

## The MC Program

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The MAKITA-MITSUI-MAN B&W Diesel two-stroke MC & MC-C engines are characterized by having mechanically driven camshaft controls the timing of fuel injection, exhaust valves, starting air valves and cylinder lubrication.

マキタ - 三井 - MAN B&W MC & MC-C 形 2 サイクルディーゼル機関の特徴は、燃料噴射、排気弁、始動空気弁及びシリンダ注油器のタイミングを、機械的に駆動されたカム軸を用いて制御していることです。

## The ME-B Program

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The ME-B engines are characterized by having electronically controlled fuel injectors and cylinder lubrication.

The new type of electronically controlled diesel engines serves to reduce operating costs, reduced emissions, increase reliability and provide a high degree of flexibility in terms of operating modes and programs.

The benefits of the ME-B engines are:

- fuel optimized over a wide power range
- improved cylinder lube oil consumption
- improved emission characteristics
- improved low load running,

ME-B形機関の特徴は、燃料噴射及びシリンダ注油器のタイミングを電子制御していることです。

電子制御された新しいタイプのディーゼル機関は、運行費用の削減、排気ガス放出物の削減、信頼性の向上といった成果をもたらし、運転モード及びスケジュールに高い柔軟性を持たせることが可能となります。

ME-B形機関の利点は、以下のとおりです：

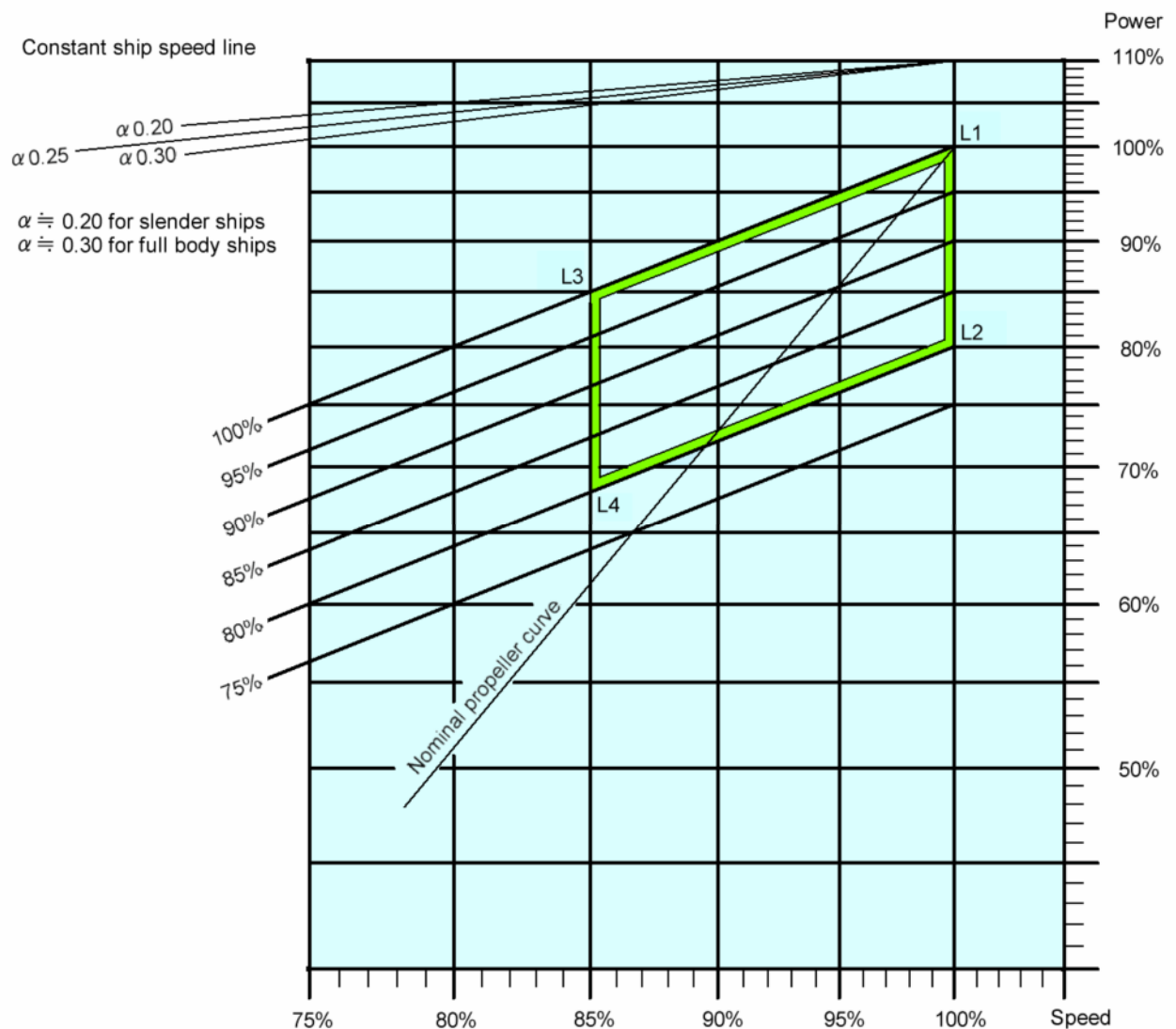
- 広い負荷範囲における燃料消費率の最適化
- シリンダ潤滑油消費量の改善
- エミッション特性の改善
- 低負荷運転の改善

