Chemical Engineering Vocabulary

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CHEMICAL ENGINEERING VOCABULARY

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a.u. (*sci.*)

Acronym/Abbreviation referral: see arbitrary units

A/P (*econ.*)

Acronym/Abbreviation referral: see accounts payable

A/R (*econ.*)

Acronym/Abbreviation referral: see accounts receivable

abrasive (*eng.*)

Calcium carbonate can be used as abrasive, for example as "polishing agent" in toothpaste.

absorbance (*chem.*)

In contrast to absorption, the absorbance A is directly proportional to the concentration of the absorbing species. A is calculated as ln (l_0/l) with l_0 being the initial and l the transmitted light intensity, respectively.

absorption (*chem.*)

The absorption of light is often called attenuation and must not be mixed up with adsorption, an effect at the surface of a solid or liquid. Absorption of liquids and gases means that they diffuse into a liquid or solid.

abstract (*sci.*)

An abstract is a summary of a scientific piece of work.

AC (*eng.*)

Acronym/Abbreviation referral: see alternating current

academic (*sci.*)

The Royal Society, which was founded in 1660, was the first academic society.

acceleration (*eng.*)

In SI units, acceleration is measured in meters/second

accompanying element (*chem.*)

After precipitation, the thallium had to be separated from the accompanying elements. TI (atomic number 81) is highly toxic and can be found in rat poisons and insecticides.

accounting (*econ.*)

Working in accounting requires paying attention to details.

accounts payable (*econ.*)

Acronym: A/P

The controller proposed to delay payment of accounts payable in order to have enough liquidity for another transaction.

accounts receivable (*econ.*)

Acronym: A/R

The young accountant was working with accounts receivable.

accrual (*econ.*)

Accrual is an accounting concept to allocate expenses and revenue to the correct time. Here is an example: On December 20, 2015, a company delivered a product to a customer who was expected to pay 30 days later. Still, the income was disclosed in the income statement of 2015, although payment would only be received in the upcoming fiscal year.

acetic acid (*chem.*)

The melting point of acetic acid is 16.5°C. The formula of this organic compound is CH_3COOH.

achromatic (*chem.*)

An achromatic lens is used when color abberation needs to be avoided.

acicular (*chem.*)

The MSDS (material safety data sheet) describes wollastonite as an acicular material.

acid (*chem.*)

A superacid is an acid that has a greater acidity than 100% sulfuric acid, such as fluorosulfuric acid (FSO_3H).

acid scavenger (*chem.*)

In the rubber industry, acid scavengers are used to neutralize traces of halogen anions (halogenides) which are released during aging and which would otherwise prematurely destroy material performance. Lead oxides and lead salts are very effective acid scavengers in this application, however, they are being phased out due to environmental concerns.

acid value (*pharm., chem.*)

The acid value is an important quality parameter of biodiesel.

acid-fast (*pharm.*)

Acid-fast organisms are difficult to characterize using Gram staining.

acidify, to (*chem.*)

The chemist acidified the sample by adding a few drops of prussic acid.

acidulous (*chem.*)

The apple had an acidulous taste.

acme thread (*eng.*)

Acme threads can be found in machines that have to bear high loads such as a lathe or a vice.

acrid (*chem.*)

The acrid smoke from the wildfire could be smelled 10 km away.

action level (*chem. eng.*)

The action level of formaldehyde was determined as 0.5 ppm.

action limit, action level (*pharm.*)

The action limit of estradiol, a steroid that is derived from cholesterol, was found to be 0.04 μg/l in pigs.

action of a drug (*pharm.*)

The action of the drug was not yet fully understood.

activated charcoal,
activated carbon (*chem.*)

Activated charcoal (activated carbon) is used for gas purification and sewage treatment.

activation energy (*chem.*)

The term "activation energy» was introduced in 1889 by Arrhenius. A catalyst changes the transition state to lower the activation energy. A biological catalyst is called enzyme.

active compound (*pharm.*)

Generic medicinal products contain the same active compounds as the original products.

active ingredient (*pharm.*)

Acronym: AI

A drug is normally not administered as a pure substance: The typical dosage form of a drug is a mixture of the active ingredient (AI) and at least one excipient, which is pharmaceutically inert.

active pharmaceutical ingredient (*pharm.*)

Acronym/Abbreviation referral: see active ingredient
Acronym: API

active substance (*pharm.*)

Acronym: API, AI

Recent research results suggest that carnosic acid, the active substance in the herb rosemary is neuroprotective.

actuator, actuating drive, servo drive (*eng.*)

A pneumatic actuator converts energy, typically in the form of compressed air, into motion, which can be rotary or linear.

acute angle (*eng.*)

The word angle comes from the Latin word angulus, which means "corner". An acute angle measures < 90° (right angle).

addictive drug (*pharm.*)

A common addictive drug is nicotine. It constitutes approximately 0.6–3.0% of dry weight of tobacco. 1 cigarette yields approx. 1 mg of absorbed nicotine ((S)-3-(1- Methyl-2-pyrrolidinyl) pyridine, $C_{10}H_{14}N_2$).

additive (*chem.*)

Plastics often contain slip agents as additives.

adhere, to (*chem.*)

The charged particles adhered to the surface.

adhesive (*chem.*)

The company is specialized in the production of adhesives.

adhesive tape (*chem.*)

Adhesive tape is a convenient tool to fix loose cables.

adiabatic (*chem.*)

In an adiabatic process, no heat is transferred between the working fluid and the surroundings. The other extreme case is an isothermal process, where heat transfer to the surroundings causes the temperature to remain constant.

adipose tissue (*med.*)

In a severely obese person, excess adipose tissue hanging downward from the abdomen is referred to as a panniculus (or pannus).

adjacent (*general*)

The researcher borrowed a beaker from the adjacent laboratory.

adjust, to (*general*)

The color of the injection moulded part had to be adjusted.

adjusting butterfly valve (*chem. eng.*)

The adjusting butterfly valve was pneumatically actuated.

adjuvant (*pharm.*)

In immunology, an adjuvant, e.g. aluminium salts, is an agent that increases the response to a vaccine.

administer, to (*pharm.*)

The medicine was administered orally.

admixture (*chem. eng.*)

Ethanol is used as an admixture to gasoline fuel.

adsorption (*chem.*)
Soot shows a strong adsorption of unburnt hydrocarbons.

advanced (*general*)
Corrosion of the vessel has advanced significantly after changing from tap water to condensate.

advisory board (*econ.*)
The advisory board insisted on a new strategy.

aerate, to (*chem.*)
In a waste water purification plant, aeration is an important unit operation.

aeration (*chem. eng.*)
The clarifier was continuously subjected to aeration.

AFS (*chem. eng.*)
Acronym/Abbreviation referral: see alternative feed stock

ageing (*eng.*)
aging (AE)
Ageing is a deliberate process by which an artwork such as a painting is made to look old.

agent (*chem.*)
The cleaning agent was not very effective.

agglutination (*pharm.*)
Agglutination is the clumping of cells, e.g. bacteria or red blood cells, in the presence of an antibody. The technique is commonly used to identify bacterial antigens.

aggravate, to (*general*)
Persons in ill health where such illness would be aggravated by exposure to 1,3-butadiene should not be allowed to work with or handle this product.

aggregated (*econ.*)
The aggregated sales and operations planning for 2016 was finalized in the first week of December 2015.

aggregated detriment (*econ.*)
The aggregated detriment amounted to 1.3 MEUR.

agitate, to (*chem.*)
The solution had to be agitated in order to suspend the catalyst particles.

agitator (*chem. eng.*)
An agitator is a mechanism to put something into motion by shaking or stirring.

AI (*pharm.*)
Acronym/Abbreviation referral: see active ingredient

aileron (*eng.*)
Ailerons are used to control the movement of aircraft.

ailment (*med.*)
The source of his ailment was unknown.

air (*chem.*)
The main constituent of air is nitrogen.

air classifier (*chem. eng.*)
An air classifier is used to separate materials by size, shape, and density. It is often deployed in recycling processes.

air cushion (*eng.*)
A hov ercraft (or air cushion vehicle) is an amphibious vehicle.

air draft (*chem.*)
The air draft has carried dust into the lab.

air knife (*eng.*)
An air knife is commonly used in strand pelletizing to dry the strands prior to cutting them into pellets.

air lock (*chem. eng.*)

An air lock is gas trapped in a high point of a pipe that is filled with liquid. The gas, which has a lower density than the liquid, rises to the highest point and restricts the flow of that liquid. This air lock can stop the fluid flow completely. Flushing the system with high flow or pressure can help to move the gas away from the highest point, or a tap can be installed to vent the gas.

airborne (*eng.*)

The Antonov An 225 has a maximum take-off weight of 640 tonnes. It was first airborne on 21 December 1988 (maiden flight).

airlock (*chem. eng.*)

Airlocks are used on gloveboxes.

airworthy (*eng.*)

It is only permitted to fly airworthy aircraft.

aka, a.k.a. (*general*)

Acronym/Abbreviation referral: see also known as

alara (*general*)

Acronym/Abbreviation referral: see as low as reasonably achievable

alcaline earth metal (*chem.*)

Calcium belongs to the alcaline earth metals.

alcaline metal (*chem.*)

Sodium and potassium are two well-known alcaline metals.

alcaline solution (*chem.*)

An alcaline solution is generally more dangerous for the human eye than an acid one.

aldehyde (*chem.*)

Fehling's solution is used to differentiate between aldehydes and ketones. Contact with an aldehyde group causes the precipitation of red Cu_2O.

align, to (*eng.*)

The engine needs to be aligned with the gearbox in order to prevent damage.

alignment chart, nomograph, nomogram, abac (*chem. eng.*)

With a pressure-temperature nomograph, boiling points at various pressures can be estimated quickly.

allergen-desensitising treatment (*general*)

allergen- desensitizing treatment (AE)

The man objected an allergen-desensitising treatment.

allow to stand, to (*chem.*)

The suspension was allowed to stand for 2 hours.

alloy (*eng., chem.*)

Chinese silver, an alloy for jewelry, is composed of 58% copper, 17.5% zinc, 11.5% nickel, 11% cobalt, and 2% silver. Brass is an alloy made from copper and zinc.

alloyed steel (*eng.*)

Steel is an alloy made from iron and 0.02% to 1.7% carbon.

alopecia, hair loss, loss of hair (*pharm.*)

Iron deficiency, chronic poisoning by boron compounds and chemotherapy can lead to hair loss.

also known as (*general*)

Acronym: aka, a.k.a.

Formaldehyde (a.k.a. methanal), also exists as cyclic trimer (trioxane) and as oligomer (paraformaldehyde). In the case of longer chains, the term polyoxymethylene (POM, polyacetal, polyformaldehyde) is used. POM has the formula (OCH_2) n.

alternate stress (*eng.*)

Reinforced concrete can withstand more alternate stress than unreinforced one.

alternating current (*eng.*)

Acronym: AC

The voltage of AC can be changed with a transformer.

alternative feedstock (*chem. eng.*)

Acronym: AFS

Sugarcane-based ethanol is an important AFS.

alum (*chem.*)

Alum crystals are easy to grow. The specific compound alum has the formula $KAl(SO_4)_2$ **.**12H O. Alums have the stoichiometry AB(SO)**.**12H O.

alumina (*chem.*)

Alumina (Al_2O_3) is made from bauxite.

aluminium (*chem.*)

aluminum (AE)
Acronym: Al
Aluminium (atomic number 13) is appreciated for its ability to resist corrosion (due to passivation) and its low density of 2.7 g/cm³, compared to iron's of 7.87 g/cm³. The melting point of Al is 660°C.

amber (*chem.*)

Real amber can be discerned from imitates by making the "lighter test".

ambient (*general*)

The vessel was only designed for ambient pressure.

ambient air (*chem.*)

The ambient air carried a characteristic smell.

ambient temperature (*chem.*)

The ambient air temperature is 20°C.

amendment (*econ.*)

An amendment to the contract was considered.

American Society for Testing and Materials (*eng.*)

Acronym: ASTM
The pipes were manufactured according to ASTM standards.

amino acid (*chem.*)

In chemistry, an amino acid is a molecule which contains both amine and carboxyl functional groups. In biochemistry, this term is more specific and describes alpha-amino acids with the general formula NH_2-CHR-COOH with R being an organic substituent.

ammeter (*eng.*)

An ammeter is an instrument to measure the electric current in a circuit, the SI unit of which is amperes (A).

amorphous (*chem.*)

Polypropylene (PP) can be crystalline and amorphous.

amplification (*eng.*)

The electronic circuit provided an amplification factor of 10.

amplifier (*eng.*)

An amplifier can add noise to a signal.

ampoule (*pharm.*)

Ampoules protect hypodermic solutions or high purity chemicals from air.

analgesic, analgetic (*pharm.*)

Analgesia are drugs that relieve pain. Paracetamol (acetaminophene, $C_8H_9NO_2$) is a widely -used analgesic. It can be derived from coal tar.

analog (*eng.*)

The primary disadvantage of analog signals, as opposed to digital ones, is that they carry noise.

analysis (*chem.*)

Wet chemical analysis is increasingly replaced by laser-based online measurements.

analytical balance (*chem.*)

An analytical balance requires proper maintenance.

anchor (*eng.*)

There are two operating principles of ship anchors: They can fix the position of a ship by their sheer mass or by hooking into the seabed.

anchor bolt (*eng.*)

Badly visible anchor bolts in the ground can be a tripping hazard in a production plant.

ancillary unit, auxiliary unit (*eng.*)

The ancillary units account for 15% of the total investment costs.

anesthetic (*pharm.*)

Butorphanol ($C_{21}H_{29}NO_2$) is an anesthetic that is rarely used in people, but commonly in animals.

angle of incidence, incident angle (*eng.*)

The incident angle equals the emergent angle.

angle of repose (*chem. eng.*)

The angle of repose of that material is 42°.

angle seat valve (*chem. eng.*)

The angle seat valve was made from stainless steel.

angular minute, minute of arc (*eng.*)

1 minute of arc is 1/60 of 1 degree.

anhydrous (*chem.*)

Anhydrous ethanol (C_2H_5OH) is called "absolute alcohol".

anion (*chem.*)

SO_4^{2-} (sulfate) is an anion. The S-O bond length is 149 pm.

anneal, to (*eng.*)

Annealing is a heat treatment method in metallurgy by which internal stresses in the material can be relieved.

annealing furnace (*chem.*)

The annealing furnace had a setpoint of 950°C.

annular (*chem.*)

Benzene (C_6H_6) is an annular molecule.

annular gap scrubber (*chem. eng.*)

He developed an annular gap scrubber for the scrubbing of blast furnace gases with water.

anodised (*chem.*)

anodized (AE)

Anodised aluminium carries a protective layer of Al2O3 which prevents further oxidation.

anti fouling agent (*chem. eng.*)

The operator poured a container of anti fouling agent into the cooling water tank.

antibiotic (*pharm.*)

Antibiotics act against microorganisms (bacteria).

anticonvulsant (*pharm.*)

Some sulfonamides (R -$S(=O)_2$-NH_2) have anticonvulsant properties.

antidote (*pharm.*)

In case of a cyanide poisoning, amyl nitrite (3-methyl-1-nitrosooxybutane, $C_5H_{11}ONO$), sodium nitrite ($NaNO_2$) or sodium thiosulfate ($Na_2S_2O_3$) are used as antidote.

antiemetic (*pharm.*)

An antiemetic is a drug that is effective against vomiting and nausea.

antihistamine (*pharm.*)

A common adverse effect (side effect) of antihistamines is sedation.

anti-inflammatory (*pharm.*)

The application of ice to tissue injuries shows anti-inflammatory effects.

antiknock fuel (*eng.*)

Due to its detrimental effects on the environment, lead is no longer used in automotive antiknock fuels.

antimony (*chem.*)

Acronym: Sb

The metalloid antimony (Sb) is no longer used in flame retardants and anti- fouling coatings on ships.

antioxidant (*chem.*)

Antioxidants are often reducing agents such as thiols (mercaptans, R-SH) or polyphenols. Vitamin E is used as an antioxidant in polyethylene (PE). Vitamin E is the collective name for a group of 8 related tocopherols and tocotrienols.

antipyretic (*pharm.*)

Paracetamol (acetaminophen, $C_8H_9NO_2$), is an analgesic and antipyretic medication with wide usage.

antiseptic (*pharm.*)

Antiseptics are antimicrobial substances which are applied to living tissue (skin) to reduce the possibility of infections. They should be distinguished from antibiotics, which destroy bacteria within the body, and from disinfectants, which destroy microorganisms on surfaces of non-living objects.

antistatic agent (*chem.*)

Antistatic agents such as glycerine-monostearate (GMS) increase the electrostatic surface conductivity of polyolefins, thereby eliminating charge build-up and dust collection.

anvil (*eng.*)

The anvil was too heavy for one person to lift.

aperture (*eng.*)

Lasers can be used to create small, symmetric apertures.

apex (*eng.*)

It is assumed that Tyrannosaurus is an extinct apex predator.

API (*pharm.*)

Acronym/Abbreviation referral: see active pharmaceutical ingredient

apolar (*chem.*)

Hydrocarbons, in contrast to water, are apolar liquids.

apparent density (*eng.*)

The apparent density of a sample can be defined as: mass divided by volume, including both permeable and impermeable voids normally present in the material. Density > apparent density > bulk density.

apparent power (*eng.*)

When the impedance is a pure resistance, the apparent power equals the real power.

appliance (*general*)

A coffee grinder is a typical kitchen appliance.

application (*general*)

After its invention, the laser was seen as a "solution looking for an application".

applied chemistry (*chem.*)

IUPAC is an acronym and stands for "International Union of Pure and Applied Chemistry».

apply, to (*general*)

He applied the ointment to the wound.

apprentice (*general*)

An apprentice should learn a profession from the basics.

apprenticeship (*general*)

A typical apprenticeship lasts three years.

appurtenances (*eng.*)

The piece of land was offered including all appurtenances.

aqua fortis (*chem.*)

Aqua fortis, which is actually a solution of HNO_3 (nitric acid) in water, was used by alchemists to separate gold from silver.

aqua regia (*chem.*)

Aqua regia can dissolve gold. It is prepared by mixing concentrated nitric acid and concentrated hydrochloric acid in the ratio 1:3.

aqueous (*chem.*)

An aqueous solution of the drug was prepared.

arbitrary units (*sci.*)

Acronym: a.u.

The laser power as a function of injection current was depicted in arbitrary units.

arc (*eng.*)

Mathematically, an arc can be defined as a closed segment of a differentiable curve in a two-dimensional plane.

arc minute (*eng.*)

In cartography, 1 arc minute at sea level equals approx. 1.86 km or 1.15 miles, which is close to 1 nautical mile (1852 m).

area classification, hazardous area classification (*chem. eng.*)

During (hazardous) area classification, it became evident that the warehouse is a zone 22 because of high dust levels.

arm saw (*eng.*)

An arm saw can be used to cut down a tree.

arsenic (*chem.*)

Acronym: As

In the past, arsenic was illicitly fed to horses to make them appear healthy before being sold.

articulated lorry (*econ.*)

semi-trailer (AE)

An articulated lorry is a trailer without a front axle.

artificial (*general*)

Artifical lubricants generally have a tighter specification than petroleum – derived ones.

as low as reasonably achievable (*chem.*)

Acronym: alara

The MSDS suggests exposure to the chemical as alara.

asbestos (*chem.*)

The use of asbestos has been reduced because of its carcinogenic effects.

as-built (*chem. eng.*)

The as-built documentation was handed over to the client 1 month after startup.

as-built documentation (*eng.*)

The as-built documentation was incomplete because the project budget was used up.

as-built drawing (*eng.*)

The as-built drawing was handed over to the client.

ascorbic acid (*chem.*)

The L-enantiomer of ascorbic acid ($C_6H_8O_6$) is commonly known as vitamin C.

aseptic (*pharm.*)

Aseptic packaging is a key requirement in the food industries.

asphyxiant (*chem.*)
By replacing breathable oxygen, nitrogen is asphyxiant. The earth's atmosphere contains 79% of asphyxiant gases (mainly N_2 and Ar).

aspirate, to (*eng.*)
The aspiration system was designed for zone 20.

assembly (*eng.*)
Assembly of the ladder was more complicated than indicated by the instruction manual.

assets (*econ.*)
Assets are depreciated over their lifetime.

assignment (*econ.*)
She was on a 2-year assignment in Canada.

assort, to (*eng.*)
The samples were assorted in the correct order.

ASTM (*eng.*)
Acronym/Abbreviation referral: see American Society for Testing and Materials

atomic bond (*chem.*)
Atomic bonds are also called valence bonds.

atomic core (*chem.*)
The atomic core is composed of protons and neutrons.

atomic nucleus (*chem.*)
Isotopes have different atomic nucleii.

atomic transmutation (*chem.*)
Atomic transmutation has not only captured the attention of alchemists.

atomise, to (*eng.*)
atomize, to (AE)
Ultrasound can be used to improve the atomizing effect of a nozzle.

attenuate, to (*general*)

The light beam was attenuated by the sample.

attenuation (*general*)

Radioactive level measurements are based on the attenuation of radiation when passing through a sample.

attraction (*chem.*)

Hygroscopic materials exhibit a strong attraction of water.

attrition (*eng.*)

Attrition from machinery can lead to product contamination.

audible (*eng.*)

Hearing protection should be constructed in a way that a human voice is still audible.

audit (*econ.*)

Plant audits by customers can be scheduled at short notice.

automation (*eng.*)

The plant has a high degree of automation.

auxiliaries (*eng.*)

The energy efficiency study revealed that the auxiliaries were consuming 40% of the electricity.

availability (*eng.*)

The availability of spare parts in remote operations needs to be considered.

avoirdupois ounce (*eng.*)

Acronym/Abbreviation referral: see ounce
Acronym: oz

axis (*eng.*)

The engineer turned the wheel around its axis.

axle (*eng.*)

The maximum load on each axle is 3 tons.

babbit, babbit metal (*chem.*)

Bush bearings are often made from babbit or graphite.

back flushing filter, (*chem. eng.*)
back flush filter

The back flush filter was activated every 15 min.

back pressure (*eng.*)

A flare creates backpressure which must be overcome.

backdraft (*chem.*)

A backdraft is a situation which can occur when a fire is starved of oxygen; Consequently, combustion stops, but the fuel gases and smoke remain at high temperature. If oxygen then reaches the fire, e.g. by opening a door, combustion can restart. This can occur in an explosive way as the gases are heated up rapidly and expand.

backlog (*general*)

After his holidays, there was a huge backlog of work.

bactericidal (*pharm.*)

The hypochlorite ion (ClO^-), a strong oxidizer, has bactericidal properties.

baffle (*eng.*)

The acoustic baffle could reduce the noise by 3 dB(A).

baffle,
baffle plate (*eng.*)

Baffles, which act as counterpart to stirrers, are often used in reactors to divert a process flow.

balance (*chem.*)

The resolution of the balance is 0.1 mg.

balance (*econ.*)

The mass balance was wrong.

balance sheet,
statement of financial position (*econ.*)

A balance sheet or statement of financial position lists all assets and liabilities of a corporation at a specific date. Also, the ownership (debt vs. equity) is disclosed.

ball and socket joint (*eng.*)

Laboratory glassware can have conically tapered joints or, like bones, ball and socket joints, where the ball-shaped end of one piece fits into the cuplike depression of the counterpart.

ball bearing (*eng.*)

The reason for the damage to the ball bearing could not be determined.

ball condenser (*chem.*)

For the synthesis of his new herbicide, he was looking for an additional ball condenser.

ball indentation hardness (*eng.*)

Vickers and Brinell hardness tests are more common than the ball indentation hardness.

ball mill (*eng.*)

To grind black powder in a ball mill, non-sparking lead, antimony, brass, or bronze grinding media are used.

ball screw (*eng.*)

With a ball screw, rotational motion can be translated into linear motion.

ball valve (*chem. eng.*)

A ball valve is a valve that opens by turning a handle attached to a ball inside the valve, which has a hole (port) in the middle. Ball valves are reliable. They achieve perfect shutoff even after years of disuse.

band saw (*eng.*)

The band saw was suitable to cut down the wood.

bar (*eng.*)

The crane driver lifted the bar from the ground.

bar absolute (*eng.*)

Acronym: bara

The instrument reading was 2 bara (1 bar = 100 kPa).

bar chart, bar graph (*sci.*)

The scientist used a bar chart to display the particle size distribution.

bar gauge (*eng.*)

Acronym: barg

There is no fixed conversion factor from barg to bara as atmospheric pressure changes daily in a range of approx. 50 mbar. By adding 1000 mbar to a barg reading, the bara value will be accurate within typically +/- 50 mbar.

bara (*eng.*)

Acronym/Abbreviation referral: see bar absolute

barbed hook (*eng.*)

The fisherman caught the bass with a barbed hook.

barbed wire (*eng.*)

Barbed wire was installed around the entire site.

barg (*eng.*)

Acronym/Abbreviation referral: see bar gauge

barrier fluid (*eng.*)

The service technican had forgotten to refill the barrier fluid.

barrier layer (*chem.*)

Carbonated soft drinks cannot be stored in PP bottles, because a barrier layer for CO_2 is missing.

basal (*pharm.*)

Basal tears contain water, mucin, lipids, lysozyme, immunoglobulins, glucose, urea, sodium, and potassium. Lysozyme fights bacterial infections by dissolving the outer coating of certain bacteria.

base face (*eng.*)

The base face of the machine is 45 m^2.

base metal (*chem.*)
Base metals like iron, nickel or lead react with diluted hydrochloric acid under hydrogen formation.

basement (*eng.*)
The basement cannot be made from concrete.

basement (*general*)
Hotel rooms in the basement are not so popular.

basic chemicals (*chem.*)
Many basic chemicals are produced from petroleum.

basic engineering (*chem. eng.*)
The result of Basic Engineering was a cost estimation of +/- 10% accuracy.

basic flux (*eng.*)
The basic flux -cored wire is suitable for welding non-alloyed steel.

basic research (*sci.*)
Basic research is done at universities.

batch (*chem. eng.*)
The color batch had to be discarded.

batch furnace (*eng.*)
The batch furnace has a residence time of 45 min.

batch operation (*chem. eng.*)
Batch operations are characterized by frequent reactor cleaning periods.

batch release (*chem. eng.*)
The results of mechanical testing had to be awaited for the batch release.

batch tracking (*econ.*)
Many customers require batch tracking of their suppliers' raw materials.

battery back-up (*eng.*)
Backup batteries (Battery back-ups) are almost always used in burglar alarms.

battery limits (*chem. eng.*)
The reactor inlet and the dryer outlet were defined as battery limits.

beaker (*chem.*)
The student rinsed the beaker.

bearing (*eng.*)
Breakage of the bearing was the suspected reason for the fire.

bearing clearance (*eng.*)
The clearance of the bearing has reached an inacceptable level.

bearing rod (*eng.*)
The bearing rod exhibits strong deformations.

bedrock (*general*)
The bedrock consists of granite (an igneous rock).

bee venom (*chem.*)

Apitoxin, or honey bee venom, is a bitter colorless liquid. The active substance of the venom is a complex mixture of proteins. The main component is melittin, a peptide consisting of 26 amino acids.

beech (*general*)

Beech grows on a wide range of soils as long as they are not waterlogged.

behind-the-counter (*pharm.*)

Acronym: BTC

This product is a behind-the-counter drug.

belt drive (*eng.*)

The belt drive did not have to be renewed for 5 years.

bench (*eng.*)

The master showed his apprentice how to use a bench.

benchmark (*general*)

The investment was benchmarked against previous projects.

bend, to (*eng.*)

When polypropylene is bent, white fraction can be observed.

benign (*pharm.*)

The tumor was found to be benign, i.e. it did not grow aggressively, it did not invade the surrounding tissue and it did not metastasize.

benzene (*chem.*)

Petrol station-grade gasoline can contain 3% of benzene (C_6H_6), which is a carcinogen.

benzocaine (*chem.*)

Benzocaine ($C_9H_{11}NO_2$) is a local anesthetic commonly used as a topical pain reliever. It is the active ingredient in some over-the-counter ointments.

bezel (*eng.*)

Jewels can be fastened by bezels.

bid (*econ.*)

The procurement specialist compared the 3 bids.

bidistilled (*chem.*)

Bidistilled water was commonly used in HPLC, but is now replaced by e.g. Milliq™ water due to more reproducible results.

big bag, flexible intermediate bulk container (*chem. eng,*)

super sack (AE)

Acronym: FIBC

Big bags are soft containers of textile material. With a capacity of up to 3m³ and load capability between 0.5 and 2 tonnes, FIBCs can be used for the transportation and storage of many free-flowing materials such as granules, powders, pellets or flakes.

bile (*chem.*)

Bile from slaughtered animals can be mixed with soap to obtain bile soap, an effective agent to remove stains in textiles.

biliously green (*chem.*)

The liquid looked biliously green.

bill of materials (*econ.*)

Acronym: BOM

The assistant typed the bill of materials into a list on the PC.

billing (*econ.*)

In their upstart company, Peter was responsible for the billing.

bimodal (*chem.*)

Bimodal plastics show both adequate processing characteristics (low molecular weight fraction) and good mechanical performance (high molecular weight fraction).

binding agent (*chem.*)

An oil binding agent helps contain a spill.

bioessay (*chem.*)

Bioassays show high sensitivity and selectivity.

biodegradable (*chem.*)

Polyhydroxyalkanoates (PHA) are biopolymers which are completely biodegradable. These compounds are linear polyesters produced by bacterial fermentation of sugar or lipids.

biodegradable plastics (*chem. eng.*)

The restaurant chain has used cutlery made from biodegradable plastics based on starch for several years.

bioreactor (*chem. eng.*)

A bioreactor is an apparatus used to carry out any kind of bioprocess. A fermenter is an example.

birefringence (*eng.*)

Birefringence can be observed in anisotropic materials such as crystals from calcite or boron nitride.

bivalent (*chem.*)

Calcium forms bivalent ions.

black liquor (*chem.*)

A paper factory has successfully built a plant to burn black liquor and to use the generated heat.

blade (*eng.*)

The blade of a knife can be sharpened by grinding.

blank experiment (*eng.*)

A blank experiment can detect instrument drift.

blank value (*eng.*)

The blank value was recorded in the lab journal.

blanket, to (*chem.*)

Nitrogen blanketing of a vessel can prevent the formation of explosive atmospheres.

blast furnace (*chem.*)

In a blast furnace, Fe_2O_3 is reduced to Fe.

blast furnace gas (*chem.*)

Blast furnace gas is rich in CO and CO_2.

blasting (*eng.*)

Blasting activities in a quarry need to be well planned.

blasting agent (*chem.*)

Blasting agents are capable of developing a high amount of heat and gas within a short period of time.

blasting fuse (*chem.*)

Blasting fuses are sensitive to moisture.

bleaching agent (*chem.*)

Bleaching agents are used in the pulp and paper industry.

bleed valve (*chem. eng.*)

Needle valves are frequently used as bleed valves in hot water heating applications.

blemish (*eng.*)

Customers generally do not accept visible surface blemishes.

blind flange,
black flange,
dummy flange,
blank flange (*eng.*)

The pipeline was terminated by a blank flange.

block and bleed valve (*chem. eng.*)

The block and bleed valve was checked by a maintenance engineer.

block and tackle (*eng.*)

The pulley of a block and tackle was probably invented by Archimedes.

blockbuster drug (*pharm.*)

A blockbuster drug is a drug generating more than $1 billion of revenue for its owner each year.

blocking (*eng.*)

The ABS (anti-lock braking system) prevents blocking of the wheels when a car brakes, thereby maintaining steerability.

blood clotting,
blood coagulation,
clotting (*pharm.*)

Blood clotting is typical for mammals.

blood corpuscle (*pharm.*)

Blood corpuscles can be divided into red blood cells (O_2 transportation), white blood cells (antibody production to fight infections) and platelets (blood clotting). They account for 45% of the blood, the rest being plasma.

blower (*chem. eng.*)

A fan is commonly used to move air in an unconfined volume, e.g. for ventilation purposes in a production hall. By contrast, a blower is generally deployed to move air through a conduit such as a pipe at relatively low overpressures, e.g. for pneumatic conveying of solids. A compressor is typically utilized to provide air at relatively high pressures through a conduit, e.g. as instrument air to control plant instruments.

blowhole, cavity (*eng.*)

Cavities can lead to premature mechanical failure.

blowing agent (*chem. eng.*)

Butane and carbon dioxide are two commonly used physical blowing agents (foaming agents).

blue collar worker (*general*)

The company employs 80% blue collar workers.

blunt (*eng.*)

A blunt tool should be used to prevent damage to the surface.

blunting (*eng.*)

Blunting is a process step in the development of a crack in a tough material such as polypropylene. It hinders further crack propagation.

blurring of vision (*med.*)

Eye contact with cyclododecanol can lead to blurring of vision.

boil down, to (*chem.*)

In order to obtain the salt, he boiled down the solution.

boiler (*chem. eng.*)

In China, boilers are typically fired with coal.

boiler scale (*eng.*)

By reducing heat transfer, boiler scale lowers the thermal efficiency of the unit.

boiling chip (*chem.*)

Boiling chips are used to prevent boiling retardation and hence dangerous material spill and loss.

boiling point (*chem.*)

The boiling point of ethanol is 78°C.

boiling point elevation (*chem.*)

Boiling point elevation can be observed when a non-volatile solute, such as a salt, is added to a pure solvent, such as water.

boiling retardation (*chem.*)

Boiling retardation can occur in very pure liquids.

bolt (*eng.*)

A bolt (cap screw) is used together with a nut to give a bolted joint.

bolt together, to (*eng.*)

A riveted connection shows a slower, more creeping fatigue than a bolted one.

bolted joint (*eng.*)

Bolted joints are commonly used in the construction of machines.

