



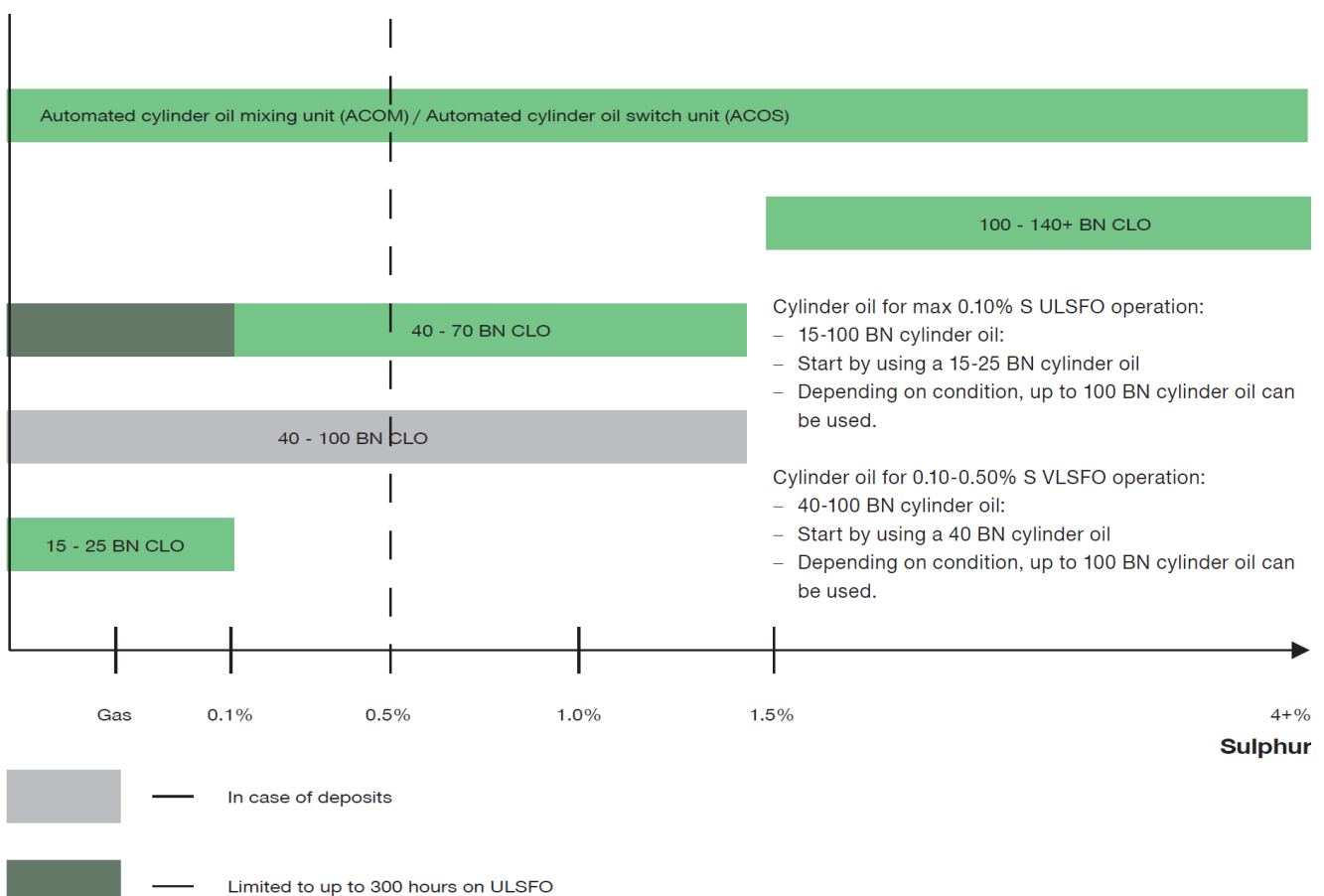
2020 Sulphur Cap Lubricant Guidelines

Technical Brief

The guidelines here are only applicable for the engine oils used in two types of engines: a) 2-stroke slow speed engines; and b) 4-stroke medium speed engines. With the upcoming 2020 IMO 0.5% Sulphur Cap regulatory changes, operators will need to review the suitability of lubricants to be used for their vessels. It will mostly depend on the fuels that their vessels use. For vessels fitted with scrubber technology, (as of Jan 1st 2020, fewer than 1% of the global fleet, ~ 2500 vessels), operators can continue using the lubricant that is being used currently as these vessels will continue to use >0.5% Sulphur fuels. But for those that opt to use low-sulphur fuels (<0.5% Sulphur), the lubricants will need to be changed depending on engine performance.

