

Public Consultation Meeting on lubricating oil

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graph TD; A([LUBRICATING OIL]) --> B[Automotives<br/>Engine oil<br/>Transmission oil]; A --> C[Industries<br/>Turbine<br/>Hydraulics<br/>Circulation<br/>Transformer];
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LUBRICATING OIL

Automotives

Engine oil

Transmission oil

Industries

Turbine

Hydraulics

Circulation

Transformer

Lubricating oil

Purposes of use

1. Reduce friction
2. Heat transfer
3. Cleaning
4. Noise reduction
5. Sealing
6. Wear resistance

LUBRICATING OIL

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graph TD; LO[LUBRICATING OIL] --> BO[BASE OIL]; LO --> AD[ADDITIVES]; BO --- P[+]; AD --- P;
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BASE OIL

+

ADDITIVES

1. Mineral (Petroleum) oil
2. Synthesis oil

1. Anti Oxidant
2. Detergent
3. Dispersant
4. Anti wear
5. Rust Inhibitors
6. Friction Modifiers
7. Anti foam agent
8. Viscosity improvers

Base oil

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graph TD; BO[Base oil] --> MO[Mineral oil]; BO --> SO[Synthesis oil]; MO --> MO_P["1. Extraction process<br/>2. Conversion process"]; SO --> SO_P["Poly Alpha Olefins/Esters<br/>1. Chemical synthesis of<br/>Alpha Olefins"]
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Mineral oil

1. Extraction process
2. Conversion process

Synthesis oil

- Poly Alpha Olefins/Esters
1. Chemical synthesis of Alpha Olefins

MINERAL OILS PRODUCTION

EXTRACTION PROCESS

1. Distillation
2. De-asphalting
3. Extraction
4. De-waxing
5. Hydro-finishing

Automotive

CONVERSION PROCESS

1. Distillation
2. Hydrocracking
3. Hydro De-Waxing
4. Hydro-Finishing

Industrial

Further treatment

1. Clay filtering
2. Acid treatment

White oil

BASE OIL PERFORMANCE CHARACTERISTICS

- a. High thermal and oxidation stability
- b. Low volatility
- c. Low pour point
- d. Compatible with elastomers
- e. Solubility of additives
- f. High Viscosity Index

API CATEGORIZATION OF LUBE BASE OIL

API GROUP	Sulfur % wt	Saturate %	VI	Process
1	> 0.03	< 90	80 -120	Extraction
2	< 0.03	> 90	80 -120	Conversion
3	< 0.03	> 90	> 120	Severely treated
4	NIL	100	> 120	Polymerization

Properties of base oil

Parameter	Extraction	Conversion
Kinematic Vis @40 c cst	18.5	16.9
Kin. Vis @ 100 c cst	3.8	3.9
Viscosity index	92	130
Pour Point c	-18	-27
Volatility % wt	37	15
Nitrogen ppm	17	1
Aromatics % wt	18.2	7.7
Non Aromatics	81.8	92.3

USED OIL RE-REFINING

Characteristic of used oil

Specific gravity	0.915
Viscosity @40 c cst	130
Viscosity @ 100 c cst.	15
Water %	5-7
Light ends	1.5 -2.5
Gas oil	4- 6
Lub oil % wt	70 -75
Asphaltenes % wt	10 -15

Re-refining process

1. Dehydration
2. Gas oil removal
3. Vacuum Distillation
4. Hydro-finishing

ISSUES/CONCERNS

1. INCOMPATIBILITY DUE MIXING OF DIFFERENT BRAND OF LUB OILS
2. FOLOW CORECT RE-REFINING PROCESSES FOR USED OIL
3. THERE CAN BE INCOMPATIBILITY WITH USED LUB OILS AS THEY ORIGINATED FROM DIFFERENT SOURCES.

THANK

YOU