

# SKF Lubricants

Poor lubrication accounts for over 36% of premature bearing failures



# Bearing grease selection chart

Grease	Description	Application examples	Temperature		Speed Range <sup>2)</sup>	Load Range <sup>2)</sup>	Base oil	
			LTTL <sup>1)</sup> °C (°F)	HTPL <sup>1)</sup> °C (°F)				
<b>LGMT 2</b>	General purpose industrial and automotive	Wheel bearings, conveyors, fans, small electric motors	-30 (-20)	120 (250)	M	M	L to M	Min
<b>LGMT 3</b>	General purpose industrial and automotive	Vertical shaft, outer ring rotation, wheel bearings	-30 (-20)	120 (250)	M	M	L to M	Min
<b>LGEP 2</b>	Extreme pressure	Heavy industrial applications, vibrating screens	-20 (-5)	110 (230)	M	L to M	H	Min
<b>LGNL 2</b>	General purpose, high load	Heavy duty, conveyors, vibrating machinery	-30 (-20)	110 (230)	M	L to M	H	Min
<b>LGWA 2</b>	Extreme pressure, wide temperature range	Wheel bearings, fans, electric motors	-30 (-20)	140 (285) <sup>3)</sup>	M to H	L to M	L to H	Min
<b>LGGB 2</b>	Biodegradable, low toxicity	Agriculture, construction, water treatment	-40 (-40)	90 (195)	L to M	L to M	M to H	Ester
<b>LGLT 2</b>	Low temperature, extremely high speed	Machine tool spindles, printing cylinders	-50 (-60)	110 (230)	L to M	M to EH	L	PAO
<b>LGWM 1</b>	Extreme pressure, low temperature	Wind turbine main shaft, heavy duty applications	-30 (-20)	110 (230)	L to M	L to M	H	Min
<b>LGEP 1</b>	Extreme pressure, high viscosity	Wind turbine main shaft, heavy duty applications	-20 (-5)	120 (250)	M	VL to M	H to VH	Min
<b>LGWM 2</b>	High load, wide temperature	Wind turbine main shaft, heavy duty off road or marine applications	-40 (-40)	110 (230)	L to M	L to M	L to H	PAO/Min
<b>LGEM 2</b>	High viscosity with solid lubricants	Jaw crushers, construction machinery, vibrating machinery	-20 (-5)	120 (250)	M	L to M	H to VH	Min
<b>LGEV 2</b>	Extremely high viscosity with solid lubricants	Rotary kilns, high pressure grinding rolls, trunnions, rocker arms	-10 (15)	120 (250)	M	VL to L	H to VH	Min
<b>LGHB 2</b>	High load, high temperature	Classifiers, work rolls and continuous casters, vibrating screens	-20 (-5)	150 (300)	M to H	VL to M	L to VH	Min
<b>LGHC 2</b>	High load, water resistant, high temperature	Classifiers, work rolls and continuous casters, vibrating screens	-20 (-5)	140 (285)	M to H	VL to M	L to VH	Min
<b>LGHP 2</b>	High performance, high temperature	Electric motors, high temperature fans	-40 (-40)	150 (300)	M to H	M to H	L to M	Min
<b>LGHQ 2</b>	Electric motor grease	Electric motors, fans	-30 (-20)	160 (320)	M to H	M to H	L to M	Min
<b>LGET 2</b>	Extreme temperature, extreme condition	Ovens, textile dryers, vacuum pumps	-40 (-40)	260 (500)	VH	L to M	H to VH	PFPE
<b>LGFG 2</b>	General purpose, food grade	Conveyors, wrapping machines, bottling machines	-30 (-20)	140 (285)	M	L to H	L to H	Min
<b>LGFQ 2</b>	High load, food grade	Pellet presses, mixers, centralized lubrication systems	-40 (-40)	130 (265)	L to H	VL to M	L to VH	PAO/Min
<b>LGED 2</b>	High temperature, food grade	Baking, vacuum pumps	-30 (-20)	240 (465)	VH	L to M	H to VH	PFPE

<sup>1)</sup> LTTL = low temperature torque limit, HTPL = high temperature performance limit for details, refer to The SKF traffic light concept for grease temperature performance on page 9.

