



## Comprehensive Petroleum Glossary

**Abel tester:** A closed-cup flash tester for kerosene and other oils

**Absolute pressure:** Total pressure equal to gauge pressure plus 14.7 lbs./sq. in at sea level

**Acidity:** The presence of acid-type constituents whose concentration is usually defined in terms of neutralization number. The constituents vary in nature and may or may not markedly influence the behavior of the oil. (see neutralization number)

**Air-Fuel Ratio:** The ratio of air weight to fuel weight consumed in an internal combustion engine or furnace.

**Aliphatic:** A class of saturated or unsaturated carbon compounds, in which the carbon atoms are joined in open chains.

**Aniline Point:** The aniline point of a petroleum product is the minimum equilibrium solution temperature with an equal volume of freshly distilled aniline.

**Annular Blowout Preventer:** Also called BOP. A mechanical device invented in 1952 and designed to prevent oil from escaping a well during the process of drilling. Blowout preventers come in two varieties: annular and ram style. These blowout preventers, often referred to as “Hydril,” they use a rubber seal to close around the drill string and seal the well. In general, both styles are combined for added security. A single BOP usually contains at least two annular BOPs and three or more ram BOPs.

These are not intended to completely seal a well, but, rather, are used to reduce the flow of oil to a manageable rate to allow time for capping.

**API:** The American Petroleum Institute (API) is a United States trade association that represents 400 corporations in the petroleum industry.

**API Gravity:** Gravity (weight per unit volume) of oils as measured by the API scale. The standard by which all crude oils are measured. API gravity is used to determine the specific gravity of crude oil and thus its density. Lighter crudes are more valuable because they are more easily refined into gasoline. Crude with an



API gravity of 10 is equivalent in density to water. This standard was adopted by the API 5/4/22 as the standard for the American petroleum industries

**Aromatics:** Group of hydrocarbons of which benzene is the parent. They are called "aromatic" because many of their derivatives have sweet or aromatic odors. These hydrocarbons contain a ring structure in which all of the bonds are of intermediate character between single and double bonds. They are often referred to as 1.5 bonds.

**Ash:** Inorganic residue remaining after ignition of combustible substances determined by definite prescribed methods. It is the same as ash that remains after wood is burned.

**Asphaltenes:** Insoluble, semi-solid, or solid particles which are combustible and are highly aromatic. Asphaltenes contain a high carbon to hydrogen ratio and entrap water, fuel ashes and other impurities. They are used in the production of asphalt.

**ASTM:** American Society for Testing Materials. Grade and quality specifications for petroleum products are determined by ASTM test methods.

**Atomization characteristics:** The ability of an oil to be broken up into a fine spray by some mechanical means.

## **B**

**Barrel:** A unit of volume measurement used for petroleum and its products. 1 barrel = 42 U.S. gallons, approximately 160 liters, or 35 British gallons

**Bbl:** Abbreviation for barrel

**Benchmark Crude:** Benchmark crude oils are used as references for pricing oils. There are approximately 161 different benchmark oils, of which the main three are West Texas Intermediate, Brent Crude, and Dubai Crude.

**Benzene:** An aromatic hydrocarbon which is a colorless, volatile, flammable liquid. Benzene is obtained chiefly from coal tar and is used as a solvent for resins and fats in dye manufacture. It is used as a solvent for resins and in dye manufacture. It is one of the top 10 chemicals produced by volume.



**BHP:** Brake horsepower or British Horsepower. This is a standard measure of power output for engines.

**Biodiesel:** Any diesel fuel that is created through the transesterification of fat. Comes in various mixtures of 100%, 20%, 5%, and 2%.

**Biofuel:** Any fuel that is derived from biological carbon fixation that has occurred relatively recently.

**Biogas:** Methane produced from fermentation. Often produced by farmers via fermentation of animal waste and used to offset fuel costs.

**Bitumen:** Bitumen is the geological term that refers to the sticky, highly viscous semi-solid hydrocarbon present in most natural petroleum. It is alternatively called pitch, resin, and asphaltum.

**BIP:** British Institute of Petroleum.

**Blender:** A device for mixing two fuel oils to achieve a less viscous and more uniform fuel.

**Blending:** Mixing of two compatible fuels having different properties in order to produce an intermediate fuel.

**Bonny Light:** This crude oil comes from Nigeria and has an API gravity of 32.9°. Its sulfur content is 0.16%.

**Brent Crude:** Named after a goose, this light, sweet crude comes from the North Sea. It has an API gravity of 38.06 and a sulfur content of 0.37%.

**British Petroleum:** The former name of petroleum company currently called BP. It is the third largest publicly traded oil company in the world with oil reserves up 18 billion barrels and the annual revenues of \$308,000,000,000. It is headquartered in London, England.

**BS & W:** Bottom Sediment and Water is a reference to how much water and sediment contamination is in a reserve.

**BS & W Monitor:** An instrument which detects water content in petroleum products. The monitor works through changes in the capacitive reactance caused by changes to the dielectric constant of the oil that are induced by water.



