

November 26th, 2025

The technical action of our transverse thruster for  
the latest VGP that US Environmental Protection Agency has issued  
(Updated on November 26th, 2025)

Dear Sirs,

US Environmental Protection Agency (EPA) has issued the latest VGP on Dec. 2013.

The VGP requires ships sailing in US waters to use EALs in all oil-to-sea interfaces “unless technically infeasible”. The Final 2013 VGP can be found at the EPA website. EALs are addressed in part 2.2.9 (page 47).

**【Technical action】**

Regarding using EAL for our thruster equipment, it needs changing to the suitable seal ring of propeller sealing device.

**【Technical evaluation】**

We consider that the life time of seal ring would be almost same as the existing device under the following condition.

- 1) Seal ring : Suitable Seal Ring for EAL
- 2) Thruster running time : Max. 600hrs/Year
- 3) The oil temperature : Max. 60 °C
- 4) Oil analysis : Water content Max. 1%, Sampling at every 3 month.

The using oil for our thruster is as following.

- Controllable pitch propeller type -

◆ TC-N type : Thruster body, Header tank . . . . . Gear lubrication oil VG150 or VG100  
Hyd. Pump unit . . . . . Hydraulic oil VG46 or VG32

◆ TCT type : Thruster body, Header tank . . . . . Gear lubrication oil VG100 or VG68  
(VG100 is our 1<sup>st</sup> recommendation.)

◆ NT-C type : Thruster body, Header tank . . . . . Gear lubrication oil VG100

- Fixed pitch propeller type -

◆ TFN type : Thruster body, Header tank . . . . . Gear lubrication oil VG150 or VG100

◆ NT-F type : Thruster body, Header tank . . . . . Gear lubrication oil VG150 or VG100

Now, we have confirmed that we can apply the EAL for our thruster as the attached list. (As on November 26th, 2025)

**【The Other】**

We kindly ask you to inform the Ship Name, IMO NO., our thruster type and the dock schedule to our Service Dept. as follows.

NAKASHIMA PROPELLER CO., LTD. Head Office/Works  
688-1, Joto-Kitagata, Higashi-ku, Okayama, 709-0625, Japan  
Service Department  
Phone: +81-86-279-6277, Fax : +81-86-279-7744  
Email: [after-service@nakashima.co.jp](mailto:after-service@nakashima.co.jp)

If you have any question, please feel free to contact us.

Sincerely yours,

**NAKASHIMA PROPELLER CO., LTD.**

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| <b>NT-C TYPE THRUSTER RECOMMEND OIL</b> |
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**[ Mineral Oil ]**

| MAKER                | NAME                         |
|----------------------|------------------------------|
| IDEMITSU KOUSAN      | DAPHNE SUPER GEAR OIL 100    |
| KYGNUS SEKIYU        | GEAR OIL ML 100              |
| ENEOS                | BONNOC TS 100                |
| COSMO OIL RUBRICANTS | COSMO GEAR SE 100            |
| SHELL                | SHELL OMALA S2 G 100         |
| EXXONMOBIL           | MOBILGEAR 600 XP 100         |
| BP                   | ENERGOL GR-XP 100            |
| CASTROL              | ALPHA SP 100                 |
| TOTAL ENERGIES       | CARTER EP 100                |
| CHEVRON              | CHEVRON GEAR COMPOUND EP 100 |
| GULF MARINE          | GULFSEA GEAR OIL 100         |
| LENOL                | RENOLIN CLP 100              |

**[ Environmental Acceptable Lubricant (EAL) ]**

| MAKER             | NAME                              |
|-------------------|-----------------------------------|
| CASTROL           | BIOTRANS GB 100                   |
| CHEVRON           | CLARITY SYNTHETIC EA GEAR OIL 100 |
| EXXONMOBIL        | MOBIL SHC AWARE GEAR OIL 100      |
| GULF MARINE       | GULFSEA BD GEAR OIL 100           |
| KLUBER            | KLUBERBIO EG2-100                 |
| LENOL             | PLANTOGEAR 100S                   |
| SHELL             | NATURELLE S4 GEAR FLUID 100       |
| RSC BIO SOLUTIONS | RSC ENVIRO LOGIC GO 100           |
| VICKERS OILS      | BIOGEAR XP 100                    |
| PANOLIN           | MARGEAR 100                       |
| KAJO              | KAJO-BIO-GEAR OIL 100             |
| NOF CORPORATION   | MILLUBE ST-100U                   |
| TOTAL ENERGIES    | BIONEPTAN HT 100                  |

**Note**

It should be applied the suitable material of seal ring for Environmental Acceptable Lubricants. Please inform us if you apply it.