<sup>2)</sup> Refer to Temperature, Speed, and Load ranges for grease selection on page 4.

<sup>3)</sup> LGWA 2 can withstand peak temperatures of 220 °C (430 °F).

Thickener	NLGI grade	Base oil viscosity		Vertical shaft	Oscillating movements	Severe vibrations	Rust protection	Water resistance	Frequent start-up	
		40 °C mm <sup>2</sup> /s	100 °C mm <sup>2</sup> /s							
Li	2	110	10	●	●	+	+	+	●	Wide range of applications
Li	3	125	12	++	●	++	+	+	●	
Li	2	200	16	●	●	+	+	+	++	
Ca Anh	2	220	14	●	●	+	+	++	++	
Lix	2	250	17	●	—	+	+	+	+	
Li-Ca	2	110	18	●	+	—	●	+	+	
Li	2	17	3.8	●	—	--	—	+	●	Low temperatures
Li	1	200	16	--	+	—	+	+	++	
Li-Ca	1	400	25	--	+	—	+	+	++	
CaSx	1-2	80	10	●	++	+	++	++	++	High loads
Li-Ca	2	500	32	+	●	+	+	+	++	
Li-Ca	2	1300	49	●	●	+	+	+	++	High temperatures
CaSx	2	425	28	●	++	+	++	++	++	
CaSx	2	450	31	●	++	+	++	++	++	
PU	2-3	96	10.5	+	—	--	++	++	●	High temperatures
PU	2	110	12	●	—	--	+	++	+	
PTFE	2	400	38	●	—	●	—	+	●	
CaSx	2	150	16	●	++	+	+	++	+	Food grade
CaSx	1-2	320	30	●	++	●	+	++	++	
PTFE	2	460	42	●	—	●	—	+	●	

++ = Very suitable

+ = Recommended

● = Suitable

— = Not recommended

-- = Not suitable

# Bearing grease selection chart

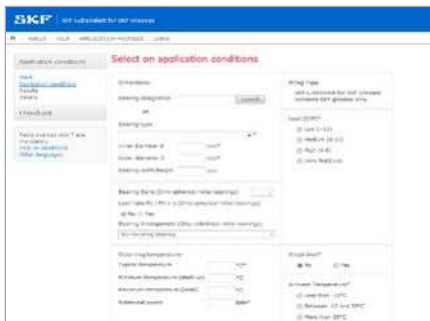
## Bearing operating parameters

Temperature range			Load range		Load ratio	
	°C	°F			C/P	
L = Low	< 50	< 120	VH = Very high	< 2		
M = Medium	50 to 100	120 to 210	H = High	~ 4		
H = High	> 100	> 210	M = Medium	~ 8		
EH = Extremely high	> 150 °C	> 300	L = Low	≥ 15		

Speed range	Speed factor		
	Ball bearings	Spherical roller, tapered roller, CARB toroidal roller bearings	Cylindrical roller bearings
	$n d_m$ mm/min		
VL = Very low		< 30 000	< 30 000
L = Low	< 100 000	< 75 000	< 75 000
M = Medium	< 300 000	≤ 210 000	≤ 270 000
H = High	< 500 000	> 210 000	> 270 000
VH = Very high	≤ 700 000		
EH = Extremely high	> 700 000		

$n$  = rotational speed [r/min]  
 $d_m$  = bearing mean diameter [mm]  
 $= 0.5 (d + D)$



Advanced tool for grease selection and relubrication calculation

## LubeSelect for SKF greases

Selecting a suitable grease for a particular bearing is a crucial step if the bearing is to meet design expectations in its application. SKF knowledge about bearing lubrication has been encapsulated into a computer program that can be consulted at [skf.com/lubeselect](http://skf.com/lubeselect)

LubeSelect for SKF greases provides you a user friendly tool to select the right grease and suggest frequency and quantity, while taking into account the particular conditions of your application. General guidelines for typical greases for different applications are also available.



