

radicon 

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Approved Lubrication Manual



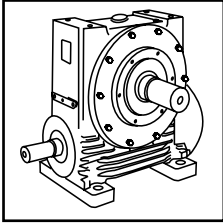
benzlers 

with you at every turn

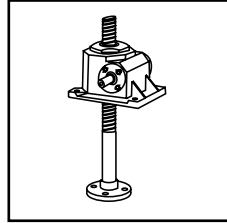
ILU-1.00GB1211

PRODUCTS IN THE RANGE

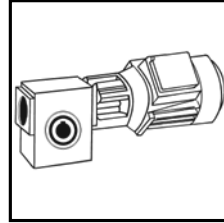
Serving an entire spectrum of mechanical drive applications from food, energy, mining and metal; to automotive, aerospace and marine propulsion, we are here to make a positive difference to the supply of drive solutions.



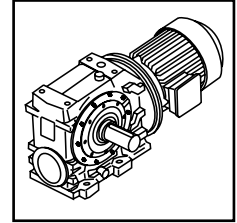
Series A
Worm Gear units
and geared motors
in single & double
reduction types



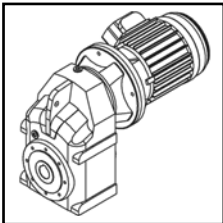
Series BD
Screwjack worm
gear unit



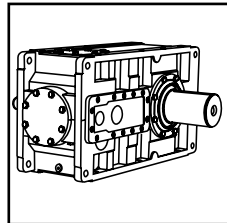
Series BS
Worm gear unit



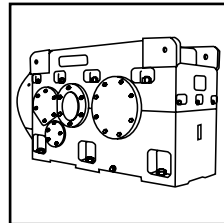
Series C
Right angle drive
helical worm geared
motors & reducers



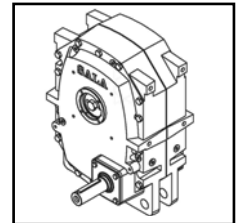
Series F
Parallel angle helical
bevel helical geared
motors & reducers



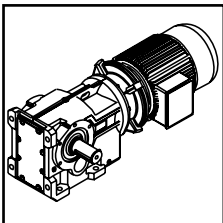
Series G
Helical parallel shaft
& bevel helical right
angle drive gear
units



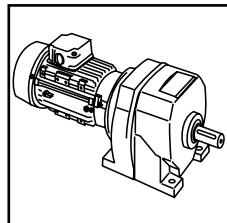
Series H
Large helical parallel
shaft & bevel helical
right angle drive units



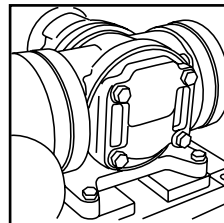
Series J
Shaft mounted
helical speed
reducers



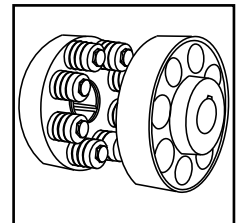
Series K
Right angle helical
bevel helical geared
motors & reducers



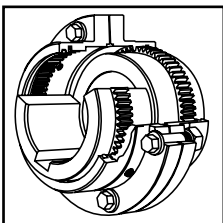
Series M
In-line helical geared
motors & reducers



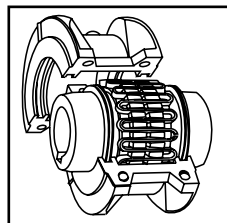
Roloid Gear Pump
Lubrication and fluid
transportation pump



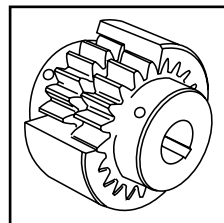
**Series X
Cone Ring**
Pin and bush
elastomer coupling



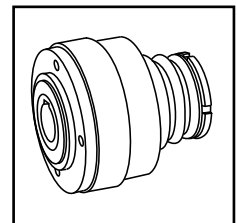
**Series X
Gear**
Torsionally rigid,
high torque coupling



**Series X
Grid**
Double flexing steel
grid coupling



**Series X
Nylon**
Gear coupling with
nylon sleeve



**Series X
Torque Limiter**
Overload protection
device



We offer a wide range of repair services and many years experience of repairing demanding and highly critical transmissions in numerous industries.

We can create custom engineered transmission solutions of any size and configuration.