**BTU:** British Thermal Unit. The amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

**Bunker Fuel Oil:** Heavy, residual fuel oil used in ships.

**Butanol:** An alcohol based fuel that is considered to be closer to gasoline than most others. Can be used in engines without any alterations.

## C

**Calorie:** The amount of heat required to raise the temperature of 1 gram of water by 1 degree centigrade, at or near maximum density.

**Calorific Value:** Amount of heat produced by the complete combustion of a unit weight of fuel. Usually expressed in calories per gram or BTU's per pound, the latter being numerically 1.8 times the former.

**Carbon:** The element with atomic number six. Carbon is the basis of all life and is one of the primary components of hydrocarbons used for fuel.

**Catalyst:** A substance which promotes a chemical reaction, but does not itself enter into the reaction.

Catalytic Fines Hard, abrasive crystalline particles of alumina, silica, and/or alumina silica that can be carried over from the fluidic catalytic cracking process of residual fuel stocks. Particle size can range from sub-micron to greater than sixty (60) microns in size. These particles become more common in the higher viscosity marine bunker fuels.

**Cat Cracker:** A large refinery vessel for processing reduced crudes or other feedstocks in the presence of a catalyst, as opposed to the older method of thermal cracking, which employs heat and pressure only. Catalytic cracking is generally preferred since it produces less gas and other highly volatile byproducts. It produces a motor fuel of higher octane than the thermal process.

**Celsius:** Europeans use this term instead of centigrade (see below) to honor Physicist Anders Celsius who developed a temperature reference that uses the freezing and boiling point of water as references. It sets the freezing point of water at 0 and the boiling point at 100.



**Centigrade:** Temperature based on 0 for the temperature at which water freezes and 100 for the temperature at which water boils. Europeans do not accept this term for Celsius. See that term above. This term is accepted and used in North American chemical textbooks, so which term you use may depend on your location, but both are abbreviated with a degree symbol and capital C, so at least you now know what it means.

**Centipoise:** 0.01 poise or centistokes times specific gravity at the test temperature.

**Centistoke:** 0.01 stoke (see stoke)

**Centrifuge:** A machine using centrifugal force produced by high-speed rotation for separating materials of different densities. Applied to Diesel engine fuels and lubricating oils to remove moisture and other extraneous materials.

**Cetane Index:** An empirical measure of ignition quality. Defined as the percentage by volume of cetane in a mixture of cetane and methyl naphthalene which has the same ignition quality when used in an engine as a fuel under test.

**CCR:** Conradson Carbon Residue

**CFR Diesel fuel testing unit:** A standard engine employed in making cetane number tests of Diesel engine fuels.

**C/H Ratio:** Carbon/Hydrogen ratio

**Chevron Corporation:** The fifth largest publicly traded oil company in the world. It has oil reserves of 10.5 billion barrels and revenue of \$204,000,000,000. It is headquartered in California.

**Clarifier:** A machine used for a liquid-sludge separation in which the particles with a higher specific gravity are separated from the lower specific gravity of the liquid. A clarifier bowl has one outlet for the light phase oil; the heavier phase particles are retained on the bowl wall.

**Cloud Point:** Temperature at which wax begins to crystallize from a distillate fuel.

**Cold Heavy Oil Production with Sand (CHOPS):** In this process sand filters are removed from pumping equipment and sand is produced along with oil. The two are then separated above ground. In general, CHOPS is capable of recovering a 5 to 6% of oil in a given a well.



**Conoco Phillips:** The sixth largest publicly traded oil company in the world with oil reserves of 8.3 billion barrels and revenue of \$198,000,000,000. It is headquartered in Houston Texas.

**Corrosion:** Detrimental change in the size or characteristics of material under conditions of exposure or use. It usually results from chemical action either regularly and slowly, as in rusting (oxidation), or rapidly, as in metal pickling. This is particularly troublesome in oil pipelines and tankers in which the metal is damaged by contaminants within the oil.

**Cracking:** Refers to a petroleum product produced by a secondary refining process such as thermal cracking or vis-breaking processes which yield very low-quality residue. Simply, larger hydrocarbons are broken down into smaller components.

**cSt:** Centistokes @ 50 Centigrade

**Cutter stock:** Flux Stock. Light petroleum used to reduce viscosity of heavier oil. These are used to “cut” heavy oil in order to make it easier to transport.

**Cyclic Steam Stimulation (CSS):** Steam is injected into a vertical well for several weeks or even months in order to liquefy the petroleum. Oil is then pumped for as long as possible before the procedure is repeated again. It is sometimes referred to as “huff and puff.”

## D

**Demulsibility:** The resistance of an oil to emulsification, or the ability of an oil to separate from any water with which it is mixed. The better the demulsibility rating, the more quickly the oil separates from water

**Density:** The mass of a unit of volume. Its numerical expression varies with the units selected. It is often expressed as mg/L.