BOM (*econ.*)

Acronym/Abbreviation referral: see bill of materials

bonded area (*jur.*)

The shipment was stored in the bonded area.

booster (*eng.*)

The space shuttle uses a booster to reach orbit.

bore (*eng.*)

The bore is the diameter of a cylinder in a piston engine.

bore bit (*eng.*)

The bore bit was lost in the workshop.

bore hole (*eng.*)

After depletion of a drilling site, the bore hole has to be properly sealed.

bore rod (*eng.*)

Bore rods have to be designed for high mechanical loads.

boric acid (*chem.*)

Boric acid ($B(OH)_3$, orthoboric acid) is used in nuclear power plants to control the fission rate of uranium.

boron (*chem.*)

Acronym: B

Borax ($Na_2B_4O_7{\cdot}10H_2O$) is an important boron compound.

boundary (*eng.*)

The boundary could be spotted clearly.

branch line, transmission line (*eng.*)

The branch line was made from copper.

brass (*eng.*)

Brass is any alloy of copper and zinc, whereas bronze is an alloy of copper and tin. Because of its malleability, brass is often used to produce instruments.

brazing (*eng.*)

Brazing is a joining process where a filler metal or alloy is heated to its melting temperature of above 450 °C. The temperature in brazing is lower than in welding and hence less likely to distort the workpiece.

breach of contract (*econ.*)

When a business partner conducts a breach of contract, legal action should be seriously considered.

break even point (*econ.*)

At the break even point, costs equal revenue, i.e. there is neither loss nor gain.

breakage (*eng.*)

Breakage of a rope may imply wrong handling.

breakage of glassware (*chem.*)

Breakage of glassware can be insured.

brick layer (*eng.*)

The brick layer finished his job on the same day.

brightness (*eng.*)

The brightness of a specimen depends on its surface structure.

brine (*chem.*)

A brine is water saturated with salt.

British thermal unit (*eng.*)

Acronym: BTU, btu

1 BTU corresponds to approx. 1060J.

brittle (*eng.*)

At low temperatures, many materials become brittle.

brittleness (*eng.*)

Brittleness at low temperatures is a disadvantage of polycarbonate.

bromic acid (*chem.*)

Bromic acid ($HBrO_3$) is a reagent in the Belousov -Zhabotinsky (BZ) oscillating reaction.

bromine (*chem.*)

Acronym: Br

At standard conditions, bromine is the only liquid, nonmetallic element.

bronze (*chem.*)

Bronze is a copper alloy, usually with tin as the main alloy partner.

broom (*eng.*)

To prevent dusty atmospheres, a vacuum cleaner should be used instead of a broom.

brown coal (*eng.*)

The calorific value of brown coal is lower than that of oil.

brownfield (*chem. eng.*)

It is suspected that many brownfields are still unknown.

BTC (*pharm.*)

Acronym/Abbreviation referral: see behind-the-counter

BTU, btu (*eng.*)

Acronym/Abbreviation referral: see British thermal unit

BU (*econ.*)

Acronym/Abbreviation referral: see business unit

bubble column (*chem. eng.*)

A bubble column can be a bioreactor where the reaction medium is kept mixed and aerated by the introduction of air into the bottom.

bucket wheel (*eng.*)

Bucket wheels do not fluidize the materials to be handled.

buffer (*chem.*)

A buffer of carbonic acid (H_2CO_3) and bicarbonate (HCO_3^-) is present in blood plasma, to maintain a pH between 7.35 and 7.45.

building rubble (*eng.*)

Building rubble that contains metal and wood cannot be landfilled in several countries.

bulk density (*eng.*)

The bulk density of a powder depends on its particle size distribution. The bulk density of PP pellets is approx. 500 kg/m³, whereas the density of the material is 950 kg/m³.

bulk goods (*eng.*)

Bulk goods are often commodities.

bulk material (*eng.*)

Container ships can be used to transport bulk materials over long distances.

bumper (*eng.*)

A bumper on a car has to absorb the shock of an impact.

buoyancy (*eng.*)

According to Archimedes' law, a body that is fully or partially submerged in a fluid experiences a force of buoyancy that is equal to the weight of the displaced liquid or gas.

burn (*pharm.*)

A burn is an injury that can be the result of tissue exposure to heat, cold, electricity, chemicals, radiation (light) or friction. It can range from slight first-degree burns to severe fourth-degree burns.

burn, to (*chem.*)

Waste incineration plants can burn domestic waste.

burn, to (*chem.*)

The acid has heavily burnt his skin, because he was not able to wash it off fast enough.

bush, bushing (*chem.*)

The bushing was rusty.

bushing, bush bearing, (*eng.*)
friction bearing,
sleeve bearing,
journal bearing

A bushing is a cylindrical liner designed to reduce friction and wear around a rotating component.

business intelligence (*econ.*)

The business intelligence department predicted a decrease of raw material prices of 15% over the next 2 quarters.

business unit (*econ.*)

Acronym: BU
The company is organized in 3 business units.

butterfly valve (*chem. eng.*)

A butterfly valve is a type of flow control device. It contains a flat circular plate which is positioned in the center of the pipe where the flow is to be regulated.

butyric acid (*chem.*)

The smell of butyric acid reminds one of sweat.

buzz saw, circular saw (*eng.*)

Industrial buzz saws often have replaceable teeth.

bypass (*eng.*)

To cope with floods, there is a bypass installed in power stations on rivers.

byproduct (*chem.*)

Whey is a byproduct from the production of cheese.

C. Ph. T. (*pharm.*)

Acronym/Abbreviation referral: see Certified Pharmacy Technician

cable (*eng.*)

Cable insultation materials are constructed from pure raw materials to prevent electrical breakthrough.

cable layout plan (*eng.*)

The cable layout plan was drafted by the engineering company.

calculus (*sci.*)

Engineers use calculus in their daily jobs.

calibrate, to (*chem.*)

The field engineer calibrated the sensor to ensure accurate instrument readings.

calibration (*chem.*)

Field calibration is an advantage of several industrial sensors.

call-off delivery (*econ.*)

The call-off delivery was quite a challenge for the supplier.

calorific value (*chem. eng.*)

Fuels can be characterized by their net calorific value (=lower heating value) were H_2O is released as vapor and by their gross calorific value (=upper heating value), where H_2O that is formed is condensed. The gross heating value accounts for moisture in the fuel and is, for instance, relevant for wood and coal.

cam shaft (*eng.*)

The cam shaft is an important construction element in engines. It is used to operate poppet valves.

cane sugar (*chem.*)

Cane sugar is fermented to alcohol on a large scale in Brazil.

cannula (*chem.*)

Cannulae are used in laboratories to transfer liquids between 2 vessels without exposing them to the atmosphere. A cannula is a kind of double-ended needle made of stainless steel or plastic. The sharp ends can easily penetrate septa.

capacitor (*eng.*)

A capacitor can store electrical energy. It is composed of thin conducting, metal plates that are separated by a dielectric. This can be, as in the case of so-called electrolytic capacitors, a metal oxide film or an insulator such as vac uum, air, glass or polymer.

capex (*econ.*)

Acronym/Abbreviation referral: see capital expenditure

capital expenditure (*econ.*)

Acronym: capex

Capex had reached 2.3 MEUR after 8 months.

capsule (*pharm.*)

Capsules, the enclosures for orally administered medication, can be made from gelatine. This is a protein which is produced by partial hydrolysis of collagen from bones and connective tissue of animals.

carbohydrate (*chem.*)

Starch and sugar are carbohydrates.

carbolic acid, phenol (*chem.*)

Phenol (old name: carbolic acid, C_6H_5OH) can be industrially produced by partial oxidation of benzene, the reduction of benzoic acid (C_6H_5COOH), by the cumene process, or by the Raschig-Hooker process. The cumene process yields phenol and acetone from benzene and propylene. Its name is derived from cumene (isopropyl benzene), the intermediate substance in that process. In the Raschig-Hooker process, phenol is won by the hydrolysis of chlorobenzene.

carbon (*chem.*)

Acronym: C

Carbon capture and storage is an emerging technology in order to fight global warming.

carbon black (*chem.*)

Carbon black can be produced by pyrolysis of methane.

carbon dioxide (*chem.*)

Acronym: CO_2

Dry ice is frozen carbon dioxide, which sublimates at -78°C.

carbon monoxide (*chem.*)

Acronym: CO

Carbon monoxide is a colorless and odourless gas.

carbon steel,
plain carbon steel (*eng.*)

The ductility, hardness, yield strength and impact resistance of carbon steel can be improved by heat treatment.

carbonic acid (*chem.*)

Carbonic acid (H_2CO_3) is diprotic. Hydrogencarbonates and carbonates are the salts of the weak acid carbonic acid.

carboxylic acid (*chem.*)

Carboxylic acids can easily be identified by infrared spectroscopy through the C=O and O-H stretch vibrations in the regions of 1680 to 1725 cm^{-1} (5.95 to 5.80 μm) and 2500 to 3000 cm^{-1} (4.0 to 3.33 μm), respectively. Acetic acid (CH_3COOH) is a carboxylic acid.

carcinogenic (*chem.*)

Butadiene (C_4H_6) is a carcinogenic gas.

carcinogenicity (*chem.*)

There are many natural carcinogens. Aflatoxin B1, which is produced by the fungus Aspergillus flavus growing on stored grains, nuts and peanut butter, is an example of a potent, naturally -occurring microbial carcinogen. Certain viruses such as Hepatitis B and human papilloma viruses have been found to cause cancer in humans. Substances with carcinogenicity are e.g. benzene and asbestos.

cardan shaft (*eng.*)

A cardan shaft is used for power transmission.

cardboard (*eng.*)

Cardboard can absorb water splashes.

cargo (*econ.*)

The Antonov An 225 is a cargo plane for exceptionally bulky and heavy goods.

carpenter (*eng.*)

The carpenter convinced him to reconsider the design of his roof.

carriage paid to (*econ.*)

Acronym: CPT

The spare part arrived CPT one day later.

carrying costs (*econ.*)

Just in time delivery is an inventory strategy to minimize capital costs. Carrying costs are negligible.

carry-over (*econ.*)

In accounting, a carry-over is a sum that is transferred to a new page.

cartridge (*eng.*)

If not consumed within 6 months, the cartridge of an inkjet printer can dry out.

CAS (*chem.*)

Acronym/Abbreviation referral: see Chemical Abstracts Service

CAS number, (*chem.*)
CAS registry number

More than 100 million organic and inorganic substances are listed with their unique CAS number in the CAS Registry, the world's largest collection of substance information.

casing (*eng.*)

The casing for the pump was made of aluminium.

cast film (*chem. eng.*)

Cast film is a polymer film that is produced in an extrusion process; the film is extruded through a slit die onto a cold roll, the so-called chillroll. A typical film thickness is between 20 and 200 μm.

cast iron (*eng.*)

The bell is made of cast iron.

castor oil (*chem.*)

Castor oil is a vegetable oil obtained from the castor bean. It can be used as laxative. Sulfonated (sulfated) castor oil, or Turkey Red Oil, is the only oil that completely disperses in water. It is made by adding sulfuric acid to pure castor oil. It was the first synthetic detergent.

catalyst (*chem.*)

Unlike reagents, a catalyst is not consumed in a chemical reaction. It is estimated that 90% of all chemicals or their precursors are produced by catalysis.

catalytic combustion unit (*chem. eng.*)

Acronym: CCU

A CCU is generally more suitable than an RTO in case of varying gas loads.

cataplasm (*pharm.*)

Acronym/Abbreviation referral: see poultice

cation (*chem.*)

K^+, Ca^{2+} and H_3O^+ are cations.

caulking (*eng.*)

Caulking was achieved with silicone.

caustic (*chem.*)

Potassium hydroxide (KOH), a caustic substance, is the precursor to most liquid soaps.

caustic soda (*chem.*)

Sodium hydroxide, also known as caustic soda, is produced in the chloralkali process, which involves the electrolysis of an aqueous solution of sodium chloride.

cavitation (*eng.*)

High rotor speeds can cause cavitation and severe damage in pumps.

cavity (*eng.*)

Cavities in teeth can be treated by lasers.

C-coupling (*eng.*)

The water hose was equipped with a C-coupling.

CCR (*econ.*)

Acronym/Abbreviation referral: see convenants, conditions, and restrictions

CCU (*chem. eng.*)

Acronym/Abbreviation referral: see catalytic combustion unit

CE marking, CE mark (*eng.*)

The Japanese vendor could not provide CE marking for his machinery.

CEFIC (*chem.*)

Acronym/Abbreviation referral: Conseil Européen de l'Industrie Chemique; see European Chemical Industry Council

ceiling,
ceiling concentration (*chem.*)

The ceiling concentration of CO, i.e. the maximum allowable human exposure limit for airborne substances that must not be exceeded even momentarily, is 200 ppm. For methyl alcohol, it is 500 ppm for 10 minutes.

cement flooring (*eng.*)

He decided that a cement flooring of 10 cm thickness would be enough.

centimetre gram(me)
second system (*eng.*)

The CGS system was replaced by the MKS (metre-kilogram-second) system, which in turn was replaced by the International System of Units (SI). SI units are the three base units of MKS plus ampere, mole, candela and kelvin.

centrifugal precipitator (*chem. eng.*)

The yeast cells could be isolated using a centrifugal precipitator.

centrifugal pump (*chem. eng.*)

The centrifugal pump was damaged by cavitation.

CERCLA (*chem. eng.*)

Acronym/Abbreviation referral: see Comprehensive Environmental Response, Compensation & Liability Act

cerium (Ce) (*chem.*)

Acronym: Ce

The rare earth metal cerium (Ce) is liquid from 795°C to 3443°C.

certificate of analysis (*pharm.*)

Acronym: CoA

The company requires a CoA for each raw material delivery.

Certified Pharmacy Technician (*pharm.*)

Acronym: C. Ph. T.

The C.Ph.T assisted the physician.

CFD (*chem. eng.*)

Acronym/Abbreviation referral: see computational fluid dynamics

CFR (*econ.*)

Acronym/Abbreviation referral: see cost and freight

cGMP (*med.*)

AcronymAbbreviation referral: see current good manufacturing practice

cgs (*eng.*)

Acronym/Abbreviation referral: see centimetre gram second system

chain drive (*eng.*)

A chain drive has to be covered so that nobody can accidentally stick his hand inside.

chairman (*econ.*)

The chairman channeled the discussion of the meeting to the core items.

challenge (*eng.*)

Constructing the seemingly impossible is a great challenge for engineers.

change order (*chem. eng.*)

The change order resulted in additional costs and a time delay.

change order request (*chem. eng.*)

A change order request is a formal request from the contractor to the client which identifies the additional scope of work, for instance in engineering, and its consequences.

change order,
engineering change order (*chem. eng.*)

Acronym: ECO

A change order is a formal order, given to the engineering partner by the client, to initiate a change in engineering, usually with a cost implication.

channel tray (*chem. eng.*)

The channel tray of the distillation column was made of stainless steel.

characteristic curve (*eng.*)

A pump should be selected according to its characteristic curve.

characteristic,
characteristic number (*chem. eng.*)

The Reynolds number is an important characteristic number of any fluid flow.

charge (*chem.*)

K^+ and Ca^{2+} carry one and two charges, respectively.

charge, to (*eng.*)

The feeders were charged with the raw materials.

charged particle (*eng.*)

Charged particles can lead to an ignition.

charred cable (*eng.*)

A charred cable could be identified as the reason for the short circuit.

chart (*sci.*)

A chart has to be labelled on all axes.

Non-return valve, check valve (*eng.*)

Check valves are often used when multiple gases are mixed together to prevent (back) mixing, e.g. of hydrocarbons into nitrogen.

chelating agent (*chem.*)

EDTA, which stands for ethylenediaminetetraacetic acid ($C_{10}H_{16}N_2O_8$), is a chelating agent that forms very strong complexes with Mn(II), Cu(II), Fe(III), Pb (II) and Co(III).

chemical (*chem.*)

The chemical industry has to register all of its approx. 100,000 different products under REACH (Registration, Evaluation, Authorisation and restriction of CHemicals), which is an important European Union Regulation.

Chemical Abstracts Service (*chem.*)

Acronym: CAS

Chemical Abstracts Service is a division of the American Chemical Society which produces bibliographic and chemistry databases.

chemical base, base (*chem.*)

Compounds with a pK_a of more than about 13 are called strong bases. Common examples of strong bases are the hydroxides of alkali metals and alkaline earth metals like NaOH and $Ca(OH)_2$.

chemical engineer (*chem. eng.*)

A chemical engineer has to have an understanding of both chemistry and mechanical engineering.

chemical engineering (*chem. eng.*)

In her home town, approx. 5 times more students study architecture than chemical engineering.

chemical grouting (*eng.*)

The cost estimation of chemical grouting was missing.

chemical oxygen demand (*chem.*)

Acronym: COD

COD indirectly measures the amount of organic matter in water, e.g. pollutants. Potassium dichromate ($K_2Cr_2O_7$), a strong oxidizing agent under acidic conditions, is commonly used for the test.

chemical reaction engineering, reaction engineering (*chem. eng.*)

The institute developed a lot of competence in the field of reaction engineering.

Chemical Safety Board, Chemical Safety and Hazard Investigation Board (**AE**) (*chem. eng.*)

Acronym: CSB

CSB, an independent US federal agency, is charged with investigating industrial chemical accidents.

chemical structure (*chem.*)

NMR (nuclear magnetic resonance) can be used to determine the chemical structure of an unkown compound.

chemical vapour deposition (*chem.*)

chemical vapor deposition (AE)

Acronym: CVD

CVD (chemical vapour deposition) is frequently used in the semiconductor industry to produce thin films. A typical reaction is $SiH_4 + O_2 \rightarrow SiO_2 + 2H_2$.

chemical worker (*chem. eng.*)

The chemical worker proposed the replacement of a malfunctioning valve.

chemist (*chem.*)

The first chemist was probably Antoine Lavoisier with his law of conservation of mass in 1783.

chemistry (*chem.*)

Chemistry has its roots in alchemy.

chequer plate (*eng.*)

checker plate, checker (AE)

Checker plate from steel and aluminum was kept in stock in 4'x8' sheets.

chew, to (*general*)

Chewing gum is made from synthetic rubber.

child proof, child resistant (*general*)

Child resistant packaging (C-R packaging) is typically used for pesticides.

China clay (*chem.*)

China clay or kaolinite is a clay mineral with the formula Al_2Si2O_5 $(OH)_4$. It is a layered silicate.

chip (*eng.*)

Because he did not wear protective equipment, a chip injured his skin.

chipboard (*eng.*)

The carpenter nailed the chipboard down.

chisel (*eng.*)

Using a chisel, he could bring the stone into its intended shape.

chloride (*chem.*)

Acronym: Cl

The melting point of sodium chloride is 801°C.

chlorinated (*chem.*)

Chlorinated water is potable.

chlorine (*chem.*)

Acronym: Cl

Chlorine is a powerful oxidant and can be used for bleaching purposes.

CHP (*eng.*)

Acronym/Abbreviation referral: see combined heat and power

chromatography (*chem.*)

She used HPLC (high performance liquid chromatography) to separate her sample.

chrome-plate, to (*chem.*)

Chrome-plated car parts are quite popular in the US.

chromium (*chem.*)

Acronym: Cr

Chromium, a transition metal used in stainless steel, is the only known element to enter quintuple bonds.

CIF (*econ.*)

Acronym/Abbreviation referral: see cost, insurance, freight

cinnabar (*chem.*)

Cinnabar is the name used for the red mineral HgS.

CIP (*general*)

Acronym/Abbreviation referral: see continuous improvement process

CIP (*chem. eng.*)

Acronym/Abbreviation referral: see cleaning in process, cleaning in place

circuit (*eng.*)

Electronic circuits are closed paths composed of electronic components through which an electric current can flow.

circular saw (*eng.*)

Last week circular saws were on sale in the local do-it-yourself store.

circulating pump (*chem. eng.*)

The circulating pump was overdesigned.

circumference (*eng.*)

The circumference of the storage area is 2,500 m.

citation (*sci.*)

The article contains 37 citations.

citric acid (*chem.*)

Citric acid, which decomposes above 175°C through the loss of CO_2 and H_2O, is part of the citric acid cycle and therefore occurs in the metabolism of almost all organisms.

city water, citywater, tap water (*eng.*)

There was plenty of citywater available.

claim (*econ.*)

A claim is a demand for financial compensation as a result of a complaint brought forward e.g. by a customer.

clamp (*chem.*)

The reaction vessel was held in place by clamps.

clamp (*eng.*)

He could not retrieve the clamps.

classifier (*chem. eng.*)

A classifier can remove over- and undersized particles.

clay (*chem.*)

Clay minerals are typically formed over long periods of time by gradual chemical weathering of rocks.

cleaning agent (*chem.*)

Cleaning agents should not leave any streaks on glass surfaces.

cleaning in process, cleaning in place (*chem. eng.*)

Acronym: CIP

CIP stands for the cleaning of production facilities without the need to dismantle them.

cleanup (*chem.*)

2 workers in hazmat suits were at the cleanup site after the fire.

cleave, to (*eng.*)

Cleaving wood with an axe is a tough job.

clevis pin (*eng.*)

Clevis pins are used with shackles. They are fasteners that allow rotation of the connected parts.

clinical studies, clinical trials (*med.*)

In health care, clinical trials are conducted to collect data about new drugs. The phases range from 0 to IV.

clipper (*eng.*)

Clippers are extensively used by climbers.

cloth (*chem.*)

The filter bag is made from cloth.

CNG (*chem. eng.*)

Acronym/Abbreviation referral: see compressed natural gas

CO_2 allowance (*chem. eng.*)

Tight CO_2 allowances are expected to foster innovation for energy-efficient production processes.

CoA (*chem.*)

Acronym/Abbreviation referral: see certificate of analysis

coagulant, flocculant (*chem.*)

Alum ($KAl(SO_4)_2.12H_2O$) is used as a coagulant in water treatment.

coagulate, to (*chem.*)

When he added the acid, the solution immediately coagulated.

coal (*eng.*)

Peat can be seen as a precursor of coal. Via lignite (brown coal), sub-bituminous coal, bituminous coal and finally anthracite can be formed.

coal liquefaction (*chem. eng.*)

The speaker presented a CTL process that is competitive at current crude oil prices.

coal-to-liquid (*chem. eng.*)

Acronym: CTL

Acronym/Abbreviation referral: see coal liquefaction

coarse (*eng.*)

The comminuition of coarse particles is an energy-consuming process.

coating (*chem.*)

The solvent has attacked the coating.

coating (*eng.*)

The lifetime of soft materials can be prolonged by the application of a suitable coating.

cobblestone (*eng.*)

On a cobblestone road, the suspension sy stem of a car can be tested.

cock (*chem.*)

The cock in the byrette was stuck.

COD (*chem.*)

Acronym/Abbreviation referral: see chemical oxygen demand

code (*eng.*)

The ASTM code proposed stainless steel.

cog wheel (*eng.*)

Cog wheels can be found in gears.

cogen (*eng.*)

Acronym/Abbreviation referral: see cogeneration

cogeneration, combined heat and power (*eng.*)

Acronym: CHP, cogen

Cogeneration (combined heat and power, CHP) is a combustion process that strives to capture all available energy from the combustion offgas.

coil (*eng.*)

The copper coil has a weight of 2.5 kg.

coiled spring (*eng.*)

A coiled spring can store mechanical energy.

coke (*eng.*)

Two critical properties of coke, a solid carbonaceous residue derived from destructive distillation of coal, are ash and sulphur content.

cold drawing (*eng.*)

By cold drawing of 1 cm thick copper rods, wires as thin as 1 micrometer in diameter can be obtained.

cold rolling (*eng.*)

Cold rolling increases the yield strength and hardness of a metal, because it introduces defects into the crystal structure of the material below its recrystallisation temperature.

collective lens, collimating lens (*eng.*)

Because of its simple geometry, the collective lens suffers from spherical aberration.

colour change (*chem.*)

color change (AE)

When the pH value is increased to 11.6–14, the pH indicator leucomalachite green (second transition) changes from green to colorless.

colour scale (*chem.*)

color scale (AE)

The colour scale was used for reference purposes.

column (*chem.*)

The longer the column in chromatography is, the better the separation of the mixture under investigation will be.

combined heat and power (*eng.*)

Acronym: CHP

Acronym/Abbreviation referral: see cogeneration

combustible (*chem.*)

Fine dust of combustible material is generally dust explosive.

combustion (*chem.*)

80–90% of the worldwide primary energy production stems from combustion processes.

combustion chamber (*chem. eng.*)

The turbulence in combustion chambers plays a key role in pollutant formation.

combustion point, fire point (*chem.*)

The flash point of a flammable liquid is the lowest temperature at which it can form an ignitable mixture in air. At this temperature the vapor will stop burning when the ignition source is removed. A slightly higher temperature, the fire point, is defined as the temperature at which the vapor continues to burn autonomously after removal of the ignition source. For oils, the fire point is generally about 10°C higher than the flash point.

comminute, to (*chem. eng.*)

To comminute solids is an energy-consuming process.

commissioning (*chem. eng.*)

Commissioning of the new production line was achieved in 2 weeks.

commitment (*econ.*)

His commitment to the team suffered from an inconsiderate email that he had received.

commodity (*econ.*)

Steel started to be traded as a commmodity on the London Metal Exchange in 2007.

commodity product (*econ.*)

A commodity product is a material that is freely available in the market from several competitors. Commodity products are often sold in high volumes and at low margins.

common name (*chem.*)

The common name of 2,2,4 trimethylpentane is isooctane (C_8H_{18}). Octane itself has 18 isomers.

community heating, district heating (*eng.*)

Community heating is an environmentally friendly technology.

competitor (*econ.*)

Talking to competitors about prices is considered highly unethical behaviour. It is also illegal.

complaint (*econ.*)

The customer filed a complaint because of poor quality of the product.

compliance (*general*)

For full compliance with legal regulations, a gas scrubber had to be installed.

complying with (*general*)

Complying with environmental protection standards is mandatory for a chemical company.

composite (*eng.*)

Composites are known for their good mechanical properties at low weight.

composite foil (*eng.*)

The composite foil is made of 7 layers.

composition (*chem.*)

The team composition was not balanced.

compound (*chem.*)

In December 2008, there were more than 40 million organic and inorganic compounds with a CAS number. By December 2015, this number had grown to over 100 million compounds.

Comprehensive Environmental Response, Compensation & Liability Act (**AE**) (*chem. eng.*)

Acronym: CERCLA

compressed air (*eng.*)

Compressed air can be used to drive equipment in classified areas.

compressed gas cylinder (*chem. eng.*)

The compressed gas cylinder was filled with nitrogen at 200 bar.

compressed natural gas (*chem. eng.*)

Acronym: CNG

The energy density of CNG is approx. only 40% of that of LNG (because it is not liquefied) and approx. 25% of that of diesel.

compression stoke (*eng.*)

In an Otto engine, the compression stroke occurs after the intake stroke.

compulsory (*general*)

In Germany, it is compulsory to follow the DIN standard for pressure vessels.

computational fluid dynamics (*chem. eng.*)

Acronym: CFD

In computational fluid dynamics (CFD), numerical methods and algorithms to solve and analyze problems involving fluid flows are used.

concealed (*eng.*)
Debottlenecking can activate concealed plant capacities.

concentration (*chem.*)
The concentration of salt in sea water is approx. 30 g/l.

concomitants (*chem.*)
The ore contains 60% of concomitants.

concrete (*chem.*)
Concrete is a construction material that contains cement.

concurrent (*eng.*)
In concurrent engineering, several tasks are carried out in parallel. This has time advantages, but bears some risks.

conditioning (*chem.*)
Conditioning can be understood as a series of operations to bring a sample or specimen into a reference state with regard to temperature and humidity.

cone (*general*)

The missing part looked like a cone.

cone crusher (*eng.*)

Cone crushers are used to comminute stones.

conference proceedings (*sci.*)

Conference proceedings belong to the so-called grey literature.

confined (*general*)

Gunpowder, when unconfined, burns gently.

congeal, to (*chem.*)

When a substance congeals, its viscosity increases. This can be achieved by a reduction in temperature or by chemical reactions.

congestion (*pharm.*)

Nasal congestion may be caused by an allergic reaction due to hay fever.

conical flask,
Erlenmeyer flask,
E-flask (*pharm.*)

The conical flask broke upon exposure to the open flame of a Bunsen burner.

conjunctivitis,
pink eye (*pharm.*)

Bacterial conjunctivitis is usually treated with antibiotic eye drops or ointments which can contain fusidic acid ($C_{31}H_{48}O_6$).

connecting rod (*eng.*)

The connecting rod of his car was chrome-plated.

consignment stock (*econ.*)

Since the ownership of consignment stock is not transferred from the manufacturer to the customer until use, invoicing is not done immediately.

constant flow stirred
tank reactor (*chem. eng.*)

Acronym/Abbreviation referral: see Continuous Stirred Tank Reactor

constant weight (*pharm.*)

A constant weight of the final product is ensured by monthly instrument calibration.

constituent (*chem.*)

Carbon black is a constituent of most dark pigments.

constitution diagram, (*chem. eng.*)
constitutional diagram

In metallurgy, a constitutional diagram (phase diagram) is a graphical representation of phase-stability relationships in an alloy system as a function of temperature.

consultant (*econ.*)

He worked for a consultant before founding his own business.

contaminated (*chem.*)

Soil contaminated with hydrocarbons needs to be disposed of in a suitable way.

contingency (*econ.*)

The cost estimation contained 10% contingency.

continuous casting (*eng.*)

Continuous casting is a process to produce steel bars.

continuous concrete (*eng.*)

The mixer for continuous concrete broke down.

continuous improvement process

Acronym: CIP

A continuous improvement process based on Kaizen was introduced.

Continuous Stirred (*chem. eng.*)
Tank Reactor

Acronym: CSTR

The CSTR, also known as vat – or backmix reactor, is an ideal reactor type where perfect mixing is assumed. Another ideal type is the PFR.