SPECIFICATION NOTES

- 1) All Radicon gear units are provided with a nameplate which should give the recommended lubricant grade number. If it is not given guidance for lubricant selection is included in the appropriate Gear Catalogue and/or Installation and maintenance Manual.
- 2) The oil change period depends upon the type of oil, the type of gear unit, operating conditions and environment. Reference should be made to the appropriate Gear Catalogue and/or Installation and Maintenance Manual or to the appropriate Radicon standard.
- 3) Where the gear oil is to be used for lubricating other machinery, its suitability for such purposes must be discussed with the oil supplier; any conflict of requirements should preferably be resolved at the design stage.
- 4) Each lubricant range may be accompanied by one or more of the following characters. These indicate limitations or restrictions on their use:
 - a) These lubricants may have their working life reduced if used at elevated temperatures. Consult oil supplier when the normal operating temperature exceeds 80°C.
 - b) These lubricants should **not** be used in units fitted with trailing sprag or backstop devices without prior agreement with the manufacturer; the additives, or the base fluids may modify the coefficient of friction which these devices depend on.
 - c) At least one of the lubricant range has passed the FZG micro-pitting test, test results are available.
 - d) These oils contain solid lubricants (eg MOS₂ or graphite) and must NOT be used in units fitted with any type of backstop device which relies on friction for its operation.
 - e) These lubricants contain additives which may adversely affect silvered or white metal components; consult oil supplier.
 - f) These lubricants should not be used in units containing copper alloys eg worm gear units.
 - g) These lubricants are not suitable for use with aluminium or aluminium alloy components.
 - h) Minimum operating temperatures of these lubricants are based on worst case values, lower operating temperatures may be available, please check with local stockist.
- 5) Different types or brand names of oils **must not** be mixed. If it is desirable to change the oil type used in the gear unit it must be thoroughly flushed; this is particularly important when type 'G' lubricants are involved.
- 6) When rationalisation of lubricant stocks is desirable, gear units can be use a different type of lubricant to that specified but the viscosity grade number (n) must be the same unless a change has been agreed by our engineers. In general:
 - i) If lubricant nM is specified use nM, nA or nE
 - ii) If lubricant nA is specified use nA or nE
 - iii) If lubricant nE is specified use nE
 - iv) Synthetic lubricants, types G and H, can be used in most applications as an alternative to mineral based products, however our engineers should be consulted before using them.

Note: Type E lubricants should not be used in units containing copper alloys at temperatures above 70°C.

The lubricants in this leaflet are approved by Radicon for use in their industrial gearboxes. Whilst every attempt is made to ensure the quality and suitability of these lubricants, no responsibility can be accepted for the lubricant actually supplied or for any defects due to unsatisfactory lubrication.

IF IN DOUBT - CONSULT OUR ENGINEERS

TABLE M

Straight mineral oils (sometimes with mild additive treatments).
These have a low load carrying capacity

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0M	1M	2M	3M	4M	5M	6M	7M	8M	9M
			Oil Suppliers' Corresponding Designations									
Batoyle Freedom Group	Cronus	a				100 (4)	150 (4)	220 (4)	320 (4)			
	Tyro		32 (7)	46 (6)	68 (5)	100 (4)						
Boxer Services incorporated with Millers Oils Limited	Volga	a	32 (5)	46 (5)	68 (5)	100 (4)	150 (4)	220 (4)	320 (4)	460 (4)	680 (4)	1000 (2)
BP Oil International Limited	Energol CS & DC	a	CS32 (7)	CS46 (5)	CS68 (5)	CS100 (4)	CS150 (4)	CS220 (4)	CS320 (4)	CS460 (4)	CS680 (4)	DCW1000 (1)
Caltex	Rando						150 (10)	220 (10)	320 (4)			
	Regal R & O		32 (7)	46 (7)	68 (4)	100 (4)						
Carl Bechem GmbH	Staroil			46 (17)	68 (20)	100 (11)	150 (7)	220 (13)	320 (16)	460 (10)	680 (7)	
Castrol International	Cresta	a								V (4)		SHS (4)
	Hyspin VG		32 (25)	46 (16)	68 (16)	100 (16)	150 (16)					
	Magna	a	32 (13)	46 (13)	68 (16)	100 (16)	150 (13)	220 (13)	320 (4)			
Chevron Lubricants	American Industrial Oil	b			68 (10)	100 (10)	150 (7)	220 (7)	320 (7)	460 (7)	680 (7)	
Engen Petroleum Limited	Turbine	b	32 (6)	46 (6)	68 (6)	100 (6)						
Esso	Canthus TK	a										1000 (+2)
	Teresso		32 (7)	46 (5)	68 (5)	100 (7)	150 (17)	220 (13)	320 (7)	460 (4)		
Exxon	Teresstic		32 (30)	46 (15)	68 (15)	100 (15)	150 (12)	220 (12)	320 (5)	460 (4)		
Fuchs Lubricants	Renolin GP					100 (7)	150 (7)	220 (7)	320 (3)	460 (2)		
Klüber Lubrication	Crucolan		32 (10)	46 (10)	68 (10)	100 (5)	150 (5)	220 (5)	320 (5)	460 (5)		
Kuwait Petroleum International	Q8 Verdi		32 (25)	46 (25)	68 (25)	100 (22)	150 (19)	220 (19)	320 (7)	460 (7)		
Lubrication Engineers Inc	Almasol Pure Mineral Oil							401 (13)				
	Monolec Turbine Oil	b	6401 (24)	6402 (24)	6403 (24)	6404 (18)	6405 (18)	6406 (18)	6407 (13)			
	Multilec Industrial Oil		6801 (35)	6802 (32)	6803 (24)	6804 (21)	6805 (13)	6806 (10)	6807 (10)			
Mobil Oil Company Limited	DTE		light (19)	medium (1)	hvy med (1)	heavy (1)						
Saudi Arabian Lubricating Oil Co.	Turbine Oil		T32 (7)	T46 (4)	T68 (4)	T100 (1)	C150 (1)	C220 (1)	C320 (+2)	C460 (+2)		
Shell Oils	Vitrea/Vitrea M	a	32 (13)	46 (4)	68 (4)	100 (4)	150 (1)	220 (1)	320 (1)	460 (1)	680 (1)	
Texaco Limited	Regal EP		32 (22)	46 (22)	68 (19)	100 (13)	150 (4)	220 (1)	320 (1)	460 (1)		

