# Supplier Approval

**SEW drives of the series**
**X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..**
**Lubricant approvals – latest version at: www.sew-eurodrive.de/lubricants**



Change information:

| **Chap./page** | **Description** (changes to the previous edition) | **Modification no.** |
|---|---|---|
| Entire document | Editorial revision | 260801 |
| 1.1/3 | Revision of the definition CLP HC | |
| 1.2/4 | Adjustment of the explanation for the individual lubricants | |
| 1.5/7 | Revision of the approved oil seals | |
| 1.5/7 | Revision of the chapter | |
| 2/8-10 | Separation of the gear unit series: Industrial gear units X series<br>Revision of the tables | |
| 3/10-13 | Separation of the gear unit series: Industrial gear units P series<br>Revision of the tables | |
| 4/14 | Revision of the chapter | |
| 4/14 | New lubricant: Deutsche Ölwerke Lubmin GmbH – Aveno Gear Ultimate FLD | |
| 4/14 | New lubricant: Gulf Oil Geartek SHD | |
| 4/14 | New lubricant: Ravensberger Schmierstoffvertrieb GmbH – Ravenol Synthetic Wind Turbines SWT | |

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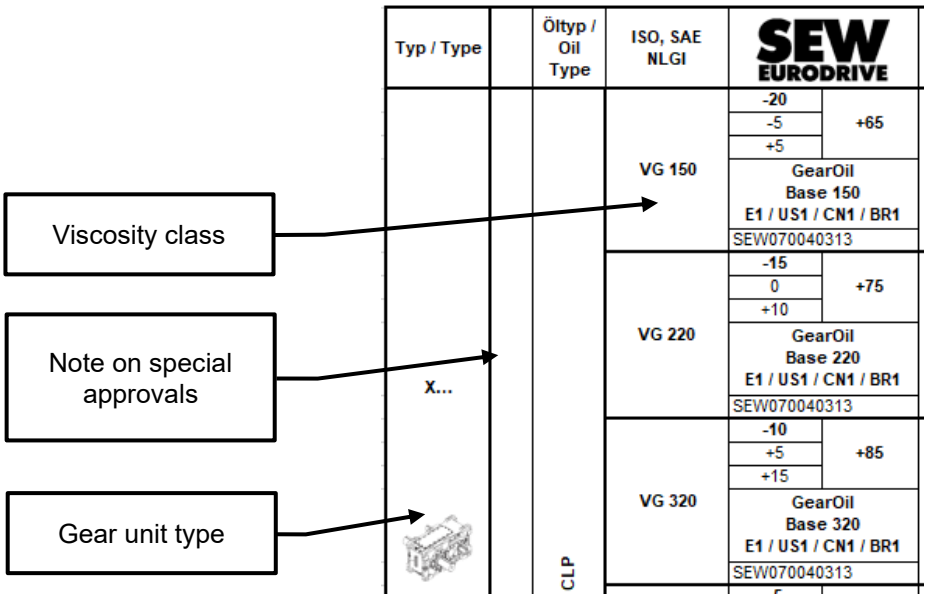
## 1 Introduction/area of application

The present document describes the approved lubricants for SEW-EURODRIVE industrial gear units (helical gear units, bevel gear units and planetary gear units). The approvals are valid worldwide.
SEW accepts no liability if different lubricants are used in the gear units and/or they are used outside of the recommended temperature ranges.
Lubricants for industrial gear units are subject to approval. The approval will be made according to the document "Supplier approval for qualification and approval of lubricants – gear unit oils" 07004__13 in its current version.
The responsibility for the consistent quality of the lubricants lies with the respective manufacturer.

**INFORMATION:** Printed documents may not include the latest changes. For the latest version of this document, refer to https://www.sew-eurodrive.de/lubricants.

### 1.1 Explanation of the structure of the tables and abbreviations




**Abbreviations:**

| | |
|---|---|
| | Mineral lubricant |
| | Synthetic lubricant |
| **CLP** | Mineral oil |
| **CLP HC** | Polyalphaolefins (PAO) and related hydrocarbons with comparable technical properties. Base oils with the code letter PR according to DIN 51502-2. |
| **E** | Ester-based lubricant |
| | Lubricant for the food processing industry and feed industry.<br>Oils are NSF-H1 registered and compliant according to FDA 21 CFR § 178.3570. |
| | Lubricants with slight bio-degradability for environmentally sensitive areas<br>(> 60% according to OECD 301 or according to appendix A of EPA 2013 VGP). |
| **RWDR** | Radial oil seal |
| **SPC** | **S**pecial **p**roduct **c**lassification<br>Note safety data sheet for product classification – requires special procedures |

