UNDERSTANDING GREASES

GREASE CHARACTERISTICS

What is grease?

GREASE = BASE OIL + ADDITIVES + THICKENER

A lubricating grease is made by mixing 2% - 15% of a thickener and other additives into a lube base oil.

How does grease work?

The thickeners in grease absorb lubricants and additives like a sponge and release them when under pressure. The lubricants prevent friction and create a barrier or film between moving parts.

What is a grease expected to do?

- Reduce friction and wear.
- Provide corrosion protection.
- Seal bearings from water and contaminants.
- Resist leakage, dripping and throw off.
- Resist change in structure or consistency during service.
- Maintain mobility under conditions of application.
- Be compatible with seals.
- Tolerate or repel moisture.
- Be suitable for a wide range of temperatures.

What are the properties of grease?

- Amount and type of thickener.
- Additives.
- Solids (i.e. Moly, Graphite).
- Water washout and spray off.
- Mechanical stability.
- Oil separation.
- Storage life.
- Oxidation resistance.
- Rust / corrosion resistance.
- Viscosity and type of base oil.
- Bearing life (wheels, electric motors).
- Compatibility (other greases, seals).
- Low temperature torque.

What type of Thickeners are used?

- Clay (Organo Clay, i.e. Bentone).
- Lithium.
- Lithium Complex.
- Lithium / Calcium Mixed Complex.
- Calcium Complex.
- Aluminium Complex.
- Others (Calcium, Sodium, Polyurea).

What types of Base Oils are used?

- Castor Oils.
- Mineral Oils (Min).
- Synthetic Oils (Syn) (Group 3 & 4, PAO & Ester).
- White Oils (Pharmaceutical Grade).
- Vegetable Oils (Food Grade).

GREASE ADDITIVES

- Extreme Pressure Additives.
- Rust/Corrosion inhibitors.
- Tacky Additive - Adhesive/ Cohesive (polymers/resins).
- Insoluble Solids (Moly, Copper Graphite, Zinc Oxide).
- Oxidation inhibitors.
- Anti Wear Additives.
- Dyes, Pigments.

GREASE TYPES

There are many types of greases which are shown below. As can be seen they have different properties which helps to define where they are best suited.

THICKENER	DROP POINT,°C	MAX SERVICE CONTINUOUS OPERATING TEMP,°C	HIGH TEMP USE	STRUCTURE	SHEAR STABILITY	WATER RESISTANCE
Calcium	100	<80	□	□	○	■
Lithium	160 - 200	125	■	□	■	■
Calcium Complex	>260	150	■	□ ◿	■	■
Lithium Complex	>240	160	■	□	■	■
Aluminium Complex	>260	150	■	□ ◸	■	■
Barium Complex	>200	150	■	◹	○	■
Polyurea	>230	150	■	■	■	■
Bentone	NA	150	■	□	○	■
Sodium	170 - 190	125	■	◹	■	□

□ Very Poor □ Poor ○ Fair ■ Good ■ Excellent

◿ Buttery □ Smooth ◹ Fibrous ◸ Gel ■ Opaque

GREASE SERVICE CLASSIFICATION

There are different categories for greases developed by the NLGI (National Lubricating Grease Institute). The classification (ASTM D 4950) covers greases designed for the lubrication of chassis components and wheel bearings of passenger cars, trucks and other vehicles.

Consistency - Is the degree of hardness of a grease and may vary considerably with temperature i.e. from fluid to very hard. This is determined by the NLGI Grade Penetration. The viscosity of the base oil used in grease also varies from ISO 15 (very thin) to 1500 (extremely thick), and can have an effect on consistency.

NLGI Grade Penetration - NLGI is measured by a cone drop method. A special cone is dropped into the grease at 25° Centigrade and the depth of the fall is measured. This describes the consistency of a grease via and NLGI grade number. A grease is identified by an NLGI number that ranges from 000 to 6. NLGI 000 is a pourable or fluid grease and an NLGI 6 grease is solid, like wax.

NLGI GRADE PENETRATION @ 25°C (1/10th mm)		
000	445 - 475	Fluid
00	400 - 430	Semi-Fluid
0	355 - 385	Very Soft
1	310 - 340	Soft
2	265 - 295	Normal
3	220 - 250	Firm
4	175 - 205	Very Firm
5	130 - 160	Hard
6 (block grease)	85 - 115	Very Hard

GREASE TESTING

Drop Point Test: The dropping point of grease is the temperature at which the thickener can no longer hold the base oil. Grease is placed in a small cup and heated in an oven-like device. When a drop of oil falls from the lower opening of the cup, the dropping point of the grease is calculated using the temperatures in the oven and inside the cup.