CSTR (*chem. eng.*)

Acronym/Abbreviation referral: see continuous stirred tank reactor

continuous tubular reactor (*chem. eng.*)

Acronym: CTR

PFRs are also sometimes called CTRs. The key assumption of PFRs is that the fluid is perfectly mixed in the radial direction but not in the axial one.

contract (*econ.*)

A contract stipulates rights and obligations of all parties involved.

contract for work and labour, service contract (*econ.*)

contract for work and labor (AE)

The service contract was issued for last week.

contractor (*econ.*)

The contractor was urged to hand in the weekly report.

contraindication (*pharm.*)

So far, no contraindictions were known about the drug.

contribution (*general*)

His contribution was not appreciated.

control a process, to (*chem. eng.*)

The process in controlled by an experienced operator.

control panel (*chem. eng.*)

An operator working at the control panel of a plant has to be able to cope with stressful situations.

control room (*chem. eng.*)

3 operators were sitting in the control room when the incident happened.

control signal (*chem. eng.*)

In closed-loop control of a process, a sensor response results in a control signal that affects the process.

control valve (*eng.*)

A control valve can be used to control operating conditions such as temperature, pressure, flow, and liquid level in a chemical plant.

control, to;
drive, to;
activate, to; (*eng.*)

The operator activated the valve.

controlled atmosphere (*chem.*)

A controlled atmosphere in food packaging can extend the shelf life significantly.

conveying belt,
conveyor belt (*chem. eng.*)

Conveyor belts are often made from reinforced rubber.

coolant (*eng.*)

An ideal coolant or heat transfer fluid shows high thermal capacity, low viscosity and chemical inertness.

copper (*eng.*)

Acronym: Cu

Copper, which like gold does not have a silvery luster typical of metals, has the second highest electrical and thermal conductivity of a pure metal after silver. The Statue of Liberty contains 81 tonnes of copper.

cord set (*eng.*)

The cord set was made from flame-retardant plastics.

corollary (*general*)

The mathematician could prove the corollary.

corotating (*eng.*)

For polypropylene compounding, corotating twin screw extruders are commonly used.

corporate social responsibility (*econ.*)

Acronym: CSR

CSR, also called corporate citizenship and responsible business, is a concept whereby organizations consider the interests of society by taking responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities and other stakeholders, as well as the environment.

corrosion (*chem.*)

In passivation, a thin film of corrosion products is formed on a metal's surface, acting as a barrier to further corrosion.

corrugated cardboard (*eng.*)

The glass was wrapped in corrugated cardboard.

corundum (*chem.*)

Corundum has a Mohs hardness of 9 (diamond is 10).

cosine (*sci.*)

The cosine of an angle is the ratio of the length of the adjacent side to the length of the hypotenuse, whereas the sine of an angle is the ratio of the length of the opposite side to the length of the hypotenuse. The tangent of an angle is the ratio of the length of the opposite side to the length of the adjacent side.

cost allocation (*econ.*)

For cost allocation, the steam consumption of the various process units had to be estimated.

cost and freight (*econ.*)

Acronym: CFR

The reactor was delivered "CFR Shanghai", meaning that the customer had to pick it up in the harbour.

cost center (*eng.*)

There was an overrun in his costcenter.

cost of capital (*econ.*)

The costs of capital in a company depend on its debt/equity ratio.

cost overrun (*econ.*)

Due to a lack of engineering resources, the project experienced a cost overrun of 15%.

cost, insurance, freight (*econ.*)

Acronym: CIF

Buyer and seller agreed on CIF.

cotton (*eng.*)

Gossypol ($C_{30}H_{30}O_8$), a polyphenol derived from the cotton plant, has contraceptive properties. Cotton is used to make textiles.

cotton wool (*chem.*)

cotton batting (AE)

Cotton wool is obtained from cotton by purification, bleaching and sterilization.

cotton plug (*pharm.*)

The lab assistant dipped a cotton plug inside the fleaker.

cough syrup (*pharm.*)

Cough syrup contains cough suppressants and expectorants. Codeine (methylmorphine, $C_{18}H_{21}NO_3$) is one of the strongest cough suppressants.

counterbalance, counterweight (*eng.*)

A counterweight is often used in elevators and cranes.

countercurrent (*eng.*)

In a concurrent (co-current, parallel) heat exchanger, thermal equilibrium is achieved, where the hot and the cold fluid reach the same temperature. In a countercurrent heat exchanger, the cold fluid becomes hot and the hot fluid becomes cold.

covalent (*chem.*)

The covalent triple bond in N_2 has an energy of 418 kJ/mol.

covenants, conditions and restrictions (*econ.*)

Acronym: CCR

The CCR can be found on the company website.

CPT (*econ.*)

Acronym/Abbreviation referral: see carriage paid to

crab, trolley (travelling ~) (*eng.*)

crab, trolley (traveling ~)(AE)

The (travelling) trolley has to be overhauled every 2 years.

cracking (*eng.*)

Cracking is a form of fatigue.

cracking pressure, crack pressure (*eng.*)

The cracking pressure is the minimum pressure at which a check valve will operate.

craft (*eng.*)

Crafts can be grouped by the use of a certain material such as wood, clay, glass or metal.

craftsman (*eng.*)

The craftsman could repair the machine within 1 hour.

crane (*eng.*)

A construction site can be seen from a distance because of the cranes.

crank shaft (*eng.*)

His main expertise is crank shaft design.

creep (*eng.*)

Unlike brittle fracture, creep is a deformation mechanism rather than a material failure. It does not occur suddenly, but steadily upon the application of stress.

crevis corrosion (eng.)

Crevice corrosion can be caused by a high concentration of impurities such as chlorides in the crevice ("hideout") or differential electrolyte chemistry inside and outside the crevice.

crimp of a tube (*pharm.*)

A crimp is obtained by joining two pieces of metal or any other malleable material by deforming them, e.g. as on a tube.

crimp, to (*pharm.*)

The liquid was leaking out because the tube had not been properly crimped.

critical (*eng.*)

Critical steps deserve sufficient planning.

cross section (*eng.*)

The cross section of a pipe has a strong influence on the flow resistance.

crucible (*chem.*)

The crucible broke when it hit the ground.

crude

Acronym/Abbreviation referral: crude oil *(chem. eng.)*

crude oil, petroleum (*chem. eng.*)

Crude oil (petroleum) contains 0.5 to 6% sulfur. The hydrocarbons can be grouped into paraffins, naphthenes, aromatics and asphaltics.

crude ore (*chem. eng.*)

The total world reserves of crude iron ore are 800 billion tons. They contain approx. 230 billion tons of iron. The global crude steel production was 1.24 billion tons in 2006.

cryogenic (*eng.*)

Lead salt diode lasers require cryogenic cooling.

cryogenic vial (*pharm.*)

The cryogenic vial could keep liquid nitrogen for 5 hours.

CSB (*chem. eng.*)

Acronym/Abbreviation referral: see Chemical Safety Board

CSR (*econ.*)

Acronym/Abbreviation referral: see corporate social responsibility

CSTR (*chem. eng.*)

Acronym/Abbreviation referral: see Continuous Stirred Tank Reactor

CTL (*chem. eng.*)

Acronym/Abbreviation referral: see coal-to-liquid

CTR (*chem. eng.*)

Acronym/Abbreviation referral: see continuous tubular reactor

culture broth, nutrient broth (*pharm.*)

The most common growth media for microorganisms are nutrient broths and agar plates.

culture medium, growth medium (*pharm.*)

Antibiotics were added to the growth media as selective growth compounds for bacteria.

cumene (*chem.*)

Cumene (isopropylbenzene), is an aromatic hydrocarbon that can be found in crude oil. Nearly all the cumene is used to produce phenol and acetone via cumene hydroperoxide ($C_6H_5C(CH_3)_2$-O-O-H).

cure, to (*chem.*)

Vulcanization is a specific curing process of rubber that involves high temperatures and the addition of sulfur.

curing (*chem. eng.*)

Curing is the hardening of a polymer material by cross-linking, which can be achieved by chemical agents, radiation or heat.

current Good Manufacturing Practice (*med.*)

Acronym: cGMP

The US laboratory was working accoring to cGMP.

curriculum vitae (*general*)

Acronym: CV

Her CV was updated.

customer (*econ.*)

Ultimately, it is the customer who pays the wages.

customer requirements (*econ.*)

Translating customer requirements into new products is a key success factor of any corporation.

customs clearance (*econ.*)

Customs clearance was delayed because of missing documents.

cut-off wheel (*eng.*)

Cut-off wheels often contain Al_2O_3 particles.

cutting torch (*eng.*)

The cutting torch was operated on acetylene and oxygen.

CV (*general*)

Acronym/Abbreviation referral: see curiculum vitae

CVD (*chem.*)

Acronym/Abbreviation referral: see chemical vapour deposition

daily allowance (*econ.*)

The employee did not know that he was entitled to a daily allowance of 35 Euro in the US.

dampen, to (*eng.*)

Vibrations in machinery need to be dampened.

dangerous good (*chem.*)

Dangerous goods include materials that are radioactive, flammable, explosive or corrosive, biohazardous, toxic, oxidizers, asphyxiants, pathogen or allergen substances and organisms, but also physical conditions as compressed gases or hot materials.

dark room (*eng.*)

With the proliferation of digital cameras, dark rooms have become pretty rare.

darting flame (*chem.*)
The ignition resulted in a darting flame.

data logger (*eng.*)
The resolution of the data logger is 0.05 psi.

davit (*eng.*)
The rescue boat was attached to the davit.

day supervisor (*chem. eng.*)
The day supervisor had 10 years of work experience.

days of inventory (*econ.*)
Acronym: DOI
The days of inventory is the number of days that finished goods inventory will support forecasted sales.

DC (*eng.*)
Acronym/Abbreviation referral: see direct current

DDP (*econ.*)
Acronym/Abbreviation referral: see delivery duty paid

DDU (*econ.*)
Acronym/Abbreviation referral: see delivery duty unpaid

deacidify, to (*pharm.*)
The researcher developed a spray to deacidify historic paper documents without harming inks or discoloring paper.

dead lime (*chem.*)
Dead lime consists of CaO.

dead weight, deadweight (*pharm.*)
The dead weight of the glass container was 13.5 g.

deaerate, to (*eng.*)
Fluidized powders can be deaerated by storing them in a silo for some t ime.

deaeration valve (*chem. eng.*)

The deaeration valve was designed for a maximum flow of 10 m^3/s.

debottleneck, to (*chem. eng.*)

The plant was debottlenecked from 32 kt/a to 42 kt/a.

debt (*econ.*)

The debt to equity ratio is known as "gearing".

decant, to (*chem.*)

The solution was decanted to remove solids.

decommissioning (*chem. eng.*)

Decommissioning of the plant had to be postponed because the new plant was not yet operational.

decomposition (*chem.*)

Thermal decomposition (thermolysis) is usually an endothermic process as heat is required to break chemical bonds in the compound, e.g. $CuCO_3$ (green)→ CuO (black)+ CO_2.

deduster (*chem. eng.*)

Dedusters can handle large volumes of air.

dedusting plant (*chem. eng.*)

The dedusting plant was designed for class ST3 materials.

dedusting,
dust collection (*eng.*)

Dust collection can prevent the accumulation of dangerous concentrations of combustible material in a plant.

default value (*eng.*)

The default value was a flow of 35 m^3/h.

degas, to (*chem.*)

The polymer pellets had to be degassed in order to get rid of unreacted monomer.

degenerate (*chem.*)

Degenerate states have the same energy level.

degradation product (*chem.*)

Peroxides can be formed as dangerous degradation products from ethers.

degrease, to (*chem.*)

Prior to applying the paint, the surface had to be degreased.

dehydration (*chem.*)

Food can be preserved by dehydration.

deliquescent (*chem.*)

Calcium chloride ($CaCl_2$), magnesium chloride ($MgCl_2$) and zinc chloride ($ZnCl_2$) are not only hygroscopic, but even deliquescent salts.

delivered duty paid,
delivery duty paid (*econ.*)

Acronym: DDP

The company made an attractive offering based on DDP.

delivered duty unpaid, (*econ.*)
delivery duty unpaid

Acronym: DDU

DDU is an Incoterm.

deluge (*general*)

The plant was in an area with increased risk for deluges.

demi water (*chem. eng.*)

Acronym/Abbreviation referral: see demineralised water (short form of ~)

demineralised water (*chem. eng.*)

de mineralized water (AE)

The demi water unit was designed for 10 m^3/h.

demix, to; unmix, to; (*chem.*)
segregate, to

Powders that have a broad particle size distribution often tend to demix in a silo.

demotion (*econ.*)

2 months after his demotion, the employee quit.

demulcent (*pharm.*)

Lozenges may contain benzocaine, an anesthetic, or eucalyptus oil. Non-menthol throat lozenges generally use either zinc gluconate glycine or pectin as an oral demulcent.

demurrage (*econ.*)

The project team underestimated the demurrage costs of the containers.

denatured (*chem.*)

Denatonium, the most bitter compound known to date, is sometimes added to denaturated alcohol.

DeNOx plant, (*chem. eng.*)
denitrification unit

The boiler was retrofitted with a small DeNOx plant.

density (*chem.*)

Acronym: ρ

At room temperature, the density of mercury (Hg) is 13.53 g/cm^3.

department (*econ.*)

The budget of the R&D department was cut by 10%.

department head (*econ.*)

The head of the IT department left the company.

deplete, to (*chem.*)

The mine was depleted 10 years ago.

depreciate, to (*econ.*)

The forklift was depreciated over 7 years.

depreciation (*econ.*)

A typical duration for plant depriciation is 5–20 years, depending on the process.

derivative (*chem.*)

The ester methyl benzoate is a derivative of methanol.

derrick (*eng.*)

There were dozens of derricks in the docks.

descale, to (*chem.*)

Descaling agents (descalants) work via dissolving the deposits (e.g. acetic acid, lactic acid, citric acid, sorbic acid, phosphoric acid or hydrochloric acid), or via chelation (e.g. phosphonates).

desiccant (*chem.*)

Potassium carbonate (K_2CO_3) can be used as a desiccant. Its melting point is 891°C.

desiccator (*chem.*)

The sample was stored in a desiccator.

design capacity (*chem. eng.*)

The design capacity of the plant is 350 kt/a.

design of experiment (*sci.*)

Acronym: DoE

A software package for statistical design of experiment will allow you to minimize your time spent in the lab and increase the quality of your results at the same time.

design pressure (*chem. eng.*)

The design pressure of the fuel pipeline was 10 bar.

desulfurization (*chem. eng.*)

The Claus process is a large-scale desulfurization process which is used in refineries.

detail engineering (*chem. eng.*)

Detail Engineering is the phase that typically follows Basic Engineering.

development (*sci.*)

Product development has to take both market requirements and plant capabilities into consideration.

deviation (*sci.*)

A recipe deviation will result in different properties of the product.

device (*eng.*)

Last year, a patent was granted for his testing device.

dew point (*chem.*)

The dew point is associated with relative humidity.

dewatering (*chem.*)

Before sewage sludge can be burnt, it needs to be dewatered.

dextrorotary (*pharm.*)

Some compounds are optically active, i.e. they can rotate plane polarized light clockwise (dextrorotation) or counterclockwise (levorotation). Such a compound with dextrorotation is called dextrorotary, while one with levorotation is termed levorotary. It consists of chiral molecules.

diagonal cut (*eng.*)

In the diagonal cut, the openings of the boiler can be seen.

diameter (*eng.*)

The diameter of a human hair is approx. 40 μm.

diaphoresis (*pharm.*)

A low oral dose of 1,4-butanediol (< 2 ml) may result in diaphoresis and ataxia, while higher doses (2–5 ml) may result in loss of consciousness. 1,4- butanediol ($HO(CH_2)_4OH$) can be converted into the important solvent tetrahydrofuran (THF, oxacyclopentane, C_4H_8O).

diaphragm valve, membrane valve (*chem. eng.*)

Diaphragm valves are commonly used for corrosive substances and in the pharmaceutical industry.

diatom (*pharm.*)

Diatom aceous earth consists of fossilized remains of diatoms, a type of hard-shelled algae.

diatomite, diatomaceous earth (*pharm.*)

The typical chemical composition of diatomaceous earth is 86% silica, 5% sodium, 3% magnesium and 2% iron.

die (*eng.*)

Dies are make from highly wear-resistant materials.

die plate (*eng.*)

A die plate is a metal plate with numerous holes that can be used for pelletising of a melt.

die swell (*chem. eng.*)

Die swell, the expansion of a melt strand after leaving a die, is proportional to the melt elasticity.

differential scanning calorimetry (*chem.*)

Acronym: DSC

By the thermoanalytical technique DSC, phase transitions of a sample can be studied.

differentiate, to (*sci.*)

The function y = x^(1/3) cannot be differentiated at x = 0.

diffraction (*eng.*)

Diffraction, wich occurs with all waves when they hit an obstacle, has the strongest effect with waves where the wavelength is on the order of the magnitude of the diffracting objects.

digestion (*chem.*)

Microwave digestion is a time-efficient process.

digit (*eng.*)

A billion has 10 digits.

diluent (*chem.*)

Organic peroxides are often phlegmatized by using a diluent.

dilute, to (*chem.*)

In order to feed the color at a constant rate, it had to be diluted.

dilution (*chem.*)

Increasing the production volume will lead to a fixed cost dilution.

dimensionless quantity (*chem. eng.*)

The Reynolds number, a dimensionless number, is the ratio of inertial forces to viscous forces in a fluid (the units cancel out). Laminar flow occurs at low Reynolds numbers, where viscous forces are dominant, whereas turbulent flow occurs at high Reynolds numbers, were inertial forces dominate. The relative density is another dimensionless quantity.

dimensionless representation (*chem. eng.*)

Dimensionless representations can be used as an aid for scale-up.

diopter (*eng.*)

He is shortsighted on both eyes (-2.5 and -3.0 diopters).

dip, to (*chem.*)

The semi-finished article was dipped into a cleaning bath.

dipole (*chem.*)

Molecules with a permanent dipole moment are known as polar molecules.

diptube (*eng.*)

The diptube is made from stainless steel.

direct current (*eng.*)

Acronym: DC

Batteries, thermocouples and solar cells produce direct current.

directional control valve (*eng.*)

A directional control valve is used to direct hydraulic fluids.

discard, to (*general*)

The scientist discarded this theory.

discharge (*general*)

The vessel was discharged.

discolouration (*eng.*)

discoloration (AE)

Discoloration of metal surfaces is a sure sign of thermal stresses.

disinfect, to (*pharm.*)

The technician disinfected the surface of the table with isopropanol (2 – propanol, C_3H_8O).

disinfectant (*pharm.*)

Often, household disinfectants contain denatonium to discourage ingestion. Denatonium, a quaternary ammonium cation, is the most bitter chemical compound known to date. Denatonium benzoate ($C_{28}H_{34}N_2O_3$, $C_{21}H_{29}N_2O{\cdot}C_7H_5O_2$) and denatonium saccharide are commonly used, also to denature alcohol.

dismantle, to (*eng.*)

The student dismantled the TV set to learn more about its setup.

disorders (*pharm.*)
Patients suffering from allergic disorders often avoid exposure to pollen.

dispatch, to (*econ.*)
The sample was dispatched as a rush order.

displace, to (*general*)
The weight of an object floating on water equals exactly that of the water which it displaces.

disposable (*general*)
Disposable packaging made from plastics can be thermally recycled.

disposal (*general*)
The disposal of chemical waste is strictly regulated.

dispose of, to (*chem.*)
Dangerous waste needs to be disposed of according to local regulations.

distill, to (*chem.*)
Distillation is a unit operation. It is the separation of a mixture based on differences in the volatilities of the constituents in a boiling liquid mixture.

distillation (*chem.*)
Water can be purified by distillation or filtration.

distribution tray (*chem. eng.*)
The pipes deliver water into a distribution tray.

district heating, community heating (*eng.*)
Vienna has an ample district heating system.

disuse (*chem. eng.*)
Ball valves are durable and usually achieve perfect shutoff even after years of disuse.

diverging lens (*eng.*)

If a lens is concave, a collimated (parallel) beam of light passing through it will be diverged (spread); the lens is termed a negative or diverging lens. If a lens is convex, a collimated beam passing through the lens will be converged (focused). In that case, the lens is termed a positive or converging lens.

diverter valve (*eng.*)

Diverter valves are used in pneumatic conveying systems.

division (*econ.*)

The company has 3 divisions.

dizziness (*med.*)

Symptoms of carbon monoxide poisoning include dizziness and fatigue.

DoE (*sci.*)

Acronym/Abbreviation referral: see design of experiment

dose (*pharm.*)
Quantities of nutrients, drugs, and toxins are referred to as doses.

doubling time (*pharm.*)
When the relative growth rate (not the absolute growth rate) is constant, one speaks about exponential growth, which has a constant doubling time.

doughy (*pharm.*)
The ointment had a doughy consistency.

downgauging (*chem. eng.*)
The packaging industry has invested heavily in R&D for downgauging. By reducing the wall or film thickness of packaging materials, disposal costs can be reduced.

downstream (*chem. eng.*)
After pelletizing, the product is treated in several downstream processes such as drying, metal separation, classifying and packaging.

downtime (*econ.*)
A malfunctioning valve could be identified as the root cause for a 3-hour downtime of the plant.

draft (*eng.*)
The draft layout of the plant was subjected to a review.

drain (*chem.*)
Concentrated acid must not be poured down the drain.

drain nipple (*eng.*)
Drain nipples should be placed at the lowest possible position.

drain valve (*chem. eng.*)
The drain valve was plugged.

drain, to (*eng.*)
After production, the water bath had to be drained completely.

draught tube, draught box (*chem. eng.*)

draft tube (AE)

A draught tube, which is also called draught box, is used with water wheels.

dredge (*eng.*)

A dregde is an excavator (digger) that operates under water.

drilling rig (*eng.*)

Drilling rigs can be reached by helicopter.

drip, to (*pharm.*)

He dripped the acid onto the sample to check for the presence of carbonates.

drive train, power train (*eng.*)

The powertrain of a car consists of engine, transmission, driveshaft, differential, and the final drive (wheels).

drop closure (*pharm.*)

The drop closure was malfunctioning.

drop, to (*pharm.*)

A drop of water has a volume of typically 0.05 ml.

droplet (*pharm.*)

Droplets are small drops (liquid particles) of <500 μm diameter.

dropping bottle (*chem.*)

The pH indicator was stored in a dropping bottle with a ground glass joint and a pipette.

drowsiness (*chem.*)

The inhalation of CO_2 led to drowsiness in the worker.

drug (*pharm.*)

Drugs must not be confused with addictive drugs. Several drugs can be obtained without prescription.

drug-resistant (*pharm.*)

The patient was found to be drug-resistant.

dry end (*chem. eng.*)

The dry end (downstream part) of a polymerisation plant includes a dryer and a pelletising unit.

drying agent, desiccant (*pharm.*)

Silica gel, calcium chloride, and molecular sieves can be used as desiccants.

drying oven (*pharm.*)

The drying oven was heated to 115°C.

dry wall, drywall, gypsum board, wallboard, plasterboard (*eng.*)

Drywall panels contain gypsum ($CaSO_4*2H_2O$) obtained from flue gas desulfurization.

DSC (*chem.*)

Acronym/Abbreviation referral: see differential scanning calorimety

due (*econ.*)

The due date was yesterday.

dump (*chem. eng.*)

The reactor was dumped because of a disturbance of the process.

dust (*eng.*)

Dust from this process is typically between 1 and 10 μm large.

dust extraction system (*chem. eng.*)

The dust extraction system was a significant improvement for operator satisfaction.

dust tight (*pharm.*)

The packaging was not dust tight.

dwell time (*pharm.*)

see residence time

dye (*chem.*)

Triphenylmethane (Ph_3CH, $(C_6H_5)_3CH$) is the basis for several synthetic dyes, the so-called triarylmethane dyes. They are used as food dyes.

dye, to (*eng.*)

Dying of natural fibres needs to take into account fluctuations in raw material brightness.

dynamic friction (*eng.*)

To maintain constant speed, dynamic friction has to be overcome.

dyne (*eng.*)

Dyne is an outdated unit of force, which was used in the cgs system. 1 dyne = 10 μN.

dyspnoea (*chem.*)

dyspnea (AE)

If swallowed, acetic acid (methane carboxylic acid) can lead to dyspnoea.

ear plugs (*eng.*)

Since the noise in the plant was > 83 dB(A), ear plugs were compulsory to wear.

ear, eye (*eng.*)

The banner was attached to the building by placing a rope through its eyes.

earthed socket (*eng.*)

The earthed socket was splashwater-proof.

earthing (*eng.*)

grounding (AE)

Earthing is an important safety practice to conduct electrical charges to ground, preventing dangerous sparks.

EC50 (*chem.*)

The effective concentration (EC50) is the concentration of a substance in water, which, administered as a single dose, is expected to cause a biological effect on 50% of the tested population.

ECO (*chem. eng.*)

Acronym/Abbreviation referral: (engineering) change order

economiser, preheater (*chem. eng.*)

economizer (AE)

The economizer was heavily corroded.

eddy (*general*)

Eddy currents (Foucault currents) are caused when a conductor is exposed to a changing magnetic field.

edema (*pharm.*)

Upon ammonia exposure, lung irritation and pulmonary edema may occur.

edge (*eng.*)

The operator hurt his knee on the edge of the transportation box.

edible (*pharm.*)

The food did not look edible.

effective concentration (*chem.*)

Acronym/Abbreviation referral: see EC50

effervesce, to (*chem. eng.*)

The carbonate started to effervesce in the acidic solution.

effervescent (*pharm.*)

The following reaction took place in the effervescent drink: $C_6H_8O_7$ + 3 $NaHCO_3$ → 3 H_2O + 3 CO_2 + $Na_3C_6H_5O_7$ (citric acid + sodium bicarbonate → water + carbon dioxide + sodium citrate).

effervescent tablet (*pharm.*)

The ingredients of effervescent tablets can penetrate the blood stream within 15 minutes.

effluent (*chem.*)

The effluent from the plant is monitored regularly.

effluvium (*pharm.*)

Effluvium stands for the shedding of hair.

egg white (*chem.*)

Egg white (albumen) consists of approx. 15% proteins in water.

EHS (*chem. eng.*)

Acronym/Abbreviation referral: see health, safety, environment

electric scale (*eng.*)

The electric scale has an accuracy of +/- 0.1 mg.

electric engineering (*eng.*)

Electrical engineering is one of the most popular disciplines at her university.

electrical engineering (*eng.*)

Acronym/Abbreviation referral: electric engineering

electropolishing (*eng.*)

Even surfaces can be obtained by electropolishing.

elementary analysis (*chem.*)

The empirical formula was determined by elementary analysis.

elevation, front elevation (*eng.*)

The client looked at the front elevation and made some comments.

elucidate, to (*eng.*)

The structure of benzene was elucidated by Kekulé.

eluent (*chem.*)

An eluent is the mobile phase in chromatography.

elute, to (*chem.*)

The sample was eluted to the FID (flame ionisation detector).

elutriator (*chem. eng.*)

An elutriator can separate pellets from undesirable dust.

embed, to (*eng.*)

The embedded file cound not be opened.

embossed (*pharm.*)

The brand of the manufacturer was embossed on the tablets.

embrittlement (*eng.*)

Hydrogen embrittlement is dangerous for pressure vessels.

embrocation, liniment (*pharm.*)

Traditional Chinese medicine (TCM) features a wide variety of liniments.

emerald (*chem.*)

The green color in emerald stems from traces of chromium. The mineral is beryl: Be3Al2(SiO3)6.

emergency response plan (*chem. eng.*)

Acronym: ERP

The emergency response plan for the 3 plants was updated and discussed with the local mayor.

emergency shutdown (*chem. eng.*)

Acronym: ESD

The ESD, which was caused by a power outage, led to an unplanned shutdown of the plant of 3 days.

emerging (*sci.*)

Hydrogen combustion in fuel cells is an emerging technology.

emery (*chem.*)

Emery paper can be used to remove deposits from glassware.

emetic (*pharm.*)

Syrup of ipecac (ipecac) is a commonly used, herbal emetic.

emollient (*pharm.*)

Emollients are substances that soften and soothe the skin.

empirical (*sci.*)

Any theory needs to be proven by empirical results.

empirical formula (*chem.*)

The empirical formula of hexane (C_6H_{14}) is C_3H_7.

empowerment (*econ.*)

Empowerment of his em ployees has greatly reduced the workload of the department head.

emulsifying agent, emulsifier, emulgent (*pharm.*)

Lecithin, a common emulsifier in food, can be extracted from soybeans using hexane.

enamel (*chem.*)

Enamel is sensitive to mechanical stress.

enamelled (*pharm.*)

enameled (AE)

Enamelled vessels can be used for hot acids.

endocrine disrupter (*pharm.*)

Bisphenol A (BPA) is an endocrine disrupter. This organic compound with two phenol functional groups is an important monomer in the production of polycarbonate.

endothermic (*chem.*)

The melting of ice and the splitting of water into H_2 and O_2 air are endothermic processes.

enema (*pharm.*)

An enema is a bowel stimulant.

energised, to be (*eng.*)

energized, to be (AE)

The wire was energized.

energy balance (*chem.*)

According to the first law of thermodynamics, energy cannot be created or destroyed, but only be modified. The energy balance of a closed system is hence zero.

energy consumption (*chem. eng.*)

The energy consumption of a pump often accounts for more than 90% of the total lifecycle costs.

engine (*eng.*)

Combustion engines have a higher energy density than batteries.

engineer (*chem. eng.*)

Engineers need to pay attention to minute details.

engineering (*eng.*)

Engineering can be categorized into several branches with aerospace engineering, chemical engineering, civil engineering, electrical engineering and mechanical engineering being the traditional ones. Software engineering and genetic engineering are two more recent branches.

Procurement and Construction (*chem. eng.*)

Acronym: EPC

The EPC contractor was chosen from a list of 3 bidders.

Engineering, Procurement and Construction Supervision (*chem. eng.*)

Acronym: EPCS

The EPCS contract was signed.

Engineering, Procurement and Construction Commissioning (*chem. eng*)

Acronym: EPCC

The plant was built under an EPCC contract.

Engineering, Procurement, Constrauction Management (*chem. eng.*)

Acronym: EPCM

The project was carried out as EPCM.

enrich, to (*chem.*)

In enriched uranium, the fraction of uranium -235 has been increased beyond its natural abundance of 0.711% in uranium, because only 235U is fissionable by neutrons and U238 is not.

enter (a vessel), to (*chem. eng.*)

Entering a nitrogen-containing vessel requires special precautions.

enteric coated (*pharm.*)

Pills that are enteric coated do not dissolve until they reach the small intestine. Enteric coatings, which can be made from cellulose acetate (the acetate ester of cellulose) or other polymers, are applied to avoid stomach irritation or a reduction in drug effectiveness by stomach acids or enzymes.

entero soluble (*pharm.*)

The company was technology leader in the production of entero-soluble gelatin capsules. Gelatin is a protein produced by partial hydrolysis of collagen extracted from bones and connective tissue.

entire system (*chem.*)

In order to set up a mass balance, the entire system needs to be considered.

entrainment (*chem.*)

Air entrainment is the deliberate creation of small air bubbles in concrete. Unlike entrapped air (larger bubbles), the small bubbles increase performance.

environment (*chem.*)

Before a new plant can be approved in China, an EIA (environmental impact assessment) has to be made to protect the environment.

environmental awareness (*chem.*)

Due to media coverage, the environmenal awareness of the public has increased.

environmental engineering, environmental technology (*chem. eng.*)

Companies working in environmental technology often have a high export rate.

Environmental Protection Agency (*chem. eng.*)

Acronym: EPA

EPA took up work in 1970 and has close to 20,000 employees.

environmental technology (*chem. eng.*)

Pollutant reduction is an important area of environmental technology.

EPA (*general*)

Acronym/Abbreviation referral: see Environmental Protection Agency

EPC (*chem. eng.*)

Acronym/Abbreviation referral: see Engineering, Procurement and Construction

EPC contractor (*chem. eng.*)

The EPC contractor charged an hourly rate of 65€ for its engineers.

EPCC (*chem. eng.*)

Acronym/Abbreviation referral: see Engineering, Procurement, Construction and Commissioning

EPCM (*chem. eng.*)

Acronym/Abbreviation referral: see Engineering, Procurement, Construction Management

EPCS (*chem. eng.*)

Acronym/Abbreviation referral: see Engineering, Procurement and Construction Supervision

equation (*chem.*)

It can take days to derive a complicated equation.

equation of state (*chem. eng.*)
In thermodynamics, an equation of state is a relation between state variables.

equilateral (*chem.*)
An equilateral triangle has three angles of 60°.

equilibrium (*chem.*)
The concept of chemical equilibrium was developed after Berthollet discovered that some chemical reactions are reversible. The equilibrium between CO and CO_2 is decribed by the Boudouard equation.

equipment (*eng.*)
The consultant handed over the equipment list to his client.

ergot (*chem.*)
Ergot is a fungus that afflicts grains and grasses.

escalation (*econ.*)
The contract mentioned a price escalation clause.

ESD (*chem. eng.*)
Acronym/Abbreviation referral: see emergency shutdown

essential oil (*pharm.*)
The yearly production of essential oils from spearmint and peppermint exceeds 1000 tons each.

estimate (80/20) (*chem. eng.*)
An estimate (80/20) has got 80% probability for underrun and 20% probability for overrun of project costs.

estimate, to (*general*)
The engineer estimated the unplanned shutdown to last at least 3 weeks.

etching (*chem.*)
Etching is an im portant unit operation in litography.

