



Since 1985 **SUPER**  
**Palco**<sup>®</sup>

Advanced Lubricant Chemistry

# PRODUCT CATALOGUE

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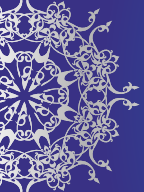
# INDUSTRIAL LUBRICANTS



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Since 1985 **SUPER**  
**Palco**<sup>®</sup>  
Advanced Lubricant Chemistry



## FROM THE DESK OF MANAGING DIRECTOR

As we look back, when we started Paras Lubricants in 1985, I am proud of growth substantially in stature, size and scale. We have always believed that great companies that are founded with a strong vision and built on solid values are the ones that thrive and live on.

We realize that with growth comes responsibility and accountability. We must manage expectations of all customers and commit to deliver superior performance each time. There is need to continuously raise the bar and reinvent ourselves. Our engineers are encouraged and supported to deliver breakthrough innovations and not just incremental improvements and attaining the vision of the Indian Lubricant manufacturing company mostly admired for its quality products, reliable performance & best services with a perspective of global excellence.

The company now operates on much bigger scale and our business has performed well across all operating vertical including export as robust business model. Joint ventures and subsidiaries across continents would supplement the growth imperative and sustain ability in the long terms but our focus would continue on operational excellence and building and enhancing our capabilities. We are also aiming to replicate our success in other markets across globe.

We hope you find this edition both informative and interesting and it will give you a greater understanding for the work undertaken by our company to meet the new generation requirements.

Warm regards  
Sd/-  
Paras Kumar Bansal  
Managing Director

August,2023



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## DIRECTOR MESSAGE

Dear Customer,

This catalogue provides a greater understanding of industrial products manufactured and marketed by Paras Lubricants and this information would serve as a reference material. However, for proper recommendation and application of these products, our customers are requested to avail the services of our experienced sales technical personnel's.

We feel pleasure in presenting this catalogue on Industrial Lubricants to our valued customers, which we hope, would serve as ready-reckoner.

Warm regards  
Sd/-  
Sushant Kumar Bansal  
Director Marketing

## INTRODUCTION

We take this opportunity to introduce ourselves as one of the leading manufacturer of Automotive, Industrial & Specialty Lubricants. These products are manufactured by using a variety of high performance modern chemistry base oils with a combinations of Ash less/Metallic Additive packages , so as to meet the stringent requirements of Fuel Economy, Euro/ Bharat Stage Norms, Environmental considerations , Energy efficiency and above all the Long Life of the Lubricant and the Engine. The products thus produced meets the requirements of National as well as International Specifications like API, ISO, DIN ,BIS etc.

The technical service department of the company offers services in trouble shooting, problem solving, lube oil management & energy management.

Finally customer is our first priority and customer satisfaction is our motto. Our technical team regularly visits to important supply point locations and other strategic areas so as to resolve any customer's complaints, issues and provide best services to the customers.

Zero defect in manufacturing and 100% customer's satisfaction, is our aim and objectives.

Warm regards  
Sd/-  
Dr. V.K. Chhatwal  
Executive Vice President



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## GENERAL PURPOSE MACHINERY OILS

### PAL REX - 46, 68, 100, 150, 220, 320, 460

These are low viscosity index mineral oils having good adhesiveness and film strength, inherent oxidation and thermal stability, resistance to rusting and corrosion besides excellent ability to separate from water. They maintain thin film of oil under light and medium loads, protect machinery from excessive wear and provide economical lubrication.

Recommended for non-critical all loss lubrication system, hand-oiling applications involving lubrication of bearings, open gears, lightly loaded slides and guide ways of machine tools. All applications where additive treated oils are not required viz. filter media in oil bath type air cleaners, fluid sealing medium for gas holder where the gases don't react with mineral oils and flushing of automotive & industrial equipment so as to clean their all-inaccessible internal surfaces.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S								
P A L R E X								
S. NO.	PROPERTIES	46	68	100	150	220	320	460
1	Kinematic Viscosity, cSt @40°C	42-50	64-72	90-110	140-160	200-240	300-340	440-480
2	Viscosity Index, min.	90	90	90	80	80	80	70
3	Flash Point, COC, °C, min.	180	180	180	180	200	200	240

\* The specifications are subject to variations/ development / customization.



## GENERAL PURPOSE LUBRICATING OILS

### PAL LUBE – 32, 46, 68, 100, 150, 220, 320, 460

These are high quality, solvent refined, high viscosity index paraffinic mineral oils, having good film strength property, inherent oxidation and thermal stability, besides excellent ability to separate from water. They offer high resistance to the formation of lacquers and other oxidation products and resistance to rusting and corrosion. They provide economical lubrication and protect roll-neck bearings of steel mills from excessive wear under light and medium loads.

Recommended for lubrication of plain or roller bearings; in particular for circulating and bath systems, vertical and horizontal enclosed crank-case engines, sliding vane rotary machines, high pressure reciprocating machines, where the operating conditions are not severe and straight mineral oils can perform satisfactorily.

**PERFORMANCE LEVEL :** IS 6552-1987, IPSS 1-09-001-81 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S									
P A L L U B E									
S. NO.	PROPERTIES	32	46	68	100	150	220	320	460
1	Kinematic Viscosity, cSt @40°C	29-35	42-50	64-72	90-110	140-160	200-240	300-340	440-480
2	Viscosity Index, min.	90	90	90	90	80	80	80	80
3	Flash Point, COC, °C, min.	180	180	180	180	180	200	200	240
4	Pour Point, °C, max.	-6	-6	-6	-3	-3	-3	0	0

\* The specifications are subject to variations/ development / customization.



## CIRCULATION AND HYDRAULIC OILS (R&O)

### PHYDOL (R&O) - 32, 46, 68, 100, 150, 220, 320, 460

These are high quality, solvent refined, high viscosity index circulation & hydraulic oils, designed to satisfy the performance requirements for a wide range of hydraulic components in systems, subjected to light and medium load operating conditions. They have good film strength property, inherent oxidation and thermal stability, besides excellent ability to separate from water. They offer high resistance to the formation of lacquers and other oxidation products and resistance to rusting and corrosion in high humidity operations or where low levels of moisture are unavoidable. They provide economical lubrication and protect the components from excessive wear.

Recommended for hydraulic systems, plain and anti-friction bearings of turbo feed pumps, turbo blowers, air compressors requiring turbine quality oil, machine tools, circulation system of industrial gear boxes etc. which do not require EP type of lubricants and where oil is changed after short duration.

PERFORMANCE LEVEL : IS 3098-1983 (Reaffirmed 1993), DIN-51524 Part-1(except for very low pour point), US Steel No. 135 & Cincinnati Milacron P-38, P-54, P-55 and P-57 specifications.

**PACKING:** 210L, 50L, 20L

**PACKING: PHYDOL R&O 68:** 210L, 50L, 26L, 20L

C H A R A C T E R I S T I C S									
PHYDOL (R & O)									
S. NO.	PROPERTIES	32	46	68	100	150	220	320	460
1	Kinematic Viscosity, cSt @40°C	29-35	42-50	64-72	90-110	140-160	200-240	300-340	440-480
2	Viscosity Index, min.	90	90	90	90	90	90	90	90
3	Flash Point, COC, °C, min.	180	180	180	180	180	220	220	220
4	Pour Point, °C, max.	-6	-6	-6	-6	-6	-3	-3	-3
5	Rust Properties(ASTM D665,24/hrs.)	-----Pass-----							

\* The specifications are subject to variations/ development / customization.



## CIRCULATION AND HYDRAULIC OILS (AW)

### PHYDOL AW - 32, 46, 68, 100, 150, 220, 320, 460

These are premium quality high performance oils, designed to satisfy the performance requirements for a wide range of hydraulic components in systems subjected to high-pressure, high-temperature operating conditions. They have good film strength property, inherent oxidation and thermal stability, besides excellent ability to separate from water and have very good air release properties. They offer high resistance to the formation of lacquers and other oxidation products and resistance to rusting and corrosion in high humidity operations or where low levels of moisture are unavoidable.

These oils are formulated with high quality base stocks and carefully selected additive system that result in finished products to provide many desirable features, to work with systems operating under moderate to severe conditions where a high level of anti-wear protection is required.

Recommended for hydraulic system, systems employing gear, bearings, vane, radial and axial piston pumps, chain drivers, compressors, vacuum pumps, mining machinery machine tools, circulation oiling system etc. where anti-wear type hydraulic oils are recommended.

**PERFORMANCE LEVEL:** IS 10522-1983 (Reaffirmed 1993), US Steel No.127, Vickers V-104C vane pump test and IPSS 1-09-022 specifications.

**PACKING:** 210L, 50L, 20L, 5L

**PACKING:** PHYDOL AW 68: 210L, 50L, 20L, 5L, 1L

C H A R A C T E R I S T I C S									
P H Y D O L ( A W )									
S. NO.	PROPERTIES	32	46	68	100	150	220	320	460
1	Kinematic Viscosity, cSt @40°C	29-35	42-50	64-72	90-110	140-160	200-240	300-340	440-480
2	Viscosity Index, min.	90	90	90	90	90	90	90	90
3	Flash Point, COC, °C, min.	180	180	180	180	180	220	220	220
4	Pour Point, °C, max.	-6	-6	-6	-3	-3	-3	-3	-3
5	Rust Properties(ASTM D665,24/hrs.)	-----Pass-----							
6	Zinc % wt (ICP Emission)	0.035 – 0.043							
7	Phosphorus, % wt. (ICP Emission)	0.028 – 0.033							

\* The specifications are subject to variations/ development / customization.





## CIRCULATION AND HYDRAULIC OILS (HLP)

### PHYDOL HLP - 32, 46, 68, 100

These are high performance heavy-duty oils, primarily intended for applications where oil is used for extended period in circulation & hydraulic systems in wide range of industrial equipment and subjected to wide variations in ambient and operating temperatures. They possess good demulsibility that permits water and other contaminants to separate readily from the oil in the system reservoir. They are incompressible and remain in a fluid enough state to allow effective power transmission besides having outstanding antiwear, antirust, good air release, anti-foam, and oxidation resistance properties.

Recommended for use in hydraulic systems employing gear, vane, radial and axial piston pumps where anti-wear hydraulic fluids are required and clearances are relatively large. Due to their low pour point, they are recommended for sophisticated high performance electro-hydraulic or numerically controlled systems. They are also recommended for use in hydraulic couplings, injection moulding machineries, certain screw compressors and vacuum pumps handling air and inert gases provided the discharge temperatures do not exceed 150°C. They are suitable as multipurpose lubricants in systems and perform well at the elevated temperatures but not suitable for shock loading and extreme pressure.

**PERFORMANCE LEVEL:** IS 11656-1986 (Reaffirmed 1993), DIN 51524 Part-2, US Steel 127, Dension HF-0&HF-2, Cincinnati Milacron P-68, P-69, P-70 specifications. It also passes Vickers Vane Pump Test.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S					
PHYDOL (HLP)					
S. NO.	PROPERTIES	32	46	68	100
1	Kinematic Viscosity, cSt @40°C	29-35	42-50	64-72	90-110
2	Viscosity Index, min.	90	90	90	90
3	Flash Point, COC, °C, min.	180	180	180	180
4	Pour Point, °C, max.	-18	-15	-12	-9
5	Copper Strip Corrosion, @100°C for 3 Hrs. (max.)	1	1	1	1
6	FZG Pass Load Stage, min.	10	10	10	10
7	Rust Properties (ASTM D665, 24/hrs.)	-----Pass-----			
8	Zinc % wt (ICP Emission)	0.048 – 0.055			
9	Phosphorus, % wt. (ICP Emission)	0.038 – 0.043			

\* The specifications are subject to variations/ development / customization.



