



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

PRODUCT GUIDE

Products	Description
Viscosity Index Improver – VII	
CHEMPOL P-30	40 SSI, Solid OCP Pellet & Solubilized Liquid VII
CHEMPOL P-20	35 SSI, Solid OCP Pellet & Solubilized Liquid VII
CHEMPOL 5001 & 5026	22 SSI, Solid OCP Bale & Solubilized Liquid VII
DUTRAL® 2530 PL & 2550	24 SSI, Solid OCP Pellet & Bale Form
Engine Oil Additive Packages	
CHEMPOL 4500	CK-4 Diesel Engine Oil Additive
CHEMPOL 7998A	CF-4, CF,CF/SF,CD/SG,CC/SC Diesel & Gasoline Engine Oil Additive
CHEMPOL 7235	CJ-4,CI-4, CH-4, CI-4/SM, ACEA E7,E5 Heavy Duty Diesel Engine Oil Additive
CHEMPOL 7424	CI-4,CH-4,CF-4, CG-4, SL/CF, ACEA A3/B3/B4 Diesel Engine Oil Additive
CHEMPOL 7980A	CI-4/SL, CH-4/SJ Heavy Duty Diesel Engine Oil Additive
CHEMPOL 7182	CF-4, CF/ SJ,SG, ACEA E2 Diesel & Gasoline Engine Oil Additive
CHEMPOL 7601	CF-4, STOUS (Super Tractor Oil Universal) Engine Oil Additive
CHEMPOL 50025	SN, SN Plus, ACEA C3 Gasoline/Passenger Car Engine Additive
CHEMPOL 6377	SM Gasoline /Passenger Car Engine Oil Additive
CHEMPOL 6373	SL,SJ,SG,SL/CF,SJ/CF-4 Gasoline & Diesel Engine Additive
CHEMPOL 6325G	SL, SL/CF,SJ/CF,SG,SG/CD,JASO MA,MB Gasoline Engine Oil Additive
CHEMPOL 6225	SF/CF, SE/CD,SD/CC,SC/CC,SB/CB Gasoline & Diesel Engine Additive
CHEMPOL 5395	Zinc Booster, Antioxidant, ZDDP & Corrosion Inhibitor
CHEMPOL 5103	Water Soluble Cutting Fluid additive, Nitrite Free.
CHEMPOL 5210	Dispersant Ash less, Chlorine Free, Polyisobutylene succinic anhydride.
CHEMPOL 5540	TBN 400 (Total Base Number), Over based Synthetic Calcium Sulfonate.
CHEMPOL 5555	PPD - Pour Point Depressant, PMA
CHEMPOL 5065	Ash less Rust & Corrosion Inhibitor For Turbine, Compressor & Hydraulic Fluids
CHEMPOL 5800	Non Silicone Antifoam
CHEMPOL 5177	Antifoam, Silicon Fluid (Concentrated)
ATF, Gear, Hydraulic, 2T & Marine Oil Additive Packages	
CHEMPOL 4146/4204	DEXRON II, III, MERCON, Alison C-4, CAT TO -2, HF-0 & For Other ATF Fluids
CHEMPOL 4343	API GL-5,GL-4 & EP Gear Oil Additive Package
CHEMPOL 5022	Anti-wear - Hydraulic & Compressor Oil Additive Package
CHEMPOL 5025	API TC, JASO FC,Two Stroke Additive Package
CHEMPOL 9424M/9012M/9018M	Marine Four Stroke, Marine Diesel Cylinder, Two Package Marine Oil Additive Package
Speciality Additive - Chemicals	
CHEMPOL DOT	Brake Fluid Dot 3, 4 & 5.1
CHEMPOL GLYCOLS	MEG,DEG,TEG,BTG,BDGE & TEA
CHEMPOL DYES	Blue, Yellow, Red, Green & Brown
Grease Additives	
CHEMPOL G - HCO	Hydrogenated Castor Oil
CHEMPOL G - HSA	12 - Hydroxy Stearic Acid
CHEMPOL G- Lithium Hydroxide	Lithium 12-Hydroxystearate (Thickener)
CHEMPOL G - Tallow	Animal Fat
CHEMPOL G - Clays	Bentonite Clays
Synfluid Base Oil	
PAO (PolyAlphaolefin) 2,4,8,65 & 150	
Synthetic Ester Fluids	



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VISCOSITY INDEX IMPROVER

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CHEMPOL P30 *OCP Viscosity Index Improver*

Description

A solid highly stable pellet form olefin co-polymer (OCP) with narrow molecular weight distribution, intended for use as a viscosity index improver (VII) and viscosity modifier/thickener in mineral oil based automotive crank case lubricants and industrial lubricants. Its excellent low temperature properties and high thickening power make it suitable for a wide range of applications.

Typical Physical Properties

PROPERTY	VALUE*	RANGE	METHOD
Appearance	White pellets	N/A	-
Density	0.86	0.85-0.87	ASTM D1505
K. Viscosity 10% SN150/100°C (cSt)	2363	+/- 300	ASTM D445
Pour Point 1% SN150 + 0.3% PPD21(C)	-33	>-30**	ASTM 97
Shear Stability Index (SSI)	43	40-50	ASTM D6002
Ash Content (%)	<0.1	0.01-0.10	ASTM D1416
Volatiles (%)	<0.1	0.01-0.10	ASTM D1416

*Typical values do not constitute a sales specification.

** Depending upon base oil. Quoted values in Middle East Group 1

Dissolving

Polymers should be dissolved under high agitation in oil at 100 °C - 120°C for 3-6 hours until all solids have been dissolved. Treat rates of 6 -10% will be required depending upon viscosity grade required and base oil used. Use with suitable PPD. Consult CHEMPOL technical department for specific recommendations.

Availability

Available in 25kg bag

Safety, Handling and Storage

Wear suitable dust mask & gloves when handling polymers. Avoid storing pellet type polymers >30°C for prolonged periods, avoid direct sunlight.



CHEMPOL P20 *Viscosity Index Improver*

Description

A solid, pellet form, highly stable olefin co-polymer with narrow molecular weight distribution, intended for use as viscosity index improver (VII) in mineral oil based automotive crank case lubricants.

Typical Physical Properties

PROPERTY	VALUE	METHOD
Appearance	White pellets	-
Density	0.862	ASTM D1505
Polymer Type	Semi-crystalline	-
K. Viscosity 10% SN150/100C (cSt)	2655	ASTM D445
Pour Point 1% SN150 + 0.3% PPD21(C)	-12	ASTM 97
Shear Stability Index (SSI)	35	ASTM D6002
Ash Content (%)	<0.1	ASTM D1416
Volatiles (%)	<0.1	ASTM D1416

Dissolving

Polymers should be dissolved under high agitation in oil at 100-120deg C for 3 – 6 hours until all solids have been dissolved. Treat rates of 4-10% will be required depending upon viscosity grade required and base oil used. Use with suitable PPD. Consult CHEMPOL technical department for specific recommendations.

Availability

Available in 25kg bag, 500kg & 1,000kg Jumbo Bag.

Safety, Handling and Storage

Wear suitable dust mask and gloves when handling polymers.

Avoid storing pellet type polymers >30 deg C for prolonged periods, avoid direct sunlight.



DUTRAL® OCP 2550 **Ethylene - Propylene Copolymer**

DUTRAL® OCP 2550 is an Ethylene-Propylene polymer produced by suspension polymerisation using a Ziegler-Natta Catalyst. A non-staining antioxidant is added during the production process.

Main Properties	Unit	Typical Value
MFI (190 °C / 2,16 Kg)	g/10 mins	8,3
Volatiles content	% wt	0.2 max
Ash content	% wt	0.4 max
Propylene content	% wt	48
YI	%	16
SSI	%	24 ⁽¹⁾
KV (100 °C)	cSt	10 ⁽¹⁾

(1) 1% wt in SN150

Key Features

DUTRAL® elastomers are characterized by excellent resistance to ageing and weathering, good resistance to both high and low temperatures, good resistance to a large number of chemicals.

DUTRAL® OCP2550 is a very low molecular weight copolymer designed as a viscosity index improver for lubricating oils. It shows a good thickening power, excellent shear stability and superior low temperature behaviour.

Main Applications

Oil viscosity modifier.

Physical Form

Bales wrapped with low melting point, oil dissolvable ethylene vinyl acetate copolymer film, typical bale weight: 20 kg.

Packaging

Cardboard box of 500 kg containing 25 bales wrapped with polyethylene film (1070 x 1270 x h1050 mm).

Storage Conditions

Store in dry and vented areas, avoiding temperatures above 35 °C and direct sunlight.
Shelf life : 36 months.