Scan or click the QR code, or go to [skf.com/lubeselect](http://skf.com/lubeselect)

# Technical data

## Bearing greases

	LGMT 2	LGMT 3	LGEP 2	LGNL 2	LGWA 2	LGGB 2
DIN 51825 code	K2K-30	K3K-30	KP2G-20	KP2K-30	KP2N-30	ISO 12924 ISO-L-XD(L)CEB 2
NLGI consistency class	2	3	2	2	2	2
Thickener	Lithium	Lithium	Lithium	Calcium anhydrous	Lithium complex	Lithium/calcium
Colour	Red brown	Amber	Light brown	Yellow brown	Amber	Light brown
Base oil type	Mineral	Mineral	Mineral	Mineral	Mineral	Ester
Operating temperature range	-30 to +120 °C (-20 to +250 °F)	-30 to +120 °C (-20 to +250 °F)	-20 to +110 °C (-5 to +230 °F)	-30 to +110 °C (-20 to +230 °F)	-30 to +140 °C (-20 to +285 °F)	-40 to +90 °C (-40 to +195 °F)
Dropping point (min), ISO 2176	180 °C (355 °F)	180 °C (355 °F)	180 °C (355 °F)	140 °C (284 °F)	250 °C (480 °F)	165 °C (330 °F)
Base oil viscosity, DIN 51562 40 °C, mm <sup>2</sup> /s 100 °C, mm <sup>2</sup> /s	110 10	125 12	200 18	220 14	250 17	110 18
Penetration DIN ISO 2137 Worked, 60 strokes, 10 <sup>-1</sup> mm Prolonged (max.), 100 000 strokes, 10 <sup>-1</sup> mm	265–295 +50	220–250 280	265–295 +50	265–295 +50 max.	265–295 +50	265–295 +50
Mechanical stability Roll stability, ASTM D 1831 (max.) 50 hrs at 80 °C, 10 <sup>-1</sup> mm V2F test, 144 hrs	+50 M	295 M	+50 M	+70 max. M	+50 M	+70 –
Corrosion protection, Emcor ISO 11007, Distilled water ISO 11007 modified, Water washout ISO 11007 modified, 0.5% NaCl	0–0 0–0 –	0–0 0–0 –	0–0 0–0 –	0–0 0–0 –	0–0 0–0 –	0–0 – –
Water resistance (max.) DIN 51 807/1, 3 hrs at 90 °C	1	1	1	1	1	0
Oil separation DIN 51 817, 40 °C, %	1–6	1–3	2–5	1–5	1–5	1–3
Lubrication ability R2F, test B at 120 °C	Pass	Pass	Pass	Pass	Pass at 140 °C (284 °F)	Pass at 90 °C (195 °F)
Copper corrosion (max.) DIN 51811 / ASTM D4048, 24 hrs at 100 °C	2 max. at 110 °C (230 °F)	2 max. at 130 °C (265 °F)	2 max. at 110 °C (230 °F)	2 max.	2 max.	2 max.
Grease life (min) R0F test L <sub>50</sub> life, 10 000 r/min, hrs at °C	1 000 at 100 °C (212 °F)	1 000 at 130 °C (265 °F)	1 000 at 110 °C (230 °F)	1 000 at 110 °C (230 °F)	1 000 at 130 °C (265 °F)	1 000 at 90 °C (195 °F)
EP performance 4 ball - Wear scar (max.) DIN 51 350, 1 400 N, mm 4 ball - Weld load (min.) DIN 51350/4, N	– –	– –	1.4 2 800	1.8 max. 2 800	1.8 2 600	1.8 2 600
<i>These characteristics represent typical values.</i>						

