



GLOBAL GLOSSARY

-A-

AAR –Abbreviation for “American Association of Railroads”

Absolute viscosity – A term used interchangeably with viscosity to distinguish it from kinematic viscosity or commercial viscosity. It is occasionally referred to as dynamic viscosity.

Acidity – In lubricants, acidity denotes the presence of acid-type constituents whose concentration is usually defined in terms of acid number. The constituents vary in nature and may or may not markedly influence the behavior of the lubricant. (See also Acid Number)

Acid Number – See Strong Acid Number and Total Acid Number

Additive – A chemical compound or compounds added to a lubricant for the purpose of imparting new properties or to improve those properties that the lubricant already has.

AGMA – Abbreviation for “American Gear Manufacturers Association,” an organization serving the gear industry.

Aniline Point – The Aniline Point of a petroleum product is the lowest temperature at which it is completely miscible with an equal volume of freshly distilled aniline.

Anti-Friction Bearing – A rolling contact type bearing in which the rotating or moving member is supported or guided by means of ball or roller elements. Does not mean without friction.

Antioxidant – A substance which retards the action of oxidation.

API Gravity – A gravity scale established by the API and in general use in the petroleum industry, the unity being called the “API degree.” This unit is defined in terms of specific gravity as follows:

$$\text{Sp.gr. (@60°F)} = \frac{141.5}{\text{Degrees API} + 131.5}$$

Or

$$\text{Degrees API} = \left[\frac{141.5}{\text{sp.gr.}(60°F)} \right] - 131.5$$



Apparent Viscosity – A measure of the resistance to flow of a grease whose viscosity varies with shear rate. It is defined by the ratio of the shear stress to the shear rate calculated from Poiseuille's equation at a given rate of shear and is expressed in poises.

Asphaltic – Essentially composed of or similar to asphalt. Frequently applied to naphthenic base lubricating oils derived from crudes that contain asphalt.

ASTM – Abbreviation for “American Society for Testing Materials,” a society for developing standards for materials and test methods.



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-B-

Babbitt – A soft, white, non-ferrous alloy bearing material composed principally of copper, antimony, tin and lead.

Ball Bearing – An antifriction bearing comprising rolling elements in the form of balls. **Base Stock** – A fully refined lube oil, which is a component of lubricant formulations.

Bearing – A support or guide by means of which a moving part such as a shaft or axle is positioned with respect to the other parts of a mechanism.

Bleeding – The tendency of a liquid component to separate from a solid or semi-solid mixture as an oil from a grease.

Block Grease – Generally, a grease of high soap content, which, under normal temperatures is firm to the touch and can be handled in block or stick form.

Bloom – A sheen or fluorescence evident in some petroleum oils when viewed by reflected light.

Boundary Lubrication – A condition of lubrication in which the bulk viscosity characteristics of the lubricant do not apply or in which partial contact takes place between the mating surfaces.

Also refers to a thin film, imperfect, or non-viscous lubrication.

Bright Stock – A term referring to high viscosity lubricating oils which have been refined to make them clear products of good color.

Axial Load Bearing – A bearing in which the load acts in the direction of the axis of rotation.

By-Pass Filtration – A system of filtration in which only a portion of the total flow of a circulating fluid system passes through a filter or in which a filter, having its own circulating pump, operates in parallel to the main flow.

-C-

Carbon Residue – The residue remaining after the evaporation of a sample of mineral oil under specified conditions, i.e., Ramsbottom and Conradson.

Centipoise (cP.) – A unit of absolute viscosity. 1 centipoise = 0.1 poise.

Centistoke (cSt.) – A standard unit of kinematic viscosity = 0.10 stoke

Cetane Number – A number that expresses the ignition quality of diesel fuel and equal to the percentage by volume of cetane (C₁₆H₃₄) in a blend with methyl naphthalene, which blend has the same ignition performance to the test fuel.

Channel Point – Lowest safe temperature that a gear lubricant can be used.

Circulating Lubrication – A system of lubrication in which the lubricant, after having passed through a bearing or group of bearings, is re-circulated by means of a pump.



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Cleveland Open Cup – See Flash Point, Fire Point

Coefficient of Friction – The ratio of the friction force between two bodies to the normal, or perpendicular, force between them.

Compounded Oil – A petroleum oil to which has been added other chemical substances.

Consistency – A term used synonymously with the term Penetration Number of a grease.

Corrosion – The attrition or wearing away of a substance by acid or electrochemical action.

Cup Grease – An early term for a calcium or lime base grease, practically obsolete now but meant originally to designate a degree of quality suitable for grease cup application.