DUTRAL® OCP 2530 PL

Ethylene - Propylene Copolymer

DUTRAL® OCP2530 PL is an Ethylene-Propylene polymer produced by suspension polymerisation using a Ziegler-Natta Catalyst. A non-staining antioxidant is added during the production process.

Main Properties	Unit	Typical Value
MFI (230 °C / 2,16 Kg)	g/10 mins	8.5
Volatiles content	% wt	0.2 max
Ash content	% wt	0.4 max
Propylene content	% wt	34
YI	%	16
SSI	%	24 ⁽¹⁾
KV (100 °C)	cSt	10.7 ⁽¹⁾

(1) 1% wt in SN150

Key Features

DUTRAL® elastomers are characterized by excellent resistance to ageing and weathering, good resistance to both high and low temperatures, low permanent set values, good resistance to a large number of chemicals.

DUTRAL® OCP 2530 PL is a very low molecular weight copolymer designed as a viscosity-index improver for lubricating oils. It shows an excellent balance between thickening power and shear-stability, combined with a good low temperature behaviour. As other semi-crystalline grades it requires a care in the selection of all the other lubricant components to avoid gelation in cold conditions. Its physical

Main Applications

Oil viscosity modifier.

Physical Form

Not free-flowing pellets in a polyethylene valve bag; typical bag weight: 20 kg.

Packaging

Cardboard packaging of 800 kg containing 40 bags (1000 x 1200 x h2090 mm).

Storage Conditions

Store in dry and vented areas, avoiding temperatures above 30 °C and direct sunlight.
Shelf life : 9 months.



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CHEMPOL 5001 Viscosity Index Improver

Application

CHEMPOL 5001 is a shear stable solid Olefin Co-Polymer (OCP) intended for use as a Viscosity Index Improver (VII) when formulating multigrade crankcase and industrial lubricants. It has good low temperature performance and when combined with the proper pour point depressant gives superior pour point results. It is also available as a liquid polymer. Ask the company for more details.

Typical Characteristics

Property	Method	Values
Density @ 15.6 °C, Kg/m ³	ASTM D 4052	860-865
Color	Visual	White
Physical form	Visual	25 Kg Bale (1)
Viscosity @ 100 °C, cSt	ASTM D 445	12.21 (2)
Viscosity @ 100 °C, cSt	ASTM D 445	800 (3)
Viscosity @ 100 °C, cSt	ASTM D 445	1480 (4)
Ash, wt %	ASTM D 5667	0.10 (MAX)
Shear Stability Index, (SSI)	ASTM D 6278	22 (3)
Volatiles, wt %	ASTM D 5668	1.0 (MAX)

Note:

1. In removable LDPE bag.
2. CHEMPOL 5001 at 1.40 wt % in SN 150 base oil.
3. CHEMPOL 5001 at 10.0 wt % in SN 150 base oil.
4. CHEMPOL 5001 at 12.5 wt% in SN 150 base oil.

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





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CHEMPOL 5026 Viscosity Index Improver (Liquid Form)

Application

CHEMPOL 5026 is a shear-stable amorphous olefin copolymer intended for use as a VI improver when formulating multigrade crankcase and industrial oils. It has good low temperature performance and when combined with the proper pour point depressant gives superior pour point results. It is also available as a solid polymer.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Viscous
ASTM Colour	ASTM D 6045	3.0
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.88
Flash Point COC, °C	ASTM D 92	>200
Viscosity @ 100 °C, cSt	ASTM D 445	420
Blend Viscosity @ 100 °C, cSt	ASTM D 445	8.9
SSI, %	ASTM D 6278	22
Ethylene content, %wt	-	52
Volatiles, %wt	-	1.0
Ash, %wt	-	0.1

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





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ENGINE OIL ADDITIVE PACKAGES

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CHEMPOL 4500

Description

CHEMPOL 4500 is a performance additive package for formulating premium quality diesel engine oils. Used at the recommended treat rate in combination with approved base stocks and viscosity modifiers, CHEMPOL 4500 provides engine oils meeting API CK-4

Performance

Performance Level:	SAE Viscosity Grade:	Mass %:
API CK-4	10W-30, 15W-40	14.5

Typical Inspections

Property:	Value ^(a) :	Unit:	Method ^(b) :
Appearance	Brown, Viscous Liquid		ITM 50-002
Base Number	68	mg KOH/g	ASTM D2896
Density @ 15 C, kg/m ³	961	kg/m ³	ASTM D4052
Density @ 60 F, lb/gal	8.00	lb/USG	ASTM D4052
Flash Point Deg.C	184	°C	ASTM D93
Kinematic Viscosity @ 100 C	183	cSt	ASTM D445
Kinematic Viscosity @ 40 C	4467	cSt	ASTM D445
Magnesium	0.69	%(m)	ASTM D5185
Molybdenum	0.05	%(m)	ASTM D4951
Nitrogen	0.75	%(m)	ASTM D5291
Phosphorus	0.79	%(m)	ASTM D5185
Sulfated Ash	6.9	%(m)	ASTM D874
Sulfur	1.99	%(m)	ASTM D4951
Zinc	0.87	%(m)	ASTM D5185

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.

CHEMPOL 7998A

Diesel Engine Oil Additive

Description

CHEMPOL 7998A additive is a heavy duty diesel package which can be used for blending oils meeting API CD, CF/SF with TBN in excess of 8 mg KOH/g.

Recommended Dosage

Performance Levels	Grades	Mass %
API CD/CF	Multi	4.4
API CD/CF	Mono	4.2
API CF/SF	Multi	4.5
API CF/SF	Mono	4.5
API CC/SC	Mono	1.20

Typical Characteristics

Property	Method	Value
Density @ 15.6 °C, g/ml	ASTM D 4052	1.0
Flash Point (PMCC), °C	ASTM D 93	140
Total Base Number, mg KOH/g	ASTM D 2896	190
Viscosity @ 100 °C, cSt	ASTM D 445	60-85
Calcium, %wt	ASTM D 5185	7.24
Zinc, %wt	ASTM D 5185	2.50
Phosphorus, %wt	ASTM D 5185	2.03

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



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CHEMPOL 7235

Heavy-Duty Diesel Engine Oil Additive

Application

CHEMPOL 7235 meets or exceeds the requirements of API CJ-4/CI-4+/CI-4/CF/SM, ACEA E7, Cummins 20081, Mack EO-O Premium Plus 07, Caterpillar ECF-3, DDC PGOS93K218, Volvo VDS-4, Navistar, DHD-1, and JASO DH-2 when formulated as an SAE 15W-40 engine oil, using an appropriate non-dispersed viscosity modifier and qualifying Group II base oils. Contact a Chempol representative for a list of all applicable industry & OEM claims and base oils coverage.

VI Improver:

CHEMPOL 7235 is formulated for use with a non-dispersed OCP Viscosity modifier with a corresponding shear stability of 23 SSI to 35 SSI.

Recommended Dosage:

13.9 wt% (12.4 vol%) is the recommended treat rate.

Typical Characteristics:

Property	Method	Value
Specific Gravity @ 15.6°C, g/ml	ASTM D4052	0.9726
Flash (COC), °C	ASTM D92	185 min.
Viscosity @ 40 °C, cSt	ASTM D445	3,450
Viscosity @ 100 °C, cSt	ASTM D445	187
Calcium, wt%	ASTM D5185	0.93
Phosphorus, wt%	ASTM D5185	0.79
Zinc, wt%	ASTM D5185	0.88
Nitrogen, wt%	ASTM D5291	0.90
Molybdenum, wt%	ASTM D5185	0.06
Baron, wt%	ASTM D5185	0.33
Magnesium, wt%	ASTM D5185	0.28
Sulfur, wt%	ASTM D4294	2.15
Sulfated Ash, wt%	ASTM D874	6.00
TBN, mg KOH/ g	ASTM D2896	53



Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



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CHEMPOL 7424

Diesel Engine Oil Additive Package

Application

CHEMPOL 7424 is a performance additive package for formulating premium and super premium quality diesel engine oils. It has been developed to meet North American and European OEM specifications as well as API CI-4 and ACEA E3/5 specifications. Lubricants formulated with CHEMPOL 7424 can also be used in passenger car engines requiring API SL or ACEA A3/B3/B4 category products. Development of CHEMPOL 7424 was conducted according to the principles of the ACC and ATC codes of practice. Claims are base stock and viscosity grade specific.