## SOLUBLE CUTTING OILS

### PALKUT - SL, SL SUPER

These are premium quality water soluble cutting oils, specially developed to form extremely stable milky emulsion even with extreme hard water (400 ppm) leading to excellent tool life and finish, in all metal cutting operations, where cooling is more important than lubrication. They have excellent antirust and anti-froth quality and cause no corrosion of machine, work piece or tool. They do not decompose chemically; leave objectionable odour, cause discoloration and staining. These are operator friendly and economical in use.

**PALKUT - SL** is blended from refined mineral oil, emulsifier and other additives.

**PALKUT - SL SUPER** is fortified with EP additive to suit wider range of metalworking operations. It has long service life even in hard water up to 600ppm, provides better lubricity and anti-wear properties.

Recommended for cutting, drilling, shaping, grinding, and other metal removal operations of ferrous and non ferrous materials where high quality of coolant is required. Not recommended for the machining of Magnesium due to potential fire hazards.

Procedure:

- ★ Dilution ratio with water varies between 5%to10% and 2%to4% for PALKUT SL&SL SUPER respectively depending on severity of machining.
- ★ While preparing emulsion always add cutting oil to water (not the other way round) to prevent inversion of the emulsion.
- ★ Clean the coolant reservoir and system periodically, recharge the system with 1% solution of coolant to be charged and circulate for at least 1 hr. and then drain completely.
- ★ Check the emulsion strength regularly and top up if necessary.

**PERFORMANCE LEVEL:** IS 1115-1986 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PALKUT SL	PALKUT SL SUPER
1	Kinematic Viscosity, cSt @40°C	20-30	20-30
2	Flash Point, COC, °C, min.	150	150
3	Copper Strip Corrosion Properties	Passes	Passes
4	Cast Iron Corrosion Properties	Passes	Passes
5	pH 5% emulsion in D/W	08-09	08-09
6	Emulsion Stability (for 24 hrs.) 5% in tap water 5% in 400ppm water	Stable Stable	Stable Stable
7	Heat Stability Properties ( at 0°C to 5°C)	Passes	Passes
8	Volatile Matter @100°C for 16 hrs. % by mass, max.	20	20

\* The specifications are subject to variations/ development / customization.



## SYNTHETIC CUTTING FLUIDS

### PAL SYNCO-100, 200

These are premium quality water-soluble oil free, fully synthetic type coolant, specially developed for use on ferrous metals only. These fluids do not undergo bacterial degradation and leave objectionable odour. Further these are non foaming, non toxic, non hazardous, thus ensuring total safety of the workmen. These are operator friendly and economical in use due to high mixing ratio and long service life.

**PAL SYNCO - 100** is fortified with rust, corrosion inhibitor, bactericide, fungicide etc. It has several advantages over conventional soluble cutting oil. Recommended for machining and grinding of ferrous metals only.

**PAL SYNCO - 200** contains EP additive to give high surface finish. Recommended for machining and grinding of iron, steel, non-alloyed steel and nickel-chrome steel.

Not recommended for the machining of non-ferrous metals.

Dilution ratio with water varies between 2%-3% depending upon the operation and product handled.

- ★ Concentrated mixture may lead to paint peel off in the machines and some discolouration of the operator's skin.
- ★ Coolant should be used only in clean circulating system.

**PERFORMANCE LEVEL:** IS 11186-1985(Reaffirmed 1990) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PAL SYNCO-100	PAL SYNCO-200
1	Appearance	Green	Green
2	Solution Appearance, @2% in distilled water	Clear fluorescent	Green
3	Cast Iron Corrosion, @250ppm, 500ppm	Passes	Passes
4	pH 2% dilution in distilled water	9	10

\* The specifications are subject to variations/ development / customization.



## SYNTHETIC CUTTING FLUIDS

### PAL SYNCO-300, 400

These are premium class of synthetic fluids based on combination of Ethylene & Propylene Oxide & provides both hydro dynamic & extreme pressure lubrication. At ambient temperature these are completely water soluble & at elevated temperatures these exhibits inverse solubility & are thus able to provide excellent lubricity at low concentration in water.

These fluids do not undergo bacterial degradation & leave objectionable odour. Further these fluids prevent the build-up of tacky or gummy residue & thus provides long term trouble free service in recirculating central cooling systems.

**PAL SYNCO - 300** is especially recommended for machining & grinding operations where it provides extremely smooth surface finish.

**PAL SYNCO -400** is recommended for machining & cutting operations of steel & nickel chrome steel. Not recommended for the machining of non-ferrous metals.

Dilution ratio with water varies between 4%-5% depending upon the operation and product handled.

- ★ Concentrated mixture may lead to paint peel off in the machines and some discoloration of the operator's skin.
- ★ Coolant should be used only in clean circulating system.

**PERFORMANCE LEVEL:** IS 11186-1985(Reaffirmed 1990) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PAL SYNCO-300	PAL SYNCO-400
1	Appearance	Green	Green
2	Solution Appearance, @2% in distilled water	Clear fluorescent	Green
3	Cast Iron Corrosion, @250ppm, 500ppm, 1000ppm	Passes	Passes
4	pH 2% dilution in distilled water	9	9.5
5	Low temperature static test	Passes	Passes

\* The specifications are subject to variations/ development / customization.



## SEMI SYNTHETIC WATER SOLUBLE CUTTING OIL

### PAL SUPER SYNCO-201

It is a premium Semi-Synthetic cutting oil which forms translucent emulsion with water and provides high lubricity & excellent cooling properties to metal specimen. It has outstanding detergency & wetting properties & can be used for cast iron as well as ferrous metals apart from CNC machines. The product contains special surfactant which perform cleaning action of the machine during use & prevents accumulation of dirt, grit, grease & oil scum on the machine. This also cleans the part & removes chips & prevents them from sticking onto the metal. The product is blended with a special grade of broad spectrum biocides which protects firm bacterial / fungicidal growth. Thus extends the tank life under normal operating conditions.

Recommended concentration 5% in water.

### ADVANTAGES

- ★ Excellent cooling properties & lubricity combined to provide extended tool life.
- ★ Compatible with a wide range of materials including ferrous, non-ferrous & nonmetallic materials.
- ★ Keeps machine and work environment clean when machining r grinding.
- ★ Minimized formulation of Fog / Mist.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL SUPER SYNCO-201
1	Appearance	Clear & Transparent
2	Colour	<4.0
3	Density @29.5°C	0.985 – 0.999
4	Kin. Viscosity @40°C	45-60
5	Solubility in water	Soluble
6	pH (5% Emulsion)	8.5-9.5

\* The specifications are subject to variations/ development / customization.



## SYNTHETIC CUTTING FLUIDS

### PAL GRINDOL-40

It is a premium quality of synthetic type of coolant which is water soluble developed for grinding operations only for ferrous metals. The solution formed is fully clear, alkaline in character and has good anti rust properties. It is non foaming, non-toxic & non-hazardous. Due to adequate concentration of bactericide, it does not undergo bacterial degradation & leave bad odour. It is operator friendly & economical to use.

**PAL GRINDOL-40** is fortified with rust, corrosion, inhibitor, lubricity agents & bactericide, fungicide.

**RECOMMENDED** for grinding operations on ferrous metals & alloys only & not recommended to non-ferrous metals.

Dilution ratio in 3% gives excellent grinding with smooth surface finish.

Concentrated mixture can lead to peeling of the paint on the machines & some discoloring of the operator's skin.

**PERFORMANCE LEVEL:** IS 11186-1985 (Reaffirmed 1990) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL GRINDOL-40
1	Appearance	Green
2	Solution Appearance, @2% in distilled water	Clear fluorescent
3	Cast Iron Corrosion, @250ppm, 500ppm	Passes
4	pH 2% dilution in distilled water	9

\* The specifications are subject to variations/ development / customization.



## NEAT CUTTING OILS

### PALKUT ST – 1,2,3,4,5,6

These products are high performance neat cutting fluids, designed for a wide range of applications. The product meet the highest demands of operating, cutting conditions, tools & work piece materials. Each of these products differ in their viscosity & other characteristics etc. to cover a wide range of applications. These products offer stable oil film, excellent heat dissipation, EP properties & improved surface finish.

#### PALKUT ST -1 & 2

Non-staining type neat cutting oils containing chlorinated EP additives. These products are recommended for machining operation on mild steel, carbon steel, nickel steel and manganese steel such as thread grinding, form grinding, milling, honing & lapping etc.

#### PALKUT ST -3

Non-staining type sulphurised fatty oil based neat cutting oil which covers a wide range of machining operations, aids in obtaining good surface finish & protects tool from excessive wear. Recommended for application in high speed automatic machine tools & multispindle lathes where operations like turning, honing etc. are performed. It is also suitable for application as general purpose machine tool lubricant.

#### PALKUT ST -4

It contains sulpharised & chlorinated additives which provides excellent performance in all machining operations on non-ferrous metals & can also be used for gear hobbling, gear sharing, screw cutting, tapping, milling etc.

#### PALKUT ST -5

It is an active sulphur-chlorinated type cutting oil which is recommended for deep hole drilling & deep hole boring. It is suitable for cutting of ferrous & ferrous alloys only.

#### PALKUT ST -6

It is a neat cutting oil containing sulphurised fat besides active sulphur & chlorinated additives. Recommended for severe metal cutting operations including gear cutting, broaching, thread cutting, hobbing etc. It is not recommended for use on non-ferrous metals.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S							
P A L K U T							
S. NO.	PROPERTIES	ST-1	ST-2	ST-3	ST-4	ST-5	ST-6
1	Appearance	Clear & Bright Amber Fluid					Dark Brown
2	Kinematic Viscosity, cSt @40°C	5-8	15-25	15-25	27-35	11-15	27-35
3	Flash Point, COC, °C, min.	120	150	150	160	135	160
4	Contains						
	a) Inactive Sulphur	NO	NO	YES	YES	NO	YES
	b) Active Sulphur	NO	NO	NO	NO	YES	YES
	c) Chlorine	YES	YES	NO	YES	YES	YES

\* The specifications are subject to variations/ development / customization.



## RUST PREVENTIVE- WATER DISPLACING FLUIDS

### PAL RUSTRANS- L, H

These are water displacing type corrosion & rust preventives. On application on wet metal surfaces, it displaces water and offers a soft film that can withstand subsequent handling and provide rust protection. PAL Rustrans - L leaves a residual, thin, soft, waxy like film on application and evaporation of solvent. PAL Rustrans - H offers a soft, tacky, oily film on application and evaporation of solvent. These can be easily applied by dipping, spraying or by brush. These are easily removable by wiping with cloth soaked in petroleum solvents.

These products are formulated with film forming ingredients, rust inhibitors and water displacing additives in solvent.

### APPLICATIONS

**PAL Rustrans - L** is widely used for temporary corrosion protection during storage and transportation. As a lubricant in mild metal pressing operations.