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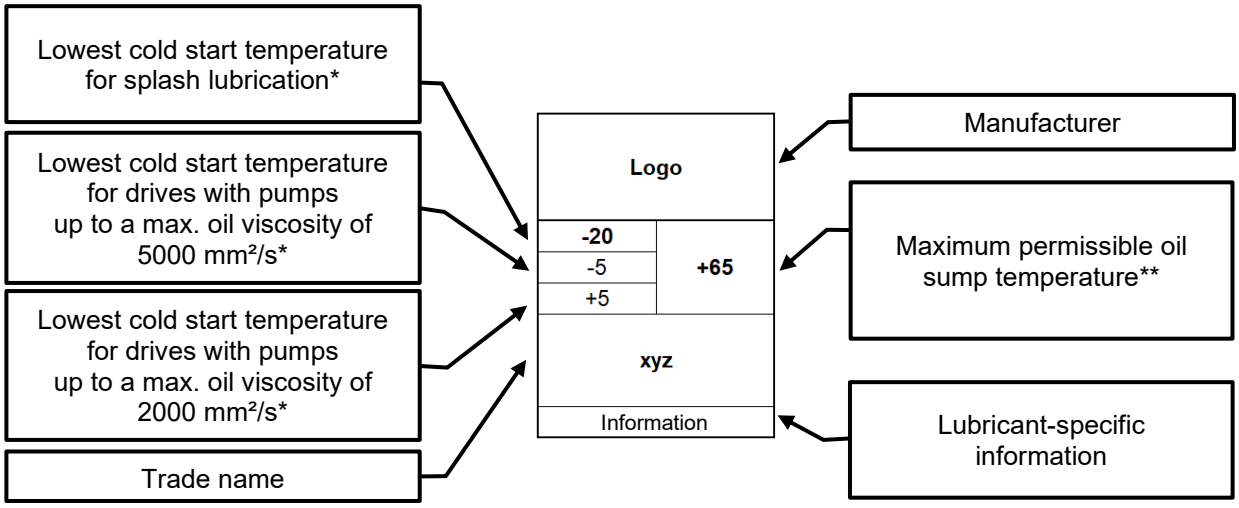
## 1.2 Explanations of the various lubricants

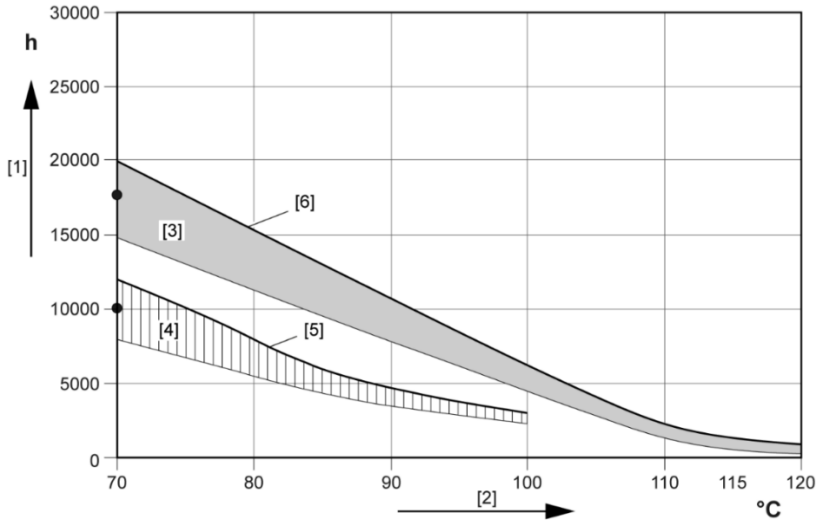
The minimum and maximum permitted oil sump temperature depends on the lubricant used and serves as a coarse preselection. If the actually measured or configured oil temperature in your drive is outside the specified limits, contact SEW-EURODRIVE.




* In case of low temperatures, the oil must be heated to the specified minimum temperature, for example, by using an oil heater. The maximum permitted oil viscosity per pump type can be found in chapter 1.4.
** The service life will be considerably reduced when exceeded. Observe the lubricant change intervals according to chapter 1.3.

## 1.3 Lubricant change intervals

The following image depicts the change intervals for industrial gear units under normal ambient conditions. In case of special designs under severe/aggressive ambient conditions, change the lubricant more frequently.
**Notice:** Filling of wrong lubricant may lead to a loss of the lubricant properties and thus damage the gear unit. Do not mix synthetic lubricants and mineral lubricants. In general, the guideline FVA 606 must be adhered to.