## Layout Diagram, IMO Tier

In our MAKITA-MITSUI-MAN B&W Diesel two-stroke MC, MC-C & ME-B engines, users can choose optimum MCR point under the range of below layout diagram.

Furthermore users can obtain the most suitable combination between engine output and propeller speed through operation plan of vessel.

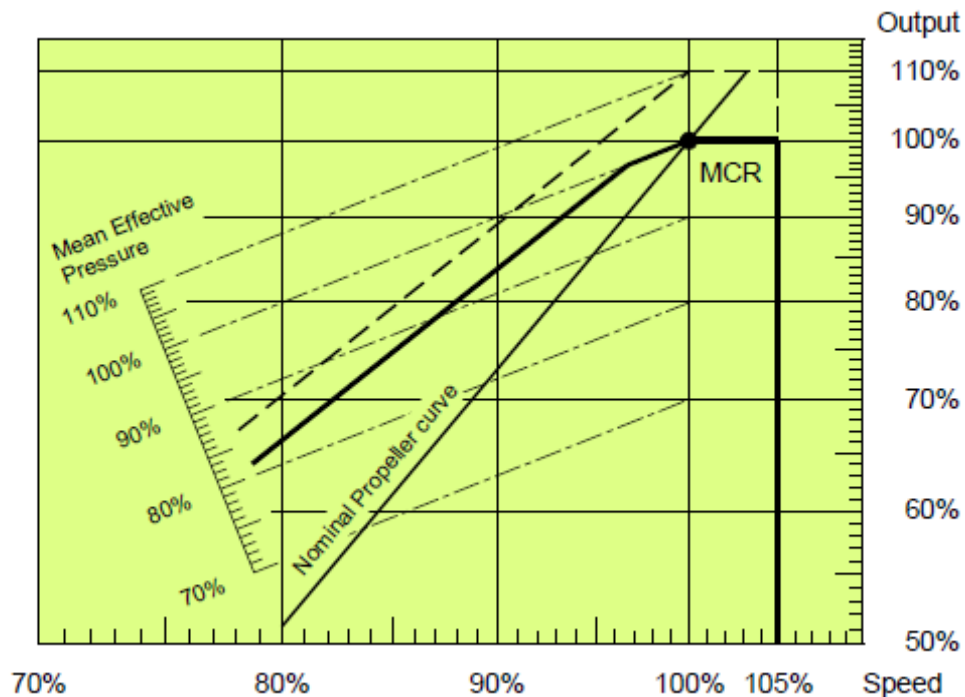
マキタ - 三井 - MAN B&W MC、MC-C & ME-B形2サイクルディーゼル機関は、下記のLayout Diagram において任意の点をMCRとして選ぶことができ、船舶の計画にあたって最も適した出力及び回転速度の組合せを得ることができます。



## Load Diagram

The limit for continuous running of engine is shown by the thick line in below load diagram for a chosen layout point (output and speed) as the MCR point.

MCR 点として選定されたLayout点(出力及び回転速度)について、下記の Load Diagramの太線の範囲内で、機関を連続運転することが可能です。



## Engine Power

The engine power figures in the catalog remain valid up to “tropical conditions” at sea level, i.e.:

- Turbocharger blower inlet temperature : 45
- Air cooler cooling water inlet temperature : 32
- Atmospheric pressure : 1,000 hPa

本カタログに記載している機関出力は、下記の“熱帯条件”においても有効となります。

- 過給機ブロア入口温度 : 45
- 空気冷却器冷却水入口温度 : 32
- 大気圧 : 1,000 hPa

## ■ Specific Fuel Oil Consumption

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The SFOC figures stated in this catalog are based on the following condition.