Very effective for protection on steel tubes, wires, strips, bare sheeting's, wheel rings, auto parts & machined components.

**PAL Rustrans - H** is widely used for protection on highly finished components e.g. cylinder liners, gears, die etc.

**PERFORMANCE LEVEL:** IS 1154-2000 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PAL RUSTRANS- L	PAL RUSTRANS - H
1	Appearance	Amber Fluid	Amber Fluid
2	Kinematic Viscosity, cSt @40°C	3-5	6-8
3	Flash Point, min. abel,°C	30	30
4	Film Foaming Property	Passes	Passes
5	Water Displacement Properties	Passes	Passes
6	Coverage Sq. M/Ltr.	100	35-45
7	Film Thickness		
8	Protection : Indoor	9 months	9 months
	Outdoor	2 months	2 months

\* The specifications are subject to variations/ development / customization.





## RUST PREVENTIVE- MINERAL OIL BASED

### PAL RUSTNIL- L, H

These are lubricant type corrosion & rust preventive. The protective film of these grades have lubricating properties besides preventing moist air coming into contact with metal surfaces. They can be applied by dipping, spraying, roller coating, flow coating, flushing or circulation. Since the protective film has lubricating properties, it is not necessary to be removed. However these are easily removable by wiping.

These oils are formulated with high quality base stocks and carefully selected additive system to ensure formation of soft oily film over the metal surfaces and protection against rusting.

### APPLICATIONS

**PAL RUSTNIL-L** offers thin lubricating film. It is recommended for protection of steel sheets, shafting, conveyors, precision and drawn tubes, exposed gear etc.

**PAL RUSTNIL-H** has higher viscosity and hence it is suitable for protection of cycle rims/frames, handle bars etc., besides internal protection of gearboxes, hydraulic mechanism chain and external protection of instruments.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PAL RUSTNIL-L	PAL RUSTNIL-H
1	Appearance	Amber Clear Fluid	Amber Clear Fluid
2	Kinematic Viscosity, cSt@40°C,	10-12	20-25
3	Flash Point, COC, °C, min.	70	150
4	Pour Point, °C, max.	-3	-6
5	Protection: Indoor Outdoor	4 months 1 month	6 months 1 month

\* The specifications are subject to variations/ development / customization.



## RUST PREVENTIVE- WATER DISPLACING FLUIDS

### PAL RUSTOP - 247

**PAL RUSTOP - 247** is water displacing type rust & corrosion preventive. It forms a soft film; solvent deposited & can be applied directly to the water wet surface where it forms a protective film after displacement of water.

It is based on blends of film forming materials, corrosion inhibitors & a special type of wetting agent which strongly adheres to the parts. It can be easily applied by dipping, spraying or by brush. The protective film can be removed by wiping off with rags or waste soaked in kerosene / mineral turpentine oil.

### APPLICATIONS

**PAL RUSTOP – 247** is especially recommended as protective for all types of bearings, machine tools & components.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL RUSTOP-247
1	Appearance	Amber Clear Fluid
2	Flash Point, COC, °C, min.	40
3	Copper strip corrosion D130, 3hr at 100°C	1
4	Water Displacement Test	Pass
5	Coverage, Sq <sup>2</sup> m / Litre	75

\* The specifications are subject to variations/ development / customization.



## RUST PREVENTIVE- WATER DISPLACING FLUIDS

### PAL RUSTOP- 910, 920, 930,940

These are water displacing type rust & corrosion preventives. These form soft film, solvent deposited & can be applied directly to the wet metal surfaces where they form a protective film after the displacement of water.

**PAL RUSTOP 910, 920, 930, 940** are based on blends of film forming materials, corrosion inhibitors to enhance the performance in salt spray & humidity cabinet tests. These are also incorporated with special type of wetting agents which will adhere to the parts.

The protective films of these grades can be removed by wiping off with rags or waste soaked in kerosene / mineral turpentine oils or by alkaline degreasants.

### APPLICATIONS

**PAL RUSTOP 910** is especially recommended for protection during storage of machine tools & components.

**PAL RUSTOP 920** has a wide application for protection of components with high degree of finish, in machine shops & heavy machinery & plant manufacturing e.g. machinery tools, fasteners, metal strips etc. Because of its excellence performance in salt spray & humidity cabinet, it can be applied on components to be freighted by sea.

**PAL RUSTOP 930** is recommended for the protection of components like machine tools, fasteners etc.

**PAL RUSTOP 940** is recommended for the protection of components which are wrapped in paper especially fasteners etc.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S					
S. NO.	PROPERTIES	PAL RUSTOP-910	PAL RUSTOP-920	PAL RUSTOP-930	PAL RUSTOP-940
1	Appearance	Amber Clear Fluid			
2	Flash Point, COC, °C, min.	45	45	45	45
3	Protection: Indoor	6 months	9 months	6 months	1 month
	Outdoor	1 month	2 months	1 month	
4	Film Thickness Microns	4-5	7-9	5-6	4-6
	Salt Spray Test	24 Hrs.	60 Hrs.	48 Hrs.	15 Hrs.
6	Dewatering Test	Time 120 Second or below passes the test – Pass			
	De-Emulsification Test	Time 60 Minutes or below passes the test - Pass			

\* The specifications are subject to variations/ development / customization.



## QUENCHING OILS

### PALQUENCH - S, C, H, HC

These are high quality, solvent refined, high viscosity index quenching oils, blended from highly refined base oils and selected additives for effective quenching and uniform hardening of metal components without metallurgical distortion. They have good oxidation and thermal stability, prevent formation of sludge, rust and corrosion and also offer long service life.

**PALQUENCH-S** is suitable for general purpose quenching operation of steel components such as nuts and bolts, ball bearings etc. manufactured by automobile and light engineering industry at bath temperature 50°C to 65°C.

**PALQUENCH-C** is recommended for quenching operation where compounded oil is preferred, viz. for quenching of variety of steel components in major industries, high speed steel tools, ball bearings, nuts, springs etc.

**PALQUENCH-H** is recommended for the mass production of high precision, high quality products viz. automotive gears and transmission components, bearing rings etc. at an optimum bath temperature up to 180°C.

**PALQUENCH-HC** is recommended for quenching operation where compounded oil is preferred at an optimum bath temperature up to 180°C.

**PERFORMANCE LEVEL:** IS 2664-1980, Straight Mineral Type, Compound Type & IS 4543-1977 (Reaffirmed 1987) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S					
P A L Q U E N C H					
S. NO.	PROPERTIES	S	C	H	HC
1	Kinematic Viscosity, cSt @40°C	26-30	26-30	210-230	95-115
2	Kinematic Viscosity, cSt @100°C	4-6	4-6	17-19	11-13
3	Flash Point, COC, °C, min.	180	190	240	240
4	Quenching Time by Magnetic Quenchometer. (ASTM D 3520)	24	18	35	28
5	Viscosity Index, min.	90	90	90	95

\* The specifications are subject to variations/ development / customization.



## WIRE DRAWING OILS

### PAL DRAW -ST, ST-2, EP

These products are non-staining, high performance mineral oil based lubricant, having good cooling abilities. They are specially developed for high speed and deep drawing application of metals. They provide optimum film strength, lubricity and good metal wetting characteristics.

The products meet the highest demands of resistance to heat and stress generated during the process of wire drawing operation, thereby helps in smooth drawing, provides high degree of finish and extends the drawing equipment's life.

**PAL DRAW - ST** is, blended with fatty oil to improve wetting characteristics. It is stable, non-staining, mineral oil based lubricant, recommended for Aluminium wire drawing operation.

**PAL DRAW ST - 2** is blended by using high performance base oils and fortified with a combination of Anti wear and Extreme Pressure additives to sustain higher loads during the drawing operations. Besides having the good cooling characteristics, the oil also provides a stable oil film between the metal surfaces and prevents the metals from breakages, rupture etc.

**PAL DRAW - EP** is chlorinated extreme pressure (EP) type, blended with fatty oils and free sulphur making it ideally suited for most severe drawing conditions. It offers high degree of finish of the tube bar both internally and externally. It is widely used for deep drawing and cold rolling of Stainless Steel tubes.

Not recommended for cuprous metals. Staining may occur on high nickel alloys.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S				
P A L D R A W				
S. NO.	PROPERTIES	ST	ST-2	EP
1	Appearance	Dark Colour Liquid		
2	Kinematic Viscosity, cSt @40°C	280-300	280-300	280-300
3	Kinematic Viscosity, cSt @100°C	21-24	21-24	31-32
4	Flash Point, COC, °C, min.	255	260	150
5	Copper Strip Corrosion, @100°C, max.	1(3hr.)	1(3hr.)	4(1hr)
6	Saponification Value	20-25	25-30	-
7	Neutralization No. mg KOH/gm	0.4	0.2	-
8	Four Ball weld load, kg	-	>200	-
9	Timken OK Load, 1bs min,	-	40	-
10	Four ball WSD @ 40kg mm max.	-	0.6	-

\* The specifications are subject to variations/ development / customization.



## COLD FORGING OILS

### PAL FORGE 68,100

These oils are formulated from highly refined mineral oils and contain a combination of chemical active & polar additives. These oils have excellent extreme pressure (E.P) properties & during thermal degradation they forms a strong protective oil film which is capable of undertaking heavier loads, reduce friction & provides the best protection for the work pieces & dies. They also provide excellent antiwear & cooling performance during operation & extend the life of dies.

Recommended as a lubricant designated exclusively for stainless steel cold forging work including bolt nuts, bushes, screws etc.

The product is not recommended for metal processing of copper & aluminium.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
P A L F O R G E			
S. NO.	PROPERTIES	68	100
1	Appearance	Dark Brown	Dark Brown
2	Kinematic Viscosity, cSt @40°C	64-72	90-110
3	Pour Point,°C, max.	-6	-6
4	Flash Point, COC,°C, min.	180	180
5	Copper Corrosion 100°C for 3hrs.	4C	4C

\* The specifications are subject to variations/ development / customization.



## TURBINE OILS

### PAL TURBINE - 32, 37, 46, 57, 68, 78, 100

These oils are high quality, corrosion and oxidation inhibited turbine oils, for use in power plant steam and gas turbine lubrication. In addition they have excellent rust preventing, demulsibility, foam suppressing and air release properties. These oils prevent sludge deposits, reduce wear and tear, rust/corrosion of components, and provide trouble free operations.

These premium grade oils are formulated with high viscosity index base stocks and carefully selected antirust, anticorrosion, antioxidant & antifoam additives. They exhibit good air & water release properties.

**PAL TURBINE** oils are recommended for the lubrication of ring oiler of bearings of steam/water/gas turbines and pressure circulating systems. These oils can also be used for the lubrication of bearings of rotary/turbo compressors, where oils of turbine quality are required.

**PERFORMANCE LEVEL:** IS 1012-2002 and DIN 51515, Part-1 specifications.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S								
P A L T U R B I N E								
S. NO.	PROPERTIES	32	37	46	57	68	78	100
1	Kinematic Viscosity, cSt @40°C	29-35	33-39	42-50	53-60	64-72	74-83	90-110
2	Viscosity Index, min.	90	90	90	90	90	90	90
3	Flash Point, COC, °C, min.	180	180	180	180	180	180	180
4	Pour Point, °C, max.	-9	-9	-6	-6	-6	-6	-6

\* The specifications are subject to variations/ development / customization.