4 Ball Weld Test: A 12.7mm steel ball is rotated against three stationary balls of the same size. Lubricant surrounds the balls. Test conditions are 1770 rpm, 25°C and 10 seconds duration. Testing steps continue with new balls and an increased load until welding of the four balls occurs.

GREASE SHELF LIFE

The shelf life of any grease is affected by the type and amount of thickener used, consistency of the grease, manufacturing method employed and the formulation complexity. Generally, straight Lithium, Lithium Complex and Calcium Complex greases remain stable for a long time. Aluminium Complex greases tend to set and harden, but remain stable. Bentone and Barium greases tend to soften on aging. Based on these observations:

The shelf life of most Penrite greases is about 5 years. However, Steering Box Lubricant and Semi Fluid Grease only have a 2 year shelf life.

GREASE COMPATIBILITY

Occasionally, grease substitution in an application may be necessary to correct problems arising from the original product in service. If the thickeners are incompatible, the mixture will not meet the properties of the individual greases and in some cases, the greases will fall apart. The below table provides a rough guide.

	Calcium	Lithium	Calcium Complex	Lithium Complex	Aluminium Complex	Barium Complex	Polyurea	Bentone	Sodium
Calcium		✔	✔	✔	●	✘	✔	✘	✘
Lithium	✔		✔	✔	●	●	✔	✘	●
Calcium Complex	✔	✔		●	✘	●	●	✘	✘
Lithium Complex	✔	✔	●		●	●	✔	✘	●
Aluminium Complex	✘	●	✘	●		✘	●	✘	✘
Barium Complex	✘	●	●	●	✘		●	✘	✘
Polyurea	✔	✔	●	✔	●	●		✘	✘
Bentone	✘	✘	✘	✘	✘	✘	✘		✘
Sodium	✘	●	✘	●	✘	✘	✘	✘	

✔ **Compatible** ✘ **Incompatible** ● **Borderline**

It is strongly advised that, in all cases, the old grease be purged or cleaned out from the system before a new one is introduced. However, compatibility between greases is temperature dependent. As the temperature rises, the problems associated with incompatibility also increase. With unknown competitors' products, it is strongly advised to treat them as incompatible.

GREASE COLOUR

A grease's colour is determined by base oil, thickener, additive and dye. A grease can be made to almost any colour to suit a particular environment, application or for identification purposes.

WHICH GREASE DO I USE? FOLLOW THE "L.E.T.S PRINCIPLE"

LOAD • ENVIRONMENT • TEMPERATURE • SPEED

LOAD

Load	ISO	NLGI	Additives/Base	Recommended Penrite Grease
High	220 460 680	1-2	High Base Oil Viscosity EP & AW Additives	Extreme Pressure Grease ACT Grease XEP2 High Temperature Wheel Bearing Grease
Low	100 150 220	2-3	Low Base Oil Viscosity Firm Consistency	Indgrease Lith R3 Indgrease 100 LXEP2

ENVIRONMENT

ENV	Protection Type	Additives/Base	Recommended Penrite Grease
Water	Rust Protection Water Resistance	Corrosion Preventative Adhesiveness Tackiness	Marine Grease Indgrease 1615 WR Indgrease CXOG-05
Acid / Alkali	Acid Protection Alkali Protection	Inert Thickener & Additives	Indgrease BM3
Long Dispensing Lines	Good Pumpability Soft Consistency		Indgrease Lith EP 0 Indgrease 100 LXEP2

TEMPERATURE

Temperature	Protection Type	Additives/Base	Recommended Penrite Grease
Very High	Up to 180°C	Clay Based Greases	Copper Eze Indgrease BM3
High	Up to 170°C	Complex Greases	Marine Grease High Temperature Wheel Bearing Grease
Moderate	Up to 140°C	Lithium Greases	Indgrease Moly HT Indgrease 1615 WR ACT Grease XEP2 QCA Grease MX9
Low	Down to -20°C	Lithium & Complex Greases	Extreme Pressure Grease Molygrease EP 3% Indgrease 100 LXEP2 ACT Grease XEP2 QCA Grease MX9

SPEED

Speed	Load	ISO	NLGI	Additives/Base	Recommended Penrite Grease
High	Low	100 150	2-3	Low Base Oil Viscosity Firm Consistency	Indgrease Lith R3 Indgrease 100 LXEP2
Low	High	220 680	2	High Base Oil Viscosity Soft Consistency	QCA Grease MX9

GREASES

Penrite has an extensive range of grease products covering most applications in the industrial and automotive sectors, from wheel and trailer bearings to anti-seize and assembly compounds. The range also includes semi-fluid greases, right up to very firm greases and also includes molybdenum disulphide and graphite containing greases to suit all lubrication requirements.