**Desalter:** The desalter mixes the hydrocarbon stream with a small amount of fresh water (e.g. 10% by volume) forming a water-in-oil emulsion. The resulting emulsion is subjected to an electric field wherein the water is coalesced as an under flow from the upper flow of a relatively water-free, continuous hydrocarbon phase. The desalted hydrocarbon stream is produced at relatively low cost and has a very



small residual salt content. The performance of this unit can be improved with a demulsifier, such as Alken 860 Demulsifier.

**Detonation:** A violent explosion involving high-velocity pressure waves; in a gasoline engine, the spontaneous combustion of part of the compressed charge after spark occurs. Detonation usually produces a characteristic metallic sound or knock.

**Diesel index:** Obtained by multiplying the API gravity by the aniline point (the temperature at which a chemical called aniline and diesel mix) of a Diesel fuel, divided by 100. It indicates the quality of the fuel.

**Distillation:** The process of heating a liquid to its boiling point and condensing and collecting the vapors

**Doctor test:** A qualitative method of detecting undesirable sulfur compounds in petroleum distillates, that is, of determining whether oil is "sour" or "sweet".

**Double Hull:** An oil tanker with two hulls. These are generally considered to be safer in the event that the tanker runs aground.

**Dubai Crude:** This is a light and sour crude with an API gravity of 31°. Its sulfur content is 2%.

## E

**E85:** Automobile fuel in which 85% is ethanol.

**Electrolytic process:** A process that causes the decomposition of a chemical compound by the use of electricity.

**Emulsion:** A liquid mixture of two or more liquid substances not normally dissolved in one another, one liquid held in suspension in the other. Water-in-oil emulsions have water as the internal phase and oil as the external, while oil-in-water have oil as the internal phase and water as the external.

**Ethanol:** The most common alcohol based fuel. It comes in various dilutions of 100%, 85%, 70%, and 15%.



**Engler viscosity:** A viscosity obtained by dividing the out-flow time in seconds for 200 ml. of the material being tested, by the time in seconds for 200 ml. of water at 68F (20C) to flow out of an Engler viscosimeter.

**Extraction:** The removal of oil from a well. The total amount of oil that can be recovered from most wells is in the range of 60%.

**Extra Heavy Crude:** Crude oil with an API gravity of less than 10. The oil sinks in water.

**Exxon Mobil:** The largest of the “Supermajors” publicly traded oil companies. It has reserves of 72 billion barrels of oil and revenue of over \$383,000,000,000. It is headquartered in Huston, Texas.

## **F**

**Fahrenheit:** Temperature scale based on 32F for the temperature at which water freezes and 212F for the temperature at which water boils (180 difference). Conversion to Fahrenheit from Celsius (centigrade) temperature scale is by the following formula:  $F = 9/5C + 32$ , where C is the temperature in Celsius degrees.

**Final Boiling Point (FBP):** The highest temperature indicated on the thermometer inserted in the flask during a standard laboratory distillation. This is generally the temperature at which no more vapor can be driven over into the condensing apparatus.

**Fire Point:** The lowest temperature at which an oil vaporizes rapidly enough to burn for at least 5 seconds after ignition, under standard conditions.

**Flash point:** The lowest temperature at which a liquid will generate sufficient vapor to flash (ignite) when exposed to a source of ignition.

**Force Majeure:** A standard clause which indemnifies either or both parties to a transaction whenever events reasonably beyond the control of either or both parties occur to prevent fulfillment of the terms of the contract.

**Fossil Fuel:** Fuels formed by natural processes such as anaerobic decomposition of dead and buried organisms. Fuels include coal, petroleum, and natural gas.



**Fraction:** A separate identifiable part of crude oil. Gasoline and kerosene are two different fractions of crude.

**Fuel oil:** The heavy distillates from the oil refining process; used as fuel for power stations, marine boilers.

**Fungible:** Interchangeable. Products which can be commingled for purposes of pipeline shipment.

## G

**Gasoil:** Designation for No.2 heating oils and diesel fuels. A clean distillate fuel oil.

**Global Warming:** The continuing rise in the average temperature of Earth's atmosphere and oceans.

**Green Diesel:** Diesel fuel derived from renewable resources, but which is produced for a standard fractionation rather than transesterification.

**Greenhouse Effect:** The process by which thermal radiation from a planetary surface is absorbed by atmospheric gases and re-radiated in all directions.

**Greenhouse Gas:** The gas in the atmosphere that absorbs any bits of radiation with them a thermal in for reader range. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

## H

**Heat of Combustion Gross:** Total heat evolved during complete combustion of unit weight of a substance, usually expressed in BTU per pound.

**Heat of Combustion Net:** Gross heat of combustion minus the latent heat of condensation of any water produced.

**Heavy crude:** Crude oil with a high specific gravity and a low API gravity due to the presence of a high proportion of heavy hydrocarbon fractions and metallic content.



**Homogenizer:** A mechanical device which is used to create a stable, uniform dispersion of an insoluble phase (asphaltenes) within a liquid phase (fuel oil). It creates an emulsion by rapidly mixing the two immiscible substances together.

