



Pentagon Lubricants (I) Private Limited



*Recipient of 'Model 5s Company'
By ABK-AOTS DOSAKAI, Japan.
1st Company in India to be conferred in SSI category.*

Issue 1

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*an initiative
of
pentagon lubricants (I)
private limited,
chennai,
india.*

*for the benefit of
its esteemed customers*

*to know more about us
please visit
www.pentagonlubricants.com*

*mail your views to
pen_lubricants@hotmail.com*

CUSTOMER EDUCATION PROGRAM

Customer Education Program, monthly mailer of Pentagon Lubricants (I) Private Limited

No.1, Appa Rao Colony, Tambaram Sanatorium, Chennai - 600 047, INDIA.

Ph: 044 2241 4538/2740, 2221 2203; Fax: 044 2221 0370; Email: pen_lubricants@hotmail.com; www.pentagonlubricants.com



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Beyond Creating
Great Products,
We Are Here To
Create More
Educated
Customers!

Customer education refers to the process of a buyer learning about the products or services that he is considering to own. Learning can be as quick as reading a label or as in-depth as taking a course in a subject. Many times, information is right at the customer's fingertips yet an enlightened customer is a buyer who takes well-thought out decision before buying.

At Pentagon, through Customer Education Program (CEP), we aim to increase customer awareness on our products and services and share articles and write-ups on proper handling, storage, maintenance practice, troubleshooting, etc.

Beginning from Feb-2013, every month, an email containing CEP shall be sent to the email id of our privileged customers like you.

*foreword
by
s.alex wilfred
managing director*

If you wish your friend or colleague in Purchase/Commercial/Production/Quality/Maintenance department to be benefitted by our CEP please send us their contact details to us.

We are sure you will find the contents worth the reading !

*Cheers !
S. Alex Wilfred*

TOPICS COVERED THIS MONTH :

**About Lubricants
Characteristics of Lubricants
Base Oil Groups
Functions of Lubricants
Types of Lubricants**

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About Lubricants

Lubricant is a substance introduced to reduce friction between moving surfaces. It may also have the function of transporting foreign particles. The property of reducing friction is known as lubricity (slipperiness).

A good Lubricant possesses the following characteristics:-

- High boiling point
- Low freezing point
- High viscosity index
- Thermal stability
- Corrosion prevention
- High resistance to oxidation



Typically Lubricants contain 90% base oil (most often petroleum fractions called mineral oils) and less than 10% additives.

Vegetable oil or synthetic liquids such as hydrogenated polyolefins, esters, silicones, fluorocarbons and many others are sometimes used as base oils.

The main families of additives are:

- Antioxidants
- Detergents
- Anti-wear
- Metal deactivators
- Corrosion inhibitors, Rust inhibitors
- Friction modifiers
- Extreme Pressure
- Anti-foaming agents
- Viscosity index improvers
- Demulsifying/Emulsifying
- Stickiness improver, provide adhesive property towards tool surface (in metalworking)
- Complexing agents

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Lubricants are generally composed of a majority of base oil plus a variety of additives to impart desirable characteristics. Although generally lubricants are based on one type of base oil, mixtures of the base oils also are used to meet performance requirements.

Base oil groups

Mineral oil term is used to encompass lubricating base oil derived from crude oil. The American Petroleum Institute (API) designates several types of lubricant base oil and they are as follows:



1. **Group I** – Saturates <90% and/or sulfur >0.03% and Society of Automotive Engineers (SAE) viscosity index (VI) of 80 to 120 - Manufactured by solvent extraction, solvent or catalytic dewaxing, and hydro-finishing processes.

Common Group I base oil are 150SN (solvent neutral), 500SN, and 150BS (brightstock)

2. **Group II** – Saturates over 90% and sulfur under 0.03%, and SAE viscosity index of 80 to 120 - Manufactured by hydrocracking and solvent or catalytic dewaxing processes.

Group II base oil has superior anti-oxidation properties since virtually all hydrocarbon molecules are saturated. It has water-white color.

3. **Group III** – Saturates > 90%, sulfur <0.03%, and SAE viscosity index over 120 - Manufactured by special processes such as isohydromerization. Can be manufactured from base oil or slax wax from dewaxing process.

4. **Group IV** – Polyalphaolefins (PAO)

5. **Group V** – All others not included above such as naphthenics, PAG, esters.

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The lubricant industry commonly extends this group terminology to include:

- Group I + with a Viscosity Index of 103–108
- Group II + with a Viscosity Index of 113–119
- Group III + with a Viscosity Index of at least 140

Can also be classified into three categories depending on the prevailing compositions:

- Paraffinic
- Naphthenic
- Aromatic

Synthetic oils: Polyalpha-olefin (PAO), Synthetic esters, Polyalkylene glycols (PAG), Phosphate esters, Alkylated naphthalenes (AN), Silicate esters

Functions of Lubricants:

- It reduces friction between two moving parts.
- It acts as a cooling medium by removing heat.
- It prevents wear by keeping the moving parts apart
- It carries away contaminants and debris
- It prevents corrosion and rust
- It acts as a sealing medium
- It also absorbs shock between two moving parts.



Types of Lubricants:

1. Solid Lubricants

Polytetrafluoroethylene (PTFE) or Teflon is an example for solid lubricant.

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Inorganic solids like graphite, hexagonal boron nitride, molybdenum disulfide and tungsten disulfide are examples of materials that can be used as solid lubricants.

Metal alloy composites and pure metals of Cadmium, Gold, Lead, Tin, Zinc can also be used to lubricate sliding surfaces alone.

Advantages of solid lubricants

- Ability to work under high loads
- High thermal stability

Disadvantages of solid lubricants

- High coefficient of friction and wear
- Low stability of the lubrication film

2. Liquid lubricants

Mineral oil, vegetable oil and synthetic oil along with additives are considered as liquid lubricants which are used for lubrication purpose.

3. Semi solid lubricants

Grease is the example for semi solid lubricant which is used for lubrication purpose.

