

GLOSSARY

- Acid and earth treatment* — Refining process used for decolourizing or purifying
- Acidizing* — Treating production formation (limestone or dolomite) with hydrochloric, acetic or hydrofluoric acid
- Additive* — A substance added to e.g., *lubricating oils* to impart new or to improve existing characteristics
- Aliphatic hydrocarbon* — Hydrocarbon in which the carbon-hydrogen groupings are arranged in open chains which may be branched. The term includes *paraffins* and *olefins* and provides a distinction from *aromatics* and *naphthenes* which have at least some of their carbon atoms arranged in closed chains or rings
- Alkane* — See *Paraffin*
- Alkene* — See *Olefin*
- Alkylation* — The chemical reaction of a low molecular weight *olefin* and an isoparaffin to form multiply branched *paraffins* of high *octane rating*
- Aniline point* — The lowest temperature at which an oil is completely miscible with an equal volume of aniline
- Antiknock* — Substance added to *gasoline* to improve *octane number*, e.g., tetraethyllead
- Aromatic* — Compound containing one or more benzene rings that also may contain sulfur, nitrogen and oxygen
- Aromatic extract* — See *Extract*
- Asphalt* — A mixture of *bitumen* and mineral matter (sand). Note — In the USA, the term asphalt is also used for *bitumen* alone.
- Asphaltene* — Constituent of petroleum products with a high molecular mass and dark colour, free from wax, insoluble in *n*-heptane and soluble in hot benzene
- ASTM* — American Society for Testing and Materials, responsible for the issue of many of the standard methods used in the petroleum industry
- Barrel* — 1 barrel = 42 US gallons = 159 l; 1 metric tonne \approx 7.4 barrels (crude oil)
- Batching oil* — Petroleum product, e.g., heavy *gas oils* and light *lubricating oils*, used primarily in the jute industry to soften and lubricate fibres before spinning
- Benzine* — *Straight-run* petroleum spirit that boils within the range 80–130°C
- Bitumen* — A viscous liquid, semisolid or solid, consisting essentially of hydrocarbons and their derivatives, which is soluble in carbon disulfide. Bitumen is obtained from the distillation of suitable *crude oils* by treatment of the *residues* (or occasionally of the heaviest fraction). It is also a component of naturally occurring *asphalt*. According to their properties, bitumens are used for emulsions, roofing, waterproofing, insulation, road construction, binding of aggregates, etc.

Black oil — A general term applied to the heavier and darker coloured petroleum products, such as heavy *diesel fuel*, *fuel oil* and some *cylinder oils*

Blending — Intimate mixing of the various components in the preparation of a product to meet a given specification

Bottoms — Residue of petroleum distillation

Bright stock — A *lubricating oil* of high viscosity prepared from a *cylinder stock* by further *refining*, e.g., *solvent deasphalting*, *dewaxing*, *acid and earth treatment*

Bunkering — The process of refuelling, e.g., a ship, with *distillate* or *residual oil*

Bunker fuel — Heavy *residual oil*, also called bunker C, bunker C fuel oil, bunker oil

Cetane — *n*-Hexadecane, used as a reference fuel for rating *diesel fuel* ignition quality

Cetane number — Measure of the ignition quality of a *diesel fuel*, expressed as the percentage of *cetane* that must be mixed with liquid α -methyl-naphthalene to produce the same ignition performance as the *diesel fuel* being rated, as determined by test method ASTM D 613. A high cetane number indicates shorter ignition lag and a cleaner burning fuel

CFR engine — A standard single-cylinder variable compression engine developed by the Co-operative Fuel Research Council to determine the *antiknock* value of motor *gasolines* or the ignition quality of *diesel fuels*

Coking — Thermal or other process yielding, e.g., *distillate*, *gasoline*, gas and nonvolatile *residue* (coke). Coking also occurs in *catalytic cracking*. X-ray analyses have shown coke to consist of condensed aromatic structures arranged in a disordered graphitic pattern

CONCAWE — Acronym standing for the oil companies' international study group for Conservation of Clean Air and Water — Europe

Cracking — A process whereby the relative proportion of lighter or more volatile components of an oil is increased by changing the chemical structure of the constituent hydrocarbons

Cracking, catalytic — A *cracking* process in which a catalyst is used to promote reaction

Cracking, hydro — A *cracking* process carried out at high temperature and pressure in the presence of hydrogen and in which a catalyst is used to promote reaction. The process combines *cracking* and hydrogenation.