**HHV:** Higher Heating Value

**HP:** Horsepower

**Hubbert Curve:** A model of oil production over time. The rate of production of individual wells grows exponentially from discovery until a peak is reached, at which point production steadily, and sometimes swiftly, declines.

**Hydraulic Fracturing (Fracking):** The process used to recover oil that is trapped in sedimentary rocks. Generally, it consists of drilling followed by the injection of air or water, which may or may not have chemicals mixed in.

**Hydrocarbon:** An organic compound composed of hydrogen and carbon that makes up the majority of petroleum and which is refined to make fuels.

**Hydrogen:** Hydrogen is the smallest of all atoms. Two hydrogen atoms combined together constitute molecular hydrogen, which can be burned as fuel or used in fuel cells.

**Hydrometer:** An instrument for determining the gravity of a liquid.

## I

**IBP:** Initial Boiling Point. In a standard laboratory distillation, the temperature on the distillation thermometer at the moment the first drop of distillate falls from the condenser.

**Innage:** Space occupied in a product container.

**International Oil Company (IOC):** Any oil company that is publicly traded.

**Ionization:** The process of adding or removing electrons from atoms, thereby creating charged particles called ions. Extremely high temperatures, electrical discharge, and nuclear radiation can cause ionization.



**IP:** British Institute of Petroleum.

**Iraqi National Oil Company (INOC):** The National Oil Company of Iraq. It was founded in 1966 and is capable of production capacity of three million barrels of oil per day.

**Isthmus 34-Light:** This is a sour crude with an API gravity of 33.74° and a sulfur content of 1.45%. It is produced in Mexico.

## **K**

**Kerogen:** The organic matter found in sedimentary rock that contains a mixture of organic chemicals and hydrocarbons and so would form. The solid hydrocarbon part is referred to as bitumen.

**Kinematic Viscosity:** The ratio of the absolute viscosity of a liquid to its specific gravity at the temperature at which the viscosity is measured. Expressed in Stokes or Centistokes. Example: Viscosity, kinematic, cS @ 100F.....5.2

**Kuwait Petroleum Corporation (KPC):** The state oil company of Kuwait. It has proven reserves of 111 billion barrels of oil and estimated revenue of \$67,000,000,000.

## **L**

**Latent heat:** Heat required to change the state of a unit weight of a substance from solid to liquid or from liquid to vapor without change of temperature.

**Layering:** This occurs in tanks when a high-density fuel is mixed with a low-density fuel and the lower density floats atop the higher density. The same phenomenon is observed in salad dressing that are allowed to sit for a long time.

**LHV:** Lower Heating Value

**Lifting:** Refers to tankers and barges taking on cargoes of oil or refined product at the terminal or transshipment point.



**Light Crude:** Crude oil with a low specific gravity and high API gravity of greater than 31 due to the presence of a high proportion of light hydrocarbon fractions and low metallic compounds. It is valued for the ease with which it can be converted to gasoline.

**Light Ends:** The more volatile products of petroleum refining; eg. butane, propane, gasoline. These are the smallest hydrocarbons and often the most valuable.

**Liter:** A measure of capacity in the metric system equal to 61,022 cubic inches, 0.908 US quarts dry and 1.0567 US quarts wet.

**Long Ton:** Measure of weight equal to 2,240 pounds.

## M

**Marine Diesel Oil (MDO):** Marine Diesel oil is a middle distillate fuel oil which can contain traces of residual fuel oil (often 10% or more) from transportation contamination and/or heavy fuel oil blending. The MDO does not require heated storage.

**MCR:** Maximum continuous Rating is defined as the maximum output (MW) that an electric power generating station is capable of producing continuously under normal conditions over a year. Under ideal conditions, the actual output could be higher than the MCR.

**MDO:** Marine Diesel Oil

**Methane:** The simplest of all hydrocarbons. It consists of a single carbon with four attached hydrogen and is a gas at room temperature.

**Metric Ton:** A weight measure equal to 1,000 kilograms, 2,204.62 pounds, or 0.9842 long tons.

**Mg/L:** Milligrams per liter = ppm (parts per million) - expresses a measure of the concentration by weight of a substance per unit volume.

**Micron:** A unit of length. One millionth of a meter or one thousandth of a millimeter. One micron equals 0.00004 of an inch.



**Middle Distillate:** Term applied to hydrocarbons in the so-called "middle range" of refinery distillation. Examples: heating oil, diesel fuels, and kerosene. These compounds constitute the elements of crude with medium density.

**Minas:** Also called Sumatran light, this is a light and sweet crude with an API gravity of 35° and a sulfur content of only 0.08%.

**mm:** Millimeter. 1/1000 of a meter.

**Molecule:** The smallest division of a compound that still retains or exhibits all the properties of the substance.

**Motor Gasoline:** A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, that have been blended to form a fuel suitable for use in spark-ignition engines.

