

— **Drilling Glossary** —

Bohrtechnische Fachvokabeln
englisch erklärt

Gerd-Ulrich Lotzwick

A

A, Area:	usually given in square inches (e.g. TFA = Total Flow Area, area of bit nozzle configuration in square inches);
abandon:	to cease producing oil and gas from a well when it becomes unprofitable or to cease further work on a newly drilled well when it proves not to contain profitable quantities of oil or gas;
abeam:	to or at the side of a ship, or offshore drilling rig and especially at right angles to the ship, vessel, or rig's length;
abnormal pressure:	formation pressure exceeding or falling below the pressure to be expected at a given depth; normal pressure increases approximately 0.465 pounds per square inch per foot of depth or 10,5 kilopascals per metre of depth; thus, normal pressure at 1,000 feet is 465 pounds per square inch; at 1 000 metres it is 10,500 kilopascals; s. pressure gradient
abrasion:	wearing away by friction;
ABS:	American Bureau of Shipping;
ABS certification:	a one-time verification that a ship or other marine structure meets an ABS standard;
ABS classification:	a process that occurs over the life of a vessel, ship, offshore rig, or other structure to ensure that such structures are not only built, but also maintained to ABS and industry-accepted standards;
absolute permeability:	a measure of the ability of a single fluid (as water, gas, or oil) to flow through a rock formation when the formation is totally filled (saturated) with the single fluid; the permeability measure of a rock filled with a single fluid is different from the permeability measure of the same rock filled with two or more fluids; compare effective permeability
absolute porosity:	the percentage of the total bulk volume of a rock sample that is composed of pore spaces or voids; s. porosity
absolute pressure:	total pressure measured from an absolute vacuum; it equals the sum of the gauge pressure and the atmospheric pressure corresponding to the barometer (expressed in pounds per square inch);
absorb:	to take in and make part of an existing whole or to soak up gradually or take in gradually something such as heat, liquid, chemicals, nutrients, or other substances;
absorption:	the process of taking up by capillary, osmotic, or solvent action or the process by which energy, such as that of electromagnetic or acoustic waves, is converted into other forms of energy or the penetration or apparent disappearance of molecules or ions of one or more substances into the interior of a solid or liquid; for example in hydrated bentonite, the planar water that is held between the mica-like layers is the result of absorption or in meteorology, the process in which shortwave radiation is retained by regions of the earth;

abyssal:	pertaining to ocean depths below about 6,000 feet;
abyssal plain:	flat regions at the bottom of major ocean basins with a water depth greater than 4,000 m;
Ac:	altocumulus;
AC bus:	in a diesel-electric power system, a common set of conductors made up of large, heavy-duty copper cables that carry alternating current generated by the system's alternators (AC generators);
acceleration:	the rate at which something increases in velocity with respect to time;
accelerator:	a chemical additive that reduces the setting time of cement; s. <i>cement, cementing materials</i>
accelerometer:	an instrument that detects changes in motion or measures acceleration;
accessory:	a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine;
accessory minerals:	minerals present in such small amount (i.e. less than 1 %) that their presence or absence is not significant when considering the mineral composition for classification purposes, but which can affect some logging measurements if their inherent properties are considerably different from those of the principal minerals (i.e. zircon and monazite which have a so high content in thorium and uranium that they affect the total radioactivity even with a percentage less than 1 %);
accretion:	a gradual increase in size of an inorganic body by the external addition of new particles deposited by a stream;
accumulator:	a vessel or tank that receives and temporarily stores a liquid used in a continuous process in a gas plant or on a drilling rig, the storage device for nitrogen-pressurized hydraulic fluid, which is used in operating the blowout preventers; s. <i>blowout preventer control unit</i>
accumulator bottle:	a bottle-shaped steel cylinder located in a blowout preventer control unit to store nitrogen and hydraulic fluid under pressure (usually at 3,000 pounds per square inch); the fluid operates the blowout preventers; s. <i>blowout preventer control unit</i>
acid brittleness:	s. <i>hydrogen embrittlement</i>
acid corrosiveness:	a characteristic of diesel fuel that indicates the likelihood of a diesel fuel's causing corrosion as the engine burns fuel; in general, a fuel with a high acid content will be more corrosive than a fuel with low acid content;
acid fracture:	to part or open fractures in productive hard limestone formations by using a combination of oil and acid or water and acid under high pressure; s. <i>formation fracturing</i>
acid gas:	a gas that forms an acid when mixed with water; in petroleum production and processing, the most common acid gases are hydrogen sulfide and carbon dioxide; both cause corrosion, and hydrogen sulfide is very poisonous;