[1] Operating hours
[2] Sustained oil bath temperature, average value per oil type at 70 °C
[3] CLP HC/CLP HC NSF H1
[4] CLP (CC)/E
[5] GearOil Base by SEW-EURODRIVE
[6] GearOil Synth (H1) by SEW-EURODRIVE

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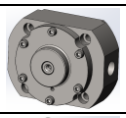
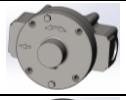
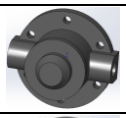
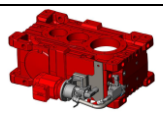
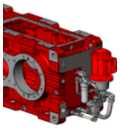
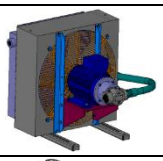
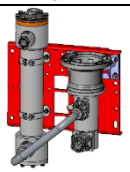
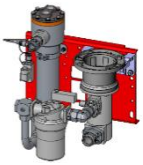
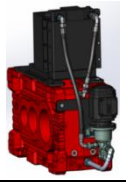
## 1.4 Explanation of the oil supply systems and their viscosity

| Type | Name | Supplier | Maximum oil viscosity [mm²/s] | Image | Comment |
|---|---|---|---|---|---|
| Shaft end pump for pressure lubrication | SEP | STOZ Pumpen nach Maß! | 5000 | | Flanged on the gear unit housing |
| Shaft end pump for pressure lubrication | SEP | Tuthill PUMP YOUR HEART INTO IT | 5000 | | Mounted inside the vertical agitator drive |
| Shaft end pump for pressure lubrication | SEP | RICKMEIER PUMPENTECHNOLOGIE | 5000 |  | Mounted inside the vertical agitator drive |
| Shaft end pump for pressure lubrication | SEP | RICKMEIER PUMPENTECHNOLOGIE | 5000 |  | Mounted inside the vertical agitator drive |
| Shaft end pump for pressure lubrication | SEP | NOP | 5000 |  | Mounted inside the vertical agitator drive |
| Shaft end pump for pressure lubrication | SEP | NOP | 5000 | | Mounted inside the vertical agitator drive |
| Motor pump for pressure lubrication | ONP1L | SEW EURODRIVE | 5000 |  | |
| Motor pump for pressure lubrication | ONP1 | SEW EURODRIVE | 5000 |  | |
| System for oil cooling by air | OAC | BÜHLER | 2000 |  | |
| System for oil cooling by water | OWC | UNIVERSAL HYDRAULIK<br>BÜHLER | 2000 |  | |
| Motor pump and heat exchanger for pressure lubrication and cooling by water | OWP | UNIVERSAL HYDRAULIK<br>BÜHLER | 2000 |  | |
| System for oil cooling by air | OAC1 | SEW EURODRIVE | 5000 |  | |

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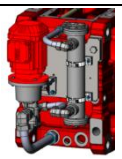
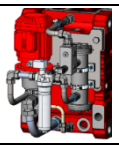
| | | | | | |
|---|---|---|---|---|---|
| Motor pump and heat exchanger for pressure lubrication and cooling by air | OAP1 | | 5000 | | |
| System for oil cooling by water | OWC1 | | 5000 |  | |
| Motor pump and heat exchanger for pressure lubrication and cooling by water | OWP1 | | 5000 |  | |

**Comment:** For the maximum permitted oil viscosity for oil supply systems that are not included in the table above, refer to the order documents or operating instructions or contact SEW-EURODRIVE if necessary.

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## 1.5 Lubricant compatibility with radial oil seals

The listed lubricants meet the minimum requirements for compatibility with radial oil seals according to SEW specification 97118__15.

**Permitted temperature range of the radial oil seals**

| Radial oil seal material class | Permitted oil sump temperature |
|---|---|
| NBR | -40°C ... +80°C |
| FKM | -25°C ... +115°C |
| FKM-PSS | -25°C ... +115°C |

In the low temperature range, radial oil seals can withstand shaft deflections (e.g. through overhung load) only to a limited extent. Especially avoid or limit pulsating or changing radial displacements of the shaft. Please contact SEW-EURODRIVE if required.

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## 2 Industrial gear units X series (X.e / M1..N / ML..2 / MC..)

