

Industrial Additives



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Way Oil Packages

FUNCTIONAL WA-64 is a high performance way oil package for GM LS-2 way oils in Group I-IV oils.

FUNCTIONAL WA-60SF is sulfur-free alternative for reduced color and odor with better copper compatibility

Product	wt%	Type	Chemistry	isApplications	Add-Ons
WA-64	1.75wt%	Ashless	S/P/N/B	Slideway lubes, way oils, general purpose machine oils	Tackifier *
WA-60SF	1.5wt%	Ashless	P/N	Sulfur-free way oils in presence of yellow metals	Tackifier *

*DM-240 demulsifier sometimes used at 0.05-0.10wt% depending on coolant or tramp oil conditions.

Gear Oil Packages

Gear oils are demanding extreme pressure lubricants that serve in a wide range of conditions from industrial gearboxes to automotive lubricants or even greases.

Product	wt%	Type	Chemistry	Applications	Add-Ons
GA-360	2wt%	Zinc-Free	S/Ca	EP industrial gear, US Steel	DM-240, DF-110
GA-360M	2wt%	Zinc-Free	S/Ca	EP industrial gear, AGMA	DM-240, DF-110
GA-614	3wt%	Ashless	S/P/N	Top tier ashless EP lubricants and greases	None
GA-400	1.1wt%	Ashless	S/P/N	NSF HX-1 incidental food contact gear	DM-400, DF-400

FUNCTIONAL GA-360 is a zinc-free gear oil package with excellent cost per treat in EP gear formulations.

FUNCTIONAL GA-360M is an enhanced version containing an industry standard micropitting resistance additive.

FUNCTIONAL GA-614 is a top-tier ashless sulfur-phosphorus EP gear oil package for industrial and automotive lubricants. Available without defoamers and demulsifiers if needed.

FUNCTIONAL GA-400 is an NSF HX-1 ashless hydraulic and light duty gear package. See the **Food Machinery** brochure.

Hydraulic Fluid Packages

Antiwear hydraulic fluids can be easily prepared using **FUNCTIONAL HF** packages and additional components. Higher performance 'high VI' hydraulic oils require viscosity modifiers, see the **Viscosity Modifier** brochure.

Product	wt%	Type	Chemistry	Applications	Add-Ons
GA-400	0.55wt%	Ashless	S/P/N	NSF HX-1 hydraulic and light duty gear package	DF-400, DM-400
HF-580	2.0wt%	Ashless	S/P/N	Top tier ashless AW hydraulic package; variable treat rate	None
HF-595	2.2wt%	Ashless	S/P/N	Ecolabel-listed hydraulic package	DF-500, DM-400

FUNCTIONAL GA-400 also performs well as an ashless antiwear (AW) hydraulic fluid package at 0.55wt%.

FUNCTIONAL GA-400 requires added defoamer and demulsifier to suit the many different base oil options available.

FUNCTIONAL HF-580 is a top-tier ashless AW hydraulic fluid package. The product can be downtreated from 2.5wt% to 2.0wt% or 1.5wt% as desired for improved economy.

FUNCTIONAL HF-595 is an Ecolabel-listed ashless AW hydraulic fluid package. **FUNCTIONAL HF-595** requires added defoamer and demulsifier to suit the many different base oil options available.

Bar & Chain Oil Packages

Product	wt%	Type	Chemistry	Applications	Add-Ons
BC-10	1.5wt%	Ashless	S/P/N	All season bar and chain package for petroleum oil	Tackifier
BC-15	1.5wt%	Ashless	S/P/N	All season bar and chain package for biobased oils	Tackifier

Bar & chain oil packages are designed for high speed sliding wear of the chain with mild shock loading. **FUNCTIONAL BC-10** and **BC-15** are low cost, streamlined packages for producing top-tier bar & chain oils. These packages include antiwear, mild EP additives, corrosion inhibitors, and pour point depressant.

Rock Drill Oil Packages

Product	wt%	Type	Chemistry	Applications	Add-Ons
RD-540	2.2wt%	Ashless	S/P/N	EP rock drill package – emulsifying (default option)	Tackifier
RD-540CP	2.4wt%	Ashless	S/P/N	EP rock drill package – demulsifying	Tackifier

Rock drill packages are designed for high shock loads to operate the hammering and drilling functions from heavy duty rock drill equipment down to pneumatic air tools. **FUNCTIONAL RD-540** and **RD-540CP** contain high levels of severe extreme pressure additives, corrosion inhibitors, and either an emulsifying or demulsifying agent.