## COMPRESSOR OILS

### PALCOMP (S) 68

This is a specially developed compressor oil to provide satisfactory lubrication under prolonged high temperature & load conditions. Formulated from highly refined & saturated oil molecules derived by the process of isomerization & severe hydrogenation & fortified with balanced combination of anti-oxidants, EP / Anti wear, anti-rust & anti foam additives.

#### PRODUCT FEATURES

- ★ Excellent oxidation & thermal stability.
- ★ Very Low Carbon forming tendency
- ★ Good demulsibility
- ★ High load carrying properties.
- ★ Very good lubrication & cooling properties.

Recommended for modern rotary air screw compressors up to a discharge temperature of 220°C. This oil is also suitable for use in air vacuum pump designed to deliver at a pressure greater than the atmosphere pressure.

**PERFORMANCE LEVEL:** IS 1012-2002 & ISO DP -6521 Specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PALCOMP (S) 68
1	Appearance	Clear & Bright
2	Kinematic Viscosity, cSt @40°C	64-72
3	Viscosity Index, min.	90
4	Flash Point, COC, °C, min.	180
5	CCR, % wt., Max.	0.3

\* The specifications are subject to variations/ development / customization.





## COMPRESSOR OILS

### PALCOMP C - 100,150,220,320

These are specially developed compressor oils to provide satisfactory lubrication under prolonged high temperature & load conditions. These are formulated with selected base stocks & special compounding agent to give excellent resistance to washing effect of water. These are further fortified with antirust & anticorrosion agent & have good fluidity at low temperature.

#### PRODUCT FEATURES

- Excellent oxidation & thermal stability.
- ★ Resistance to washing effect of water.
- ★ Good antiwear properties
- ★ Excellent lubrication of cylinder liners, piston valves.

Recommended for cylinder lubrication of single & multistage compressors handling moist air.

**PALCOMP C** are not recommended for crankcase lubrication

**PERFORMANCE LEVEL:** DIN 51506 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S					
P A L C O M P C					
S. NO.	PROPERTIES	100	150	220	320
1	Appearance	Clear, Bright Colour			
2	Kinematic Viscosity, cSt @40°C	90-110	140-160	200-240	300-340
3	Viscosity Index, min.	90	80	80	80
4	Flash Point, COC, °C, min.	180	180	200	200
5	Saponification number, KOH/g	2.5-5.0	2.5-5.0	2.5-5.0	6-10

\* The specifications are subject to variations/ development / customization.



## COMPRESSOR OILS

### PALCOMP - 32, 46, 68, 100, 150

These are developed to meet satisfactory lubrication under moderate oxidation & thermal performance. Blended from high performance solvent refined & hydro cracked base stocks with suitable selected antioxidants, antiwear, antirust & antifoam additives.

#### PRODUCT FEATURES

- ★ High level of oxidation & thermal stability.
- ★ Low Carbon forming characteristics
- ★ Good EP/Antiwear properties

Recommended for moderate performance reciprocating rotary air / screw compressors up to a discharge air temperature of 220°C. These oils are suitable for use in air vacuum pump designed to deliver at a pressure greater than the atmosphere pressure.

**PERFORMANCE LEVEL:** DIN 51506 VD-L & ISO DP -6521 Specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S						
P A L C O M P						
S. NO.	PROPERTIES	32	46	68	100	150
1	Appearance	Clear, Bright Colour				
2	Kinematic Viscosity, cSt @40°C	29-35	42-50	64-72	90-110	140-160
3	Viscosity Index, min.	90	90	90	90	80
4	Flash Point, COC, °C, min.	180	180	180	180	180
5	Pour Point, °C, max.	-9	-9	-6	-6	-3

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL GEAR LUBRICANTS – ZINC TYPE

### PAL INGOL ZN-68, 100, 150, 220, 320, 460, 680

These are zinc based antiwear industrial gear lubricants, specially developed for the lubrication of enclosed gear sets including spur, helical and bevel designs and provide protection under non-critical conditions. Due to good film strength property, thermal and chemical stability these oils provide strong protection to mating surfaces thereby extending life of the gears.

These oils are formulated with high quality base stocks and carefully selected antioxidant, antirust, anticorrosion, antifoam, and antiwear additives. PAL Ingol ZN is suitable for systems operating under moderate to severe conditions where a high level of anti-wear protection is required.

Recommended for use in a wide range of enclosed and semi-enclosed gear systems having spur/straight bevel/spiral bevel/worm/herring-bone/helical types of gears, industrial, plain and roller bearings, sliding surfaces, chain drives, sprockets, flexible coupling etc. especially operating under non-critical conditions.

These are not suitable for foods and drug industries and those required to be operated under extremely severe and hostile environment viz. gear drives operating at speed over 3600 rev/min and/or pitch-line velocities exceeding 1500m/min and lubricant's sump temperatures generally exceeding 110°C.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S								
P A L I N G O L Z N								
S. NO.	PROPERTIES	68	100	150	220	320	460	680
1	Kinematic Viscosity, cSt @40°C	64-72	90-110	140-160	200-240	300-340	440-480	650-710
2	Viscosity Index, min.	90	90	80	80	80	70	70
3	Flash Point, COC, °C, min.	180	180	180	200	200	240	240
4	Pour Point, °C, max.	-6	-6	-6	-6	-6	-3	-3

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL GEAR LUBRICANTS – EP TYPE

### PAL INGOL EP – 68, 100, 150, 220, 320, 460, 680

These are industrial extreme pressure gear lubricants, specially developed for the lubrication of heavily loaded enclosed gear sets including spur, helical and bevel designs and provide protection in applications where shock loading occurs. PAL Ingol EP has high load carrying ability, protection against wear; helps to reduce sludge formation and increases oil service life. Further these oils provide strong protection against corrosion of steel and copper containing alloys and resists foaming besides having good water separation properties for easy water elimination.

These oils are formulated with high quality base stocks and carefully selected sulphur/phosphorus extreme pressure additive to provide high level of anti-wear & E.P. properties.

Recommended for use in a wide range of heavy duty enclosed and semi-enclosed gear systems having spur/straight bevel/spiral bevel/worm/herring-bone/helical types of gears, industrial, plain and roller bearings, sliding surfaces, chain drives, sprockets, flexible coupling etc. especially operating at low speeds and high loads for continuous service up to 110°C.

These are not suitable for foods and drug industries and those required to be operated under extremely severe and hostile environment viz. gear drives operating at speed over 3600 rev/min and/or pitch-line velocities exceeding 1500m/min and Lubricant's sump temperatures generally exceeding 110°C.

**PERFORMANCE LEVEL:** IS 8406-1993 (EP Type Gear Lubricants), DIN 51517 Part-3, Cincinnati Milacron P-35, P-59, P-63, P-77, IPSS 1-09-003 and US Steel 224 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S								
P A L I N G O L E P								
S. NO.	PROPERTIES	68	100	150	220	320	460	680
1	Kinematic Viscosity, cSt @40°C	64-72	90-110	140-160	200-240	300-340	440-480	650-710
2	Viscosity Index, min.	90	90	80	80	80	70	70
3	Flash Point, COC, °C, min.	180	180	180	200	200	240	240
4	Pour Point, °C, max.	-6	-6	-6	-6	-6	-3	-3

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL GEAR OILS

### PAL ST GEAR- 90, 140

These are high quality, solvent refined, high viscosity index moderate duty industrial gear oils, conforming to API: GL-4 specifications. They have good film strength property, inherent oxidation and thermal stability, besides excellent ability to separate from water. They offer high resistance to the formation of lacquers and other oxidation products and resistance to rusting and corrosion. They provide economical lubrication and protect industrial gears from excessive wear under light and medium loads.

These oils are formulated from high quality base stocks and a proprietary additive system to provide superior protection against rust, excellent resistance to oxidation and thermal degradation, and a high level of protection against wear, plus excellent resistance to corrosion and foaming.

Recommended for lubrication of worm gear as well as spiral-bevel and double reduction gears, highly loaded industrial spur, herringbone, helical and spiral bevel gears, operating under moderate duty conditions.

These are not suitable for foods and drug industries and those required to be operated under extremely severe and hostile environment viz. gear drives operating at speed over 3600 rev/min and/or pitch-line velocities exceeding 1500m/min and lubricant's sump temperatures generally exceeding 110°C.

**PERFORMANCE LEVEL:** IS 1118-1992, API:GL-4 specifications.

**PACKING: ST GEAR 90:** 210L, 50L, 20L, 10L, 5L, 1L

**ST GEAR 140:** 210L, 50L, 20L, 5L

C H A R A C T E R I S T I C S			
P A L S T G E A R			
S. NO.	PROPERTIES	90	140
1	Kinematic Viscosity, cSt @100°C	17-20	28-34
2	Viscosity Index, min.	90	90
3	Pour Point,°C	-9	-6
4	Flash Point, COC,°C, min.	220	230

\* The specifications are subject to variations/ development / customization.



## TRANSFORMER OIL

### PAL POWER FLUID - 20

**PAL POWER FLUID - 20** is a fluid medium specially developed to meet the requirements of all types of transformers from medium to extra high voltage range ensuring optimum performance and safety of the transformers. It cools the transformers and insulates the coils from electric short circuit. It is non-conductive and has excellent fluidity, even at low temperature (-6°C). It has high flash point resulting in low evaporation losses and has good dielectric properties resulting in minimum power loss.

It is formulated from highly refined mineral oil, having good high temperature stability & excellent electrical insulating properties. Special refining steps are used to ensure that oil-soluble current-carrying ionic materials are removed.

**PAL POWER FLUID - 20** is recommended for use in Transformers, oil immersed circuit breakers and switch gears. This oil is also widely used in special transformers designed to operate at elevated temperatures and in low maintenance / maintenance-free transformers designed to operate for longer periods.

This product is not recommended for use where safety specifications require the use of non-flammable insulating oil. Also not recommended for use where synthetic dielectric fluids and uninhibited oils are required.

**PERFORMANCE LEVEL:** IS 335-1993 (Reaffirmed 2005) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL POWER FLUID -20
1	Kinematic Viscosity, cSt @40°C	20
2	Density @29.5°C, g/cm <sup>3</sup> , Max.	0.89
3	Flash Point (PMCC), °C, Min	150
4	Pour Point, °C, Max	-6
5	Total acidity, mg KOH/gm	0.03
6	Electric Strength(breakdown voltage), KV,Min	30

\* The specifications are subject to variations/ development / customization.



## PNEUMATIC EQUIPMENT OILS

### PAL ROCKDRILL – L, H

These products are high performance mineral oil based lubricant, specially developed for airline lubrication of all type of pneumatically operated equipments. The products meet the highest demands of operation thereby reducing oil consumption and extending the life of machine components. They provide optimum film strength, lubricity and good metal wetting characteristics. These oils have good flow characteristics which ensure proper feed and dispersion through the oilers.

These oils are formulated with a blend of refined base stocks and selected additives containing extreme pressure, tackiness, antiwear, antirust, anticorrosion antioxidant, and antifoam properties.