**MSDS:** Material safety data sheet - a document that provides pertinent information and a profile of a particular hazardous substance or mixture. An MSDS is normally developed by the manufacturer or formulator of the hazardous substance or mixture. The MSDS is required to be made available to employees and operators whenever there is the likelihood of the hazardous substance or mixture being introduced into the workplace. Some manufacturers prepare MSDS for products that are NOT considered to be hazardous to show that the product or substance is NOT hazardous.

## N

**Naphtha:** A volatile, colorless product of petroleum distillation. Used primarily as paint solvent, cleaning fluid, and blendstock in gasoline production to produce motor gasoline by blending with straight-run gasoline.

**Naphthenes:** One of three basic hydrocarbon classifications found naturally in crude oil. Naphthenes are widely used as petrochemical feedstock. Examples are: cyclopentane; methyl-, ethyl-, and propylcyclopentane.

**National Iranian Oil Company (NIOC):** The National Oil Company of Iran with oil reserves of 138 billion barrels and revenues of \$78,000,000,000. It has a production capacity of four million barrels of crude per day.



**National Oil Company (NOC):** Any oil company controlled by a state and which is not publicly traded.

**National Oil Corporation (NOC):** The state oil company of Libya. It controls reserves of 50 billion barrels of oil. Annual revenue is estimated at roughly \$45,000,000,000.

**Neutralization number:** The number that expresses the weight in milligrams of an alkali needed to neutralize the acidic material in one gram of oil. The neutralization number of an oil is an indication of its acidity.

**NH<sub>3</sub>N:** Ammonia nitrogen.

**Nigerian National Petroleum Corporation (NNPC):** The state oil company of Nigeria. It controls oil deposits of 64 billion barrels and earned roughly \$12,000,000,000 in profit and in 2006. It has production capacity of 2.39 million barrels of oil per day.

**NPDES permit:** National Pollutant Discharge Elimination System permit is the regulatory agency document issued by either a federal or state agency which is designated to control all discharges of pollutants from point sources into U.S. waterways. NPDES permits regulate discharges into navigable waters from all point sources of pollution, including industries, municipal wastewater treatment plants, sanitary landfills, large agricultural feed lots and return irrigation flows.

## **O**

**Oil:** Crude petroleum and other hydrocarbons produced at the wellhead in liquid form

**Oil Shale:** Oil shale is an organic-rich fine-grained sedimentary rock containing kerogen from which liquid hydrocarbons called shale oil can be produced. This type of oil is referred to as shale oil.

**Oil Tanker:** Ships used for transporting petroleum across water. Oil tankers can be double-hulled or single-hulled. Oil tankers, the variety of sizes ranging from a those that can safely carry tens of thousands of barrels of oil to those that can carry over two million barrels of oil.



**Olefins:** Class of unsaturated paraffin hydrocarbons recovered from petroleum. Typical examples include: butene, ethylene and propylene.

**OPEC:** The Organization of Petroleum Exporting Countries is an intergovernmental organization of 12 nations that export oil. The countries that make up OPEC are: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela. OPEC is headquartered in Vienna.

**OSHA:** The Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA) is a law designed to protect the health and safety of industrial workers and treatment plant operators. It regulates the design, construction, operation and maintenance of industrial plants and wastewater treatment plants. The Act does not apply directly to municipalities, EXCEPT in those states that have approved plans and have asserted jurisdiction under Section 18 of the OSHA Act. Wastewater treatment plants have come under stricter regulation in all phases of activity as a result of OSHA standards. OSHA also refers to the federal and state agencies which administer the OSHA regulations.

**Outage:** Space left in a product container to allow for expansion during the temperature changes it may undergo during shipment and application. Measurement of space that is NOT occupied in a drum.

**Oxidation:** Combining elemental compounds with oxygen to form a new compound. A part of the metabolic reaction. This is the process that leads to rust.

**Oxidizing agent:** Any substance such as oxygen and chlorine that can accept electrons. When oxygen or chlorine is added to wastewater, organic substances are oxidized. These oxidized organic substances are more stable and less likely to give off odors or to contain disease bacteria.

**Ozonation:** The application of ozone to water, wastewater, or air, generally for the purposes of disinfection or odor control.

## P

**Particulate:** Free suspended solid in a gas or liquid.

**PAH:** Polycyclic aromatic hydrocarbons. (occasionally polyaluminum hydroxide)



**PCB:** Polychlorinated biphenyls; polychloro-biphenyls. Difficult to remediate chemical used in old-style transformers. Concentrated PCBs used to be referred to as "1268"

**Peak Oil:** On a global scale, this term refers to the point at which extraction of petroleum is at its maximum and after which production of oil can only diminish. Peak oil can also be applied to individual wells and is the point at which maximum oil extraction for that well occurs.

**Pensky-Martens:** A closed-cup test for flash points of oil.

**Peristaltic pump:** A type of positive displacement pump.

**Petrochemical:** An intermediate chemical derived from petroleum, hydrocarbon liquids or natural gas, such as: ethylene, propylene, benzene, toluene and xylene.

**Petroleum:** A generic name for hydrocarbons, including crude oil, natural gas liquids, natural gas and their products.

