

# Validated engine oils for WinGD engines

**Version 16**

November 2024



**WINGD**

# Validated engine oils for WinGD engines

## Version 16 – November 2024

This document must be read and used in conjunction with the WinGD document “Lubricants” [Link](#)

### Engine types

The oil lists are valid for the following engine types:

WinGD X, WinGD X-DF, WinGD X-DF-A, WinGD X-DF-M, WinGD RT-flex, WinGD RT-flex-DF, Wärtsilä RTA, Wärtsilä RT-flex and Wärtsilä X engines as well as in Sulzer 2-stroke engines

### Changes to version 15 – July 2024

#### New products added:

- ADNOC Voyager Marine Oil 570
- Castrol Cyltech 140
- Gulf Marine GulfSea Cylcare 5040H
- Gulf Marine GulfSea Cylcare XP 5040H
- Gulf Marine GulfSea Cylcare XP 5040X
- Gulf Marine GulfSea Cylcare XP 50100H
- Petromar DCL 4050
  
- ADNOC Marine System Oil 306
- Castrol CDX30f
- Chevron Veritas 800a Marine 30
- Petrogulf Marine System Oil 3006

#### Products phased out:

- ExxonMobil Mobilgard 540X

#### Changes on existing products:

- Shell Alexia 40 now “LNG validated”
- “LNG validated” BN 40 cylinder lubricating oils are allowed for usage in ammonia mode

For additional information on any of the above products, please contact the respective oil company directly.

#### General amendments to this document:

- Column for Ammonia added to the table “List of validated cylinder lubricating oils”
- Notes 3 & 4 added to “List of validated cylinder lubricating oils”

### General remarks

#### LNG column

All cylinder lubricating oils shown under the LNG gas fuel column are allowed for general usage in gas mode.

- “LNG-validated” oils have passed a field validation trial running in gas mode. These oils have demonstrated a good ability to keep the piston running components clean while running in gas mode at optimised low feed rates.
- “General Usage” oils have passed a field validation trial running on liquid fuels only. Based on their performance, the usage of these oils in gas mode is also allowed.
- Oils which are not allowed to be used in gas mode have an empty field in the LNG gas fuel column.

## Ammonia column

- “General Usage” oils have passed a field validation trial running in gas mode (LNG). Based on their performance, the usage of these oils in ammonia mode is also allowed.