- Tolerance margin : +5%
- Fuel oil lower calorific value : 42,700 kJ/kg
- ISO 3046/1-1995
  - Turbocharger blower inlet temperature : 25
  - Air cooler cooling water inlet temperature : 25
  - Atmospheric pressure : 1,000 hPa

本カタログに記載している燃料消費率は、下記の条件によるものです。

- 燃料消費率公差 : +5%
- 燃料油低発熱量 : 42,700 kJ/kg
- ISO 3046/1-1995
  - 過給機ブロア入口温度 : 25
  - 空気冷却器冷却水入口温度 : 25
  - 大気圧 : 1,000 hPa

## ■ Emission Control

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All engines in this catalog has option of modifying and adjusting to comply with the Regulation 13 of New Annex VI (1997) - Regulation for Prevention of Air Pollution from ships, of MARPOL 73/78, referred to as Tier .

本カタログに記載している機関は、MARPOL 73/78 新附属書VI (1997) - 船舶からの大気汚染防止のための規則 - 第13規則 (Tier ) に適合するよう調整可能です。

## Specific Cylinder Oil Consumption

The figures given in this catalog represent values based on research as well as service experience.

For the MC/MC-C type engine, the cylinder lubricating system can be either the conventional mechanical lubricators (standard scope of supply) or electronically controlled Alpha lubricator system (option).

For the ME-B type engines, the Alpha lubricator system is equipped as standard scope of supply.

The Basic Setting of cylinder oil feed rate for the Alpha lubricating system can be reduced lower than that of conventional mechanical lubricators. Furthermore, the Alpha lubricator system regulates the cylinder oil feed rate at partial load proportionally to MEP.

本カタログに記載しているシリンダ潤滑油消費量は、研究所及び海上実績を基にした値としています。

MC/MC-C形機関のシリンダ注油システムは、従来の機械式注油器(標準装備)、あるいは電子制御式アルファ注油システム(オプション)となります。ME-B形機関には、電子制御式アルファ注油システムが標準装備されます。

アルファ注油システムによって実現されるシリンダ注油率のBasic Settingは、機械式注油器のそれに比べて低くすることが可能です。さらに、アルファ注油システムは、部分負荷における注油率をMEPに比例して制御しています。

MC, MC-C engines with Mechanical lubricator (guidance value)

	S-MC / S-MC-C	L-MC
Basic Setting	1.5 g/kW·h	1.2 g/kW·h
Minimum Feed Rate	0.95 g/kW·h	0.8 g/kW·h

ME-B, MC, MC-C engines with Alpha lubricator system (guidance value)

	S-ME-B	S-MC / MC-C / L-MC
Basic Setting	1.53 g/kW·h	1.1 g/kW·h
Minimum Feed Rate	0.7 g/kW·h	0.8 g/kW·h

As the another control regulation for cylinder feed rate, the Alpha ACC (Adaptive Cylinder oil Control) can be selected, where the cylinder oil feed rate is adjusted depending on sulphur percentage (S%) in the fuel oil. Furthermore, the cylinder oil feed rate at partial load is regulated proportionally to engine load.

アルファ注油器における別の注油率設定方法として、アルファACC (Adaptive Cylinder oil Control) を選択した場合、シリンダ注油率は、燃料油中に含まれる硫黄分含有量 (S%) に応じて調整されます。また、部分負荷における注油率は、LOAD に比例して制御されます。

(guidance value)

Feed Rate (TBN 40)	$0.34 \times 70/40 \times S\% \text{ g/kW}\cdot\text{h}$
Feed Rate (TBN 70)	$0.34 \times S\% \text{ g/kW}\cdot\text{h}$
Minimum Feed Rate	0.7 g/kW·h