**Petroleum Reserve:** A commercially recoverable deposit of oil. Subdivided into proven, unproven, and strategic reserves. A new category was created into 2007 termed resources.

**pH:** pH is an expression of the intensity of the basic or acidic condition of a liquid. Mathematically, pH is the logarithm (base 10) of the reciprocal of the hydrogen ion concentration. The pH may range from 0 to 14, where 0 is most acidic, 14 most basic, and 7 is neutral. Natural waters usually have a pH between 6.5 and 8.5.

**Phenol:** An organic compound that is an alcohol derivative of benzene.

**PIB:** Product Information Bulletin. General information on a product.

**Pipeline:** Pipelines are used to transport a number of substances including natural gas, fuels, hydrogen, water, and petroleum.

**Pollution:** The impairment (reduction) of water quality by agriculture, domestic or industrial wastes (including thermal and radioactive wastes) to such a degree as to hinder any beneficial use of the water or render it offensive to the senses of sight, taste, or smell or when sufficient amounts of waste creates or poses a potential threat to human health or the environment.



**Polycyclic Aromatic Hydrocarbon (PAH):** Atmospheric pollutants that are byproducts of burning aromatic hydrocarbons. Many of these can be found in cigarette smoke.

**Polymer:** A chemical formed by the union of many monomers (a molecule of low molecular weight). Polymers are used with other chemical coagulants to aid in binding small suspended particles to form larger chemical flocs for easier removal from water. All polyelectrolytes are polymers, but not all polymers are polyelectrolytes.

**Polymerization:** Process of combining two or more simple molecules of the same type, called monomers, to form a single molecule having the same elements in the same proportion as in the original molecules, but having increased molecular weight. The product of the combination is a polymer.

**Pour Point:** Lowest temperature at which an oil will pour or flow freely.

**ppm:** Parts per million - the unit commonly used to designate the concentration of a substance in a wastewater in terms of weight ie. one pound per million pounds, etc. PPM is synonymous with the more commonly used term mg/L (milligrams per liter).

**Primary Extraction:** The primary stage of recovery after an oil well has been drilled. Oil flows to the surface under natural mechanisms that include pressure from the expansion of natural gas as well as gravity drainage of oil from upper parts of the well and displacement of oil by water. Primary extraction is able to recover 5 to 15% of the total amount of petroleum within a well.

**Proven Reserve:** A petroleum reserve in which there is a 90% certainty that the petroleum can be recovered.

**Purifier:** A machine used for a liquid-liquid separation in which the two intermixed liquids which are insoluble in each other have different specific gravities. Solids with specific gravities higher than those of the liquids can be separated off at the same time. A purifier bowl has two outlets; one for the light phase liquid and one for the heavy phase liquid.



**Q.**

**Qatar Petroleum:** The state oil company of Qatar with total recoverable reserves capacity of 170 billion barrels of oil and production capacity of one million barrels per day. Profits of roughly nine billion dollars.

**R**

**Ramsbottom coke:** A carbon residue test originated by Dr. J.R. Ramsbottom in England.

**Ram Style Blowout Preventer:** Also called BOP. A mechanical device invented in 1952 and designed to prevent oil from escaping a well during the process of drilling. Blowout preventers come in two varieties: annular and ram style. These blowout preventers, often referred to as “Hydril,” use a rubber seal to close around the drill string and seal the well. These are not intended to completely seal a well, but, rather, are used to reduce the flow of oil to a manageable rate to allow time for capping. Modern ram bops are termed “shear rams” and are capable of cutting through drill pipe to completely stop the flow of oil and the well.

In general, both styles are combined for added security. A single BOP usually contains at least two annular BOPs and three or more ram BOPs.

**Reagent:** A pure chemical substance that is used to make new products or is used in chemical tests to measure, detect, or examine other substances.

**Recycle:** The use of water or wastewater within (internally) a facility before it is discharged to a treatment system.

**Reduced Crude Oil:** Crude oil that has undergone at least one distillation process to separate some of the lighter hydrocarbons. Reducing crude lowers its API gravity, but it increases the handling safety by raising the flash point.

**Reducing agent:** Any substance, such as the base metal (iron) or the sulfide ion, that will readily donate (give up) electrons. This is the opposite of an oxidizing agent.



**Redwood viscosity:** The number of seconds required for 50 ml. of an oil to flow out of a standard Redwood viscosimeter at a definite temperature; British viscosity standard.

**Refinery:** A plan used to separate the various components present in crude oil and convert them into usable products or feedstock for other processes.

**Refining:** The process of separating crude oil into useful components including gasoline, diesel fuel, jet fuel, fuel oil, and other products.

**Residual Fuel Oil:** Heavy fuel oils produced from the non-volatile residue from the fractional distillation process. Heavy oils that are "leftovers" from various refining processes. Heavy black oils used in marine boilers and in heating plants.

**Resource:** The term introduced in 2007 that adds categories for contingent and prospective resources in addition to proven and unproven reserves. Contingent reserves are those that are potentially recoverable, but for which commercial development is not yet feasible due to one or more contingencies. Prospective reserves or prospective resources refer to locations where oil may be found, but for which no actual discovery has occurred.