APPLICATION CHART

PENRITE

Since 1926

		EXTREME PRESSURE GREASE	MOLYGREASE EP 3%	SEMI FLUID GREASE	INDGREASE LITH EP 0	INDGREASE LITH EP2	INDGREASE LITH R3	CAM ASSEMBLY LUBE	10 TENTHS POWER SPORTS GREASE	MARINE GREASE	HIGH TEMPERATURE WHEEL BEARING GREASE	HEAVY DUTY BEARING GREASE	ACT GREASE XEP2	INDGREASE 100LX EP2	INDGREASE MOLY HT	GRAPHITE GREASE	WATER PUMP GREASE	INDGREASE 1615 WR	INDGREASE CX 152WR	QCA GREASE MX9	INDGREASE CXOG-05	COPPER EZE	RUBBER GREASE	INDGREASE BM3
		LITHIUM							LITHIUM COMPLEX							CALCIUM		CALCIUM COMPLEX		MIXED COMPLEX		CLAY BASED		
SPECIFICATIONS	NLGI Grade	2	2	00	0	2	3	Paste	2	2	2	2	2	2	1.5	3	4	1.5	2	2	0.5	1.5	2	3
	Colour	Red	Grey / Black	Light Brown	Light Brown	Amber	Amber	Grey / Black	Green	Green	Blue	Purple	Red / Orange	Brown	Grey/ Black	Grey/ Black	Amber	Brown	Beige	Grey/ Black	Dark Brown	Copper	Red	Grey/ Black
	Extreme Pressure	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No
	Solids and %	No	3	No	No	No	No	Yes	No	No	No	No	No	No	5	15	No	No	No	9	No	20	No	3
	"ISO" Base Oil Viscosity	320	220	150	150	180-210	100	NA	220	220	220	220	560	100	460	100	NA	460	200	680	800	460	320	100
	Base Oil Type	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Semi Syn	Min	Min	Min	Min	Min	Min	Min	Min	Min	Cas-tor	Min
	Drop Point, °C	190	190	170	195	195	195	NA	275	275	275	275	>270	275	>260	80	90	>260	>280	>250	>260	Non Melt	275	Non Melt
	Recommended Operating Temperature Range, °C	Minus 20 to plus 130	Minus 20 to plus 130	Minus 20 to plus 130	Minus 20 to plus 130	Minus 20 to plus 130	Minus 20 to plus 130	NA	Minus 15 to plus 170	Minus 15 to plus 170	Minus 10 to plus 170	Minus 10 to plus 170	Minus 20 to plus 140	Minus 20 to plus 160	0 to plus 160	Max 60	0 to plus 75	Minus 20 to plus 150	Minus 20 to plus 150	Minus 20 to plus 140	Minus 20 to plus 140	0 to plus 1093	Minus 9 to plus 80	Minus 20 to plus 200
	Four Ball Weld Load, kg	400	315	250	250	250	NA	NA	315	315	620	620	350	315	550	NA	NA	>660	>765	>800	765	NA	NA	NA
	Contains Tacky Additive	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes	Yes	No	No	No
AUTOMOTIVE	Vintage Water Pumps																R							
	Wheel Bearings								R	R	R	R		S					R					
	Engine Assembly							R																
	Chassis	R	R			S	S		S	S	R	R	S	S	R	S		S	R	S	S			S
	General Purpose	R	R			S			S	S	R	R	S	S					S					
	CV Joints		S												S					R				
	Petrol Resistant																						R	
	Tyre Mounting																						R	
	Universal Joints		R						S	S	S	S			R				S	R				
	Steering Boxes			S																				
TRUCK & BUS	Wheel Bearings								S	S	S	S	R						S					
	Chassis	S	R		S	S			S	S	S	S	S	S	R	S		S	R	S	S			S
	General Purpose	S	S			S			S	S	S	S	S	S				S	R					
	Trailer Couplings		R												R				R	R				R
	Universal Joints												R		R				S	R				
	Fifth Wheel		S	S											S	S				S	R			S
	Truck Mounted Automated Greasing Systems				S																			
INDUSTRIAL	High Speed						S		R	R	R	R		R					R					
	Low Speed	S	S			S					S	S	S		R	S		R		R	R			S
	Electric Motors/Fans						R							R										
	High Temperature								R	R	R	R	R	R	R			R	R	R	R	R		R
	High Load	S	R			R			S	S	S	S	R		R			R	R	R	R			S
	Central Systems	S		S	R	S								S	S						S			
	Long Life						S						R	R	S			R	R	R	S			
	Shock Loads	S	R			S			S	S	S	S	S	R	R			R	R	R	R			R
	Anti Seize																					R		
	Sliding Surfaces / Splines		R																					
	Wet Environments		R						R	R	S	S	S	S	S	S		R	R	S	S	S		R
AGRI	General Purpose	S	S			S					R	R	S	S	S			S	S		S			
	Slasher Gearboxes			R																				
	Sugar Mills																	S			S			
	Vintage Water Pumps																R							
MINING & CONSTRUCTION	Wheel Bearings								S	S	S	S	R						S					
	King Pins/Shackles		S										S		R	S		S	S	R	S			R
	Gearboxes			S																				
	Open Gears																				R			
	Anti Seize																					R		
	Wire Ropes																	S	S		S			
	Vibrating Conditions		S										R		R					R				S
	High Temperatures								R	R	R	R	R	R	R			R	R	R	R			R
	Wet Environments		S						R	R	R	R	R	R	R	S		R	R	R	R			R
	Central Systems			S	R									S										
MARINE	Boat Trailer Bearings								R	R	R	R		S					R					
	Deck Equipment		S			S			R	R	S	S	S	S	S	R		R	R	S				S
	Anti Seize																					R		
	Wire Ropes & Cables																	S	S		S			

