

## Approved List of Lubricants

For Cone Drive Double Enveloping Worm Speed Reducers & Gearsets

MANUFACTURER	AGMA #7S SYNTHETIC (ISO Viscosity Grade 460) <sup>5</sup>			Food Grade (Note 3)
	BRAND NAME	POUR POINT °F (°C)	KIN. VISCOSITY cSt @ 100°C	
Chevron	Chevron Clarity Synthetic Machine Oil	-33 (-36)	46.1	
Exxon Mobil Oil Corp.	Mobil SHC 634 Synthetic Lubricant	-40 (-40)	46.5	
Exxon Mobil Oil Corp.	Mobil Glygoyle 460 (Note 6)	-27 (-33)	77.2	X
Exxon Mobil Oil Corp.	Mobil SHC Cibus 460	-44 (-42)	43.6	X
Total Lubricants	Carter SE 460	-40 (-40)	49.6	
Kluber Lubrication	Kluberoil 4 UH1 460 N	-22 (-30)	47.0	X
Royal Purple, Ltd.	Thermyl-Glyde Worm Gear 680 (Note 4)	-27 (-33)	43.0	
Shell	Shell Morlina S4 B	-44 (-42)	45.5	

MANUFACTURER	AGMA #8 COMPOUND (NON-E.P.) (ISO Viscosity Grade 680)			AGMA #8A COMPOUND (NON-E.P.) (ISO Viscosity Grade 1000)			Food Grade (Note 3)
	BRAND NAME	POUR POINT °F (°C)	KIN. VISCOSITY cSt @ 100°C	BRAND NAME	POUR POINT °F (°C)	KIN. VISCOSITY cSt @ 100°C	
BP Oil NOT AVAILABLE IN THE U.S.				Energol DC-C 1000	21 (-6)	45.3	
<b>Bel-Ray Company</b>	HP Worm Gear Oil		37.2				
Bel-Ray Company	No-Tox HD Oil 680	9 (-13)	50.2	No-Tox HD Oil 1000	9 (-13)	66.8	X
Chevron	Cylinder Oil W-ISO #680	10 (-12)	39.3				
<b>Citgo</b>	Cylinder Oil #680-7	5 (-15)	40				
Castrol	Worm Gear Oil #680	-7 (20)	37	Worm Gear Oil #1000	-7 (20)	45.5	
<b>Imperial</b>	Cylesstic TK 680	-7 (20)	37.8	Cylesstic TK 1000	-1 (30)	46.7	
Total Lubricants	Cylan WG 680	-7 (20)	36				
<b>Fiske Brothers Refining</b>				Lubriplate CP-8A	35 (2)	47	
<b>Fiske Brothers Refining</b>	Lubriplate SPO-288	10 (-12)	38				
<b>Imperial/Esso Oil</b>	Cylessso TK 680	-7 (20)	37.8				
<b>Lubrication Engineers</b>	680 Almasol	-6 (-21)	48.3				
<b>Mobil Oil</b>	Extra Hecla Super Cylinder Oil	32 (0)	35.8	Extra Hecla Super Cylinder Oil Mineral	37 (3)	43.0	
Schaeffer Manufacturing	#147 Steam Cylinder Oil	-10 (-12)	27-30				
<b>Shell Oil</b>	Valvata J-680	27 (-3)	38.44				

**NOTES:**

- 1... The listed synthetic lubricants are acceptable for use as an AGMA #7, #8 or #8A. AGMA #7 lubricants are primarily used in force feed lubrication systems or other special applications.
- 2... Manufacturers listed in bold print have product available worldwide. Contact a listed manufacturer for availability in your area.
- 3... For specific food grade approval type, refer to manufacturer for details.
- 4... Thermyl-Glyde Worm Gear 680 is an ISO grade 680 and AGMA 8S lubricant
- 5... Synthetic lubricants with viscosity grades other than those shown may be recommended by Cone Drive Engineering in some cases.
- 6... This is a polyalkylene glycol (PAG) based product. See supplier for compatibility guidelines and other specifications unique to this PAG lubricant.