European Chemical Industry Council;
Conseil Européen de l'Industrie Chemique

Acronym: CEFIC

Cefic represents the European chemical industry and thereby stands for approx. 30,000 chemical companies which employ approx. 1.3 million people and account for nearly a third of the world's chemical production.

eutectic point (*chem.*)

The melting point of a mixture of two or more solids depends on their fractions in that mixture. At the eut ectic point, the melting temperature is lowest.

evaluation (*sci.*)

The evaluation of results deserves at least as much time as the experiments themselves.

evaporate, to (*chem.*)

Liquids and solids have a tendency to evaporate into a gaseous form and to condense back. The vapor pressure expresses the equilibrium condition.

even (*eng.*)

2, 4 and 6 are even numbers.

evolution of gas (*chem.*)

The evolution of H_2 gas from recharging of lead accumulators has to be evaluated for potential risks.

evolution of heat (*chem.*)

The evolution of heat in exothermic reactions has to be controlled.

ex works (*econ.*)

Acronym: EXW

The machine will be available ex works in 2 weeks.

excavation work (*eng.*)

The excavation works were delayed by 2 weeks.

excavator (*eng.*)

Front loaders and excavators were used to remove the contaminated soil.

exceed, to (*eng.*)

The market response has exceeded the expectations.

excess (*chem.*)

The cheaper reaction partner was added in excess.

excess pressure (*chem. eng.*)

It needs to be ensured that the excess pressure in the process can never surpass the design pressure of the equipment.

excipient (*pharm.*)

Excipients account for a large portion of tablets. For instance, binders hold the ingredients in a tablet together. Binders are usually starches, sugars, cellulose or modified cellulose such as hydroxypropyl cellulose, lactose, or sugar alcohols like xylitol, sorbitol or maltitol.

excite, to (*general*)

The OH radicals were excited at 278.5 nm.

executive (*econ.*)

In company A, all executives are entitled to a company car.

executive board (*econ.*)

The exective board holds biweekly meetings.

exhaust, exhaust gas (*chem.*)

In modern DeNOx plants, ammonia slip in the exhaust gases is measured.

exothermic (*chem.*)

The mixing of strong acids with water, combustion and most polymerisation reactions are exothermic.

expansion sleeve (*chem. eng.*)

The expansion sleeve could compensate thermal expansion between -10 and +300°C.

expat (*econ.*)

Acronym/Abbreviation referral: short form for expatriate

expatriate (*econ.*)

Acronym: expat

For his company, he went to China as an expat for 2 years.

expectation (*general*)

In order to fulfil customer requirements, one needs to know their expections.

expertise (*general*)

His expertise was not disputed.

expiration date, expiry date (*pharm.*)

Shelf life is different from expiration date; the former relates to food quality, the latter to food safety.

expire, to (*general*)

The software licence has to be renewed before it expires.

explosion (*chem.*)

Explosions in a confined space are particularly dangerous.

explosion proof (*chem. eng.*)

The vessel was designed to be explosion proof in order to avoid the installation of a pressure relief valve.

exposure (*chem.*)

Chronic exposure to lead amongst workers in ammunition factories can lead to serious diseases.

exposure limit (*chem.*)

The exposure limit of CO is 50 ppm.

extensible (*eng.*)

His remote control has an extensible antenna.

extinguishing medium (*chem. eng.*)

Carbon dioxide and water can be used as extinguishing media.

extractables (*chem.*)

Extractables are chemicals which are released by the packaging and can contaminate a pharmaceutical drug in it.

extraction (*chem.*)

Some essential oils can be obtained by extraction.

extrusion (*eng.*)

Extrusion and injection moulding are two important plastics processing technologies.

EXW (*econ.*)

Acronym/Abbreviation referral: see ex works

eye wash equipment (*chem.*)

The lab was equipped with state-of -the-art eye wash equipment.

fabric (*eng.*)

Fabrics are woven on dedicated machines.

facilitator (*econ.*)

To structure the workshop, a facilitator was invited.

factory (*chem.*)

The glass factory is the largest employer of the region.

factory acceptance test (*econ.*)

Acronym: FAT

The FAT was witnessed by three technical experts of the customer to verify that the equipment was functioning according to specifications.

fail closed (*eng.*)

The propane feed line was equipped with a fail closed valve.

fail open (*eng.*)

A fail open shutter should generally not be used on these storage tanks.

fail open valve (*eng.*)

The vessel had a fail open valve.

fail safe position (*chem. eng.*)

The fail safe position of the valve is "open".

failed batch (*chem. eng.*)

The failed batch was reworked in the subsequent productions.

fail-safe, fail-secure (*chem. eng.*)

The vessel was made fail-safe by redundant systems.

failure (*eng.*)

Denial of the project was considered a failure of the project manager.

failure mode and effect analysis

Acronym: FMEA

The customer asked for a process FMEA.

falsification (*general*)

No falsification could be seen on the packaging.

FAT (*eng.*)

Acronym/Abbreviation referral: see factory acceptance test

fat (*chem.*)

Fats are generally triesters of glycerol (propane-1,2,3-triol, $C_3H_5(OH)_3$) and fatty acids.

fatigue (*eng.*)

Material fatigue can be depicted on an S-N curve, which is also known as the Wöhler curve. It is a graph of the magnitude of a cyclical stress (S) against the logarithmic scale of cycles to failure (N).

fatty acid (*chem.*)

A fatty acid is a carboxylic acid (carbonic acid). It can have a long unbranched aliphatic saturated or uns aturated tail (chain). Most naturally occurring fatty acids have an even number of carbon atoms, because their biosynthesis involves the coenzyme acetyl-CoA.

faulty (*eng.*)

The manual is faulty.

FDA (*eng.*)

Acronym/Abbreviation ref erral: see Food and Drug Administration

feasibility (*general*)

The economic feasibility of the project was doubtful.

feasibility study (*chem. eng.*)

In the feasibility study, the production process was chosen.

feasible (*chem.*)

According to the laws of physics, the construction of a perpetuum mobile is not feasible.

federal (*general*)

The use of that chemical in regulated by federal law.

Federal Environment(al) Agency (*general*)

The German Federal Environmental Agency had a study on PAH conducted.

Federal Register (AE) (*general*)

Acronym: Fed. Reg.

The Federal Register is an official, daily publication issued by Federal agencies and organizations in the United States.

feed port (*chem. eng.*)

The PFD does not show the feed ports of the catalyst.

feed water (*chem. eng.*)

The feed water consumption of a plant has to be estimated in the basic engineering phase.

FEL (*chem. eng.*)

Acronym/Abbreviation referral: see front end loading

felt (*chem.*)

Felt, a nonwoven cloth, is the oldest fabric.

fermentation (*chem.*)

Acetic acid is produced from ethanol by fermentation.

ferric (*chem.*)

Iron(III) oxide, Fe_2O_3, also known as ferric iron, is rust. It is red.

ferrous (*chem.*)

Iron(II) oxide, FeO, also known as ferrous oxide, is black.

ferrous metal (*chem.*)

Ferrous metals (Fe, Ni, Co) are attracted by a magnet.

fertiliser, fertilizer (*chem. eng.*)

fertilizer (AE)

Most fertilizers contain the three major plant nutrients (nitrogen, phosphorus, potassium: N -P-K).

FIBC (*chem. eng.*)

Acronym/Abbreviation referral: see flexible intermediate bulk container

fibre (*chem.*)

fiber (AE)

The fiber was made from PP (polypropylene).

fibre glass, glass fibre (*chem.*)

fiber glass, glass fiber (AE)

Fibre glass can be used in plastics compounds.

fibre reinforced (*chem.*)

fiber reinforced (AE)

Fibre reinforced materials have a good performance/weight ratio.

fibrous (*chem.*)

Wollastonite has a fibrous structure.

field erection (*eng.*)

The silo was field-erected to save transportation costs.

field force (*econ.*)

The field force has to understand the strengths and weaknesses of a company's products.

field size (*eng.*)

The asset field size is 20,000 m^2.

field test (*eng.*)

The prototype was subjected to a 3-week field test.

FIFO (*econ.*)

Acronym/Abbreviation referral: see first in, first out

file (*eng.*)

A good filing stucture greatly facilitates searching for old data.

film coated tablet (*pharm.*)

The film coated tablet could be swallowed easily by the patient.

film forming agent (*pharm.*)

Polyvinylpyrrolidone (PVP, povidone, polyvidone) is a film-forming agent.

filter residue (*pharm.*)

The toxic filter residue was disposed of.

fin (*eng.*)

Fins on a heat exchanger can improve heat transfer.

final study (*chem. eng.*)

Verification of the business case is a vital part of a final study.

final yield (*chem.*)

The final yield can be increased to 85% when the reaction is conducted in the most preferable solvent.

financial accounting,
financial accountancy (*econ.*)

Financial accounting needs to follow local and international accounting standards.

fine adjustment (*pharm.*)

By fine adjustment of the reactor, the yield could be increased by 3%.

fir (*general*)

Fir, which is not suitable as timber, is often used as plywood.

fire (*chem.*)

The smoke detector set off the fire alarm.

fire diamond (*chem. eng.*)

The fire diamond is a symbol designed by the NFPA to provide a quick overview about the hazards of a substance by a number code in colored boxes: Blue stands for health, red for flammability, yellow for the reactivity and white for specific hazard of the substance in question.

fire extinguisher (*general*)

Potassium bicarbonate (potassium hydrogen carbonate, $KHCO_3$) is used in class B and class C fire extinguishers.

fireproof (*eng.*)

Historically, asbestos was used for fireproofing in buildings.

firewater (*eng.*)

Firewater was stored in a pond.

first in, first out (*econ.*)

Acronym: FIFO

FIFO is a stock valuation technique where the value of materials that are taken out of a warehouse is set equal to the value of the oldest material in stock.

first order reaction (*chem.*)

A first-order reaction depends on the concentration of only one reactant. An example is the unimolecular reaction $H_2O_2 \rightarrow H_2O + 1/2\ H_2$.

fix, to (*general*)

The meeting could be fixed for October 23, 2016.

fixed costs (*econ.*)

Costs that do not change in line with production output, e.g. factory rent, depreciation of plant and machinery, are termed fixed costs. Also salaries are included in fixed costs since they can be reduced only in a very long time perspective.

flake (*chem.*)

Snow flakes exhibit a 6-fold symmetry, which arises from the hexagonal crystal structure of ice.

flame sieve, flame arrestor, flame arrester (*chem. eng*)

Flame arrestors which are designed to stop deflagrations might be overriden by a detonation.

flammable (*chem.*)

Acetone and ethanol are flammable liquids. Their autoignition temperatures are 465°C and 425°C, respectively.

flange (*chem. eng.*)

Pipe flanges can be divided into pressure classes.

flap (*eng.*)

The flap was actuated to stop the material flow.

flare, to (*chem. eng.*)

Flaring is generally only performed at startup and shutdown of the plant.

flashback (*chem.*)

A flashback can occur with an acetylene torch if the gas pressure is too low (i.e. the gas flow of the combustible mixture is slower than the laminar flame speed so that the flame can travel backwards).

flashover (*chem.*)

In household fires, a flashover typically occurs at 500 °C, when the combustible gases, which have accumulated in the room, ignite simultaneously. If this phenomenon occurs in an unconfined space, it is termed firestorm.

flashpoint, flash point (*chem.*)

The flashpoint of gasoline is below -20°C, wheras its autoignition temperature is 246°C. For diesel, the values are approx. 62°C and 210°C, respectively.

flask (*pharm.*)

The lab technician was looking for a clean flask.

flavouring agent (*pharm.*)

flavoring agent (AE)

Synthetic vanillin, instead of natural vanilla extract, which contains several hundred different compounds in addition to vanillin, is sometimes used as a flavoring agent in foods, beverages, and pharmaceuticals. It can be made from guaiacol (2-methoxyphenol, $C_7H_8O_2$) or lignin. The lignin-derived product contains acetovanillone (apocynin, 1-(4-Hydroxy -3-methoxypheny l) ethanone, $C_9H_{10}O_3$) as an impurity.

fleece (*general*)

Sheep were among the earliest animals to be domesticated for agricultural purposes. They give fleece, meat (lamb or mutton) and milk.

flexibiliser, plasticiser (*chem.*)

flexibilizer, plasticizer (AE)

Plasticizers for plastics are additives, most commonly phthalates, that give hard plastics like PVC the desired flexibility and durability. They are often based on esters of polycarboxylic acids with linear or branched aliphatic alcohols of moderate chain length.

flexible (*general*)

The construction was held together by flexible wire.

flexible intermediate bulk container (*chem. eng.*)

Acronym: FIBC

Acronym/Abbreviation referral: see big bag

flint stone (*chem.*)

Flint is a hard, cryptocrystalline form of quartz, which can be found as nodules in sedimentary rocks such as chalk and limestone.

floating roof (*eng.*)

The fuel storage tank, which has a capacity of approx. 5,000,000 litres, is equipped with a fixed roof with internal floating roof.

flocculate, to (*chem.*)

The emulsion was flocculated using multivalent cations such as aluminium, calcium and magnesium ions.

flocculation (*chem.*)

In flocculation, unlike precipitation, the solute coming out of the solution does so at a concentration below its solubility limit.

flow limiter, flow restrictor (*chem. eng.*)

An orifice plate is a simple flow limiter (flow restrictor).

flow rate, volume flow, volume flow rate (*chem. eng.*)

The blower supplies a flow rate of 5,400 m^3/h.

flow sheet (*chem. eng.*)

The engineer attempted to simplify the flow sheet.

fluent (*general*)

Fluent English is vital in many roles.

fluid (*chem.*)

The instrument was designed for fluid flows from 0.1 to 50 t/h.

fluid dynamics, fluid mechanics (*eng.*)

An important set of equations in fluid dynamics are the Navier-Stokes equations. These differential equations describe the motion of viscous fluids.

fluidised bed (*chem. eng.*)

fluidized bed (AE)

Fluidized beds show good heat and mass transfer and can hence be used for numerous processes such as combustion.

fluorine (*chem.*)

Acronym: F

Fluorine is the most reactive and most electronegative element.

flush, to (*chem.*)

Before the Grignard reaction could be started, flushing of the entire system with nitrogen had to be done.

flywheel (*eng.*)

A flywheel can store mechanical energy and release it within a short period of time.

FMEA (*general*)

Acronym/Abbreviation referral: see failure mode and effect analysis

foam (*chem.*)

Foam can have open and closed cells.

foam extinguisher (*eng.*)

Foam extinguishers can be found in many households.

focal point (*eng.*)

The focal point of a lens, a spherical or parabolic mirror, is a point onto which light parallel to the axis is focused.

fog (*chem.*)

People suspected that the chemical plant was responsible for the fog.

Food and Drug Administration (*eng.*)

Acronym: FDA

The company expected an FDA inspection in the next weeks.

food approval (*jur.*)

Since the new additive did not yet have food approval, it could not be used in packaging materials designed for food contact.

food supplement (*pharm.*)

Food supplements are generally over-the-counter drugs.

foodborne illness, (*pharm.*)
foodborne disease,
food poisoning

There are two reasons of foodborne diseases: food infection and food intoxication. The former refers to the presence of bacteria or other microbes which infect the body after food consumption. The latter refers to the ingestion of toxins in the food.

fool's gold (*eng.*)

The nickname of pyrite (FeS_2) is fool's gold.

force (*eng.*)

The SI unit of force is Newton (N). 1 N = 1 kgm/s^2.

force discharge, (*eng.*)
forced discharge

The liquid was too viscous for gravity discharge, therefore, forced discharge was used.

force per volume (*eng.*)

In contrast to density (unit kg/m^3), the force per volume (unit N/m^3) is irrespective of the location.

forced ageing (*eng.*)

forced aging (AE)

Forced ageing tests can speed up product development time.

forced ventilation (*chem. eng.*)

The solvent storage room is equipped with forced ventilation.

forecast (*general*)

The sales forecast for the upcoming quarter looked gloomy.

foreman (*eng.*)

The foremen showed role model conduct in terms of safety.

forensic chemistry (*jur.*)

Forensic chemistry can reveal the root cause of poisonings.

forge, to (*eng.*)
The tool was forged.

forklift (*chem. eng.*)
In a warehouse, electrically operated forklifts are preferred over diesel-fuelled ones.

formation (*chem.*)
The formation of carbonaceous deposits on viewing windows of combustors can be prevented by purging the windows.

formation (*eng.*)
The formation of a task force could be completed in half a day.

formic acid (*chem.*)
Formic acid (HCOOH, methanoic acid) is the simplest carboxylic acid.

formula (*chem.*)
Some formulae need to be learnt by heart.

fortification (*eng.*)
The fortification of the cooling tower was designed for high wind loads.

foul, to (*chem.*)
Boiler fouling reduces the lifetime of the unit.

fouling (*chem.*)
Without the addition of special anti-fouling agent, the water bath showed algae growth within days.

foundation (*eng.*)
The foundation of the building was made from concrete.

foundry (*eng.*)
Due to lack of orders, the foundry was closed down.

four stroke engine (*eng.*)
Diesel engine and Otto engine are four stroke engines.

fraction (*sci.*)

A fraction has a numerator and denominator.

frame building (*eng.*)

Framed buildings were common in Germany.

freeze-drying, lyophilisation, cryodesiccation (*chem.*)

lyophilization (AE)

The process of freeze-drying is used to preserve food and make it lightweight.

freezing range (*chem.*)

Chocolate exhibits a freezing range rather than a freezing point.

frequency converter (*eng.*)

By investing in a frequency converter for the blower, the air flow could me matched to the process requirements in an energy-efficient way.

freshwater (*chem.*)

3% of the water on earth are freshwater, most of which is frozen.

friability (*pharm.*)

Low friability is an important quality parameter of pharmaceutical tablets.

friction (*eng.*)

Friction creates heat.

front end loading (*chem. eng.*)

Acronym: FEL

Front end loading of the project was poor, leading to significant cost overruns during project execution.

frostbite (*pharm.*)

Forstbite is damage on tissue from exposure to extreme cold or contact with extremely cold liquids or solids.

FTE (*econ.*)

Acronym/Abbreviation referral: see full time equivalent

fuel (*chem.*)

CNG (compressed natural gas) can be used as fuel for cars.

fuel-lean mixture (*chem. eng.*)

Modern gas engines operate on fuel-lean mixtures.

fuel-rich mixture (*chem. eng.*)

Fuel-rich mixtures facilitate engine startup.

fugitive (*chem.*)

Fugitive emissions are harder to control than stack emissions.

fugitive emissions (*chem. eng.*)

Unlike stack emissions, fugitive emissions are difficult to quantify.

fulcrum (*eng.*)

The fulcrum is the pivot on which a lever moves.

full time equivalent (*econ.*)

Acronym: FTE

The project needed 3 additional FTE.

fume cupboard (*chem.*)

The fume cupboard should not be misused as storage area.

funnel (*chem.*)

The funnel was too small for the filter.

funnel flow (*chem. eng.*)

The funnel flow behavior of the raw material silo has a slight homogenisation effect.

fuse (*eng.*)

A fuse needs to have a short response time.

fused glass (*chem.*)

The main constituent of fused glass is silica (SiO_2).

galvanised sheet (*chem. eng.*)

galvanized sheet (AE)

Galvanized steel can be recognized by the crystallization pattern on the surface ("spangle").

gangrene (*med.*)

A gangrene can be caused by an ischaemia or an infection, the latter being a detrimental colonization of a host organism by a foreign species.

gap (*general*)

The consultant proposed to make a gap analysis.

gargle, to (*pharm.*)

Antiseptic mouthwash can be gargled, too, in order to remove bacteria from the throat.

gas liquid interface (*chem.*)

The formula describes gas exchange at the gas liquid interface.

gas mileage (*eng.*)

The car has a gas mileage of 25 mpg.

gas scrubber (*chem. eng.*)

The gas scrubber can reduce the concentration of SO_2 in the exhaust gas from 7 mg/m³ to less than 1 mg/m³.

gaseous (*chem.*)

The gaseous fuel/air mixture was ignited.

gasification (*chem. eng.*)

A pilot plant for biomass gasification was built in Guessing/Austria.

gasify, to (*chem.*)

Coal can be gasified with water to yield CO and H_2.

gasket (*eng.*)

She selected gaskets for the aggressive process media.

gasometer (*chem.*)

The gasometer can store up to 3,500 Nm^3 of butane.

gastric juice (*pharm.*)

Gastric juice is a strong acidic liquid with a pH of 1 to 3 in humans. Its main components are the digestive enzymes pepsin and rennin, plus hydrochloric acid and mucus.

gastro resistant (*pharm.*)

The capsules were designed to be gastro-resistant and enterosoluble.

gate (*eng.*)

The gate was made from wood.

gate valve (*chem. eng.*)

A gate valve is a valve that opens by lifting a round or rectangular gate/wedge out of the path of the fluid. Gate valves are sometimes used for regulating flow, but mostly they are designed to be fully opened or closed. When fully open, a gate valve typically has no obstruction in the flow path.

gauge pressure (*eng.*)

Acronym: barg

The gauge pressure was 1.2 bar.

gauze (*pharm.*)

Gauze is a thin, translucent fabric, often made from cotton. It is used for bandages to dress wounds where other fabrics might stick to the burn or laceration.

gauze bandage (*pharm.*)

The gauze bandage is sterile unless the package is opened or damaged.

gearbox (*eng.*)

Vibration monitoring on gearboxes is state of the art for large, stat ionary engines.

gearing (*econ.*)

The company targets for a gearing (net debt divided by equity) between 40–60%, which is a good balance between costs of capital and risk.

gellant (*pharm.*)

The gellant was produced in China.

gelling agent (*pharm.*)

Gelling agents are used to thicken and stabilize emulsions and suspensions. Typical gelling agents include natural gums, starches, pectins, agar-agar and gelatin. Often they are based on polysaccharides or proteins.

general terms and conditions (*econ.*)

Acronym: T&C, GT&C

The general terms and conditions can be found on the company website.

generate, to (*chem.*)

CO_2, H_2 and H_2S can be generated in Kipp's apparatus from an acid reacting with $CaCO_3$, Zn and FeS, respectively.

generic medicinal products, generic drugs, generics (*pharm.*)

Generic drugs must contain the same active ingredients as the brand name formulation. They need to be identical or bioequivalent to the original medication.

generic name (*pharm.*)

The generic name was proposed by the WHO.

genetic engineering (*chem. eng.*)

The first genetically engineered medicine was synthetic human insulin (1982).

genetics (*chem.*)

A milestone in genetics was the determination of the structure of DANN by James D. Watson and Francis Crick in 1953.

germ (*pharm.*)

Germs are microorganisms, especially pathogenic ones.

germicidal (*chem.*)

Iodine, hydrogen peroxide, boric acid, alcohols and quaternary ammonium compounds have germicidal effects.

germicide (*chem.*)
Overusing germicides might lead to an increase in dangerous, resistant strains of bacteria.

germinate, to (*chem.*)
Germinated barley grains are used for the production of beer.

gingival (*pharm.*)
The formulation was developed for gingival use.

gland (*eng.*)
Glands are used to seal a rotating or reciprocating shaft against a fluid.

glass rod (*chem.*)
The laboratory assistant stirred the solution with a glass rod.

glassware (*chem.*)
Glassware needs to be handled with care.

globe valve (*chem. eng.*)

Globe valves are used to regulate the flow in a pipeline.

gloss (*eng.*)

The gloss on the surface disappeared after 2 weeks.

GLP (*chem. eng.*)

Acronym/Abbreviation referral: see good laboratory practise

GMP (*chem. eng.*)

Acronym/Abbreviation referral: see good manufacturing practise

good laboratory practise (*chem. eng.*)

practice (AE)
Acronym: GLP
GLP, which applies to non-clinical studies, provides a framework within which laboratory studies are planned, performed, monitored, recorded, reported and archived.

good manufacturing practise (*chem. eng.*)

practice (AE)
Acronym: GMP
An important aspect of GMP is documentation of every process step.

gout (*pharm.*)

Gout (metabolic arthritis) is a disease created by a buildup of uric acid (2,6,8 Trioxypurine, $C_5H_4N_4O_3$). In this condition, crystals of monosodium urate or uric acid are deposited on the articular cartilage of joints, tendons and surrounding tissues. These crystals cause inflammation and pain.

grain (*eng.*)

A single grain of contamination can destroy a wafer.

Gram straining (*pharm.*)

Gram staining (or Gram's method) is an empirical method of differentiating bacterial species into two large groups (Gram-positive and Gram-negative) based on the chemical and physical properties of their cell walls.

grassroot plant (*chem.*)

see greenfield plant

grease (*chem.*)

Grease, which is used as a lubricant, consists of an oil or another liquid lubricant which is mixed with a soap to yield a solid.

green chemistry (*chem.*)

Green chemistry is a field that has attracted numerous researchers in the last years.

greenfield plant (*chem.*)

The company built a greenfield plant close to Seoul in Korea.

greenhouse effect (*chem.*)

Without the natural greenhouse effect, the average surface temperature of Earth of 14 °C would be approx. -18°C.

grid (*eng.*)

For his computer simulation, he placed a grid over the reactor.

grind, to (*eng.*)
(**ground, ground**)

He ground the knife so much that a significant loss of metal could be seen.

grindstone (*eng.*)

Grindstones, tools to sharpen various bodies, were often made from sandstone in the shape of a wheel.

groove (*eng.*)

The groove could not be seen.

grooved (*eng.*)

The grooved surface enabled him to walk safely despite the rainfall.

gross (*general*)

The gross weight of the container is 33,850 kg.

ground glass (*chem.*)

By using ground glass joints in laboratories, a leak-tight apparatus can be fitted together in a fast and easy way.

ground stopper (*chem.*)

The ground stopper broke on the floor.

groundbreaking (*chem. eng.*)

100 employees attended the groundbreaking ceremony.

grounding (*eng.*)

Grounding of electrical equipment is specified in national standards.

grout, grouting (*eng.*)

Grout is a construction material used to embed rebars in masonry walls or to fill voids. It is generally composed of a mixture of water, cement, sand and sometimes fine gravel.

guarantee (*econ.*)

In addition to the warranty, which is stated by law, a seller can give an additional, voluntary guarantee to a customer that the product will comply with the specifications for a longer period of time, e.g. 10 years.

gums, gingiva (*pharm.*)

Inflammation of the gums, which can be recognized by a change in color, can be caused by the accumulation of bacterial plaque.

gunpowder (*chem.*)

A typical mixture of gunpowder contains 75% potassium nitrate, 15% softwood charcoal and 10% sulfur.

gypsum (*chem.*)

Desert roses consist of gypsum ($CaSO_4 \cdot 2H_2O$).

gyroscope (*eng.*)

In his final exam, he had to explain a gyroscope.

half-life (*chem.*)

The half-life of uranium-238, which decays to thorium-234 by the emission of alpha particles, is 4.5 billion years.

halide (*chem.*)

Acronym: X

All metals from group 1 form halides with the halogens. These binary compounds are white solids (salts).

hallway (*general*)

The hallway of the building was misused for storage purposes.

hardness (*eng.*)

Hardness, which can be defined as the resistance to scratching or permanent deformation, can be measured on the scales of Mohs, Rockwell, Vickers, and Brinell.

harmful (*eng.*)

Noise > 85 dB(A) is harmful.

harmless (*eng.*)

Air humidity is harmless to the transformer.

hazard classification (*chem. eng.*)

The hazard classification of the warehouse was challenged by the insurance company.

hazardous (*chem.*)

Fluorine is a hazardous gas.

hazardous material (AE) (*chem.*)

Acronym: hazmat

Acronym/Abbreviation referral: see dangerous good

hazardous materials identification system (*chem.*)

Acronym: HMIS

HMIS is a database that provides information on health, flammability, and reactivity hazards of substances that are encountered in the workplace. A number is assigned to a material indicating the degree of hazard, from 0 for the least up to 4 for the most severe. Letters are used to designate suggested personal protective equipment.

hazardous substance (*chem.*)

Before hazardous substances are manipulated, the safety data sheets ought to be consulted.

hazardous waste (*chem.*)

Hazardous waste needs to be properly labelled.

hazmat (*chem.*)

Acronym/Abbreviation referral: see hazardous material

head office (*econ.*)

For tax reasons, the head office was moved to Bern.

health, safety, environment

Acronym: HSE

The company is considered a leader in HSE.

Note: HSE is sometimes written as SHE or as EHS, depending on an organization's focus.

heartburn (*med.*)

Heartburn is a painful and burning sensation in the esophagus, usually associated with regurgitation of gastric acid.

heat recovery (*eng.*)

A project for heat recovery from cooling water often has a short payback time.

heat tracing (*eng.*)

Water pipelines in industrial plants sometimes require heat tracing.

heat transfer (*eng.*)

Heat transfer could be improved by increasing the turbulence.

heat value, fuel value (*eng.*)

The heat value is often given in BTU (British Thermal Unit). 1 BTU is approx. 1.05 kJ or 2.9×10^{-4} kWh.

heating ventilation air conditioning (*eng.*)

Acronym: HVAC

The HVAC engineer overdesigned the cooling tower by 20%.

heavy metal (*eng.*)

The term "heavy metal» is misleading. Many different definitions have been proposed, e.g. based on density, atomic number, atomic weight or toxicity. Beryllium, the fourth lightest element, is much more poisonous than bismuth, the heaviest stable element.

hemp (*chem.*)

Hemp can be used to produce natural fibers.

HEPA (*eng.*)

Acronym/Abbreviation referral: see high effiency particulate air filter

hepatic (*pharm.*)

Tetrachloroethylene can lead to hepatic disorders.

heterogeneous (*chem.*)

In chemical kinetics, a heterogeneous reaction takes place at the interface of two phases, e.g. a solid and a gas or a liquid and a gas.

high efficiency particulate air filter (*eng.*)

The HEPA filter needed be be replaced, because it had become wet.

highly alloyed (*eng.*)

Highly alloyed steel contains between 4 and 50% of elements such as molybdenum, manganese, nickel, chromium, vanadium, silicon or boron.

highly toxic (*chem.*)

A chemical in any of the following categories is considered highly toxic:

* A chemical with a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats between 200 and 300 grams each.

* A chemical with a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.

* A chemical with a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each. Antimony compounds are highly toxic.

high voltage current (*eng.*)

High voltage can be defined as min. 1000 V for alternating current and at least 1500 V for direct current. High voltage current is used in electrical power transmission.

hinge (*eng.*)

Hinges can either be made of flexible material or of moving parts.

hinged (*eng.*)

The hinged lid was too heavy to lift.

hippuric acid (*chem.*)

High concentrations of hippuric acid (benzoylaminoacetic acid, $C_9H_9NO_3$) can indicate a toluene intoxication. Hippuric acid is an organic acid which is found in the urine of horses and other herbivores.

HMIS (*chem.*)

Acronym/Abbreviation referral: see hazardous materials identification system

hoist (*eng.*)

A hoist was deployed to transport the raw materials to the bag slitting station.

hoisting device (*eng.*)

The hoisting device could handle loads of up to 5 tons.

holding company (*econ.*)

Berkshire Hathaway is one of the largest publicly-traded holding companies.

hole punch (*general*)

A hole punch is an office tool used to make holes in a sheet of paper.

homeopathy (*pharm.*)

Homeopathic preparations are effective, they may make people feel better via the placebo effect. A central thesis of homeopathy is that a sick person can be treated by a substance (in serial dilution) which can produce similar symptoms to those of the sickness.

homogeneous (*chem.*)

Homogeneous catalysts work in the same phase as the reactants, an example being organometallic catalysts.

hood (*eng.*)

Noisy equipment can be placed under a hood.

hopper (*eng.*)

The main feed hopper of the extruder was blocked with agglomerates.

horse power (*eng.*)

Acronym: HP

An engine rated at 75 kW has got 100 HP.

hose (*eng.*)

Hoses lying on the floor can lead to serious accidents.

hose coupling, hose fixture (*eng.*)

The hose coupling was worn out.

HP (*eng.*)

Acronym/Abbreviation referral: see hydroprocessing

HSE (*chem. eng.*)

Acronym/Abbreviation referral: see health, safety, environment

hue (*eng.*)

A hue is an element of the color wheel.

husbandry (*general*)

Modern husbandry often relies heavily on fertilisers.

HVAC (*eng.*)

Acronym/Abbreviation referral: see heating ventilation air conditioning

hydrated lime (*chem.*)

Hydrated lime ($Ca(OH)_2$) is used in the manufacture of ebonite, which was one of the earliest plastics. Ebonite is a very hard rubber with a high sulphur content.

hydraulic diameter (*chem. eng.*)

The hydraulic diameter was determined to be 12 μm.

hydraulic fluid (*eng.*)

Brake fluid is a hydraulic fluid with high boiling point and low freezing point. It is hygroscopic in order to absorb moisture which would otherwise cause corrosion in the brake system.

hydraulic lock, (*eng.*)
hydrostatic lock

Acronym/Abbreviation referral: see hydrolock

hydrocarbon (*chem.*)

Butadiene (C_4H_6) is an unsaturated hydrocarbon.

hydrochloric acid (*chem.*)

Hydrochloric acid is the solution of hydrogen chloride (HCl) in water. HCl is a monoprotic acid.

hydroflouric acid (*chem.*)

Hydrofluoric acid, which can etch glass, is used as a precursor for Teflon™, which is a registered trademark of DuPont for products made from fluorine-containing polymers (fluoropolymers).

hydrogen (*chem.*)

Acronym: H_2

Hydrogen, the most abundant element in the universe, accounts for 75% of matter by mass and for over 90% by the number of atoms.

hydrogen chloride (*chem.*)

Acronym: HCl

Hydrogen chloride is a colorless gas, which can form white fumes of hydrochloric acid at contact with air humidity.

hydrogen peroxide (*chem.*)

Acronym: H_2O_2

Hydrogen peroxide can be used in the production of epoxides such as propylene oxide, which can be processed to polyurethane. Epoxides are ethers with only 3 ring atoms.

hydrolock, hydro lock (*eng.*)

Hydrolock (short for hydraulic lock or hydrostatic lock) is an unwanted condition of an internal combustion engine in which an incompressible liquid such as water has entered into the cylinders. The pistons' movement is prevented, and the engine will suffer significant damage.

hydrolysis (*chem.*)

Polymers which are susceptible to hydrolysis such as PET, polycarbonate and nylon need to be dried prior to processing.

hydronics (*eng.*)

In hydronics, water is used as medium for heat transfer for heating and cooling applications.

hydrophilic (*chem.*)

Soap molecules have a hydrophilic head and a hydrophobic tail.

hydrophobic (*chem.*)

Alkanes, oils and fats are hydrophobic molecules.

hydroprocessing (*chem.*)

Acronym: HP

During the hydroprocessing of heavy oils, asphaltenes act as coke precursors which leads to catalyst deactivation.

hypergolic (*chem.*)

A hypergolic propellant is either of the two rocket propellants used in a hypergolic rocket engine, which spontaneously ignite when they come into contact. The terms "hypergol" or "hypergolic propellant" denote the most common such propellant combination, hydrazine plus dinitrogen tetroxide.

hypoxia (*med.*)

Hypoxia is a medical condition in which the body as a whole or a part of it is deprived of oxygen.