Cracking, steam — *Thermal cracking* of, e.g., *naphtha*, at high temperatures with superheated steam injection

Cracking, thermal — A *cracking* process in which no catalyst is used to promote reaction

Crude oil — Naturally occurring mixture consisting essentially of many types of hydrocarbons, but also containing sulfur, nitrogen or oxygen derivatives. Crude oil may be of paraffinic, asphaltic or mixed base, depending on the presence of *paraffin wax*, *bitumen* or both *paraffin wax* and *bitumen* in the *residue* after atmospheric distillation. Crude oil composition varies according to the geological strata of its origin

Cut — The *distillate* obtained between two given temperatures during a distillation process

Cut-back (bitumen) — *Bitumen* to which a solvent has been added so it does not require heating to a high temperature before use

Cycloalkane — See *Naphthene*

Cycloparaffin — See *Naphthene*

Cylinder oil — *Lubricating oil* of high viscosity and high *flash-point* used primarily to lubricate the cylinders and valves of steam engines

- Cylinder stock* — Dark-coloured, *residual oil* of high viscosity used as the basis of steam *cylinder oil*
- Deasphalting* — The removal of asphaltic constituents from *residual stock* for *lubricating oil* manufacture. A *solvent refining* process in which the *asphalt* is precipitated, for example, by liquid propane (also called *decarbonizing*)
- Decarbonizing* — See *Deasphalting*
- Dewaxing* — The removal of waxes from *lubricating oil* stocks, now usually carried out by filtration at low temperature of a mixture of the oil and a solvent such as methyl ethyl ketone
- Diesel fuel* — That portion of *crude oil* that distills out within the temperature range 200–370°C. A general term covering oils used as fuel in diesel and other compression ignition engines
- Diesel oil* — See *Diesel fuel*
- Distillate* — A product obtained by condensing the vapours evolved when a liquid is boiled and collecting the condensate in a receiver which is separate from the boiling vessel
- Distillation range* — A single pure substance has one definite boiling-point at a given pressure. A mixture of substances, however, exhibits a range of temperatures over which boiling or distillation commences, proceeds and finishes. This range of temperatures, determined by means of standard apparatus, is termed the 'distillation' or 'boiling' range.
- Doctoring* — Chemical *sweetening*, used to reduce odour level of products containing mercaptans
- Domestic fuel* — *Heating oil*
- Electrical oil* — See *Insulating oil*
- End-point* — See *Final boiling-point*
- Engine oil* — *Lubricating oil* used in internal combustion and other types of engines
- Extender oil* — Diluent or carrier oil especially for rubbers and plastics
- Extract* — During *solvent refining* processes, other than *dewaxing* or *deasphalting*, part of the *feedstock* passes into solution in the solvent and is subsequently recovered by evaporating off the solvent. This fraction is the extract and is generally *aromatic* in character and thus referred to as an *aromatic extract*.
- Feedstock* — Primary material introduced into a plant for processing
- Final boiling-point* — Maximal temperature noted (corrected if required) during the final phase of a distillation carried out under standardized conditions
- Fixed bed* — Reactor used in heterogeneous catalysis when the catalyst remains in a fixed position
- Flash off* — To distill continuously under constant equilibrium conditions, the resulting vapour and liquid products being withdrawn continuously
- Flash-point* — Minimal temperature to which a product must be heated for the vapours emitted to ignite momentarily in the presence of a flame, when operating under standardized conditions
- Fluid bed* — Reactor used in heterogeneous catalysis, which is based on the principle of suspending finely dispersed catalyst particles in an upward flowing gas stream
- Flux oil* — Oil of low volatility suitable for softening *bitumen* or natural *asphalt*
- Fractional distillation* — See *Fractionation*
- Fractionation* — A distillation process in which the *distillate* is collected as a number of separate fractions each with a different boiling range