acidic:	a descriptive term applied to those igneous rocks that contain more than 60 % SiO ₂ ;
acidity:	the quality of being acid; relative acid strength of liquid measured by pH; a liquid with a pH below 7 is acid; s. pH
acidize:	to treat oil-bearing limestone or other formations with acid for the purpose of increasing production; hydrochloric or other acid is injected into the formation under pressure; the acid etches the rock, enlarging the pore spaces and passages through which the reservoir fluids flow; the acid is held under pressure for a period of time and then pumped out, after which the well is swabbed and put back into production; chemical inhibitors combined with the acid prevent corrosion of the pipe; sandstone reservoirs are often treated with small amounts of acid with other chemicals to decrease damage caused by mud and filtrate while drilling;
acid wash:	an acid treatment in which an acid mixture is circulated through a wellbore to clean the perforations;
acoustic backup system:	in offshore drilling from a floating drilling rig using a subsea blowout preventer stack, devices that send acoustic signals to a subsea receiver to operate the blowout preventer (BOP) components; the system consists of a miniature control pod with several subsea pilot manipulated (SPM) valves to operate the selected BOP components; the system is used when the hydraulically operated system fails;
acoustic log:	a record of the measurement of porosity done by comparing depth to the time it takes for a sonic impulse to travel through a given length of formation; the rate of travel of the sound wave through a rock depends on the composition of the formation and the fluids it contains; because other logs can ascertain the type of formation, and because sonic transit time varies with relative amounts of rock and fluid, porosity can usually be determined in this way or also called sonic log; a record of changes in the character of sound waves as they are transmitted through liquid-filled rock; a record of the transit time (t) is the most common; amplitude and the full, acoustic waveform also are recorded;
acoustic televiewer log:	a record of the amplitude of high-frequency acoustic pulses reflected by the borehole wall; provides location and orientation of bedding, fractures, and cavities;
acoustic wave:	a sound wave transmitted through material by elastic deformation;
activation:	technique in which the rocks are irradiated with neutrons that transmute some nuclei into radioisotopes which are characterized by the energy of the induced gamma rays and by their decay time schemes;
activation log:	also called neutron-activation log; a record of radiation from radionuclides that are produced in the vicinity of a well by irradiation with neutrons; the short-half-life radioisotopes usually are identified by the energy of their gamma radiation or decay time;
active mud tank:	one of usually two, three, or more mud tanks that holds drilling mud that is being circulated into a borehole during drilling; they are called active tanks because they hold mud that is currently being circulated;

- actuator:** a device that activates or puts into motion a process or an action by use of pneumatic, hydraulic, or electronic signals; for example, a valve actuator open or closes a valve;
- adapter spool:** a joint to connect blowout preventers of different sizes or pressure ratings to the casinghead;
- adaptive electromagnetic propagation tool:** Schlumberger wireline tool that measures phase shift and attenuation of a 1 100 MHz wave; used for hydrocarbon identification independent of formation water salinity, thin bed detection, hydrocarbon saturation and mobility and to evaluate invaded zones;
- additive:** in general, a substance added in small amounts to a larger amount of another substance to change some characteristic of the latter; in the oil industry, additives are used in lubricating oil, fuel, drilling mud, and cement
or
 in cementing, a substance added to cement to change its characteristics to satisfy specific conditions in the well; a cement additive may work as an accelerator, retarder, dispersant, or other reactant;
- adiabatic expansion:** as used in text page is the expansion of steam in a steam cylinder after the valves cut off the intake of live steam; it is accomplished by expenditure of intrinsic energy; in order to attain high efficiency a steam cylinder must take advantage of the power developed by this expansion; a direct acting pump cannot;
- adhesion:** a force of attraction that causes molecules of one substance to cling to those of a different substance
or
 the attraction or force which holds together unlike molecules; stickiness between unlike bodies;
- adjustable choke:** a choke in which the position of a conical needle, sleeve, or plate may be changed with respect to their seat to vary the rate of flow; may be manual or automatic; s. **choke**
- adjustable kickoff tool:** **(AKO)** a part of a downhole motor assembly used to kick off or deflect the hole from vertical in a directional hole; the critical equipment is the adjustable kickoff sub (as opposed to a fixed bent sub or bent housing); the kickoff angle can be set in an adjustable sub then pulled and reset without changing tools; it can be used to increase or to decrease hole angle; s. **bent housing**
- adsorption:** adherence of gas molecules, or of ions or molecules in solution, to the surface of solids with which they are in contact
or
 a surface phenomenon exhibited by a solid (adsorbent) to hold or concentrate gases, liquids or dissolved substances (adsorptive) upon its surface, due to adhesion; for example, water held to the outside surface of hydrated bentonite is adsorbed water;
- advection fog:** a fog caused by the movement of warm, moist air over a surface with a temperature less than the dew point of the air; the cold surface cools the warm air to the dew-point temperature and fog occurs; also called sea fog;
- A electrode:** one of the current-emitting electrodes of a resistivity-logging system (**A**); the current-return electrode is labeled **B**;

