



MAR-0002-0904

MARINE SERIES

Diesel Engine Oil for Marine Use

As marine engines have seen advances in recent years in the areas of high performance, high output, and reduced fuel consumption, low-quality heavy fuels have seen further use, leading to stricter performance requirements for lubricant oil.

The **MARINE Series** lineup consists mainly of three types of oil: the **C Series**, named for its use as cylinder oil, the **S Series** for use as system oil, and the **T series** of trunk-piston engine oil. The numbers following the letter C, S, or T in the name of each oil type represent the oil's base number and SAE viscosity grade.

(1) MARINE C705

● Features

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

The MARINE C705 grade demonstrates superior performance as cylinder oil for use in large high-supercharged, high-output engines such as those from MAN Diesel, Wartsila, and Mitsubishi Heavy Industries that use high-viscosity heavy fuel oil.

2. Outstanding acid-neutralizing and anti-wear properties prolong the life of engine parts

With high detergent and dispersion capabilities, excellent acid-neutralizing capability, and outstanding oil spreading performance and anti-wear property, MARINE C705 keeps the insides of cylinders clean and keeps wear to liner rings and other components to a minimum, enabling operation over a long period of time between overhauls.

(2) MARINE C405S

● Features

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

Optimal cylinder oil when using A heavy

oil or low-sulphur C heavy oil (with sulphur content of 1.5% or less), this oil enables operation over a long period of time between overhauls thanks to its outstanding acid-neutralizing and anti-wear properties.

(3) MARINE C504

● Features

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

This oil demonstrates superior performance as cylinder oil for use in large and medium-sized trunk-piston engines such as trunk-piston engines made by Hanshin Diesel that use heavy fuel oil.

2. Outstanding anti-corrosive and detergent properties prolong the life of engine parts

This oil, which prevents corrosion and wear in engine parts and has outstanding detergent dispersive property, helps prevent adhesion to pistons and cylinders of deposits including combustion products and unburned hydrocarbons.

Typical properties of MARINE C series oil

	C705	C405S	C504
SAE viscosity grade	50	50	40
Appearance	Brown liquid	Dark brown liquid	Dark brown liquid
Density (15°C)	g/cm ³ 0.936	0.917	0.928
Flash point (COC)	°C 264	262	240
Kinematic viscosity (40°C)	mm ² /s 226	219	157
(100°C)	mm ² /s 20.5	20.5	15.3
Viscosity index	106	109	98
Pour point	°C -12.5	-12.5	-10.0
Base number (perchloric acid method)	mgKOH/g 70	40	50
Packaging	BK, D/M		

Note: The values of typical properties are subject to change based on revisions of the product without notification. (June 2009)

(4) MARINE S20, MARINE S30

● Features

1. Oil exclusively for use in cross-head engine systems

This heavy-duty lubricant oil containing carefully selected antioxidants and detergent-dispersants, exclusively for use in cross-head engine systems, features outstanding thermal resistance and water resistance in addition to high levels of acid-neutralizing and detergent dispersive properties.

2. Outstanding detergent dispersive property prolongs the life of engine parts

This oil maintains outstanding detergent dispersive property even with increased viscosity and Base number due to mixing of cylinder drip oil.

(5) MARINE T303, T304, T404, T504

● Features

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

This oil demonstrates outstanding performance in engines for use with heavy fuel. Lubricant oil for use in trunk-piston engines, with dramatic improvements in performance over conventional heavy-duty oil, this oil has a high Base number (30-50

BN) and demonstrates outstanding acid-neutralizing and detergent dispersive properties.

2. Outstanding detergent, dispersion, and anti-wear properties prolong the life of engine parts

This oil helps prevent corrosion and wear in engine parts as well as ring stick and carbon buildup. It also has outstanding water separation and water resistance properties.