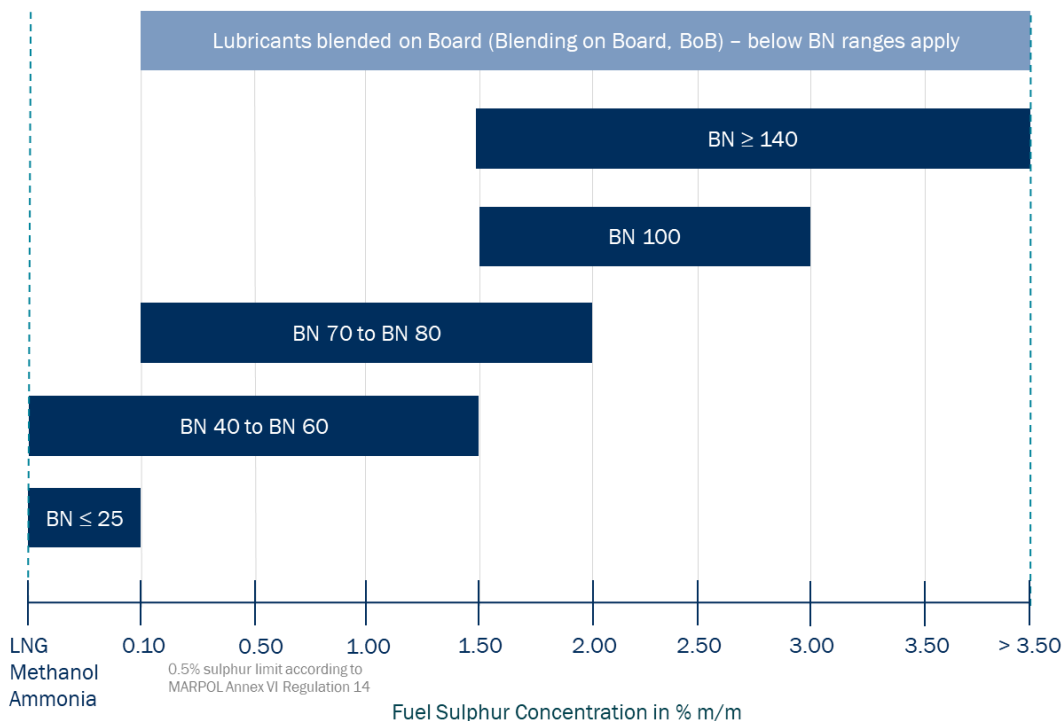
## Methanol column

- “General Usage” oils have passed a field validation trial running on liquid fuels and/or in gas mode. Based on their performance, the usage of these oils in gas mode is also allowed.

## General guideline for cylinder lubricating oil selection

Step 1: Choose a suitable BN range for cylinder lubricating oil from the following overview based on intended fuel usage.

Step 2: Refer to the table “List of validated cylinder lubricating oils” on the next pages to verify specific cylinder oil usage guidelines



**Note:** In all instances the information in this document takes precedence and should be regarded as the final approved guidelines by WinGD.

## List of validated cylinder lubricating oils

| Oil supplier    | Oil name                         | BN       | BN range | LNG           | Ammonia | Methanol | Fuel sulphur concentration |                  |                  |                  |                  |                  |                  |           |
|-----------------|----------------------------------|----------|----------|---------------|---------|----------|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
|                 |                                  |          |          |               |         |          | 0.00% to 0.10% S           | 0.10% to 0.50% S | 0.50% to 1.50% S | 1.50% to 2.00% S | 2.00% to 2.50% S | 2.50% to 3.00% S | 3.00% to 3.50% S | > 3.50% S |
| ADNOC           | Voyager                          | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| Aegean          | Alfacylo 540 NG                  | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Alfacylo 570                     | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| ARG             | Alfacylo 570GII                  | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | ARGuard Marine ACC 5040          | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | ARGuard Marine ACC 5070          | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Marine Diesel Cylinder Lubricant | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| AVIN            | ARGuard Marine ACC 5000          | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                 | Neptune 40 SAE 50                | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Neptune 70 SAE 50                | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| Bardahl         | Neptune 100 SAE 50               | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                 | Naval 50                         | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| Castrol         | Cyltech 40                       | 40       | 40 - 60  | 2)            |         | 2)       |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Cyltech 40 SX                    | 40       | 40 - 60  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Cyltech 40 XDC                   | 40       | 40 - 60  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Cyltech 70                       | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Cyltech 100                      | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| Cepsa           | Cyltech 140                      | 140      | ≥ 140    |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                 | Gavia 4050                       | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Gavia 7050                       | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| Chevron         | Taro Ultra 20                    | 20       | 15 - 25  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 40                    | 40       | 40 - 60  | 2)            |         | 2)       |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 40X                   | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra Advanced 40           | 40       | 40 - 60  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 70                    | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 70J                   | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 70X                   | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Taro Ultra 100                   | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                 | Taro Ultra 100J                  | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| Taro Ultra 100X | 100                              | 80 - 100 |          |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| Cosmo           | Taro Ultra 140                   | 140      | ≥ 140    |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                 | Marine 5040                      | 40       | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                 | Marine 5070S                     | 70       | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                 | Marine 5100S                     | 100      | 80 - 100 |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |

| Oil supplier     | Oil name                  | BN  | BN range | LNG           | Ammonia | Methanol | Fuel sulphur concentration |                        |                        |                        |                        |                        |                        |              |
|------------------|---------------------------|-----|----------|---------------|---------|----------|----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
|                  |                           |     |          |               |         |          | 0.00%<br>to<br>0.10% S     | 0.10%<br>to<br>0.50% S | 0.50%<br>to<br>1.50% S | 1.50%<br>to<br>2.00% S | 2.00%<br>to<br>2.50% S | 2.50%<br>to<br>3.00% S | 3.00%<br>to<br>3.50% S | > 3.50%<br>S |
| CPC              | Marilube Oil CO-200 Plus  | 20  | 15 - 25  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Marilube Oil CO-700       | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Marilube Oil CO-700 Plus  | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Marilube Oil CO-1000 Plus | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
|                  | Marilube Oil CO-1000 SP   | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
| Cyclon<br>Hellas | Nautilus LS               | 40  | 40 - 60  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Nautilus Heavy            | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Nautilus Heavy XT         | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
| ENEOS            | Marine C405               | 40  | 40 - 60  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Marine C405S              | 40  | 40 - 60  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Marine C405Z              | 40  | 40 - 60  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Marine C705               | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Marine C705S              | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Marine C1005              | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
| ENI              | Punica 570                | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
| ENOC             | STRATA CYL 540LS          | 40  | 40 - 60  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | STRATA CYL N 570          | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
| ExxonMobil       | Mobilgard 540             | 40  | 40 - 60  | 2)            |         | 2)       |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Mobilgard 540 AC          | 40  | 40 - 60  | LNG validated |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Mobilgard 570             | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Mobilgard 5100            | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
|                  | Mobilgard 5145            | 145 | ≥ 140    |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
| Formosa          | XC05070                   | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
| GazProm<br>Neft  | Ocean CCL 17 ULSF         | 17  | 15 - 25  |               |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|                  | Ocean CCL 70              | 70  | 70 - 80  |               |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|                  | Ocean CCL 100 HSF         | 100 | 80 - 100 |               |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |

| Oil supplier              | Oil name                  | BN    | BN range | LNG              | Ammonia | Methanol | Fuel sulphur concentration |                  |                  |                  |                  |                  |                  |           |
|---------------------------|---------------------------|-------|----------|------------------|---------|----------|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
|                           |                           |       |          |                  |         |          | 0.00% to 0.10% S           | 0.10% to 0.50% S | 0.50% to 1.50% S | 1.50% to 2.00% S | 2.00% to 2.50% S | 2.50% to 3.00% S | 3.00% to 3.50% S | > 3.50% S |
| Gulf Marine               | GulfSea Cylcare ECA 50S   | 20    | 15 - 25  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare ECA 50X   | 17    | 15 - 25  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 5040H     | 40    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 5040X     | 40    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare XP 5040H  | 40    | 40 - 60  | LNG validated    |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare XP 5040X  | 40    | 40 - 60  | LNG validated 4) | 4)      | 4)       | 4)                         |                  |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 5070H     | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 5070S     | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 5070X     | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                           | GulfSea Cylcare 50100S    | 100   | 80 - 100 |                  |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                           | GulfSea Cylcare 50100X1   | 100   | 80 - 100 |                  |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                           | GulfSea Cylcare XP 50100H | 100   | 80 - 100 |                  |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                           | GulfSea Cylcare XP 50100X | 100   | 80 - 100 |                  |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
| GulfSea Cylcare 50140S    | 140                       | ≥ 140 |          |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| GulfSea Cylcare 50140X    | 140                       | ≥ 140 |          |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| GulfSea Cylcare XP 50140X | 140                       | ≥ 140 |          |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| Hyundai Oilbank           | Xteer MCL 5040L           | 40    | 40 - 60  | 2)               |         | 2)       |                            |                  |                  |                  |                  |                  |                  |           |
|                           | Xteer MCL 5070            | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                           | Xteer MCL 50100           | 100   | 80 - 100 |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| Idemitsu Kosan            | Daphne Seamaster A-50LS   | 40    | 40 - 60  | 2)               |         | 2)       |                            |                  |                  |                  |                  |                  |                  |           |
| Indian Oil                | Servo Marine 7050         | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                           | Servo Marine ME10050      | 100   | 80 - 100 |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                           | Servo Marine ME14050      | 140   | ≥ 140    |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| LENOL                     | CLX 20                    | 20    | 15 - 25  | LNG validated    |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | CLX 40                    | 40    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | CL 40                     | 40    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | CL 50                     | 50    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | CL 70                     | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
| LOTOS                     | CL 100                    | 100   | 80 - 100 |                  |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                           | Marinol RG 4050           | 40    | 40 - 60  |                  |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                           | Marinol RG 7050           | 70    | 70 - 80  |                  |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |

| Oil supplier               | Oil name                                     | BN  | BN range | LNG           | Ammonia | Methanol | Fuel sulphur concentration |                  |                  |                  |                  |                  |                  |           |
|----------------------------|--|-----|----------|---------------|---------|----------|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
|                            |  |     |          |               |         |          | 0.00% to 0.10% S           | 0.10% to 0.50% S | 0.50% to 1.50% S | 1.50% to 2.00% S | 2.00% to 2.50% S | 2.50% to 3.00% S | 3.00% to 3.50% S | > 3.50% S |
| Lubmarine (Total Energies) | Talusia LS 40                                | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Talusia Universal                            | 57  | 40 - 60  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Talusia HR 70                                | 70  | 70 - 80  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                            | Talusia Universal 100                        | 100 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | Talusia Optima                               | 100 | 80 - 100 |               |         |          | <300 h                     |                  |                  |                  |                  |                  |                  |           |
| LUKOIL                     | Talusia HR 140                               | 140 | ≥ 140    |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | Navigo MCL Ultra                             | 20  | 15 - 25  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Navigo MCL Extra                             | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Navigo 70 MCL AW                             | 70  | 70 - 80  |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                            | Navigo 100 MCL                               | 100 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
| Motor Oil Hellas           | Blended Cylinder Oil (BN 60 to 100)          | N/A | N/A      |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | EMO Neptune 40 SAE 50                        | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | EMO Neptune 70 SAE 50                        | 70  | 70 - 80  |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| Pertamina                  | EMO Neptune 100 SAE 50                       | 100 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | Medripal 5040                                | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
| Petrobras                  | Medripal 570                                 | 70  | 70 - 80  |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                            | Marbrax CID-54-AP                            | 40  | 40 - 60  | LNG validated |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Marbrax CID-55                               | 50  | 40 - 60  |               |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                            | Marbrax CID-57                               | 70  | 70 - 80  |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
| PetroChina                 | Marbrax CID-5100                             | 100 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | KunLun DCA 5070H                             | 70  | 70 - 80  |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
| PetroGulf                  | Marine Cylinder Oil 5040                     | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Marine Cylinder Oil 5070                     | 70  | 70 - 80  |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | Marine Cylinder Oil 50100                    | 100 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
| Petromar                   | DCL 4050                                     | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
| Petronas                   | Silub 20 LS50                                | 20  | 15 - 25  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
| Premier Six                | Opt-Max Shieldguard 5040                     | 40  | 40 - 60  |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |
|                            | Opt-Max Shieldguard 5070                     | 70  | 70 - 80  |               |         |          |                            |                  | Monitor          |                  |                  |                  |                  |           |
|                            | Opt-Max Shieldguard 50110                    | 110 | 80 - 100 |               |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
|                            | Opt-Max BoB 300 <sup>1)</sup> (BN 40 to 120) | N/A | N/A      |               |         |          |                            |                  |                  |                  |                  |                  |                  |           |