Cutting Fluid or Oil – Any fluid applied to a cutting tool to assist in the cutting operation by cooling, lubricating or other means.

-D-

Demulsibility – The ability of a non-water-miscible fluid to separate from water with which it may be mixed. The higher the demulsibility rating, the more rapidly the fluid separates from water. Demulsibility is sometimes expressed as the rate, in cubic centimeters per hour, or settling out of a fluid from an emulsion under specified conditions. See Steam Emulsion Number.

Density – The mass of a unit volume of a substance. Its numerical value varies with the units used.

Detergent – In lubrication, either an additive or a compounded lubricant having the property of keeping insoluble matter in suspension thus preventing its deposition where it would be harmful. A detergent may also re-disperse deposits already formed.

Dewaxing – Process which removes wax from a lube distillate by solvent means (physical separation) or catalytic means (conversion).

Dielectric Strength – A measure of the ability of an insulating fluid to withstand the electric stress (voltage) without failure. Fluids with high dielectric strength (usually expressed in volts or kilovolts) are good electrical insulators.

Dispersing – In lubrication, usually used interchangeably with detergent. An additive which keeps fine particles of insoluble materials in a homogeneous solution. Hence, particles are not permitted to settle out and accumulate.

Distillate – A term applied to a liquid collected when condensing distilled vapors such as naphtha, kerosene, fuel oil and light lubricating oils.

Drop Feed Lubrication – A system of lubrication in which the lubricant is applied to the bearing surfaces in the form of drops at regular intervals.



GLOBAL GLOSSARY

-E-

EP Lubricants – Lubricants that have been fortified with additives that appreciably increase the load carrying properties of the base lubricant, thus reducing excessive wear.

Emulsibility – The ability of a non-water miscible fluid to form an emulsion with water.

Emulsion – A mechanical mixture of two immiscible liquids as oil and water. Water-in- oil emulsions have water as the internal phase and oil as the external. Oil-in-water emulsions have water as the external phase and oil as the internal.

-F-

Fatty Acid – An organic acid of aliphatic structure originally derived from fats and fatty oils.

Filler – Any solid substance such as talc, mica, or various powders, etc., which is added to a grease to increase its weight or consistency.

Filter – Any device or porous substance used as a strainer for cleaning fluids by removing suspended matter.

Fire Point (Cleveland Open Cup) – The flash point of an oil is the temperature to which it must be heated to give off sufficient vapor to form momentarily a flammable mixture with air when a small flame is applied under specified conditions.

Foam – A froth produced by whipping air into a lubricant.

Force Feed Lubrication – A system of lubrication in which the lubricant is supplied to the bearing surface under pressure.

Form Oil – A compound or an oil used to lubricate wooden or metal concrete forms in order to keep cement from sticking to them.

Fretting Corrosion – A process of mechanical attrition combined with chemical reaction taking place at the common boundary of loaded contact surfaces having small oscillatory relative motion.

Friction – The resisting force encountered at the common boundary between two bodies when, under the action of an external force, one body moves or tends to move over the surface of the other.

Full Flow Filtration – A system of filtration in which the total flow of a circulating fluid system passes through a filter

-G-

Graphite – A crystalline form of carbon either natural or synthetic in origin, which is used as a lubricant.

Gravity – See Specific Gravity, API Gravity

Grease – A lubricant composed of an oil or oils thickened with a soap, or other thickener to a solid or semi-solid consistency.



GLOBAL GLOSSARY

-H-

Hydraulic Oil – An oil specially suited for use as a power transmission medium in hydraulically operated equipment.

Hydrodynamic Lubrication – A system of lubrication in which the shape and relative motion of the sliding surfaces causes the formation of a fluid film having sufficient pressure to separate the surfaces.

Hydrotreating – A process which converts and removes undesirable components with the use of a catalyst.

Hypoid Gear Lubricant – A gear lubricant having extreme pressure characteristics for use with hypoid type of gear as in the differential of an automobile.

HVI – High Viscosity Index, typically from 80 to 110 VI units.

-I-

Inhibitor – Any substance which slows or prevents chemical reaction or corrosion.

Interfacial Tension (I.F.T.) – The energy per unit area present at the boundary of two immiscible liquids. It is commonly measured as the force per unit length necessary to draw a thin wire or ring through the interface.

Intermediate Base Crude – See Mixed Base Crude.

ISO – International Standards Organization, sets viscosity reference scales.

-J-

Journal Bearing – A sliding type of bearing in conjunction with which a journal operates. In a full or sleeve type journal bearing, the bearing surface is 360° in extent. In a partial bearing, the bearing surface is less than 360° in extent.

