

LUBRICANTS COMPARISON TABLE (MARINE OIL)

	TBN	SAE	MICHANG (ENEOS)	S-OIL	TOTAL	SK(한유에너지)	GS-CALTEX (Chevron)	BP-CASTROL	LUK OIL	Shell	Exxon-Mobil	Gulf	IDEMITSU	
System Oil	7	30	MARINE S30	MARINE S00630	ATLANTA MD3005	SUPERMAR AS	Veritas 800 Marine 30	CDX 30	NAVIGO 6C0	Melina S30	Mobilgard 300C	GulfSea SuperBear 3006	Daphne Marine Oil SY30	
TPEO	9~16	40	MARINE T103	MARINE TP1230	DISOLA M3015	SUPERMAR 13TP30	Delo 1000 Marine 30	MHP 153	NAVIGO TPEO15/30	Gadinia S3 30	Mobilgard 312	GulfSea Power MDO 3012	Daphne Marine Oil SY30	
		40	MARINE F30	MARINE TP1240	DISOLA M4015	SUPERMAR 13TP40	Delo 1000 Marine 40	MHP 154	NAVIGO TPEO15/40	Gadinia AL30	Mobilgard 412	GulfSea Power MDO3015	Daphne Marine Oil SY40	
	40	MARINE T104	Gadinia S3 40							GulfSea Power MDO4012				
	20~26	50	MARINE F40	MARINE TP2030	DISOLA M5015	SUPERMAR 15TP40	Taro 20 DP 30	TLX XTRA203	Shell Argina Oil T30, T40	NAVIGO TPEO20/30	Gadinia AL40	Mobilgard M320	GulfSea Power MDO4015	Daphne Marine Oil SW30
		50	MARINE T105								GulfSea Power MDO3020			
	30~35	30	MARINE T203	MARINE TP2040	AURELIA TI3020	SUPERMAR 24TP30	Taro 20 DP 40	TLX XTRA204	NAVIGO TPEO20/40	Argina S2 40	Mobilgard M420	GulfSea Power MDO4020	Daphne Marine Oil SW40	
		40	MARINE T204	MARINE TP3030	AURELIA TI4020	SUPERMAR 24TP40	Taro 30 DP 30	TLX XTRA303	NAVIGO TPEO30/30	Argina S3 30	Mobilgard M330	GulfSea Power 3030	Daphne Marine Oil SA30	
		40	MARINE T303	MARINE TP3040	AURELIA TI3030	SUPERMAR 30TP30	Taro 30 DP 40	TLX XTRA304	NAVIGO TPEO40/30	Argina S3 40	Mobilgard M430	GulfSea Power 4030	Daphne Marine Oil SA40	
40		MARINE T304	MARINE TP4040	AURELIA TI4030	SUPERMAR 30TP40	Cynara 50	TLX XTRA403	NAVIGO TPEO40/30	Argina S4 40	Mobilgard M440	GulfSea Power 4040	Daphne Marine Oil SH40		
Cylinder Oil	40~50	40	MARINE C404	MARINE CL2550	TALUSIA UNIVERSAL	MARINE CYL25	Taro Special HT LF	BP Energol HP 32	NAVIGO ULTRA	Alexia 25	Mobilgard 525	GulfSea Cylcare ECA 50	Daphne Seamaster A50N	
	51~60	40	MARINE C504		TALUSIA LS25		BP Energol HP 46	Alexia 40		Mobilgard 540				
	20~30	70	MARINE C255		TALUSIA LS40		Taro Special HT LS40	CYLTECH 40SX		NAVIGO EXTRA	Alexia 70	Mobilgard 570		GulfSea Cylcare DCA 5070
	40~50	70	MARINE C405		TALUSIA HR70		Taro Ultra 70	CYLTECH 70		NAVIGO MCL 70AW	Alexia 100	Mobilgard 5100		GulfSea Cylcare DCA 50100
	min 60	70	MARINE C705		TALUSIA UNIVERSAL100		MARINE CYL100	Taro Ultra 100		CYLTECH 100	NAVIGO MCL 100	Alexia 100		Mobilgard 5100
Hydraulic Oil			FBK RO	HYDRO FLUID AW	AZOLLA ZS	ZIC SUPERVIS	AZOLLA ZS 100	Mobil DTE		Tellus S2 VX				
			SUPER HYRANDO		EQUVIS ZS	VEGA	Kixx RD HD							
			SUPER HD/Z		EQUVIS ZS	VEGA EX	Kixx RD CZ							
				HYDRO MASTER HV	EQUVIS ZS	VEGA LX	Kixx RD Z	HYPIN AWH-M						
Gear OIL			BOONOC M	GEAR LUBE	CARTER EP	SUPER GEAR EP	Kixx Gear EP	ALPHA SP						

OEM



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MARINE OIL

Asia's leading integrated energy company expanding throughout the globe.