Recommended for lubrication of pneumatic equipments like rock drills, jack hammers, wagon drills, chippers etc. They are also used in small in-plant pneumatic tools such as drills, tapers, impact wrenches grinders, filing tools, riveters and hoists etc.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S			
R O C K D R I L L			
S. NO.	PROPERTIES	L	H
1	Appearance	Dark	Dark
2	Kinematic Viscosity, cSt @100°C	11-13	15-18
3	Relative Density, @30°C	0.88	0.93
4	Flash Point, COC, °C, min.	180	180

\* The specifications are subject to variations/ development / customization.



## SUGAR MILL ROLL BEARING OILS

### PAL SMR- 2, 3

These lubricants are specially developed to meet the requirements of heavily loaded mill roll bearings in sugar mills. These oils are formulated with high viscosity lubricating oil base stocks and fortified with selected non-toxic mild EP and special compounding agents. They possess excellent resistance to leakage and protect the bearings against corrosion and wear.

Recommended for lubrication of sugar mill roll bearings. Also recommended for open gear lubrication by slush pan method and centralized lubrication system of slow speed spur and helical gears in industries.

**PACKING:** 210L

C H A R A C T E R I S T I C S			
P A L S M R			
S. NO.	PROPERTIES	2	3
1	Kinematic Viscosity, cSt @100°C	38-45	78-88
2	Flash Point, COC, °C, min.	210	210

\* The specifications are subject to variations/ development / customization.





## SPINDLE OILS

### PAL SPIN -10, 12, 22

These are high quality, low viscosity lubricant manufactured from solvent refined, high viscosity index base oils, having good film strength property, chemical and oxidation stability, besides excellent ability to separate from water. They provide economical bearing lubrication of high-speed textile spindle, machine tool spindles and protection from excessive wear.

These oils are blended from highly refined base stocks and carefully selected antioxidants, anticorrosion, antirust, antiwear and antifoam additives.

These oils are recommended for lubrication of textile and machine tools spindle bearings, hydraulic system of precision machine tools, timing gears, centrifugal separators, and positive displacement blowers.

**PERFORMANCE LEVEL:** IS 493 PART-II (Reaffirmed 1993) specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S				
P A L S P I N				
S. NO.	PROPERTIES	10	12	22
1	Kinematic Viscosity, cSt @40°C	9-11	11-13	21-23
2	Viscosity Index, min.	90	90	90
3	Flash Point, COC, °C, min.	160	160	180
4	Pour Point, °C, max.	-3	-3	-3
5	Copper corrosion @ 100°C for 3 hours.	1	1	1

\* The specifications are subject to variations/ development / customization.



## KNITTING OILS (WASHABLE)

### PALKNIT OILS 22, 32

These are non-corrosive, easily washable, non-abrasive knitting oils which are self emulsifiable in water and provide high level of scour ability from knitted yarns or fabrics. Good wetting and good lubricity with excellent washable properties leaving the fabric free from stains.

Formulated by using high quality of mineral oils & fortified with selected additives so as to provide good anti-wear, antirust, antistatic & anti-oxidant properties.

Recommended as non-staining type needle lubricants for large diameter circular knitting machines as well as for various other types of knitting machines & are suitable for automatic oiling units commonly fixed to circular knitting machines or by manual oiling methods. These are recommended for knitting of cotton or cotton-polyester, synthetics & dyed / undyed yarns etc.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PALKNIT-22	PALKNIT-32
1	Appearance	Clear liquid free from suspended matter.	
2	Colour	Colour less liquid	
3	pH of 10% Emulsion	7-8	7-8
4	Ionic Nature	Non-Ionic	Non-Ionic
5	Kinematic Viscosity cSt @40°C	20-24	29-35
6	Specific Gravity @15°C	0.86-0.87	0.86-0.87
7	Flash Point, COC, °C min.	180	180
8	Wash ability	Excellent	Excellent

\* The specifications are subject to variations/ development / customization.



## KNITTING OILS (WASHABLE)

### PALKNIT OILS 22(E), 32 (E)

These are economical type washable knitting oils which are self-emulsifier in water and provide high level of scour ability from knitted yarns or fabrics.

Formulated by using high quality of mineral oils & fortified with selected additives so as to provide good anti-wear, antirust, antistatic & anti-oxidant properties.

Recommended as non-staining type needle lubricants for large diameter circular knitting machines as well as for various other types of knitting machines & are suitable for automatic oiling units commonly fixed to circular knitting machines or by manual oiling methods. These are recommended for knitting of cotton or cotton-polyester, synthetics & dyed / undyed yarns etc.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PALKNIT-22 (E)	PALKNIT-32 (E)
1	Appearance	Amber Fluid	
2	Colour	Colour less to slightly yellowish	
3	pH of 10% Emulsion	7-8	7-8
4	Ionic Nature	Non-Ionic	Non-Ionic
5	Kinematic Viscosity cSt @40°C	20-24	29-35
6	Specific Gravity @15°C	0.86-0.87	0.86-0.87
7	Flash Point, COC, °C min.	180	180
8	Wash ability	Good	Good

\* The specifications are subject to variations/ development / customization.



## REFRIGERATION COMPRESSOR OILS – MINERAL OIL BASED

### PAL FRIZ - 12, 22, 32, 46, 68, 100

These oils are formulated from selected lube base stocks to provide low pour point, low floc point, good solubility in liquefied refrigerants & good chemical stability. They possess high fluidity at very low temperatures, resist deposit formation & have reduced tendency to foam. These oils ensure higher condenser efficiency and reduced compressor valve maintenance due to less deposits. These oils also impart antiwear & rust protection properties.

Recommended for a wide range of refrigeration compressor, both reciprocating as well as rotary using conventional refrigerants except sulphur dioxide. These grades are also recommended for the lubrication of hermetically sealed refrigeration compressors.

**PERFORMANCE LEVEL:** IS 4578-1989 specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S							
P A L F R I Z							
S. NO.	PROPERTIES	12	22	32	46	68	100
1	Appearance	Clear, Brown Liquid					
2	Kinematic Viscosity, cSt @40°C	12-14	20-24	29-35	42-50	64-72	90-110
3	Flash Point, COC, °C, min.	180	180	180	180	180	180
4	Pour Point, °C, max.	-39	-36	-33	-30	-27	-27
5	TAN, mg KOH/g of oil, Max.	0.05	0.05	0.05	0.05	0.05	0.05

\* The specifications are subject to variations/ development / customization.



## SEMI-SYNTHETIC REFRIGERATION OILS

### PALSYNTH REF - 32, 46, 68

These are premium quality of semi-synthetic refrigeration oils which are blended with appropriate chemistry of antioxidants, antiwear & E.P agents so as to impart desired lubrication & cooling properties. Better viscosity / temperature characteristics of products results in improved hydrodynamic lubrication of compressor bearings.

#### PRODUCT FEATURES

- ★ Low pour point.
- ★ Very low Freon flock point.
- ★ High dielectric strength.
- ★ Compatibility with CFC refrigerants.
- ★ High chemical stability in the presence of refrigerants.

#### APPLICATIONS

- ★ All types of reciprocating, rotary compressors using conventional refrigerants except sulphur dioxide.
- ★ Hermetically sealed refrigeration compressors.

**PERFORMANCE LEVEL:** IS 4578-1989 specifications.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S				
P A L S Y N T H R E F				
S. NO.	PROPERTIES	32	46	68
1	Appearance	Clear & Bright		
2	Kin. Viscosity, cSt @40°C	29-35	42-50	64-72
3	Pour Point,°C Max.	-42	-39	-36
4	Flash Point,°C, Min.	180	180	180
5	Freon Floc Point,°C Max.	-48	-48	-45
6	Dielectric strength, kv	35	35	30

\* The specifications are subject to variations/ development / customization.



## HEAT TRANSFER FLUIDS – MINERAL OIL BASED

### PALTHERM – 500, 600

These are high performance products designed for heat transfer in Textile, Pharmaceutical, Chemical and Processing Industries, equipped with indirect or secondary heating systems. They possess excellent resistance to thermal cracking and chemical oxidation and are non-corrosive and non-toxic. They possess high specific heats and thermal conductivities that provide good heat transfer efficiency and their viscosities are such that they can be pumped readily at both start-up and operating temperatures.

**PALTHERM** Heat Transfer Fluids are formulated from very stable high viscosity index base oils, coupled with a low pour point and fortified with high temperature oxidation inhibitors.

**PALTHERM** Heat Transfer Fluids are recommended for use in closed, forced circulation with indirect or secondary heating systems, equipped with expansion tanks. The temperature of the oil film surrounding the heating element should be about 15°C to 30°C above the bulk oil temperature. Higher than this may lead to deposit of sludge and coke which would interfere with the heat transfer rates and also shorten the service life of the oil.

**PALTHERM - 500** and **PALTHERM - 600** grades are suitable for heat transfer system operating up to 290°C & 310°C respectively.

These oils are not recommended for use in open systems where hot oil is exposed directly to the air. If they spray or escape from leakage points, hot oils may spontaneously ignite.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S			
P A L T H E R M			
S. NO.	PROPERTIES	500	600
1	Kinematic Viscosity, cSt @40°C	28-32	32-35
2	Viscosity Index, min.	95	95
3	Flash Point, COC, °C, min.	200	210
4	Pour Point, °C, min.	-3	-3
5	Copper Strip Corrosion, 3 hrs. @100°C, (ASTM), max.	1	1
6	Neut. Number, mg KOH/gm., max.	0.15	0.15

\* The specifications are subject to variations/ development / customization.



## SYNTHETIC HEAT TRANSFER FLUIDS

### PALTHERM S - LIGHT & MEDIUM

**PALTHERM S - LIGHT** is the synthetic heat transfer fluid for use in the liquid phase for heat transfer at operating temperature ranging from 40°C to 250°C applications.

**PALTHERM S - LIGHT** is ideally suited for processes in which heat has to be both applied & removed. It provides improved thermal stability over its entire range of applications. With its use, thermal changes involving the formation of highly viscous or solid deposits on the walls & heat transfer fluid circuit can be eliminated / reduced even over long operating periods within the operating range, the product exhibits an excellent service life.

**PALTHERM S - MEDIUM** is a moderate viscosity synthetic heat transfer fluid capable of providing satisfactory service life upto a bulk oil temperature of 320°C. It offers the following advantages over mineral based fluid.

- ★ Resists deterioration at recommended operating temperatures.
- ★ Assures long fluid life & clean systems.
- ★ Good heat transfer characteristics.
- ★ Low pour point & moderate viscosity, decreases the pumping losses and power requires for circulation.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S			
P A L T H E R M			
S. NO.	PROPERTIES	S-LIGHT	S-MEDIUM
1	Appearance	Clear& Bright	Clear& Bright
2	Kinematics viscosity, cSt @40°C	4.08	23.2
	@100°C	1.48	4.4
	@150°C	0.89	2.86
	@200°C	0.56	2.15
3	Pour point,°C, Max.	-54	-42
4	Total acid No. mg.KOH/g	0.02	0.02
5	Flash Point,°C, Min.	120	210
6	Thermal stability at 135°C / 168 hrs. CM (A)		
	- Appearance of oil offer test	Clear & Bright	Clear & Bright
	- Sludge, mg.	0.09	0.1
	- % Kinematic Viscosity change at 40°C, cSt	Nil	Nil
	- TAN change	0.16	0.26

\* The specifications are subject to variations/ development / customization.