S = SUITABLE • R = RECOMMENDED *May be used in this application only if a clay/bentone grease has been used prior.

Contact Penrite Lubricants Help Line for further details. Phone **1300 PENRITE (736 748)**

LITHIUM GREASES

Extreme Pressure Grease

Product Code	Pack Size	Carton Qty
EPGR00045	450 Grams	6
EPGR0005	500 Grams	6
EPGR0025	2.5 Kilograms	6
EPGR020	20 Kilograms	1
EPGR055	55 Kilograms	1
EPGR180	180 Kilograms	1

Colour: **Red**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 2, ISO 6743, DIN 51502: KP2K-30

Penrite Extreme Pressure Grease is an NLGI 2, general purpose grease manufactured from high quality base oils and uses a lithium soap base. It is suitable for use in all general grease applications in automotive and industrial service. This includes plain bearings, slow speed wheel and anti-friction bearings, chassis grease, general plant lubrication and agricultural and construction equipment lubrication.

Molygrease EP 3%

Product Code	Pack Size	Carton Qty
MOLY00045	450 Grams	6
MOLY0005	500 Grams	6
MOLY0025	2.5 Kilograms	6
MOLY020	20 Kilograms	1
MOLY055	55 Kilograms	1
MOLY180	180 Kilograms	1

Colour: **Grey/Black**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 2

Penrite Molygrease EP 3% is an all purpose, NLGI 2, high temperature grease. It features a lithium soap base with premium quality base oils and molybdenum disulphide (moly) for added protection. It is suitable for use where the grease is likely to be exposed to weather and/or squeezed out. In these applications, a thin film of molybdenum will provide some measure of protection until the component can be re-greased.

Semi Fluid Grease

Product Code	Pack Size	Carton Qty
SEMI00045	450 Grams	6
SEMI0005	500 Millilitres (UK)	6
SEMI020	20 Kilograms	1

Colour: **Light Brown**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 00

Penrite Semi Fluid Grease is an extreme pressure, NLGI 00, lithium soap thickened grease, blended using extreme pressure additives, anti-wear, rust and oxidation inhibitors. It extends bearing and gear life by minimising wear and shock loads as well as resisting leakage even under heavily loaded conditions. It is suitable for use in trailer bearing hubs where heavy oils are specified and leakage is a problem, chain cases, slow speed industrial gearboxes where AGMA 7EP (ISO 460 and above) industrial gear oils are specified, leaky gearboxes, reduction gearboxes in slasher mowers, track rollers in earthmoving equipment, centralised lubrication systems that require fluid (or "liquid") type greases and in Burman motorcycle gearboxes.

Indgrease Lith EP 0

Product Code	Pack Size	Carton Qty
IGRLITHEP0020	20 Kilograms	1

Colour: **Light Brown**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 0, DIN 51502: KP0K-20, ISO 6743: ISO-L-XCCFB0

Penrite Indgrease Lith EP 0 is an NLGI 0, lithium based, mineral lubricating grease. It is made with a combination of antioxidants, corrosion inhibitors and extreme pressure (EP) and anti-wear (AW) additives. Indgrease Lith EP 0 is a high quality multi-purpose, semi-fluid type grease for use in many types of automotive and industrial applications including heavy duty service where high loads are encountered. It is suitable for rolling element bearings, plain bearings, gears and couplings, where an NLGI 0 grease is required.