**Royal Dutch Shell:** The second largest publicly traded oil company in the world. It has oil reserves of over 20 billion barrels and annual revenue of \$368,000,000,000. It is headquartered in The Hague, Netherlands as well as London, England.

## S

**Saudi Aramco:** The largest oil company in the world and perhaps the world's most valuable privately held company with an estimated total worth of 2.27 trillion in U.S. dollars. It has total estimated petroleum reserves of 260 to 303,000,000,000 barrels of oil and production capacity of 8.3 million barrels per day. Revenue has been estimated at \$233,000,000,000 per year.

**Saybolt Furol Viscosity:** A viscosity test similar in nature to the Saybolt Universal viscosity test but one more appropriate for testing high-viscosity oils. Certain transmission and gear oils, and heavy fuel oils are rated by this method. The results



obtained are approximately 1/10th the viscosity which would be shown by the Saybolt Universal method.

**Second Generation Biofuel:** Any biofuel produced from sustainable feedstock which is not diverted from either in animal or human food chains.

**Secondary Extraction:** Secondary recovery of petroleum occurs after natural forces no longer drive oil to the surface. Secondary recovery depends on mechanical methods to increase pressure in the well including the injection of natural gas or the use of pumps. Secondary recovery accounts for 30% of the total output obtained from an oil well.

**SSF:** Seconds Saybolt Furol

**SSU:** Seconds Saybolt Universal

**Shale Oil:** The crude oil that is extracted from organic-rich, fine-grained sedimentary rock, also referred to as “oil shale,” that contains kerogen.

**Short Ton:** A measure of weight equal to 2,000 lbs.

**Single Hull:** In reference to oil tankers, this means the ship has only one hull structure as compared to those with two.

**Slagging:** Formation of hard deposits on boiler tubes and/or piston crowns, usually due to the presence of sodium, vanadium and sulfur.

**Sludge:** Deposits in fuel tanks caused by the presence of wax, sand, scale, asphaltenes, tars, water, etc. The "sludge" formed in a #6 fuel oil storage tank is mostly composed of heavy hydrocarbons. Alken Even-Flo® 905 eliminates this type of sludge by breaking the sludge into small particles and re-suspending them in the fuel for more efficient combustion. The "sludge" formed in diesel storage tanks is a combination of water with fungus and bacteria, which grow on the unevenly mixed water/fuel interface. Adding Alken Even-Flo® 910 and 910S to stored fuel promotes a clean separation of water and fuel, reducing the substrate upon which bacteria and fungus can grow. Since the bacteria and fungus bind to the separated water, they can be removed by draining the water from the storage tank. If draining the storage tank is impossible, EF 905 and 910E will emulsify the water into tiny droplets and break the sludge into such small particles that they will no longer clog filters and will efficiently burn.



**Soluble:** Matter or compounds capable of dissolving into a solution.

**Solvent:** A substance, normally a liquid, which is capable of absorbing another liquid, gas, or solid to form a homogeneous mixture.

**Sonatrach:** The National Oil Company of Algeria. It has proven reserves of 39 billion barrels of oil and produces approximately 620,000 barrels per day. It had net income in 2010 of \$2.4 billion.

**Sour Crude:** Sour crude has a sulfur content of greater than 0.5% by weight.

**Specifications:** Term referring to the properties of a given crude oil or petroleum product, which are "specified" since they often vary widely even within the same grade of product. In the normal process of negotiation, seller will guarantee buyer that product or crude to be sold will meet certain specified limits, and will agree to have such limits certified in writing.

Generally, the major qualities of oil for which a buyer would demand a guarantee are: API gravity (or specific gravity, in some cases), sulfur percentage measured by weight, pour point measured by degrees C maximum, viscosity min./max., BS&W percentage by weight, etc.

**Specific gravity:** Weight of a particle, substance or chemical solution in relation to an equal volume of water at 15C. Abbreviated as Sp.Gr.

**Specific heat:** The quantity of heat required to raise the temperature of a unit weight of a substance by 1 degree; usually expresses as calories/gram/C or BTU/lb./F.

**Spec. Sheet:** Specification Sheet. Detailed information of a product including, tests, color, odor, specific gravity, bacterial strains, other major ingredients, etc.

**SIT:** Spontaneous Ignition Temperature. The temperature at which an oil ignites of its own accord in the presence of air or oxygen under standard conditions.

**SR1:** Seconds Redwood # 1 @ 100 F

**Stabilize:** To convert to a form that resists change. Organic material is stabilized by bacteria which convert the material to gases and other relatively inert substances. Stabilized organic material generally will not give off obnoxious odors.



**Static mixer:** A motionless mixer which has a series of fixed, geometric elements enclosed within a tubular housing. The internal elements impart flow division and radial mixing to the media flowing through the housing to produce a uniform dilution of the production.

