

# MARINE SERIES

## Diesel Engine Oils for Marine Use

As marine engines have progressed in recent years in the areas of high output and low fuel consumption, the requirements for the performance of a lubricant have become stricter.

The MARINE SERIES lineup consists of three types of oils: C Series (cylinder oil), S Series (system oil) and T series (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 C1005

#### ● Features

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

**MARINE C1005** is an optimal cylinder oil, which has high base number of 100, for highly efficient turbocharging, high-output engines such as MAN Energy Solutions Mark 8 or later, Win GD (Wartsila) and J-ENG, which use high-sulfur fuel oil (sulfur content: 0.5 to 3.5%).

#### 2. Outstanding acid-neutralizing and anti-wear properties

If cylinder oil of base number 70 is used for Mark 8 or later engine with high-sulfur fuel, low temperature corrosion may occur at low load operation. To avoid the risk of corrosion, **MARINE C1005** is formulated to have base number of 100 mgKOH/g. It has high detergent and dispersion capabilities, excellent acid-neutralizing capability, outstanding oil spreading performance and anti-wear property so that it can maintain the insides of cylinders clean and keep wear on liner rings and other components to a minimum, enabling operation over a long period of time between overhauls.

### (2) MARINE C705

#### ● Features

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

**MARINE C705** demonstrates superior

performances using high-viscosity heavy fuel oil in large high-supercharged, high-output engines such as those from MAN Energy Solutions, Win GD (Wartsila) and J-ENG.

#### 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 C705** keeps the insides of cylinders clean and keeps wear on liner rings and other components to a minimum, enabling operation over a long period of time between overhauls.

### (3) MARINE C405

#### ● Features

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

**MARINE C405** is an optimal cylinder oil when using marine diesel fuel or low-sulfur heavy fuel (sulfur content: less than 0.5%).

#### 2. Outstanding acid-neutralizing and anti-wear properties

**MARINE C405** 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 40 mgKOH/g, because the high base number of **MARINE C705** 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 operation over a long period of time between overhauls.

### 3. Approval from main engine licensor

**MARINE C405** is approved as Category I diesel engine oil for low-sulfur heavy fuel by main engine licensor, MAN Energy Solutions.

## (4) MARINE C255

### ● Features

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

**MARINE C255** 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 C255** 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 25 mgKOH/g, because the high base number of **MARINE C705** or **C405** becomes superfluous when very 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 operation over a long period of time between overhauls.

### ● Typical Properties of MARINE C Series Oil

		C1005	C705	C405	C255
SAE viscosity grade		50	50	50	50
Appearance		Brown liquid	Brown liquid	Brown liquid	Brown liquid
Color (ASTM)		D8.0	L8.0	L6.5	D8.0
Density (15°C)	g/cm <sup>3</sup>	0.953	0.936	0.919	0.909
Flash point (COC)	°C	264	276	292	270
Kinematic viscosity (40°C)	mm <sup>2</sup> /s	217	230	248	234
Kinematic viscosity (100°C)	mm <sup>2</sup> /s	20.7	20.8	21.0	20.5
Viscosity index		112	106	100	102
Pour point	°C	-25.0	-15.0	-27.5	-30.0
Base number (perchloric acid method)	mgKOH/g	101	70.8	40.9	25.1
Packaging		BK, D/M			

Note: The values of typical properties are subject to change based on revisions of the product without notification. (January 2025)

## (5) MARINE C504

### ● Features

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

**MARINE C504** demonstrates superior performances as cylinder oil for use in large and medium-sized trunk-piston engines. **MARINE C504** is the best to use for trunk-piston engines made by Hanshin Diesel using heavy fuel oil.

#### 2. Outstanding anti-corrosive and detergent properties

**MARINE C504**, 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.

## (6) MARINE S20, MARINE S30

### ● Features

#### 1. Oils exclusively for use in cross-head engine systems

**MARINE S** is exclusively for use in heavy-duty (HD) type cross-head engine systems, containing carefully selected antioxidants, detergents and dispersants. It features outstanding thermal resistance and water resistance in addition to high levels of acid-neutralization and soot dispersibility.