- Fuel oil* — A general term applied to an oil used for the production of power or heat. In a more restricted sense, it is applied to any petroleum product that is burnt under boilers or in industrial furnaces. These oils are normally *residues*, but blends of *distillates* and *residues* are also used as fuel oil. The wider term, '*liquid fuel*', is sometimes used, but the term 'fuel oil' is preferred.
- Furfural extraction* — A single solvent process in which furfural (the aldehyde, C_4H_3OCHO) is used to remove primarily *aromatic* but also *naphthenic*, *olefinic* and unstable hydrocarbons from a *lubricating oil* charge stock, thereby improving the *viscosity index* and stability
- Gas oil* — A petroleum *distillate* with a viscosity and *distillation range* intermediate between those of *kerosene* and light *lubricating oil*
- Gasoline (petrol)* — Refined petroleum distillate, normally boiling within the limits of 30–220°C, which, combined with certain additives, is used as fuel for spark-ignition engines. By extension, the term is also applied to other products that boil within this range
- Gas turbine* — Turbine driven by gas, e.g., air, that is compressed and heated by burning fuel in it
- Gear oil* — An oil suitable for the lubrication of gears. Gear oils vary in characteristics according to their specific application
- Grease* — Semisolid or solid lubricant consisting essentially of a stabilized mixture of mineral, fatty or synthetic oil with soaps or other thickeners. It may contain other ingredients.
- Heating oil* — *Gas oil* or *fuel oil* used for firing the boilers of central heating systems
- Heat transfer oil* — A medium used for the transfer of heat at temperatures above that of steam. Probably the most widely used medium is a high-boiling petroleum fraction, usually in the *gas oil* range
- Heat-treating oil* — An oil used for cooling metal components in hardening and tempering operations
- Heavy benzine* — See *Naphtha*
- Heavy gasoline* — See *Naphtha*
- Hydraulic fluid* — A fluid supplied for use in hydraulic systems. Low viscosity and low *pour-point* are desirable characteristics. Hydraulic fluids may be of petroleum or non-petroleum origin.
- Hydrocracking* — See *Cracking, hydro-*
- Hydrodesulfurization* — A desulfurization process in which the oil is treated with hydrogen
- Hydrofinishing* — A mild *hydrotreating* process used mainly for finishing solvent-extracted *lubricating oils*. It has largely replaced earth treating
- Hydrotreatment* — A general term covering treatment with hydrogen at elevated temperature and pressure, usually in the presence of a catalyst. Severity of treatment ranges from mild (*hydrofinishing*) to severe (*hydrocracking*).
- Initial boiling-point* — The temperature (corrected if required) at which the first drop of *distillate* falls from the condenser during a laboratory distillation carried out under standardized conditions
- Insulating oil (electrical oil, transformer oil)* — Oil with good dielectric properties used in electrical equipment
- Institute of Petroleum* — The official British organization which deals with petroleum technology and with the standardization of test methods for petroleum
- Isomerization* — Process for converting compounds into structural or geometric isomers (molecules composed of the same type and number of atoms)
- Jet fuel* — *Kerosene* or *gasoline*/*kerosene* mixture for fuelling aircraft *gas turbine* engines

- Kerosene* — A refined petroleum *distillate* intermediate in volatility between *gasoline* and *gas oil*. Its *distillation range* generally falls within the limits of 150 and 300°C. Its main uses are as a jet engine fuel, an illuminant, for heating purposes and as a fuel for certain types of internal combustion engines
- Kerosine* — European term for *kerosene*
- Light distillate* — A term lacking precise meaning, but commonly applied to *distillates*, the *final boiling-point* of which does not exceed 300°C
- Liquefied natural gas* — Oilfield or naturally occurring gas, chiefly methane, liquefied for transport purposes
- Liquefied petroleum gas* — Light hydrocarbon material, gaseous at atmospheric temperature and pressure, held in the liquid state by pressure to facilitate storage, transport and handling. Commercial liquefied gas consists essentially of either propane or butane, or mixtures thereof.
- Liquid fuel* — See *Fuel oil*
- Loading, bottom* — The filling of the compartments of a road tanker vehicle from the bottom up via the manifold or delivery hose connection point
- Loading, top* — The filling of the compartments of a road tanker vehicle from the top, i.e., through the manholes
- Long residue* — The residual fraction from the atmospheric pressure distillation of *crude oil*
- Lubricating oil* — Oil, usually refined, primarily intended to reduce friction between moving surfaces
- Lubricating oil distillate* — A *vacuum distillation* cut with a *distillation range* and viscosity such that, after refining, it yields *lubricating oil*
- Machine oil* — Oil with a viscosity of about 11 cSt at 100°C used for the lubrication of the moving parts of lightly loaded machines operating at moderate temperatures. Historically, an unrefined or mildly refined *distillate*, but not commonly applied to oils of the relevant viscosity
- Maintenance staff* — Within the context of this volume, those persons who carry out repair work on and scheduled overhauls of *refinery* equipment
- Microcrystalline wax* — Product consisting predominantly of a mixture of non-normal saturated hydrocarbons, solid at ordinary temperatures, with a finer crystalline structure than *paraffin wax*. It is manufactured from *bright stock slack wax*.
- Middle distillate* — One of the *distillates* obtained between *kerosene* and *lubricating oil* fractions in the *refining* processes. These include *light fuel oils* and *diesel fuels*.
- Mould oil* — A lubricant used to ensure easy parting of ceramic, glass, concrete or other material from the mould in which it is cast
- Moving bed* — Reactor used in heterogeneous catalysis in which the catalyst is constantly recycled through the reactor and a *regenerator*
- Naphtha* — *Straight-run* gasoline fractions boiling below *kerosene* and frequently used as a *feedstock* for *reforming* processes. Also known as *heavy benzine* or *heavy gasoline*
- Naphthene* — Petroleum industry term for a *cycloparaffin* (*cycloalkane*)
- Naphthenic oil* — A petroleum oil derived from *crude oil* containing little or no wax
- Octane number* — See *Octane rating*
- Octane rating (of gasoline)* — The percentage by volume of iso-octane in a mixture of iso-octane and *n*-heptane which is found to have the same knocking tendency as the gasoline under test in a *CFR engine* operated under standard conditions (also called *octane number*)

