Technical Data Sheet (TDS)

Centlube LONG LIFE OAT ENGINE COOLANT/ANTIFREEZE (Long Life OAT)

LONG LIFE OAT ENGINE COOLANT/ANTIFREEZE (Long Life OAT) - mixed with the appropriate amount of water – is used as a cooling and heat transferring fluid in combustion engines. Excessive heat is transferred via the fluid to the radiator where the mixture is cooled by means of airflow. Long Life OAT is an ethylene glycol-based fluid that provides maintenance-free protection against freezing and boiling but also against corrosion. Extended coolant life, often for the whole life of the engine or vehicle, is obtained through the use of virtually non-depleting corrosion inhibitors.

THIS PRODUCT IS READY TO USE | DO NOT ADD WATER | 50/50 PRE-MIX | FOR PETROL AND DIESEL ENGINES

Designed to Perform

Benefits

Long Life OAT offers many benefits to the engine designer as well as to the user:

- **Extended life** by synergistic combination
- **Improved heat transfer** leaves more flexibility to engine design
- **Reduces repairs** to thermostat, radiator and water pump
- **Reliability** depletion free and stable inhibitor
- **Improved hard water stability** absence of silicates and phosphates
- **Save time and money** maintenance-free coolant
- **Suitable for mixed fleets** coolant for automotive & heavy-duty application
- **Environmentally friendly** by using carboxylic additive

Based on patented silicate-free aliphatic additive technology, Long Life OAT provides long-life corrosion protection for all engine metals, including aluminum and ferrous alloys. During extensive fleet testing, the synergistic combination of mono- and dicarboxylates present in this coolant, has proven to provide protection for at least 650,000 km (ca. 8,000 hours) in truck & bus application or 250,000 km (ca. 2,000 hours) for passenger cars or 32,000 hours (or 6 years) for stationary engines. It is recommended to change the coolant every five years or at above mileages or operating times, whichever comes first. Long Life OAT provides long-life protection against all forms of corrosion by the use of optimized and patented organic corrosion inhibitors. Excellent and lasting high temperature corrosion protection is provided for the aluminum heat transfer surfaces contained in modern engines. The inhibitor package of Long-Life OAT offers excellent cavitation protection even without using nitrite or nitrite-based supplemental coolant additives (SCA's).

Application

Long Life OAT provides long-life frost and corrosion protection. To ensure good corrosion protection it is recommended to use at least 33 vol. % of Long-Life OAT in the coolant solution. This provides frost protection to -20°C. Typical mixtures in Northern Europe are 50/50, offering frost protection down to - 40°C. Mixtures with more than 70 vol. % Long Life OAT in water are not recommended. The maximum frost protection (about -69°C) is obtained at 68 vol. % Long Life OAT. Long Life OAT may be used with confidence in engines manufactured from cast iron, aluminum or combinations of the two metals, and in cooling systems made of aluminum or copper alloys. Long

Life OAT is particularly recommended for hi-tech engines, where high temperature aluminum protection is important.

Compatibility and mix-ability

Long Life OAT is compatible with most other coolants based on ethylene glycol. Exclusive use of Long-Life OAT is, however, recommended for optimum corrosion protection and sludge control. For optimal performance and controlled quality, we recommend the use of deionized or distilled water to prepare the ready-to-use dilutions. Despite this recommendation, lab testing has shown that acceptable corrosion results are still obtained with water of 20°dH, containing up to 500 ppm chlorides or 500 ppm sulphates.

Approvals by OEMs

Long Life OAT is a rebrand of the original coolant purchased from a major global coolant supplier. The original formulation has been *officially approved* by many engine manufactures, both car and truck manufacturers. Some of these approvals are:

- Ford specification WSS-M97B44-D
- Mercedes-Benz specification 325.3
- General Motors specification GM 6277M
- MAN specification 324 type SNF
- Volkswagen specification TL 774F
- Komatsu KES 07.892.1

The original formulation also *meets the performance requirements* of the following:

- John Deere JDM H5
- Mitsubishi MHI
- Volvo Construction/Volvo Trucks

A complete and up to date list with all approvals is available at the end of this document. Even though some OEMs have not yet given a formal approval, Long Life OAT is suitable for use as coolant/antifreeze in any combustion engine. See the OEM's manual on recommended coolant type.

Typical Physical Characteristics

Property	Temp	Units	Test Methods
Color		Magenta	
Ingredients		Ethylene Glycol and inhibitors	
Flash Point (COC)	°C	ASTM D92	Non-Flammable
Density	@ 20 °C	kg/m3	ASTM 4052	1.113 typical
Ph		8.6 typical	
Odour		Neutral	

These characteristics are typical of current product methods whilst future production will conform to Centlube Lubricants specifications, variations in these physical characteristics may occur.