Recommended Dosage

Performance level	SAE Viscosity Grade (1)	Mass %
API CI-4/CH-4/CG-4/CF-4/CF/SL	10w30, 15w40	13.8
API SL/CF/CF-2	30, 40	13.8
API CF/CF-2	30, 40	10.5
ACEA E3-96#4/E5-02	15w40	13.8
ACEA A3-02/B3-98#/B4-02	10w30, 15w40	13.8

(1) Also more limited claims in SAE 10w, 20w, 20w40 and 20w50.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Brown Viscous
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.955
Viscosity @ 100 °C, cSt	ASTM D 445	140
Total Base Number, mgKOH/g	ASTM D 2896	70
Calcium, wt%	ASTM D 5185	1.64
Zinc, wt%	ASTM D 5185	0.99
Phosphorus, wt%	ASTM D 5185	0.90
Magnesium, wt%	ASTM D 5185	0.20
Flash Point (PMCC), °C	ASTM D 93	190



Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL 7980A Heavy- Duty Diesel Engine Oil Additive

Application

CHEMPOL 7980A, a functional additive package fully proved by bench tests is prepared from advanced additive components and formula technology. It is a quality Additive Package for blending high grade oil, and it is qualified and well received by many engine manufacturers.

Features

The test data of oil formulated by adding appropriated dosage of Chempol 7980A into group II/III base oil has met the requirements of API CI-4/SL. The test is made according to the API base oil interchange rule, which can meet the requirements of SAE 15W40, 10W30 and 10W40.

Recommended Dosage

Performance Level	SAE Viscosity Grades	Mass %
API CI-4/SL	15W40,10W30,10W40	13.0
API CH-4/SJ	15W40,10W30,10W40	13.0

Typical Characteristics

Property	Method	Value
Density@15 °C, Kg/m ³	ASTM D4052	971
Flash Point (COC), °C	ASTM D92	165
Viscosity 100 °C, cSt	ASTM D445	125
Calcium content, Mass %	ASTM D5185	2.24
Nitrogen content, Mass %	ASTM D5291	0.66
Phosphorus content, Mass %	ASTM D5185	0.88
Zinc content, Mass %	ASTM D5185	0.98
Sulphated Ash, Mass %	ASTM D874	9.10
Total base number, mg KOH/g	ASTM D2896	71

Storage, Handling & Toxicity

Recommended maximum blending temperature 70 °C.

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL 7182 Diesel Engine Oil Additive

Application

CHEMPOL 7182 additive is an economic diesel engine oil package developed to meet a range of specific market requirements. This additive can be used to blend API CF-4/SG performance oils.

Recommended Dosage

The recommended dosage of for CHEMPOL 7182 additive is 9.0 %.

- API CF-4/CF/SJ
- MB 228.0/1 package approval
- ACEA E2-96 Issue 3
- MAN 270/1
- MTU Oil Type 1
- Volvo VDS
- Allisson C4

Features

- Licensable API Claim and formal Mercedes Benz approval, supported by complete engine test data.
- Utilizes a core technology approach which allows full rationalism to other performance levels.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Amber Oily Liquid
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.990
Flash Point (PMCC), °C	ASTM D 93	168
Viscosity @ 100 °C, cSt	ASTM D 445	137
Calcium, %wt	ASTM D 5185	2.90
Zinc, %wt	ASTM D 5185	1.33
Phosphorus, %wt	ASTM D 5185	1.20
Total Base Number, mg KOH/g	ASTM D 2896	92

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.

CHEMPOL 7601

Tractor Oil Additive

Application

CHEMPOL 7601 additive is a rationalized additive system for the formulation of STOUS meeting the requirements of all tractors.

Recommended Dosage

The recommended dosage for CHEMPOL 7601 additive is 13.0 %wt to meet all of the latest tractor requirements. At 11.5 %wt, CHEMPOL 7601 additive can be used to provide an economic STOUS meeting the basic needs of the market.

Features

- Wear and Friction control suitable for all transmissions, including power shift transmissions covered by Ford 134-D
- Diesel engine performance up to and including API CF-4
- Gear protection for hypoid axles, which have completed break-in.

Typical Characteristics

Property	Method	Value
Density @ 15.6 °C, g/ml	ASTM D 4052	9.8
Flash Point (PMCC) C°	ASTM D 93	165
Total Base Number, mg KOH/g	ASTM D 2896	85
Viscosity 100 C°, cSt	ASTM D 445	78
Calcium, %wt	ASTM D 5185	2.74
Zinc, %wt	ASTM D 5185	1.10
Phosphorus, %wt	ASTM D 5185	1.12

Packing & Storage

The packing marking transportation, storage and delivery acceptance should meet requirements of environmental rules & regulations. It is packed in 200ltr metal drums. Store in dry clean and ventilated warehouse.

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



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CHEMPOL 50025

Description

CHEMPOL 50025 is a fully formulated passenger car additive package which has been designed and optimized to meet API SN and CF performance claims in Group III base stocks with approved viscosity modifiers.

Performance

Performance Level:	SAE Viscosity Grade:	Mass %:
API SN	5W-20, 5W-30, 5W-40, 10W-30	7.6
API CF	5W-20, 5W-30	7.6

Typical Inspections

Property:	Value ^(a) :	Unit:	Method ^(b) :
Appearance	Brown liquid		ITM 50-022
Base Number	89	mg KOH/g	ASTM D2896
Calcium	2.44	%(m)	ASTM D5185
Density @ 15 C, kg/m ³	982	kg/m ³	ASTM D4052
Flash Point Deg C	180	°C	ASTM D93
Kinematic Viscosity @ 100 C	134	cSt	ASTM D445
Kinematic Viscosity @ 40 C	3084	cSt	ASTM D445
Molybdenum	0.11	%(m)	ASTM D5185
Nitrogen	0.85	%(m)	ASTM D5291
Phosphorus	1.01	%(m)	ASTM D5185
Zinc	1.11	%(m)	ASTM D5185

(a) Not a specification, (b) Methods typically used by CHEMPOL manufacturing plants

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



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CHEMPOL 6377

Passenger Car Additive Package

Application

CHEMPOL 6377 is a fully formulated passenger car additive package which has been designed and optimised to meet API SM performance claims in Group III SK base stocks with approved viscosity modifiers.

Recommended Dosage

Performance Level	SAE Grade	Dosage, Wt%
API SM	5W-20, 5W-30, 10W-30, 5W-40, 5W-50	7.6%

Typical Characteristics

Property	Method	Value
Density at 15°C, kg/m ³	ASTM D 4052	982
Flash Point (PMCC), °C	ASTM D 93	180
Viscosity at 40°C, cSt	ASTM D 445	3084
Calcium Content, mass %	ASTM D 5185	2.44
Molybdenum Content, mass %	ASTM D 5185	0.11
Nitrogen Content, mass %	ASTM D 5291	0.85
Phosphorus Content, mass %	ASTM D 5185	1.01
Viscosity at 100°C, cSt	ASTM D 445	134
Zinc Content, mass %	ASTM D 5185	1.11
Total Base Number, mg KOH/g	ASTM D 2896	89
Appearance	Visual	Brown Liquid

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



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Chempol 6325G

Passenger Car Motor Oil

Application

Chempol 6325G is a new addition to the Chempol Family of additive Packages for the efficient formulation of passenger car, light duty diesel & 4-stroke motorcycle engine oils. Chempol 6325G is specifically design to provide basic API performance claims for a booster package. Chempol 6325G is design to complement the existing Chempol economic product family with abroad base oil coverage including severe market stocks of the Middle East and Asia Pacific regions. Further flexibility is afforded with Chempol 6325G having demonstrated JASO MA and JASO MB clutch friction of 4 stroke motorcycle performance.

Recommended Dosage

Chempol 6325G additive covers the following API and JASO 4T clutch Friction performance levels:

Typical Characteristics:

Performance Level	Multigrade, %wt		
	Chempol 6325G	Chempol5716	Chempol5656
API SL/CF/CF-4/JASO MA	6.8	-	-
API SL/CF/ JASO MB*	6.8	0.8	-
API SJ/CF/ JASO MA	5.45	-	-
API SJ/CF/ JASO MB*	5.45	0.65	-
API SG/CD	4.9	-	-
API SG/ JASO MA	4.9	-	0.1

Typical Characteristic

Appearance Dark	Brown Slightly Hazy Liquid
Density @ 15°C, g/ml	0.998
Viscosity @ 100°C, mm ² /s	130
Flash Point (PMCC), °C	150 min.
Calcium, % weight	3.41
Zinc, % weight	1.62
Phosphorus, % weight	1.47
Total Base Number, mgKOH/g	112
Molybdenum % weight	0.16

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 6225

Passanger Car Engine Oil Additive

Description

CHEMPOL 6225 additive is a passenger car engine oil package that utilizes a core technology, which allows full rationalization to the more classical API performance specifications.

Recommended Dosage

CHEMPOL 6225 additive has been developed to give efficient and economical treat rates to permit the manufacture of oils ranging in quality levels from API SF/CF to SB/CB.