# Technical data

## SKF Bearing greases

	LGLT 2	LGWM 1	LGEP 1	LGWM 2	LGEM 2	LGEV 2
DIN 51825 code	KHC2G-50	KP1G-30	KP1K-20	KP2G-40	KPF2K-20	KPF2K-10
NLGI consistency class	2	1	1	1–2	2	2
Thickener	Lithium	Lithium	Lithium-Calcium	Calcium sulphonate complex	Lithium/calcium	Lithium/calcium
Colour	Beige	Brown	Beige	Light brown	Black	Black
Base oil type	PAO	Mineral	Mineral	Mineral/PAO	Mineral	Mineral
Operating temperature range	–50 to +110 °C (–60 to +230 °F)	–30 to +110 °C (–20 to +230 °F)	–20 to +120 °C (–4 to +240 °F)	–40 to +110 °C (–40 to +230 °F)	–20 to +120 °C (–5 to +250 °F)	–10 to +120 °C (15 to 250 °F)
Dropping point (min), ISO 2176	180 °C (355 °F)	170 °C (340 °F)	170 °C (340 °F)	300 °C (570 °F)	180 °C (355 °F)	180 °C (355 °F)
Base oil viscosity, DIN 51562 40 °C, mm <sup>2</sup> /s 100 °C, mm <sup>2</sup> /s	17 3.8	200 15	400 25	80 10	500 32	1300 49
Penetration DIN ISO 2137 Worked, 60 strokes, 10 <sup>-1</sup> mm Prolonged (max.), 100 000 strokes, 10 <sup>-1</sup> mm	265–295 +50	310–340 +50	310–340 +50	280–310 +30	265–295 +50	265–295 +50
Mechanical stability Roll stability, ASTM D 1831 (max.) 50 hrs at 80 °C, 10 <sup>-1</sup> mm V2F test, 144 hrs	– –	– –	+50 –	+30 –	+50 M	+50 M
Corrosion protection, Emcor ISO 11007, Distilled water ISO 11007 modified, Water washout ISO 11007 modified, 0.5% NaCl	0–1 – –	0–0 0–0 0–0	0–0 0–0 0–0 (1% NaCl)	0–0 0–0 0–0	0–0 0–0 2–2	0–0 0–0 2–2
Water resistance (max.) DIN 51 807/1, 3 hrs at 90 °C	1	1	1	1	1	1
Oil separation DIN 51 817, 40 °C, %	1–5	8–13	1–5	1–3 at 60 °C (140 °F)	1–5	1–5
Lubrication ability R2F, test B at 120 °C	–	Pass at 100 °C (210 °F)	Pass at 80 °C (176 °F)	Pass	Pass, 100 °C (210 °F)	Pass, 100 °C (210 °F)
Copper corrosion (max.) DIN 51811 / ASTM D4048, 24 hrs at 100 °C	1 max.	2 max.	1 max. at 120 °C (250 °F)	2 max.	2 max.	1 max.
Grease life (min) ROF test L <sub>50</sub> life, 10 000 r/min, hrs at °C	1 000 at 100 °C (210 °F) and 20 000 r/min.	1 000 at 110 °C (230 °F)	1 000 at 100 °C (210 °F)	1 000 at 110 °C (230 °F)	1 000 at 100 °C (210 °F)	1 000 at 100 °C (210 °F)
EP performance 4 ball - Wear scar (max.) DIN 51 350, 1 400 N, mm 4 ball - Weld load (min.) DIN 51350/4, N	– 2 000 min.	1.8 2 800	1.8 3 400	2 4 000	1.2 3 400	1.2 3 000
<i>These characteristics represent typical values.</i>						