**Comment:** Lubricant recommendations also apply to older or discontinued SEW industrial gear unit series.

| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | Castrol | FUCHS | KLÜBER LUBRICATION | Mobil | Shell | SINOPEC | TotalEnergies |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IG-X | | CLP | VG 150 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | -20 / -5 / +5 … +80 | |
| | | | | GearOil Base 150 E1 / US1 / CN1 / BR1 | Optigear BM 150 | Alpha SP 150 | Renolin CLP 150 Plus | Renolin HighGear 150 | Klüberoil GEM 1-150 N | Mobilgear 600 XP 150 | Shell Omala S2 GX Plus 150 | AP-SGO 150 | |
| | | | VG 220 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 | -15 / 0 / +10 … +90 |
| | | | | GearOil Base 220 E1 / US1 / CN1 / BR1 | Optigear BM 220 | Alpha SP 220 | Renolin CLP 220 Plus | Renolin HighGear 220 | Klüberoil GEM 1-220 N | Mobilgear 600 XP 220 | Shell Omala S2 GX Plus 220 | AP-SGO 220 | Carter EP 220 |
| | | | VG 320 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / +5 / +15 … +90 | -10 / 5 / +15 … +90 | -10 / 5 / +15 … +90 | -10 / +5 / +15 … +90 |
| | | | | GearOil Base 320 E1 / US1 / CN1 / BR1 | Optigear BM 320 | Alpha SP 320 | Renolin CLP 320 Plus | Renolin HighGear 320 | Klüberoil GEM 1-320 N | Mobilgear 600 XP 320 | Shell Omala S2 GX Plus 320 | AP-SGO 320 | Carter EP 320 |
| | | | VG 460 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 | -5 / +10 / +20 … +90 |
| | | | | GearOil Base 460 E1 / US1 / CN1 / BR1 | Optigear BM 460 | Alpha SP 460 | Renolin CLP 460 Plus | Renolin HighGear 460 | Klüberoil GEM 1-460 N | Mobilgear 600 XP 460 | Shell Omala S2 GX Plus 460 | AP-SGO 460 | Carter EP 460 |
| | | | VG 680 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 | 0 / +15 / +25 … +90 |
| | | | | GearOil Base 680 E1 / US1 / CN1 / BR1 | Optigear BM 680 | Alpha SP 680 | Renolin CLP 680 Plus | Renolin HighGear 680 | Klüberoil GEM 1-680 N | Mobilgear 600 XP 680 | Shell Omala S2 GX Plus 680 | AP-SGO 680 | Carter EP 680 |
| | | | VG 1000 | | +5 / +20 / +30 … +90 | | | | | | | | |
| | | | | | Optigear BM 1000 | | | | | | | | |