Saw Guide Oil Packages

Product	wt%	Type	Chemistry	Applications	Add-Ons
SGP-567	1.5wt%	Ashless	S/P/N	Multipurpose saw guide and forestry oil package	Tackifier
SGP-563	1.5wt%	Ashless	Ca	Ecolabel-listed low friction, phosphorus-free package	Tackifier

Saw guide oil packages are designed for low friction and heat buildup. **FUNCTIONAL SGP-567** is a versatile package built around ashless friction modifiers. **FUNCTIONAL SGP-563** is an Ecolabel-listed alternative with greatly reduced coefficient of friction for negligible heat generation during use.

Pour Point Depressants for Petroleum Oils

FUNCTIONAL PD-6## series pour point depressants (PPDs) are engineered to selectively treat the different types of wax profiles found in API Group I, II, or III type paraffinic oils. Different catalysts, extractions, and hydrogenating conditions in the petroleum refining process produce different species of wax.

FUNCTIONAL PD-610, **PD-620**, and **PD-630** are highly versatile polymethacrylate-based pour point depressants which are notable for their versatility in specific API Groups or viscosity ranges.

Product	wt%	Chemistry	Application Note
PD-610	0.3wt%	PMA	Medium to heavy Group I/II paraffinic and naphthenic oils; 220 SUS (ISO 46) and above
PD-620	0.3wt%	PMA	Light Group I/II/III oils; 150 SUS (ISO 32) and below
PD-630	0.3wt%	PMA	Light to heavy Group III oils (4/6/8 cSt Group III)

Exact recommendation may depend on: the base oil manufacturer's production conditions and catalyst; use of viscosity modifiers or heavy base stocks; and the additive package.

See the **Biobased Additives** brochure for information on pour point depressants for vegetable oils and esters.

Components and Chemistries

Functional Products Inc. manufactures individual components for delivering the exact performance needed.

Corrosion Inhibitors

Product	wt%	Chemistry	Applications	Use With
CI-426	0.2wt%	P/N	Amine phosphate corrosion inhibitor with mild antiwear, EP; NSF HX-1	Petroleum, PAO, Ester, PAG
CI-427	0.2wt%	P/N	Amine phosphate, replacement for CAS# 80939-62-4; NSF HX-1	
CI-408	0.5wt%	Proprietary	Ferrous corrosion inhibitor for glycol/water blends	Glycol/Water
CI-498	0.2wt%	Proprietary	Ferrous corrosion inhibitor for aqueous lubricants; NSF HX-1	Water

FUNCTIONAL CI-426 and **CI-427** are neutral amine phosphate corrosion inhibitors for ferrous rust on iron or steel.

FUNCTIONAL CI-408 is a unique corrosion inhibitor for glycol or water/glycol mixtures.

FUNCTIONAL CI-498 is a corrosion inhibitor for aqueous (predominantly water-based) lubricants with mild antiwear.

Antiwear and Extreme Pressure

Product	wt%	Chemistry	Applications	Use With
AW-116	0.5wt%	P/N	Amine phosphate balanced for AW/EP performance; NSF HX-1	Petroleum, PAO, Ester, PAG
CI-426EP	2.0wt%	S/P/N	Enhanced amine phosphate for extra EP protection; NSF HX-1	
AW-487	0.5wt%	Na	Aqueous anti-wear and lubricity additive	Water

FUNCTIONAL AW-116 is a mildly acidic amine phosphate which adds extra antiwear and EP performance while retaining good ferrous corrosion resistance. **FUNCTIONAL CI-426EP** is an amine phosphate blend with higher EP performance using either a sulfur or phosphorus based booster.

FUNCTIONAL AW-487 is an antiwear additive for aqueous lubricants with mild corrosion inhibition.

Demulsifiers

Product	wt%	Chemistry	Applications	Use With
DM-240	0.1wt%	PAG	Highly effective industrial PAG-based demulsifier	Petroleum, PAO, Ester, PAG
DM-400	0.1wt%	Sulfonate	Versatile sulfonate-based demulsifier; NSF HX-1	

FUNCTIONAL DM-240 and **DM-400** provide two options from two different chemistry types to improve demulsibility in ASTM D1401, ASTM D2711, and steam emulsion number.

Defoamers

Product	wt%	Chemistry	Applications	Use With
DF-110	0.1wt%	Silicone	Silicone defoamer balanced for synthetic (Group III/IV) oils	Petroleum, PAO, Ester, PAG
DF-400	0.1wt%	Silicone	Versatile silicone-based defoamer; Ecolabel, NSF HX-1	
DF-500	0.1wt%	Acrylate	Acrylate-based defoamer for fatty esters / veg oil; Ecolabel	Fatty Esters / Veg Oil

FUNCTIONAL DF-110, **DF-400**, and **DF-500** are effective defoamers for a wide range of applications.

FUNCTIONAL DF-500 is best in vegetable oils or TMPTO with long chain fatty acids. Specialty defoamers for more polar synthetic esters (adipates, short chain TMP esters) are available.