## GENERAL PURPOSE ENGINE OILS

### PAL SAE- 30, 40, 20W40 20W40 (G)

These oils are quality performance moderate duty engine oils specially developed to protect engine parts from rust, corrosion and wear. They reduce formation of sludge in the engine and increase engine life, reduce exhaust emission, increase oil drain period interval due to good dispersant properties, lower oil consumption and increase fuel efficiency.

These oils are formulated from selected base oils having high thermal & oxidation stability and additives to provide optimum performance features and minimize maintenance cost.

These oils are recommended for lubrication of diesel engines coupled with generating sets operating under moderate duty conditions.

**PERFORMANCE LEVEL:** IS 13656-2002(E-PL1/E-DL1), US MILITARY-MIL-L-2104B, API: SC/CC specifications.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S					
P A L S A E					
S. NO.	PROPERTIES	30	40	20W40	20W40(G)
1	Colour	Red	Red	Red	Golden Natural
2	Kinematic Viscosity, cSt @100°C	9-12	13-16	13-16	13-16
3	Viscosity Index, min.	95	95	110	110
4	Pour Point, °C, max.	-6	-6	-6	-6
5	Flash Point, COC, °C, min.	220	220	200	200
6	TBN, mg KOH/gm.	4-5	4-5	4-5	4-5

\* The specifications are subject to variations/ development / customization.





## INDUSTRIAL ENGINE OILS

### PAL HYLUBE - 40, 20W40

These are quality performance industrial engine oils, meeting API: SC/CC performance requirements, specially developed for lubrication of engines coupled with generators/industrial equipment's in SSI or Medium Scale Industries. They provide good detergent / dispersant properties which keeps the engine clean & good antiwear characteristics keep the rubbing surfaces well apart.

These oils are formulated from selected solvent refined base oils & combination of antioxidant, antiwear and detergent / dispersant additives.

Recommended for lubrication of diesel engines coupled with power generating sets/industrial equipment's, operating under moderate duty conditions.

**PERFORMANCE LEVEL:** IS 13656-2002(E-PL1/E-DL1), US MILITARY-MIL-L-2104B, API: SC/CC specifications.

**PACKING: PAL HYLUBE 40 :** 210L, 50L, 20L

**PAL HYLUBE 20W40 :** 210L, 50L, 20L, 10L

C H A R A C T E R I S T I C S			
P A L H Y L U B E			
S. NO.	PROPERTIES	40	20W40
1	Kinematic Viscosity, cSt @100°C	13-16	13-16
2	Viscosity Index, min.	95	110
3	Pour Point, °C	-6	-21
4	Flash Point, COC, °C, min.	220	200
5	TBN, mg KOH/gm.	4-5	4-5

\* The specifications are subject to variations/ development / customization.



## MARINE OILS

### PAL MARINE - 410, 420, 430, 440

These oils are superior performance heavy-duty high TBN engine oils, meeting API: CD performance requirements, specially developed to protect engine parts from corrosion attributed to high sulphur levels encountered in residual fuels. They reduce formation of sludge in the engine and increase engine life, reduce exhaust emission due to high detergency, increase oil drain interval due to good dispersant properties, lower oil consumption and increase fuel efficiency.

These oils are formulated from selected base oils having high thermal & oxidation stability and anticorrosive, antirust, antioxidation, antiwear and high detergency additives to provide optimum performance features, keep engine clean and minimize maintenance cost.

Recommended for lubrication of engines operating on diesel/residual fuels (FO/LSHS/HPS etc.) coupled with high power generating sets operating under severe duty conditions.

**PERFORMANCE LEVEL:** IS 13656-2002(E-DL3), US MILITARY-MIL-L-2104C and API:CD, specifications.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S					
P A L M A R I N E					
S. NO.	PROPERTIES	410	420	430	440
1	SAE Grade	40	40	40	40
2	Kinematic Viscosity, cSt @100°C	13-16	13-16	13-16	13-16
3	Viscosity Index, min.	95	95	95	95
4	Pour Point,°C, max.	-6	-6	-6	-6
5	Flash Point, COC,°C, min.	220	220	220	220
6	TBN, mg KOH/gm.	10	20	30	40

\* The specifications are subject to variations/ development / customization.



## CYLINDER OILS

### PAL CYL – 460, 680

These are high quality, heavy base stocks having excellent lubricating properties & thermal stability.

#### PRODUCT FEATURES

- ★ Excellent oiliness & film strength.
- ★ Resistant to washing effect.
- ★ Excellent load carrying capacity.
- ★ Good inherent oxidation and thermal stability.

#### APPLICATIONS

- ★ Steam cylinder lubrication.
- ★ Calendar bearings & sugar mill roller bearings.
- ★ Lubricating of worm gears.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S			
P A L C Y L			
S. NO.	PROPERTIES	460	680
1	Kinematic Viscosity, cSt @100°C	440-480	650-710
2	Viscosity Index min.	70	70
3	Pour Point, C° max.	6	12
4	Flash Point, COC, °C, min.	240	240

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL MACHINERY TOOL WAY OILS

### PAL WAY OILS 32, 68, 220

These oils are formulated from high performance base stocks & additives which provides tackiness, anti-corrosive & anti – foaming properties resulting in higher loading of machine tools, minimum stick-slip & improved surface finish to the job.

These oils have excellent antiwear / EP performances, good demulsibility & excellent filter ability in the presence of water. Due to their good adhesive properties, these oils results in reduced oil consumption.

Recommended for slide way lubrication of planers, grinders, horizontal boring machines, jig borers, shapers etc.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S				
S. NO.	PROPERTIES	PALWAY OILS		
		32	68	220
1	Kinematic Viscosity, cSt @40°C	29-35	64-72	200-240
2	Viscosity Index, min.	90	90	80
3	Flash Point, COC, °C, min.	180	180	200
4	Copper corrosion @ 100°C for 3 hours.	1	1	1
5	Steel corrosion	Pass	Pass	Pass

\* The specifications are subject to variations/ development / customization.



## GENERAL PURPOSE FLUSHING OIL

### PAL FLUSH

**PAL FLUSH** is formulated for flushing of engine, transmission and other lubrication systems after the old oil has been drained out. It is a blend of highly refined light mineral oil and detergent/dispersant additives to enhance removal of sludge and lacquers.

Recommended for use where a system's history is unknown or service fill lubricant may have been used beyond its oil drain interval / contamination problem.

#### Direction for use

- ★ Warm up the oil by running the system till the oil reaches normal operating temperature.
- ★ Open the drain plug and drain out the used oil.
- ★ Fill the system with PAL FLUSH OIL between minimum and maximum level.
- ★ Run the system without load for 5 to 10 minutes or till the oil reaches normal operating temperature and circulates throughout the system.
- ★ Drain out the flushing charge and ensure that the system is free of sludge and lacquers or any other contamination. If the examination is not satisfactory, repeat the procedure.
- ★ Refill the system with recommended lubricant.

**PACKING:** 210L, 50L, 20L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL FLUSH
1	Kinematic Viscosity, cSt @40°C	21-23
2	Kinematic Viscosity, cSt @100°C	3-4
3	Specific gravity, Max.	0.901
4	Flash Point, COC, °C, Min.	170
5	Pour Point, °C, Max.	-3

\* The specifications are subject to variations/ development / customization.



## GLASS MOULD OIL

### PAL GLASS MOULD

This oil is a low viscosity blend of selected fraction of mineral oils doped with surface active agents having good wetting properties.

#### PRODUCT FEATURES

- ★ Low fume giving tendency
- ★ Good cleaning & wetting properties.

#### APPLICATIONS

Glass manufacturing industry.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL GLASS MOULD
1	Appearance	Clear, Bright Yellow Liquid
2	Density @15°C gm/ml	0.85 to 0.88
3	Kinematic Viscosity, cSt @40°C	6-9
4	Pour Point, °C, max.	3
5	Flash Point, COC, °C, min.	135
6	TAN, mg. KOH/g, max.	0.05

\* The specifications are subject to variations/ development / customization.



## OPEN GEAR COMPOUNDS

### PAL OGC- 120, 140

These are heavy viscous black bituminous product, fortified with special EP and thickening agents. They have excellent film strength to withstand the high pressure normally encountered in heavily loaded open gears. They also possess good antiwear and antirust properties. They are homogeneous and heat reversible, i.e., they return to the same homogeneous state after heating. Thus they have the ability to stay in place and provide protection to open gears and wire ropes.

**PAL OGC- 120, 140** meet IS 9554-1980 specifications and are recommended for lubrication of open gears, cable and wire ropes.

Not recommended for lightly loaded open gears and not to be used in food processing industries.

**PACKING:** 180KG

C H A R A C T E R I S T I C S			
S. NO.	PROPERTIES	PAL OGC-120	PAL OGC-140
1	Kinematic Viscosity, cSt @100°C	200-250	400-550
2	Flash Point, COC,°C, min.	210	210
3	Copper strip corrosion test, 3 hrs, @ 100°C, max.	Negative	Negative
4	Acidity, inorganic	Nil	Nil
5	Water content, %by mass, max.	1	1
6	Homogeneity test	Passes	Passes
7	Colour	Black	Black

\* The specifications are subject to variations/ development / customization.



## GENERAL PURPOSE GREASE - CALCIUM BASE

### PAL CUP

This is a calcium-based general purpose NLGI-3 type grease containing highly-refined mineral oils and suitable tackifier. It is smooth, homogeneous, and free from objectionable odour, visible impurities and abrasive or deleterious particles.

Recommended for the lubrication of plain bearings operating under slow to medium-speed, medium-load and temperature up to 70°C. Due to good water repellency characteristics, it is also recommended for the lubrication of the bearings and packing of water pumps immersing equipments. Also recommended for application to exposed components where high temperature is not encountered.

**PACKING:** 180KG, 18KG

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL CUP
1	Appearance	Golden Yellow
2	Soap Type	Calcium
3	Base Oil Type	Mineral
4	Cone Penetration, @25°C ± 0.5°C	220-250
5	Drop Point, °C min.	95

\* The specifications are subject to variations/ development / customization.





## EXTREME PRESSURE GREASES -LITHIUM BASE

### PAL EP- 00, 0, 1, 2

These greases are lithium-based products containing highly-refined mineral oils and fortified with extreme pressure (EP) additives as well as corrosion and oxidation inhibitors. These greases have been formulated with additives that provide good film strength under medium-to-high loads.

They are designed for plant-wide lubrication, the range extending from NLGI-2 for general purpose bearing lubrication to NLGI-0 (semi-fluid grease) suitable for centralized lubrication systems and grease filled gearboxes. These greases provide good protection against rust and corrosion as well as resistance to water wash-out which makes them particularly suitable for equipment where moist or wet conditions are common. These greases also possess high mechanical stability, good adhesion and anti-wear properties, thus enhancing component life and increase re-lubrication intervals.

Recommended for lubrication of all plain and anti-friction bearings, heavy duty ball and roller bearings of industrial equipment used in steel plants, heavy engineering units, machine tool units, textile mills, paper mills, fertilizer plants, sugar mills etc. particularly where contacting surfaces are exposed to very heavy pressure and shock loads and for continuous service up to 130°C.

These greases are compatible only with lithium base grease. Sealed bearings should be thoroughly cleaned before using grease described in this product bulletin.