I/A (*chem. eng.*)

Acronym/Abbreviation referral: see instrument air

ICA (*eng.*)

Acronym/Abbreviation referral: see instrumentation control automation

ICE (*eng.*)

Acronym/Abbreviation referral: see internal combustion engine

ideal batch reactor (*chem. eng*)

Acronym: IBR

The ideal batch reactor can be modelled more easily than an actual one.

ideal plug flow reactor (*chem. eng.*)

Acronym: IPFR

The ideal plug flow reactor is easy to model.

idle (*eng.*)

An idle running engine has a low fuel consumption.

IDLH (*chem.*)

Acronym/Abbreviation referral: see immediately dangerous to life and health

ignition (*chem.*)

The auto ignition temperature of hydrogen is 571°C.

immediately dangerous to life and health (*chem.*)

Acronym: IDLH

IDLH is the maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects.

immersion bath (*chem.*)

The workpieces were treat ed in an immersion bath prior to shipment.

immiscible (*chem.*)

Water and oil are immiscible.

impair, to (*pharm.*)

Chronic exposure to methanol can lead to impaired vision and damage to kidneys, heart and other organs.

impermeable, nonpermeable, impervious (*chem.*)

The landfill was sealed with an impermeable plastic foil.

impetus (*eng.*)

The impetus is a conserved quantity.

implant (*pharm.*)

A hip implant can consist of a titanium hip prosthesis with a ceramic head.

imprint (*pharm.*)

The imprint on the packaging was hard to read.

improper fraction (*pharm.*)

9/7 is an improper fraction.

impurity (*eng.*)

Raw material income control can detect impurities in received goods.

in excess (*chem.*)

If the solvent is a reaction partner, it is normally supplied in excess.

inadvertent use (*pharm.*)

Inadvertent use of household chemicals can be prevented by properly labelling them and avoiding to put them into bottles designed for food.

Inc. (*econ.*)

Acronym/Abbreviation referral: see incorporated

inch (*eng.*)

Acronym: in

inch rod (*eng.*)

Carpenters use inch rods.

incident (*eng.*)

Learning from previous indicents will eventually increase the safety of a plant.

incinerate, to (*eng.*)

Hazardous waste is generally incinerated.

inclination (*eng.*)

The inclination of the factory floor is not acceptable for installing the new equipment.

inclusion (*chem.*)

The pellets showed brown inclusions of degraded product.

incorporated (*econ.*)

Acronym: Inc.
He works for XYZ Ltd.

incoterms (**international commercial terms**) (*econ.*)

Incoterms can be: EXW, FCA, FAS, FOB, CFR, CIF, CPT, CIP, DAF, DES, DEQ, DDU and DDP. Terms outside of those should be avoided as these are then typically not clearly defined and may lead to disputes between buyer and seller. EXW = ex works, FCA = free carrier, FAS = free alongside ship, FOB = free on board, CFR = cost and freight, CIF = cost, insurance and freight, CPT = carriage paid to, CIP = carriage and insurance paid to, DAF = delivered at frontier, DES = delivered ex ship, DEQ = delivered ex quay, DDU = delivery, duty unpaid, DDP = delivery, duty paid.

incremental costs (*eng.*)

To fully load a plant, it might be advisable to sell overcapacity close to incremental costs.

indelible (*pharm.*)

He used an indelible marker to cross out the name on the packaging.

industrial accident (*general*)

Industrial accidents have to be reported.

industrial water (*chem. eng.*)

The plant cannot obtain more than 450 m^3/h of industrial water.

inert gas purging (*pharm.*)

The Grignard reaction, which is an important technique to form carbon-carbon, carbon-phosphorus and carbon-silicon bonds with alkyl- or aryl-magnesium halides, required inert gas purging.

inertia (*eng.*)

Inertia makes a moving body continue on his path.

infiltration (*eng.*)

Fast action by the fire brigade could prevent oil infiltration into the ground.

infinite (*sci.*)

There are seemingly infinite opportunities.

inflammable, flammable (*chem.*)

If inflammable substances such as acetone are transported on the road, a special sign has to be placed on the vehicle.

inflammation (*med.*)

An inflammation of the skin can be caused by burns, chemical irritants, infections by pathogens or foreign bodies/physical inury.

inflatable (*eng.*)

Rotary valves with an inflatable gasket require more maintenance than standard ones.

inflow (*chem. eng.*)

The inflow was sent through a metal separator.

ingest, to (*pharm.*)

If methanol is ingested, blindness can occur.

inhale, to (*pharm.*)

If inhaled, the chemical poses a serious choking hazard.

inhibitor (*chem.*)

Volatile amines added to steam are an example of corrosion inhibitors; For instance, they can be used in boilers used to drive turbines to protect the pipelines by increasing the pH.

inhomogeneous (*chem.*)

Inhomogeneous raw materials can lead to fluctuations in a downstream process.

initial value (*eng.*)

A recipe stores the initial value of the various feeds.

INN (*chem.*)

Acronym/Abbreviation referral: see International Nonproprietary Name

inoculate, to (*pharm.*)

The cow was inoculated against the disease.

inoculation (*pharm.*)

By inoculation, immunity against various infectious diseases can be obtained. The earliest record of inoculation dates back to India in the 8th century.

inorganic (*chem.*)

Inorganic carbon compounds are, for example, carbon monoxide (CO), carbon dioxide (CO_2), carbonates (CO_3^{2-}), cyanides (CN^-), cyanates (OCN^-), carbides, and thiocyanates (SCN^-, rhodanide). Urea was the first organic molecule that could be synthesized from inorganic precursors.

inquiry (*general*)

The inquiry about 300 tons of antioxidant was a huge opportunity.

insect infestation (*pharm.*)

By monitoring temperature and moisture of grain storage rooms, insect infestation can be controlled.

inside battery limits (*chem. eng*)

Acronym: ISBL

ISBL is typically the process unit itself, whereas OSBL consists of all connections to make ISBL work, such as utilties, feed streams and product streams.

insoluble (*pharm.*)

Barium sulfate ($BaSO_4$) is virtually insoluble in water (0.00115 g/l at 18°C).

inspect, to (*chem. eng.*)

Prior to inspecting the vessel, the engineer measured the atmosphere inside.

instrument air, plant air (*chem. eng.*)

Acronym: I/A

The instrument air was supplied at 10 bar (150 psi).

Instrumentation Control Automation (*eng.*)

Acronym: ICA

The ICA engineer received his training at Munich University of Technology.

insufflation (*med.*)

Insufflation of inert, nontoxic gases such as carbon dioxide into a body cavity is done to expand workroom during surgery.

insulate, to (*chem.*)

Thermal insulation can strongly decrease operating costs.

insulator (*chem.*)

Silicon dioxide is a very good electrical insulator.

intellectual property (*eng.*)

Acronym: IP

Patents offer intellectual property protection.

intellectual property rights (*eng.*)

Acronym: IP R

The company employs three IPR officers.

interact, to (*chem.*)

Light and matter can interact by absorption, emission and scattering.

interest (*econ.*)

Debts bear interest.

inteface (*chem.*)

The interface between the solid and the surrounding liquid was studied.

interim storage (*pharm.*)

There was no room for interim storage of the raw materials.

interlock (*chem. eng.*)

The accident happened because a safety interlock had been bypassed.

intermediate product, intermediate (*chem.*)

In the production of ethylene from sugar cane, ethanol is an intermediate product. Metabolites are intermediates and products of metabolism.

intermediate stage (*pharm.*)

Sodium pyrosulfate ($Na_2S_2O_7$) is produced in an intermediate stage in the preparation of sulfur trioxide (SO_3).

intermediate storage (*chem.*)

Also intermediate storage areas have to fulfill all safety requirements.

intermixing (*pharm.*)

The researcher investigated atom intermixing at metal/semiconductor interfaces at the nano-scale.

internal combustion engine (*eng.*)

Most internal combustion engines run on liquid or gaseous fuels.

internal rate of return (*econ.*)

Acronym: IRR

The IRR is the "yield" of a project. It can be used to rank competing projects by their profitability.

International Nonproprietary Name (*pharm.*)

Acronym: INN

The International Nonproprietary Name (INN, rINN (recommended International Nonproprietary Name), pINN (proposed International Nonproprietary Name)) of a pharmaceutical substance is the official non-proprietary or generic name, assigned by the WHO, e.g. "paracetamol".

International Protection, Ingress Protection (*eng.*)

Acronym/Abbreviation referral: see IP code

interpolate, to (*sci.*)

Data from interpolation are more reliable than those from extrapolation.

interprete, to (*sci.*)

The engineer interpreted the damage to the engine as a result of knocking.

intersect, to (*sci.*)

The engineer wondered why the 2 lines did not intersect.

intestine (*med.*)

Gastroenteritis is an inflammation of the intestines and is the most common disease of the intestines. Colitis is an inflammation of the large intestine.

intimate mixture (*chem.*)

A plastics compound is an intimate mixture of base resin, color and mineral fillers.

intrinsically safe (*eng.*)

An intrinsically safe electronic equipment can be deployed in explosive atmospheres.

invention (*sci.*)

Generally, a patent grants protection of an invention for up to 20 years.

inventory (*econ.*)

A huge inventory can block significant amounts of working capital.

investigation (*general*)
The incident led to an official investigation.

iodine (*chem.*)
Acronym: I
Iodine is the heaviest element known to be necessary for all living organisms.

IP (*econ.*)
Acronym/Abbreviation referral: see intellectual property

IP code (*chem. eng.*)
The IP Code consists of the letters IP followed by two digits and an optional letter. It classifies the degrees of protection offered by electrical enclosures. The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g. electrical conductors and moving parts) and the ingress of solid foreign objects. The second digit indicates the level of protection of the equipment inside the enclosure against ingress of water. The highest level of protection, IP 68, stands for complete dust-tightness and water-tightness.

IPR (*econ.*)
Acronym/Abbreviation referral: see intellectual property rights

iron (*chem.*)
Acronym: Fe
Hematite (Fe_2O_3) and magnetite (Fe_3O_4) are iron oxide minerals.

IRR (*econ.*)
Acronym/Abbreviation referral: see internal rate of return

irradiate, to (*pharm.*)
By irradiating certain plastics, cross -linking can be achieved.

irrigate, to (*eng.*)
Farmers regularly need to irrigat e dry fields.

irrigation (*eng.*)
By irrigation, the yield of a crop can be increased.

irritant to the skin (*chem.*)

Formaldehyde (methanal, HCHO) is irritant to the skin, the eyes, and the mucous membranes.

irritate, to (*chem.*)

The product irritates the skin upon contact.

irritating (*pharm.*)

Acetone ($(CH_3)_2CO$) shows an irritating effect on the skin due to defatting action. The vapors are irritating to the eyes, too.

IS (*eng.*)

Acronym/Abbreviation referral: see intrinsically safe

ISBL (*chem.eng.*)

Acronym/Abbreviation referral: see inside battery limits

isolate, to (*chem.*)

The contaminated room was isolated.

isolation (*chem.*)

To prevent contagious diseases from being spread from one patient to another, the victims were kept in isolation.

issue (*general*)

People issues had led to the low plant performance.

issue, to (*general*)

The final report was issued three weeks after the incident.

jack, screw jack (*eng.*)

A self -locking jack screw is intrinsically safer than other hydraulic actuators that require continuous pressure to rem ain in a locked position.

jar (*chem.*)

The contents of the jar had to be thrown away because the label was missing.

jaundice (*pharm.*)

Jaundice is a yellowish discoloration of tissue, whites of the eyes, and bodily fluids with bile pigment caused by liver problems.

jet pump, injector (*chem. eng.*)

The steam injector was insulated to prevent burns at the hot surface.

jigsaw (*eng.*)

She needs a new blade for her jigsaw.

job application (*eng.*)

A job application by email deserves the same attention to spelling mistakes as one sent by letter.

jobsite (*general*)

The wearing of PPE is mandatory at the jobsite.

join, to (*eng.*)

The man joined the two wires.

joiner (*general*)

The joiner was looking out for a successor.

jointless (*eng.*)

Jointless railway tracks are made of steel with a low coefficient of thermal expansion.

keg (*eng.*)

A Munich-based company develops and markets a keg for beer which can be cooled down without electricity.

key performance indicators (*econ.*)

Acronym: KPI

The KPI of the plant could be fulfilled easily.

kilopond (*eng.*)

Acronym/Abbreviation referral: see kp

knob (*eng.*)

Door knobs need to have good haptics.

knowledge (*general*)

Some knowledge expires, so it has to be constantly increased.

kp (*eng.*)

1 kilogram-force (kilopond, kp) is equal to 9.81 N, which is the SI unit of force. The unit kp is outdated.

KPI (*econ.*)

Acronym/Abbreviation referral: see key performance indicators

K_V flow factors (*eng.*)

The K_V flow factor, measured in m^3/h or l/min, is used to describe the flow through a valve at a pressure difference of 1 bar.

L/C (*econ.*)

Acronym/Abbreviation referral: see letter of credit

lab coat (*chem.*)

She exchanged her lab coat from cotton with one from a flame-retardant material.

label (*general*)

The label on the flask did not reveal the quantity of the substance therein.

label, to (labelled) (*general*)

label, to (labeled)(AE)

The flask with the brown liquid was not labelled.

laboratory (*chem.*)

The laboratory is equipped with two fume cupboards.

laboratory assistant (*chem.*)

Laboratory assistants have to make sure that they record all experimental data.

laboratory notebook (*chem.*)

After he had spilled a bottle of acetic acid over his laboratory notebook, the entries were barely readable.

laboratory technician (*chem.*)

During the last years, the laboratory technician has gained vast experience.

labour (*general*)

labor (AE)

Technology has made redundant a lot of hard labour.

lacrimal fluid (*pharm.*)

There are basal tears, reflex tears and emotional tears. The lacrimal fluid of emotional tears contains more protein-based hormones such as prolactin and leucine enkephalin (a natural painkiller) than basal or reflex tears.

lacrimator, lacrymator, lachrymator, lachrymatory agent (*chem.*)

Bromoacetone (CH_3COCH_2Br) is a lachrymatory agent.

lactic acid (*chem.*)

Lactic acid (2-hydroxypropanoic acid) is chiral and has two optical isomers. The L-(+)-lactic acid is biologically important.

lactose (*chem.*)

Lactose (milk sugar) makes up 2–8% of milk (by weight).

laminated core (*eng.*)

In a rapidly changing field, e.g. a transformer, iron cannot be used in bulk form, because its good conductivity leads to intense eddy currents, resulting in huge losses (this is used advantageously in induction heating, though). Two techniques are commonly used together to increase the resistivity of iron for use in transformers: lamination (yielding a laminated core) and alloying of the iron with silicon.

laminated foil (*eng.*)

The laminated foil consists to 60% of cardboard.

laminated tablet (*pharm.*)

The laminated tablet has a coating made out of polystyrene.

landfill (*eng.*)

Landfill gas can be used to produce electricity.

large scale production (*chem. eng.*)

Down time in large scale production plants is rigorously minimized.

large-scale synthesis, industrial synthesis (*chem.eng*)

Industrial synthesis of ammonia exceeds 100 million tonnes/year.

last in, first out (*econ.*)

The consultant proposed not to run the warehouse for perishable goods according to the LIFO principle.

lasting (*eng.*)

Glue offers a lasting connection.

latency period, incubation period (*med.*)

The incubation period, i.e. the time that elapses between exposure and the first manifestations of a disease, is often longer in adults than in children.

lattice (*chem.*)

The monoclinic crystal system is one of the 7 lattice point groups.

laxative, purgative (*pharm.*)

Laxatives are typically prescribed to relieve constipation.

layer (*eng.*)

The oil formed an even layer on the water.

Layer of Protection Analysis (*chem. eng.*)

Acronym: LOPA

LOPA is a tool for hazard evaluation and risk assessment.

layout (*eng.*)

The layout of the utility building was still unclear.

layout diagram (*chem. eng.*)

The layout diagram of the warehouse did not show the firefighting equipment.

layout plan (*eng.*)

The plant layout plan was well organized.

LC50 (*chem.*)

The LC50 (lethal concentration 50, median lethal concentration) is the concentration of a substance in air that, via the respiratory route, is expected to kill 50% of a population of test animals when administered as a single exposure in a specific time period, usually 1 hour.

LCLO (*chem.*)

LCLO (lethal concentration low) is the lowest concentration of a substance in air reported to have caused death in humans or animals. The reported concentrations may be entered for periods of exposure that are less than 24 h (acute) or greater than 24 h (subacute and chronic).

LD50 (*chem.*)

The LD50 or median lethal dose is a dose which will kill 50% of an exposed population.

LDLO (*chem.*)

LDLO (lethal dose low) is the lowest dose of a substance introduced by any route, other than inhalation, reported to have caused death in humans or animals.

leaching (*chem.*)

Leaching is commonly used in metallurgy to convert metals into soluble salts, as illustrated for zinc oxide here: $ZnO + H_2SO_4 \rightarrow ZnSO_4 + H_2O$.

lead (*chem.*)

Acronym: Pb

Lead glass is composed of 10-30% lead oxide.

lead time (*econ.*)

The lead time for a new product is 8 months.

leak, to (*chem. eng.*)

A leaking valve poses a safety risk.

lean (*chem.*)

Fuel-lean combustion produces low NO_x emissions, however, unburnt hydrocarbons and CO can increase.

ledger (*econ.*)

The whole department frantically looked f or the missing ledger.

legal enforcement (*jur.*)

He wanted legal enforcement of the contract.

legend drugs (AE) (*pharm.*)

Acronym/Abbreviation referral: see POM

legible (*pharm.*)

The handwriting was barely legible.

LEL (*chem.*)

Acronym/Abbreviation referral: see lower explosive limit

lesion (*med.*)

A lesion is an abnormal change, injury, or damage to tissue or to an organ.

lethal concentration low (*chem.*)

Acronym: LCLO

letter of credit (*econ.*)

Acronym: L/C

A duly confirmed and irrevocable L/C guarantees full payment.

lever (*eng.*)

He lifted the machine using a steel bar as lever.

lever rule (*eng.*)

The lever rule can be understood intuitively.

levorotary (*chem.*)

If a chiral molecule is dextrorotary, its enantiomer will be levorotary, and vice-versa.

liabilities (*econ.*)

Assets and liabilities of a company can be found in the balance sheet.

licence to operate (*chem. eng.*)

license to operate (AE)

Acronym: LTO

The licence to operate was coupled to a few requirements by authorities.

lid (*eng.*)

The space between vessel and lid showed significant contamination.

life science (*chem.*)

Life sciences offer interesting career opportunities.

LIFO (*econ.*)

Acronym/Abbreviation referral: see last in, first out

light alloy (*eng.*)

He bought light alloy rims.

light bulb (*eng.*)

Conventional light bulbs only convert 1% of the electrical energy into light.

light metal (*eng.*)

Lithium, beryllium, sodium, magnesium and aluminum are light metals.

lighting (*eng.*)

The skylight provided sufficient lighting for the production hall.

lightning rod (*eng.*)

The lightning rod of the house protrudes 1 m into the air.

lignite (*eng.*)

Lignite, which contains approx. 60% carbon, has got an ash content between 6% to 19% compared to bituminous coal, where it is only 6% to 12%.

lime (*chem.*)

Acronym: CaO

When working with lime, protective goggles should be worn.

lime, calcium carbonate (*chem.*)

Acronym: $CaCO_3$

Marble is made of calcite, a crystalline modification of $CaCO_3$. $CaCO_3$ is also the main component of shells of marine organisms and eggshells.

limited (*econ.*)

He works for Company ABC Ltd.

line voltage (*eng.*)

The line voltage in China is 220V.

linear programming (*eng.*)

Linear programming for chemical engineering problems, e.g. yield increase of a plant, can be facilitated by several software packages.

lining (*chem.*)

The lining was damaged by the corrosive medium.

lining disk (*eng.*)

The apprentice bought a set of lining disks.

lin-log graph (*sci.*)

A lin-log graph uses a logarithmic scale on the x axis, and a linear scale on the y axis.

linseed oil (*chem.*)

Linseed oil is used by some painters.

liquefaction (*chem. eng.*)

The Bergius process is a method to produce liquid hydrocarbons by the hydrogenation of lignite (brown coal) at elevated temperature and pressure. The coal liquefaction can be described as $nC + (n+1)\ H_2 \rightarrow C_nH_{2n+2}$.

liquefied propane gas (*chem. eng.*)

Acronym: LPG

The energy density of LNG is approx. 60% of that of diesel fuel.

liquefy, to (*chem. eng.*)

LNG (liquefied natural gas) can be transported on special ships.

liquid (*chem.*)

By supercooling, a liquid can be chilled below its freezing point without becoming solid. For water, supercooling down to -42°C is feasible.

liquidate, to (*econ.*)
Liquidated damages were 2 MEUR.

liquor (*chem.*)
Black liquor is a byproduct of the Kraft process, where pulp is produced from wood.

litigation (*jur.*)
The costs of litigation pose a great threat, since they typcially have to be borne by the losing party.

litmus (*chem.*)
Litmus paper is one of the oldest pH indicators changing from blue (acidic) to red (alkaline) between a pH of 4.5–8.3.

live vaccine (*pharm.*)
A live vaccine is prepared from living attenuated organisms or viruses.

load (*eng.*)
The shear load was too high for the material.

lock nut (*eng.*)
The engineer tightened the lock nut.

lock washer (*eng.*)
Due to its special design, the piece outperforms sim ilar lock washers.

locknut (*eng.*)
In applications were a standard nut would loosen over time due to vibration, a so-called locknut can be tightened against it to permanently fix its position.

lockout/tagout (*chem. eng.*)
A good lockout/tagout system is important to guarantee safe maintenanc e conditions in chemical plants (lock out = protection with a padlock, tag out = protection with a notice).

log-lin graph (*sci.*)
A log-lin graph uses a linear scale on the x axis, and a logarithmic scale onthe y axis.

log-log graph,
log-log plot (*sci.*)

y = a*x^b will appear as a straight line on a log-log graph, in which b will be the slope of the line and log(a) will be the y value corresponding to x=1. These graphs are useful when the parameters a and b need to be estimated from numerical data.

long-pass filter (*eng.*)

A long-pass filter transmits wavelengths longer than a specific wavelength.

loose, bulk, not fixed (*general*)

The string was hanging loosely from the ceiling.

LOPA (*chem. eng.*)

Acronym/Abbrevation referral: see Layer of Protection Analysis

lose, to (lost, lost) (*general*)

After exposure to propanol vapours, the operator lost his consciousness.

loss of containment (*chem. eng.*)

Loss of containment was the root cause for the fire in the refinery.

lot (*chem. eng.*)

The last three lots worked well at customer B.

lot, batch (*chem.*)

Steel cooking is typically carried out as a discontinuous batch process.

louvre (*eng.*)

Louvres were installed on 2 sides of the building.

low current, weak current (*eng.*)

Low current LEDs work at 1–2 mA.

low voltage (*eng.*)

The IEC (International Electrotechnical Commission) defines low voltage as any voltage between 50–1000 V AC or 120–1500 V DC.

lower explosion limit (*chem.*)

Acronym/Abbrevation referral: see lower explosive limit

lower explosive limit (*chem.*)

Acronym: LEL

The LEL of 1,3 butadiene is ~2%.

lozenge (*pharm.*)

Cough tablets have taken the name lozenge, based on their original shape.

LPG (*chem. eng.*)

Acronym/Abbreviation referral: see liquefied propane gas

Ltd. (*econ.*)

Acronym/Abbreviation referral: see limited

LTO (*chem. eng.*)

Acronym/Abbreviation referral: see licence to operate

lube (*pharm.*)

Lubes are often silicone-based.

lubricant (*eng.*)

Molybdenum disulfide (MoS_2) is a solid lubricant suitable for elevated temperatures.

lubricate, to (*eng.*)

Machines need to be lubricated according to the manufacturers' recommendations.

lug (*eng.*)

3 lugs were used to lift the reactor.

lukewarm (*general*)

The water was lukewarm.

lumber (*eng.*)

She found a cheap source for lumber.

lump (*eng.*)

Moisture has led to the formation of lumps in the product.

lye scrubber (*chem. eng.*)

A lye scrubber is used to wash out acid gases.

lyophilised (*pharm.*)

lyophilized (AE)

The lyophilised blood sample was retrieved from the storage room.

magic potion (*pharm.*)

A potion is usually prepared by a magician or witch and has magical properties.

magnetic stirring bar (*pharm.*)

The magnetic stirring bar was coated with polybutadiene rubber.

magnifying glass (*eng.*)

In order to read the comments on the P&ID, he had to use a magnifying glass.

main group (*chem.*)

Main group elements are the most abundant elements both on earth and in the universe.

main header (cooling water) (*eng.*)

The main header could handle a flow of 500 m^3/h.

maintenance (*chem. eng.*)

A rule of thumb is that yearly maintenance costs are approx. 2% of the investment value of an equipment.

major constituent (*chem.*)

Nitrogen is the major constituent of air.

malaise (*pharm.*)

Malaise is a feeling of general discomfort, distress, or uneasiness.

malfunction (*eng.*)

Malfunction of a single valve has led to a complete plant shutdown.

malignant (*med.*)

The term malignant tumor is synonymous with cancer.

malleable (*eng.*)

In material science, ductility specifically refers to a material's ability to deform under tensile stress (e.g. stretching into a wire). Malleability, a similar concept, refers to a material's ability to deform under compressive stress (e.g. forming a thin sheet by hammering or rolling). Ductility and malleability do not always correlate with each other; for instance, gold is both ductile and malleable, but lead is only malleable. The most malleable metals are, in descending order: gold, silver, lead, copper, aluminium, tin, platinum, zinc, iron, and nickel.

mammal (*pharm.*)

There are approximately 5,400 species of mammals, all of which (expect the egg-laying monotremes) give birth to live young. Mammals are vertebrates.

management ratio (*econ.*)

ROE (return on equity) and ROA (return on assets) are two commonly used management ratios. The former is calculated as net profit/equity, the latter as net income /total assets.

manganese (*chem.*)

Acronym: Mn

The salt potassium permanganate ($KMnO_4$), where manganese is found in the +7 oxidation state, is a strong oxidizer that produces MnO_2, which is also known as pyrolusite.

manganese module (*chem. eng.*)

Manganese nodules are made of concentric layers of iron and manganese hydroxides. The growth process is one of the slowest of all geological phenomena with a rate of 1 centimeter over several million years.

manhole (*chem. eng.*)

The vessel was inspected via the manhole.

manifold (*eng.*)

A manifold is a distribution piece of pipes or channels in systems that handle fluids.

manual (*chem.*)
It is advisable to read the manual before use of the instrument.

MAOP (*eng.*)
Acronym/Abbreviation referral: see maximum allowable operating pressure

marble (*chem.*)
Finely ground marble is used in toothpaste.

marginal costs (*econ.*)
The larger a plant is, the lower the marginal costs are.

markup (*econ.*)
Items that went via the consultant's books were subjected to a 5% markup.

masonry (*eng.*)
The masonry was made from concrete.

mass (*chem.*)
The mass of the earth and the sun is $6*10^{24}$ kg and $2*10^{30}$ kg, respectively.

mass balance (*chem. eng.*)
The mass balance results from the conservation of mass.

mass flow (*chem. eng.*)
The angle in the cone of the silo did not permit mass flow.

mass flow,
mass flow rate (*chem. eng.*)
The mass flow through the PFR (plug flow reactor) was 50 kg/h.

master formula (*pharm.*)
He did not disclose the master formula of the ointment.

masticator (*eng.*)
Masticators are extensively used in the rubber industry.

material (*chem.*)
Plywood is a common composite material.

material safety data sheet (*chem. eng.*)

Acronym: MSDS, SDS

Operators need to have access to MSDS in their native language.

material science, materials science (*chem.*)

Tribology, the study of wear due to friction, is part of material science.

matter (*chem.*)

Granite, an igneous rock, is an example of inhomogeneous matter.

maximum allowable concentration (*chem.*)

Acronym: MAC

Acronym/Abbreviation referral. see threshold limit value

Granite, an igneous rock, is an example of inhomogeneous matter.

maximum allowable operating pressure (*eng.*)

Acronym: MAOP

The vessel ruptured 0.5 MPa above its MAOP.

MBTU (*eng.*)

Though an unofficial unit, the MBTU is still used in many countries, for instance for air conditioning units.

MC room (*eng.*)

Acronym/Abbreviation referral: see motor control room

MCC (*eng.*)

Acronym/Abbreviation referral: see motor control cabinet

mean free path (*chem.*)

The mean free path of a gas molecule decreases with increasing pressure.

mean lethal dose (*chem.*)

Acronym/Abbreviation referral: see LD50

measure, to (*eng.*)

The flow was measured at three locations in the process.

measurement (*eng.*)

In-situ measurements are more timely, accurate and reliable than offline analyser results.

measurement and control, instrumentation and control (*chem. eng.*)

The instrumentation and control engineer attended a training.

measuring station (*chem. eng.*)

The measuring station was situated in the middle of the production hall.

mechanical advantage (*eng.*)

A block and tackle is commonly used on boats, where motorized aids are often not available, and where the mechanical advantage can be used to lift heavy loads.

mechanical engineering (*eng.*)

Germany is strong in exporting mechanical engineering know-how.

medicated (*pharm.*)

An ointment may be medicated or not.

medication (*pharm.*)

There was no medication to treat his rash.

medicinal product (*pharm.*)

Medicinal products are used to treat or prevent diseases in human beings.

melamine (*chem.*)

Melamine, a trimer of cyanamide, together with formaldehyde yields melamine resin, a very durable thermosetting plastic. Cyanamide can be obtained by hydrolysis of calcium cyanamide in the presence of carbon dioxide by the Frank -Caro process according to: $CaCN_2 + H_2O + CO_2$? $NH_2\text{-}CN + CaCO_3$.

melting point (*chem.*)

The melting point of polypropylene is approx. 160°C.

Memorandum of understanding (*econ.*)

Acronym: MoU

The two parties signed a brief MoU.

mesh (*eng.*)

The mesh was made from polypropylene.

metabolic path (*pharm.*)

Toluene (C_7H_8) is less toxic than benzene (C_6H_6), because its methyl group is more readily oxidized than the aromatic ring. This metabolic path leads to less toxic metabolites.

metabolite (*pharm.*)

Urea (aminomethylamide, carbamide, $(NH_2)_2CO$) is an end product (metabolite) of protein degradation in mammals.

metallic (*chem.*)

Metallic bonding is based on delocalized electrons.

metallic compound (*chem.*)

Steel is a metallic compound that contains between 0.02% and 1.7% (by mass) carbon.

metalloid (*chem.*)

Metalloids (B, Si, Ge, As, Sb, Te, Po) often behave as semiconductors (B, Si, Ge) or semimetals (Sb). Also, they tend to form amphoteric oxides (these can react as either acid or base).

meter, to (*pharm.*)

The active ingredient was metered with an accurate instrument.

methane (*chem.*)

Acronym: CH_4

The bond angles in methane are 109.5 degrees.

metrology (*eng.*)

The market for industrial metrology in Asia is expanding heavily.

mica (*chem.*)

Mica is a sheet silicate (phyllosilicate) mineral.

microbial count (*pharm.*)

The airborne microbial count in the cleanroom was determined twice per day.

microbiological strain (*pharm.*)

The researcher isolated a new microbiological strain.

microprobe (*chem.*)

The team has developed a microprobe for the speciation of Fe with a lateral resolution of only 2 µm.

mildew (*pharm.*)

Mildew refers to certain kinds of mold or fungus.

mildewed (*pharm.*)

The mildewed roses had to be discarded.

mileage, milage (*eng.*)

The mildewed roses had to be discarded.

miles per gallon (AE) (*eng.*)

Acronym: mpg

A fuel consumption of 7.83 l/100 km corresponds to 30 mpg.

miner (*eng.*)

Several hundred miners lost their jobs.

mineral coal (*eng.*)

Mineral coal accounts for approx. 10% of the primary energy production in Brazil.

mineral wool (*eng.*)

Mineral wool, which is prod uced from molten rock, can be used for thermal insulation and filtration purposes.

minor constituent (*chem.*)

Depending on regulations, minor constituents need not be mentioned on the packaging.

minute of arc (*eng.*)

1 minute of arc (MOA), which is 1/60 of 1 degree, corresponds to 2.91 cm in a distance of 100 m.

minutes (of meeting) (*eng.*)

Acronym: MoM

The minutes were distributed one week after the meeting.

miscellaneous (*general*)

At the end of the meeting, miscellaneous items were discussed.

miscibility (*chem.*)

Octanol (C_8H_{18}) shows no miscibility with water. It is commonly used as a standard for partition equilibria.

miscible (*chem.*)

Water and ethanol are fully miscible, whereas copper and cobalt are not miscible.

misfire (*eng.*)

Misfire leads to emissions of unburnt hydrocarbons.

misidentification (*pharm.*)

A misidentification of the samples led to a wrong treatment.

mist (*chem.*)

The mist disappeared in the afternoon.

mixed fraction (*sci.*)

3 1/3 is a mixed fraction.

mixer (*chem. eng.*)

A plow mixer is more complicated to clean than a container mixer because the mixing tool cannot be removed.

mixture (*chem.*)

A mixture of salt and iron particles can be separated easily.