LGHB 2	LGHC 2	LGHP 2	LGHQ 2	LGET 2	LGFG 2	LGFQ 2	LGED 2
KP2N-20	KP2N-20	K2N-40	K2P-30	KFK2U-40	KP2N-30	KP1/2N-40	KFK2U-30
2	2	2-3	2	2	2	1-2	2
Calcium sulphonate complex	Complex calcium sulphonate	Polyurea	Polyurea	PTFE	Calcium sulphonate complex	Calcium sulphonate complex	PTFE
Brown	Brown beige	Blue	Blue	White	Brown	Pale brown	White
Mineral	Mineral	Mineral	Mineral	PFPE	Mineral	PAO/Mineral	PFPE
-20 to +150 °C (-5 to +300 °F)	-20 to +140 °C (-5 to +284 °F)	-40 to +150 °C (-40 to +300 °F)	-30 to +160 °C (-2 to +320 °F)	-40 to +260 °C (-40 to +500 °F)	-30 to +140 °C (-2 to +284 °F)	-40 to +130 °C (-40 to +266 °F)	-30 to +240 °C (-2 to +464 °F)
300 °C (570 °F)	300 °C (570 °F)	240 °C (465 °F)	260 °C (500 °F)	300 °C (570 °F)	280 °C (536 °F)	300 °C (570 °F)	300 °C (570 °F)
425 28	450 31	96 10.5	110 12	400 38	150 16	320 30	460 42
265-295 -20 to +50	265-295 +30	245-275 365 max.	265-295 385 max.	265-295 -	265-295 +50 max.	265-295 +30 max.	265-295 30 max.
-20 to +50 M	+30 -	365 max. -	385 max. -	+30 max. at 130 °C (265 °F) -	+50 max. -	+30 max -	- -
0-0 0-0 0-0	0-0 - 0-1	0-0 0-0 0-0	0-0 0-1 2-2	1-1 - -	0-0 0-0 0-0	0-0 - 0-0	0-0 - -
1	1	1	1	0	1 max.	1 max.	1 max.
1-3 at 60 °C (140 °F)	1-3 at 60 °C (140 °F)	3 max.	1-3	1-3	1-5	1-3	1-3
Pass at 140 °C (284 °F)	Pass	Pass at 100 °C (210 °F)	Pass at 100 °C (210 °F)	-	Pass	Pass	-
2 max. at 150 °C (302 °F)	2 max.	1 max. at 150 °C (300 °F)	2 max.	1 max. at 150 °C (300 °F)	1 max.	2 max.	1 max.
1000 at 130 °C (265 °F)	1000 at 110 °C (230 °F)	1000 at 150 °C (300 °F)	1000 at 160 °C (302 °F)	1000 at 220 °C (428 °F)	1000 at 120 °C (248 °F)	1000 at 120 °C (248 °F)	1000 at 200 °C (392 °F)
2 4 000	1.2 4 000	- -	1 2600	- 8 000 min.	1 max 4000 min.	1.5 max. 3 400 min	- 8 000 min.

# Food grade lubricants

Grease	Description	Application examples	Base oil	Temperature range <sup>1)</sup>	
				LTTL	HTPL
<b>LGFG 2</b>	General purpose food grade grease	Conveyor bearings Wrapping machines Bottling machines	White mineral oil	-30 °C (-22 °F)	+140 °C (+284 °F)
<b>LGFQ 2</b>	High load, water resistant and wide temperature food grade grease	Pellet presses Mills Mixers	PAO/White mineral oil	-40 °C (-40 °F)	+130 °C (+265 °F)
<b>LGED 2</b>	High temperature & harsh environment bearing grease	Bakery/brick oven equipment Glass industry Vacuum pumps	PFPE	-30 °C (-22 °F)	+240 °C (+464 °F)
<b>LFFM 100</b>	Food grade chain oil	General chain lubrication as in confectionery industries and fruit and vegetable processing. Even in the presence of moisture.	PAO	-30 °C (-22 °F)	+130 °C (+265 °F)
<b>LFFT 220</b>	Food grade chain oil	High temperature applications as bakery ovens	Ester	0 °C (32 °F)	+250 °C (482 °F)
<b>LDS 1</b>	Food grade dry film lubricant	Conveyors in bottling lines using PET, carton, glass or can packages	Mineral/PTFE	-5 °C (25 °F)	+60 °C (140 °F)