#### 2. Outstanding detergent and dispersive properties

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

### ● Typical Properties of MARINE C 504

SAE viscosity grade		40
Appearance		Dark brown liquid
Color (ASTM)		L6.5
Density (15°C)	g/cm <sup>3</sup>	0.919
Flash point (COC)	°C	292
Kinematic viscosity (40°C)	mm <sup>2</sup> /s	248
Kinematic viscosity (100°C)	mm <sup>2</sup> /s	21.0
Viscosity index		100
Pour point	°C	-27.5
Base number (perchloric acid method)	mgKOH/g	40.9
Packaging		BK, D/M

Note: The values of typical properties are subject to change based on revisions of the product without notification. (January 2025)

### ● Typical Properties of MARINE S Series Oil

	S20	S30
SAE viscosity grade	20	30
Appearance	Yellow liquid	Yellow liquid
Color (ASTM)	L2.0	L2.0
Density (15°C)	0.884	0.889
Flash point (COC)	256	270
Kinematic viscosity (40°C)	67.1	105
Kinematic viscosity (100°C)	8.82	11.8
Viscosity index	104	100
Pour point	-15.0	-12.5
Base number (perchloric acid method)	7.3	7.3
Packaging	BK, D/M, P/L	

Note: The values of typical properties are subject to change based on revisions of the product without notification. (January 2025)

## **(7) MARINE T303, T304, T403, T404, T504**

### **● Features**

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

**MARINE T30X, T40X and T504** demonstrate outstanding performances in trunk-piston engines for use with heavy fuel oil. They have high base number (30-50 BN) and demonstrate outstanding acid-neutralizing property and detergency.

#### **2. Outstanding anti-wear property and good water resistance**

**MARINE T30X, T40X and T504** help prevent corrosion, wear, ring-sticking and carbon deposition in engine parts. They also have good water separation and water-resistant properties.

### **● Typical Properties of MARINE T Series Oil**

		T303	T304	T403	T404	T504
SAE viscosity grade		30	40	30	40	40
Appearance		Brown liquid	Brown liquid	Brown liquid	Brown liquid	Dark brown liquid
Color (ASTM)		L5.5	L5.5	L4.5	L4.5	L6.5
Density (15°C)	g/cm <sup>3</sup>	0.902	0.905	0.905	0.911	0.919
Flash point (COC)	°C	250	264	240	256	256
Kinematic viscosity (40°C)	mm <sup>2</sup> /s	94.3	142	80.2	134	130
Kinematic viscosity (100°C)	mm <sup>2</sup> /s	11.4	14.9	10.5	14.5	14.2
Viscosity index		108	105	115	108	108
Pour point	°C	-22.5	-22.5	-17.5	-17.5	-12.5
Base number (perchloric acid method)	mgKOH/g	31.2	31.4	41.7	40.6	50.2
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. (January 2025)

## **(8) MARINE T203, T204, T102, T103, T104**

### **● Features**

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

**MARINE T20X and T10X** are 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 (20BN,13BN), they demonstrate outstanding acid-neutralizing and detergency. They help prevent corrosion and wear in engine parts, keeps engines clean, and provides smooth lubrication.

#### **2. Extend the life of engine parts**

**MARINE T20X and T10X** prevent ring-sticking and carbon deposition due to the performance of heavy-duty (HD) type diesel engine oil. They have 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
Color (ASTM)		L3.0	L3.0	L2.0	L2.5	L2.5
Density (15°C)	g/cm <sup>3</sup>	0.897	0.902	0.888	0.893	0.896
Flash point (COC)	°C	264	276	248	256	266
Kinematic viscosity (40°C)	mm <sup>2</sup> /s	99.5	140	57.1	102	138
(100°C)	mm <sup>2</sup> /s	11.6	14.4	7.92	11.7	14.3
Viscosity index		104	101	104	103	101
Pour point	°C	-25.0	-22.5	-25.0	-25.0	-25.0
Base number (perchloric acid method)	mgKOH/g	20.4	20.4	12.8	12.7	12.8
Packaging		BK, D/M, P/L				

Note: The values of typical properties are subject to change based on revisions of the product without notification. (January 2025)




### Handling Precautions

▼ Follow these precautions when handling this product.


MARINE C1005, MARINE C705, MARINE C405, MARINE S30, MARINE S20

<b>Composition :</b>	Base Oil(s), Additives
<b>Hazard pictograms:</b>	Not applicable
<b>Signal word:</b>	Not applicable
<b>Hazard Statement:</b>	Not applicable
<b>Precautionary Statements:</b>	<ul style="list-style-type: none"> <li>• Do not handle until all safety precautions have been read and understood.</li> <li>• Wear protective gloves/protective clothing/eye protection/face protection.</li> <li>• Do not allow the eyes to become exposed to the product. Do not swallow the product.</li> <li>• Wash hands thoroughly after handling.</li> <li>• Do not eat, drink or smoke when using this product.</li> </ul>
<b>Prevention</b>	
<b>Response</b>	<ul style="list-style-type: none"> <li>• IF SWALLOWED: Immediately call a POISON CENTER/doctor.</li> <li>• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</li> <li>• If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician.</li> <li>• IF ON SKIN: Wash with plenty of soap and water.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight.</li> <li>• Containers that have been opened must be tightly sealed.</li> </ul>
<b>Disposal</b>	<ul style="list-style-type: none"> <li>• Dispose of contents/container in accordance with local/regional/national/international regulations.</li> <li>• If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.</li> </ul>