MMBTU, mmBTU (*eng.*)

For natural gas, 1 mmBTU is defined as ~1.05 GJ (28.26m^3 of natural gas at the defined temperature and pressure).

moisten, to (*chem.*)

She moistened her finger before leafing over the book page.

moisture (*chem.*)

The customer filed a complaint because of moisture in the product.

molar mass (*chem.*)

The molar mass of NaCl is 58.443 g/mol. 1 mol is 6.02214×10^{23} entities of a given substance (Avogadro's number).

mole (*chem.*)

The mole (symbol: mol) is the SI base unit for the amount of substance. 1 mole is the amount of substance which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon 12, the most abundant of the two stable isotopes of the element carbon, accounting for 98.89% of carbon. Avogadro's constant in SI units is 6.022×10^{23} mol^{-1}.

monitor, to (*pharm.*)

The study was closely monitored.

monocrystal (*chem.*)

Wafers are produced from silicon monocrystals.

monograph (*sci.*)

She wrote a monograph about combustion diagnostics.

monovalent (*chem.*)

Cl^- is a monovalent ion.

mordant (*chem.*)

Mordants are used for dyeing fabrics. They include several salts of aluminium, chromium, copper, iron and tin.

mortar (*eng.*)

The bricklayer ran out of mortar.

mortar (*pharm.*)

Mortars and pestles were traditionally used in pharmacies to crush various ingredients prior to preparing an extemporaneous prescription.

mother liquor (*chem.*)

The crystal was taken out of the mother liquor.

mother lye (*chem.*)

The mother lye was discarded.

motor control cabinet (*eng.*)

Acronym: MCC

Acronym/Abbrevation referral: see motor control room

motor control room (*eng.*)

Acronym: MC room

The MC room was placed next to the transformer room.

mottled (*pharm.*)

The pill is mottled.

MoU, MOU (*econ.*)

Acronym/Abbreviation referral: see memorandum of understanding

mould (*chem.*)

mold (AE)

In contrast to yeast, which has single fungi cells, moulds are fungi that grow in multicellular filaments (hyphae).

mould (*eng.*)

mold (AE)

The mould was designed for a lifetime of 2 years or 1,000,000 injection-moulded parts.

moulded (*eng.*)

Injection moulded parts can be mass manufactured.

mouldy (*pharm.*)

moldy (AE)

Mouldy buildings pose a serious health risk.

mount, to (*eng.*)

Mounting of the building took 2 weeks.

mouthwash (*pharm.*)

Active ingredients in mouthwash can include thymol, menthol, methylparaben, hydrogen peroxide and fluoride.

mpg (AE) (*eng.*)

Acronym/Abbreviation referral: see miles per gallon

MSDS (*chem.*)

Acronym/Abbreviation referral: see material safety data sheet

mucilage (*chem.*)

Some carnivorous plants use mucilage to catch insects.

mucous (*pharm.*)

The precipitated substance had a muscous appearance.

mucous membrane (*pharm.*)

HCl can cause severe irritations to the mucous membranes.

mucus (*pharm.*)

Mucus is a slippery secretion produced by and covering mucous membranes in vertebrates. Also some invertebrates like snails produce it.

mud guard (*eng.*)

Mud guards increase air resistance and fuel consumption of a car.

multi stage (*chem. eng.*)

Multi stage combustion can reduce pollutant emission.

n/a (general)

Acronym/Abbreviation referral: see not applicable

nail (*eng.*)

Joiners are skilled at using nails.

name plate (*chem.eng.*)

The name plate capacity of the pump was 3,500 l/h.

naphtha (*chem. eng.*)

In a refinery, oil and gas are separated into different products (fractions) by destillation. Naphtha is the light fraction from oil. It can be further processed in a cracker.

narcotic drug (*pharm.*)

Effects of narcotic drugs, apart from addiction, include sleeplessness, inability to concentrate, apathy and vomiting.

narcotic substance, narcotic, anaesthetic (*pharm.*)

anesthetic (AE)

Anaesthetic agents in widespread current use are isoflurane (C_3H2ClF_5O, a halogenated ether), desflurane ($C_3H_2F_6O$, a highly fluorinated methyl ethyl ether) and sevoflurane (C_4H3F_7O, a highly fluorinated methyl isopropyl ether).

National Fire Protection Association (*eng.*)

Acronym: NFPA

There are over 300 NFPA codes and standards.

National Institute for Occupational Safety and Health (*chem. eng.*)

Acronym: NIOSH

NIOSH is an institution in the US.

native (*chem.*)

Metals from the gold group and the platinum group can be found native in nature. The gold group is made up of gold, copper, lead, mercury, and silver. The platinum group is made up of platinum, iridium, osmium, palladium, rhodium, and ruthenium.

natural gas (*chem.*)

Methane is the main constituent of natural gas.

natural rubber (*chem.*)

Natural rubber is produced from the sap of the rubber tree. It is a milky colloidal suspension (latex) of natural, elastic polymers.

nausea (*pharm.*)

Food poisoning can lead to nausea.

nebulise, to (*pharm.*)

nebulize, to (AE)

The peroxide was nebulized by a nozzle with an orifice of 0.2 mm diameter.

nebuliser (*chem.*)

nebulizer (AE)

Piezoelectric nebulizers are used in electronic cigarettes.

necking (*eng.*)

Necking is a localised reduction in cross-section that can occur in a material under tensile stress as the start of failure.

needle valve (*chem. eng.*)

A needle valve is a type of valve with a small orifice and a threaded, needle – like plunger. It allows precise regulation of flow. It is only used for small flow rates.

negotiate, to (*econ.*)

In business, one does not get what he deserves, but rather what he negotiates.

net (*econ.*)

Her net income has increased by 7% over the last three years.

net present value (*econ.*)

Acronym: NPV

The NPV is the economic value of a project calculated by summing up its costs and revenues over its full life. Future costs and revenues need to be discounted by the relevant interest rate (e.g. the cost of capital).

neutral conductor (*eng.*)

The neutral conductor has the color green/yellow.

NFPA (*eng.*)

Acronym/Abbreviation referral: see National Fi re Protection Association

niche (*pharm.*)

The company is specialized on the synthesis of nice chemicals.

NIOSH (*chem. eng.*)

Acronym/Abbreviation referral: National Institute for Occupational Safety and Health

nitric acid (*chem.*)

White fuming nitric acid, also called 100% nitric acid, and red fuming nitric acid, which contains substantial quantities of dissolved nitrogen dioxide (NO_2) are strong acids.

nitrile rubber (*chem.*)

Nitrile rubber is a copolymer of acrylonitrile (CH_2CHCN) and butadiene (C_4H_6). Nitrile rubber has considerable resistance to oils and abrasion.

nitrogen (*chem.*)

Acronym: N_2

The triple bond in N_2 is extremely strong. Therfore, NO_x from N_2 and O_2 is only formed at elevated temperatures (thermal NO_x).

No Observed Adverse Effect Level (*chem.*)

Acronym: NOAEL

NOAEL is the highest dose known to show no adverse effects.

No Observed Effect Level (*chem.*)

Acronym: NOE L

NOEL is the highest dose known to show no effect.

NOAEL (*chem.*)

Acronym/Abbreviation referral: see No Observed Adverse Effect Level

noble gas (*chem.*)

XeF_4 was one of the first discovered noble gas compounds.

noble metal (*chem.*)

Because of their resistance to corrosion and oxidation, copper and silver are counted to the group of noble metals.

NOEL (*chem.*)

Acronym/Abbreviation referral: see No Observed Effect Level

noise (*eng.*)

The signal-to-noise ratio (SNR or S/N) in the spectrum was not good enough to determine the concentration.

non abrasive (*eng.*)

When processing glas fibres, non abrasive materials have to be used for all machine parts that are in contact with the product.

non return valve, check valve (*chem. eng.*)

A check valve only permits fluid flow in one direction.

non-disclosure agreement (*econ.*)

When entering a cooperation with another company, it is wise to sign a non-disclosure agreement upfront.

nonflammable (*chem.*)

Water and carbon tetrachloride are nonflammable liquids.

non-intrusive (*chem. eng.*)

Laser spectroscopy works non-intrusively. Therefore, the probed system is hardly influenced.

non-positive, force-fit, friction-locked (*eng.*)

The metal piece was friction-locked.

non-steroidal anti-inflammatory drug (*pharm.*)

Acronym: NSAID

Acetylsalicylic acid ($C_9H_8O_4$, Aspirin) belongs to the class of NSAIDs.

nonvoven fabric (*eng.*)

In a nonwoven fabric, the single fibres have no defined order and are not connected through weaving, but by local attachment.

nootropics (*pharm.*)

Ginko is a herbal, nootropic substance.

noria (*eng.*)

One of the largest norias in the world, which has a diameter of 20 m, is located in Hama in Syria.

not applicable (*general*)

Acronym: n/a

Vapour pressure of NaCl: n/a

notch (*eng.*)

The worker made a notch in the wood using an axe.

notch, to (*eng.*)

The Charpy test uses a notched specimen in order to improve the reproducability of the results.

notification (*general*)

A notification about potential delays in the project was not issued to the steering committee in time.

novation (*econ.*)

The novation agreement was exercised.

noxious (*chem.*)

Phosphine is a noxious gas.

nozzle (*chem. eng.*)
It is recommended to use a filter upstream of the nozzle to prevent clogging.

nozzle head (*chem.eng.*)
The spray from the nozzle head did not reach all corners of the vessel.

NPV (*econ.*)
Acronym/Abbreviation referral: see net present value

NSAIDs, NAIDs (*pharm.*)
Acronym/Abbreviation referral: see non-steroidal anti-inflammatory drug

nuisance particles (*chem.en g.*)
Nuisance particles are dusts that do not produce significant toxic effects.

nuisance particulates (*chem. eng.*)
Acronym/Abbreviation referral: see nuisance particles

nut (*eng.*)
A nut is a fastener with internal screw thread. Nuts can be left-threaded or right-threaded.

nutraceutical water (*pharm.*)
Nutraceutical water is a new lifestyle product.

nutrient (*chem.*)
Organic nutrients include carbohydrates, fats, proteins (or their building blocks, amino acids), and vitamins.

nuts and bolts (*general*)
The book claims to present the nuts and bolts of engineering.

oak (*eng.*)
Oak wood, which has a density of about 750 kg/m^3, shows good resistance to insects and fungi due to its high concent in tannins. Tannins are polyphenols.

oar (*eng.*)
The oar created an eddy in the water.

obtuse angle (*eng.*)

Angles between 90° and 180° are called obtuse angles. Angles of 180° are called straight angles.

occlusion (*eng.*)

Natural occlusions are responsible for the pattern in marble.

occultation (*general*)

The smoke resulted in an occultation of the sunlight.

occupational exposure limit (*chem.*)

Acronym: OEL

Acronym/Abbreviation referral: see Permissible Exposure Limit

Occupational Health and Safety Assessment Systems (*chem. eng.*)

Acronym: OHSAS

The company is certified according to OHSAS 18001.

Occupational Health, Safety and Environment (*general*)

Acronym/Abbreviation referral: see HSE

Occupational Health & Safety Administration (*eng.*)

Acronym: OSHA

OSHA is a branch of the Department of Labor (DOL). It regulates the use of personal protective equipment in the workplace. Since the creation of OSHA in 1971 with a mission to prevent work-related injuries, illnesses and deaths, occupational deaths have been cut by 62% and injuries have declined by 42% in the US.

odd (*eng.*)

1, 3 and 5 are odd numbers.

odour (*chem.*)

odor (AE)

The foul odor of rotten eggs stems from H_2S.

OEL (*chem.*)

Acronym/Abbreviation referral: see occupational exposure limit

offensive smell (*chem.*)

H_2S is characterized by an offensive smell.

offer (*econ.*)

The offer was sold out quickly.

OHSE (*general*)

Acronym/Abbreviation referral: see Occupational Health, Safety and Environment

oil (*chem.*)

Oil is not miscible with water.

ointment (*pharm.*)

The nurse put an ointment onto the wound.

ointment base (*pharm.*)

Petrolatum (which can be hardened with wax) is the most widely used greasy ointment base.

oleaginous (*chem.*)

Petrolatum is suitable for the incorporation of oleaginous materials.

olefin (*chem.*)

Olefins are mono-unsaturated hydrocarbons like ethylene and propylene, which are monomers for polyolefins.

oleochemicals (*chem. eng.*)

Oleochemicals are chemicals derived from biological oils or fats. They are analogous to petrochemicals which are chemicals derived from petroleum. Hydrolysis and alcoholysis of oils or fats form the basis of the oleochemical industry.

olfactory (*chem.*)

Some vertrebrates have a well developed olfactory sense.

OP (*econ.*)

Acronym/Abbreviation referral: see operating profit

operating pressure (*eng.*)

The operating pressure of the pump was 2.5 barg.

operating profit (*econ.*)

Acronym: OP

The operating profit of the energy -intense products was adjusted by the controller.

operating temperature (*eng.*)

The lifetime of electronic components is often inversely proportional to their operating temperature.

operations (*chem. eng.*)

He enjoyed working in operations.

operations research (*econ.*)

The student acquainted himself with operations research.

operator (*chem. eng.*)
The operator had 10 years of experience in the process industry.

opportunity (*general*)
Multinational corporations offer plenty of opportunities for graduates.

ore (*chem.*)
He is in the ore trading business.

orifice (*eng.*)
Lasers can be used to produce an orifice < 1 μm.

OSBL (*chem. eng.*)
Acronym/Abbreviation referral: see outside battery limits

OSHA (*eng.*)
Acronym/Abbreviation referral: see Occupational Safety and Health Administration

osmosis (*chem.*)
Reverse osmosis is a process to produce freshwater in dry areas.

OTC (*pharm.*)
Acronym/Abbreviation referral: see over the counter

ounce (*general*)
Acronym: oz
1 ounce (oz) is 1/16 of 1 pound (lb) or ~28.35 g

outflow (*chem. eng.*)
The outflow from the reactor has a temperature of 80°C.

outlier (*sci.*)
The outliner was detected using the student t test.

outpatient, out-patient (*pharm.*)
The nurse provided outpatient care.

outside battery limits (*chem. eng.*)

Acronym: OSBL

As OSBL often does not get the same attention as ISBL, there can be a big potential for cost savings.

over the counter (*pharm.*)

Acronym: OTC

Medications can be grouped into the following categories: over-the-counter (OTC) medications, which are available in pharmacies and supermarkets without special restrictions, behind-the-counter (BTC), which are dispensed by a pharmacist without needing a doctor's prescription, and prescription only medicines (POM).

overall (*eng.*)

The overall project costs are often underestimated.

overexposure (*chem.*)

After overexposure, the MSDS recommends prompt medical attention.

overhaul (*eng.*)

Machines need to be overhauled regularly to ensure uninterruped operation.

overpressure (*chem.eng.*)

The safety valve opens at an overpressure of 2.5 bar.

over-the-counter drug (*pharm.*)

Acronym: OTC

OTC drugs are generally used to treat conditions not necessarily requiring care from a health care professional. They are less prone for errors with self-medication by patients and often have a low strength.

overvoltage (*eng.*)

The overvoltage damaged his PC.

oxidizing agent (*chem.*)

Hydrogen peroxide is a powerful oxidizing agent.

oxygen (*chem.*)

Acronym: O_2

Oxygen is a paramagnetic molecule.

oxygenate, to (*chem.*)

The liquid turned turbid upon oxygenation.

oxyhydrogen gas (*chem.*)

A mixture of methane and oxygen shows a similar behaviour as oxyhydrogen gas.

oz (*eng.*)

Acronym/Abbreviation referral: see ounce

oz (tr) (*general*)

Acronym/Abbreviation referral: see troy ounce

ozone (*chem.*)

Acronym: O_3

Ozone turns cyanides to the significantly less toxic cyanates according to $CN^- + O_3 \rightarrow CNO^- + O_2$.

ozone layer (*chem.*)
The ozone layer absorbs highly energetic UV light.

ozt (*eng.*)
Acronym/Abbreviation referral: see troy ounce

P&ID (*chem. eng.*)
Acronym/Abbreviation referral: see piping and instrumentation diagram

P&L (*econ.*)
Acronym/Abbreviation referral: see profit and loss statement

p. a. (*chem.*)
Acronym/Abbreviation referral: see pro analysi

package (*pharm.*)
The package contains 50 tablets.

package insert, (*pharm.*)
prescribing information,
patient information leaflet
Acronym: PIL
The section about contraindications on package inserts should be studied in detail to learn about situations in which the medication should not be used, for instance in patients with special medical conditions such as kidney problems or allergies.

package, to (*pharm.*)
Medication should always be packaged in a child-proof way.

packaging (*pharm.*)
The packaging was damaged during the transport.

pad (*pharm.*)
Cotton pads are used for medical and cosmetic purposes.

padlock (*general*)
For maintenanc e work, the machine was secured by a padlock.

PAH (*chem.*)

Acronym/Abbreviation referral: see polycyclic aromatic hydrocarbons

pain killer, painkiller (*pharm.*)

Aspirin (acetylsalicylic acid, 2-acetyloxybenzoic acid, $C_9H_8O_4$) is often used as a painkiller (analgesic), as an antipyretic and as anti-inflammatory medication.

pallet (*eng.*)

Pallets made from 25 kg bags are wrapped to be stable enough for transportation.

palletize, to (*eng.*)

Manual palletizing demands a lot of labour and is limited to low throughput.

palpitation (*med.*)

Caffeine $C_8H_{10}N_4O_2$) intake can trigger heart palpitations (irregular, rapid heartbeat).

panacea (*pharm.*)

The company was hoping to develop a panacea against cancer.

panel (*chem. eng.*)

The panel was only labelled in English.

panel operator (*chem. eng.*)

The panel operator immediately called the fire bridage.

partial pressure (*chem.*)

According to Dalton's law (= Dalton's law of partial pressures), the total pressure of a gaseous mixture is equal to the sum of the partial pressures of each individual com ponent in a gas mixture.

particle (*chem.*)

Nanoparticles have unique properties, but their health effects have not yet been fully studied.

partition coefficient (*chem.*)

The partition coefficient is a ratio of the concentrations of a neutral compound between two solutions. In case of ionizable solutes, the pH of the aqueous phase is adjusted to transform the compound into its non-ionized state.

partner, shareholder, asscociate (*econ.*)

The 3 partners decided to venture into oil trading.

pastille (*pharm.*)

A pastille is a medical pill. Originally, it was a pill made from compressed herbs, which was burnt to release its medicinal properties.

PAT (*chem. eng.*)

Acronym/Abbreviation referral: see process analytical technology

patent infringement (*econ.*)

Deliberate patent infringements are often difficult to prove.

patentable (*econ.*)

Information that was already disclosed, e.g. in a scientific publication, is no longer patentable.

pathogen, infectious agent, germ (*pharm.*)

By water treatment, the threat from pathogens (pathogenic bacteria and viruses) can be reduced.

patient information leaflet (*pharm.*)

Acronym: PIL

A prescription drug usually contains a PIL.

PC (*chem.*)

Acronym/Abbreviation referral: see polycarbonate

PCB (*chem.*)

Acronym/Abbreviation referral: see polychlorinated biphenyl(s)

PEG (*chem.*)

Acronym/Abbreviation referral: see polyethylene glycol

PEL (*chem.*)

Acronym/Abbreviation referral: see permissible exposure limit

pelletize, to (*chem. eng*)

Underwater pelletizing is a common process for thermoplastics.

pellets (*chem. eng.*)

Pellets of a product can be handled easily.

pending (*jur.*)

The pending lawsuit was a key topic at the shareholders' meeting.

peptide (*chem.*)

Peptides are short polymers of a-amino acids.

perceive, to (*general*)

The color change could hardly be perceived.

percolating filter (*chem. eng.*)

The percolating filter was made from activated carbon.

perester (*chem.*)

Peresters have the general structure RC(O) OOR.

perforated (*eng.*)

Stamps are perforated.

performance (*general*)

The performance of a team is dependent on the qualities of the leader.

periodic table of elements (*chem.*)

Acronym: PTE

The PTE finishes with element 111, Rg (roentgenium).

peristaltic pump (*chem. eng.*)

Peristaltic pumps can be used to handle clean or aggressive fluids without the risk of contamination.

Permissible Exposure Limit (*chem.*)

PEL is the highest concentration permitted under US OSHA regulations.

Personal Exposure Limit (*chem.*)

Acronym: PEL

Acronym/Abbreviation referral: see Permissible Exposure Limit

PEL is the highest concentration permitted under US OSHA regulations.

personal protective equipment (*general*)

Acronym: PPE

Flame-resistant PPE is often made from aramid fibres, which are an asbestos substitute. The name is short for "aromatic polyamide".

perturbation (*general*)

After the perturbation, the pendulum returned to its initial condition.

petrochemicals (*chem. eng.*)

Ethylene, propylene, toluene, and benzene are four major petrochemicals.

petrolatum, petroleum jelly (*chem.*)

Petrolatum is a semi-solid mixture of hydrocarbons (with carbon numbers mainly higher than 25).

petroleum (*chem.*)

Acronym/Abbreviation referral: see crude oil

PFD (*chem. eng.*)

Acronym/Abbreviation referral: see process flow diagram

PFD (*chem. eng.*)

Acronym/Abbreviation referral: see probability of failure on demand

PFR (*chem. eng.*)

Acronym/Abbreviation referral: see plug flow reactor

pharmacist (*pharm.*)

Pharmacists are sometimes referred to as dispensing chemists, which may cause confusion with scientists in the field of chemistry (chemists).

pharmacopoeia (*pharm.*)

The European Pharmacopoeia, in its 2005 edition, includes 1,800 monographs. These contain quality standards with which all medicines must comply to guarantee a certain quality level for consumers.

pharmacy, chemist's shop (*pharm.*)

drugstore (AE)

In the US, several drugstores are open 24/7.

PhD (*chem.*)

She obtained her PhD from the University of Toronto/Canada.

phlegm (*pharm.*)

Phlegm is expelled by coughing.

phosphor (*chem.*)

Zinc sulfide (ZnS) with about 5 ppm of copper as activator is a common phosphor.

phosphorus (*chem.*)

Acronym: P

Phosphorus, a multivalent nonmetal of the nitrogen group, cannot be found as a free element in nature because of its high reactivity.

physician, medical practitioner, medical doctor (*pharm.*)

The physician worked in an interdisciplinary team with 2 chemists.

PI (*chem. eng.*)

Acronym/Abbreviation referral: see process intensification

pickle, to (*chem.*)

He did not like the taste of pickled meat.

piecework (*econ.*)

Piecework pay is the oldest form of performance pay.

PIL (*pharm.*)

Acronym/Abbreviation referral: see Patient Information Leaflet

piling (*eng.*)

For piling of the construction site, the contractor took 2 weeks.

pillar (*eng.*)

Pillars offer vertical support.

pilot plant (*eng.*)

The pilot plant can produce samples of up to 200 kg.

pinch valve, squeeze valve, squeezing valve (*chem. eng.*)

The pinch valve was damaged by abrasive material.

pine (*general*)
The resin of pine trees, which are a significant source of softwood, can be used to produce turpentine.

pipe (*chem. eng.*)
Plastics sewage pipes are designed for a lifetime exceeding 100 years.

pipe cap (*chem. eng.*)
Pipe caps prevent contamination of pipes on a construction site.

pipeline (*chem. eng.*)
The Trans-Alaska Pipeline System (Alaska Pipeline) measures 48 inch (1.22 m) in diameter and almost 800 miles (1,286 km) in length.

piping and instrumentation diagram (*chem. eng.*)
Acronym: P&ID, PID
A HAZOP study will be carried out as soon as updated P&IDs are available.

piston (*eng.*)
Pistons are used in reciprocating engines and some pumps.

pit (*eng.*)
Oil and water had accumulated in the pit.

pitch (*chem.*)
Petroleum-derived pitch is also called bitumen.

pitting (*chem.*)
Pitting is a special type of corrosion.

pivot (*eng.*)
The technican pointed to the pivot of the lever.

plaintiff (*jur.*)
The plaintiff's damages may include compensatory and punitive damages. Punitive damages are only awarded in the event of wanton and reckless conduct.

plant (*chem. eng.*)

A modern pharmaceutical plant is highly automated.

plant engineering and construction (*chem. eng.*)

Before becoming an independent consultant, he worked as project manager in a plant engineering and construction company.

plasma (*chem.*)

Blood serum is blood plasma without clotting factors such as fibrinogen.

plaster (*chem.*)

Plaster is a building material.

plastered wall (*chem.*)

The paint did not stick to the plastered wall.

plastics (*chem. eng.*)

The worldwide plastics production has increased from 1.5 million tonnes in 1950 to 245 million tonnes in 2006.

plate (*chem. eng.*)

The concept of theoretical plates (equilibrium stages, theoretical trays) is used for the design of distillation processes.

plate, blanking plate, isolating plate (*eng.*)

The isolating plate was not clearly visible from the ground.

platinum (*chem.*)

Acronym: Pt

The six platinum family metals (ruthenium, rhodium, palladium, osmium, iridium, platinum) show outstanding catalytic behaviour.

PLC (*chem.*)

Acronym/Abbreviation referral: see programmable logic control(ler)

pliable (*chem.*)

The shell was pliable.

pliers (*eng.*)

Pliers were probably first used to handle hot objects.

plough (*eng.*)

plow (AE)

Oxen were used to drag ploughs. (1 ox, 2 oxen).

plug (*chem.*)

She did not hear her cell phone because of the ear plugs.

plug flow reactor, tubular reactor (*chem. eng.*)

Acronym: PFR

The model of a plug flow reactor (PFR) is used to describe chemical reactions in continuous, flowing systems under ideal situat ions.

plug valve (*chem. eng.*)

Plug valves are often used as shut-off valves in domestic natural gas lines.

plugged (*eng.*)

When a pipeline is plugged, it needs to be brought back into operation as fast as possible.

plumbing (*eng.*)

The plumbing contractor did not meet the time schedule.

plywood (*eng.*)

The plies (layers) of plywood can be bonded together by phenol formaldehyde resin. Therefore, plywood can be considered a composite material.

PMC (*chem. eng.*)

Acronym/Abbreviation referral: see Project Management Consultancy

pneumatic conveying (*chem. eng.*)

Dense phase conveying (plug flow conveying) causes less product attrition than dilute phase conveying.

PO (*econ.*)

Acronym/Abbreviation referral: see purchase order

pollutant (*chem.*)

PAH (polycyclic aromatic hydrocarbons) are combustion-derived pollutants.

polycarbonate (*chem.*)

Acronym: PC

Polycarbonates are thermoplastic polymers. They derive their name from carbonate groups (-O-(C=O)-O-) in the molecular backbone chain.

Acronym: PCB

PCBs ($C_{12}H_{10-x}Cl_x$) were used as coolants and insulating fluids in transformers and as additives in flexible PVC before their ban.

Acronym: PAH

Benzopyrene (Benzo[a]pyrene), $C_{20}H_{12}$, is a five-ring polycyclic aromatic hydrocarbon that is mutagenic and highly carcinogenic. It acts as a procarcinogen, because the ultimate metabolite that causes cancer is benzo[a] pyrene diol epoxide, by interacting with the DNA.

polyethylene glycol (*chem.*)

Acronym: PEG

PEG (PEO, POE, HO-(CH_2-CH_2-O-)$_n$-H) is a polyether. It is the oligomer or polymer of ethylene oxide. Polyethylene glycol can be used to create very high osmotic pressures (>10^6 Pa).

polyolefins (*chem.*)

Polyethylene and polypropylene are two ubiquitious polyolefins.

polyvalent (*chem.*)

Polyvalent atoms such as carbon are capable of forming more complex structures than monovalent ones.

POM (BE) (*pharm.*)

Acronym/Abbreviation referral: see prescription only medicine

poppet valve (*eng.*)

Poppet valves are generally very robust and resilient, so they are frequently used as industrial directional control valves.

port (*eng.*)

The goods could not leave the port because some documents were missing.

port, portside (*general*)

Portside is the left side of a ship.

positioner (*eng.*)

Valve positioners are available as pneumatic, electro-pneumatic and digital models.

positive locking (*eng.*)

The metal piece was installed with positive locking.

postgraduate (*sci.*)

He earned a postgraduate degree in economics.

potable (*pharm.*)

The tap water was not potable.

potable water (*chem.*)

1.3 billion people do not have access to sufficient potable water.

potassium (*chem.*)

Acronym: K

Potassium ions are colorless in water.

pottery (*chem.*)

Pottery is sensitive to shock.

poultice (*pharm.*)

A poultice can be applied to inflamed parts of the body.

pound (*eng.*)

Acronym: lb, lbm

1 pound weighs approx. 0.45 kg.

pounds per square inch (*chem.*)

Acronym/Abbreviation referral: see psi

pounds per square inch absolute (*chem. eng.*)

Acronym/Abbreviation referral: see psia

pounds per square inch gauge (*chem.*)

Acronym/Abbreviation referral: see psig

pounds per square inch, pound-force per square inch (lbf/in^2) (*eng.*)

Acronym: psi

Acronym/Abbreviation referral: see psi

1 psi is approx. 0.069 bar or 6900 Pa. The atmospheric pressure at sea level (standard) is 14.7 psi.

pounds per square inch absolute (*chem.*)

Acronym: psia

Acronym/Abbreviation referral: see psia

A 4.3 psia pressure suit was developed for astronauts in the International Space Station.

pounds-force per square inch gauge (*eng.*)

Acronym: psig

Acronym/Abbreviation referral: see psig

The solenoid valve operates from vacuum to 3,000 psig.

pour point (*chem.*)

The pour point is an important parameter for lubricants and other petroleum products.

pour, to (*eng.*)

The worker poured the mixture into the vessel.

powder (*chem.*)

The aerodynamic properties of powders can be used to transport them in industrial applications by pneumatic conveying. There are 2 regimes: dilute phase conveying and dense phase conveying. Hydraulic conveying (i.e. conveying with water instead of air) is another option.

power (*eng.*)

Power is measured in Watt (W).

power factor (*eng.*)

The power factor can be between 0 and 1. In a purely resistive AC circuit, voltage and current waves are in phase. When reactive loads such as capacitors or inductors are present, energy storage in the loads results in a time difference between the current and voltage waves. The following memory hook helps to memorize the relations: "CIVIL" – in a Capacitor, I (current) leads Voltage, Voltage leads I (current) in an inductor L.

power plant (*eng.*)

Power plants can be situated close to the feedstock or to the consumer.

PPE (*chem. eng.*)

Acronym/Abbreviation referral: see personal protective equipment

precious metal (*chem.*)

The best-known precious metals are gold and silver.

precipitant (*chem.*)

Silver was reclaimed by precipitation of AgCl.

precipitation (*chem.*)

The solution showed hardly any percipitation.

pre-clinical studies (*med.*)

Pre-clinical studies involve in vitro (test tube) and in vivo (animal) experiments.

precommissioning (*chem. eng.*)

In the construction of a (chemical) plant, precommissioning is the testing, adjustment and verification that the entire installation is working according to the designed purpose so that the systems involved are brought to a stage where they are ready for commissioning. Precommissioning is a part of the Mechanical Completion activity.

preliminary (*general*)

A preliminary report was issued 2 weeks after the incident.

premium (*econ.*)

Fine chemicals of superior purity can be sold with a premium.

prescription (*pharm.*)

He was given a prescription for sedative drugs.

prescription only medicine (*pharm.*)

Acronym/Abbreviation referral: see POM

prescription drug, (*pharm.*)
rx-only drug, legend drug, prescription only drug

Acronym/Abbreviation referral: see prescription only medicine

Vitamins are generally no prescription drugs.

prescription drug (*pharm.*)

Acronym/Abbreviation referral: see POM

Many antibiotics are POM.

pressure (*chem.*)

The pressure in the combustion chamber can reach 142 bar.

pressure gauge (*eng.*)

The pressure gauge was destroyed by overstretching.

pressure regulator (*chem.*)

The pressure regulator was set at 2.3 bar.

pressure relief valve (*eng.*)

A pressure relief valve has to vent into an unconfined area.

pressure swing adsorption (*chem. eng.*)

N_2 can be produced by fractionation of air, membrane separation or pressure swing adsorption.

prestressed concrete (*eng.*)

With prestressed concrete, bridges with a longer span than feasible with ordinary reinforced concrete can be built.

prestudy (*chem. eng.*)

During the prestudy, it was discovered that the warehouse needs an expansion, too.

prevailing (*general*)

The prevailing opinion about waste incinceration is positive.

primary air (*chem. eng.*)

The primary air preheater was designed for a maximum pressure of $2*10^6$ Pa.

primer (*eng.*)

Azides are commonly used as primers.

pro analysi (*chem.*)

Acronym: p.a.