MAN 2-Stroke Slow Speed Marine Engines

MAN's latest Service Letter SL2019-671/JAP issued in April 2019, recommended the following cylinder lubricants:



From the chart above, MAN recommends the use of 40BN cylinder oil (Gulfsea Cylcare DCA 5040H) for engines burning <0.5% Sulphur fuel. But if the condition of the engine is unsatisfactory (for instance, cold corrosion or deposits

build-up, etc), the use of higher BN cylinder oil, upto 100BN (Gulfsea Cylcare DCA 5070H & Gulfsea Cylcare 50100) is recommended.

For vessels operating in ECA (Emission Control Areas; <0.1% Sulphur), MAN recommends the use of 15BN to 25BN (Gulfsea Cylcare ECA 50). Again, subject to the engine condition, vessels can use a higher BN cylinder oil (Gulfsea Cylcare DCA 5040H, Gulfsea Cylcare DCA 5070H or Gulfsea Cylcare 50100) if necessary.

The general guidelines on cylinder oil for MAN engines are as follows :

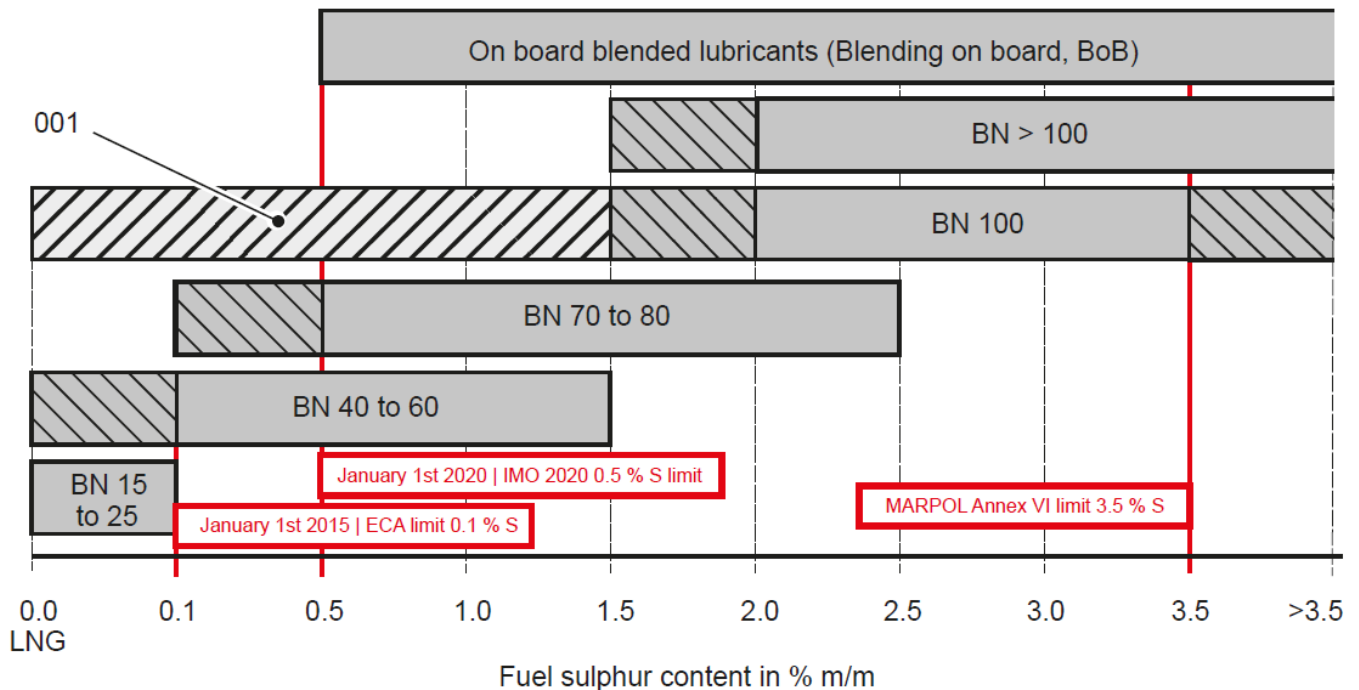
- General guidance for operation on:
- Max. 0.10% S fuel: 15–25 BN CLO
 - 0.10%-0.50% S fuel: 40–70 BN CLO