Indgrease Lith EP2

Product Code	Pack Size	Carton Qty
IGRLITHEP200045	450 Grams	20
IGRLITHEP2020	20 Kilograms	1

Colour: **Amber**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-20, ISO 6743: ISO-L-XBCEB 2

Penrite Indgrease Lith EP2 is an NLGI 2, lithium based, industrial mineral lubricating grease. It is made with a combination of antioxidants, corrosion inhibitors and extreme pressure (EP) and anti-wear (AW) additives. Indgrease Lith EP2 is high quality multi-purpose grease for use in many types of industrial applications where medium to high loads are encountered. It is suitable for use in general purpose bearing applications such as rolling element bearings and plain bearings, where a more pumpable, NLGI 2 grease is required.

Indgrease Lith R3

Product Code	Pack Size	Carton Qty
IGRLR300045	450 Grams	12

Colour: **Amber**
Recommended Operating Temperature Range: **-20°C to 130°C**

Key Specifications: NLGI 3, DIN 51502: KP3K-20, ISO 6743: ISO-L-XCCFA3

Penrite Indgrease Lith R3 is a high quality NLGI 3, lithium soap thickened grease. It is made using highly refined base oils and features include a high level of oxidation, rust and water washout protection. It is a multi-purpose rust and oxidation (R&O) type grease designed as a multi-service grease for industrial applications, particularly high speed, low load bearing applications. Recommended for use in most types of industrial applications operating under high speed, low load conditions, where an NLGI 3 grease is required.

Cam Assembly Lube

Product Code	Pack Size	Carton Qty
CAM0001	100 Grams	6

Colour: **Grey/Black**
Recommended Operating Temperature Range: **N/A**

Key Specifications: NLGI 2

Penrite Cam Assembly Lube is a special purpose sticky paste formulated with a lithium grease, designed for the initial lubrication of engine parts during the engine assembly process. It contains rust inhibitors, oxidation inhibitors, tackiness additives, zinc and graphite anti-wear agents to provide outstanding engine lubrication protection prior to and during first starting of new or rebuilt engines.

LITHIUM COMPLEX GREASES

10 Tenths Power Sports Grease NEW

Product Code	Pack Size	Carton Qty
PSGR0001	100 Grams	6

Colour: **Green**
Recommended Operating Temperature Range: **-15°C to 170°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-30, ISO 6743: ISO-L-XCDIB2

Penrite 10 Tenths Power Sports Grease is a water resistant, high temperature, multi-purpose grease that contains a special anti-rust additive for enhanced protection against rust and corrosion. It also contains a tackiness agent to provide increased protection during severe performance conditions allowing for exceptional water wash out resistance and spray off resilience. It has been formulated to provide outstanding lubrication and protection in all outdoor conditions such as motorcycling, marine, automotive and other outdoor activities where a water-resistant type grease is required. It has excellent resistance to water, snow, ice and mud, and provides outstanding film strength.

Marine Grease

Product Code	Pack Size	Carton Qty
MARGR00045	450 Grams	6
MARGR0005	500 Grams	6
MARGR0025	2.5 Kilograms	6

Colour: **Green**
Recommended Operating Temperature Range: **-15°C to 170°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-30, ISO 6743: ISO-L-XCDIB2

Penrite Marine Grease is an NLGI 2, tacky, high temperature multi-purpose lithium complex grease. It contains a special anti-rust additive for enhanced protection against rust and corrosion in marine and salt water environments. It has been formulated to provide outstanding lubrication and protection in marine applications. It is suitable for leisure craft through to industrial marine fleets. Its applications include winch gears, stern drives, prop shaft splines, steering tubes and cables, throttle lines and linkages, dog seals, trunnion steering mounts, shaft support bearings and most other general on-board greasing points. Also suitable for automotive wheel bearings.

High Temperature Wheel Bearing Grease

Product Code	Pack Size	Carton Qty
HTGR00045	450 Grams	6
HTGR0005	500 Grams	6
HTGR0025	2.5 Kilograms	6
HTGR020	20 Kilograms	1
HTGR055	55 Kilograms	1
HTGR180	180 Kilograms	1

Colour: **Blue**
Recommended Operating Temperature Range: **-10°C to 170°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-30, ISO 6743: ISO-L-XCDIB2, Volvo 97720 (level)

Penrite High Temperature Wheel Bearing Grease is an NLGI 2, high temperature all-purpose, extreme pressure (EP) grease manufactured from high quality base oils and a lithium complex soap. Suitable for use in all general chassis grease applications in automotive and industrial service including in cars, 4WDs, trucks and buses. It is also particularly suitable for use in wheel bearings of vehicles fitted with disc brakes, as well as drum brakes, boat trailer wheel bearings and other marine applications.