<The end>

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| <b>TCT TYPE THRUSTER RECOMMEND OIL</b> |
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**[ Mineral Oil ]**

| MAKER                | NAME                             |
|----------------------|----------------------------------|
| IDEMITSU KOUSAN      | DAPHNE SUPER GEAR OIL 68, 100    |
| KYGNUS SEKIYU        | GEAR OIL ML 68, 100              |
| ENEOS                | BONNOC TS 68, 100                |
| COSMO OIL LUBRICANTS | COSMO GEAR SE 68, 100            |
| SHELL                | SHELL OMALA S2 G 68, 100         |
| EXXONMOBIL           | MOBILGEAR 600 XP 68, 100         |
| BP                   | ENERGOL GR-XP 68, 100            |
| CASTROL              | ALPHA SP 68, 100                 |
| TOTAL ENERGIES       | CARTER EP 68, 100                |
| CHEVRON              | CHEVRON GEAR COMPOUND EP 68, 100 |
| GULF MARINE          | GULFSEA GEAR OIL 68              |
| LENOL                | RENOLIN CLP 68, 100              |

**[ Environmental Acceptable Lubricant (EAL) ]**

| MAKER             | NAME                              |
|-------------------|-----------------------------------|
| CASTROL           | BIOTRANS GB 100 (68)              |
| CHEVRON           | CLARITY SYNTHETIC EA GEAR OIL 100 |
| EXXONMOBIL        | MOBIL SHC AWARE GEAR OIL 100 (68) |
| GULF MARINE       | GULFSEA BD GEAR OIL 100 (68)      |
| KLUBER            | KLUBERBIO EG2-100 (68)            |
| LENOL             | PLANTOGEAR 100S                   |
| SHELL             | NATURELLE S4 GEAR FLUID 100 (68)  |
| RSC BIO SOLUTIONS | RSC ENVIRO LOGIC GO 100           |
| VICKERS OILS      | BIOGEAR XP 100 (68)               |
| PANOLIN           | MARGEAR 100                       |
| KAJO              | KAJO-BIO-GEAR OIL 100             |
| NOF CORPORATION   | MILLUBE ST-100U                   |
| TOTAL ENERGIES    | BIONEPTAN HT 100                  |

**Note**

It should be applied the suitable material of seal ring for Environmental Acceptable Lubricants. Please inform us if you apply it.

Regarding the oil viscosity, it should be selected by the supposed condition (ambient temperature and running time). For EAL, the oil viscosity VG100 is as the first recommendation. <THE END>

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| <b>TC-N TYPE RECOMMEND HYDRAULIC OIL</b> |
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**【 Mineral Oil 】**

| MAKER                | NAME  |
|----------------------|---|
| IDEMITSU KOUSAN      | DAPHNE SUPER HYDRO A 32 (46)                  |
| KYGNUS SEKIYU        | UNIT OIL WR 32 (46)                           |
| ENEOS                | SUPER HYRANDO 32 (46)                         |
| COSMO OIL LUBRICANTS | COSMO HYDRO AW 32 (46)                        |
| SHELL                | SHELL TELLUS OIL 32 (46)                      |
| EXXONMOBIL           | MOBIL DTE 10 EXCEL 32(46) or MOBIL DTE 24(25) |
| BP                   | ENERGOL SHF-HV 32 (46)                        |
| CASTROL              | HYSPIN AWH-M 32 (46) or BIOBAR 32 (46)        |
| TOTAL ENERGIES       | AZOLLA ZS 32 (46)                             |
| CHEVRON              | CHEVRON CLARITY HYDRAULIC OIL AW 32 (46)      |