Fleet tests

Long Life OAT has been extensively fleet tested for over 100,000,000 km! 540 vehicles, both heavy duty and automotive, have been closely monitored and showed:

- limited depletion rates of the corrosion inhibitors: less than 10 %
- superior aluminum protection
- average pump life increased by 50 %
- excellent cavitation protection even without the addition of nitrite
- no compatibility problems with good quality traditional coolants
- no compatibility problems with seals, hoses and plastic components

Storage and requirements

The product should be stored above -20°C and preferably at ambient temperatures. Periods of exposure to temperatures above 35°C should be minimized. Further, it is strongly advised not to expose the coolant in translucent packages to direct sunlight because this can degrade the colour dyes present in the coolant, and result in fading of the colour or discoloration over time. This reaction can be accelerated if coupled with high ambient temperatures. It is therefore advisable to store coolant filled in translucent packages indoors to avoid this issue.

Long Life OAT can be stored for minimum 8 years in unopened containers without any effect on the product quality or performance. It is strongly recommended to use new containers and not recycled ones. As with any antifreeze coolant, the use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation.

Toxicity & Safety

For Toxicity and Safety Data we refer to the Material Safety Data Sheet. The information and advice given should be observed and due attention should be given to the precautions necessary for handling chemicals. This product should not be used to protect the inside of drinking water systems against freezing. The transport is not regulated. All information contained in this Product Information Leaflet is accurate to the best of our knowledge and belief as at the date of issue specified. However, the Company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information.

Technical information

			Long Life OAT	ASTM 3306 requirements	method
Chemical and physical properties	Long Life OAT	Ethylene glycol	93 % w/w glycol	Base	
		Other glycols	0.5 % max.	5 % w/w max.	
		Inhibitor content	5 % w/w		
		Water content	5 % w/w max	5 % w/w max	ASTM D1123
		Ash content	1.1 % w/w typ	5 % w/w max	ASTM D1119
		Nitrite, amine, phosphate, borate, silicate	Nil		
		Specific gravity, 15°C	1.116 typ.	1.110 to 1.145	ASTM D5931
		Specific gravity, 20°C	1.113 typ.		ASTM D5931
		Equilibrium boiling point	180°C typ.	> 163°C	ASTM D1120
		Reserve alkalinity (pH 5.5)	6.2 typ.	Report	ASTM D1121
		pH, 20°C	8.6 typ.		ASTM D1287
		Refractive Index, 20°C	1.430 typ.		ASTM D1218

			50 % dilution	40 % dilution	33 % dilution	ASTM 3306	METHOD
Chemical and physical properties	DILUTIONS	pH	8.6	8.4	8.3	7.5 to 11.0	ASTM D1287
		Foaming properties at 25°C - break time	50 ml typ. 5 sec. typ.	-			ASTM D1881
		Foaming properties at 88°C -break time	50 ml typ. 5 sec. typ.		50 ml typ. 5 sec typ.	150 ml max.	ASTM D1881
		Initial crystallization	< - 37 °C	< - 24°C	< -18°C	< - 37°C	ASTM D1177
		Freezing protection.	- 40°C typ.	- 27°C Typ.	- 20 °C typ.		
		Specific gravity, 20°C	1.068 typ.	1.056 typ.	1.053 typ.		ASTM D5931
		Reserve alkalinity (pH 5.5)	3.0 typ.	2.4 typ.	2.1 typ.		ASTM D1121
		Refractive Index, 20°C	1.385 typ.		1.369 typ.		ASTM D1218
		Equilibrium boiling point	108°C typ.		104°C typ.		ASTM D1120
		Effect on non-metals	no effect	no effect	no effect		GME60 255
		Staining characteristics			no effect	no effect	ASTM D 1882
		Hard water stability	No precipitate				VW PV 1426

ASTM D1384 glassware corrosion tests

	Weight loss in mg/coupon[1]					
	Brass	Copper	Solder	Steel	Cast Iron	Aluminium
ASTM D3306 (max)	10	10	30	10	10	30
Long Life OAT	1.6	1.9	0.1	0.5	1.4	4.6

1 Weight loss AFTER chemical cleaning acc. to ASTM procedure. Weight gain is indicated by a - sign.

ASTM D4340 Aluminium heat rejection test, 25 %

	Weight loss in mg/cm²/week[1]
ASTM D3306 (max)	1.0
Long Life OAT	< 0.2

1 Weight loss AFTER chemical cleaning acc. to ASTM procedure. Weight gain is indicated by a - sign.

Modified MTU High Temperature corrosion test (2000 W)

Weight loss in mg/coupon[2]						
	Cast Iron			Aluminium		
test duration, hrs	48	69	116	[2]48	69	116
Reference coolant [3]						
hot coupon	-30.0	-13.1	4.3	-18.2	284.2	-
top coupon	-20.0	1.6	5.7	6.2	152.2	-
Long Life OAT						
hot coupon	-0.2	-2.1	-0.5	20.2	24.6	35.1
top coupon	3.4	0.1	1.9	20.1	42.1	18.5

2 Weight loss AFTER chemical cleaning acc. to (shortened) MTU procedure. Weight gain is indicated by a - sign.
3 Reference coolant is a conventional, high quality, silicate-based coolant

Aging test

To emphasize the corrosion protection offered by Long Life OAT, the aging test is conducted under more severe conditions compared to those commonly used in the industry.