**PERFORMANCE LEVEL:** IS 7623-1993 & NLGI-0,1&2 specifications.

**PACKING:** 180KG, 18KG

C H A R A C T E R I S T I C S					
S. NO.	PROPERTIES	PAL EP-00	PAL EP- 0	PAL EP-1	PAL EP-2
1	Appearance	Brown			
2	Soap Type	Lithium			
3	Base Oil Type	Mineral			
4	Base Oil Viscosity, @40°C	120			
5	Viscosity Index of base oil, min.	90			
6	Cone Penetration, @25°C ± 0.5°C	400-430	355-385	310-340	265-295
7	Drop Point,°C min.	180	180	180	180

\* The specifications are subject to variations/ development / customization.



## LITHIUM COMPLEX GREASES

### PAL LITHCOM - 2, 3, 2M

These greases are made from lithium complex soaps which have excellent mechanical stability & water tolerance. These can work smoothly under high temperature & pressure for a very long time & have also very good resistance to oil separation during operation.

#### PRODUCT FEATURES

- ★ Very high drop point.
- ★ Excellent thermal and structural stability.
- ★ Work excellently in very adverse conditions like high temperatures pressures.

#### APPLICATIONS

- ★ Plain and anti-friction bearings that works under normal and very severe condition.
- ★ Heavy duty ball and roller bearings for commercial vehicles.
- ★ Can widely be used in steel plants, mining and engineering industries.
- ★ Can run for a very long time even under adverse conditions.

**PERFORMANCE LEVEL:** IS 14847-2000 specifications.

**PACKING:** 180KG, 18KG

C H A R A C T E R I S T I C S				
S. NO.	PROPERTIES	PAL LITHCOM -2	PAL LITHCOM -3	PAL LITHCOM -2M
1	Appearance	Brown		Black
2	Consistency of worked grease, @25 ± 0.5°C, (60 double strokes) Change in consistency after 1,00,000 strokes	265-295	220-250	265-295
		Should not differ by more than 40 units from 60 strokes		
3	Drop Point, °C, min.	260	260	260
4	MoS <sub>2</sub>	--		3%
5	Soap Type	Lithium Complex		
6	Structure	Smooth & buttery		

\* The specifications are subject to variations/ development / customization.



## NON SOAP GREASES

### PAL NSG , MDG

**PAL NSG** is non-soap base grease having smooth structure and excellent thermal stability for lubrication of both plain and antifriction bearings under increasing temperatures.

**PAL MDG** is multipurpose non-soap base grease, compounded with finely dispersed molybdenum disulphide ( $\text{MoS}_2$ ), which is very effective solid lubricant with extremely good anti-scuffing characteristics.

**PAL NSG, MDG** greases are engineered to resist rust, oxidation and corrosion while reducing wear. In addition, these greases have excellent resistance to water washout and do not get affected by mild acids and alkalis. These greases meet IS 12790-1999 grade3, U.S.Steel No. 372 requirement and IPSS:1-09-008 specifications.

**PAL NSG** grease is recommended for lubrication of plain and antifriction bearings in all areas of industrial, automotive, farm machinery and other off-road applications, operating continuously at high temperature up to 250°C.

**PAL MDG** grease is especially recommended for heavy duty multi-purpose applications including ball joints, king pins, ball and roller bearings, sleeve bearings, pillow blocks, oven conveyors, sugar cane cutters, sliding surfaces, cranes, drag lines, wheel bearings etc.

These greases gives optimum performance when used in applications up to 135°C with normal re-greasing, and up to 250°C with frequent re-greasing, making it suitable for use in a wide range of high temperature applications.

These greases are not compatible with other greases. Former grease must be completely removed and cleaned from bearings before using greases described in this product bulletin.

**PACKING:** 180KG, 18KG

### C H A R A C T E R I S T I C S

S. NO.	PROPERTIES	PAL NSG	PAL MDG
1	Appearance	Dark Brown	Black
2	Soap Type	Non Soap	
3	Base Oil Type	Mineral	
4	Base Oil Viscosity, @40°C	460	
5	Viscosity Index of base oil, min.	90	
6	Cone Penetration, @25°C ± 0.5°C	280-300	
7	Drop Point, °C min.	280	

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL SPECIAL OILS

### EXTRA SUPER-40, 15W40, 10W30, 20W40, 20W40 (GOLD) & 2T

These oils are economical type quality performance moderate duty engine oils developed for general purpose industrial and automotive applications. These oils are inhibited with rust and corrosion inhibitors which helps to reduce the formulation of sludge and increase the machinery life.

**PERFORMANCE LEVEL** : API: SC/CC specifications.

**EXTRA SUPER 2T**: This is economical type quality performance moderate duty 2-stroke engine oil developed for Petrol engines. This is a diluted to provide easy mixing with fuel.

**PERFORMANCE LEVEL** : API: TC Specifications.

**PACKING**: 210L, 50L

C H A R A C T E R I S T I C S							
P A L E X T R A S U P E R							
S. NO.	PROPERTIES	40	15W40	10W30	20W40	20W40 (GOLD)	2T
1	Colour	Clear Red	Clear Golden Natural	Clear Golden Natural	Clear Red	Clear Golden Natural	Green
2	Kinematic Viscosity, cSt @40°C	-	-	-	-	-	50-65
3	Kinematic Viscosity, cSt @100°C	13-16	12.5-16	9.5-12.0	13-16	13-16	-
4	Viscosity Index, min.	95	110	110	110	110	95
5	Pour Point, °C, max.	-6	-6	-6	-6	-6	-
6	Flash Point, COC, °C, min.	220	220	200	200	200	70
7	TBN, mg KOH/gm.	4-5	4-5	4-5	4-5	4-5	-

\* The specifications are subject to variations/ development / customization.



## LITHIUM SOAP GREASES WITH MoS<sub>2</sub>

### PAL LIMOX

This grease is multipurpose lithium base grease, compounded with extreme pressure (EP) additives as well as finely dispersed molybdenum disulphide (MoS<sub>2</sub>), which is very effective solid lubricant with extremely good anti-scuffing characteristics. This grease is also fortified with corrosion and oxidation inhibitors and additives that provide good film strength under medium-to-high loads.

PAL LIMOX grease provide good protection to contacting surfaces against rust, corrosion and wear as well as resistance to water wash-out. This grease also has an application in sliding motions where the prevention of scuffing is desirable and may be used in dry or moist conditions. This grease also possess good mechanical stability, load carrying properties, resistance to shock loads and overcomes boundary lubrication conditions, thus enhancing component life and increasing re-lubrication intervals.

Recommended for lubrication of heavily loaded slow/medium speed bearings of all types and is particularly useful in preventing bearing damage caused by excessive vibration or shock loads. When exposed to extreme operating conditions, particularly where contacting surfaces are exposed to very heavy pressure and shock loads and for continuous service up to 130°C this grease helps prevent the depletion of normal grease lubrication by a residual coating on the metal surface with molybdenum disulphide to give 'dry' or 'solid' lubrication.

It is not recommended for use in small, high speed ball and roller bearings.

These greases are compatible only with lithium base grease. Sealed bearings should be thoroughly cleaned before using grease described in this product bulletin.

**PACKING:** 180KG, 18KG

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL LIMOX
1	Appearance	Black
2	Soap Type	Lithium
3	MoS <sub>2</sub>	3%
4	Base Oil Type	Mineral
5	Base Oil Viscosity, @40°C	120
6	Viscosity Index of base oil, min.	90
7	Cone Penetration, @25°C ± 0.5°C	265-295
8	Drop Point, °C min.	180

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL SPECIAL OILS

### EXTRA SUPER- GEAR-90, 140

These oils are economical type quality performance moderate duty gear oils developed for general use in automotive and industrial applications. These oils are a combination of base oils and detergents which provides good anti-foaming and anti-wear characteristics.

These provides satisfactory performance under medium type of load conditions and are recommended for manual transmissions.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S			
PAL EXTRA SUPER GEAR			
S. NO.	PROPERTIES	90	140
1	Colour	Clear Golden Natural	Clear Golden Natural
2	Kinematic Viscosity, cSt @100°C	17-20	28-34
3	Viscosity Index, min.	90	90
4	Pour Point, °C, max.	-9	-6
5	Flash Point, COC, °C, min.	210	230

\* The specifications are subject to variations/ development / customization.



## INDUSTRIAL SPECIAL OILS

### PAL 4T GOLD-10W30

This oil is economical type quality performance moderate duty 4-stroke engine oils developed for general use. It provides total engine protection viz. protection from rust, corrosion, high temperature, wear and tear etc.

#### APPLICATIONS

Recommended for all new generation 4-stroke, two wheelers, plying under severe duty conditions like frequent stop and go, dusty environment, variable climatic conditions etc. viz. Hero Honda, Bajaj, TVS, Suzuki, LML, Kinetic etc. and 3-wheelers also.

Note: Check / top-up engine oil every 2000km or as per manufacturer recommendations.

**PERFORMANCE LEVEL:** JASO MA/ API: SJ Specifications requirements.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL 4T GOLD 10W30
1	Colour	Clear Golden Natural
2	Kinematic Viscosity, cSt @100°C	9.5-12
3	Viscosity Index, min.	110
4	Pour Point, °C, max.	-12
5	Flash Point, COC, °C, min.	210
6	TBN, mg KOH/gm.	6-7

\* The specifications are subject to variations/ development / customization.



## HIGH TEMPERATURE NON SOAP GREASES

### PAL HTG - 1 , 2

These greases are formulated from a special blend of high viscosity solvent refined base oil, thickened with bentonite clay. They have smooth structure, ability to retain their consistency under increasing temperatures; offer excellent resistance to chemicals such as mild acids and alkalis besides having good water repellency characteristics.

These greases meet IS 12790-1999 grade 3, U.S.Steel No.372 requirements and IPSS:1-09-008 specifications. These greases are suitable for the lubrication of machine elements, plain bearings and anti-friction bearings operating at high temperatures between 120°C to 250°C.

Recommended for use in industrial ball and roller bearings, kiln car wheel bearings, furnace door bearings, heat exchange motor bearings, oven conveyor bearings and other applications where extremely high temperatures are encountered. These greases gives optimum performance when used in applications up to 135°C with normal re-greasing, and up to 250°C with frequent re-greasing, making it suitable for use in a wide range of high temperature applications.

These greases are not compatible with soap type greases. Bearings must be thoroughly cleaned before changing over to Bentonite type greases.

**PACKING:** 180KG, 18KG, 1KG

#### C H A R A C T E R I S T I C S

S. NO.	PROPERTIES	PAL HTG-1	PAL HTG-2
1	Appearance	Dark Brown	Dark Brown
2	Soap Type	Bentonite Clay	
3	Base Oil Type	Mineral	
4	Base Oil Viscosity, @40°C	460	
5	Viscosity Index of base oil, min.	90	
6	Cone Penetration, @25°C ± 0.5°C	310-340	265-295
7	Drop Point, °C min.	280	280

\* The specifications are subject to variations/ development / customization.





## HIGH TEMPERATURE MOLY GREASE

### PAL EHT- 30, 60,100

These greases are multipurpose non-soap base grease made from a heat resistant bentonite thickener, compounded with EP additives and finely dispersed molybdenum disulphide (MoS<sub>2</sub>), which is very effective solid lubricant with extremely good anti-scuffing characteristics. They are engineered to resist rust, oxidation and corrosion while reducing wear besides excellent ability to withstand high temperature and severe shock load conditions. In addition, these greases have excellent resistance to water washout and do not get affected by mild acids and alkalies.