- Oil mist* — Suspended liquid droplets of oil which are produced when there is condensation of the oil from the gaseous to the liquid state; alternatively, a mist can be produced by dispersion of liquid oil
- Olefin* — Synonymous with *alkene*
- Operator* — Within the context of this volume, one of the employees who actually runs (operates) the various units, plant and equipment that make up a *refinery*
- Pale* — Term of US origin used to describe a lightly refined, low *viscosity index naphthenic oil*
- Paraffinic oil* — A petroleum oil derived from a *crude oil* with a substantial wax content
- Paraffin (alkane)* — One of a series of saturated aliphatic hydrocarbons, the lowest numbers of which are methane, ethane and propane. The higher homologues are solid waxes.
- Paraffin wax* — Product obtained from petroleum *distillates* consisting essentially of a mixture of saturated hydrocarbons, solid at ordinary temperatures. Fully-refined paraffin wax has a low oil content and a rather marked crystalline structure
- Petrol* — See *Gasoline*
- Platforming* — A refining process using a platinum-containing catalyst which includes 0.1-8.0% fluorine or chlorine on an alumina base
- Pour-point* — The lowest temperature at which a petroleum oil will pour or flow when it is chilled without disturbance under prescribed conditions
- Preflash tower* — Type of *refinery* distillation unit
- Preservative oil* — Oil used to coat metal parts temporarily in order to protect them against corrosion; usually contains additives
- Process oil* — Oil used as a processing aid or ingredient of a formulation not destined for use as a lubricant, e.g., jute batching oil, concrete *mould oil*, *rubber extender oil*
- Raffinate* — Refined product resulting from a *solvent refining* process, i.e., that portion of the *feedstock* not soluble in the solvent
- Reduced crude* — Term of US origin. The product obtained after removal, by atmospheric distillation, of the light components of *crude oil*
- Refinery* — A plant, together with all its equipment, for the manufacture of finished or semifinished products from *crude oil*
- Refining* — The separation of *crude oil* into its component parts and the manufacture therefrom of products. Important processes in *lubricating oil* refining are distillation, *hydrotreatment* and *solvent extraction*
- Reforming* — A process for treating light petroleum fractions to yield *gasoline* with a higher *aromatic* content and a higher *octane number* than the *feedstock*
- Reforming, catalytic* — *Reforming* in which reaction is promoted by a catalyst
- Reforming, thermal* — *Reforming* without the use of a catalyst
- Regenerator* — That part of a *catalytic cracking* unit in which the coke that deposits on the catalyst during cracking is burnt off
- Residual oil* — Grade No. 4 to grade No. 6 *fuel oils*
- Residue (residuum)* — The heavy fraction or *bottoms* remaining undistilled after volatilization of all lower-boiling constituents
- Riser* — Vertical pipe
- Rolling oil (shurry oil)* — The bottom, i.e., heaviest, product from a *catalytic cracking* unit (also known as *roll oil*)