API Performance Levels	Monograde % wt	Multigrade % wt
SF/CF	4.7+1.6%wt CHEMPOL 1530	4.9+1.8%wt CHEMPOL 1530
SF/CD	4.7	4.7
SF/CC	4.7	4.7
SE/CD	4.3	4.5
SE/CC	4.0	4.3
SD/CC	3.5	3.8
SC/CC	3.0	3.3
SB/CB	2.0	2.2

Typical Characteristics

Property	Test Method	Values
Appearance	Visual	Dark Brown Viscous Liquid
Specific gravity @15.6 °C, g/ml	ASTM D 4052	1.02
Flash Point (PMCC), °C	ASTM D 93	140
Viscosity @100 °C, cSt	ASTM D 445	120
Total Base Number, mg KOH/g	ASTM D 2896	116
Calcium, %wt	ASTM D 5185	3.8
Zinc, %wt	ASTM D 5185	2.07
Phosphorus, %wt	ASTM D 5185	1.88

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5210 Ashless Dispersant Additive

Description

CHEMPOL 5210 has high temperature detergency and low temperature dispersing capability. Compared to common dispersing agents, it has better low and high temperature dispersing capability and, it is free of chlorine, which meets the demands of environment. Widely used in gasoline, diesel and gas engine oils.

Recommendation

The recommended dosage is 1-5% by weight depending on the application.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Reddish Brown transparen viscous liquid
Kinematic Viscosity@100°C, cSt	ASTM D 445	250
Total Base Number, mg KOH/g	ASTM D 2896	25
Nitrogen Content , % wt	ASTM D 5291	1.8
Flash Point (COC), °C	ASTM D 92	>180

CHEMPOL 5395 Antioxidant

Description

CHEMPOL 5395 additive is prepared from butyl octyl thiophosphoric acid. It provides the lubricant with fine anti-oxidant/corrosion, antiwear, thermostability, and certain extreme pressure performance.

Recommendation

The dosage of CHEMPOL 5395 will vary with application and base stock quality.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Clear Amber Liquid
Specific gravity @15.6 °C, g/ml	ASTM D 4052	1.06 to 1.15
Flash Point, COC, °C	ASTM D 92	206
Viscosity @ 100 °C, cSt	ASTM D 445	23.2
Zinc, %wt	ASTM D 5185	8.0 to 10
Phosphorus, %wt	ASTM D 5185	6.0 to 8.5

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5103

Water Soluble Cutting Fluid Additive Multi-Purpose Emulsifier Base for Soluble Oils Nitrite Free

Application

CHEMPOL 5103 has been formulated to meet the requirements for the preparation of soluble oils from paraffinic and naphthenic base oils, which will give stable milky emulsions in all types of water. It is also suitable as the base for the preparation of translucent semi-synthetic micro-emulsions and also heavy-duty EP emulsions.

It is a blend of emulsifying agents, wetting agents, and rust inhibitors, together with solvent refined mineral oils. It also contains biocides and fungicide additives to give the finished soluble oils and long service life, prevent emulsion breakdown and spoilage.

It is an extremely versatile product for medium-cutting operations, provides all the lubrication and cooling properties necessary to ensure good work piece finish, and extended tool life. It is suitable on ferrous and non-ferrous metals in turning, milling, drilling, tapping, threading and cold sawing operations.

Typical Characteristics

Property	Method	Value
ASTM Colour	ASTM D 1500	Brown
Specific gravity @ 20 °C, g/ml	ASTM D 4052	0.98
Total Acid Number, mg KOH/g	ASTM D 664	38

For improved emulsion stability the concentrate can be adjusted for the base oil used by addition of more acid (Olein, Tall oil Distillate) or by more alkali (Triethanolamine, Potassium Hydroxide).

Soluble oil formulations based on CHEMPOL 5103:

Typical opaque soluble oil formulations

A treat rate of 15-20 % wt in paraffinic base oils yields a concentrate, which forms stable emulsions (5%) in medium hard water. The pH-value of a 5% emulsion is between 8.5-8.8. The addition of biocide is recommended.

• Suggested minimum treatment levels of CHEMPOL 5103 in base oil:

150 SUS Paraffinic Oil;	from 15 % w/w
100 SUS Paraffinic Oil;	from 17 % w/w
100 SUS Naphthenic Oil;	from 15 % w/w

Emulsion Characteristics

Stability of 5 % emulsion	stable milky
PH of 5 % emulsion	8.7
Corrosion test IP.287	20:1 Pass

• Semi-synthetic formulation

CHEMPOL 5103	50% w/w
100 SUS Naphthenic oil	48% w/w
Triethanolamine	2% w/w

Emulsion Characteristics

Appearance	Transparent
Corrosion test IP.287	50:1 Pass

• EP Soluble oil formulation

CHEMPOL 5103	40% w/w
100 SUS Naphthenic oil	50% w/w
Chlorinated paraffin	10% w/w

Emulsion Characteristics

Corrosion test IP.287	20:1 Pass
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Note: for improved emulsion stability in these formulations the concentrate can be adjusted for the individual base oil used by addition of more acid (eg. Distilled Tall Oil) or by more alkali (eg. Potassium Hydroxide). Supplementary biocides are customarily added to the finished product.

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5800

Non-Silicon Type Foam Inhibitor for use in Automotive & Industrial Lubricants

Description

CHEMPOL 5800 is recommended for use at 50 to 1,000 ppm to impart characteristics to blended lubricants.

Features

- Good solubility characteristics
- Improved foam inhibitor as measured by ASTM 892 foam test
- High flash point

Typical Characteristics

Property	Method	Value
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.960
Flash Point (PMCC), °C	ASTM D 93	120
Viscosity @ 100 °C, cSt	ASTM D 445	48.0
Viscosity @ 40 °C, cSt	ASTM D 445	475.0
Pour Point, °C	ASTM D 97	-23

CHEMPOL 5540

Base Number Booster

Description

CHEMPOL 5540 is a calcium sulphonate Base Number booster designed for use in lubricants. Nominal dosages would range from 0.5 to 5.0 %wt of the finished lubricant. Other applications include automotive, diesel, marine, railroad and stationary diesel lubricants. The use of CHEMPOL 5540 is recommended for lubricants where high alkalinity is desired to neutralize the acidic fuel combustion by products.

Typical Characteristics

Property	Method	Value
Specific Gravity @ 15.6 °C, g/ml	ASTM D 4052	1.2
Flash Point, COC, °C	ASTM D 92	208
Kinematic Viscosity @100 °C, cSt	ASTM D 445	81
Total Base Number, mgKOH/g	ASTM D 2896	401
Calcium, %wt	ASTM D 5185	15.30

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5555 Pour Point Depressants

Application

Shear-Stable Pour Point Depressants for use in engine oils, hydraulic fluids and gear oils.

Recommended Dosage

Advanced technology tailored to provide robust low-temperature solutions across a broad range of lubricants. Particularly effective in formulations using catalytically dewaxed base stocks and higher ethylene content OCP viscosity modifiers. Conventional pour point depressants particularly effective in lubricants formulated with solvent-refined base stocks.

Typical addition rates are 0.1 % wt to 0.3 % by wt. Higher treat rates – for example, 0.5 % wt to 1.0 % by wt – may be required for SAE 80W-90 gear oils.

Composition

CHEMPOL 5555 is a viscous concentrate to polyalkyl methacrylate in highly refined neutral oil.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Viscous & clear
ASTM Colour	ASTM D 6045	1.0
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.92
Flash Point (PMCC), °C	ASTM D 93	150
Viscosity @ 100 °C, cSt	ASTM D 445	390

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5065 Ashless Rust & Oxidation Inhibitor

Application

CHEMPOL 5065 ashless rust and oxidation (R & O) inhibitor is fully formulated for high – performance, turbine – quality R & O hydraulic fluids. It provides extended oxidation life and is compatible with other additives commonly used in hydraulic fluids. It also provides excellent rust control, demulsibility and filterability. These features all add up to longer fluid life and reduced system maintenance.

Recommended Dosage

At a dosage of 0.80 % wt (0.75 % Volume) in suitable base stocks the CHEMPOL 5065 R & O inhibitor meets the following requirements:

- Cincinnati Milacron P-38, P-55 and P-57
- General Electric GEK-32568
- Solar Turbines ES9-224
- U.S Military MIL-H-17672 D
- DIN 51524, Part 1
- Hagglunds-Denison HF-1
- Hagglunds-Denison HF-0 Bench Tests

Features

- Excellent rust control.
- Extended oxidation life.
- Anti – corrosion.
- Water tolerance.
- Resistance to sludge formation.
- Filterability.
- Compatible with a wide range of industrial fluids.
- Good air entrainment properties (does not contain foam inhibitor).