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE A

Mineral oils containing mild EP or Anti-Wear additives.
These have a medium load carrying capacity

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0A	1A	2A	3A	4A	5A	6A	7A	8A	9A
			Oil Suppliers' Corresponding Designations									
Batoyle Freedom Group	Apollo	b,e	32 (24)	46 (-4)	68 (-3)	100 (-3)	150 (-3)	220 (-2)	320 (-2)	460 (-2)	680 (-1)	1000 (-1)
Boxer Services incorporated with Millers Oils Limited	Tiber	b,e	32 (31)	46 (-28)	68 (-28)	100 (-25)						
BP Oil International Limited	Energol HLP - HM	b,e	32 (25)	46 (-25)	68 (-25)	100 (-19)						
Caltex	Rando HD	b	32 (28)	46 (-28)	68 (-25)	100 (-16)	150 (-10)	220 (-7)				
Carl Bechem GmbH	Staroil Nr	b	32 (25)	46 (-25)	68 (-25)	100 (-18)	150 (-18)	220 (-7)				
Castrol International	Alpha ZN	b,e			68 (-16)	100 (-16)	150 (-16)	220 (-4)	320 (-4)	460 (-4)		
	Hyspin AWS	b,e	32 (25)	46 (-16)	68 (-16)	100 (-16)	150 (-16)					
Chevron Lubricants	Machine Oils AW	b				100 (-10)	150 (-7)	220 (-7)	320 (-7)			
Engen Petroleum Limited	Gencirc	b,e					150 (-1)	220 (-1)	320 (-1)			
	TQH 20	b,e	32 (12)	46 (-9)	68 (-9)	100 (-6)	150 (-6)					
Esso/Exxon	Nuto H	h	32 (31)	46 (-23)	68 (-21)	100 (-17)	150 (-15)					
Fuchs Lubricants	Renolin CLP	b,e				103 (-22)	104 (-19)	106 (-16)	108 (-10)	110 (-10)	112 (-10)	
Kuwait Petroleum International	Q8 Haydn	b,e	32 (25)	46 (-25)	68 (-25)	100 (-22)	150 (-19)					
	Q8 Holst		32 (13)	46 (-13)	68 (-7)							
Mobil Oil Company Limited	DTE	b,e	24 (19)	25 (-16)	26 (-16)		extra hvy (-7)	BB (-7)	AA (+2)	HH (+2)		
Omega Manufacturing Division	Omega 612	b	SA10 (4)		SAE20 (-4)	SAE30 (-4)	SAE40 (-4)					
	Omega 670	b						SAE90 (-4)		SAE140 (-4)		
	Omega 680	b						SAE90 (-17)				
Sasol Oil (Pty) Limited	Rubis	b,e	32 (19)	46 (-16)	68 (-13)	100 (-7)						
Saudi Arabian Lubricating Oil Co.	Hydraulic Oil AW		32 (25)	46 (-19)	68 (-16)	100 (-10)						
Shell Oils	Tellus	b	32/37 (25)	46 (-25)	68 (-19)	100 (-19)	150 (-1)	220 (-1)	320 (-1)			
Texaco Limited	Rando HD	b	32 (25)	46 (-25)	68 (-25)	100 (-13)	150 (-10)					
Total	Azolla ZS	b	32 (22)	46 (-19)	68 (-16)	100 (-13)	150 (-10)					
	Cirkan ZS	b						220 (-4)	320 (-4)			
	Equivis ZS	b	32 (34)	46 (-31)	68 (-31)							
Tribol GmbH	Tribol 770	b	771 (27)	772 (-27)	773 (-24)	775 (-4)	776 (-4)	779 (-2)				