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

# Supplier Approval

**SEW drives of the series**

**X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..**

**Lubricant approvals – latest version at: www.sew-eurodrive.de/lubricants**



| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | Castrol | | FUCHS | KLÜBER LUBRICATION | Mobil | | Shell | TotalEnergies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IG-X | | CLP HC | VG 32 | | | | | | -40 -30 -25 / +45 / SHC 624 | | | |
| | | | VG 68 | | | | -35 -20 -10 / +65 / Renolin Unisyn CLP 68 | -35 -20 -10 / +65 / Klübersynth GEM 4-68 N | -40 -25 -15 / +70 / SHC 626 | | | |
| | | | VG 150 | -35 -15 -5 / +95 / GearOil Synth 150 E1 | -25 -10 0 / +85 / Alphasyn EP 150 | -30 -10 0 / +90 / Optigear Synthetic X 150 | -30 -10 0 / +90 / Renolin Unisyn CLP 150 | -25 -10 0 / +90 / Klübersynth GEM 4-150 N | -30 -10 0 / +90 / SHC 629 | -35 -15 -5 / +95 / SHC Gear 150 / SPC | -35 -15 0 / +90 / Shell Omala S4 GXV Plus 150 | -35 -15 -5 / +90 / Carter SH 150 |
| | | | VG 220 | -30 -10 0 / +105 / GearOil Synth 220 E1 | -25 -5 +5 / +100 / Alphasyn EP 220 | -25 -5 +5 / +100 / Optigear Synthetic X 220 | -25 -5 +5 / +100 / Renolin Unisyn CLP 220 | -25 -5 +5 / +100 / Klübersynth GEM 4-220 N | -25 -5 0 / +105 / SHC 630 | -30 -10 +5 / +105 / SHC Gear 220 / SPC | -30 -10 0 / +100 / Shell Omala S4 GXV Plus 220 | -25 -5 +5 / +100 / Carter SH 220 |
| | | | VG 320 | -25 -5 +5 / +110 / GearOil Synth 320 E1 | -20 0 +10 / +110 / Alphasyn EP 320 | -20 0 +10 / 110 / Optigear Synthetic X 320 | -20 0 +10 / +110 / Renolin Unisyn CLP 320 | -20 0 +10 / +110 / Klübersynth GEM 4-320 N | -20 0 +10 / +110 / SHC 632 | -25 -5 +10 / +110 / SHC Gear 320 / SPC | -25 0 +5 / +110 / Shell Omala S4 GXV Plus 320 | -20 0 +10 / +110 / Carter SH 320 |
| | | | VG 460 | -20 0 +15 / +110 / GearOil Synth 460 E1 | -15 +5 +15 / +110 / Alphasyn EP 460 | -15 +5 +15 / +110 / Optigear Synthetic X 460 | -15 +5 +15 / +110 / Renolin Unisyn CLP 460 | -15 +5 +20 / +110 / Klübersynth GEM 4-460 N | -15 +5 +15 / +110 / SHC 634 | -20 0 +15 / +110 / SHC Gear 460 / SPC | -20 0 +15 / +110 / Shell Omala S4 GXV Plus 460 | -15 +5 +15 / +110 / Carter SH 460 |
| | | | VG 680 | -15 +5 +20 / +110 / GearOil Synth 680 E1 | | -10 +10 +25 / +110 / Optigear Synthetic X 680 | -10 +10 +25 / +110 / Renolin Unisyn CLP 680 | -10 +10 +25 / +110 / Klübersynth GEM 4-680 N | -10 +10 +25 / +110 / SHC 636 | -15 +10 +25 / +110 / SHC Gear 680 / SPC | -15 +5 +20 / +110 / Shell Omala S4 GXV Plus 680 | -10 +10 +25 / +110 / Carter SH 680 |
| | | | VG 1000 | | | | | 0 +20 +30 / +110 / Klübersynth EG 4-1000 | -10 +15 +30 / +110 / SHC 639 | -10 +15 +30 / +110 / SHC Gear 1000 / SPC | | |

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | bremer & leguil | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|---|
| IG-X | | CLP HC NSF H1 [2] | VG 68 [1] | | -35 / -20 / -10 … +50<br>Cassida Fluid HF 68<br>SPC | -40 / -25 / -15 … +50<br>Optileb HY 68<br>SPC | -35 / -20 / -10 … +50<br>Cassida Fluid HF 68 | -35 / -20 / -10 … +50<br>Klüberoil 4UH1-68 N<br>SPC |
| | | | VG 220 [1] | -30 / -5 / 0 … +85<br>GearOil Synth 220 H1 E1<br>SPC | -20 / -5 / +5 … +80<br>Cassida Fluid GL 220<br>SPC | -25 / -5 / +5 … +85<br>Optileb GT 220<br>SPC | -20 / -5 / +5 … +80<br>Cassida Fluid GL 220 | -25 / -5 / +5 … +80<br>Klüberoil 4UH1-220 N<br>SPC |
| | | | VG 460 [1] | -20 / 0 / +15 … +110<br>GearOil Synth 460 H1 E1<br>SPC | -15 / +5 / +20 … +100<br>Cassida Fluid GL 460<br>SPC | -15 / +5 / +20 … +110<br>Optileb GT 460<br>SPC | -15 / +5 / +20 … +100<br>Cassida Fluid GL 460 | -15 / +5 / +15 … +105<br>Klüberoil 4UH1-460 N<br>SPC |
| | | | VG 680 [1] | | -10 / 10 / +25 … +110<br>Cassida Fluid GL 680 | | -10 / 10 / +25 … +110<br>Cassida Fluid GL 680 | -10 / 10 / 25 … +110<br>Klüberoil 4UH1-680 N<br>SPC |
| | | E | VG 320 | | | | -20 / 0 / +10 … +95<br>Plantogear 320 S | -20 / 0 / +10 … +95<br>Klüber Bio EG 2-320 |
| | | | VG 460 | | | | -15 / +5 / +15 … +105<br>Plantogear 460 S | |

**1) Lubricants must only be used if the service factor $F_s$ and peak load factor $F_F \geq 1.6$.**
**The peak output torque $MK2_{per}$ is limited as follows: $F_F \geq 1.6 \rightarrow M_{K2per} \leq 1.25 \times M_{N2}$ (nominal torque) $\rightarrow M_{K2per} \leq 2x\ M_{N2}/F_F = 2/1.6x\ M_{N2}$. In case of deviations, contact SEW-EURODRIVE.**