- aerated mud:** drilling mud into which air or gas injected; aeration with air or gas reduces the density of the mud and allows for faster drilling rates; the lighter aerated mud does not develop as much pressure on bottom as a normal mud; the lower pressure allows the cuttings made by the bit to easily break away from the bit's cutter; the cutters therefore always contact fresh, undrilled formation;
- aeration:** the technique of injecting air or gas in varying amounts into a drilling fluid for the purpose of reducing hydrostatic head; s. also **air cutting**
- aerosol:** suspension of very small particles in a gas;
- A-frame:** a derrick or crane shaped like the letter A and used to handle heavy loads
or
an **A**-shaped openwork structure that is the stationary and supporting component of the mast of a jackknife rig and to which the mast is anchored when it is in an upright or drilling position
or
the uppermost section of a standard derrick, shaped like the letter **A** and used as a support in lifting objects such as the crown block to the water table;
- aftercooler:** on a supercharged engine, a device, cooled by either air or by engine coolant, that reduces the temperature of the engine's exhaust; it is necessary to cool the exhaust's temperature because the exhaust drives the supercharged air must be at an acceptable level; otherwise, the engine will run too hot; s. **supercharger**
- afternoon tour:** on rigs that employ three 8-hour shifts, the work period that covers the afternoon and evening hours, such as from 3:00 pm to 11:00 pm; also called evening tour;
- agglomerate:** a pyroclastic rock composed mostly of bombs;
- aggradation:** the building-up of the earth's surface by deposition of detrital material by a stream;
- aggregate:** a group of two or more particles held together by strong forces; **a.s** are stable with normal stirring, shaking, or handling; they may be broken by treatment such as ball milling a powder or shearing a suspension
or
a mass or body of rock particles or mineral grains or both;
- aggressiveness:** a relative measure of a bit's efficiency (relationship between energy input and formation removed) under constant formation characteristics;
- aging test:** a procedure whereby a product may be subjected to intensified but controlled conditions of heat, pressure, radiation, or other variables to produce, in a short time, the effects of long-time storage or use under normal conditions;
- agitator:** a motor-driven paddle or blade used to mix the liquids and solids in drilling mud;
- air, primary:** air required for combustion that is mixed with the fuel (gas, oil, or pulverized coal) through the burner; the ideal burner supplies the exact amount of air (oxygen) necessary for complete combustion without the use of secondary air;

