



8 Design and Operating Notes

8.1 Guideline for oil selection

General

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives without oil fill.



It is therefore necessary to fill the gear unit with the correct type and quantity of oil before taking it into operation. The required information is indicated on the gear unit nameplate.

The required type and quantity of the gear unit oil depends on the following:

- gear unit size and type
- gear unit design (MC..L., MC...V., MC...E) and housing orientation (M1...M6)
- oil operating temperature, which depends on
 - transmitted power
 - ambient temperature
 - lubrication type (splash, bath or pressure lubrication)
 - additional cooling methods
- minimum temperature at cold start

In addition to the required viscosity, the oil must meet the following criteria:

- High viscosity index
- Must contain anti-wear, anti-rust, anti-oxidant and anti-foam additives
- Must also contain pressure-resistant additives (EP additives)

If synthetic oils are selected due to operating temperatures or oil change intervals, SEW-EURODRIVE recommends polyalphaolefin-based (PAO) oil.

Mineral oils

Standards

Lubricating oils are grouped in ISO VG viscosity classes according to the ISO 3448 and DIN 51519 standards.

ISO class	ISO 6743-6 designation	DIN 51517-3 designation	AGMA 9005-D94 designation
220	ISO-L-CKC 220	DIN 51517-CLP 220	AGMA 5 EP
460	ISO-L-CKC 460	DIN 51517-CLP 460	AGMA 7 EP



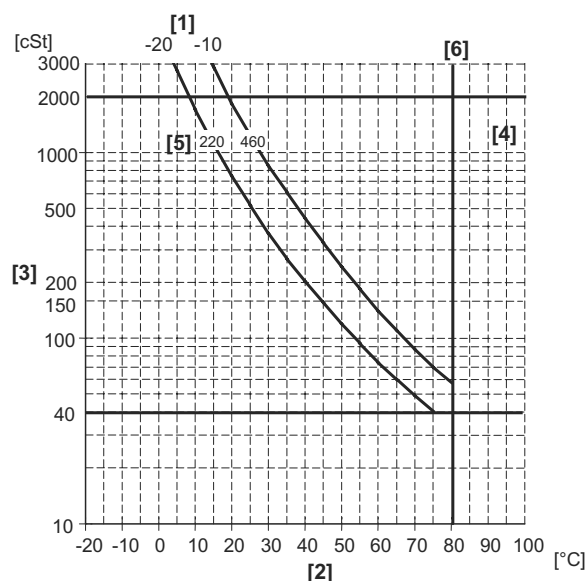
Selecting viscosity of mineral oils

Lubrication method	Ambient temperature	Mineral ISO VG
<ul style="list-style-type: none"> Bath lubrication Splash lubrication Pressure lubrication with oil heater and cooler 	-15...+20 °C	220
<ul style="list-style-type: none"> Bath lubrication Splash lubrication Pressure lubrication with oil heater and cooler 	-5...+40 °C	460
<ul style="list-style-type: none"> Pressure lubrication with cooler 	+10...+20 °C	220
<ul style="list-style-type: none"> Pressure lubrication without cooler 	+20...+40 °C	460



Pressure lubrication with or without cooler requires that the situation at cold start is checked! When using an oil pump (pressure lubrication), the starting viscosity must be below 2000 cSt (see following figure).

Use an oil heater if necessary.



[1] Pour point [°C]

[2] Gear unit's operating temperature of oil [°C]

[3] Viscosity [cSt]

[4] Viscosity index VI = 90...100

[5] ISO VG

[6] Temperature limitation 80°C



Observe the max. running temperature of the gear unit. The max allowed running temperature is 70°C (long running temp) for ISO VG 220, and 80°C for ISO VG 460. 90°C are permitted for short periods.

When needed, a cooling device must be used (fan, water/air cooling) or the oil changing interval must be shortened (see chapter "Lubrication change interval" in the operating instructions).



Design and Operating Notes

Guideline for oil selection

Selecting oil type of mineral oils

Select the oil type according to the required viscosity from the table in chapter "8.2 Lubricants."

Synthetic oils

Standard

Lubricating oils are grouped in ISO VG viscosity classes according to the ISO 3448 and DIN 51519 standards.

ISO-L-CKT 460	ISO 6743-6 designation
220	ISO-L-CKT 220
320	ISO-L-CKT 320
460	ISO-L-CKT 460

Minimum requirements are the same as for mineral oils

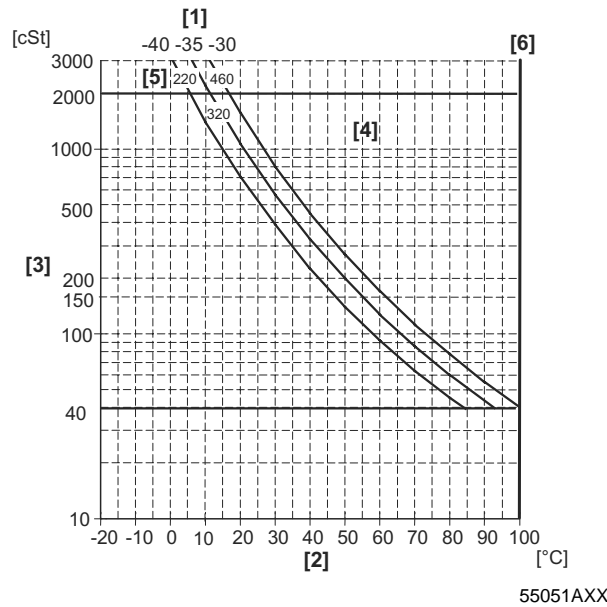
Selecting viscosity of synthetic oils

Lubrication method	Ambient temperature	Synthetic ISO VG
<ul style="list-style-type: none"> Bath lubrication Splash lubrication Pressure lubrication with oil heater and cooler 	-35...+30 °C	220
<ul style="list-style-type: none"> Bath lubrication Splash lubrication Pressure lubrication with oil heater and cooler 	-30...+40 °C	320
<ul style="list-style-type: none"> Bath lubrication Splash lubrication Pressure lubrication with oil heater and without cooler 	-25...+50 °C	460
<ul style="list-style-type: none"> Pressure lubrication with cooler 	+5...+30 °C	220
<ul style="list-style-type: none"> Pressure lubrication with cooler 	+10...+40 °C	320
<ul style="list-style-type: none"> Pressure lubrication without cooler 	+15...+50 °C	460



Pressure lubrication with or without cooler requires that the situation at cold start is checked! When using an oil pump (pressure lubrication), the starting viscosity must be below 2000 cSt (see following figure).