**2) NSF-H1 registered oils for the food processing industry can not be combined with the gear unit option "Extended storage" (a VCI anti-corrosion agent is added).**

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

## 3 Industrial gear units P series (P..2e / P..2 / XP.. / P-X.e / PPK..)

**Comment:** Lubricant recommendations also apply to older or discontinued SEW industrial gear unit series.

| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | Castrol | Castrol | FUCHS | FUCHS | KLÜBER LUBRICATION | Mobil | Shell | SINOPEC | TotalEnergies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IG-P | | CLP | VG 150 | -20 / -5 / +5 — +65<br>GearOil Base 150 E1 / US1 / CN1 / BR1 | -20 / -5 / +5 — +65<br>Optigear BM 150 | -20 / -5 / +5 — +65<br>Alpha SP 150 | -20 / -5 / +5 — +65<br>Renolin CLP 150 Plus | -20 / -5 / +5 — +65<br>Renolin HighGear 150 | -20 / -5 / +5 — +65<br>Klüberoil GEM 1-150 N | -20 / -5 / +5 — +65<br>Mobilgear 600 XP 150 | -20 / -5 / +5 — +65<br>Shell Omala S2 GX Plus 150 | -20 / -5 / +5 — +65<br>AP-SGO 150 | |
| | | | VG 220 | -15 / 0 / +10 — +75<br>GearOil Base 220 E1 / US1 / CN1 / BR1 | -15 / 0 / +10 — +75<br>Optigear BM 220 | -15 / 0 / +10 — +75<br>Alpha SP 220 | -15 / 0 / +10 — +75<br>Renolin CLP 220 Plus | -15 / 0 / +10 — +75<br>Renolin HighGear 220 | -15 / 0 / +10 — +75<br>Klüberoil GEM 1-220 N | -15 / 0 / +10 — +75<br>Mobilgear 600 XP 220 | -15 / 0 / +10 — +80<br>Shell Omala S2 GX Plus 220 | -15 / 0 / +10 — +75<br>AP-SGO 220 | -15 / 0 / +10 — +75<br>Carter EP 220 |
| | | | VG 320 | -10 / +5 / +15 — +85<br>GearOil Base 320 E1 / US1 / CN1 / BR1 | -10 / +5 / +15 — +85<br>Optigear BM 320 | -10 / +5 / +15 — +80<br>Alpha SP 320 | -10 / +5 / +15 — +80<br>Renolin CLP 320 Plus | -10 / +5 / +15 — +80<br>Renolin HighGear 320 | -10 / +5 / +15 — +80<br>Klüberoil GEM 1-320 N | -10 / +5 / +15 — +80<br>Mobilgear 600 XP 320 | -10 / 5 / +15 — +90<br>Shell Omala S2 GX Plus 320 | -10 / 5 / +15 — +80<br>AP-SGO 320 | -10 / +5 / +15 — +80<br>Carter EP 320 |
| | | | VG 460 | -5 / +10 / +20 — +90<br>GearOil Base 460 E1 / US1 / CN1 / BR1 | -5 / +10 / +20 — +90<br>Optigear BM 460 | -5 / +10 / +20 — +90<br>Alpha SP 460 | -5 / +10 / +20 — +90<br>Renolin CLP 460 Plus | -5 / +10 / +20 — +90<br>Renolin HighGear 460 | -5 / +10 / +20 — +90<br>Klüberoil GEM 1-460 N | -5 / +10 / +20 — +90<br>Mobilgear 600 XP 460 | -5 / +10 / +20 — +100<br>Shell Omala S2 GX Plus 460 | -5 / +10 / +20 — +90<br>AP-SGO 460 | -5 / +10 / +20 — +90<br>Carter EP 460 |
| | | | VG 680 | 0 / +15 / +25 — +90<br>GearOil Base 680 E1 / US1 / CN1 / BR1 | 0 / +15 / +25 — +90<br>Optigear BM 680 | 0 / +15 / +25 — +90<br>Alpha SP 680 | 0 / +15 / +25 — +90<br>Renolin CLP 680 Plus | 0 / +15 / +25 — +90<br>Renolin HighGear 680 | 0 / +15 / +25 — +90<br>Klüberoil GEM 1-680 N | 0 / +15 / +25 — +90<br>Mobilgear 600 XP 680 | 0 / +15 / +25 — +110<br>Shell Omala S2 GX Plus 680 | 0 / +15 / +25 — +90<br>AP-SGO 680 | 0 / +15 / +25 — +90<br>Carter EP 680 |
| | | | VG 1000 | | +5 / +20 / +30 — +90<br>Optigear BM 1000 | | | | | | | | |