The company sells p.a. grade chemicals.

probability of failure on demand (*eng).*

Acronym: PFD

SIL 4 has a PFD better than 10^{-4}.

probe (*eng.*)

The sample was taken by a water-cooled probe.

procedure (*general*)

The operating procedure for the distillation column was updated only 2 weeks ago.

process (*chem. eng.*)

The process has not yet been implemented in a large scale plant.

process analytical technology (*chem. eng.*)

Acronym: PAT

Process Analytical Technology (PAT) has been defined by the United States Food and Drug Administration (FDA) as a concept to analyze and control pharmaceutical manufacturing processes through the measurement of Critical Process Parameters (CPP).

process capability (*chem. eng.*)

The process capability can be expressed by the c_{pk} (six sigma approach), which basically means that the standard deviation of a production process needs to be smaller than the product specifications.

process chemistry, (*chem. eng.*)
process engineering

He holds a tenture in process chemistry.

process development (*chem. eng.*)

During process development, one should also think about the energy consumption.

process engineer (*chem. eng.*)

The process engineer proposed to lower the temperature in the discharge zone.

process flow diagram (*chem. eng.*)

Acronym: PFD

A process flow diagram (PFD) is a diagram commonly used in chemical and process engineering to indicate the general flow of plant processes and equipment. The PFD displays the relationship between major equipment of a plant and does not show minor details such as piping details and designations (those can be seen on a P&ID). Another commonly -used term for a PFD is a flow sheet.

process industry (*chem. eng.*)

Chemicals, food and drinks and pharmaceuticals are produced by the process industry.

process intensification (*chem. eng.*)

Acronym: PI

Process intensification is an approach to build much smaller (i.e. intensified) chemical plants that are significantly cheaper and safer than existing ones.

process measuring and control technology (*chem. eng.*)

The process measuring and control technology department was reorganized.

process technology (*chem. eng.*)

The process technology was covered by 3 patents.

process water (*chem. eng.*)

The process water was more corrosive than expected.

process, to (*chem.*)

The plants processes waste oil.

processing (*chem. eng.*)

The processing of concrete is performed at throughputs of 50 t/h and more.

procurement (*econ.*)

The procurement of local equipment is generally less costly than to import it from offshore.

prodrug (*pharm.*)

A prodrug is a pharmacological substance which is administered in an inactive form. It is then metabolised in vivo into an active metabolite.

produce (*chem.*)

The chemist produced H_2 from water.

product (*chem. eng.*)

The new employee studied the product range of his company.

production site (*chem. eng.*)

The company has production sites in three countries.

profit (*econ.*)

The owners of a company are interested in its profit.

profit and loss statement, income statement (*econ.*)

Acronym: P&L

A profit and loss statement (P&L) or income statement indicates how revenues ("top line") were transformed into net income ("bottom line") of a corporation to see how much money was made in the period of interest, typically 1 year. Thereby, the P&L differs from the balance sheet, which represents a single point in time.

proforma invoice (*econ.*)

A proforma invoice can be sent upfront to a buyer if not all details are known. It is often used for customs clearance purposes.

profuse (*general*)

Ingestion of large amounts of propylene glycol can result in rapid heartbeat and profuse sweating. A programmable logic controller (PLC) is used for the automation of industrial processes.

prohormone (*pharm.*)

Vitamin D is a group of fat-soluble prohormones, the two major forms of which are vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Vitamin D3 is produced in skin exposed to sunlight.

Project Management Consultancy (*eng.*)

Acronym: PMC

The PMC suggested to speed up the project.

propagation (*general*)

The propagation of the flue was faster than expected.

propellant (*chem.*)

A hypergolic propellant consists of fuel and oxidizer. It ignites spontaneously upon contact of the two media, e.g. hydrazine and nitrogen tetraoxide.

properties (*chem.*)

The professor wanted to know the properties of helium from the candidate.

proposed International Nonproprietary Name (*pharm.*)

Acronym: pINN

Acronym/Abbreviation referral: see International Nonproprietary Name

protective clothing (*chem.*)

A chemsuit (hazmat suit) is a special type of protective clothing.

protein (*chem.*)

Proteins are polypeptide molecules. The distinction is that peptides are short and polypeptides/proteins are long. They are composed of amino acids.

prussic acid (*chem.*)

Prussic acid is a solution of hydrogen cyanide (HCN) in water. HCN reacts with ketones and aldehydes to give cy anohydrins.

psi (*chem. eng.*)

Acronym/Abbreviation referral: see pounds per square inch 1 bar = 100,000 Pa = 14.5 psi.

psia (*chem. eng.*)

Acronym/Abbreviation referral: see pounds-force per square inch absolute

Psia is the gauge pressure plus local atmospheric pressure.

psig (*chem. eng.*)

Acronym/Abbreviation referral: see pounds-force per square inch gauge

Psig is a unit of pressure relative to the surrounding atmosphere. By contrast, psia measures the pressure relative to vacuum.

pulley (*eng.*)

A pulley is a grooved wheel that can accomodate a rope or cable. It can be used to change the direction of an applied force.

pulp (*chem.*)

Pulp is a fibrous material made from wood which can be converted into paper.

pump (*chem. eng.*)

The impeller of the pump was destroyed by solids.

pump head (*eng.*)

The pump head was 3 bar.

punch (*eng.*)

The punch was made from hardened metal.

punch list (*chem. eng.*)

A punch list is a "to do» list which contains items of a project that require rectification or completion before the entire work scope is completed.

pungent (*chem.*)

Glutaraldehyde (pentane-1,5-dial, pentanedial, glutural, $C_5H_8O_2$) is a liquid with a pungent odor. It is used to sterilize medical and dental equipment.

purchase order (*econ.*)

Acronym: PO

A purchase order was issued.

purchase, to (*econ.*)

Raw materials can be purchased from one supplier in order to claim volume discount.

purge, to (*chem.*)

The reactor was purged with nitrogen.

purification (*chem.*)

Reagents for delicate processes can be subjected to a purification step by recrystallization, i.e. dissolution in a very pure solvent, crystallisation and crystal recovery.

purportedly (*general*)

Most medications are potent and safe after the expiration date. A rare exception is a case of renal damage purportedly caused by expired tetracycline.

putrefaction (*pharm.*)

Putrefaction is the decomposition of animal proteins by putrefying bacteria. It usually yields amines such as putrescine ($NH_2(CH_2)_4NH_2$ (1,4-diaminobutane, butanediamine) and cadaverine ($NH_2(CH_2)_5NH_2$, pentane-1,5-diamine).

pylon (*eng.*)

A pylon has the shape of a truncated pyramid.

pyruvic acid (*chem.*)

Pyruvic acid (2-oxopropanoic acid, -$CH_3COCOOH$) is the simplest alpha-keto acid. The carboxylate anion (-COO) of pyruvic acid is known as pyruvate, which plays an important role in biochemical processes.

quantum well (*phys.*)

Quantum wells, which can be produced in semiconductors, are used in some lasers.

quarry (*eng.*)

Because of dust formation, quarries are situated in remote areas.

quarter-turn screw,
flat leaf screw (*eng.*)

The hose was connected to the tank by a flat leaf screw.

quartz (*chem.*)

Quartz crystals exhibit the piezoelectric effect.

quaternary ammonium compounds, quaternary ammonium salts, quaternary amines (*chem.*)

Acronym: quats

Quats are positively charged ions of the structure NR^+ with R being alky l groups. Unlike the ammonium ion NH_4 , the primary, secondary, or tertiary ammonium cations, the quaternary ammonium cations are permanently charged, independent of the pH of their solution.

quats (*chem.*)

Acronym/Abbreviation referral: see quaternary ammonium compouonds

quench, to (*eng.*)

The radicals were quenched on the vessel wall.

quenching (*chem.*)

Flame quenching on metal surfaces results in the formation of pollutants such as CO and unburnt hydrocarbons.

quick lime (*chem.*)

Acronym: CaO

Calcium oxide (CaO, burnt lime, quick lime) is obtained from the thermal decomposition of calcium carbonate ($CaCO_3$, calcite) in a lime kiln above 825°C in a process called calcination or lime-burning.

quotation (*econ.*)

The quotation met the client's expectations.

R&D (*sci.*)

Acronym/Abbreviation referral: see research and development

R. Ph. (*pharm.*)

Acronym/Abbreviation referra l: see Registered Pharmacist

rack (*eng.*)

Rack storage of pallets requires forklifts.

radial engine (*eng.*)

Private planes are sometimes equipped with radial engines.

radiation (*chem.*)

Ionizing radiation can be divided into alpha, beta and gamma radiation.

railcar (*eng.*)

In contrast to a railway car, a railcar is self -propelled.

rancid (*chem.*)

Butyric acid, $CH_3CH_2CH_2$-COOH, gives the characteristic, unpleas ant smell to rancid butter.

random sample (*pharm.*)

A random sample of employees was picked to test the new software.

randomly (*general*)

The sample was randomly selected.

range (*sci.*)
The measurements range from 4 to 65 mg/m³.

rated capacity (*eng.*)
The rated capacity of the extruder is 7.5 t/h.

rated power (*eng.*)
The engine has a rated powder of 3.7 kW.

ratholing (*chem. eng.*)
The vibrating bottom is supposed to prevent ratholing in silos.

rating (*eng.*)
The level sensor has no rating for use in dust-explosive atmospheres.

ratio (*general*)
The 12C/16C isotope ratio can be measured to estimate the age of a sample.

raw material (*chem.*)
He was looking for two missing raw materials in the warehouse.

RCRA (*chem. eng.*)
Acronym/Abbreviation referral: see Resource Conservation and Recovery Act

REACH (*chem. eng.*)
Acronym/Abbreviation referral: see Registration, Evaluation and Authorisation of Chemicals

reaction (*chem.*)
According to the IUPAC definition, a chemical reaction is a process that results in the interconversion of chemical species.

readily soluble (*pharm.*)
The readily soluble heavy metals were extracted from the soil sample.

reading (*chem.*)
The instrument reading was faulty.

reagent (*chem. eng.*)

In contrast to solvents and catalysts, a reagent (or reactant) is a substance that is consumed during a chemical reaction.

real power (*eng.*)

The ratio between real power and apparent power in an AC circuit is called power factor.

real-estate agent (*general*)

The real-estate agent was very experienced in the area.

rear view (*eng.*)

The rear view of some houses is more attractive than the front view.

reassessment (*general*)

After the cost estimation, a reassessment of the project profitability wad carried out.

rebars (*eng.*)

Acronym/Abbreviation referral: see reinforcing bars

receipt (*econ.*)

Reimbursement of expenses can only be made against original receipts.

receivables (*econ.*)

To improve the cash flow, the receivables were screened for overdue payments.

receptacle (*eng.*)

Power plugs are inserted into power sockets (=power receptacles, power outlets).

reclaimed rubber (*chem.eng.*)

Reclaimed rubber can be used to save natural resources.

recommendation (*general*)

The chemist made a recommendation about two suppliers.

recommended exposure limit (*chem.*)

The recommended exposure limit is the highest allowable airborne concentration of a substance that is not expected to give damage to a person at work.

recommended International Nonproprietary Name (*pharm.*)

Acronym: rINN

Acronym/Abbreviation referral: see International Nonproprietary Name

recommissioning (*chem. eng.*)

After a 6-month shutdown, the plant was in a condition for recommissioning.

recovered glas (*chem. eng.*)

Recovered glas needs to be freed from metal parts prior to processing.

recovered paper (*chem. eng.*)

Recovered paper can be used to produce cardboard.

recovery (*chem. eng.*)

Recovery of solvent is done to meet emission requirements.

rectangle (*sci.*)

A sheet of paper in A4 format constitutes a rectangle.

rectangular (*sci.*)

The surface area of a rectangular piece of land can be figured out easily.

rectifier (*eng.*)

A rectifier converts alternating current (AC) to direct current (DC). The opposite device is called an inverter.

red line drawing (*chem. eng.*)

The engineer marked the changes in a red line drawing.

redox reaction (*chem.*)

Examples of a redox reaction are the oxidation of carbon by oxygen to carbon dioxide or the reduction of carbon by hydrogen to methane. The former reaction is associated with a loss of electrons (oxidation), the latter one with a gain of electrons (reduction) for the carbon.

reducer (*chem.*)

A reducer is a component in a pipeline that reduces the pipe size from one diameter to another.

reducing agent (*chem.*)

A reducing agent becomes oxidized in a redox reaction and is therefore the electron donor.

reducing valve (*chem. eng.*)

The reducing valve on the gas bottle was frozen because of the Joule-Thomson effect. At room temperature, all gases except hydrogen, helium and neon cool down upon expansion.

reduction (*chem.*)

An example of a reduction is the reaction of benzene to cyclohexane in the presence of a platinum catalyst according to $C_6H_6 + 3H_2 \rightarrow C_6H_{12}$.

redundancy (*general*)

Critical process equipment can be built in redundancy.

reel (*eng.*)

A reel is used to redirect a rope.

refinery (*chem. eng.*)

The world's largest refineries process over 500,000 barrels of crude oil per day. 1 barrel (bbl) is 42 US gallons or 159 l.

reflux (*chem. eng.*)

By boiling the sample under reflux for 8 h, 80% of the total mass could be dissolved.

refraction (*eng.*)

Refraction, as described by Snell's law, is the change in direction of a wave due to a change in its speed, e.g. at an interface between 2 media.

refractive index (*eng.*)

The refractive index (n) of glass is around 1.5. Therefore, the speed of light in glass (v) is 1/1.5 = 0.67 times the speed of light in vacuum (c) according to n= c/v. n is dependent on the wavelength.

refractory (*chem.*)

Refractories are non-metallic materials that are used above 1000°F (538°C).

refractory (*chem. eng.*)

The oxides of aluminium (alumina, $Al_2 O_3$), silicon (silica, SiO_2) and magnesium (magnesia, MgO) can be used to produce refractories.

refractory material (*chem. eng.*)

A furnace is typically lined with refractory material.

regenerative thermal oxidiser (*chem. eng.*)

regenerative thermal oxidizer (AE)

Acronym: RTO

An RTO unit can cope with sulfur-containing gases, which would poison the catalyst in a CCU.

register ton (*general*)

1 register ton, a unit of volume used for the cargo capacity of a ship, is defined as 100 cubic feet (2.83 m^3).

Registered Pharmacist (*pharm.*)

Acronym: R. Ph.

He worked as a Registered Pharmacist in the United States.

Registration, Evaluation and Authorisation of Chemicals (*chem. eng.*)

Acronym: REACH

REACH is a new European Chemicals Policy that came into effect in 2007. REACH applies to all chemicals with a production or import volume exceeding 1 tonne/year.

registry of toxic effects of chemical substances (*chem. eng.*)

Acronym: RTECS

Published by NIOSH, RTECS presents basic toxicity data of numerous substances.

reinforced (*eng.*)

The cover is made from fibre-reinforced plastics.

reinforced concrete (*eng.*)

Reinforced concrete is used in most skyscrapers.

reinforcing bars (*eng.*)

A rebar, or reinforcing bar, is a carbon steel bar that is commonly used in reinforced concrete and reinforced masonry structures. It has ridges for better mechanical anchoring into the concrete.

release (*pharm.*)

In that accident, 2 tons of chlorine were released.

remainder (*chem.*)

When dividing 27 by 4, 6 is the quotient and 3 is the remainder, because $27=6\times4+3$.

remains (*chem.*)

There were some metallic remains in the ash.

remedy (*pharm.*)

In homeopathy, concordant remedies are remedies of similar action but of dissimilar origin.

remittance (*econ.*)

A remittance, or "money sent home", is a transfer of money by a foreign worker to his home country.

remitter, buyer, client, principal (*econ.*)

Extra costs are to be borne by the principal.

remuneration (*econ.*)

The employee's remuneration included stock options.

repatriation (*general*)

After 12 years abroad, repatriation of the employee was a challenging task.

reportable quantity (*chem. eng.*)

Acronym: RQ

RQ is the amount of a substance that, when spilled, must be reported to authorities under CERCLA.

research (*sci.*)

Research and development are vital to the growth of any chemical company.

research and development (*sci.*)

Acronym: R&D

In Finland, R&D spendings amount to 3.4% of the GNP.

researcher (*sci.*)

The researcher was hired from competition.

residence time (*chem. eng.*)

A narrow residence time distribution is often advantageous.

residue (*eng.*)

Ash and soot are combustion residues.

resilient (*eng.*)

A resilient material can store energy elastically.

resin (*chem.*)

Since two weeks, the resin has been stickier than usually.

Resource Conservation and Recovery Act (*chem.*)

Acronym: RCRA

RCRA (pronounced as "rick-rah" or "Wreck-rah") is an US law governing the disposal of solid and hazardous waste.

respirator (*general*)

A respirator is a device designed to protect the wearer from inhaling harmful dusts, fumes, vapors, and/or gases. There are cost-effective, disposable masks and reusable models with replaceable filter cartridges.

respiratory system (*pharm.*)

Ammonia can cause irritation to the respiratory system, the eyes and the skin.

responsibility (*general*)

It is a responsibility of engineers to check and verify their assumptions.

retail customer (*econ.*)

Retail customers are entitled to extensive warranties.

retention (*eng.*)

The adsorption column did not show any retention for H_2S.

retention time (*chem. eng.*)
Retention time is an important parameter in gas chromatography.

reticule, reticle, crosshair (*eng.*)
In old instruments, the reticule was made from a thread of the brown recluse spider, an animal with 3 pairs of eyes.

retractable (*eng.*)
Planes usually have a retractable landing gear.

retrofit, to (*eng.*)
A larger column was retrofitted into the HPLC instrument.

return line (*chem.*)
The return line showed strong fouling.

revamp (*chem. eng.*)
A revamp is a major modification to an industrial plant in operation.

reverse osmosis (*chem. eng.*)
The desalination of seawater to freshwater is based on reverse osmosis.

revolutions per minute (*eng.*)
Acronym: rpm
A dental drill runs with up to 800,000 rpm.

reward (*general*)
A working machine is an inventor's greatest reward.

rhomb, rhombus (*sci.*)
The area of a rhombus is the product of the lengths of its diagonals divided by two.

ribbon (*eng.*)
The man attached the wooden stick to the scaffold using a rubber ribbon.

right angle (*sci.*)
When placing tiles on the floor, right angles in the corners come in handy for the do-it-yourselfer.

right-hand(ed) thread (*eng.*)

Most threads are right -handed. This means that a bolt or nut, seen from the top, is tightened by turning it in clockwise direction.

rigid (*eng.*)

By using H-type steel bars, he could build a rigid structure.

rim (*eng.*)

The rim was too rough for the next processing step.

rinse, to (*eng.*)

After cutting the meat, the cook rinsed the knife with water.

rivet (*eng.*)

The rivets are made from stainless steel.

rock salt (*chem.*)

The solubility of rock salt (NaCl) in water is 359 g/l at 25°C.

rod (*eng.*)

The mechanic used a rod to bridge the gap.

rodent (*pharm.*)

Rodent poisons fall into 2 categories: anticoagulant agents and hypercalcemic agents. Anticoagulants (most common type) block the production of vitamin K so that the rodent will bleed to death. Hypercalcemic agents contain vitamin D. These poisons work by raising the calcium content in the rodent's blood stream to toxic levels.

roller mill (*eng.*)

A roller mill can be found in a steel factory.

rolling friction (*eng.*)

Rolling friction is smaller than static friction.

Roots blower (*chem. eng.*)

The Roots blower is a positive displacement pump. This type of blower is frequently used as supercharger in cars.

rope ladder (*eng.*)

A rope ladder was supplied for emergencies.

rotary cement kiln (*chem. eng.*)

The heat losses of the rotary cement kiln were analysed.

rotary evaporator (*chem.*)

A rotary evaporator is used to gently remove solvents from a sample by evaporation under reduced pressure.

rotary feeder,
rotary valve (*chem. eng.*)

A rotary valve can be used to transfer solids between 2 pressure levels.

rotary kiln (*chem. eng.*)

The rotary kiln was plugged by molten ash.

rotating current, three-phase current (*eng.*)

Three phase current is used on engines. There are hardly any engines > 10 kW that use single phase electricity (design, vibration, efficiency advantages). In industry, such engines are used to drive pumps, fans, blowers and compressors.

rough calculation (*eng.*)

A rough calculation revealed that the pump had been designed too small.

round off, to (*eng.*)

3.74 can be rounded off to 3.7.

round robin test (*eng.*)

The lab participated in a round robin test.

round up, to (*eng.*)

3.76 can be rounded up to 3.8.

royalty (*econ.*)

The author received 2% royalties on the sales of his book.

RQ (*chem. eng.*)

Acronym/Abbreviation referral: see reportable quantity

RTECS (*chem. eng.*)

Acronym/Abbreviation referral: see registry of toxic effects of chemical substances

RTO (*chem. eng.*)

Acronym/Abbrevation referral: see regenerative thermal oxidizer

rubber (*eng.*)

Rubber is a soft material.

rubber hose (*eng.*)

A rubber hose can be connected to a silo truck to unload it.

rubber tube (*eng.*)

The rubber tube burst from the high pressure.

rubbing alcohol (*chem.*)

Isopropanol is used as rubbing alcohol.

rule of thumb (*eng.*)

As a rule of thumb, the lifetime of electronic equipment can be assumed to be 5 years.

running water (*eng.*)

A water ring pump consumes a high amount of running water.

rust (*eng.*)

Stainless steel does not develop rust.

Rx-only drugs (AE) (*pharm.*)

Acronym/Abbreviation referral: see POM

sacrificial anode (*eng.*)

The pipeline was protected by equally spaced sacrificial anodes.

SADT (*chem.*)

Acronym/Abbreviation referral: see self accelerating decomposition temperature

safety (*general*)

Safety has to be a key concern in the design, operation and decommissioning of a chemical plant.

safety data sheet (*chem. eng.*)

Acronym/Abbreviation referral: see SDS

safety instrumented function (*chem. eng.*)

Acronym: SIF

A Safety Instrumented Function (SIF) is defined as a function implemented by a SIS, which is intended to achieve or maintain a safe condition of the plant at all times.

Safety Instrumented System (*chem. eng.*)

Acronym: SIS

A Safety Instrumented System (SIS) is a common form of process control for industrial processes.

Safety Intergrity Level (*chem. eng.*)

Acronym: SIL

Safety Integrity Level SIL is a measure of risk reduction provided by a SIF based on four levels. Each level represents an order of magnitude of risk reduction. Every SIF has a SIL assigned to it. The SIS and equipment does not have a SIL assigned to it.

safety relief valve (*eng.*)

A safety relief valve has to be designed for the maximum flow rate.

safety wire, lockwire (*eng.*)

Safety wires (lockwires) are common in the aircraft and racing industries as additional precaution to keep vital fasteners from unintentionally loosening due to vibration.

sales force (*pharm.*)
The hit rate of the competitor's sales force was 17%.

sales margin (*econ.*)
Acronym: SM
The sales margin of the chemical was 50 €/ton below expectations.

saliva (*pharm.*)
Human saliva consists to 98% of water.

salve, ointment (*pharm.*)
Salves can be based on hydrocarbons (e.g. hard paraffin, soft paraffin), fat and water soluble substances (e.g. polyethyleneglycol (PEG)).

sampler (*chem. eng.*)
The sampler was installed in the wrong locat ion.

sandstone (*eng.*)
Sandstone can be easily processed.

sanitiser (*pharm.*)
sanitizer (AE)
The nurse used a sanitizer for her hands before touching the tools.

saponification (*chem.*)
Soap, which consists of sodium or potassium salts of fatty acids, is obtained by the saponification of fat with lye. Thereby, the fats are hydrolyzed to alkali salts of fatty acids and glycerol.

saponification value (*chem.*)
The saponification value is a measure of the average molecular weight (chain length) of fatty acids, which are carboxylic acids with long unbranched aliphatic tails (chains). These can be either saturated or unsaturated.

sarcoma (*med.*)
A sarcoma is a cancer of the connective tissue (bone, cartilage, fat) resulting in mesoderm proliferation.

saturated (*chem.*)
Hexane is a saturated hydrocarbon.

saturated steam (*chem.*)

The temperature of dry saturated steam at 10 bar (absolute) is 180°C.

saturation vapor pressure (*chem.*)

At saturation vapor pressure, a substance in the gas phase is in equilibrium with the liquid phase of that substance beneath.

scaffold (*eng.*)

A scaffold is no permanent installation.

scale (*eng.*)

The scale on the layout diagram is 1:75.

scale-up (*chem. eng.*)

Scale-up often relies on the use of dimensionless numbers.

scaly (*pharm.*)

Muskovite is a scaly mineral with a pearlescent shine.

scanty (*general*)
The information provided by the MSDS is scanty.

scattering (*chem.*)
Scattering of sunlight on air molecules mak es the sky appear blue.

schedule (*econ.*)
The project schedule was endangered by the results of the soil investigation.

scholar (*sci.*)
A good scholar is able to explain a complicated situation in simple words.

science (*sci.*)
Calculating the Peclet number is not rocket science.

scientist (*sci.*)
On international conferences, scientists can exchange thoughts with their peers.

scope (*general*)
The project scope was not clearly defined.

SCR (*chem. eng.*)
Acronym/Abbreviation referral: see selective catalytic reduction

scrap (*eng.*)
There is a scrapyard close to the plant.

scrap copper (*eng.*)
Scrap copper is collected and processed by specialized companies.

scraper (*eng.*)
Kitchen scrapers can be made from metal, plastics, wood or rubber.

screen (*eng.*)
The process engineer studied the temperature drop on his screen.

screen cloth (*eng.*)
The industrial screen cloth has 10 mesh, i.e. 1651 μm wide openings.

screen pack (*eng.*)

The screen pack was blocked by metallic parts.

screw (*eng.*)

The bar was secured by two screws.

screw cap (*eng.*)

A screw cap is a closure on a container, i.e. a mechanical device which is screwed on and off (reclosable).

screw conveyor (*eng.*)

A screw conveyor can be used to transport solids or sludges.

screw driver (*eng.*)

His screw driver was too small to losen the connection.

screw gauge (*eng.*)

The workshop was not equipped with a screw gauge.

screw joint (*eng.*)

The screw joint failed due to too high forces.

scrubber (*chem. eng.*)

The scrubber was designed for a maximum SO_2 capturing capacity of 500 g/h.

SD (*chem.*)

Acronym/Abbreviation referral: see shutdown

SDS (*chem. eng.*)

Acronym/Abbreviation referral: see material safety data sheet

seal (*eng.*)

In contradiction to the vendor's statement, the seal as not completely gas tight.

sealing compound (*eng.*)

The application limit of the sealing compound was overlooked.

seam (*eng.*)

The seam between the steel plates was ground.

seaport (*eng.*)

Dover in the UK is one of the busiest seaports for passengers.

seaworthy (*eng.*)

After the storm, the ship was not seeworthy any more.

second order reaction (*chem.*)

In a second order reaction, the reaction rate is determined by the concentration of two chemical species.

secondary air (*chem. eng.*)

By using secondary air, the CO emissions could be reduced by 85%.

seed crystal (*chem.*)

Impurities on the vessel wall can act as seed crystals.

segregation (*eng.*)

The day supervisor proposed to wet the powder in an attempt to limit segregation.

seizure (*med.*)

Ingestion of the herbicide by humans can lead to seizures.

selective catalytic reduction (*chem. eng.*)

Acronym: SCR

SCR catalysts are manufactured from various ceramic materials used as carriers, e.g. titanium dioxide. As active catalytic components, oxides of base metals (e.g. vanadium and tungsten), zeolites, and various precious metals are used.

selective non-catalytic reduction (*chem. eng.*)

Acronym: SNCR

SNCR is a method to reduce NO_x emissions in power plants that burn biomass, waste and coal. The process involves injecting either ammonia or urea into the combustion chamber to react with the nitrogen oxides. The reduction can be described as $4\ NO + 4\ NH_3 + O_2 \rightarrow 4\ N_2 + 6\ H_2O$.

self-accelerating autodecomposition temperature (*chem. eng.*)

Acronym: SADT

The SADT of an organic peroxide needs to be looked up in its MSDS to determine a safe storage temperature.

self acting (*eng.*)

Self acting filling machines can operate over the weekend.

self cleaning (*eng.*)

The lotus effect explains self cleaning surfaces.

self supporting (*eng.*)

The self supporting roof was designed to withstand wind speeds of 130 m/s.

self-aspirated (*eng.*)

The flare has a self-aspirated igniter.

self-contained breathing apparatus (*chem. eng.*)

In order to enter the vessel, the worker put on a self -contained breathing apparatus.

semi finished product (*eng.*)

Over the last month, the company had built up a too high stock level of semi finished products.

semi metal (*chem.*)

A semimetal is a material with a small overlap in the energy of the conduction band and valence band. Metalloids are a group of chemical elements that are neither metal nor nonmetal. Semimetals, in contrast to metalloids, can be elements (arsenic, antimony, bismuth) or compounds (HgTe). Tin and graphite are semimetals, but no metalloids.

semi-batch (*chem. eng.*)

In a semi-batch operation, one reactand is already present, while the second one is continuously fed to the process. It is also possible to withdraw one product continuously. A typical avantage of a semi-batch operation is a controlled reaction with higher yields. Examples of this reaction type are esterifications.

semiconductor (*chem.*)

By doping, silicon can be made a p-type or an n-type semiconductor. The most common dopants are acceptors from group III (p-type) or donors from group V elements (n-type).

semilog graph, semi-log graph, semi-log plot (*sci.*)

A semilog graph is a convenient way to visualize data that are changing with an exponential relationship.

senior advisor (*econ.*)

The senior legal advisor left the company to found his own business.

senior management (*econ.*)

The investment proposal was not approved by senior management.

sensitiser (*chem.*)

sensitizer (AE)

Tetracene ($C_{18}H_{12}$, naphthacene) is a common sensitiser. It is used in organic light-emitting diodes (OLEDs).

sensitising (*pharm.*)

sensitizing (AE)

The risk of allergic sensitization and the development of allergies varies with age.

sensitive to heat (*eng.*)

The researcher was not aware that his construction was sensitive to heat.

separating funnel (*chem.*)

A separating funnel is used for liquid-liquid extractions to separate the components of a mixture between two immiscible solvent phases of different densities, which are typically water and an organic solvent.

separation process (*chem. eng.*)
Common separation processes in chemical engineering are adsorption, centrifugation, chromatography, crystallisation, drying, extraction, filtration and sieving.

set screw (*eng.*)
The apprentice did not know which set screw he should engage.

setting time (*eng.*)
The man disregarded the setting time of the formulation.

settle, to (*eng.*)
The flocculated material was allowed to settle for 10 min prior to filtration.

settling tank (*eng.*)
The level sensors in the settling tanks of the waste water treatment plant did not work.

sewage (*eng.*)
Untreated sewage water from the mill was sent to the river.

sewer (*eng.*)
A leak in the sewer system was discovered by accident.

sewing machine (*eng.*)
The knowledge how to operate a sewing machine is not so widespread among men.

shackle (*eng.*)
Shackles are common construction elements.

shaft (*eng.*)
The shaft has a specific torque density of 10 Nm/mm^3.

share (*econ.*)
Everybody had contributed his share to the success of the project.

shavings (*eng.*)
Shavings can be converted into wood pellets.

SHE (*chem. eng.*)

Acronym/Abbreviation referral: see health, safety, environment

shear (*eng.*)

Shear is the deformation of materials when parallel internal surfaces slide past each another.

shear modulus (*eng.*)

The shear modulus (modulus of rigidity, G) of diamond is 480 GPa, whereas it is only 80 GPa for steel and 0.1 GPa for polyethlyene (room temperature). G is defined as the ratio of shear stress to shear strain.

shear strength (*eng.*)

Shear strength is an important parameter in material science. Ductile materials generally fail in shear (e.g. aluminum), whereas brittle materials (e.g. cast iron) fail in tension.

sheath (*eng.*)

The sheath is the outer layer of a cable.

sheathing (*eng.*)

By sheathing, he applied a weatherproof cladding to his house.

sheet metal (*eng.*)

Sheet metal is used for the production of cars.

shelf life (*pharm.*)

The shelf life of a product is influenced by its exposure to light and heat.

shielding gas (*chem. eng.*)

Nitrogen, carbon dioxide or argon can be used as shielding gas.

shift (*econ.*)

At shift handover, valuable information was lost.

shift supervisor, shift leader (*chem. eng.*)

The shift supervisor was responsible for a team of 6.

ship yard (*eng.*)

The boat was taken to the ship yard for maintenance.

shock absorber (*eng.*)

Screens for the removal of over- and undersized particles are equipped with shock absorbers so that they do not disturb the equipment close by.

shock wave (*eng.*)

An object moving at supersonic speed creates a shock wave.

shop floor (*chem. eng.*)

In contrast to white collar workers, blue collar workers in the process industries generally perform their tasks on the shopfloor.

short circuit (*eng.*)

The short circuit was caused by a broken glass inside a heating hood.

short term exposure limit (*chem. eng.*)

Acronym: STEL

STEL is the highest concentration permitted for short periods of time, generally 15–30 minutes.

short-pass filter (*eng.*)

A short-pass filter transmits wavelengths below a specific wavelength.

short-term exposure value (*chem.*)

Acronym/Abbreviation referral: see STEV

shotcrete (*eng.*)

Shotcrete can be applied on vertical and overhead surfaces.

shovel (*eng.*)

With the larger shovel, he could easily dig a hole into the ground.

shunt (*eng.*)

In electronics, a shunt is a device which allows electric current to pass around another point in the circuit.

shutdown, shut down (*chem.*)

Acronym: SD

The plant was shut down in a controlled way.

shutoff device, isolation valve, shutoff valve (*chem. eng.*)

The shutoff valve was stuck.