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark Brown Viscous Liquid
Specific gravity @15.6 °C, g/ml	ASTM D 4052	0.98
Flash point, PMCC, °C	ASTM D 93	95
Nitrogen, %wt	ASTM D 5291	2.31

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5177 Silicon Base Antifoam Inhibitor

Description

CHEMPOL 5177, Silicon base antifoam inhibitor is prepared from Dimethylpolysiloxane polymers with linear chains. It can be used as Foam Inhibitor for motor oil formulations.

Features

- Excellent thermal stability
- Good resistance to combustion
- Good dielectric properties
- Low freezing point
- High compressibility
- Good oxidation resistance
- Absence of ageing under exposure to weather conditions
- Low variation of viscosity with temperature
- Good shear resistance
- Non-miscible with most of organic materials
- Soluble in aromatic, aliphatic and chlorinated solvents
- Insoluble in water and alcohols

Recommended Dosage

The recommended dosage is 30 to 50 ppm.

Prepare a master batch as follows:

Dodecylbenzene (Kerosene) 99.9 %wt
CHEMPOL 5177 0.1 %wt

The treat level range is between 0.030 to 0.050 %wt of the above master batch and depends on the quality of base oil being used.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Bright Clear liquids
Specific gravity @ 25 °C, g/ml	ASTM D 4052	0.973
Flash Point, [COC], °C	ASTM D 92	>300
Viscosity @ 25 °C, cSt	ASTM D 445	12500
Fire point, °C	ASTM D 92	>350
Pour Point, °C	ASTM D 97	-45
Refractive index @ 25 °C	-	1.404

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

ATF, GEAR , HYDRAULIC, 2T & MARINE OIL ADDITIVE PACKAGES

www.chempol.co.uk



CHEMPOL 4146 **Automotive Transmission Fluid Additive**

Application

CHEMPOL 4146 is a complete additive package used for formulating top quality ATF oils. CHEMPOL 4146 additive has been specifically designed to formulate oils to gain approvals against General Motors DEXRON III® and Ford's MERCON® specifications in solvent refined Middle East base stocks.

Recommended Dosage

The recommended dosage for CHEMPOL 4146 additive is 13 %wt with suitable low viscosity base stocks to give the viscometrics and overall performance required for ATF application.

Features

Oils containing CHEMPOL 4146 additive at 13 %wt are designed for use in applications previously satisfied by DEXRON III® and MERCON® specifications which allowed Brookfield values up to 20,000 cP max at -40 °C. Additional performance requirements which can be achieved include:

- Allison C - 4
- Caterpillar TO - 2
- Hugglunds Denison HF - 0

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark Brown Viscous Liquid
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.92
Flash point, PMCC, °C	ASTM D 93	220
Viscosity @ 100 °C, cSt	ASTM D 445	150
Boron, %wt	ASTM D 5185	0.07
Phosphorous, %wt	ASTM D 5185	0.15
Sulphur, %wt	ASTM D 5185	0.55

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL 4204

Automatic Transmission Fluid Additive

Application

CHEMPOL 4204 is a complete additive package used for formulating top quality ATF oils. CHEMPOL 4204 additive has been specifically designed to formulate oils to gain approvals against General Motors DEXRON IID® and Ford's MERCON® specifications in solvent refined Middle East base stocks.

Recommended Dosage

The recommended dosage for CHEMPOL 4204 additive is 10.2% wt with suitable low viscosity base stocks to give the viscometrics and overall performance required for ATF application.

Features

Oils containing CHEMPOL 4204 additive at 10.2% wt are designed for use in applications previously satisfied by DEXRON IID® and MERCON® specifications which allowed Brookfield values up to 50,000 cP max at -40 °C. Additional performance requirements which can be achieved include:

- Allison C - 4
- Caterpillar TO - 2
- Hagglands Denison HF - 0

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark Brown Viscous Liquid
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	0.92
Flash point, PMCC, °C	ASTM D 93	125
Viscosity @ 100 °C, cSt	ASTM D 445	185
Baron, %wt	ASTM D 5185	0.13
Phosphorous, %wt	ASTM D 5185	0.28
Sulphur, %wt	ASTM D 5185	0.69

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 4343 **Gear Oil Additive**

Application

CHEMPOL 4343 is a premium grade, non-chlorine, extreme pressure additive system for automotive gear oils. At the recommended treat rate of 4.2 %wt in suitable base stocks, it produces finished gear lubricants meeting API GL-5 service classifications.

At the lower treat rate of 2.1 %wt it will produce finished gear lubricants of a quality suitable for API service classification GL-4.

Typical Characteristics

Property	Method	Value
Specific gravity @15.6 °C, g/ml	ASTM D 4052	1.010
Flash point, PMCC, °C	ASTM D 93	100
Viscosity @ 100 °C, cSt	ASTM D 445	12.7
Sulphur, wt%	ASTM D 5185	26.5
Phosphorus, wt%	ASTM D 5185	1.3

Performance level	SAE Viscosity Grade	Mass %
API GL-5	90 w 140, 80 w 90, 85 w 140	3.8 – 4.2
API GL-4	90 w 140	2.0 – 2.1

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5022 Antiwear Hydraulic Additive Package

Application

CHEMPOL 5022 additive is designed for the formulation of hydraulic oils. In addition to superior wear control, the product imparts rust and oxidation inhibition to the oil. CHEMPOL 5022 additive is a flexible package suitable for both premium quality and economic performance levels through an appropriate choice of dosage.

Recommended Dosage

The recommended dosage for CHEMPOL5022 additive is as follows:

- 0.3 % to 0.5 %wt for minimum antiwear performance in high leakage system.
- 0.6 % to 0.75 %wt for economic hydraulic oil requiring wear and oxidation protection.
- 0.8 % to 1.0 %wt for premium hydraulic oils meeting major National and International Specifications.
- 1.25 %wt to formulate hydraulic oil meeting Rexnord Racine requirements for long drain applications with increased load carrying abilities.

Features

- Outstanding wear protection, as manifested by performance in the 35VQ25 pump exceeding Vickers requirements.
- Good filterability.
- Security and confidence from a product with an extensive history of trouble – free performance worldwide.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Amber Oily Liquid
Specific gravity @15.6 °C	ASTM D 4052	1.06
Flash point (PMCC), °C	ASTM D 93	110
Viscosity @ 40 °C, cSt	ASTM D 445	125
Zinc, %wt	ASTM D 5185	7.25
Phosphorus, %wt	ASTM D 5185	6.30

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 5025 Two - stroke Additive Packages

Application

CHEMPOL 5025 additive is a low ash multifunctional additive for two stroke oils. It has been developed to meet the latest performance requirements including JASO FC, Global GC/GD and Thailand Industrial Standards Institute (T.I.S.I).

Recommended Dosage

- 5.0 %wt for API TC, JASO FC, Global GC and T.I.S.I performance levels.
- 7.5 %wt for the proposed Global GD performance level.

Features

- Strong detergent performance.
- Increased protection from piston seizure, ring sticking, engine deposits and exhaust blocking.
- Ability to be used with a wide variety of base stock systems.
- A rationalized system to cover performance for API TA to Global CD.

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark Brown Viscous Liquid
Specific gravity @15.6 °C, g/ml	ASTM D 4052	0.925
Flash point, PMCC, °C	ASTM D 93	155
Viscosity @ 100 °C, cSt	ASTM D 445	190
Total Base Number, mgKOH/g	ASTM D 2896	41
Calcium, %wt	ASTM D 5185	0.53

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.





CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 9424M Marine Four Stroke Diesel Engine Oil Additive

Application

CHEMPOL 9424M is an additive package suitable to formulate Marine Stationary Four Stroke Diesel Engines operating on Gasoil, Marine and Fuel oil.

Recommended Dosage

CHEMPOL 9424M %wt	CHEMPOL 9012M %wt	Total %wt	TBN	Performance
3.20	-	3.20	5	To formulate System Oil (SO) for crosshead engines with oil-cooled piston. API CC
3.20	0.40	3.60	6	To formulate System Oil (SO) for crosshead engines with oil-cooled piston
3.45	0.60	4.05	7	To formulate System Oil (SO) for crosshead engines with oil-cooled piston
6.30	-	7.90	10	For normally aspirated Marine Diesel Engines. Also suitable to formulate System Oils for crosshead engines with oil cooled pistons. API CD
6.30	0.80	7.10	12	For up-rated Diesel Engines operated on Gasoil or Marine Diesel Oil. API CD.
6.30	3.95	10.25	20	For Diesel Engines operated on Residual Fuel to formulate lubricants of TBN 20
6.30	7.90	14.20	30	For Diesel Engines operated on Residual Fuel to formulate lubricants of TBN 30
6.30	11.80	18.10	40	For Diesel Engines operated on Residual Fuel to formulate lubricants of TBN 40

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark brown viscous liquid
Specific gravity @ 15.6 °C, g/ml	ASTM D 4052	1.02
Flash Point, (PMCC)°C	ASTM D 93	200
Viscosity at 100 °C, cSt	ASTM D 445	60
Total Base Number, mg KOH/g	ASTM D 2896	160
Calcium, %wt	ASTM D 5185	5.95
Zinc, %wt	ASTM D 5185	0.82
Phosphorus, %wt	ASTM D 5185	0.76
Nitrogen, %wt	ASTM D 5291	0.20

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL
ADDITIVES & CHEMICAL SPECIALITY

CHEMPOL 9012M Marine Diesel Cylinder Lubricant Oil Additive

Application

CHEMPOL 9012M has been developed to formulate high quality Marine Diesel Cylinder Lubricants (MDCL) in cross-head engines burning high sulfur residual fuels.