Heavy Duty Bearing Grease NEW

Product Code	Pack Size	Carton Qty
HDBG020	20 Kilograms	1
HDBG180	180 Kilograms	1

Colour: **Purple**
Recommended Operating Temperature Range: **-10°C to 170°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-30, ISO 6743: ISO-L-XCDIB2, Volvo 97720 (level)

Penrite Heavy Duty Bearing Grease is an NLGI 2, high temperature all-purpose, extreme pressure (EP) grease manufactured from high quality base oils and a lithium complex soap. Suitable for use in all general chassis grease applications in heavy duty vehicles, including trucks and buses, agricultural, construction equipment and for industrial service. It is also particularly suitable for use in wheel bearings of heavy duty vehicles fitted with disc brakes, as well as drum brakes.

ACT Grease XEP2

Product Code	Pack Size	Carton Qty
ACTXEP200045	450 Grams	6
ACTXEP2180	180 Kilograms	1

Colour: **Red/Orange**
Recommended Operating Temperature Range: **-20°C to 140°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-20, ISO 6743: ISO-L-XBDIB2

Penrite ACT Grease XEP2 is a tenacious, highly specialised semi synthetic, NLGI 2, lithium complex grease designed for use in agricultural and construction equipment as well as on highway trucks. It is manufactured from a bismuth EP/AW additive technology and utilises carefully blended polymers, to help provide excellent stay in place properties and to adhere to critical parts where it can better lubricate metal surfaces.

Indgrease 100LX EP2

Product Code	Pack Size	Carton Qty
INDGR100LXEP200045	450 Grams	6
INDGR100LXEP2180	180 Kilograms	1

Colour: **Brown**
Recommended Operating Temperature Range: **-20°C to 160°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-20, ISO 6743: ISO-L-XCDIB2

Penrite Indgrease 100LX EP2 is a premium, high melting point, NLGI 2, lithium complex grease. It is a high temperature grease designed to meet the most demanding grease applications especially where a low base oil viscosity and long life is required. It is formulated to provide extreme pressure (EP) and anti-wear (AW) protection plus water resistance properties. Indgrease 100 LXEP 2 is also formulated to give a high level of oxidation, rust and corrosion protection.

Indgrease Moly HT

Product Code	Pack Size	Carton Qty
INDGRSMOLYHT00045	450 Grams	6
INDGRSMOLYHT018	18 Kilograms	1
INDGRSMOLYHT180	180 Kilograms	1

Colour: **Grey/Black**
Recommended Operating Temperature Range: **0°C to 160°C**

Key Specifications: NLGI 1.5

Penrite Indgrease Moly HT is a premium heavy duty, NLGI 1.5 grease designed for the mining and construction industries. It is a smooth grease based on a lithium complex thickener and is formulated with high quality base stocks combined with extreme pressure additives for maximum loading applications and anti-wear protection. Indgrease Moly HT contains molybdenum disulphide and graphite for boundary protection against the heaviest sliding, shock or impact loading conditions as well as containing effective rust, oxidation and corrosion inhibitors.

CALCIUM GREASES

Graphite Grease

Product Code	Pack Size	Carton Qty
GRGR0004	400 Grams (UK)	6
GRGR0005	500 Grams	6

Colour: **Grey/Black**
Recommended Operating Temperature Range: **Max 60°C**

Key Specifications: NLGI 3

Penrite Graphite Grease is an NLGI 3, graphite impregnated calcium based grease. It is designed for the lubrication of spring leaves, handbrake cables, flexible drives and exposed chains. Graphite Grease is suitable for use in slow speed plain bearings and slides where a heavy grease with solid lubricants is required. It can also be used in plain bearing locks, latches and fasteners, cables and springs and even as a fifth wheel lubricant.

Water Pump Grease

Product Code	Pack Size	Carton Qty
WPGR00005	50 Grams	6

Colour: **Amber**
Recommended Operating Temperature Range: **0°C to 75°C**

Key Specifications: NLGI 4

Penrite Water Pump Grease is an NLGI 4, moderate duty, very firm grease manufactured from high quality base oils and a calcium soap. It is recommended for the lubrication of water pumps in older vehicles or in fire fighting and irrigation equipment requiring a heavy grease. Water Pump Grease can be used in spring loaded greasing units, via a grease gun to pump shafts or in screw applied greasers.