-K-

Kinematic Viscosity – The absolute viscosity of a fluid divided by its density. In a c.g.s. system, the standard unit of kinematic viscosity is the stoke and is expressed in sq. cm. Per sec. In the English system, the standard unit of kinematic viscosity is the newt and is expressed in sq. in. per sec.

-L-

Lacquer – A deposit resulting from the oxidation and polymerization of fuels and lubricants when exposed to high temperatures. Similar to but harder than varnish.

Lard Oil – An animal oil prepared from chilled lard or from the fat of swine.

Lubricant – Any substance interposed between two surfaces in relative motion for the purpose of reducing the friction between them. Less exactly, any substance interposed between two surfaces in relative motion to facilitate their action.

LVI – Low Viscosity Index, typically below 40 VI units.



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-M-

Mineral Oil – Oils derived from a mineral source, such as petroleum, as opposed to oils derived from plants and animals.

-N-

Naphthenic Base Oils – A characterization of certain petroleum products prepared from naphthenic type crudes (crudes containing a high percentage of ring type hydrocarbon molecules).

Neatsfoot Oil – A pale yellow animal oil made from the feet and shinbones of cattle.

Needle Bearing – A bearing comprising rolling elements in the form of rollers that are relatively long compared to their diameter.

Neutralization Number – A term still used in the petroleum industry, but rapidly becoming obsolete in the lubrication field. See Acid, Strong Acid, Strong Base, Total Acid, and Total Base Numbers.

NLGI – An abbreviation for “National Lubricating Grease Institute,” a technical organization serving the grease industry

-O-

Oil Ring – A loose ring, the inner surface of which rides a shaft or journal and dips into a reservoir of lubricant from which it carries the lubricant to the top of a bearing by its rotation with the shaft.

Oxidation Stability – Ability of a lubricant to resist natural degradation upon contact with oxygen.

-P-

Pad Lubrication – A system of lubrication in which the lubricant is delivered to a bearing surface by a pad of felt or similar material.

Paraffin Base Oil – A characterization of certain petroleum products prepared from paraffinic type crudes (crudes containing a high percentage of straight chain aliphatic hydrocarbon molecules). Lubricating oils made with these crudes are normally distinguished from similar oils from other crudes (both oils equally well refined) by higher API gravity and higher viscosity index.

Penetration or Penetration Number – The depth, in tenths of a millimeter that a standard cone penetrates a solid or semisolid sample under specified conditions. This test is used for comparative evaluation of grease and grease-like materials. (See Worked Penetration)

Petrolatum – A jelly-like product obtained from petroleum and having a microcrystalline structure. Often used in rust preventatives.

Plain Bearing – Any simple sliding type bearing as distinguished from tapered land, tilting pad, or antifriction bearings, etc.

Poise – The standard unit of absolute viscosity in the c.g.s. system expressed in dyne sec. Per sq. cm.



GLOBAL GLOSSARY

-R-

Ring Lubrication – A system of lubrication in which the lubricant is supplied to the bearing surfaces by an oil ring.

R&O – An additive inhibitor package which contains rust and oxidation inhibitors.

Roller Bearing – An antifriction bearing comprising rolling elements in the form of rollers.

Rust Prevention Test (Turbine Oils) – A test for determining the ability of an oil to aid in preventing the rusting of ferrous parts in the presence of water.

-S-

SAE – An abbreviation for “Society of Automotive Engineers,” an organization serving the automotive industry.

SAE Numbers – Numbers applied to motor, transmission and rear axle lubricants to indicate their viscosity range.

Saybolt Furol Viscosity – The time in seconds required for 60 cubic centimeters of a fluid to flow through the orifice of a Saybolt Furol Viscometer at a given temperature under specified conditions. The orifice of the furol viscometer is larger than that of the universal viscometer, the former instrument being used for more viscous fluids.

Semi Fluid – Any substance having the attributes of both a solid and a liquid. More generally, any substance in which the force required to produce a deformation depends both on the magnitude and on the rate of deformation.

Shear Stress – The force per unit area acting tangent to the surface of an element of a fluid or solid.

Sleeve Bearing – A journal bearing, usually a full journal bearing.

Sludge – Insoluble material formed as a result either of deterioration reactions in an oil or by contamination of an oil, or both.

Slushing Oil – An oil or grease-like material used on metals to form a temporary protective coating against rust, corrosion, etc.

“Soluble” Cutting Oil – A mineral oil containing an emulsifier which makes it capable of mixing easily with water to form a cutting fluid.