Test Conditions	**Typical Industry**	**Long Life OAT**
Test duration	169 h	504 h
Fluid content	5.0 l	6.0 l
Pressure	1.5 bar	2.5 bar
Flow	3.0 l/min	3.5 l/min
Heat input	5500 W	5000 W
Temperature in heating vessel	95 °C	115°C
Temperature in cooling vessel	75 °C	95°C

Concentration of coolant in water		40 vol. %			20 vol. %	
Weight loss in g/m² (using Arteco test parameters) [1]						
	Al[2]	AlMn	Cast Iron	Steel	Cu	CuZn	Solder CB
Reference Coolant[3]						
after initial cleaning	82.10	64.02	-2.19	-1.68	3.62	2.90	21.45
after final cleaning	125.01	94.33	-0.36	0.11	4.99	5.66	25.83
Long Life OAT							
after initial cleaning	9.77	0.71	-0.07	0.17	1.44	1.62	0.43
after final cleaning	23.58	4.14	0.0	0.24	2.63	2.53	0.55

1. Weight loss AFTER chemical cleaning acc. to (shortened) MTU procedure. Weight gain is indicated by a - sign.
2. Aluminium SAE 329.
3. Reference coolant is conventional, high quality, silicate-based coolant.

PRODUCT APPROVED BY OEM

OEM Group	OEM	Specification
ADE	ADE	
Behr	Behr	
Caterpillar	MAK	A4.05.09.01
Cummins	Cummins	IS series u N14
Daimler	Mercedes-Benz	325.3
Detroit Diesel	Detroit Diesel	Power Cool Plus
Deutz	Deutz	0199-99-1115/6
Deutz/MWM	Deutz-MWM	0199-99-2091/8
Ford	Ford	WSS-M97B44-D
General Motors	Chevrolet	
General Motors	Opel - GM	GMW 3420
General Motors	Saab	GM 6277M (+B040 1065)
General Motors	Saturn	
General Motors	Vauxhall	GME L1301
General Motors	Vauxhall	GM 6277M (+B040 1065)
Hitachi		
Isuzu	Isuzu	
Jenbacher	Jenbacher	TA 1000-0201
Irisbus	Karosa	
Kobelco	Kobelco	
Komatsu	Komatsu	07.892 (2009)
Liebherr	Liebherr	MD1-36-130
MAN	MAN	324 Typ SNF
MAN	MAN B&W AG	D36 5600
MAN	MAN B&W A/S	
Mazda	Mazda	MEZ MN 121 D
Suzuki	Santana Motors	
Tata Motors	Jaguar	CMR 8229
Tata Motors	Jaguar	WSS-M97B44-D
Tata Motors	Land-Rover	
Tata Motors	Land-Rover	WSS-M97B44-D
Volvo AB	Mack	014 GS 17009
VW	Audi	TL-774 D = G 12
VW	Audi	TL-774 F = G 12+
VW	Seat	TL-774 D = G 12
VW	Seat	TL-774 F = G 12+
VW	Skoda	TL-774 D = G 12
VW	Skoda	TL-774 F = G 12+
VW	Skoda	61-0-0257
VW	Volkswagen	TL-774 D = G 12
VW	Volkswagen	TL-774 F = G 12+

PRODUCT MEETS PERFORMANCE REQUIREMENTS OF THE OEM

OEM Group	OEM	Specification
Aston Martin	Aston Martin	
Claas	Claas	
Fiat	Case New Holland	MAT3624
John Deere	John Deere	JDM H5
MAN	Semt Pielstick	
Mitsubishi Heavy Industry (MHI)	Mitsubishi MHI	
Renault-Nissan	Renault RNUR	41-01-001/- -S Type D
Volvo AB	Volvo Penta	128 6083 / 002
Volvo AB	Renault Trucks	41-01-001/- -S Type D
Volvo AB	Volvo Construction	128 6083 / 002
Volvo AB	Volvo Trucks	128 6083 / 002

STANDARDS & SPECIFICATIONS - PRODUCT MEETS PERFORMANCE

OEM Group	OEM	Specification
BRB	BR 637	
ASTM Standards	ASTM D3306	
ASTM Standards	ASTM D4656	
ASTM Standards	ASTM D4985	
British Standards	BS 6580	
French Standards	NFR 15-601	
FVV Standards	Germany	FVV Heft R443
Japanese Standards	JASO M325	
Korean Standards	KSM 2142	
MIL Standards	MIL-Belgium	BT-PS-606 A
MIL Standards	MIL-France	DCSEA 615/C
MIL Standards	MIL-Italy	E/L-1415b
MIL Standards	MIL-Sweden	FSD 8704
NATO Standards	NATO S-759	
Önorm	Önorm V5123	
SAE Standards	SAE J1034	
UNE Standards	uNE 26-361-88/1	