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
(100°C)	mm ² /s 9.03	11.8
Viscosity index	100	96
Pour point	°C -15.0	-12.5
Acid number	mgKOH/g 1.7	1.7
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. (June 2009)

Typical properties of MARINE T series oil

	T303	T304	T404	T504
SAE viscosity grade	30	40	40	40
Appearance	Brown liquid	Brown liquid	Brown liquid	Dark brown liquid
Density (15°C)	g/cm ³ 0.904	0.907	0.913	0.919
Flash point (COC)	°C 248	260	258	258
Kinematic viscosity (40°C)	mm ² /s 94.1	141	139	140
(100°C)	mm ² /s 11.0	14.5	14.5	14.5
Viscosity index	102	101	101	102
Pour point	°C -15.0	-15.0	-15.0	-15.0
Acid number	mgKOH/g 1.8	1.8	2.1	2.7
Base number (perchloric acid method)	mgKOH/g 30	30	40	50
Packaging	BK, D/M, P/L		BK, D/M	

Note: The values of typical properties are subject to change based on revisions of the product without notification. (March 2005)

(6) MARINE T203, T204, T102, T103, T104

● **Features**

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

This oil 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 detergent dispersive properties, helps prevent corrosion and wear in engine parts, keeps engines clean, and provides smooth lubrication.

2. Outstanding detergent, dispersion, and anti-wear properties prolong the life of engine parts

As heavy-duty, high-grade marine lubricant oil, this oil helps prevent ring stick and carbon buildup. It also has outstanding water separation and water resistance 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 0.898	0.901	0.889	0.893	0.897
Flash point (COC)	°C 252	264	240	246	252
Kinematic viscosity (40°C)	mm ² /s 95.2	142	57.8	102	145
(100°C)	mm ² /s 11.0	14.5	7.84	11.5	14.5
Viscosity index	100	100	100	100	98
Pour point	°C -15.0	-15.0	-15.0	-15.0	-12.5
Acid number	mgKOH/g 1.5	1.5	1.3	1.3	1.3
Base number (perchloric acid method)	mgKOH/g 20	20	13	13	13
Packaging	BK, D/M, P/L				
Hazardous material classification under the Fire Service Law	4th class petroleum				

Note: The values of typical properties are subject to change based on revisions of the product without notification. (March 2005)



Handling Precautions

(MARINE C series)

▼ Please handle this product with care in accordance with the following precautions.

Caution	<ul style="list-style-type: none"> ● <u>If the oil comes into contact with the eyes, it may cause irritation.</u> Always wear <u>protective glasses.</u> ● <u>Contact with the skin may cause inflammation.</u> Always wear <u>protective gloves.</u> ● Avoid swallowing the oil. (If swallowed, it may cause diarrhea and vomiting.) ● <u>Keep out of reach of children.</u> ● Refer to the applicable “Material Safety Data Sheet” (MSDS) prior to use. Please obtain the “Material Safety Data Sheet” from the store or shop where the product is purchased.
Handling Precautions	
First Aid Measures	<ul style="list-style-type: none"> ● If the oil comes into contact with the eyes, rinse the eyes thoroughly with clean water and seek medical attention. ● If the oil comes into contact with the skin, wash the affected area thoroughly with soap and water. ● If oil is swallowed, do not induce vomiting. Seek immediate medical attention.
Disposal of Waste Oil and Container	<ul style="list-style-type: none"> ● Do not pressurize the empty drum. It may rupture when pressurized. ● Do not weld, heat, drill or cut the container. The residue may ignite, causing an explosion. ● Disposal methods are regulated by laws and ordinances. Disposal must be carried out properly in accordance with laws and ordinances. <p>If you have further questions concerning disposal, consult the store or shop where the product is purchased.</p>
Storage Methods	<p>After using, always seal the container securely to prevent dust and water from entering the oil. Store in a dark place and avoid exposure to direct sunlight.</p>

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Handling Precautions

(MARINE S series, T series)

▼ Please handle this product with care in accordance with the following precautions.

Caution	<ul style="list-style-type: none"> ● Draining the oil while the engine is hot <u>may cause burning.</u> <u>Wait until the engine has cooled.</u> ● <u>If the oil comes into contact with the eyes, it may cause irritation.</u> Always wear <u>protective glasses.</u> ● <u>Contact with the skin may cause inflammation.</u> Always wear <u>protective gloves.</u> ● Avoid swallowing the oil. (If swallowed, it may cause diarrhea and vomiting.) ● <u>Keep out of reach of children.</u> ● Refer to the applicable “Material Safety Data Sheet” (MSDS) prior to use. Please obtain the “Material Safety Data Sheet” from the store or shop where the product is purchased.
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Storage Methods	<p>After using, always seal the container securely to prevent dust and water from entering the oil. Store in a dark place and avoid exposure to direct sunlight.</p>

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