For engines / vessels fitted with scrubbers, the recommended cylinder oil BN is between 100BN (Gulfsea Cylcare 50100) to 140BN (Gulfsea Cylcare 50140) as these vessels will continue to use high sulphur fuels.

There will be no change for the system oil (Gulfsea Superbear 3006) for all engines whether they are fitted with scrubbers or are running <0.5%S fuels or if the vessels are trading in ECA (Emission Control Areas <0.1% Sulphur).

WIN G&D 2-Stroke Slow Speed Engines

WIN G&D’s latest Service Letter Issue 003 2019-03 (Lubricants) published in March 2019 recommended the following cylinder lubricants:



From the chart above, WIN G&D recommends the use of 40BN (Gulfsea Cylcare DCA 5040H) to 70BN (Gulfsea Cylcare DCA 5070H) cylinder oil for engines burning <0.5% Sulphur fuels. But if the condition of the engine is found unsatisfactory (for instance, cold corrosion or deposits build-up observed), a higher BN cylinder oil (Gulfsea Cylcare DCA 5070H) is recommended.

For vessels operating in ECA (Emission Control Areas <0.1% Sulphur), WIN G&D recommends the use of 15BN to 25BN (Gulfsea Cylcare ECA 50).

For engines / vessels fitted with scrubbers, the recommended cylinder oil BN is between 100BN (Gulfsea Cylcare 50100) to 140BN (Gulfsea Cylcare 50140) as these vessels will continue to use high sulphur fuels.

There will be no change for the system oil (Gulfsea Superbear 3006) for all engines whether they are fitted with scrubbers or are running <0.5%S fuels or if the vessels are trading in ECA (Emission Control Areas <0.1% Sulphur).

J-ENG (MITSUBISHI UEC) 2-Stroke Slow Speed Engines

With reference to J-ENG latest Technical Information No.0305 published in December 2014, there is no change in their recommended cylinder lubricant for their engines:

Sulphur content of fuel oil	Recommended cylinder oil BN
Sulphur content ≤ 0.1%	BN ≤ 40mgKOH/h
0.1% ≤ Sulphur content ≤ 1.5%	40 ≤ BN ≤ 70mgKOH/h
1.5% ≤ Sulphur content	70 ≤ BN ≤ 100mgKOH/h

From the table above, J-ENG recommends the use of 40BN (Gulfsea Cylcare DCA 5040H) to 70BN (Gulfsea Cylcare DCA 5070H) cylinder oil for engines burning <0.5% Sulphur fuels. But if the condition of the engine is found unsatisfactory (for instance, cold corrosion or deposits build-up observed), a higher BN cylinder oil (Gulfsea Cylcare DCA 5070H) is recommended.

For vessels operating in ECA (Emission Control Areas <0.1% Sulphur), J-ENG recommends the use of 15BN (Gulfsea Cylcare ECA 50) to 40BN (Gulfsea Cylcare DCA 5040H), depending on the condition of the engine.

For engines / vessels fitted with scrubbers, the recommended cylinder oil BN is between 100BN (Gulfsea Cylcare 50100) to 140BN (Gulfsea Cylcare 50140) as these vessels will continue to use High Sulphur fuels.

There will be no change for the system oil (Gulfsea Superbear 3006) for all engines whether they are fitted with scrubbers or are running <0.5%S fuels or if the vessels are trading in ECA (Emission Control Areas <0.1% Sulphur).