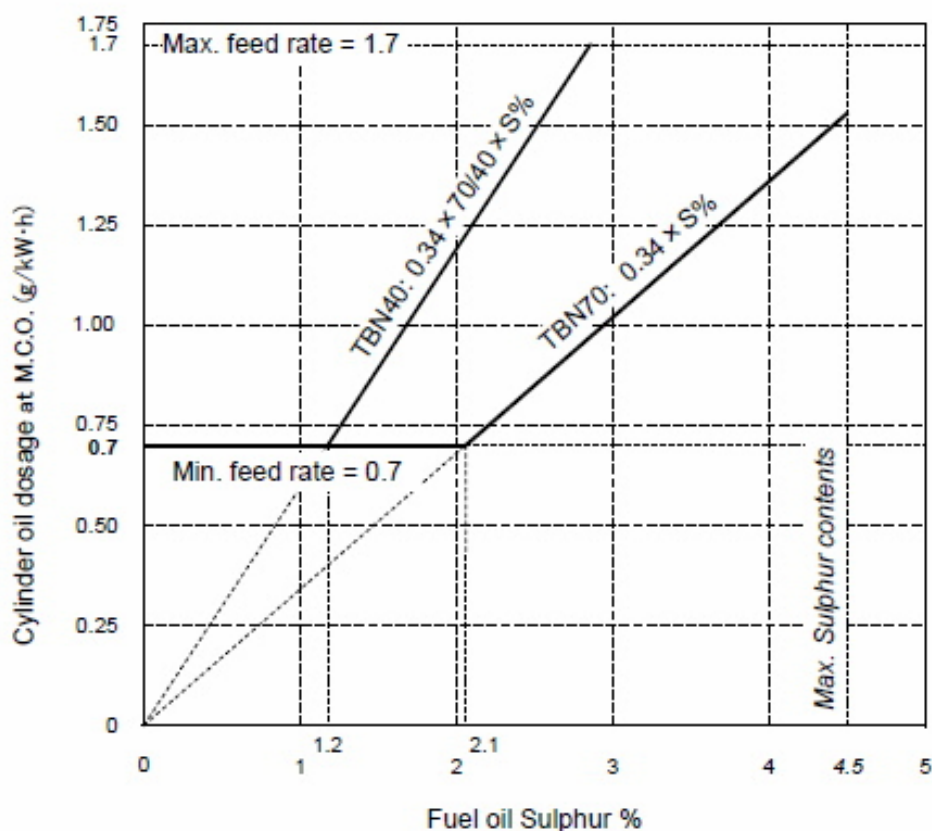
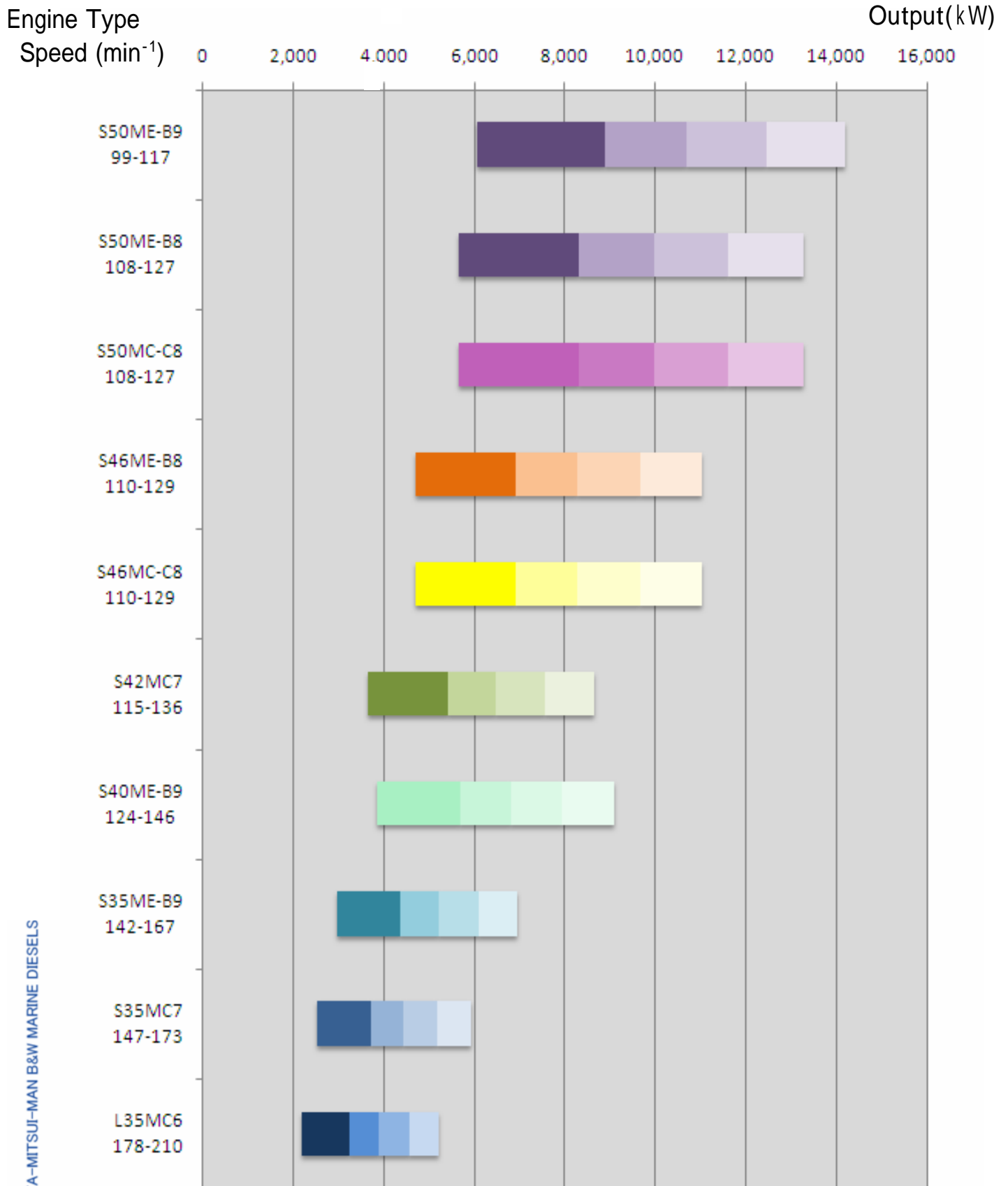