CALCIUM COMPLEX GREASES

Indgrease 1615 WR

Product Code	Pack Size	Carton Qty
INDGR1615WR018	18 Kilograms	1
INDGR1615WR180	180 Kilograms	1

Colour: **Brown**
Recommended Operating Temperature Range: **-20°C to 150°C**

Key Specifications: NLGI 1.5, DIN 51502: KP1.5N-20, ISO 6743: ISO-L-XBDFB1.5

Penrite Indgrease 1615WR is an NLGI 1.5, calcium sulphonate complex thickened, extreme pressure lubricating grease. The grease contains a mineral oil base with antioxidants and corrosion inhibitors. It does not contain conventional EP and anti-wear additives as they are built in as an integral part of the soap structure. It is a modern high performance product especially suitable for industrial applications where wet and corrosive environments are encountered.

Indgrease CX 152WR

Product Code	Pack Size	Carton Qty
INDGRCX152WR00045	450 Grams	6
INDGRCX152WR020	20 Kilograms	1

Colour: **Beige**
Recommended Operating Temperature Range: **-20°C to 150°C**

Key Specifications: NLGI 2, DIN 51502: KP2N-20, ISO 6743: ISO L-XB(F)DIB 2

Penrite Indgrease CX 152WR is an NLGI 2, calcium sulphonate complex thickened, extreme pressure lubricating grease based on mineral oil. It is formulated with antioxidants and corrosion inhibitors and does not contain conventional extreme pressure (EP) and anti-wear additives since they are built in as an integral part of the soap structure. It is an advanced, high performance grease especially suitable for marine and industrial applications or where wet and corrosive conditions are encountered.

MIXED COMPLEX GREASES

QCA Grease MX9

Product Code	Pack Size	Carton Qty
QCAG00045	450 Grams	6
QCAG020	20 Kilograms	1
QCAG180	180 Kilograms	1

Colour: **Grey/Black**
Recommended Operating Temperature Range: **-20°C to 140°C**

Key Specifications: NLGI 2, Caterpillar MPGM

Penrite QCA Grease MX9 is an advanced technology, NLGI 2, mixed-complex grease, containing 9% solids that provide additional lubrication in high load applications in industries such as quarries, construction and agriculture. It is made using a lithium-calcium complex soap with "built-in" extreme pressure and anti-wear properties. These are further enhanced by the addition of anti-oxidant and corrosion inhibitors. It also uses special tackifiers to help the product stay in place and adhere to critical metal surfaces.

Indgrease CXOG-05

Product Code	Pack Size	Carton Qty
INDGRCXOG5400	400 Millilitres	12
INDGRCXOG5018	18 Kilograms	1
NDGRCXOG5180	180 Kilograms	1

Colour: **Dark Brown**
Recommended Operating Temperature Range: **-20°C to 140°C**

Key Specifications: NLGI 0.5, DIN 51 502: KPGOG0.5N-30, ISO 6743: ISO-L-XCDIB0.5

Penrite Indgrease CXOG-05 is an NLGI 0.5, advanced technology lithium-calcium complex grease with built-in extreme pressure and anti-wear properties. These are further enhanced by the addition of anti-oxidant and corrosion inhibitors. It also uses special tackifiers to help the product stay in place and adhere to critical surfaces where it can better lubricate metal surfaces. Indgrease CXOG-05 is recommended for use in severe heavy duty applications where high shock loads are common including those in corrosive environments. It is especially suited to open gear applications where greases containing solids are normally used.