| Oil supplier | Oil name                           | BN  | BN range | LNG              | Ammonia | Methanol | Fuel sulphur concentration |                        |                        |                        |                        |                        |                        |              |
|--------------|------------------------------------|-----|----------|------------------|---------|----------|----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
|              |                                    |     |          |                  |         |          | 0.00%<br>to<br>0.10% S     | 0.10%<br>to<br>0.50% S | 0.50%<br>to<br>1.50% S | 1.50%<br>to<br>2.00% S | 2.00%<br>to<br>2.50% S | 2.50%<br>to<br>3.00% S | 3.00%<br>to<br>3.50% S | > 3.50%<br>S |
| Puma Energy  | Marine Cylinder Oil TBN 70 SAE 50  | 70  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Marine Cylinder Oil TBN 100 SAE 50 | 100 | 80 - 100 |                  |         |          |                            |                        | Monitor                |                        |                        |                        |                        |              |
| Repsol       | Innocean Cylindex 40               | 40  | 40 - 60  | 2)               |         | 2)       |                            |                        |                        |                        |                        |                        |                        |              |
|              | Innocean Cylindex 70               | 70  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Innocean Cylindex 100              | 100 | 80 - 100 |                  |         |          |                            |                        | Monitor                |                        |                        |                        |                        |              |
| Shell        | Alexia 40                          | 40  | 40 - 60  | LNG validated 3) | 2)      |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Alexia 40 XC                       | 40  | 40 - 60  |                  |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Alexia 70                          | 70  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Alexia 100                         | 100 | 80 - 100 |                  |         |          |                            |                        | Monitor                |                        |                        |                        |                        |              |
|              | Alexia 140                         | 140 | ≥ 140    |                  |         |          |                            |                        | Monitor                | Monitor                |                        |                        |                        |              |
| SINOPEC      | Cylinder Oil 5017                  | 17  | 15 - 25  |                  |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Cylinder Oil 5040                  | 40  | 40 - 60  | 2)               |         | 2)       |                            |                        |                        |                        |                        |                        |                        |              |
|              | Cylinder Oil 5040N                 | 40  | 40 - 60  |                  |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Cylinder Oil 5070N                 | 70  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Cylinder Oil 5070S                 | 70  | 70 - 80  |                  |         |          |                            | Monitor                | Monitor                |                        |                        |                        |                        |              |
|              | Cylinder Oil 5080S                 | 80  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Cylinder Oil 50100                 | 100 | 80 - 100 |                  |         |          |                            |                        |                        | Monitor                |                        |                        |                        |              |
|              | Cylinder Oil 50100N                | 100 | 80 - 100 |                  |         |          |                            |                        | Monitor                | Monitor                |                        |                        |                        |              |
|              | Cylinder Oil 50140N                | 140 | ≥ 140    |                  |         |          |                            |                        | Monitor                | Monitor                |                        |                        |                        |              |
| SK           | Supermar CYL 40 Plus               | 40  | 40 - 60  | 2)               |         | 2)       |                            |                        |                        |                        |                        |                        |                        |              |
|              | Supermar CYL 40                    | 40  | 40 - 60  |                  |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Supermar CYL 40L                   | 40  | 40 - 60  |                  |         |          |                            |                        |                        |                        |                        |                        |                        |              |
|              | Supermar CYL 70 Plus               | 70  | 70 - 80  |                  |         |          |                            | Monitor                |                        |                        |                        |                        |                        |              |
|              | Supermar CYL 100                   | 100 | 80 - 100 |                  |         |          |                            |                        | Monitor                |                        |                        |                        |                        |              |



| Oil supplier         | Oil name                    | BN  | BN range | LNG | Ammonia | Methanol | Fuel sulphur concentration |                  |                  |                  |                  |                  |                  |           |
|----------------------|-----------------------------|-----|----------|-----|---------|----------|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
|                      |                             |     |          |     |         |          | 0.00% to 0.10% S           | 0.10% to 0.50% S | 0.50% to 1.50% S | 1.50% to 2.00% S | 2.00% to 2.50% S | 2.50% to 3.00% S | 3.00% to 3.50% S | > 3.50% S |
| Texas Petro-chemical | Texmarine 700               | 70  | 70 - 80  |     |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |
|                      | Texmarine 1000              | 100 | 80 - 100 |     |         |          |                            |                  |                  | Monitor          |                  |                  |                  |           |
| United Oil company   | U Star Lube Star Marine 570 | 70  | 70 - 80  |     |         |          |                            | Monitor          |                  |                  |                  |                  |                  |           |

|   |  |
|---|--|
| <b>&lt; 300 hrs</b>   | GENERAL USAGE: Allowed within WinGD general usage guidelines   |
| <b>Monitor</b>  | SPECIFIC USAGE: Allowed continuously for maximum time limit stated   |
| <b>LNG validated</b>  | SPECIFIC USAGE: Allowed but with increased frequency of Piston Underside Inspections (PUIs) and Cylinder Scrape Down Oil Analysis.                                       |
|   | SPECIFIC USAGE: Allowed without restriction within WinGD general usage guidelines. Cylinder Oil has passed full validation trial running on LNG                          |
| <b>NOTES: 1)</b>  | Multiple blending combinations with different system oils are possible. Not all of them are validated. Speak to the supplier for more data about the validated products. |
| <b>NOTES: 2)</b>  | Only valid for products formulated and blended with Gp. I base oils  |
| <b>NOTES: 3)</b>  | “LNG validated” only valid for products formulated and blended with Gp. I base oils  |
| <b>NOTES: 4)</b>  | Only valid for products formulated and blended with Gp. II base oils   |
| <p>It is the responsibility of the NOL holder to apply for renewals of NOLs prior to expiry. Expired NOLs will be removed from the list if no renewal application has been made in good time. In this respect, the list will be reviewed annually and expired NOLs, and those not currently in reissuance process, will be removed.</p> |  |