Fig. 1 Sulphur content and Basic Feed Rate at M.C.O.

# Output Range





## S50ME-B9

Bore : 500 mm

Stroke : 2214 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	117	117	99	99
mep	MPa	2.10	1.68	2.10	1.68
Cylinder	Power				
5S50ME-B9	kW	8,900	7,100	7,550	6,050
	BHP	12,100			
6S50ME-B9	kW	10,680	8,520	9,060	7,260
	BHP	14,520			
7S50ME-B9	kW	12,460	9,940	10,570	8,470
	BHP	16,940			
8S50ME-B9	kW	14,240	11,360	12,080	9,680
	BHP	19,360			

### Specific Fuel Oil Consumption (SFOC)

g/kW·h	170	164	170	164
g/BHP·h	125.0			

The SFOC excludes 1g / kW·h for the consumption of the electric HPS.

### Lubricating and Cylinder Oil Consumption

Lubricating oil	4 - 5 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

### Main Dimensions and Masses

Cyl. No.	5	6	7	8
Dry Mass ton	194	225	257	289
L mm	5,990	6,865	7,740	8,615
A mm	9,315	9,315	9,315	9,315
B mm	8,130	8,130	8,130	8,130
C mm	1,190	1,190	1,190	1,190
D mm	3,310	3,310	3,310	3,310
E mm	875	875	875	875
H1 mm	10,185	10,185	10,185	10,185
H2 mm	9,765	9,765	9,765	9,765

## S50ME-B8

Bore : 500 mm

Stroke : 2000 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	127	127	108	108
mep	MPa	2.00	1.60	2.00	1.60
Cylinder	Power				
5S50ME - B8	kW	8,300	6,650	7,050	5,650
	BHP	11,300			
6S50ME - B8	kW	9,960	7,980	8,460	6,780
	BHP	13,560			
7S50ME - B8	kW	11,620	9,310	9,870	7,910
	BHP	15,820			
8S50ME - B8	kW	13,280	10,640	11,280	9,040
	BHP	18,080			

### Specific Fuel Oil Consumption (SFOC)

g/kW·h	171	165	171	165
g/BHP·h	125.8			

The SFOC excludes 1g / kW·h for the consumption of the electric HPS.