- air, secondary:** the air necessary to supply oxygen for complete combustion when the burner proper does not furnish a sufficient quantity; it is admitted to the fire box through special vents rather than through the burner itself;
- air actuated:** equipment activated by compressed air, as are the clutch and the brake system in drilling equipment;
- air bazooka:** a special aeration unit that forces air into dry mud material (such as bentonite), and which assists crew members in transferring the dry material from a bulk tank on the rig to a transport truck;
- air bit:** a roller cone bit that is specially designed for air or gas drilling; it is very similar to a regular bit, but features screens over the bearings protect them from clogging with cuttings and thicker hardfacing on the shirrtail to protect them from abrasive, high-velocity air or gas drilling fluid;
- air cutting:** the inadvertent mechanical incorporation and dispersion of air into a drilling fluid system; s. also **aeration**
- air diving:** diving in which a diver uses a normal atmospheric mixture of oxygen and nitrogen as a breathing medium; it is limited to depths less than 190 feet because of the danger of nitrogen narcosis; however, dives with bottom times of 30 minutes or less may be conducted to a maximum of 220 feet;
- air drilling:** a method of rotary drilling that uses compressed air as the circulation medium; the conventional method of removing cuttings from the wellbore is to use a flow of water or drilling mud; compressed air removes the cuttings with equal or greater efficiency; the rate of penetration is usually increased considerably when air drilling is used; however, a principal problem in air drilling is the penetration of formations containing water, since the entry of water into the system reduces the ability of the air to remove the cuttings;
- air gap:** distance from the normal water level to the bottom of the hull or main element of an offshore drilling platform when elevated above the surface of the sea;
- air gun:** a hand tool that is powered pneumatically
or
a chamber filled with compressed air, often used offshore in seismic exploration; as the gun is trailed behind a boat, air is released, making a low-frequency popping noise, which penetrates the surface rock layers and is reflected by the layers; sensitive hydrophones receive the reflections and transmit them to recording equipment on the boat;
- air hoist:** a relatively small lifting device installed on the rig floor and operated by compressed air that crew members use to lift (hoist) elements of the drill stem and other equipment from one place to another on the rig
or
a hoist operated by compressed air; a pneumatic hoist; air hoist are often mounted on the rig floor and are used to lift joints of pipe and other heavy objects;
- air intake manifold:** on a diesel engine, an arrangement of pipes and passageways through which air is conducted to the engine's combustion chambers;

air knocking:	on a diesel engine, a phenomenon that occurs when trapped air in the fuel injection system enters the engine's cylinder with the fuel; the fuel-air mixture ignites but, because of the extra air in the fuel, the engine cylinder misfires and knocks or hammers; the problems should be corrected promptly to prevent damage to the engine;
air mass:	a body of air that remains for an extended period of time over a large land or sea area uniform heating and cooling properties; the a.m. will acquire characteristics (such as temperature and moisture content) of the underlying region;
air mass source region:	an area over which an air mass rests and develops temperature and moisture characteristics typical of the location;
air motor:	a motor powered by compressed air;
air motor starter:	on an engine, a device powered by compressed air that starts the engine; the compressed air, when allowed to enter the starter motor by means of a valve, causes a gear on the starter to engage a gear attached to the outer edge of the engine's flywheel; the rotating starter gear moves the flywheel gear, which causes the engine's pistons to move; if fuel, air, and, on spark-ignition engines, an electric spark are present in the engine, the engine will start after a few rotations; as soon as the engine starts, the starter gear disengages from the flywheel gear; a.m.s.s are installed on large industrial engines like those used on a drilling rig;
air shutoff valve:	on a diesel engine, a special valve that, when activated, prevents air from entering the engine's combustion chambers, thereby stopping the engine; a.s.v.s are a safety feature that may be needed when a well blows out; if natural gas is present in the blowout's fluids, a diesel engine can take in the gas and continue to run even when its normal fuel source is cut off;
air slide:	a mechanism using pressurized air through a diaphragm to fluidize powdered materials so that they will flow from a delivery truck to a storage tank on the rig site;
air weight:	the weight of an object in air as opposed to the weight of an object suspended or floating in liquid; compare buoyant weight
alarm:	a warning device triggered by the presence of abnormal conditions in a machine or system; for example, a low-water alarm automatically signals when the water level in a vessel falls below its preset minimum; offshore, alarms are used to warn personnel of dangerous or unusual conditions, such as fire and escaping gases;
albite:	pure sodium-feldspar end member in the plagioclase series;
alkali:	a substance having marked basic (alkaline) properties, such as a hydroxide of an alkali metal; s. base
alkalinity:	the combining power of a base as measured by the maximum number of equivalents of an acid with which it can react to form a salt; in water analysis, it represents the carbonates, bicarbonates, hydroxides and occasionally the borates, silicates and phosphates in the water; it is determined by titration with standard acid to certain datum points or the quality of being basic; the strength of a liquid's alkalinity is measured by pH; a pH above 7 is alkaline; s. pH