CLAY BASED GREASES

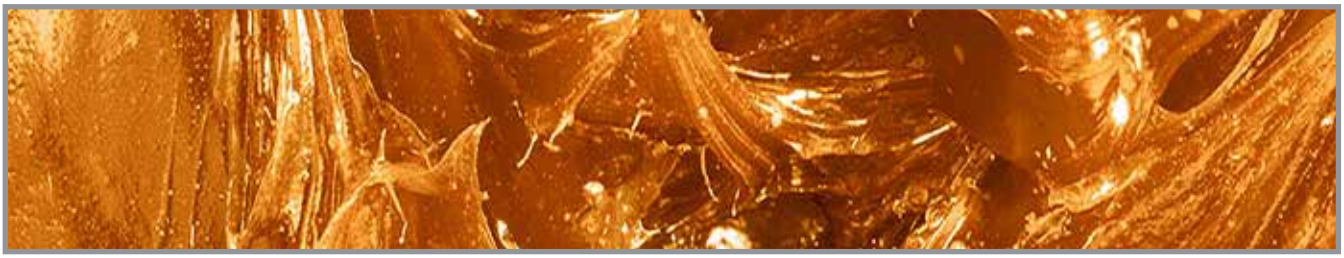
Copper Eze

Product Code	Pack Size	Carton Qty
CEZE0001	100 Grams	6
CEZE0005	500 Grams	6

Colour: **Copper**
Recommended Operating Temperature Range: **0°C to 1093°C**

Key Specifications: NLGI 1.5

Penrite Copper Eze is a bentone based anti-seize grease containing micro-size copper, zinc oxide and additional synthetic base oil that will resist temperatures of up to 1093°C. It is used to coat flanges, threads, nuts, bolts that are subject to corrosion or seizure. Copper Eze is also ideal for exhaust manifold studs, exhaust clamps, turbocharger connections, spark plug threads and brake assemblies. Ideal for boat trailer wheel studs, external hinges, flanges, screws, nuts and bolts to prevent seizure and corrosion in automotive, marine, industrial, agricultural and general domestic environments.



Rubber Grease

Product Code	Pack Size	Carton Qty
RUBGR0001	100 Grams	6
RUBGR0005	500 Grams	6

Colour: Red
Recommended Operating Temperature Range: -9°C to 80°C

Key Specifications: NLGI 2

Penrite Rubber Grease is a premium quality clay based grease containing castor oil for use when contact with natural and/or synthetic rubber is likely to occur. It can be used as a general purpose, non-harmful grease for industrial, automotive and consumer rubber parts such as hydraulic dust covers, braking system components, seals and washers. It is specially designed for use on rubber components in hydraulic systems where compatibility with the rubber seals is essential.

Indgrease BM3

Product Code	Pack Size	Carton Qty
IGRBM300045	450 Grams	6

Colour: Grey/Black
Recommended Operating Temperature Range: -20°C to 200°C

Key Specifications: NLGI 3

Penrite Indgrease BM3 is a highly specialised, NLGI 3, Bentone (Clay) no-melt type grease, manufactured with highly refined base oils and molybdenum disulphide. It can be used on equipment exposed to severe weather conditions such as cranes, conveyor chains, ore crushers, rolling mills and other exposed drives that can use this grade. General applications include shackle bolts, king pins and torsion bar bushings. Indgrease BM3 is suitable for use on trucks and buses on chassis points and fifth wheel areas. It is ideal for use in marine applications such as in deck equipment, cargo and warping winches, lifeboat davits, hatch covers and ships' stabilisers.

PENRITE PRODUCT	Grams					Kilograms					Millilitres	
	50	100	400	450	500	2.5	18	20	55	180	400	500
Extreme Pressure Grease	-	-	-	⊙	⊙	⊙	-	⊙	⊙	⊙	-	-
Molygrease EP 3%	-	-	-	⊙	⊙	⊙	-	⊙	⊙	⊙	-	-
Semi Fluid Grease	-	-	-	⊙	-	-	-	⊙	-	-	-	⊙
Indgrease Lith EP 0	-	-	-	-	-	-	-	⊙	-	-	-	-
Indgrease Lith EP2	-	-	-	⊙	-	-	-	⊙	-	-	-	-
Indgrease Lith R3	-	-	-	⊙	-	-	-	-	-	-	-	-
Cam Assembly Lube	-	⊙	-	-	-	-	-	-	-	-	-	-
10 Tenths Power Sports Grease	-	⊙	-	-	-	-	-	-	-	-	-	-
Marine Grease	-	-	-	⊙	⊙	⊙	-	-	-	-	-	-
High Temperature Wheel Bearing Grease	-	-	-	⊙	⊙	⊙	-	⊙	⊙	⊙	-	-
Heavy Duty Bearing Grease	-	-	-	-	-	-	-	⊙	-	⊙	-	-
ACT Grease XEP2	-	-	-	⊙	-	-	-	-	-	⊙	-	-
Indgrease 100LX EP2	-	-	-	⊙	-	-	-	-	-	⊙	-	-
Indgrease Moly HT	-	-	-	⊙	-	-	⊙	-	-	⊙	-	-
Graphite Grease	-	-	⊙	-	⊙	-	-	-	-	-	-	-
Water Pump Grease	⊙	-	-	-	-	-	-	-	-	-	-	-
Indgrease 1615 WR	-	-	-	-	-	-	⊙	-	-	⊙	-	-
Indgrease CX 152WR	-	-	-	⊙	-	-	-	⊙	-	-	-	-
QCA Grease MX9	-	-	-	⊙	-	-	-	⊙	-	⊙	-	-
Indgrease CXOG-05	-	-	-	-	-	-	⊙	-	-	⊙	⊙	-
Copper Eze	-	⊙	-	-	⊙	-	-	-	-	-	-	-
Rubber Grease	-	⊙	-	-	⊙	-	-	-	-	-	-	-
Indgrease BM3	-	-	-	⊙	-	-	-	-	-	-	-	-