### Lubricating and Cylinder Oil Consumption

Lubricating oil	4 - 5 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

### Main Dimensions and Masses

Cyl. No.	5	6	7	8
Dry Mass ton	175	205	235	265
L mm	5,589	6,439	7,289	8,139
A mm	8,583	8,583	8,583	8,583
B mm	7,495	7,495	7,495	7,495
C mm	1,088	1,088	1,088	1,088
D mm	3,150	3,150	3,150	3,150
E mm	850	850	850	850
H1 mm	9,300	9,300	9,300	9,300
H2 mm	8,828	8,828	8,828	8,828

# S50MC-C8

Bore : 500 mm

Stroke : 2000 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	127	127	108	108
mep	MPa	2.00	1.60	2.00	1.60
Cylinder	Power				
5S50MC-C8	kW	8,300	6,650	7,050	5,650
	BHP	11,300			
6S50MC-C8	kW	9,960	7,980	8,460	6,780
	BHP	13,560			
7S50MC-C8	kW	11,620	9,310	9,870	7,910
	BHP	15,820			
8S50MC-C8	kW	13,280	10,640	11,280	9,040
	BHP	18,080			

## Specific Fuel Oil Consumption (SFOC)

g/kW·h	175	169	175	169
g/BHP·h	128.7			

## Lubricating and Cylinder Oil Consumption

Lubricating oil	4 - 5 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

## Main Dimensions and Masses

Cyl. No.	5	6	7	8
Dry Mass ton	186	212	238	273
L mm	5,589	6,439	7,289	8,139
A mm	8,583	8,583	8,583	8,583
B mm	7,495	7,495	7,495	7,495
C mm	1,088	1,088	1,088	1,088
D mm	3,150	3,150	3,150	3,150
E mm	850	850	850	850
H1 mm	9,300	9,300	9,300	9,300
H2 mm	8,828	8,828	8,828	8,828



# S46ME-B8

Bore : 460 mm

Stroke : 1932 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	129	129	110	110
mep	MPa	2.00	1.60	2.00	1.60
Cylinder	Power				
5S46ME - B8	kW	6,900	5,525	5,875	4,700
	BHP	9,400			
6S46ME - B8	kW	8,280	6,630	7,050	5,640
	BHP	11,280			
7S46ME - B8	kW	9,660	7,735	8,225	6,580
	BHP	13,160			
8S46ME - B8	kW	11,040	8,840	9,400	7,520
	BHP	15,040			

## Specific Fuel Oil Consumption (SFOC)

g/kW·h	173	169	173	169
g/BHP·h	127.2			

The SFOC excludes 1g / kW·h for the consumption of the electric HPS.

## Lubricating and Cylinder Oil Consumption

Lubricating oil	3.5 - 4.5 kg/cyl.·day (guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"

## Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton				
L mm	5,146	5,928	6,710	7,492
A mm	8,117	8,117	8,117	8,117
B mm	7,131	7,131	7,131	7,131
C mm	986	986	986	986
D mm	2,924	2,924	2,924	2,924
E mm	782	782	782	782
H1 mm	8,860	8,860	8,860	8,860
H2 mm	8,480	8,480	8,480	8,480

## S46MC-C8

Bore : 460 mm

Stroke : 1932 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	129	129	110	110
mep	MPa	2.00	1.60	2.00	1.60
Cylinder	Power				
5S46MC-C8	kW	6,900	5,525	5,875	4,700
	BHP	9,400			
6S46MC-C8	kW	8,280	6,630	7,050	5,640
	BHP	11,280			
7S46MC-C8	kW	9,660	7,735	8,225	6,580
	BHP	13,160			
8S46MC-C8	kW	11,040	8,840	9,400	7,520
	BHP	15,040			

### Specific Fuel Oil Consumption (SFOC)

g/kWh	177	173	177	173
g/BHP·h	130.2			

### Lubricating and Cylinder Oil Consumption

Lubricating oil	3.5 - 4.5 kg/cyl.·day (guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"

### Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	157	175	197	217
L mm	5,146	5,928	6,710	7,492
A mm	8,117	8,117	8,117	8,117
B mm	7,131	7,131	7,131	7,131
C mm	986	986	986	986
D mm	2,924	2,924	2,924	2,924
E mm	782	782	782	782
H1 mm	8,860	8,860	8,860	8,860
H2 mm	8,480	8,480	8,480	8,480

# S42MC7

Bore : 420 mm

Stroke : 1764 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	136	136	115	115
mep	MPa	1.95	1.56	1.95	1.56
Cylinder	Power				
5S42MC7	kW	5,400	4,325	4,575	3,650
	BHP	7,350			
6S42MC7	kW	6,480	5,190	5,490	4,380
	BHP	8,820			
7S42MC7	kW	7,560	6,055	6,405	5,110
	BHP	10,290			
8S42MC7	kW	8,640	6,920	7,320	5,840
	BHP	11,760			