MARINE C SERIES¹

MARINE C 1005

Features

1 Optimal as a cylinder lubricant for use in new generation cross-head diesel engines using high-sulfur fuels

MARINE C 1005 is an optimal cylinder oil, which has high base number of 100, for highly efficient turbocharging, high-output engine such as Mark 8 from MAN Diesel & Turbo which uses high-sulfur fuel oil (sulfur content: 1.5 to 3.5%) and also same type of new generation engines.

2 Outstanding acid-neutralizing and anti-wear properties

If cylinder oil of base number 70 is used for new Mark 8 engine with high-sulfur fuel, low temperature corrosion may occur at low load operation. To avoid the risk of corrosion, MARINE C 1005 is formulated to have base number of 100mgKOH/g. It also maintains the insides of cylinders clean and keeps wear on liner rings and other components to a minimum, enabling it to operate over a long period of time between overhauls with high detergent and dispersion capabilities, excellent acid-neutralizing capability, and outstanding oil spreading performance and anti-wear property

Typical Properties of MARINE C Series Oilatures

	C1005	C705	C405	C255
SAE viscosity grade	50	50	50	50
Appearance	Brown liquid	Brown liquid	Brown liquid	Brown liquid
Density (15°C)	g/cm ³ 0.954	0.936	0.918	0.908
Flash point (COC)	°C 240	264	264	290
Kinematic viscosity (40°C)	mm ² /s 216	226	236	233
Kinematic viscosity (100°C)	mm ² /s 20.5	20.5	20.5	20.5
Viscosity index	111	106	101	102
Pour point	°C -15.0	-12.5	-12.5	-12.5
Base number (perchloric acid method)	mgKOH/g 100	70	40	25
Packaging				BK, D/M

Note: The values of typical properties are subject to change based on revisions of the product without notification. (June 2015)

MARINE C 705

Features

1 Optimal as a cylinder lubricant for use in cross-head diesel engines

MARINE C 705 demonstrates superior performances using high-viscosity heavy fuel oil in large high-supercharged, high-output engines such as those from MAN Diesel & Turbo, Win GD (WARTSILA Corporation) and Mitsubishi Heavy Industries.

2 Outstanding acid-neutralizing and anti-wear properties

With high detergent and dispersion capabilities, excellent acid-neutralizing capability, and outstanding oil spreading performance and anti-wear property, MARINE C 705 keeps the insides of cylinders clean and keeps wear on liner rings and other components to a minimum, enabling it to operate over a long period of time between overhauls.

MARINE C 405

Features

1 Optimal as a cylinder lubricant for use in cross-head diesel engines using low-sulfur fuels

MARINE C 405 is an optimal cylinder oil when using marine diesel fuel or low-sulfur heavy fuel (sulfur content : 0.5 to 1.5%).

2 Outstanding acid-neutralizing and anti-wear properties

MARINE C 405 indicates high detergent and dispersion capabilities, excellent acid-neutralizing capability, outstanding oil spreading performance and anti-wear property, while holding down the base number to 40mgKOH/g, because the high base number of MARINE C 705 becomes superfluous when low-sulfur-fuel is used. It maintains the insides of cylinders clean and keeps wear on liner rings and other components to a minimum, enabling it to operate over a long period of ime between overhauls.

MARINE C 255

Features

1 Optimal as a cylinder lubricant for use in cross-head diesel engines using very low-sulfur fuels

MARINE C 255 is an optimal cylinder oil when using marine diesel fuel or very low-sulfur heavy fuel (sulfur content : less than 0.1%).

2 Outstanding acid-neutralizing and anti-wear properties

MARINE C 255 indicates high detergent and dispersion capabilities, excellent acid-neutralizing capability, outstanding oil spreading performance and anti-wear property, while holding down the base number to 25mgKOH/g. It maintains the insides of cylinders clean and keeps wear on liner rings and other components to a minimum, enabling it to operate over a long period of ime between overhauls.

3 Approval from main engine licenserlicenser

MARINE C 255 is approved by main engine licenser, MAN Diesel & Turbo and Win GD(WARTSILA Corporation), as diesel engine oil for very low-sulfur heavy fuel.

MARINE C 504

Features

1 Optimal as a cylinder lubricant for use in trunk-piston diesel engines

MARINE C 504 demonstrates superior performances as cylinder oil for use in large and medium-sized trunk-piston engines. MARINE C 504 is the best to use for trunk-piston engines made by Hanshin Diesel usingheavy fuel oil.

2 Outstanding anti-corrosive and detergent properties

MARINE C 504, which prevents corrosion and wear in engine parts and has outstanding detergent and dispersive properties, helps prevent adhesion of pistons and cylinders due to deposits including combustion products and unburned hydrocarbons. It prolongs the life of engine parts.



MARINE T SERIES¹



MARINE T 303, T 304, T 403, T 404, T 504

Features

1 High-base-number engine oil for trunk-piston engines

MARINE T demonstratesoutstandingperformancesin trunk-piston engines for use with heavy fuel oil. MARINE T hashigh base number (30-50 BN) and demonstrates outstanding acid-neutralizing property and detergency.