It may be also used as TBN booster to formulate high TBN lubricants for Four Stroke Engines.

Recommended Dosage

Treat rates % wt	Performance
20.0	For 50 TBN oils in suitable basestocks
27.8	For 70 TBN oils in suitable basestocks
31.6	For 80 TBN oils in suitable basestocks
39.5	For 100 TBN oils in suitable basestocks

Typical Characteristics

Property	Method	Value
Appearance	Visual	Dark brown viscous liquid
ASTM Colour	ASTM D 6045	6.8
Specific gravity @15.6 °C, g/ml	ASTM D 4052	1.10
Flash Point, PMCC, ° C	ASTM D 93	190
Viscosity @ 100 °C, cSt	ASTM D 445	100
Total Base Number, mg KOH/g	ASTM D 2896	260
Calcium, %wt	ASTM D 5185	9.2
Zinc, %wt	ASTM D 5185	0.05
Phosphorus, %wt	ASTM D 5185	0.02

Handling/ Precaution

When handling this product a MAXIMUM temperature of 60°C should be observed for storage, unloading and blending. However, it is strongly recommended that for long-term storage the temperature should not exceed 50°C. For detailed data, please refer to the relevant MSDS.



CHEMPOL 9018M Two Package Marine Additive

TPMAS benefits:

A) Only two packages to blend all Marine Lubricants.

- a) CHEMPOL 9424M
- b) CHEMPOL 9012MM

B) Complete line of Marine Engine Lubricants Blended from these two packages

- a) System Oil (SO)
- b) Trunk Piston Engine Oil (TPEO)
- c) Marine Cylinder Lubricants (MCL)

Marine Lubricants Type	SO			TPEO					MCL			
	5	6	7	10	12	20	30	40	50	70	80	100
Total Base Number	5	6	7	10	12	20	30	40	50	70	80	100
Chempol 9424M %wt	3.2	3.2	3.45	6.3	6.3	6.3	6.3	6.3	-	-	-	-
Chempol 9012M %wt	-	0.4	0.6	-	0.8	3.95	7.9	11.8	20	27.8	31.6	39.5
Total %wt	3.2	3.6	4.05	6.3	7.1	10.25	14.2	18.1	20	27.8	31.6	39.5

C) Proven Performance In :

- a) Several Base Stocks
 - Both solvent refined and hydrocracked.
 - Middle East base stocks.
- b) Different Engines Services
 - Power Plants.
 - Vessels, Car carriers, Crude Oil Tankers.
 - Wide range of marine makes and models.

D) Four-Stroke Engines

- TPEO
- a) Lubricates both the cylinder and the crankcase.
- b) Cleaning and cooling down parts, minimize deposit formation, neutralization of acidic by-products, protection against wear...
- c) Total base Number (TBN) from 10 to 40 mg KOH/g.



CHEMPOL
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SPECIALITY CHEMICALS ADDITIVE

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CHEMPOL DOT

(Brake Fluid DOT 3, 4 & 5.1)

DESCRIPTION

CHEMPOL DOT are premium quality, non-silicone, non-mineral/petroleum based, fully synthetic brake fluid designed for use in a wide range of brake and clutch applications. It offers superior dry and wet boiling points and maintains viscosity in cold and hot environments.

APPLICATIONS

Recommended for re-fill or top-up of brake and clutch systems in passenger cars, 4WD's, motorcycles, light and heavy duty commercial vehicles, mining, construction and agricultural equipment that require a non-petroleum based brake & clutch hydraulic fluid.

DOT 5.1 Suitable for use where the vehicle manufacturer specifies either DOT 3, DOT 4, or DOT 5.1 fluids. It is also suitable for use with all types of seals, hoses and other brake and clutch system parts. Low viscosity (at -40C), for faster fluid circulation in micro-valves of ABS systems

DOT 4 Suitable for use where the vehicle manufacturer specifies DOT 3 or DOT 4 brake fluid. Better performance for life of fluid compared to DOT 3 fluids.

DOT 3 Suitable for use where the vehicle manufacturer specifies DOT 3 brake fluid.

NOTE: Intermixing of brake fluids of different grades is not recommended. Intermixing may impact braking performance of some brake systems. This product is not miscible with silicone based brake fluids. This product is not compatible with any mineral or synthetic oil based fluids

Product Benefits

- Excellent braking response due to high boiling point of fluid.
- High wet boiling point ensures long term retention of fluid performance.
- Better performance for life of fluid.
- Compatible with all common brake system materials
- Borate esters to scavenge water and maintain ERBP as the fluid ages
- Anti-corrosion properties: complete brake system protection.
- Elastomer compatibility: no leakage or fluid losses.

Recommendations / Specifications

DOT 5.1 - FMVSS 116 DOT 5.1, DOT 4 and DOT 3, SAE J1703/ J1704, ISO 4925 (Class 5.1, 4 & 3)

DOT 4 - FMVSS, No. 116, DOT 4 and DOT 3, SAE J1703/J1704, ISO 4925 Class 4&3

DOT 3 - FMVSS No 116 DOT 3, SAE J1703, ISO 4925 Class 3, AS 1960-2005 Grade 1

Meets the quality requirements of European Manufacturers

Specification / Characteristics

	DOT 5.1	DOT 4	DOT 3
Density at 20°C, g/ML, ASTM	1.069	1.040	1.031
Kinematic Viscosity at -40°C, mm²/s, ASTM D445	810	1200	1300
Kinematic Viscosity at 100°C, mm²/s, ASTM D445	2.16	2.6	2.4
Dry ERBP (FMVSS No. 116) S.11, °C (min.)	275	263	240
Wet ERBP (FMVSS No. 116) S.12, °C (min.)	187	165	150
pH (FMVSS No. 116) S.14	7.5	8.5	9.0
Boron	-	1.30 mass %	-
Corrosion Test @ 100°C for 120hrs	passes test	passes test	passes test

STORAGE STABILITY

Storage time is up to three years in sealed, metal, bulk containers. Protection should be provided to prevent any moisture contamination. Moisture contamination will result in a 5–10°C boiling point drop for each 0.1% of water absorbed.



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CHEMPOL BLUE DYES

Product Information

Property	Method	Value
Odour	Typical	Aromatic
Appearance	Visual	Dark Blue Liquid
Specific Gravity @15.6 °C, g / ml	ASTM D 4052	0.93 – 0.98
Flash Point (PMCC), °C	ASTM D 93	> 28
Boiling Point, °C	-	> 140
Active Matter, % wt	-	50
Solvents, % wt	-	40

Chemical Properties:

Solvent Chemistry: Xylene / Dimethyl Benzene / Alkyl Benzene

Physical Properties:

Solubility:

- Water - Insoluble
- Benzene - Soluble
- Xylene - Soluble
- Oils - Soluble



CHEMPOL YELLOW DYES

Product Information

Property	Method	Value
Odour	Typical	Aromatic
Appearance	Visual	Dark Yellow Liquid
Specific Gravity @15.6 °C, g / ml	ASTM D 4052	0.991
Flash Point (PMCC), °C	ASTM D 93	63
Insoluble Matter in toluene, % wt	-	0.81
Moisture Content, % wt	ASTM D 6304	0.11

Chemical Properties:

Solvent Chemistry: Xylene / Dimethyl Benzene / Alkyl Benzene

Physical Properties:

Solubility:

- Water - Insoluble
- Benzene - Soluble
- Xylene - Soluble
- Oils - Soluble



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CHEMPOL RED DYES

Product Information

Property	Method	Value
Odour	Typical	Aromatic
Appearance	Visual	Dark Red Liquid
Specific Gravity @15.6 °C, g / ml	ASTM D 4052	0.981
Flash Point (PMCC), °C	ASTM D 93	58
Insoluble Matter in Toluene, % wt	-	0.28
Moisture Content, % wt	ASTM D 6304	0.25