- Roll oil* — See *Rolling oil*
- Rubber extender oil (extending oil, extenders)* — Highly aromatic petroleum oils, usually *aromatic extracts* containing 80–90% aromatics, added to latex in large quantities (up to 50% in rubber) to extend the bulk of the rubber
- Rubber processing oils* — Mineral oils such as light *naphthenic oils* containing up to about 40% aromatics, added in relatively small quantities during the milling of polymerized rubber to improve properties
- Short residue* — The residual fraction from the *vacuum distillation* of long residue
- Slack wax* — Crude petroleum wax obtained by *dewaxing a distillate*; it contains a high proportion of liquid hydrocarbons
- Slurry oil* — See *Rolling oil*
- Soluble oil* — Oil containing emulsifiers and capable of forming stable emulsions or colloidal suspensions in water, used particularly for lubrication and cooling in metal working
- Solutizer* — Solubility promoter, e.g., for mercaptans in a *sweetening* process
- Solvent deasphalting* — A process for removing *asphaltic* and resinous materials from reduced *crude oil* residues, *lubricating oil* stocks, *gas oils* or *middle distillates* by the extraction or precipitant action of solvents in which *asphalt* is soluble. The principal *deasphalting* solvents are low molecular weight hydrocarbons, particularly liquid propane, and oxygenated compounds, such as alcohols and esters
- Solvent dewaxing* — A process for removing wax from oils by means of suitable solvents
- Solvent extraction* — Processes in which solvents are used to dissolve out undesirable constituents, e.g., the removal of *aromatics* from *kerosene* by extraction with liquid sulfur dioxide
- Solvent refining* — Processes in which solvents are used to eliminate undesirable constituents, either by dissolving them out, i.e., *solvent extraction*, or by precipitating them, as in *solvent dewaxing* and *solvent deasphalting*
- Sour* — Acidic and malodorous
- Standpipe* — Pipe rising vertically from the ground
- Steam cylinder oil* — Oil used to lubricate cylinders of steam engines. Usually dark, viscous petroleum oils of high *flash-point*, sometimes compounded with fatty oil
- Steam turbine oil* — Highly-refined petroleum oil usually containing additives, used for the lubrication of steam turbines and with the property of resisting the formation of stable emulsions with water
- Straight-run product* — A product of the primary distillation of *crude oil*
- Stream (refinery)* — *Refinery* intermediate; product or by-product from a treating or distillation unit
- Stripping (in catalytic cracking)* — Process whereby spent catalyst from a *catalytic cracking* unit comes into contact at an elevated temperature with steam, with the aim of desorbing adsorbed hydrocarbons
- Sweating* — Separation of liquid hydrocarbons from certain *slack waxes* by the action of slow progressive heating
- Sweetening* — Removal or conversion of undesirably acidic and malodorous constituents present in *sour feedstock* or *refinery stream*, e.g., conversion of mercaptans to disulfides
- Topping* — Distillation to remove light fractions only

- Transformer oil* — A well-refined, pale petroleum oil of low viscosity, resistant to oxidation under conditions of use. Used in transformers for cooling and for electrical insulation
- Transmission lubricant* — An oil or other fluid used to lubricate the transmission of an automobile
- Treatments* — Somewhat loosely used to cover all those *refining* operations in which small proportions of undesirable constituents are removed from products by chemical or physical means, e.g., *acid and earth treatment* and *sweetening*
- Turbine oil* — A well-refined, selected petroleum distillate, or mixture of such with a *bright stock*, used for lubricating steam turbines. These oils show high resistance to emulsification with water and to oxidation under conditions of use
- Vacuum distillation* — Distillation under reduced, as opposed to atmospheric, pressure, e.g., *fractional distillation of short residue* to produce *distillates* for *lubricating oil* manufacture
- Visbreaking* — Viscosity breaking; lowering or 'breaking' the viscosity of a *residue* by *thermal cracking*
- Viscosity index* — An arbitrary number used to characterize the rate at which the viscosity of a *lubricating oil* changes with changing temperature. Oils of high viscosity index exhibit relatively small change of viscosity with changing temperature and *vice versa*.
- Waxy distillate* — Distillation *cut* containing a relatively large amount of *paraffin wax*
- Wide-cut* — Wide boiling range