## Specific Fuel Oil Consumption (SFOC)

g/kW·h	179	175	179	175
g/BHP·h	131.7			

## Lubricating and Cylinder Oil Consumption

Lubricating oil	3 - 4 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

## Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	121	141	158	175
L mm	4,988	5,736	6,484	7,232
A mm	7,589	7,589	7,589	7,589
B mm	6,689	6,689	6,689	6,689
C mm	900	900	900	900
D mm	2,670	2,670	2,670	2,670
E mm	748	748	748	748
H1 mm	8,255	8,255	8,255	8,255
H2 mm	7,790	7,790	7,790	7,790



## S40ME-B9

Bore : 400 mm

Stroke : 1770 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	146	146	124	124
mep	MPa	2.10	1.68	2.10	1,68
Cylinder	Power				
5S40ME - B9	kW	5,675	4,550	4,825	3,850
	BHP	7,725			
6S40ME - B9	kW	6,810	5,460	5,790	4,620
	BHP	9,270			
7S40ME - B9	kW	7,945	6,370	6,755	5,390
	BHP	10,815			
8S40ME - B9	kW	9,080	7,280	7,720	6,160
	BHP	12,360			

### Specific Fuel Oil Consumption (SFOC)

g/kW·h	175	171	175	171
g/BHP·h	128.7			

The SFOC excludes 1g / kW·h for the consumption of the electric HPS.

### Lubricating and Cylinder Oil Consumption

Lubricating oil	3 - 4 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

### Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	112	131	148	163
L mm	5,000	5,700	6,400	7,100
A mm	7,455	7,455	7,455	7,455
B mm	6,505	6,505	6,505	6,505
C mm	950	950	950	950
D mm	2,650	2,650	2,650	2,650
E mm	700	700	700	700
H1 mm	8,150	8,150	8,150	8,150
H2 mm	7,700	7,700	7,700	7,700

## S35ME-B9

Bore : 350 mm

Stroke : 1550 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	167	167	142	142
mep	MPa	2.10	1.68	2.10	1.68
Cylinder	Power				
5S35ME - B9	kW	4,350	3,475	3,700	2,975
	BHP	5,925			
6S35ME - B9	kW	5,220	4,170	4,440	3,570
	BHP	7,110			
7S35ME - B9	kW	6,090	4,865	5,180	4,165
	BHP	8,295			
8S35ME - B9	kW	6,960	5,560	5,920	4,760
	BHP	9,480			

### Specific Fuel Oil Consumption (SFOC)

g/kW·h	176	172	176	172
g/BHP·h	129.4			

The SFOC excludes 1g / kW·h for the consumption of the electric HPS.

### Lubricating and Cylinder Oil Consumption

Lubricating oil	2 - 3 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

### Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	81	90	99	111
L mm	4,378	4,990	5,602	6,214
A mm	6,454	6,454	6,454	6,454
B mm	5,624	5,624	5,624	5,624
C mm	830	830	830	830
D mm	2,265	2,265	2,265	2,265
E mm	612	612	612	612
H1 mm	7,100	7,100	7,100	7,100
H2 mm	6,720	6,720	6,720	6,720

# S35MC7

Bore : 350 mm

Stroke : 1400 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	173	173	147	147
mep	MPa	1.91	1.53	1.91	1.53
Cylinder		Power			
5S35MC7	kW	3,700	2,975	3,150	2,525
	BHP	5,050			
6S35MC7	kW	4,440	3,570	3,780	3,030
	BHP	6,060			
7S35MC7	kW	5,180	4,165	4,410	3,535
	BHP	7,070			
8S35MC7	kW	5,920	4,760	5,040	4,040
	BHP	8,080			

## Specific Fuel Oil Consumption (SFOC)

g/kW·h	179	175	179	175
g/BHP·h	131.7			

## Lubricating and Cylinder Oil Consumption

Lubricating oil	2 - 3 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

## Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	67	77	87	96
L mm	4,120	4,720	5,320	5,920
A mm	6,053	6,053	6,053	6,053
B mm	5,403	5,403	5,403	5,403
C mm	650	650	650	650
D mm	2,200	2,200	2,200	2,200
E mm	600	600	600	600
H1 mm	6,650	6,650	6,650	6,650
H2 mm	6,270	6,270	6,270	6,270