## MARINE C255

<b>Composition :</b>	Base Oil(s), Additives
<b>Hazard pictograms:</b>	
<b>Signal word:</b>	Warning
<b>Hazard Statement:</b>	May cause an allergic skin reaction.
<b>Precautionary Statements:</b>	<ul style="list-style-type: none"> <li>• Do not handle until all safety precautions have been read and understood.</li> <li>• Wear protective gloves/protective clothing/eye protection/face protection.</li> <li>• Do not allow the eyes to become exposed to the product. Do not swallow the product.</li> <li>• Contaminated work clothing should not be allowed out of the workplace.</li> <li>• Avoid breathing dust/fume/gas/mist/vapours/spray.</li> <li>• Wash hands thoroughly after handling.</li> <li>• Do not eat, drink or smoke when using this product.</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• IF SWALLOWED: Immediately call a POISON CENTER/doctor.</li> <li>• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</li> <li>• If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician.</li> <li>• IF ON SKIN: Wash with plenty of soap and water.</li> <li>• If skin irritation or a rash occurs: Get medical advice/attention.</li> <li>• Take off contaminated clothing and wash it before reuse.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight.</li> <li>• Containers that have been opened must be tightly sealed.</li> </ul>
<b>Disposal</b>	<ul style="list-style-type: none"> <li>• Dispose of contents/container in accordance with local/regional/national/international regulations.</li> <li>• If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.</li> </ul>

## MARINE C504

<b>Composition :</b>	Base Oil(s), Additives
<b>Hazard pictograms:</b>	
<b>Signal word:</b>	Danger
<b>Hazard Statement:</b>	May damage fertility or the unborn child.
<b>Precautionary Statements:</b>	<ul style="list-style-type: none"> <li>• Do not handle until all safety precautions have been read and understood.</li> <li>• Wear protective gloves/protective clothing/eye protection/face protection.</li> <li>• Do not allow the eyes to become exposed to the product. Do not swallow the product.</li> <li>• Obtain special instructions before use.</li> <li>• Wash hands thoroughly after handling.</li> <li>• Do not eat, drink or smoke when using this product.</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• IF SWALLOWED: Immediately call a POISON CENTER/doctor.</li> <li>• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</li> <li>• If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician.</li> <li>• IF ON SKIN: Wash with plenty of soap and water.</li> <li>• IF exposed or concerned: Get medical advice/attention.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight.</li> <li>• Containers that have been opened must be tightly sealed.</li> <li>• Store locked up.</li> </ul>
<b>Disposal</b>	<ul style="list-style-type: none"> <li>• Dispose of contents/container in accordance with local/regional/national/international regulations.</li> <li>• If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.</li> </ul>

MARINE T303, MARINE T304, MARINE T403, MARINE T404, MARINE T504,  
MARINE T203, MARINE T204, MARINE T102, MARINE T103, MARINE T104

<b>Composition :</b>	Base Oil(s), Additives
<b>Hazard pictograms:</b>	
<b>Signal word:</b>	Warning
<b>Hazard Statement:</b>	Causes serious eye irritation May cause an allergic skin reaction
<b>Precautionary Statements:</b>	<ul style="list-style-type: none"> <li>• Do not handle until all safety precautions have been read and understood.</li> <li>• Wear protective gloves/protective clothing/eye protection/face protection.</li> <li>• Do not allow the eyes to become exposed to the product. Do not swallow the product.</li> <li>• Contaminated work clothing should not be allowed out of the workplace.</li> <li>• Avoid breathing dust/fume/gas/mist/vapours/spray.</li> <li>• Wash hands thoroughly after handling.</li> <li>• Do not eat, drink or smoke when using this product.</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• IF SWALLOWED: Immediately call a POISON CENTER/doctor.</li> <li>• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</li> <li>• If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician.</li> <li>• IF ON SKIN: Wash with plenty of soap and water.</li> <li>• If skin irritation or a rash occurs: Get medical advice/attention.</li> <li>• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</li> <li>• If eye irritation persists: Get medical advice/attention.</li> <li>• Take off contaminated clothing and wash it before reuse.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight.</li> <li>• Containers that have been opened must be tightly sealed.</li> </ul>
<b>Disposal</b>	<ul style="list-style-type: none"> <li>• Dispose of contents/container in accordance with local/regional/national/international regulations.</li> <li>• If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.</li> </ul>