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE E

Mineral oils containing industrial EP additives.
These have a high load carrying capacity

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0E	1E	2E	3E	4E	5E	6E	7E	8E	9E
			Oil suppliers' corresponding designations									
Batoyle	Remus	b	32 (4)	46 (4)	68 (3)	100 (3)	150 (3)	220 (2)	320 (2)	460 (2)	680 (1)	1000 (1)
Boxer Services incorporated with Millers Oils Limited	Indus	b,e	32 (13)	46 (13)	68 (13)	100 (13)	150 (13)	220 (10)	320 (10)	460 (10)	680 (10)	1000 (10)
BP Oil International Limited	Energol GR-XF	b,c,e					150 (19)	220 (16)	320 (13)	460 (1)	680 (1)	
	Energol GR-XP	b,e			68 (19)	100 (19)	150 (19)	220 (15)	320 (10)	460 (7)	680 (4)	
Caltex	Meropa	b			68 (4)	100 (4)	150 (4)	220 (4)	320 (4)	460 (4)	680 (1)	1000 (+5)
	RPM Borate EP Lubricant	b			68 (22)		150 (22)	220 (7)	320 (4)	460 (7)		
Carl Bechem GmbH	Berugear GS BM	b					150 (20)	220 (20)	320 (13)	460 (10)		1000 (0)
	Staroil G	b		46 (25)	68 (20)	100 (22)	150 (13)	220 (13)	320 (13)	460 (10)	680 (7)	
Castrol International	Alpha Max	b,c,e				100 (19)	150 (19)	220 (19)	320 (13)	460 (10)		
	Alpha SP	b,e		46 (16)	68 (16)	100 (16)	150 (16)	220 (16)	320 (16)	460 (1)	680 (1)	1000 (+2)
Chevron Lubricants	Gear Compound EP (USA Version)	b			68 (22)	100 (22)	150 (16)	220 (16)	320 (13)	460 (10)	680 (7)	1000 (4)
	Gear Compound EP (Eastern Hemisphere ver)	b		46 (19)	68 (16)	100 (16)	150 (13)	220 (13)	320 (13)	460 (13)	680 (10)	
	Ultra Gear	b			68 (22)		150 (25)	220 (10)	320 (7)	460 (7)	680 (2)	
Eko-Elda Abee	Eko Gearlube	b			68 (22)	100 (16)	150 (19)	220 (13)	320 (10)	460 (1)		
Engen Petroleum Limited	Gengear	b			68 (21)	100 (21)	150 (21)	220 (15)	320 (12)	460 (3)	680 (3)	
Esso	Spartan EP	b,c			68 (22)	100 (16)	150 (19)	220 (16)	320 (13)	460 (7)	680 (4)	
Esso/Exxon	Spartan EP	b,h			68 (21)	100 (15)	150 (15)	220 (12)	320 (12)	460 (4)	680 (4)	1000 (3)
Fuchs Lubricants	Powergear	b							P/Gear (16)	M460 (4)	H680 (4)	
	Renogear V	b			68EP (20)	100EP (20)	150EP (17)	220EP (13)	320EP (4)	460EP (4)	680EP (4)	1000EP (4)
	Renogear WE	b						220 (7)	320 (4)	400 (4)		
	Renolin CLPF Super	b,d,e				4 (16)	5 (16)	6 (13)	8 (10)	10 (10)	12 (10)	
Klüber Lubrication	Klüberoil GEM1	b	46 (15)	68 (15)	100 (5)	150 (5)	220 (5)	320 (5)	460 (5)	680 (0)		
Kuwait Petroleum International	Q8 Goya	b	46 (25)	68 (25)	100 (25)	150 (22)	220 (16)	320 (13)	460 (10)	680 (4)	1000 (1)	
Lubrication Engineers Inc	Almasol Vari-Purpose Gear	b				606 (21)	604 (15)	607 (18)	605 (13)	608 (10)	609 (7)	5250 (7)
	Monolec Industrial Lubricant	b			300 (24)							

Continued on page 5...

Note: Type E lubricants should not be used in units containing copper alloys at temperatures above 70°C.