# L35MC6

Bore : 350 mm

Stroke : 1050 mm

Layout points		L1	L2	L3	L4
Speed	min <sup>-1</sup>	210	210	178	178
mep	MPa	1.84	1.47	1.84	1.47
Cylinder	Power				
5L35MC6	kW	3,250	2,600	2,750	2,200
	BHP	4,425			
6L35MC6	kW	3,900	3,120	3,300	2,640
	BHP	5,310			
7L35MC6	kW	4,550	3,640	3,850	3,080
	BHP	6,195			
8L35MC6	kW	5,200	4,160	4,400	3,520
	BHP	7,080			

## Specific Fuel Oil Consumption (SFOC)

g/kW·h	179	175	179	175
g/BHP·h	131.7			

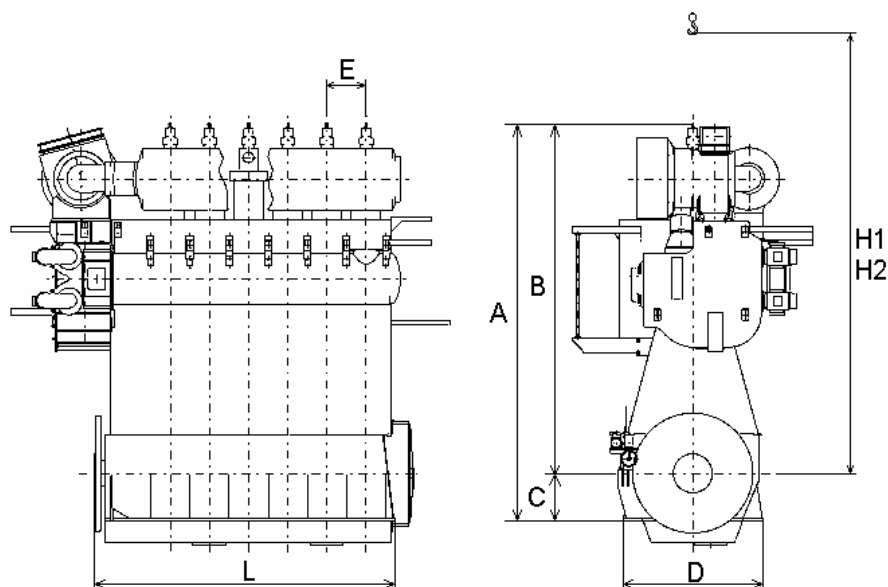
## Lubricating and Cylinder Oil Consumption

Lubricating oil	2 - 3 kg/cyl.·day	(guidance value)
Cylinder oil	refer item "Specific Cylinder Oil Consumption"	

## Main Dimensions and Masses

Cyl. No	5	6	7	8
Dry Mass ton	60	68	77	86
L mm	4,085	4,685	5,285	5,885
A mm	5,061	5,061	5,061	5,061
B mm	4,511	4,511	4,511	4,511
C mm	550	550	550	550
D mm	1,980	1,980	1,980	1,980
E mm	600	600	600	600
H1 mm	5,445	5,445	5,445	5,445
H2 mm	5,125	5,125	5,125	5,125

## ■ Main Dimension and Dry Masses



Main dimensions stated in this catalog are given in mm, for guidance only.

Dismantling height:

H1: Normal vertical lift

H2: Vertical lift between cylinder cover studs

The masses are stated for engines with standard turbocharger, a standard turning wheel and can vary up to 10% depending on the design and options chosen such as moment compensators, tuning wheel, etc.

Note:

For S50ME-B, S50MC-C, S46ME-B, S46MC-C, S40ME-B engines, standard turbocharger arrangement is AFT side, however, REAR side arrangement is also possible.

本カタログに記載している機関の主要寸法(mm)は、ガイダンス寸法です。

開放高さ寸法は:

H1: 通常垂直吊り高さ

H2: 垂直吊り高さ(シリンダカバー締付用スタッド間)

機関重量は、標準過給機、標準回転勢車を装備した場合におけるものであり、モーメントコンペンサータ、チューニングホイール等といったオプション項目や設計点により、10%程度増量することがあります。

注記:

S50ME-B、S50MC-C、S46ME-B、S46MC-C、S40ME-B 機関の過給機は、AFT側が標準配置ですが、REAR側に配置することも可能です。



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本カタログの内容は、将来予告なしに変更することがあります。

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