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

# Supplier Approval

**SEW drives of the series**

**X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..**

**Lubricant approvals – latest version at: www.sew-eurodrive.de/lubricants**



| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | Castrol | | FUCHS | KLÜBER LUBRICATION | Mobil | | Shell | TotalEnergies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IG-P | | CLP HC | VG 32 | | | | | | -40 / -30 / -25 +30 SHC 624 | | | |
| | | | VG 68 | | | | -35 / -20 / -10 +50 Renolin Unisyn CLP 68 | -35 / -20 / -10 +50 Klübersynth GEM 4-68 N | -40 / -25 / -15 +50 SHC 626 | | | |
| | | | VG 150 | -35 / -15 / -5 +75 GearOil Synth 150 E1 | -25 / -10 / 0 +70 Alphasyn EP 150 | -30 / -10 / 0 +70 Optigear Synthetic X 150 | -30 / -10 / 0 +70 Renolin Unisyn CLP 150 | -25 / -10 / 0 +70 Klübersynth GEM 4-150 N | -30 / -10 / 0 +75 SHC 629 | -35 / -15 / -5 +75 SHC Gear 150 SPC | -35 / -15 / 0 +75 Shell Omala S4 GXV Plus 150 | -35 / -15 / -5 +75 Carter SH 150 |
| | | | VG 220 | -30 / -10 / 0 +85 GearOil Synth 220 E1 | -25 / -5 / +5 +80 Alphasyn EP 220 | -25 / -5 / +5 +80 Optigear Synthetic X 220 | -25 / -5 / +5 +80 Renolin Unisyn CLP 220 | -25 / -5 / +5 +80 Klübersynth GEM 4-220 N | -25 / -5 / 0 +85 SHC 630 | -30 / -10 / +5 +85 SHC Gear 220 SPC | -30 / -10 / 0 +80 Shell Omala S4 GXV Plus 220 | -25 / -5 / +5 +80 Carter SH 220 |
| | | | VG 320 | -25 / -5 / +5 +100 GearOil Synth 320 E1 | -20 / 0 / +10 +90 Alphasyn EP 320 | -20 / 0 / +10 +90 Optigear Synthetic X 320 | -20 / 0 / +10 +90 Renolin Unisyn CLP 320 | -20 / 0 / +10 +95 Klübersynth GEM 4-320 N | -20 / 0 / +10 +95 SHC 632 | -25 / -5 / +10 +100 SHC Gear 320 SPC | -25 / 0 / +5 +90 Shell Omala S4 GXV Plus 320 | -20 / 0 / +10 +90 Carter SH 320 |
| | | | VG 460 | -20 / 0 / +15 +110 GearOil Synth 460 E1 | -15 / +5 / +15 +100 Alphasyn EP 460 | -15 / +5 / +15 +100 Optigear Synthetic X 460 | -15 / +5 / +15 +100 Renolin Unisyn CLP 460 | -15 / +5 / +20 +105 Klübersynth GEM 4-460 N | -15 / +5 / +15 +105 SHC 634 | -20 / 0 / +15 +110 SHC Gear 460 SPC | -20 / 0 / +15 +100 Shell Omala S4 GXV Plus 460 | -15 / +5 / +15 +100 Carter SH 460 |
| | | | VG 680 | -15 / +5 / +20 +110 GearOil Synth 680 E1 | | -10 / +10 / +25 +110 Optigear Synthetic X 680 | -10 / +10 / +25 +110 Renolin Unisyn CLP 680 | -10 / +10 / +25 +110 Klübersynth GEM 4-680 N | -10 / +10 / +25 +110 SHC 636 | -15 / +10 / +25 +110 SHC Gear 680 SPC | -15 / +5 / +20 +110 Shell Omala S4 GXV Plus 680 | -10 / +10 / +25 +110 Carter SH 680 |
| | | | VG 1000 | | | | | 0 / +20 / +30 +110 Klübersynth EG 4-1000 | -10 / +15 / +30 +110 SHC 639 | -10 / +15 / +30 +110 SHC Gear 1000 SPC | | |