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE E

Mineral oils containing industrial EP additives.
These have a high load carrying capacity

...Continued from page 4

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0E	1E	2E	3E	4E	5E	6E	7E	8E	9E
			Oil suppliers' corresponding designations									
Mobil Oil Company Limited	Mobil gear 600 Series	b			626 (19)	627 (19)	629 (19)	630 (13)	632 (13)	634 (1)	636 (1)	
	Mobil Gear XMP	b,c			68 (22)	100 (22)	150 (22)	220 (19)	320 (13)	460 (7)	680 (4)	
Omega Manufacturing Division	Omega 690	b,e					80w/90 (26)		85w/140 (15)			
Optimol Ölwerke GmbH	Optigear BM	b			68 (19)	100 (19)	150 (13)	220 (11)	320 (10)	460 (7)	680 (4)	1000 (4)
	Optigear	b,f	32 (32)	46 (24)	68 (24)	100 (20)	150 (19)	220 (18)	320 (9)	460 (7)	680 (10)	
Pertamina (Indonesia)	Masri	b,e	32 (7)	46 (4)	68 (4)	100 (4)	150 (4)	220 (4)	320 (4)	460 (4)	680 (4)	
Petro-Canada	Ultima EP	b,e					150 (28)	220 (22)	320 (16)	460 (10)	680 (4)	
	Ultima EP	b,e				68/150 (34)	68/220 (31)					
Rocol	Sapphire Hi- Torque	b,e				100 (15)		220 (13)	320 (13)	460 (13)	680 (13)	
Sasol Oil (Pty) Limited	Cobalt	b,e			68 (13)	100 (7)	150 (7)	220 (4)	320 (1)	460 (4)	680 (+2)	
	Hemat	b,e			68 (19)		150 (19)	220 (10)	320 (7)	460 (4)	680 (+2)	
Saudi Arabian Lubricating Oil Co.	Gear Lube EP	b,e			EP68 (3)	EP100 (3)	EP150 (2)	EP220 (1)	EP320 (0)	EP460 (0)		
Shell Oils	Omala	b			68 (7)	100 (4)	150 (4)	220 (4)	320 (4)	460 (4)	680 (1)	1000 (1)
	Omala F	b,c			68 (22)	100 (22)	150 (16)	220 (13)	320 (10)	460 (4)	680 (4)	
Texaco Limited	Meropa	b			68 (25)	100 (22)	150 (19)	220 (16)	320 (16)	460 (10)	680 (10)	1000 (10)
	Meropa WM	b,c				100 (22)	150 (19)	220 (19)	320 (16)	460 (11)		
Total	Carter EP	b			68 (10)	100 (7)	150 (7)	220 (7)	320 (7)	460 (4)		
	Carter VP/CS	b						220 (16)	320 (13)	460 (7)		
Tribol GmbH	Molub-Alloy Gear Oil	b,d				80W (28)	814 (21)	90 (18)	690 (16)	140 (13)	170W (5)	300S (4)
	Tribol 1100	b			68 (29)	100 (26)	150 (23)	220 (20)	320 (18)	460 (16)	680 (10)	1000 (4)

Note: Type E lubricants should not be used in units containing copper alloys at temperatures above 70°C.

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE G

Polyglycol based synthetic lubricants with Anti-wear or EP additives.
These have a medium to high load carrying capacity. (see +)