## List of validated system lubricating oils

| Oil supplier              | Oil name                       | BN |
|---------------------------|--------------------------------|----|
| ADNOC                     | Marine System Oil 3006         | 6  |
| Aegean                    | Alfasys 305                    | 5  |
| ARG                       | ARGuard Marine ASC 3005        | 5  |
| AVIN                      | Panoil M 530                   | 5  |
| Castrol                   | CDX 30                         | 5  |
| Castrol                   | CDX 30f                        | 5  |
| Cepsa                     | Ciconia 30                     | 5  |
| Chevron                   | Veritas 800 Marine 30          | 5  |
| Chevron                   | Veritas 800a Marine 30         | 5  |
| Cosmo                     | Marine 3005                    | 5  |
| CPC                       | Marilube Oil AC-30 Plus        | 5  |
| CPC                       | Marilube Oil AC-30 SP          | 5  |
| Cyclon Hellas             | Armor Medium SAE 30            | 5  |
| Eneos                     | Marine S30                     | 7  |
| ENI                       | Cladium 50                     | 5  |
| ExxonMobil                | Mobilgard 300 C                | 9  |
| Formosa                   | XSO3005                        | 5  |
| Four C Marine Lubricants  | Athen Marine System Oil 3005   | 5  |
| GasPromNeft               | Ocean CS0 7                    | 7  |
| Gulf Marine               | GulfSea Superbear 3006         | 6  |
| Gulf Marine               | GulfSea Superbear 3006 S       | 5  |
| Gulf Marine               | GulfSea Superbear 3008         | 8  |
| Hyundai                   | Xteer SO 3005                  | 5  |
| IndianOil                 | Servo Marine 0530              | 5  |
| Lenol                     | 6 S 30                         | 6  |
| Lubmarine (TotalEnergies) | Atlanta Marine D 3005          | 5  |
| LUKOIL                    | Navigo 6 CO                    | 6  |
| Motor Oil Hellas          | EMO Panoil M 530               | 5  |
| Pertamina                 | Medripal 307                   | 7  |
| Petrobras                 | Marbrax CAD-308                | 8  |
| PetroChina                | KunLun DCC3008                 | 8  |
| Petrogulf                 | Marine System Oil 3006         | 6  |
| Petronas                  | DISROL 5 LS30                  | 5  |
| Premier Six               | Opt-Max Shieldguard 3008       | 8  |
| Puma Energy               | Marine System Oil TBN 5 SAE 30 | 5  |
| Shell                     | Melina S30                     | 5  |

| Oil supplier | Oil name                  | BN |
|--------------|---------------------------|----|
| SINOPEC      | Marine System Oil 3005    | 5  |
| SINOPEC      | Marine System Oil 3005S   | 5  |
| SINOPEC      | Marine System Oil 3006    | 6  |
| SINOPEC      | Marine System Oil 3008    | 8  |
| SINOPEC      | Marine System Oil 3008N   | 8  |
| SK           | Supermar AS <sup>1)</sup> | 5  |

NOTES: 1) Multiple formulations of this product are available. Not all of them are validated. Speak to the supplier for more data about the validated products.

## Appendix

### BN140/145 cylinder oils for fuels with a sulphur content higher than 3 %

Evidence from engines with a range of bore sizes shows that the performance limits of BN100 oils are being reached when used in combination with >3.00 % S fuels. This is mostly evidenced through lacquering and cold corrosion on liners.

- An increase in oil feed rate has shown little to no improvement in most cases.
- In some cases, maximum feed rate settings have been reached, and cannot be further increased.
- Furthermore, excessive feed rates may have negative effects over time:
  - On the piston running & other components (e.g. Ca deposits)
  - Wasting of cylinder oil for the customer where unused cylinder oil is scraped down into the piston underside
  - Scraping down large amounts of fresh oil makes the results of the scrape down oil analysis less useful
- WinGD has gathered information from field validation trials to support this
- Customers have worked with WinGD to monitor and assess the situation

*Therefore, a cylinder oil with a higher BN has been considered necessary.*

During oil validation trials of BN140/145 products WinGD confirmed that these lubricants perform very well. The main improvements when compared to BN100 oils is further increased cleanliness of the combustion chamber and substantially lower feed rates that are achieved. This presents in an overall benefit for the operators: cleaner components, lower risks for cold corrosion and lower feed rates for reduced OPEX costs.

**Note:** Engage with the supplier in advance to make sure the oil is available in time. Batches might be produced on demand only.