**【 Environmental Acceptable Lubricant (EAL) 】**

| MAKER             | NAME   |
|-------------------|--|
| CASTROL           | BIOBAR 32(46)  |
| PANOLIN           | ATLANTIS N32   |
| EXXONMOBIL        | MOBIL SHC AWARE H32(46) or<br>MOBIL SHC AWARE HS32(46) |
| SHELL             | NATURELLE HF-E 46                                      |
| RSC BIO SOLUTIONS | Futerra HF 32(46)                                      |
| VICKERS OILS      | ECOSURE HSE32(46) or ECOSURE EAF32(46)                 |

**Note**

Regarding the oil viscosity, it should be selected by the supposed condition (ambient temperature and running time).

<The end>

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| <b>TC-N/TFN/TFT/NT-F TYPE RECOMMEND LUBRICATION OIL</b> |
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**【 Mineral Oil 】** Gear Oil

| MAKER                | NAME                               |
|----------------------|------------------------------------|
| IDEMITSU KOUSAN      | DAPHNE SUPER GEAR OIL 150 (100)    |
| KYGNUS SEKIYU        | GEAR OIL ML 150 (ML 100)           |
| ENEOS                | BONNOC TS 150 (TS 100)             |
| COSMO OIL LUBRICANTS | COSMO GEAR SE 150 (100)            |
| SHELL                | SHELL OMALA S2 G 150 (100)         |
| EXXONMOBIL           | MOBILGEAR 600 XP 150 (100)         |
| BP                   | ENERGOL GR-XP 150 (100)            |
| CASTROL              | ALPHA SP 150 (100)                 |
| TOTAL ENERGIES       | CARTER EP 150 (100)                |
| CHEVRON              | CHEVRON GEAR COMPOUND EP 150 (100) |
| LENOL                | RENOLIN CLP 100                    |

**【 Environmental Acceptable Lubricant (EAL) 】** Gear Oil

| MAKER             | NAME                               |
|-------------------|------------------------------------|
| CASTROL           | <b>BIOTRANS GB 150 (100)</b>       |
| CHEVRON           | CLARITY SYNTHETIC EA GEAR OIL 100  |
| EXXONMOBIL        | MOBIL SHC AWARE GEAR OIL 150 (100) |
| GULF MARINE       | GULFSEA BD GEAR OIL 150 (100)      |
| KLUBER            | KLUBERBIO EG2-150 (100)            |
| LENOL             | PLANTOGEAR 150S (100S)             |
| SHELL             | NATURELLE S4 GEAR FLUID 150 (100)  |
| RSC BIO SOLUTIONS | RSC ENVIRO LOGIC GO 150 (100)      |
| VICKERS OILS      | BIOGEAR XP 150 (100)               |
| PANOLIN           | MARGEAR 100                        |
| KAJO              | KAJO-BIO-GEAR OIL 100              |
| NOF CORPORATION   | MILLUBE ST-150U (100U)             |
| TOTAL ENERGIES    | BIONEPTAN HT 100                   |

**Note**

It should be applied the suitable material of seal ring for Environmental Acceptable Lubricants. Please ask NAKASHIMA PROPELLER for combination before use on your thruster.

Regarding the oil viscosity, it should be selected by the supposed condition (ambient temperature and running time). <The end>

**TUNNEL THRUSTER RECOMMEND GREASE**

| <b>MAKER</b>         | <b>NAME</b>                        |
|----------------------|------------------------------------|
| IDEMITSU KOUSAN      | DAPHNE EPONEX SR No.2              |
| ENEOS                | EPNOC GREASE AP (N) 2              |
| COSMO OIL LUBRICANTS | DYNAMAX EP2                        |
| SHELL                | SHELL ALVANIA EP GREASE 2          |
| EXXONMOBIL           | MOBILGREASE XHP 222 or MOBILUX EP2 |
| BP                   | ENERGREASE MP-MG 2                 |
| CASTROL              | SPHEEROL SX2                       |
| TOTAL ENERGIES       | MULTIS EP2                         |

&lt;The end&gt;