SUMMARY (2-Stroke Slow Speed Engine Recommended Cylinder Oil)

	Compliant Fuels		Fitted with Scrubbers
	Types of Fuel		
	<0.1% Sulphur	<0.5% Sulphur*	>0.5% Sulphur
MAN	Gulfsea Cylcare ECA 50	Gulfsea Cylcare DCA 5040H Gulfsea Cylcare DCA 5070H Gulfsea Cylcare 50100	Gulfsea Cylcare 50100 Gulfsea Cylcare 50140
WIN G&D	Gulfsea Cylcare ECA 50	Gulfsea Cylcare DCA 5040H Gulfsea Cylcare DCA 5070H	Gulfsea Cylcare 50100 Gulfsea Cylcare 50140
J-ENG	Gulfsea Cylcare ECA 50 Gulfsea Cylcare DCA 5040H	Gulfsea Cylcare DCA 5040H Gulfsea Cylcare DCA 5070H	Gulfsea Cylcare DCA 5070H Gulfsea Cylcare 50100

* Notes:

GulfSea Cylcare DCA 5040H is suitable for VLSFO ($\geq 0.1\%$ sulphur content up to 0.5% sulphur content) in accordance with OEM recommended operating advisories which state a minimum of 40BN but remains subject to the operating condition of the engine including the condition of cylinder liners and piston rings. Higher BN cylinder oil may be a recommended option should there be any evidence of deposit formation or deterioration on the cylinder liners and piston rings during routine inspections. In such instances, please consult the relevant OEM.

4-Stroke Medium Speed Engines

The various OEMs' recommended lubricants for 4-stroke medium speed engines (Auxiliary Generator Engine & Main Engine) are broadly similar.

For vessels using distillate fuels or gas oil, the recommended BN is between **12BN (Gulfsea Power MDO 3012/ 4012)** and **15BN (Gulfsea Power MDO 3015/ 4015)**.

For vessels using $< 0.5\%$ Sulphur Heavy Fuel Oil (HFO), the recommended BN is between **20BN (Gulfsea Power MDO 3020/ 4020)** and **30BN (Gulfsea Power 3030/ 4030)**.

For engines fitted with scrubbers, the recommended BN is between **30BN (Gulfsea Power 3030 / 4030)**, **40BN (Gulfsea Power 4040)** and **55BN (Gulfsea Power 4055)**.

SUMMARY (4-Stroke Medium Speed Engine Recommended Oil)

	Compliant Fuel		Fitted with Scrubbers
	Types of Fuel		
	<0.1% Sulphur Distillate Fuels / Gas Oil	<0.5% Sulphur Heavy Fuel Oil (VLSFO)	>0.5% Sulphur Heavy Fuel Oil (HSFO)
MAN	Gulfsea Power MDO 3012 / 4012 Gulfsea Power MDO 3015 / 4015	Gulfsea Power MDO 3020 / 4020	Gulfsea Power 3030 / 4030 Gulfsea Power 4040 / 4055
WARTSILA	Gulfsea Power MDO 4012 Gulfsea Power MDO 4015	Gulfsea Power 4030	Gulfsea Power 4030 Gulfsea Power 4040 / 4055
DAIHATSU	Gulfsea Power MDO 3012 / 4012 Gulfsea Power MDO 3015 / 4015	Gulfsea Power MDO 3020 / 4020	Gulfsea Power 3030 / 4030 Gulfsea Power 4040 / 4055
YANMAR	Gulfsea Power MDO 3012 / 4012 Gulfsea Power MDO 3015 / 4015	Gulfsea Power MDO 3015 / 4015 Gulfsea Power MDO 3020 / 4020	Gulfsea Power 3030 / 4030 Gulfsea Power 4040 / 4055
HYUNDAI HIMSEN	Gulfsea Power MDO 4012 Gulfsea Power MDO 4015	Gulfsea Power MDO 4020	Gulfsea Power 4030 Gulfsea Power 4040 / 4055
MaK	Gulfsea Power MDO 4012 Gulfsea Power MDO 4015	Gulfsea Power MDO 4020 Gulfsea Power 4030	Gulfsea Power 4030 Gulfsea Power 4040 / 4055
NIIGATA	Gulfsea Power MDO 4012 Gulfsea Power MDO 4015	Gulfsea Power MDO 4020 Gulfsea Power 4030	Gulfsea Power 4030 Gulfsea Power 4040 / 4055
HANSHIN	Gulfsea Power MDO 3015 Gulfsea Power MDO 3020	Gulfsea Power 3030	Gulfsea Power 3030

Please feel free to consult any Gulf Oil Marine technical engineers should you require further clarifications.

[Updated on October 2019]