



Lubricants Glossary

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.

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.

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.

Base Stock: A fully refined lube oil, which is a component of lubricant formulations.

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.

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

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

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

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.

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

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

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.

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.

Dropping Point of Grease: The temperature at which a grease passes from a semi-solid to a liquid state under specified test conditions.

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.

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

Fire Point: The fire or 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.

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.

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

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

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

ISO: International Standards Organization sets viscosity reference scales.

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.

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

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

NLGI: An abbreviation for "National Lubricating Grease Institute," a technical organization serving the grease industry.

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

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)

Pour Point: The pour point of a lubricant is the lowest temperature at which the lubricant will pour or flow when it is chilled without disturbance under specified conditions.

Power Factor: A measure of the dielectric loss, or ability to perform as an electrical insulating oil.

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 as lubricants; they are used as chemical components in the manufacturing of rubber, plastics, and other polymeric materials.

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

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.

SAE: An abbreviation for "Society of Automotive Engineers," an organization serving the automotive industry.

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.

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.

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.

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

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.

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

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

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

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.

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 = 6.9×10^4 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.

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.

Metalworking Fluids Glossary

Bacteria and Mold: Microscopic organisms that naturally occur in industrial fluids. If left to grow unchecked, they can cause odors, dermatitis and rust on parts.

Biocide and Fungicide: Chemical agents used to kill and consequently control microbial organisms (e.g., bacteria, fungi, yeast, and mold) in MWFs. These can be formulated into the concentrate or added to the sump.

Biological Testing: Testing for the presence of bacteria, yeast, and mold by the use of paper- like test strips or paddles coated with a media that allows the bacteria and mold to grow on them; then they are measured.

Concentration Control: Metalworking fluids are mixtures of ingredients, each performing a definite function. Concentration control, which can be accomplished by a number of different methods, checks the overall concentration or the level of several of these components during use in the plant.

Defoamer: A chemical additive that physically alters the surface tension of a fluid to reduce or eliminate foaming. It can be formulated into the concentrate or added tank side.

Dilution or Concentration: The ratio or percent of water to concentrate in the machine sump

Fines and Swarf: Metal fines and grinding wheel particles generated during grinding or machining

"Neat" Oil: As it comes from the drum, not diluted. Refers to either "straight oil" not intended to be further diluted with water, or to "soluble oil," as it comes from the container, before mixing with water to form soluble oil and waterMWF mixtures.

pH: This is an expression that is used to indicate whether a substance is acidic, neutral, or alkaline. A pH measurement determines the degree of acidity or alkalinity of a metalworking fluid mix.

Rancidity: A term used to describe a system that has been overcome with bacteria, mold, and/or fungal growth, and has a strong and foul ("locker room") odor.

Refractometer: An optical instrument that measures the refractive index of a water soluble MWF and is used to determine concentration. Skimmer: A device for removing floating tramp oil from the surface of the MWF.

Tank Side Additive: Products used to control foam, bacterial, or fungal growth that are added to the working sump.

Titration: Chemical titration methods can be established to measure either overall concentration or certain components or groups of components in any fluid mix. These would include measuring the alkalinity, the anionic content, the nonionic level, or the sulfonates.

Tramp Oil: Oil that is present in a metalworking fluid mix and is not from the product or concentrate. The usual sources are machine tool lubrication systems and leaks.

Water Quality: A measurement of the levels of calcium, magnesium, and chloride that affect the performance of a metalworking fluid. Hard water would have high levels of these metals and would form residues. Soft water would have low levels and tend to foam.