*These characteristics represent typical values.*

# Lubricants for non rolling bearing applications

Grease	Description	Application examples	Thickener/Base oil	Temperature range <sup>1)</sup>	
				LTL	HTPL
<b>LMCG 1</b>	Grid and gear coupling grease	Grid and gear couplings Flexible heavy duty grid and gear coupling	Polyethylene / mineral	0 °C (32 °F)	120 °C (248 °F)
<b>LGTE 2</b>	Biodegradable grease for total loss applications	Marine and wire rope applications Construction as well as forestry and agricultural equipment. Ecolabel certified.	Anhydrous calcium / ester	-40 °C (-40 °F)	+100 °C (+212 °F)
<b>LGLS 0</b>	Wide temperature lubrication systems grease	Plain bearings and chassis sliding surfaces Centralized lubrication systems	Anhydrous calcium / mineral	-40 °C (-40 °F)	+100 °C (+212 °F)
<b>LGLS 2</b>	High viscosity lubrication systems grease	Slow plain bearings, joints, wire ropes Lubrication systems under medium to high ambient temperatures	Anhydrous calcium / mineral	-20 °C (-4 °F)	+120 °C (+248 °F)
<b>LHMT 68</b>	Medium temperature chain oil	Ideal for medium temperatures and dusty environments	Mineral	-20 °C (-4 °F)	+100 °C (212 °F)
<b>LHHT 250</b>	High temperature chain oil	Ideal for high load and/or high temperature conditions	Ester	-0 °C (32 °F)	+250 °C (482 °F)

*These characteristics represent typical values.*

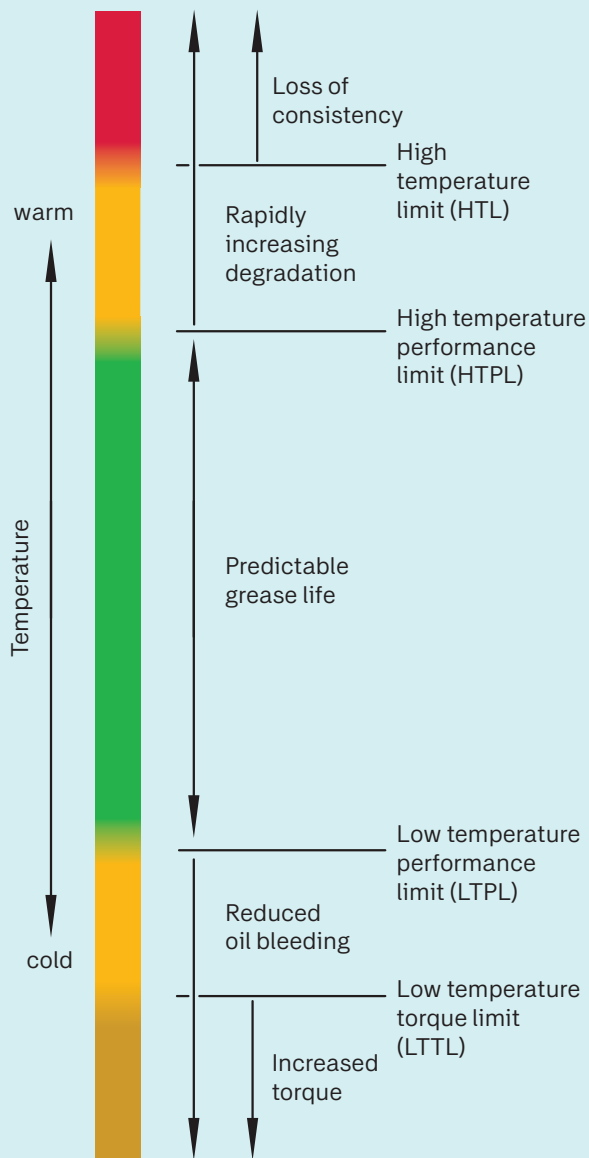
<sup>1)</sup> LTTL = Low Temperature Torque Limit  
HTPL = High Temperature Performance Limit