Use an oil heater if necessary.



- [1] Pour point [°C]
- [2] Gear unit's operating temperature of oil [°C]
- [3] Viscosity [cSt]
- [4] Viscosity index VI = 140...180
- [5] ISO VG
- [6] Temperature limitation 100°C



Observe the max. running temperature of the gear unit. The max allowed running temperature is 70°C (long running temp) for ISO VG 220, and 80°C for ISO VG 460. 90°C are allowed for short periods.

When needed, a cooling device must be used (fan, water/air cooling) or the oil changing interval must be shortened (see chapter "Lubrication change interval" in the operating instructions).

Selecting oil type
of synthetic oils

Select the oil type according to the required viscosity from the table in chapter "8.2 Lubricants".



8.2 Lubricants

General Information


The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Please note the following key to the lubricant table.


Key to the lubricant table

Abbreviations and meaning of shading and notes:

CLP = Mineral oil

CLP PAO = Synthetic polyalphaolefin

 = Synthetic lubricant (= synthetic anti-friction bearing grease)

 = Mineral lubricant (= mineral-based anti-friction bearing grease)

1) = Ambient temperature



= please contact SEW-EURODRIVE



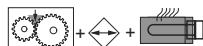
= Lubrication and cooling



= Splash lubrication



= Bath lubrication



= Pressure lubrication with cooler and oil heater



= Pressure lubrication with cooler (without oil heater)



Lubricant table

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					ISO VG class	Mobil®									
MC..P 		-35 +5		CLP PAO	VG 220	Mobilgear XMP220	Omala Oil HD 220	Klüber GEM 1-220N	Degol BG Plus 220	BP Energol GX-XF 220	Meropa 220	Renolin Unisyn CLP 220	Q8 ELGRECO 220	Alphamax 220 Tribol 1710/ 220 Optigear BM 220	Carter SH 220
		-30 +10		CLP PAO	VG 320	Mobilgear XMP320	Omala Oil F320	Klüber GEM 1-320N	Degol BG Plus 320	BP Energol GX-XF 320	Meropa 320	Renolin CLP320Plus	Q8 Goya NT 320	Alphamax 320 Tribol 1100 / 320 Optigear BM 320	Carter SH 320
MC..R 		-20 +15		CLP PAO	VG 460	Mobilgear XMP460	Omala Oil HD 460	Klüber GEM 1-460N	Degol BG Plus 460	BP Energol GX-XF 460	Meropa 460	Renolin CLP460Plus	Q8 Goya NT 460	Alphamax 460 Tribol 1100 / 460 Optigear BM 460	Carter SH 460
		-30 +10		CLP PAO	VG 680	Mobilgear XMP680	Omala Oil HD 680	Klüber GEM 1-680N	Degol BG Plus 680	BP Energol GX-XF 680	Meropa 680	Renolin CLP680	Q8 Goya NT 680	Alphamax 680 Tribol 1100 / 680 Optigear BM 680	Carter SH 680



8.3 Sealing grease

SEW-EURODRIVE recommends the grease types listed in below table for operating temperatures from – 30°C to +100°C.

Company	Oil
Aral	Aralub HLP2
BP	Energrease LS-EPS
Castrol	Spheerol EPL2
Chevron	Dura-Lith EP2
Elf	Epexa EP2
Esso	Beacon EP2
Exxon	Beacon EP2
Gulf	Gulf crown Grease 2
Klüber	Centoplex EP2
Kuwait	Q8 Rembrandt EP2
Mobil	Mobilux EP2
Molub	Alloy BRB-572
Optimol	Olista Longtime 2
Shell	Alvania EP2
Texaco	Multifak EP2
Total	Multis EP2
Tribol	Tribol 3030-2



8.4 Fastening of gear units

Not included in the scope of delivery:

- Wrench set
- Torque wrench (for shrink discs)
- Mounting device
- Shims and spacing rings if necessary
- Fasteners for input and output elements
- Lubricant (e.g. NOCO[®] fluid from SEW-EURODRIVE)
- For hollow shaft gear units (→ Sec. "Mounting/removal of hollow shaft gear units with keyed connection): Threaded rod, nut (DIN 934), retaining screw, ejector screw
- Securing components for the gear unit foundation

Installation tolerances

Shaft end	Flanges
Diametric tolerance in accordance with DIN 748 <ul style="list-style-type: none"> • ISO k6 for solid shafts with $\varnothing \leq 50$ mm • ISO m6 for solid shafts with $\varnothing > 50$ mm • ISO H7 for hollow shafts for shrink disc • ISO H8 for hollow shafts with keyway • Center hole in accordance with DIN 332, shape DS.. 	Centering shoulder tolerance: <ul style="list-style-type: none"> • ISO js7 / H8

Tightening torques

Gear unit size	Screw / nut	Tightening torque screw / nut [Nm]
02	M20	315
03		
04	M24	540
05		
06	M30	1090
07		
08	M36	1900
09		