**Steam Assisted Gravity Drainage (SAGD):** Two horizontal wells are drilled, with one well approximately 5 m above the other. Steam is injected into the upper well, sometimes along with other chemicals, and heats the crude oil to increase liquidity. Oil is then collected as it drains into below were well. SAGD can reach efficiencies of up to 60%.

**Stoke:** The unit of kinematic viscosity

**Straight-Run:** Refers to a petroleum product produced by the primary distillation of crude oil, free of cracked components.

**Strategic Reserve:** Government-controlled oil stockpiles maintained to protect a country's economic and National Security.

**Stratification:** Occurs in blended fuels that have a compatibility problem. It is usually experienced when paraffinic based oils are mixed with asphaltic based oils, causing asphaltenes to precipitate and settle to the bottom of the tank.

**STP:** Standard Temperature (25C) and Pressure (300 mm Mercury).

**Sulfur:** An element that is present in crude oil and natural gas as an impurity in the form of its various compounds.

**Super Tanker:** Any oil tanker capable of transporting more than 320,000 metric tons.

**Surfactant:** Surface-active agent. The active agent in detergents that possesses a high cleaning ability. Used in a spray solution to improve its sticking and wetting properties when applied to plants, algae, or petroleum.

**Sweet Crude:** Sweet crude has a sulfur content of less than 0.5% by weight.



## T

**Tapis:** This is often referred to as “the world’s costliest oil.” It comes from a single field in Malaysia and has an API gravity of 45.2° and a sulfur content of 0.0343%, making it an exceptionally light and sweet crude oil.

**Tag-Robinson Colorimeter:** An instrument used to determine the color of oils. Also, a scale of color values.

**TBN:** Total Base Number. ASTM D2896. This is measured in mg. KOH needed to neutralize an acidic solution through a reverse titration. TBN is the ability of the product to neutralize acid. In a motor oil, this is a property which allows the oil to neutralize acids from combustion that would otherwise degrade the oil.

**Tertiary Extraction:** The final stage of oil extraction. Methods are applied to increase the liquidity of the oil and often include the injection of heat and chemicals. Increasingly, oil-eating bacteria are being used in this step. Accounts for 5 to 15% of the total amount that can be recovered from a well.

**Toe-to-Heel Air Injection (THAI):** The newest method in heavy oil extraction. Air is injected into the tunnel or for end of the well and then a fire is ignited in order to burn heavier components of the oil. The lighter elements are then extracted. The fire is self-limiting that due to the lack of oxygen in the well.

**Thermal Value:** Calories per gram or BTU per pound produced by burning fuels.

**Topped Crude Oil:** Oil from which the light ends have been removed by a simple refining process. Also referred to as "reduced crude oil".

**Total Existent Sediment:** Combination of inorganic and hydrocarbon sediments existing in a fuel as delivered.

**Toxic:** A poisonous substance

**Toxicity:** The relative degree of being poisonous or toxic. A condition which may exist in wastes and will inhibit or destroy the growth or function of certain organisms.



## U

**Ubbelohde viscosimeter:** A suspended level apparatus for accurately determining the viscosity of a liquid.

**Ullage:** The amount which a tank or vessel lacks from being full.

**Unproven Reserve:** Geologically equivalent to proven reserves, their unproven status rests on technical, regulatory, or political issues. Unproven reserves fall into two categories: probable and possible. A probable reserve has a 50% chance for petroleum recovery and is termed in the industry P50. A possible reserve, also called a P10 reserve, has a 10% chance of recovery.

## V

**Vanadium Inhibitor:** An organic and/or inorganic metal bearing chemical intended to chemically and/or physically combine with the compounds formed during combustion of heavy fuel oil to improve the surface properties of the treated ash compounds.

**Vapor Extraction:** In this method of oil extraction, two horizontal Wells are drilled, with one well approximately 5 m above the other. Chemical solvents or injected into the upper well in order to liquefy the petroleum, which drains to the lower well and is extracted.

**Viscosimeter:** A device for determining the viscosity of oil. There are several methods or devices in general use. Basically, a fixed quantity of oil is allowed to pass through a fixed orifice at a specified temperature over a measured time span and then compared to a standard liquid such as a calibration oil or water.

**Viscosity:** Measure of the internal friction or resistance of an oil to flow. As the temperature of an oil is increased, its viscosity decreases and it is therefore able to flow more readily. Viscosity is measured on several different scales, including Redwood No. 1 at 100F, Engler Degrees, Saybolt Seconds, etc. The most common method for designation of viscosity is kinematic viscosity, measured in centistokes, cst @ 50Centigrade. (See Saybolt Furol, Saybolt Universal, Engler, Redwood, Kinematic)



**Vis-Breaking:** A light thermal cracking process carried out on a fuel oil during the refining process to reduce product viscosity without blending.

**Volatile:** A volatile substance is one that is capable of being evaporated or changed to a vapor at a relatively low temperature. Volatile substances also can be partially removed by air stripping.

## **W**

**West Texas Intermediate:** The most famous of the benchmark crude oils. WTI is a light, sweet crude with an API gravity of 39.6° and a sulfur content of 0.24%.