- alloy:** a substance with metallic properties that comprises two or more elements in solid solution;
- alluvial:** pertaining to or composed of alluvium, or deposited by a stream or running water;
- alluvium:** a general term for detrital material deposited by a stream or running water in the bed of the stream or its flood plain or delta, or as a cone at the base of a mountain slope;
- alternating current:** **(AC)** current in which the charge-flow periodically reverses and whose average value is zero; s. **direct current**
- alternator:** an electric generator that produces alternating current;
- altocumulus (Ac):** a white or gray mid-level cloud that appears as closely arranged rolls; this type of cloud is composed of either ice crystals or water droplets;
- altostratus (As):** a bluish or grayish layer of uniform mid-level clouds that cover large portions of the sky; this type of cloud is composed of either ice crystals or water droplets;
- American Bureau of Shipping (ABS):** U.S. organization that sets standards and specifications for ships and ship equipment manufactured in the United States; the organization also makes inspections during offshore rig construction and conducts periodic surveys to ensure that requirements for classification are maintained; its official publications are **Records of the American Bureau of Shipping** and **ABS Activity Report**; Address: ABS Plaza; 16855 Northchase Dr.; Houston, TX 77060; (281) 877 – 5800; www.eagle.org
- American National Standards Institute (ANSI):** serves as clearinghouse for nationally coordinated voluntary standards for fields ranging from information technology to building construction; Address: 11 W. 42d St., 13th floor; New York, NY 10036; (212) 642 - 4900
- American Petroleum Institute (API):** oil trade organization (founded in 1920) that is the leading standard-setting organization for all types of oilfield equipment; it is concerned with exploration, production, transportation, refining, and marketing; its official publications are **Petroleum Today**, **Washington Report**, and hundreds of standards, recommended practices, and bulletins; address: 1220 L St., NW; Washington, DC 20005; (202) 682-8000
- amine salt:** an organic compound derived from ammonia, in which organic compounds replace one or more of the hydrogen atoms in the ammonia;
- ammeter:** an instrument for measuring electric current in amperes;
- ampere(A):** the fundamental unit of electric current; 1 ampere = 6.28×10^{18} electrons passing through the circuit per second; one ampere delivers 1 coulomb in 1 second
or
the rate of transfer of electricity, comparable to the fluid delivery of a pipe line;
- amphibolit:** a metamorphic rock consisting mainly of amphibole and plagioclase with little or no quartz;

- amplitude:** in marine architecture, the maximum absolute value of a periodically varying quantity, such as the roll of a floating vessel
or
in electronics, the maximum absolute value reached by a voltage or current waveform
or
in well logging, the shapes and heights of the peaks in a spontaneous potential curve
or
half the height of the crest of a wave above the adjacent troughs; the maximum value of the displacement in an oscillatory motion;
- amplitude log:** the amplitude of a selected portion of the received acoustic waveform;
- anaerobic:** said of organisms that can live in the absence of free oxygen, or of conditions that exist only in the absence of free oxygen;
- analog data:** information indicated by a continuous form, usually a needle or pointer moving across a dial face; compare **digital readout**
- analog recording:** data are represented as a continuous record of physical variables, instead of discrete values as in digital recording;
- analog signal:** the representation of the magnitude of a variable in the form of a measurable physical quantity that varies smoothly rather than in discrete steps;
- analysis, of mud or drilling fluid:** examination and testing of the drilling fluid to determine its physical and chemical properties and condition;
- anchor:** a heavy object attached to a vessel by a cable or rope and cast overboard to keep the vessel in place either by its weight or by its flukes, which grip the bottom; in offshore drilling, floating drilling vessels are often secured over drill sites by large **a.s** like those used on ships
or
any of various metal devices dropped by a cable, chain, or rope to the sea bottom for preventing motion or movement of a floating vessel by means of flukes that dig into the bottom;
- anchor deadline:** means of holding the deadline to the derrick or substructure; usually this is the primary element of the weight indicator;
- anchor key:** a device on the deadline tie-down anchor used to secure the drilling line;
- anchor washpipe spear:** a fishing tool installed inside washover pipe to prevent a fish stuck off bottom from falling to bottom during a washover; slips on the **a.w.s.** engage the inside of the washover pipe as the pipe travels downhole around the fish: an **a.w.s.** also can be used to retrieve a fish on bottom and avoid tripping out for an overshot;
- anchor windlass:** rotating mechanism for hoisting or hauling an anchor off the sea bottom and to the deck of a floating vessel;
- anemometer:** an instrument for measuring wind speed in the atmosphere; the most common types are cup, vane, and hot-wire anemometers;
- aneroid barometer:** a device for measuring atmospheric pressure (a barometer) that consists of a flexible, spring-filled metal cell from which air has been removed and a mechanism that registers the pressure; s. **barograph**