2 Outstanding anti-wear property and good water resistance

MARINE T helps prevent corrosion and wear in engineparts.It also has goodwater separationand water-resistant properties. MARINE T is used as oil in mid-to high-speed trunk-piston diesel engines and as system oil in large, low-speed diesel engines. With medium and low base numbers (20, 13, BN), it demonstrates outstanding acid-neutralizing and detergency.MARINE T helps prevent corrosion, ring stick and wear inengineparts, keeps engines clean, and provides

Typical Properties of MARINE T Series Oil

	T303	T304	T403	T404	T504
SAE viscosity grade	30	50	50	50	
Appearance	Brown liquid	Auburn liquid	Auburn liquid	Brown liquid	Dark brown liquid
Density (15°C)	g/cm ³ 0.905	0.907	0.907	0.913	0.919
Flash point (COC)	°C 260	262	242	258	256
Kinematic viscosity (40°C)	mm ² /s 91.0	137	92.0	733.5	129.4
Kinematic viscosity (100°C)	mm ² /s 10.9	14.4	11.2	14.4	14.2
Viscosity index	105	104	107	106	108
Pour point	°C -15.0	-15.0	-12.5	-12.5	50
Base number (perchloric acid method)	mgKOH/g 30	30	40	40	50
Packaging		BK, D/M, P/L	D/M		BK, D/M

Note: The values of typical properties are subject to change based on revisions of the product without notification. (August 2013)

MARINE T 203, T 204, T 102, T 103, T 104

Features

1 Mid-base-number engine oil for trunk-piston engines

MARINE T is used as oil in mid-to high-speed trunk-piston diesel engines and as system oil in large, low-speed diesel engines. With medium and low base numbers (20,13 BN), it demonstrates outstanding acid-neutralizing and detergency. MARINE T helps prevent corrosion, ring stick and wear in engine parts, keeps engines clean, and provides smooth lubrication.

2 Extend the life of engine parts

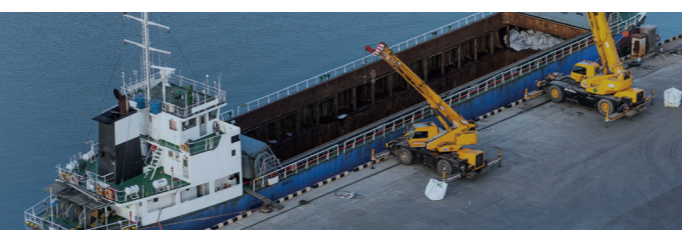
MARINE T prevents ring-sticking and carbon deposition due to the performance of heavy-duty(HD) type diesel engine oil. It has also good water separation and water-resistant properties.

Typical Properties of MARINE T Series Oil

	T203	T204	T102	T103	T104
SAE viscosity grade	30	40	20	30	40
Appearance	Brown liquid	Brown liquid	Brown liquid	Brown liquid	Brown liquid
Density (15°C)	g/cm ³ 0.899	0.902	0.892	0.894	0.98
Flash point (COC)	°C 250	258	240	258	262
Kinematic viscosity (40°C)	mm ² /s 95.0	139.2	57.5	97.9	146.3
Kinematic viscosity (100°C)	mm ² /s 11.0	14.4	7.86	11.5	14.6
Viscosity index	102	101	100	100	99
Pour point	°C -22.5	-22.5	-25.0	-22.5	-22.5
Base number (perchloric acid method)	mgKOH/g 20	20	13	13	13
Packaging			BK, D/M, P/L		

Note: The values of typical properties are subject to change based on revisions of the product without notification. (August 2013)

MARINE S SERIES¹



MARINE S 20, MARINE S 30

Features

1 Oils exclusively for use in cross-head engine systems

MARINE S contains carefully selected antioxidants, detergents and dispersants, exclusively for use in cross-head engine systems. It features outstanding thermalresistance and water resistance in addition to high levels of acid-neutralizationand soot dispersancy characteristics.

2 Outstanding detergent and dispersive properties

MARINE S maintains outstanding detergent and dispersive properties when it is mixed with cylinder drip oil and its viscosity and base number are increased. It prolongs the life of engine parts.

Typical Properties of MARINE S Series Oil

	S20	S30
SAE viscosity grade	20	30
Appearance	Yellow liquid	Yellow liquid
Density (15°C)	g/cm ³ 0.884	0.895
Flash point (COC)	°C 242	268
Kinematic viscosity (40°C)	mm ² /s 71.4	109
Kinematic viscosity (100°C)	mm ² /s 9.03	11.8
Viscosity index	100	96
Pour point	°C -15.0	-12.5
Base number (perchloric acid method)	mgKOH/g 7	7
Packaging		BK, D/M, P/L

Note: The values of typical properties are subject to change based on revisions of the product without notification. (August 2013)