Recommended for lubrication in all areas of industrial, automotive, farm machinery and other off-road applications These greases meet IS 12790-1999 grade 3, U.S.Steel No.372 requirement and IPSS:1-09-008 specifications. These greases are widely used for the lubrication of machine elements, plain bearings and anti-friction bearings operating at high temperatures between 120°C to 250°C. These greases gives optimum performance when used in applications up to 135°C with normal re-greasing, and up to 250°C with frequent re-greasing, making it suitable for use in a wide range of high temperature applications.

These greases are not compatible with other greases. Former grease must be completely removed and cleaned from bearings before using greases described in this product bulletin.

**PACKING:** 180KG, 18KG, 1KG

C H A R A C T E R I S T I C S				
S. NO.	PROPERTIES	PAL EHT-30	PAL EHT-60	PAL EHT-100
1	Appearance	Black		
2	Soap Type	Bentonite		
3	MoS <sub>2</sub>	3%	6%	10%
4	Base Oil Type	Mineral		
5	Base Oil Viscosity, @40°C	460		
6	Viscosity Index of base oil, min.	90		
7	Cone Penetration, @25°C ± 0.5°C	265-295		
8	Drop Point, °C min.	280		

\* The specifications are subject to variations/ development / customization.



## TEFLON FORTIFIED LITHIUM SOAP GREASES

### PAL TEFLITH – NLGI 0, 1, 2

This is a blend of Polytetrafluoroethylene (PTFE) fluorocarbon particles in specially prepared lithium-based, water-repellent grease. This grease is also fortified with rust, corrosion and oxidation inhibitors and additives that provide good film strength, better adhesion at high speed, under medium-to-high loads. The plating of PTFE applied to the mating surfaces under working conditions enhances the component's life and increases re-lubrication intervals.

This grease have an application in a continuous operating temperature up to 140°C and in majority of situations specifying lubrication, especially in high pressure, water and salt-water conditions including wire ropes. Use of this grease on a continuous basis, will prevent seizing and pitting on the friction surfaces

Recommended for all general purpose application in automotive and Industrial segments viz. machinery, tools, overhead garage door, channels, fan, motors, slides, gears etc. These greases have good corrosion prevention characteristics and as such finds application in marine segment also viz. cables, couplings, gears, hitches, winches etc.

These greases are compatible only with lithium base grease. Sealed bearings should be thoroughly cleaned before using grease described in this product bulletin.

**PACKING:** 180KG, 18KG

C H A R A C T E R I S T I C S				
P A L T E F L I T H				
S. NO.	PROPERTIES	NLGI-0	NLGI-1	NLGI-2
1	Appearance		Red	
2	Soap Type		Lithium	
3	PTFE		0.03	
4	Base Oil Type		Mineral	
5	Base Oil Viscosity, @40°C		120	
6	Viscosity Index of base oil, min.		90	
7	Cone Penetration, @25°C ± 0.5°C	355-385	310-340	265-295
8	Drop Point, °C min.	180	180	180

\* The specifications are subject to variations/ development / customization.



## SILICONE GREASE

### PAL SNG-1000

This is premium quality lithium soap based multi functional synthetic grease having EP properties and wide operating temperature range of -40°C to 170°C; making it an ideal choice for aircraft and other applications where low temperatures are encountered. It demonstrates excellent resistance to extreme weather conditions and chemicals such as mild acids, alkalis and alcohols etc. It has good thermal, chemical, and structural stability including water repellency characteristics.

Recommended for lubrication of all types of bearings, operating under very high speed and high temperature conditions. It has very low starting torque and as such it is an ideal choice for home appliances like portable air cooler, washing machines etc. It is also suitable for electric motor of "H" insulation, water turbines, steam joints and conveyor system. It is an outstanding lubricant for plastic, rubber and glass materials, which normally deteriorates under prolonged contact with petroleum lubricants and greases. Due to excellent steam and moisture resistance properties it gives better service than other conventional lubricants in dyeing and textile finishing units.

It is not compatible with other greases and as such, this should be used only after complete removal of old grease of the bearings.

**PACKING:** 180KG, 18KG, 1KG

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL SNG-1000
1	Appearance	Smooth, Homogeneous & Milky
2	Soap Type	Lithium
3	Water Resistance	Excellent
4	Consistency (NLGI)	#2
5	Viscosity Index of base oil, min.	90
6	Cone Penetration, @25°C ± 0.5°C	265-295
7	Drop Point, °C min.	210
8	Copper Strip Corrosion	Negative

\* The specifications are subject to variations/ development / customization.



## WIRE DRAWING OIL – DILUENT (VISCOSITY REDUCTION FLUID)

### PAL VRF

The product is blended from highly refined base oils & fortified with additives having excellent lubricity & load carrying properties. The product is to be used as a diluent with PAL-DRAW ST or PAL-DRAW EP. It has been observed that during the wire drawing operating, high stress & heat is generated & further the mixing of metal specimens / debris with the oils results in polymerization of the oil with increase in viscosity. This hampers the wire drawing operation. Mixing of PAL VRF with residual oil results in optimum viscosity of the fluid with improved wetting characteristics and extended service life.

Recommended that after 6 months of wire drawing operations, the resultant mixture should be diluted with 10 to 15% of PAL VRF OR depending upon the severity of the operation.

**PACKING:** 210 L, 50 L

C H A R A C T E R I S T I C S		
S. NO.	PROPERTIES	PAL VRF
1	Appearance	Dark Colour Liquid
2	Kinematic Viscosity, cSt @40°C	90-110
3	Kinematic Viscosity, cSt @100°C	09-11
4	Flash Point, COC, °C, min.	210
5	Copper strip corrosion @100°C, max.	1 (3hr.)
6	Saponification Value	20-25
7	Neutralization No. mgKOH/gm	0.4

\* The specifications are subject to variations/ development / customization.



## TEXTILE MILL OILS

### PAL LOOM S-68,100,150, PAL LOOM A-320, A-460

These oils are formulated from mineral oils having good adhesiveness and film strength, inherent oxidation and thermal stability, besides excellent ability to separate from water, resistance to rusting and corrosion. They maintain thin film of oil under light and medium loads, protect machinery from excessive wear and provide economical lubrication.

**PAL LOOM S-68,100,150** are recommended for lubrication of looms and other textile machinery where a scour able type of oil is preferred. Stains from these oils are easily removed by normal process.

**PAL LOOM A-320 & A460** are recommended for lubrication of non-critical all loss system of textile machinery particularly the looms. These oils are also suitable for all applications where additive treated oils are not required.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S						
		P A L L O O M S			P A L L O O M A	
S. NO.	PROPERTIES	68	100	150	320	460
1	Kinematic Viscosity, cSt @40°C	64-72	90-110	140-160	300-340	440-480
2	Viscosity Index, min.	90	90	80	80	70
3	Flash Point, COC, °C, min.	180	180	180	200	240
4	Pour Point, °C, max.	-6	-6	-3	-3	-3

\* The specifications are subject to variations/ development / customization.



## RUBBER PROCESS OILS

### PAL RUBPRO – A 1000, N 20, P 30

**PAL RUBPRO** oils are specially developed to improve the processing, mixing operations and reduce compounding time. They modify the physical properties of finished product, minimize power consumption and reduces the cost.

These oils are classified into three groups viz. Aromatic, Paraffinic and Naphthenic.

**PAL RUBPRO-A 1000** is an aromatic type of oil and is dark in colour. Recommended for use in the manufacturer of automobile tyres, beltings etc. where colour is not an important factor.

**PAL RUBPRO-N 20** is naphthenic type of oil. It has fairly good colour stability and good high temperature properties. Recommended for use in the manufacture of footwear, mats, moulded and extruded goods.

**PAL RUBPRO-P 30** is paraffinic type of oil. It is light in colour and has good high temperature properties. Recommended for use in butyl and ethylene propylene rubber for the manufacturer of light coloured rubber goods viz. toys, shoe soles, sports goods and white walled tyres etc.

**PACKING:** 210L, 50L

C H A R A C T E R I S T I C S				
P A L R U B P R O				
S. NO.	PROPERTIES	A-1000	N-20	P-30
1	Kinematic Viscosity, cSt @100°C	22-26	-	-
2	Kinematic Viscosity, cSt @40°C	-	20-24	30-35
3	Flash Point, COC, °C, min.	200	160	190
4	Pour Point, °C, max.	30	-6	-
5	Aniline Point, °C, Min.	40	75	90
6	Molecular Analysis ASTM D 2007			
	a) Asphaltenes wt. %	<0.09	Nil	Nil
	b) Polar Compounds wt. %	9	2.2	0.6
	c) Aromatics wt. %	68.6	47.8	20.5
	d) Saturates wt. %	22.4	50	78.9

\* The specifications are subject to variations/ development / customization.



## RANGE OF PALCO AUTOMOTIVE LUBRICANTS

### CAR ENGINE OILS

ENERGY 20W50/20W40  
PHG 20W50  
GARNET-5W30 /10W40  
LEOPARD-5W30

### GRADES

SL  
SF/CD  
SN/ACEA-A3/B4  
SM/CF

### OTHER ENGINE OILS

PHB-20W40 (BOUNCER)  
UNITRACK 20W

SC/CC

### GEAR OILS

EP-90  
EP-140  
EP-80 W  
HYPOID 90  
HYPOID 140  
HYPOID 80W90  
HYPOID 85W140  
TRANSOL-A  
TRANSFLUID C4-30

GL-4  
GL-4  
GL-4  
GL-5  
GL-5  
GL-5  
GL-5  
TASA  
TES228

### COOLANTS

ULTRA COOL  
MINT KOOL  
ICY KOOL

JISK 2234  
JISK 2234  
JISK 2234

### PUMP SET OIL

PPS-2

SC/CC

### HEAVY DUTY ENGINE OILS

PPG4 - 20W40  
PPG4 - 15W40  
HITECH 15W40

CF-4/SJ  
CF-4/SJ  
CI-4/SL

### SHOCK ABSORBER OIL

PAL FRONT FORK OIL

### TWO WHEELER OILS

2T POWER  
2T POWER GOLD  
2T SUPREME  
4T BOSS 20W40  
4T BOSS 20W50  
TRIDENT 20W40  
SOLITAIRE 20W40  
PANTHER 10W30  
TRAIO 10W30

### GRADES

TC/FB  
TC/FB  
TC/FC  
MA2/SJ  
MA2/SJ  
MA2/SL  
MA2/SN  
MA2/SL  
MB/SL

### DIESEL ENGINE OILS

PHD-10W  
PHD-40(CAPTAIN)  
PHD 20W40(COMMANDER)  
PHD 15W40(COMMANDER)  
TRACTOR SAMRAT 20W40  
TRACTOR SAMRAT 20W50  
PMG-20W40 SHAKTIMAN

CD  
CD  
CF  
CF  
CF  
CF  
CF/SF

### GREASES

AP-3  
MEGA (LLAP)  
RUBY GEL  
W.B  
CHASSIS

NLGI-3  
NLGI-3  
NLGI-3  
NLGI-2  
NLGI-1

### BRAKE FLUID / OIL SAVER

HAWK for Giriling Sys.  
ENGINE OIL SAVER

DOT-3



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Urban Development Department, Maharashtra



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