# Traffic light concept

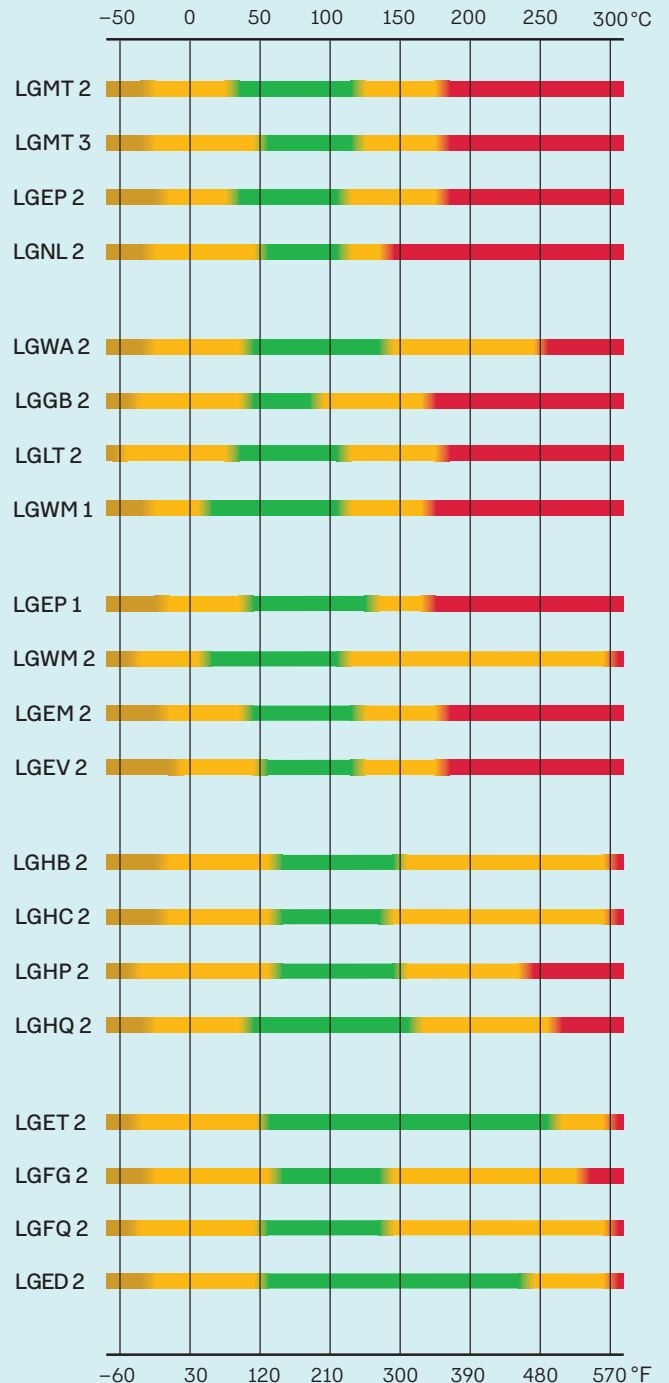
## SKF Traffic light concept

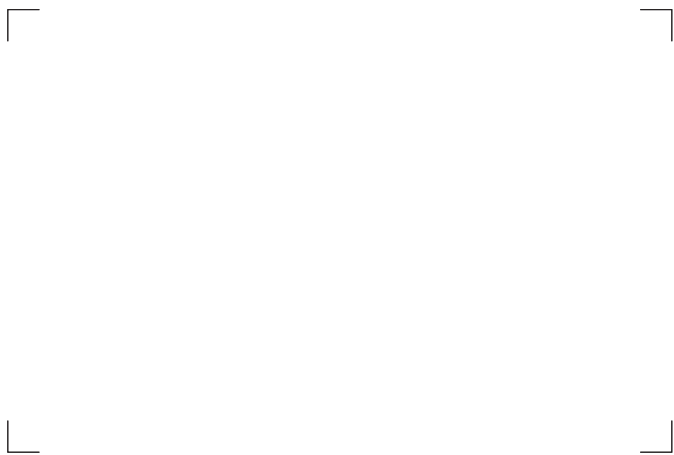
The temperature range over which a grease can be used depends mainly on the type of base oil, thickener, and additives, but also on the bearing type. The relevant temperature limits are illustrated schematically using traffic light colours. In the green zone, you can predict the grease life. The amber zones indicate temperature ranges where more careful considerations are required. At temperatures in the red zone, there is a risk of losing the required grease properties or bearing damage.



## Operating temperature range of SKF greases

When evaluating the suitability of a grease for a certain temperature range, keep in mind that greases typically do not change their properties suddenly at a temperature limit. There is always a transition zone.





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