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

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# Supplier Approval

**SEW drives of the series**
**X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..**
**Lubricant approvals – latest version at: www.sew-eurodrive.de/lubricants**

| Typ / Type | | Öltyp / Oil Type | ISO, SAE NLGI | SEW EURODRIVE | bremer & leguil | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|---|
| IG-P | | CLP HC NSF H1 [2] | VG 68 [1] | | -35 / -20 / -10 … +45 | -40 / -25 / -15 … +45 | -35 / -20 / -10 … +45 | -35 / -20 / -10 … +45 |
| | | | | | Cassida Fluid HF 68 | Optileb HY 68 | Cassida Fluid HF 68 | Klüberoil 4UH1-68 N |
| | | | | | | SPC | | SPC |
| | | | VG 220 [1] | -30 / -5 / 0 … +80 | -25 / -5 / +5 … +75 | -25 / -5 / +5 … +75 | -25 / -5 / +5 … +75 | -25 / -5 / +5 … +75 |
| | | | | GearOil Synth 220 H1 E1 | Cassida Fluid GL 220 | Optileb GT 220 | Cassida Fluid GL 220 | Klüberoil 4UH1-220 N |
| | | | | SPC | | SPC | | SPC |
| | | | VG 460 [1] | -20 / 0 / +15 … +100 | -15 / +5 / +20 … +90 | -15 / +5 / +20 … +95 | -15 / +5 / +20 … +90 | -15 / +5 / +15 … +95 |
| | | | | GearOil Synth 460 H1 E1 | Cassida Fluid GL 460 | Optileb GT 460 | Cassida Fluid GL 460 | Klüberoil 4UH1-460 N |
| | | | | SPC | | SPC | | SPC |
| | | | VG 680 [1] | | -10 / 10 / +25 … +105 | | -10 / 10 / +25 … +105 | -10 / 10 / 25 … +110 |
| | | | | | Cassida Fluid GL 680 | | Cassida Fluid GL 680 | Klüberoil 4UH1-680 N |
| | | | | | | | | SPC |
| | | E | VG 320 | | | | -20 / 0 / +10 … +85 | -20 / 0 / +10 … +85 |
| | | | | | | | Plantogear 320 S | Klüber Bio EG 2-320 |
| | | | VG 460 | | | | -15 / +5 / +15 … +95 | |
| | | | | | | | Plantogear 460 S | |

**1) Lubricants must only be used if the service factor $F_S$ and peak load factor $F_F \geq 1.6$.**
**The peak output torque $MK2_{per}$ is limited as follows: $F_F \geq 1.6 \rightarrow M_{K2per} \leq 1.25 \times M_{N2}$ (nominal torque) $\rightarrow M_{K2per} \leq 2x\ M_{N2}/F_F = 2/1.6x\ M_{N2}$. In case of deviations, contact SEW-EURODRIVE.**

**2) NSF-H1 registered oils for the food processing industry can not be combined with the gear unit option "Extended storage" (a VCI anti-corrosion agent is added).**

**NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.**

## 4 Other approved lubricants

The lubricants listed below meet the SEW requirements according to SEW specification 07004__13 for use in industrial gear units of the X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK.. series, they are, however, not available as initial filling ex works.
The responsibility for the consistent quality of the lubricants lies with the respective manufacturer.

The maximum permitted oil bath temperatures must not be exceeded.
The viscosity temperature behavior can vary greatly depending on the selected lubricant product.
The minimum and maximum permissible operating viscosities must be observed. Please contact SEW-EURODRIVE for this.

| **Oil type** | **Manufacturer** – product name | **Viscosity** |
|---|---|---|
| **CLP (mineral)**<br>Max. oil bath temperature 80 °C (90 °C for a short time) | **Total Energies** – Carter EP | VG150, VG1000 |
| **CLP HC (Polyalphaolefins and related hydrocarbons)**<br>Max. oil bath temperature 100 °C (short-term 110 °C) | **Chevron / Texaco / Caltex** – Meropa EliteSyn XM | VG150 – VG680 |
| | **Deutsche Ölwerke Lubmin GmbH** – Aveno Gear Ultimate FLD | VG150 – VG680 |
| | **Gulf Oil** – Geartek SHD | VG150 – VG680 |
| | **Hindustan Petroleum Corporation Limited** – Parthan SL | VG220 – VG460 |
| | **Klüber Lubrication** – Klübersynth MEG-4 | VG150 – VG680 |
| | **PetroChina Lubricant Company** – KunLun KPM/S Synthetic Heavy-duty Industrial Gear Oil | VG150 – VG680 |
| | **Petro Canada** Enduratex Synthetic EP series | VG150 – VG680 |
| | **Ravensberger Schmierstoffvertrieb GmbH** – Ravenol Synthetic Wind Turbines SWT | VG150 – VG680 |
| | **Sinopec** – AP-S Industrial Gear Oil | VG150 – VG680 |
| | **Total Energies** – Carter SY | VG1000 |

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