Pour Point Depressant – An additive that retards wax crystallization, and lowers the pour point.

Process Oils – A lube base stock that receives additional processing to impart a very specific hydrocarbon composition in addition to viscometrics. Process oils are not used

Solvency – Ability of a fluid to dissolve organic materials and polymers, which is a function of aromaticity.

Specific Gravity – The ratio of the weight in air of a given volume of a material to the weight in air of an equal volume of water at a stated temperature.

Sperm Oil – A fixed nondrying pale yellow oil obtained from the head cavities and blubber of the sperm whale. Formerly used as an oil additive but now prohibited from use by law in the United States.

Spindle Oil – A light-bodied oil used principally for lubricating textile spindles and for light, high speed machinery



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-S-

Splash Lubrication – A system of lubrication in which parts of a mechanism dip into and splash lubricant onto themselves and/or other parts of the mechanism.

Stability – Ability of a lubricant to resist natural degradation reactions upon exposure to UV radiation, heat, or oxygen.

Static Friction – The friction between two surfaces not in relative motion but tending to slide over one another. The value of the static friction at the instant relative motion begins is termed break-away friction.

Strong Acid Number (S.A.N.) – The quantity of base, expressed in milligrams of potassium hydroxide, required to titrate the strong acid constituents present in 1 gram of sample.

Strong Base Number (S.B.N.) – The quantity of acid, expressed in milligrams of potassium hydroxide, required to titrate the strong base constituents present in 1 gram of sample.

Sulfurized Oil – Oil to which sulfur or sulfur compounds have been added.

Surface Tension – The tension exhibited at the free surface of liquids, measured in force per unit length.

SSU – An abbreviation for Saybolt Seconds Universal Seconds used to indicate viscosity, e.g., SSU @ 100°F. Also SUS.

Synthetic Ester – Oil Molecule prepared by reacting an organic acid with an organic alcohol and possessing some lubricant properties.

Synthetic Hydrocarbon – Oil Molecule prepared by reacting paraffinic materials.

Synthetic Lubricant – A lubricant produced from materials not naturally occurring in crude oil by either chemical synthesis or refining processes.

-T-

Tacky – A descriptive term applied to greases which are particularly sticky or cohesive.

Tallow – Animal fat prepared from beef and mutton.

Thermal Conductivity – Measure of the ability of a solid or liquid to transfer heat.

TOST – Turbine Oil Stability Test, ASTM D-943

Total Acid Number (TAN) – The quantity of base, expressed in milligrams of potassium hydroxide, that is required to titrate all acidic constituents present in 1 gram of sample.

Total Base Number (TBN) – The quantity of base, expressed in terms of the equivalent number of milligrams of potassium hydroxide, that is required to titrate all basic constituents present in 1 gram of sample.

Turbine Quality – Lube base stocks suitable for turbine applications, finished with severe hydrotreating. TQ base stocks exhibit improved oxidation stability over MQ base stocks.



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-U-

Unworked Penetration – The penetration at 77°F of a sample of grease that has received only the minimum of handling in transfer from a sample can to the test apparatus and which has not been subjected to the action of a grease worker.

-V-

Varnish – When applied to lubrication, a deposit resulting from oxidation and polymerization of fuels and lubricants. Similar to but softer than lacquer.

Viscometer – Viscosimeter – An apparatus for determining the viscosity of a fluid.

Viscosity – That property of a fluid or semi-solid substance characterized by resistance to flow and defined as the ratio of the shear stress to the rate of shear of a fluid element. The standard unit of viscosity in the c.g.s. system is the poise and is expressed in dyne sec. Per square centimeter. The standard unit of viscosity in the English system is the reyn and is expressed in lb. sec. Per square in. (1 reyn = 6.9 x 10⁴ poise)

Viscosity Grade – Any of a number of systems that characterize lubricants according to viscosity for particular applications, such as industrial oils, gear oils, automotive engine oils, automotive gear oils, and aircraft piston engine oils.

Viscosity Index (VI) – A measure of a fluid's change of viscosity with temperature. The higher the viscosity index the smaller the change in viscosity with temperature.

Viscosity Index Improver – Additive that increases lubricant viscosity index, necessary for formulation of multi-grade engine oils.

-W-

White Oils – Light colored and unusually highly-refined mineral oils usually employed in medicinal and pharmaceutical preparations, and as a base for creams, salves, and ointments, but also used as lubricants.

Worked Penetration – The penetration of a sample of lubricating grease immediately after it has been brought to 77°F+ / -1°F and then subject to 60 strokes in the ASTM standard grease worker.