Chemical Properties:

Solvent Chemistry: Xylene / Dimethyl Benzene / Alkyl Benzene

Physical Properties:

Solubility:

- Water - Insoluble
- Benzene - Soluble
- Xylene - Soluble
- Oils - Soluble



CHEMPOL GREEN DYES

Product Information

Property	Method	Value
Odour	Typical	Aromatic
Appearance	Visual	Dark Green Liquid
Specific Gravity @15.6 °C, g / ml	ASTM D 4052	0.986
Flash Point (PMCC), °C	ASTM D 93	63
Insoluble Matter in Toluene, % wt	-	0.34
Moisture Content, % wt	ASTM D 6304	0.11

Chemical Properties:

Solvent Chemistry: Xylene / Dimethyl Benzene / Alkyl Benzene

Physical Properties:

Solubility:

- Water - Insoluble
- Benzene - Soluble
- Xylene - Soluble
- Oils - Soluble



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CHEMPOL BROWN DYES

Product Information

Property	Method	Value
Odour	Typical	Aromatic
Appearance	Visual	Dark Brown Liquid
Specific Gravity @15.6 °C, g / ml	ASTM D 4052	0.93-0.98
Flash Point (PMCC), °C	ASTM D 93	>28
Boiling Point, °C	-	>140
Active Matter, % wt	-	50
Solvents, % wt	-	40

Chemical Properties:

Solvent Chemistry: Xylene / Dimethyl Benzene / Alkyl Benzene

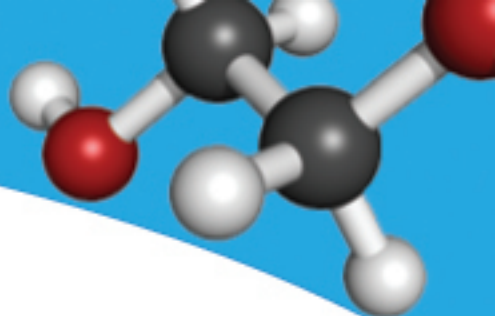
Physical Properties:

Solubility:

- Water - Insoluble
- Benzene - Soluble
- Xylene - Soluble
- Oils - Soluble



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ETHYLENE GLYCOL

Ethylene Glycol is an organic compound which was obtained first in 1860 as a result of reaction of water and ethylene oxide and appeared to have no commercial application before the World War I.

Ourdays it has found its wide application in the production of polyester fibers, polyethylene resins (PET) used in bottling. It has been often used as a component of automotive antifreeze formulations due to its low freezing point. Ethylene Glycols are commonly used in personal care industry. EG has no odor or color. It is a syrupy, sweet-tasting liquid; classified as a moderately toxic substance.

Chempol produces the whole range of Ethylene Glycols including:

- MONOETHYLENE GLYCOL GF
- MONOETHYLENE GLYCOL H
- MONOETHYLENE GLYCOL GI
- MONOETHYLENE GLYCOL GC107-21-1
- DIETHYLENE GLYCOL
- TRIETHYLENE GLYCOL

INFORMATIVE PROPERTIES

	MEG GF	MEG H	MEG GI	MEG GC	DEG	TEG
Appearance @ 25°C	liquid	liquid	liquid	liquid	liquid	liquid
Purity, %wt.	99.9	99.9	99.5	99.9	99.5	98.5
Pt-Co Color @ 25 ° C	5 max.	5 max.	10 max.	10 max.	15 max.	50 max.
Suspended solids	Substantially Free	Substantially Free	Substantially Free	Substantially Free	Substantially Free	Substantially Free
Density, 20/20°C	1.1153 to 1.1156	1.1151 to 1.1156	1.1151 to 1.1156	1.1151 to 1.1156	1.117 to 1.120	1.124 to 1.126
Water (%wt.)	0.04 Max.	0.06 Max.	0.3 max.	0.1 max.	0.1 max.	0.1 max.
Acidity as acetic acid (ppm)	20 Max.	20 Max.	150 Max.	-	50 Max.	100 Max.
Aldehydes as acetaldehyde (ppm)	8 Max.	8 Max.	50 Max.	-	-	-
Iron (ppm)	0.1 Max.	0.1 Max.	-	0.1 Max.	-	-
Ash (ppm)	10 Max.	-	50 Max.	-	50 Max.	50 Max.
pH @ 25°C and in aqueous solution 25% wt	6.5 to 7.5	6.5 to 7.5	6.5 to 7.5	6.5 to 7.5	-	-
Flash Point (COC), °C	115.5	115.5	115.5	115.5	143.3	165.5
Freezing Point °C	-15.6	-15.6	-15.6	-15.6	-10.5	-7.2

APPLICATION

MONOETHYLENE GLYCOL

DIETHYLENE GLYCOL

TRIETHYLENE GLYCOL

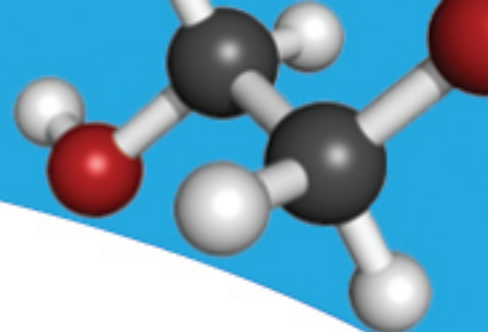
Industrial refrigeration, personal care products, PET industries
Paint & Varnishes industries, Anti freeze coolant
Fibers, films and polyester resins production
Auxiliary additive in cement production
Used in brake fluid formulations
Used as a synthesis intermediates emulsifier and plasticizer for polymers

Handling and Storage

EGs have low volatility at room temperature, so the risks of poisoning by inhalation of its vapors are minimal. Prolonged or repeated contact with skin and eyes should be avoided. During handling, it is advisable to wear gloves, PVC apron and safety glasses.



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TRIETHANOLAMINE

Triethanolamine is an organic compound derived from ammonia. It has a low volatility, it is hygroscopic and appears in liquid and solid forms.

TEA 85.0%

Characteristic	Test Method	Unit	Value
PURITY	MA – 503 (GC)	[WT%]	85 MIN.
SP. GR (20/20 °C)	ASTM D -891	-	1.122 - 1.130
WATER	ASTM D -1364	[WT%]	0.2 MAX.
MEA	GC	[WT%]	0.5 MAX.
DEA	GC	[WT%]	15.0 MAX.
COLOR Pt-Co	ASTM D -1209	-	50 MAX.

TEA 99.0%

Characteristic	Test Method	Unit	Value
PURITY	MA – 503 (GC)	[WT%]	99 MIN.
SP. GR (20/20 °C)	ASTM D -891	-	1.124 - 1.127
WATER	ASTM D -1364	[WT%]	0.2 MAX.
COLOR Pt-Co	ASTM D -1209	-	75 MAX.

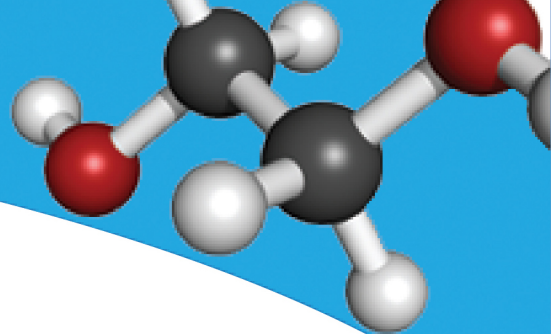
APPLICATION

Triethanolamine is used as :

- a component in detergent production for multiple degreasers, disinfectants, etc
- a neutralizer agent in car wash shampoos, degreasing non-corrosive detergents, many purpose cleaners
- an alkalizing agent to increase PH level and neutralize Carbomer to thicken gel in cosmetic industry
- In agrochemical industry as a neutralizer agent for natural gas treatment to facilitate carbon dioxide absorption
- auxiliary agent in cement production to accelerate hardening rate



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Butyl Glycol

Butyl glycol is a clear, low-volatility, mobile liquid with a very faint, mild odour. It is miscible with many common solvents, e. g. aliphatic hydrocarbons, alcohols, ketones, aldehydes, ethers, glycols, glycol ethers and water. Butyl glycol may form peroxides, if it comes into contact with atmospheric oxygen

Applications

- A low-volatility solvent component in various paint systems to improve gloss and levelling
- An additive for metal degreasers and floor cleaners etc.
- A co-solvent for printing inks, stamp-pad inks, writing and drawing inks
- Additive for brake fluids. (Note: Butyl glycol can cause seals to swell if added in large amounts)
- An intermediate in the manufacture of plasticizers
- An ingredient for cutting oils

Technical Properties

Parameters	BDGE	BTG
Pt/Co color value, Maxt	10	50
Density @ 20°C (g/cm ³)	0.952- 0.956	0.990 – 0.998
Viscosity @ 20°C (mPa•s)	NA	10-11
Boiling range °C	228-232	265 – 350
Refractive index n _{20D}	1.431-1.433	1.440 – 1.442
Evaporation rate, Approx.	3500	8000
Flash point °C	NA	131
Ignition temperature °C	NA	202
Water %,max	0.1	0.1

Storage & Handling

Butyl glycols should be stored under nitrogen. The storage temperature must not exceed 40°C and moisture are excluded. Under these conditions, a storage stability of minimum 12 months can be expected.