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0G	1G	2G	3G	4G	5G	6G	7G	8G	9G
			Oil suppliers' corresponding designations									
Batoyle Freedom Group	Helicol W	b					*					
Boxer Services incorporated with Millers Oils Limited	Boxergear W	b					150 (-15)	220 (-31)	320 (-31)	460 (-28)		
BP Oil International Limited	Enersyn SG-XP	b,e						220 (-31)		460 (-34)	680 (-28)	
Caltex	Synlube CLP	b			68 (-40)		150 (-37)	220 (-34)	320 (-31)	460 (-28)	680 (-31)	
Carl Bechem GmbH	Berusynth EP	b			68 (-35)	100 (-31)	150 (-26)	220 (-25)	320 (-25)	460 (-25)	680 (-28)	1000 (-28)
Castrol International	Alphasyn PG	b,c					150 (-34)	220 (-34)	320 (-31)	460 (-28)		
Esso/Exxon	Glycolube	b,h					150 (-25)	220 (-25)	320 (-25)	460 (-23)		
Fuchs Lubricants	Renogear PGW +	b					120 (-23)					
	Renolin PG	b			68 (-34)	100 (-31)	150 (-34)	220 (-34)	320 (-34)	460 (-34)	680 (-28)	1000 (-28)
Klüber Lubrication	Klübersynth GH6	b,g	32 (-40)		80 (-30)	100 (-30)	150 (-30)	220 (-25)	320 (-25)	460 (-20)	680 (-20)	1000 (-20)
	Klübersynth UH1 6	b,e						220 (-30)	320 (-25)	460 (-25)		
Kuwait Petroleum International	Q8 Gade	b						220 (-22)	320 (-22)	460 (-22)		
Laporte Performance Chemicals Limited	Breox Industrial Lubricant SW	b					150 (-25)	220 (-25)	320 (-25)	460 (-23)	680 (-20)	1000 (-20)
	Breox SL range	b			68 (-46)		150 (-42)	220 (-40)	320 (-37)	460 (-35)		
	Breox Oil Soluble Industrial Lub x	b						220 (-23)				
	Breox Worm Gear Lube	b					65 (-25)					
Mobil Oil Company Limited	Glygoyle	b					22 (-25)	30 (-22)	HE320 (-37)	HE460 (-35)		
Optimol Ölwerke GmbH	Optiflex A +	b,e,g					150 (-31)	220 (-28)	320 (-28)	460 (-28)	680 (-28)	1000 (-25)
Shell Oils	Tivela	b					SA (-25)	SB (-25)	SC (-25)	SD (-23)		
Texaco Limited	Synlube CLP	b			68 (-40)		150 (-37)	220 (-34)	320 (-31)	460 (-28)	680 (-31)	
Total	Carter SY	b						220 (-25)	320 (-28)	460 (-22)		
Tribol GmbH	Tribol 800	b,c				100 (-37)	150 (-37)	220 (-27)	320 (-25)	460 (-25)	680 (-25)	1000 (-23)

* ONLY ONE OIL GRADE AVAILABLE HENCE NO GRADE DESIGNATION

+ NOT SUITABLE FOR APPLICATIONS REQUIRING INDUSTRIAL EP ADDITIVES

x THIS PARTICULAR LUBRICANT IS COMPATIBLE WITH TYPES M,A, E AND H

NOTE: TYPE G LUBRICANTS WILL AFFECT CERTAIN GEARCASE PAINTS AND SHRINK CERTAIN SEALS, CONTACT OUR APPLICATION ENGINEERS BEFORE USE

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE H

Polyalphaolefin based synthetic lubricants with Anti-Wear or EP additives.
These have a medium to high load carrying capacity.

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0H	1H	2H	3H	4H	5H	6H	7H	8H	9H
			Oil suppliers' corresponding designations									
Batoyle Freedom Group	Titan	b			68 (-40)	100 (-38)	150 (-35)	220 (-31)	320 (-28)			
Boxer Services incorporated with Millers Oils Limited	Silkgear	b	32 (-40)	46 (-40)	68 (-40)	100 (-40)	150 (-35)	220 (-35)	320 (-35)	460 (-35)	680 (-35)	1000 (-35)
	Enersyn EPX	b,e							320 (-28)			
Caltex	Pinnacle EP	b					150 (-45)	220 (-43)	320 (-43)	460 (-37)		1000 (-30)
Carl Bechem GmbH	Berusynth GP	b			68 (-49)		150 (-42)	220 (-38)	320 (-35)	460 (-32)		
Castrol International	Alphasyn EP	b,c					150 (-43)	220 (-37)	320 (-31)	460 (-31)		
	Alphasyn T	b	32 (-49)	46 (-43)	68 (-43)	100 (-35)	150 (-31)	220 (-31)	320 (-28)	460 (-28)	680 (-16)	1000 (-16)
Chevron Lubricants	Tegra	b					150 (-46)	220 (-46)	320 (-33)	460 (-31)	680 (-25)	
Esso/Exxon	Spartan Synthetic EP	b,e,f				100 (-52)	150 (-49)	220 (-46)	320 (-43)	460 (-40)		
Fuchs Lubricants	Renogear SG	b					150 (-35)	220 (-32)	320 (-30)			
	Renolin Unisyn CLP	b			68 (-46)	100 (-40)	150 (-40)	220 (-37)	320 (-34)	460 (-28)	680 (-28)	
Klüber Lubrication	Klübersynth EG 4	b,e					150 (-35)	220 (-30)	320 (-25)	460 (-30)		
Kuwait Petroleum International	Q8 Schumann	b	32 (-49)	46 (-49)	68 (-49)	100 (-43)						
	Q8 EL Greco	b					150 (-28)	220 (-22)	320 (-19)	460 (-16)		
Lubrication Engineers Inc	Synolec Gear Lubricant	b						9920 (-40)				
Mobil Oil Company Limited	Mobilgear SHC	b						220 (-40)	320 (-37)	460 (-32)	680 (-29)	
	Mobilgear SHC XMP	b,c					150 (-43)	220 (-40)	320 (-33)	460 (-31)	680 (-25)	
Optimol Ölwerke GmbH	Optigear Synthetic A	b				100 (-40)		220 (-31)	320 (-31)			
Petro-Canada	Super Gear Fluid	b,e					150 (-37)	220 (-43)	320 (-37)	460 (-37)		
Shell Oils	Omala HD	b,c,f			68 (-55)	100 (-49)	150 (-49)	220 (-43)	320 (-40)	460 (-37)	680 (-34)	1000 (-31)
Texaco Limited	Pinnacle EP	b				100 (-49)	150 (-45)	220 (-43)	320 (-43)	460 (-37)		
	Pinnacle WM	b,c					150 (-43)	220 (-43)	320 (-40)			
Total	Carter SP	b					150 (-37)	220 (-34)	320 (-31)	460 (-28)		1000 (-13)
Tribol GmbH	Tribol 1510	b				100 (-44)	150 (-41)	220 (-36)	320 (-33)	460 (-28)	680 (-25)	

