparison to other commercial defoamers.

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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FORMULATION GUIDE:

FUNCTIONAL DF-500 is recommended in all vegetable oils and any synthetic ester which uses medium to long chain fatty acids including TMPTO, polyols, and complex esters. Blends of fatty esters with hydrocarbons or other base stocks are also compatible. **FUNCTIONAL DF-500** is less effective in pure mineral oils or highly branched and saturated esters like iso adipates.

ASTM D892 Sequence I Foam Results* Before/After FUNCTIONAL DF-500 Treat

	ISO 100 Hydraulic Fluid	ISO 46 Rock Drill	ISO 100 Bar & Chain	ISO 460 Chain Oil	ISO 4600 Mining Gear
Base Oil Type	Vegetable	Vegetable/Gr. II Blend	Vegetable/Gr. II Blend	Vegetable	Vegetable
ASTM D892 Foam Before	80/10	140/0	210/0	550/300	500/300
wt% FUNCTIONAL DF-500	0.25wt%	0.25wt%	0.25wt%	0.25wt%	0.25wt%
ASTM D892 Foam After	0/0	0/0	0/0	0/0	0/0

* Denoted as "[mL of foam tendency after 5 min] / [mL of foam stability after 10 min]" @ 25°C

Flashpoint and Hazard Comparison vs. Popular Mineral Oil Defoamers

	Carrier Fluid	Flashpoint (D92 or D93)	GHS Hazards
FUNCTIONAL DF-500	Synthetic Ester	220°C / 428°F (open cup)	None
Silicone Defoamer "FB"	Light isoalkanes	106°C / 223°F (open cup)	Aspiration Toxicity 1
Acrylate Defoamer "PX"	Kerosene	46°C / 115°F (closed cup)	Flammable 3 Skin Irritation 2 Eye Irritation 2
PAG Defoamer "TL"	Light aromatic naphtha, Methylbenzenes, Isooctanol	47.8°C / 118°F (closed cup)	Flammable 3 Skin Irritation 2 Eye Irritation 2 Carcinogenicity 2 Aquatic Chronic 2

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