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GREASE ADDITIVES

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CHEMPOL G - HCO

(Hydrogenated Castor Oil)

Hydrogenated Castor Oil (HCO), also called Castor Wax, is a hard, brittle, high melting solid which is tasteless and odorless. It is insoluble in water and solubility in many organic solvents is also very limited. HCO is available as flakes or powder which melts to a clear transparent liquid. It is a non-toxic, non-hazardous material .HCO is used in manufacturing of greases and lubricants.

Specification / Characteristics

Parameters	Typical Value
Apperance	White Flakes/Powder
Colour Gardner	1 to 2
Acid Value % (mgKOH/gm)	1 to 3
Iodine Value gl2 /100g	3 to 4
Hydroxyl Value (mgKOH/gm), Min	157
Saponification Value , Min	178
Melting Point ° C	84 - 88
Unsaponifiable Matter, Max	1.0
Nickel , PPM	3 - 5
12 HSA %	82 - 87
12 Keto Stearic Acid, Max	4
Flash Point ° C , Min	218

CHEMPOL G – 12 HSA

(12 Hydroxy Stearic Acid)

12-Hydroxy Stearic Acid is the mixed fatty acid obtained by hydrolysis of Hydrogenated Castor Oil. It is high melting, brittle, waxy solid at ambient temperatures. It should be stored away from heat to avoid deterioration. It is insoluble in water and it's solubility in many organic solvents is also limited. It is a non-toxic, non-hazardous material. It is used in the manufacturing of greases.

Specification / Characteristics

Parameters	Typical Value
Apperance	Off White Flakes/Powder
Colour Gardner	3 to 7
Acid Value % (mgKOH/gm)	175 - 185
Iodine Value gl2 /100g	3 to 4
Hydroxyl Value (mgKOH/gm), Min	157
Saponification Value , Min	180
Melting Point ° C	72 - 78
Unsaponifiable Matter, Max	1.0
Nickel , PPM	3 - 5
12 HSA %	83 - 87
12 Keto Stearic Acid, Max	4



CHEMPOL G – Lithium Hydroxy (Lithium 12-hydroxystearate)

Lithium 12-hydroxystearate (C₁₈H₃₅LiO₃) is a chemical compound classified as a lithium soap. In chemistry "soap" refers to salts of fatty acids. Lithium 12-hydroxystearate is a white solid. Lithium soaps are key component of many lubricating greases. Lithium 12-hydroxystearate exhibits high oxidation stability and a dropping point up to around 200 °C. Most greases used today in motor vehicles, aircraft, and heavy machinery contain lithium stearates, mainly lithium 12-hydroxystearate. Greases can be made with the addition of several different metallic soaps. Some greases are prepared from sodium, barium, lithium, and calcium soaps. Lithium soap greases are preferred for their water resistance, and their oxidative and mechanical stability. Depending on the grease, they also have good performance at high or low temperatures.

Specification / Characteristics

Parameters	Typical Value
Apperance	White Powder
Melting Point ° C, Min	>200
Molecular Weight, g/Mol	306.41

CHEMPOL G – Clay (Bentonite Clay)

Bentonite Clay/ powder used as a non-soap thickener in manufacturing of greases. Organophilic clay thickeners include the minerals bentonite. These minerals are purified to remove any non-clay material, ground to the desired particle size distribution, and then chemically treated to make the particles organophilic (more compatible with organic chemicals). Bentonite Clay particles are then dispersed in a fluid lubricant to form grease. Clay particles must be activated with a polar material to stabilize the thickener structure. No chemical reaction takes place in the production of clay thickened greases. Clay thickeners have no defined melting point, so they have been used historically in high-temperature greases.

Specification / Characteristics

Parameters	Typical Value
Apperance	Powder
Moisture, % Max	3
Loss On Ignition (LOI) %	28 - 33

CHEMPOL G – Tallow Tallow (Fatty Acid/Animal Fat)

Tallow based product has a wide variety of functions. This product is used as a lubricity additive in greases and lubricants. It works as a humectant, emollient, gelling agent, flotation aid, release aid and is often used as a chemical intermediate and processing aid.

Specification / Characteristics

Parameters	Typical Value
Acid Value (mgKOH/gm)	200 - 208
Iodine Value gI ₂ /100g	40 - 62
Titer ° C	38 - 45
Saponification Value , Min	200
Composition % : C ₈ ,C ₁₀ ,C ₁₂ ,C ₁₄ ,C ₁₆ ,C ₁₈₋₁ ,C ₁₈₋₂ & C ₁₈₋₃	<0.5,<0.5,<1.5,2,25,20,43,5 & 1



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SYNFLUID BASE OIL

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Synfluid® PAOs (PolyAlphaolefin)

(Highly Branched Isoparaffinic PolyAlphaolefin)

Synfluid® PAOs are specially designed chemicals that are uniquely made from alpha olefins. These stable molecules are produced by Steam cracking hydrocarbons to produce ultra-high-purity ethylene, Ethylene oligomerization to develop 1-decene and 1-dodecene & Decene or dodecene oligomerization to form a mixture of dimers, trimers, tetramers and higher oligomers.

Applications

Synfluid® PAOs can be used in many industrial and automotive lubricant applications. These include gear oils, compressor oils, engine oils, hydraulic fluids, greases, and other functional fluids.

Features & Benefits

- Greater oxidative stability
- Superior volatility
- Excellent low-temperature viscosities
- Consistent, quality base stock
- Extremely high viscosity index
- Excellent pour points
- Pure petrochemical feed stocks

Typical Properties

Property	Value				
cSt	2	4	8	65	150
Appearance	C & B	C & B	C & B	C & B	C & B
Color, Pt-Co	0	0	0	0	0
Odor	No Foreign	No Foreign	No Foreign	No Foreign	No Foreign
Specific Gravity, 60°/60°F, 15.6°/15.6°C	0.7981	0.8190	0.8326	0.8460	0.849
Kinematic Viscosity, cSt @ 212 °F, 100°C	1.7	3.9	7.8	65	156
Kinematic Viscosity, cSt @ 104°F, 40°C	5.1	16.8	46.4	605	1719
Kinematic Viscosity, cSt @ -40°F, -40°C	260	2498	19574	-	-
Viscosity Index	-	124	138	181	205
Pour Point, °C	-73	-68	-56	-46	-39
Flash Point (COC), °C	158	226	262	266	278
Bromine Index	<200	<200	<200	<400	<400
Total Acid Number	<0.03	<0.03	<0.03	-	-
Volatility, Noack , wt%	-	13.4	3.5	-	-



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Synfluid® Ester

(Di, Poly & Complex Ester)

Synfluid® Esters are common Group V base oils used in different lubricant formulations to improve the properties of the existing base oil. Ester oils can take more abuse at higher temperatures and will provide superior detergency compared to a PAO synthetic base oil, which in turn increases the hours of use.

Applications

Synfluid® Ester can be used in many industrial and automotive lubricant applications. These include gear oils, compressor oils, engine oils, hydraulic fluids, turbine fluids, greases, chain lubricants, and other functional fluids.

Features & Benefits

- Resistant to thermal breakdown
- Good metal-wetting ability
- High film strength
- Good shear stability
- Superior low-temperature performance, low volatility

Typical Properties

Property	Value				
Synative® ES	2971	2917	3345	TMP 05/68	TMP 05/320
Appearance	C & B	C & B	Clear yellow	Clear yellow	Clear yellow
Specific Gravity, 60°/60°F, 15.6°C	0.909	0.916	0.990	0.918	0.932
Kinematic Viscosity, cSt @ 100°C	5.3	2.5	14.4	13	42
Kinematic Viscosity, cSt @ 40°C	26.7	8.4	112	71	326
Viscosity Index	135	127	155	184	176
Pour Point, °C	-57	-36	-49	-42	-39
Flash Point (COC), °C	236	210	300	>300	>300
Hydroxyl Value, mgKOH/g	<2	<2	<12	<15	<15
Acid Value, mgKOH/g	<0.03	<0.03	<0.05	<2	<1
Volatility, Noack , wt%	7	31	2.0	1.4	<1



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