NOTE: TYPE H LUBRICANTS THAT DO NOT CONTAIN EP ADDITIVES AND ARE SUITABLE FOR USE IN WORM GEAR UNITS ARE LISTED ON PAGE 8

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.

TABLE F

Lubricants having incidental food contact approval

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers										
			0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	
			Oil suppliers' corresponding designations										
Caltex	Cygnus Gear 1,4	b							220 (-7)		460 (-)		
Castrol International	Vitalube G 3,4	b					150 (-)	220 (-7)	320 (-10)				
	Vitalube GS 3,4,6	b					150 (-31)	220 (-31)	320 (-31)				
Chevron Lubricants	Lubricating Oil FM 1,4,5	b	32 (-4)	46 (-4)	68 (-4)	100 (-4)		220 (-4)		460 (-4)			
Klüber Lubrication	Klüberoil 4 UH 1 3,4,6	b	32 (-30)	46 (-30)	68 (-30)	100 (-30)	150 (-30)	220 (-30)		460 (-30)	680 (-25)		
	Klübersynth UH1 6 2,4*,5,6	e,b						220 (-30)	320 (-25)	460 (-25)			
Mobil Oil Company Limited	Mobil DTE FM Series 3,4	b	32 (-1)	46 (-1)	68 (-1)	100 (-4)	150 (-4)	220 (-7)	320 (-34)	460 (-28)	680 (-31)		
Omega Manufacturing Division	Omega 585 3,5,6,7	a,b						H (-31)					
Optimol Ölwerke Industrie GmbH	Optileb GT 3,4,6	b				100 (-37)		220 (-31)		460 (-16)	680 (-16)		
Petro-Canada	Purity FG 1,4	b				100 (-7)	150 (-4)	220 (-4)	320 (-4)	460 (-4)			
Rocol	Foodlube Hi-Torqu 3,4*,5,6	b					150 (-25)	220 (-25)	320 (-25)	460 (-15)			
Shell Oils	Cassida 3,4,5	b	HF32 (-45)	HF46 (-45)	HF68 (-45)	HF100 (-45)	HF150 (-45)	GL220 (-43)	GL320 (-43)	GL460 (-40)	GL680 (-35)		
Texaco Limited	Cygnus Gear 1,4	b						220 (-7)		460 (-5)			
Total	Lubriplate FMD AW 1,4*	b				100 (-12)	150 (-12)	220 (-10)	320 (-10)	460 (-7)	680 (-4)		
Tribol GmbH	Tribol 1810 1,4	b						220 (-5)	320 (-5)	460 (-5)			

- 1 Mineral oil based
- 2 Polyglycol based synthetic
- 3 Polyolefin based synthetic
- 4 USDA H1 approved (* meets the former requirements of USDA H1)
- 5 FDA approved
- 6 Mineral Hydrocarbon free
- 7 AQIS approved

NOTE: Type F lubricants are approved for use in Radicon Gear units. Radicon **DO NOT** give food approval for lubricants, please consult suppliers before use.