Cone Drive reserves the right to improve or change product design and specifications without notice.

## Lubrication Information

For Cone Drive Double Enveloping Worm Speed Reducers & Gearsets

### AGMA Lubricant Number Guidelines

CENTER DISTANCE	WORM SPEED (RPM)	AMBIENT TEMPERATURE		WORM SPEED ABOVE (RPM)	AMBIENT TEMPERATURE	
		-10°C to +10°C (14°F to 50°F)	+10°C to +50°C (50°F to 125°F)		-10°C to +50°C (14°F to 125°F)	-10°C to +50°C (14°F to 125°F)
Up to 6" inclusive	0-700	AGMA 7S or AGMA 8 comp	AGMA 7S or AGMA 8A comp	700-up	AGMA 7S or AGMA 8 comp	
Over 6" to 12"	0-450			450-up		
Over 12" to 18"	0-300			300-up		
Over 18" & above	0-200			200-up		

### Viscosity Ranges

AGMA NO.	ASTM SYSTEM		ISO VISC.
	SUS @210°F	SUS @100°F	CST @40°C
7S Synthetic		1919-2346	414-506
7 Compound	125-150	1919-2346	414-506
8 Compound	150-190	2837-3467	612-748
8A Comp.	190-250	4171-5098	900-1100

**IMPORTANT: In any applications of Cone Drive Products where breakage, damage, disconnection, any other malfunction of any drive train component, or excessive wear could result in personal injury or property damage, a fail safe device capable of stopping and holding the load in the event of such an occurrence must be incorporated after the drive train.**

### Lubrication and Maintenance Notes:

- 1 Type of Oil.** For Cone Drive double enveloping worm gear speed reducers use the lubricant information on the nameplate and this *Approved List of Lubricants* to select the proper lubricant. For Cone Drive gear sets used in other assemblies, use this document to select a lubricant. Contact Cone Drive if in doubt.
- 2 Ambient Temperature.** The lubricants in this list are for use in an ambient temperature range of approximately 15°F to 125°F with the low end of the range depending on the pour point of the specific oil used. The lubricant Pour Point must be at least 5°C (9°F) less than the minimum startup temperature expected. If the ambient temperature will be below or above this range please contact Cone Drive for specific recommendations on proper lubricant as well as proper oil seal and shim materials.
- 3 Sludge.** It is necessary that the oil be clean and free from sludge at all times to obtain long life from the gear unit. Sludge in gear units may be caused by excessive heat, from dust and dirt and other contaminants and by the presence of moisture or chemical fumes. Therefore, every precaution should be taken to prevent water and foreign particles from entering the gear case.
- 4 Oil Change.** If an approved synthetic lubricant is used, it should be changed after 5000 hours of operation or once per year, whichever occurs first. If a recommended steam cylinder oil is used, the change interval should be after 2500 hours of operation or every six months, whichever occurs first. These change intervals are recommended for units operating under

favorable conditions. Where operating conditions are severe, such as a rapid rise and fall in temperature of the gear case with accompanied sweating of the inside wall and resulting formation of sludge, or where operation is in moist or dusty atmospheres, or in the presence of chemical fumes or extended running at sump temperatures in excess of 180°F, it may be necessary to change the oil at intervals of one to three months. It is recommended a sampling program be established with your lubricant manufacturer where reducers are exposed to the severe operating conditions, mentioned above.

- 5 Oil Level.** Oil level should always be checked with the unit stopped.
- 6 Extreme Pressure (EP) Lubricants.** Extreme Pressure (EP) lubricants or cylinder oils with sulfur-phosphorus additives are not acceptable and should not be used with worm gearing.
- 7 High Speed Applications.** Double enveloping worm gears operating at a sliding velocity in excess of 10 m/s (2,000 ft/min) may require force-feed lubrication. For force feed lubrication recommendations, contact Cone Drive Engineering.
- 8 Greased Bearings.** High quality lithium base NLGI #2 or NLGI #3 grease should be applied to fittings at normal maintenance intervals depending on duty cycle. Only bearings requiring added grease will have fittings.