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

TABLE B

Bio-degradable oils

Supplier	Lubricant Range	Refer to notes page 1	Radicon Grade Numbers									
			0B	1B	2B	3B	4B	5B	6B	7B	8B	9B
			Oil suppliers' corresponding designations									
Caltex	Biostar Gear	a,b			68 (-28)		150 (-28)	220 (-28)				
Castrol International	Carelube GTG	a,b,e					150 (-19)	220 (-25)				
	Carelube GES	a,b,e			68 (-34)	100 (-34)	150 (-28)	220 (-25)	320 (-25)	460 (-25)		
Klüber Lubrication	Klüberbio CA	a,b,e,f				2-100 (-30)					2-460 (-15)	
	Klüberbio GM	a,b,e,f						2-220 (-20)				
Shell	Naturelle HF-R	a,b,e	32 (-31)									
	Naturelle HF-E	a,b,e		46 (-45)	68 (-34)							
Texaco Limited	Biostar Gear	a,b			68 (-28)		150 (-28)	220 (-28)				
Total	Biohydran SE	b		46 (-43)								

NOTE: The use of Bio-degradable lubricants may adversely affect gear unit ratings, contact Radicon before use

DANGER

Numbers in brackets indicate recommended minimum operating temperature in °C. **THE UNIT MUST NOT RUN BELOW THIS TEMPERATURE.**

GREASES

Greases

Supplier	Lubricant Range	Refer to notes page 11	NLGI Number					
			3	2	1	0	00	000
Oil suppliers' corresponding designations								
BP Oil International Limited	Energrease FG	y					✓	
	Energrease LS-EP	w,x,y	✓	✓	✓		✓	
Caltex	Coupling Grease	x			✓			
	Multifak EP	w		✓	✓	✓		
Carl Bechem GmbH	Berulit GA 800	x,y					✓	
Castrol International	CLS Grease	y					✓	
	LMX Grease	w,x		✓				
	Spheerol AP	w,x	✓	✓				
	Spheerol EPL	w,x		✓	✓	✓		
Fuchs Lubricants	Renolit EP	w,y		✓	✓	✓	✓	✓
Klüber Lubrication	Klüberlub BE 41-542	w		✓				
	Klüberplex GE 11-680	x,y				✓		
	Klübersynth GE 46-1200	y					✓	
	Microlube GB 0/00	w,y				✓	✓	
Mobil Oil Company Limited	Glygoyle Grease	y					✓	
	Mobilgrease XHP	w	✓	✓	✓			
	Mobilith SHC	w,x,y		✓	✓		✓	
	Mobilux EP 111	x			✓			
Omega Manufacturing Division	Omega 85	w,x,y		✓		✓		
Optimol Ölwerke GmbH	Longtime PD	w,x,y		✓	✓	✓	✓	
	Optitemp OG	x,y				✓		
Shell Oils	Albida RL	w		✓	✓			
	Alvania EP B	w,x,y		✓				
	Alvania EP LF	x,y		✓	✓	✓	✓	
	Alvania GL	y					✓	
	Alvania WR2	x,y		✓				
	Coupling Grease	x			✓			
	Nerita HV	w		✓				
	Semi Fluid EP	x,y					✓	
	Tivela Compound A	y					✓	
	Tivela Compound GL	y					✓	
Texaco Limited	Coupling Grease	x,y			✓			
	Multifak All Purpose EP	w		✓				
Total	Specis EPG	x,y				✓		

NOTES: w Bearing Grease
x Coupling Grease
y Semi-Fluid Gear Unit Grease

GREASES

Greases having USDA H1 incidental food contact approval

Supplier	Lubricant Range	Refer to notes page 12	NLGI Number					
			3	2	1	0	0	0
			Oil suppliers' corresponding designation					
Caltex	RPM Poly FM	w		✓	✓	✓		
Chevron Lubricants	FM Grease EP	w		✓	✓	✓		
Klüber Lubrication	Klübersynth UH1 14-151/1600	y			✓		✓	
Mobil Oil Company Limited	Mobil Grease FM	w,x,y		✓✓	✓		✓✓	
Optimol Ölwerke GmbH	Obeen UF	w,x,y		✓	✓	✓	✓	✓
Petro-Canada	Purity FG	w,x,y		✓			✓	
Rocol	Foodlube Universal Grease	w,x,y		✓	✓			✓
Shell Oils	Cassida EPS	w,y			✓		✓	
	Cassida RLS	w,x,y	✓		✓			
Texaco Limited	Poly FM Grease	w,x,y		✓	✓	✓		
Total	Lubriplate FGL	y				✓	✓	

NOTES: Greases with USDA H1 approval are approved for use in Radicon Gear Units. Radicon **DO NOT** give food approval for greases, please consult suppliers before use.

- ✓✓ Two alternative products are available, please consult suppliers before use.
- w Bearing Grease
- x Coupling Grease
- y Semi-Fluid Gear Unit Grease

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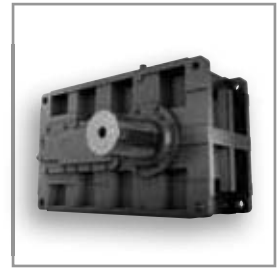
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