SI unit (*eng.*)

The SI system (International System of Units, SI from French "Système International d'Unités") has seven base units:

1) metre (m) for length,
2) kilogram (kg) for mass,
3) second (s) for time,
4) ampere (A) for electric current,
5) Kelvin (K) for thermodynamic temperature,
6) candela (cd) for luminous intensity, and
7) mole (mol) for the amount of substance.

Three nations have not officially adopted the SI system as their primary and sole measurement system: Liberia, Myanmar and the United States.

sickle (*eng.*)

Some country flags show a sickle.

side effect (*pharm.*)

Dolasetron ($C_{19}H_{20}N_2O_3$) is a well-tolerated drug with few side effects, e.g. headache, dizziness, and constipations.

side valve (*chem.*)

The engine was equipped with side valves.

sieve (*chem.*)

This sieve has 500 mesh.

SIF (*chem. eng.*)

Acronym/Abbreviation referral: see safety instrumented function

sign a contract, to (*econ.*)

The general manager refused to sign the contract.

SIL (*chem. eng.*)

Acronym/Abbreviation referral: see Safety Integrity Level

silencer (*eng.*)

Blowers that are installed inside a production building should be equipped wi th silencers.

silica, silicon dioxide (*chem.*)

Acronym: SiO2

Fibers for data transmission via light are produced from silica.

silicic acid (*chem.*)

Silicic acid is a general name f or compounds with the formula $[SiO_x(OH)_{4-2x}]n$. In dilute aqueous solutions, metasilicic acid (H_2 SiO_3), orthosilicic acid (H_4SiO_4), disilicic acid ($H_2Si_2O_5$) and pyrosilicic acid ($H_6Si_2O_7$) can be found. In the solid state, they condense to polymeric silicic acids.

silicon (*chem.*)

The Czochralski process is used to produce single crystals of semiconductors (e.g. silicon), metals and salts. Typical ingot diameters are 200 mm and 300 mm. The thickness of standard silicon wafers is 0.2 to 0.75 mm.

silicone, polysiloxane (*chem.*)

Silicone (not to be confused with silicon) consists of polymerized siloxanes (polysiloxanes). Silicones are mixed inorganic-organic polymers with the formula $[R_2SiO]_n$, where R stands for organic groups suc h as methyl, ethyl or phenyl, that are attached as side groups to an inorganic silicon-oxygen backbone (…-Si-O- Si-O-Si-O-…).

silk (*chem.*)

Silk is a natural protein fiber, i.e. a chain of amino acids.

single crystal, monocrystal (*chem.*)

Wafers are made from silicon single crystals. These can be obtained in the Czochralski process.

sink (*chem.*)

The sink must not be misused for solvents.

SIS (*chem. eng.*)

Acronym/Abbreviation referral: see Safety Instrumented System

sketch (*eng.*)
He captured his idea in a sketch inside his laboratory notebook.

skill (*general*)
Each employee should be deployed according to his individual skills to achieve optimum results.

skimmer (*chem. eng.*)
Skimmers are frequently used to remove oil floating on water.

skylight (*eng.*)
The skylight was properly dimensioned.

slide, to (slid, slid) (*eng.*)
The mercury droplets were sliding on the laboratory bench.

sliding friction (*eng.*)
The new tire causes lower sliding friction than the previous model.

slit (*eng.*)
At the slit, the waves were diffracted.

slope (*eng.*)
The slope of the ramp was 10°.

slot (*eng.*)
The student tried to model nitrogen conversion in a slot burner.

slotted (*eng.*)
A slotted spoon can be compared to a sieve.

slotted hole, slot hole (*eng.*)
The slotted hole showed sharp edges.

sludge (*chem. eng.*)
Sewage sludge cannot be readily used as a fertilizer.

sluice valve (*chem. eng.*)
Sluice valves normally have flanged ends.

slurry (*chem. eng.*)

Slurry pipelines are used to transport coal, copper, iron, bauxite and oil sands, but also trailings for disposal.

SM (*econ.*)

Acronym/Abbreviation referral: see sales margin

smear (*pharm.*)

She performed a smear test.

smear, to (*pharm.*)

He smeared the paint onto the wall.

smell (*chem.*)

The smell of natural gas comes from butanethiol (C_4H_9SH), which has a "skunk" odor.

smelter (*eng.*)

In a smelter, metal is obtained by reduction from its ore.

smoke (*chem.*)

Cigarette smoke contains more than 600 substances.

smooth (*eng.*)

A coupling is used for smooth engine power transmission.

snake venom (*chem.*)

Snake venom is a mixture of toxins and different enzymes used for other purposes like increasing the prey's uptake of toxins.

snap ring, retainer, circlip (*eng.*)

A circlip is a fastener that permits rotation, but prevents lateral movement.

SNCR (*chem. eng.*)

Acronym/ Abbreviation referral: see selective non-catalytic reduction

soap bubble (*eng.*)

A good recipe for soap bubbles consists of dishwashing detergent, glycerin and water in the ratio of 5:1:100.

soap stone (*chem.*)

Soap stone is largely composed of talc, which is a hydrated magnesium silicate with the chemical formula $Mg_3Si_4O_{10}(OH)_2$.

soda ash, soda (*chem.*)

Acronym: Na2 CO3

Soda ash, which is industrially produced in the Solvay process according to 2 NaCl + $CaCO_3$ → Na_2CO_3 + $CaCl_2$, can be found in the ash of many plants.

sodium (*chem.*)

Acronym: Na

Sodium has a cubic body centered crystal structure and melts at 98°C.

sodium dodecyl sulfate, sodium lauryl sulfate (*chem.*)

Acronym: SDS, NaDs

$NaC_{12}H_{25}SO_4$; SDS is an anionic surfactant used in many cleaning agents.

sodium hydroxide (*chem.*)

Acronym: NaOH

Sodium hydroxide, which can be bought as pellets, is deliquescent if exposed to air moisture. Also, it will absorb CO_2 and therfore has to be sealed for storage.

sodium hydroxide (*chem.*)

Acronym: NaOH

Unlike NaOH, the hydroxides of most metals are insoluble in water, so sodium hydroxide can be used to precipitate metal hydroxides.

sodium silicate, soluble glass, water glass (*chem.*)

An aquaeous solution of sodium metasilicate, Na_2SiO_3, is used in the "chemical garden".

SOF (*eng.*)

Acronym/Abbreviation referral: see solar occultation flux

soften, to (*chem.*)

Glass can be made from pure silica (SiO_2), but fused silica has a high glass transition point of approx. 1200°C. The softening temperature of glas s can be lowered, however, by adding lime ($CaCO_3$) and soda (Na_2CO_3) before melting, to incorporate calcium and sodium oxide into the glass.

softener (*chem.*)

Fabric softeners work by coating the surface of the cloth fibers with a thin layer of chemicals which act as lubricant and are electrically conductive, thus making the fibers feel smoother and preventing the buildup of static electricity. Typical softeners are based on quaternary ammonium salts wi th one or two long alkyl chains.

soil (*eng.*)

To determine the required length of the ground pillars, a soil investigation was performed.

solar occultation flux (*eng.*)

Acronym: SOF

SOF is a method to quantify emissions from point sources such as volcanoes or industrial production plants.

soldering (*eng.*)

For soldering, it is advantageous to use an eutectic alloy (e.g. 63% tin and 37% lead), because it is easier to obtain reliable joints.

solenoid (*chem.*)

The solenoid valve broke down.

solicitor (*jur.*)

attorney, attorney-at-law (AE)

An attorney is knowlegdeable about the jurisdiction in his country.

solid (*chem.*)

Aerogels are the lightest known solids. Their density can be below 2 kg/m^3.

solid solution (*chem.*)

In a solid solution, some atoms or molecules in a crystalline structure are partly substituted without a change in the structure.

solid state physics (*chem.*)

Electrical and thermal properties of condensed matter are described by solid state physics.

solid state reaction (*chem.*)

A solid-state reaction is a chemical reaction system in the absence of a solvent. Advantages can be easy purification, a high reaction rate and cost savings.

solid wood (*eng.*)

Furniture from solid wood is regarded as superior quality.

solidification (*chem.*)

Solidification usually starts at the surface, which is the coldest area.

solidify, to (*chem.*)

When a material starts to solidify, multiple crystals begin to grow in the liquid to yield a polycrystalline solid.

solubility (*chem.*)

When added to water, ethanol can act as solubility enhancer for trichloroethylene, a substance which was widely used as a degreasing agent and that can now be found in contaminated soil.

solute (*chem.*)

Glucose ($C_6H_{12}O_6$) is a solute in blood. The concentration of blood sugar is between 4 and 6 mM (mmol/l).

solvent (*chem.*)

Acetone (CH_3COCH_3), the simplest ketone, is a polar, aprotic solvent (i.e. does not release acidic hydrogen H^+). It dissolves most plastics.

soot (*chem.*)

Soot is a byproduct of fuel-rich combustion processes.

sophisticated (*general*)

He has developed a sophisticated formula to predict the yield of his reaction.

soundproofing (*eng.*)
Soundproofing can be achieved by noise reduction and noise absorption.

source (*general*)
She forgot to quote the source of her information.

space group (*chem.*)
There are 230 space groups to describe all possible crystal symmetries.

spacer (*chem.*)
The patent is about a molecular spacer that is covalently bonded to the substrate.

spacing (*chem.*)
In hexa-tert-butyldisilane, the s pacing between the 2 Si atoms is longer than in any other silane.

spare part (*eng.*)
For each critical process equipment, spare parts need to be kept on stock.

spark (*chem.*)
A spark caused by static electricity can ignite several gases.

spark plug (*eng.*)
A spark plug is used in internal combustion engines working on the Otto principle.

SPC (*chem. eng.*)
Acronym/Abbreviation referral: see statistical process control

speciality gas (*chem. eng.*)
specialty gases (AE)
The company sells over 30 speciality gases.

species (*chem.*)
CO, H_2O and OH are species present in flames.

specific density (*chem.*)
The specific density (relative density) of a substance is the ratio of its density to that of a given reference material, for instance air or water.

specific gravity (*chem.*)

Aluminium has a specific gravity of 2.7, so it is 2.7 times as dense as water. Lead has a specific gravity of 11.35, so it is 11.35 times as dense as water.

specifications (*econ.*)

The technical specifications of the plant were derived from laboratory experiments.

specifications,
product requirement
specifications (*econ.*)

The supplier handed over the draft of his product requirement specifications to the client for review.

specifications,
specification sheet,
functional specification,
customer requirement
specifications (*econ.*)

The specifications were based on the input of 2 engineers.

specimen (*chem.*)

The specimen was characterized by its emission spectrum.

specs. (*econ.*)

Acronym/Abbreviation referral: see specifications (short form for ~)

spectrometry (*chem.*)

Mass spectrometry is a sensitive technology to determine the mass/charge ratio of sample (fragments).

spectroscopy (*chem.*)

In spectroscopy, the interaction of light with matter is measured as emission, absorption or scattering in order to gain information on the sample.

speed (*eng.*)

The speed of ships is commonly stated in knots.

speed of sound (*eng.*)

The speed of sound in water and in steel is approx. 1,500 and 4,500 m/s, respectively.

sphere (*sci.*)

A sphere has a minimum surface/volume ratio.

splash proof (*eng.*)

Splash proof equipment is classified as IP54. The IP Code (International Protection Rating, Ingress Protection Rating) is an international standard that describes the degree of protection provided against the intrusion of solid objects, dust and water into electrical enclosures.

splash water (*eng.*)

When manual cleaning is performed in a plant, all electrical equipment must be protected against splash water.

splash, to (*eng.*)

Protective goggles avoid harm to the eyes from aggressive liquid splashes.

splice, to (*eng.*)
The technician spliced the two cables.

spoke (*eng.*)
Spokes can be made of different materials, depending on whether they have to withstand tension (e.g. bicycle wheel) or compression (horse carriage wheel).

spool (*eng.*)
The solenoid spool was malfunctioning.

spoonful (*chem.*)
She added a spoonful of pigment to the mixture.

spotting test (*chem.*)
The spotting test for Mo (Molybdenum) in CrNi steel can tell the materials 1.4401 and 1.4571 apart.

spray, to (*eng.*)
A protective coating was sprayed onto the conveyor belt.

spreadsheet (*eng.*)
The assistant prepared a spreadsheet with all costs.

spring (*eng.*)
A spring is described by Hook's law.

sprinkle, to (*chem.*)
He sprinkled the surface with powder.

spruce (*general*)
Spruce, an evergreen tree, is amongst the most important woods for paper manufacture.

square with (*eng.*)
The warehouse is sited square with the main road.

staff (*econ.*)
The staff was invited to visit the customer.

staggered (*eng.*)

The student drew the alkane in staggered conformation in Newman projection.

stagnant (*general*)

The nearly stagnant flow was observed.

stainless (*chem.*)

Stainless steel is used in all equipment that is directly exposed to the product.

standard deviation (*sci.*)

Acronym: σ

In case of a Gaussian distribution, 66% of all values fall within the mean +/- 1 standard deviation.

standard temperature and pressure (*chem. eng.*)

Acronym: STP

The current version of IUPAC's definition of STP is a temperature of 0°C (273.15 K, 32°F) and an absolute pressure of 100 kPa (14.504 psi).

stannous (*chem.*)

Acronym: Sn

Stannous fluoride (tin(II) fluoride) is a common ingredient in toothpaste, because it converts apatite into fluoroapatite in the enamel.

starboard (*eng.*)

Starboard is the right side of a ship (green navigation light). The left side is referred to as port (red navigation light).

starch (*chem.*)

The carbohydrate starch $(C_6H_{10}O_5)_n$) is a polysaccharide. It is a polymer of glucose monosaccharide joined together by glycosidic bonds. Starch has 2 components: amylose (linear polymer of glucose) and amylopectin (highly branched polymer of glucose).

start up, to start-up (*chem. eng.*)

Starting up a cracker can take several days.

starting torque (*eng.*)

The extruder was heated to 240°C to lower the starting torque.

state of matter (*chem.*)

Plasma is the fourth state of matter.

state of the art, state-of-the-art (*eng.*)

In patent law, the state of the art or "prior art» is the starting point to assess the novelty of an invention.

state variable (*chem. eng.*)

State variables (state parameters, thermodynamic variables) describe the momentary condition of a thermodynamic system. Examples are pressure, temperature, mass, density, entropy and enthalpy.

state friction (*eng.*)

The coefficient of static friction between steel and steel was determined as 0.8 in case of dry surfaces and as 0.3 in the presence of a thick oxide layer.

statistical process control (*chem. eng.*)

Acronym: SPC

Using SPC tools, the product quality could be improved significantly.

steam (*chem.*)

Plants that have oversized boilers and steam distribution systems should investigate a steam pressure reduction in order to save energy.

steam boiler (*chem. eng.*)

Steam boilers fall under the pressure vessel directive and therefore have to meet certain minimum requirements.

steam engine (*eng.*)

A steam engine can convert heat from almost any source into mechanical work. Without steam condensation, the efficiency is on the order of 1-10% (historic steam locomotives) compared to 85-90% for power plants that use steam in cogeneration.

steam reforming (*chem. en g.*)

In steam reforming, the following endothermic reaction takes places: $C_nH_{2n+2} + nH_2O \rightarrow nCO + (2n+1)\ H_2$.

steel (*chem.*)

Steel is an alloy consisting mostly of iron, where the carbon content lies below 2% by weight. The global steel production surpasses 1.5 billion tonnes/year.

steel refining (*chem. eng.*)

steel refining, vacuum can be applied to remove unwanted gaseous components such as hydrogen before further processing.

steel wool (*eng.*)

Because of its high surface area, steel wool can be ignited with a lighter.

steelmaking (*eng.*)

Some people say that steelmaking is more an art than a science.

steelmaking plant (*eng.*)

The profitability of a steelmaking plant is driven by its production costs.

STEL (*chem.*)

Acronym/Abbreviation referral: see Short Term Exposure Limit

stencil (*eng.*)

The labelling of the silos was done with a stencil.

sterilise, sterilize, to (*pharm.*)

sterilize, to (AE)

Ultraviolet light was used to sterilize (i.e. to completely eliminate all microorganisms) the tools.

STEV (*chem.*)

Acronym/Abbreviation referral: see STEL

sticky (*chem.*)

The first adhesives were natural sticky substances such as plant resins or saps.

stimulant (*pharm.*)

Caffeine ($C_8H_{10}N_4O_2$) and nicotine ($C_{10}H_{14}N_2$) are two common stimulants.

stirrer tank,
stirrer vessel,
stirred tank,
stirred vessel (*chem. eng.*)

The key process variables of the stirrer tank (residence time, volume, temperature, pressure, species concentrations and heat transfer coefficients) were specified in the kick-off meeting.

stock solution (*chem.*)

A stock solution is generally a concentrated solution which will be diluted for actual use. Their use helps to save preparation time and storage space. Also, they can improve the accuracy of an analysis.

stock(s) (*econ.*)

At company A, employees are entitled to free stock.

stockpile (*chem.*)

The sulphur stockpile was ready for transportation.

stoichiometric (*chem.*)

The air/fuel eqivalence ratio lambda is 1 for a stoichiometric mixture.

stop valve (*chem. eng.*)

The stop valve was designed for a pressure of 100 bar.

stopcock (*chem. eng.*)

The stopcock made from glass did not move any more, because the sodium hydroxide had reacted with the glass to form sodium silicate.

stopper (*pharm.*)

He used a ground glass stopper to temporarily seal the flask.

stopper plug (*chem.*)

The stopper plug in the drain was not tight any more due to corrosion.

stopping device (*chem.*)

He placed a stopping device in front of the door to prevent it from closing.

storage (*general*)

The storage of combustible material has to meet certain regulations.

stove (*chem.*)

In order to store the heat, the stove was surrounded by soapstone.

STP (*chem.*)

Acronym/Abbreviation referral: see standard temperature and pressure

strainer (*eng.*)

The strainer was blocked with rust particles.

streak (*general*)

She carefully tried to remove the streaks from the lens.

strength (*eng.*)

The strength of the connection was overestimated.

stress (*eng.*)

In material science, stress can be defined as the average amount of force exerted per unit area (SI unit: Pa).

stress cycle (*eng.*)

She investigated the effect of stress cycle frequency upon fatigue and corrosion of the alloy.

stress strain curve (*eng.*)

The stress strain curve of a material shows the relationship between stress (based on the applied force), and strain (derived from the deformation of the sample such as elongation, compression or distortion). Ductile and brittle materials behave differently.

stress whitening (*chem. eng.*)

The formation of white areas in a deformation process of a polymer article, created by microvoids in the material, is called stress whitening. It is especially critical for polypropylene.

stretch, to (*eng.*)

The rubber ribbon was stretched until it tore.

strip chart (*chem.*)
The housewife used a stripchart to determine the hardness of her water.

strip, to (*chem.*)
By steam stripping, polycyclic aromatic hydrocarbons (PAH) can be removed from harbor soils.

stroke (*eng.*)
The car has got a 4 stroke engine.

structural change (*chem.*)
The metastable phase underwent a structural change when it was heated.

stud (*eng.*)
The mechanic was looking for a suitable stud.

study (*general*)
A feasibility study typically ends up at a cost estimation of +/- 40%.

stuff (*general*)
Foodstuff production has to follow several strict regulations.

stupor (*med.*)
Vitamin D deficiency can cause stupor.

subcontractor (*econ.*)
The work of subcontractors is difficult to assess.

submarine (*eng.*)
On submarines, CO_2 has to be filtered out of the air.

submerged (*eng.*)
After the heavy rainfalls, parts of the cellar were submerged in water.

submersible pump (*chem. eng.*)
A submersible pump is a pump which has a hermetically sealed motor.

subsidiary (*econ.*)
Foreign subsidiaries are often controlled by the headquarters.

subsidy (*econ.*)

Extensive subsidies were granted for companies who decided to move to the region.

substance (*chem.*)

To the over 100 million organic and inorganic chemical substances that have a CAS Registry Number (CASRN), several thousand new substances are added every day.

substation (*eng.*)

The substation was placed next to the production hall.

succinic acid (*chem.*)

Succinic acid, a dicarboxylic acid, has the formula $C_4H_6O_4$.

succussion (*pharm.*)

"Dynamisation" or "potentisation" is a process used by homeopaths whereby a remedy is diluted with alcohol or water and then vigorously shaken by ten hard strikes against an elastic body, which is called "succussion".

suck off, to (*eng.*)

In welding processes, fumes have to be sucked off.

suction filter, (*chem.*)
Büchner funnel,
Buechner funnel

A Büchner funnel is used for suction filtration with a piece of filter paper as filter medium.

suction pressure (*eng.*)

The pump can provide a suction pressure of 200 mbar.

sulfuric acid (*chem.*)

The largest fraction of the more than 150 million tonnes/year of sulfuric acid that are produced worldwide is used for ore processing and fertilizer manufacturing.

sulphur (*chem.*)

sulfur (AE)
Acronym: S
Thioethers (R-S-R') are the sulfur equivalents of ethers (R-O-R'). While ethers are relatively stable, thioethers are easily oxidized to the sulfoxides (R-S(=O)-R'), which can be further oxidized to sulfones ($R\text{-}S(=O)_2\text{-}R'$).

sundry costs (*econ.*)

The cost estimation did not consider sundry costs.

superconductor (*sci.*)

Transformers, power storage devices, magnetic levitation devices and motors are promising future applications of superconductors.

supercooled (*chem.*)

Water can be supercooled to -42°C.

supercritical (*chem.*)

CO_2 behaves as a supercritical fluid above its critical temperature of 31.1°C and its critical pressure of 72.9 bar. When used as a solvent, supercritical CO_2 does not denature most substances due to the low temperatures involved.

superficial (*general*)

He took a superficial look at the article.

superfund (AE) (*chem. eng.*)

Superfund is the common name for CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act).

superheated (*chem.*)

Superheated water is liquid, pressurized water at temperatures between the boiling point (100°C) and the critical temperature (374°C).

superheated steam (*chem.*)

Superheated steam and liquid water cannot coexist under thermodynamic equilibrium.

superheater (*eng.*)

A superheater in a boiler increases the capacity of the plant and reduces the steam consumption of the steam turbine.

supernatant (*chem. eng.*)

Traces of mineral oil were discovered in the supernatant.

supersaturate, to (*chem.*)

Both liquids and gases can become supersaturated. An example are scuba divers' tissues that become supersaturated with N_2. If the divers ascend too fast, the N_2 forms bubbles, resulting in decompression sickness.

supersonic (*eng.*)

The Concorde was a commercial supersonic jet.

supplier (*econ.*)

Suppliers, customers, shareholders and employees are some of the relevant stakeholder groups of a corporation.

supply line, supply pipe, feed, forerun (*chem. eng.*)

The supply line was manufactured from stainless steel.

suppository (*pharm.*)

Suppositories can be based on a greasy substance such as cocoa butter, in which the active ingredient and other excipients are dissolved. They can also be made from a water soluble base such as polyethylene glycol (PEG). Suppositories are used for rectal administration.

surface (*chem.*)

SERS (surface enhanced Raman spectroscopy) is a technique to gain information about the surface of a sample.

surface mining (*eng.*)

In contrast to underground mining, all overburden (overlying rock and soil) has to be removed in surface mining. Surface mining is necessary for materials that do not allow tunneling such as sand or gravel.

surface tension (*eng.*)

It is surface tension and not buoyancy that prevents a water strider from sinking.

survey (*general*)

She did not participate in the survey because she felt that she would not stay anonymous.

susceptible (*general*)

Steel under water is susceptible to corrosion.

suspension point (*eng.*)

The suspension point was chosen to balance the load.

sustainable (*general*)

The engineer did not consider the work instruction for operators a sustainable solution to prevent the incident from reoccurring.

sweetener (*pharm.*)

Aspartame (Aspartyl-phenylalanine-1-methyl ester) is an artificial sweetener. The compound is a methyl ester of the dipeptide of aspartic acid and phenylalanine, 2 amino acids. Phenylalanine is an a-amino acid with the formula $HO_2CCH(NH_2)\ CH_2C_6H_5$.

switch (*eng.*)

The woman activated the switch.

swivel arm (*eng.*)

The swivel arm proved to be a major improvement.

synthesis (*chem.*)

The dream of many organic chemists is the synthesis of a new blockbuster drug.

synthon (*chem.*)

Carbon dioxide, carbon monoxide and cyanide are C1 synthons. Acetylene and acetaldehyde are C2 synthons.

syringe (*pharm.*)

A glass syringe can be used to inject small samples (1–10 μl) into a gas chromatograph or mass spectrometer.

T&C (*econ.*)

Acronym/Abbreviation referral: see general terms and conditions

T&G (*eng.*)

Acronym/Abbreviation referral: see tongue and groove

TA (*chem.*)

Acronym/Abbreviation referral: see turnaround

tablet (*pharm.*)

A tablet is a mixture of active substances and excipients (e.g. binders, flavours, pigments) compressed to a small solid.

tabular (*eng.*)

Talc is composed of tabular particles.

tag (*chem. eng.*)

In a chemical plant, a tag is a unique code defining the location and function of a physical component in an installation.

tagging (*chem. eng.*)

The project team started tagging of the plant.

tail fin (*eng.*)

Airlines have their logos painted on the tailfins of their aircraft.

tailrace (*eng.*)

The race bringing water to the water wheel is called headrace. The one carrying water away from the wheel is the tailrace.

talc (*chem.*)

In plastics compounds, talc influences the shrinkage behaviour of the product.

tamper proof seal (*pharm.*)

A tamper proof seal on a tablet packaging prevents unnoticed opening.

tamper-resistant (*pharm.*)

Packages which cannot be resealed are considered tamper-resistant.

tantalum (*chem.*)

Acronym: Ta

Unlike gold, tantalum is not dissolved by aqua regia.

tap (*eng.*)

The water tap was dripping for months before it was repaired.

tapped coil (*eng.*)

The transformer has 2 tapped coils made from copper.

tapped hole (*eng.*)

The tapped hole was suitable for M6 bolts.

tar (*chem.*)

Tar is obtained by destructive distillation of organic matter such as coal, petroleum or wood, often as a byproduct. Destructive distillation is the process of pyrolysis carried out in a distillation apparatus where the volatile products are collected and the tar remains in the bottom.

tar pitch (*chem.*)

Pitch that is made from petroleum is called bitumen.

tare (*eng.*)

The tare is the weight of an empty container, vessel or vehicle. Gross weight minus tare = net weight (weight of the goods loaded).

tartaric acid (*chem.*)

Tartaric acid, which is one of the main acids in wine, is added to some foods as an antioxidant. $C_4H_6O_6$ is chiral, meaning that it has molecules which cannot be superimposed on their mirror-images.

task force (*econ.*)

The task force did not have a clear mandate.

tax (*econ.*)

Value added tax is between 10 and 30% in most countries.

TBR (*chem. eng.*)

Acronym/Abbreviation referral: see trickle bed reactor

TCO (*econ.*)

Acronym/Abbreviation referral: see total costs of ownership

technical (*eng.*)

For technical reasons, the throughput was reduced.

technical indicative concentration (*chem.*)

The technical indicative concentration for butadiene is 5 ppm.

technician (*eng.*)

The technican could fix the problem with the transducer easily.

technique (*eng.*)

Filtration is a widespread sample purification technique.

technology (*eng.*)

Wireless communication is an emerging technology.

tee (*general*)

A legal golf tee must not be longer than 4 inches (~102 mm), and it must not indicate the line of play or influence the movement of the ball.

telemetry (*eng.*)

Telemetry is used in industrial production plants.

temper, to (*eng.*)

Like annealing, tempering is a heat treatment technique for metals and alloys. Steel can be tempered to render it more tough by transforming brittle martensite into bainite or a combination of ferrite and cementite.

template (*general*)

Using a template can save a considerable amount of time.

temporary (*general*)

The temporary work permit was already expired.

tender (*econ.*)

After the invitation to bid, 5 tenders were received.

tendering, call for bids (*econ.*)

The tendering (call for bids) process took 3 months.

tensile (*eng.*)

The instrument measures tensile deformation.

tension (*eng.*)

Tension, the pulling force exerted by a cable or chain, is measured in Newton, the SI unit of force [kgm/s^2]. It always acts parallel to the string by which it is applied.

teratogenic (*med.*)

The following chemicals are known or suspected teratogenic substances: 1,3- butadiene, cadmium oxide, ethyl benzene, ethylene glycol, and styrene.

terpolymer (*chem.*)

A terpolymer consists of polymer chains composed of three distinct monomers such as vinyl chloride (CH_2=CHCl), vinyl acetate ($CH_3COOCH=CH_2$) and maleic acid (COOH -CH=CH-COOH).

test piece (*eng.*)

Test pieces that were produced under varying conditions will distort the results.

test tube (*chem.*)

Test tubes can be found in most laboratories.

tetrahedron (*chem.*)

A tetrahedron is a triangular pyramid with a dihedral angle of 70.53°. It is composed of 4 triangles.

tetravalent (*chem.*)

Carbon is a tetravalent atom.

thaw, to (*chem.*)

If the Russian permafrost soil started to thaw, methane would be liberated. Permafrost is defined as soil at or below the freezing point of water (0°C, 32°F) for at least two years.

theoretical plate (*chem. eng.*)

In order to improve the separation, the number of theoretical plates in the column should be increased.

theory (*sci.*)

A good theory describes a model which is derived from experimental data.

thermocouple (*eng.*)

The thinner a thermocouple is constructed, the faster its response time can be.

thermoplastics (*chem.*)

Thermoplastics are polymeric materials without crosslinking. They can be brought into a defined shape in the liquid state (melt) by e.g. injection moulding or extrusion.

thermoset (*chem.*)

Thermosets are crosslinkable or crosslinked polymeric materials that, unlike thermoplastics, cannot be formed in the molten state.

thermowell (*eng.*)

A temperature sensor sitting in a thermowell generally has a slower response than an in-situ temperature sensing device.

thesis (*sci.*)

He wrote a cumulative thesis composed of 8 journal articles.

thickening (*chem.*)

In cooking, starch is a common thickening agent. Starch, a carbohydrate with the formula $(C_6H_{10}O_5)_n$, is a polysaccharide.

thin fluid, low viscosity (chem.)

The viscosity of water at 20°C is 1×10^{-3} Pa·s. Compared to glycerol (viscosity of 1.5 Pa·s), water is a low viscosity liquid. The study of viscosity is known as rheology.

thread (*eng.*)

The droplet was suspended on a thin thread.

thread gauge (*eng.*)

The thread gauge did not fit, because it belongs to a different standard.

three way stopcock (*chem.*)

He could not find a supplier for a three way stopcock made from Teflon™.

three way valve (*chem. eng.*)

Three -way valves have three ports.

threshold (*eng.*)

Below the threshold current, a laser does not emit light.

threshold limit value (*eng.*)

Acronym: TLV

TLV is the airborne concentration of a substance below which no adverse effect in people is observed. One can distinguish between

* TLV-C (ceiling limit, concentration that should not be exceeded even instantaneously).
* TLV-STEL (short term exposure limit, maximum concentration for a continuous 15-minute exposure period).
* TLV-TWA (time-weighted average, concentration for a normal 8-hour work day or 40-hour work week).

threshold value (*eng.*)

The threshold value that the oxygen sensor can detect is 0.5%.

throat lozenge (*pharm.*)

A throat lozenge is a small, medicated candy to soothe irritated tissues of the throat, e.g. from an influenza.

throttle, to (*eng.*)

In order to slow down the polymerization reaction, the feed of the catalyst was throttled.

through-hole (*eng.*)

In contast to a blind hole, a through-hole goes all the way through the substrate.

throughput (*chem. eng.*)

The throughput of the plant was limited by the raw material conveying.

thrust (*eng.*)

The thrust of the engine is 135 kN.

tie rod (*eng.*)

The spokes of bicycle wheels are tie rods.

tie-in point (*chem. eng.*)

The tie-in points for cooling water and instrument air were not shown on the layout diagram.

tighten, to (*eng.*)

Screws on vibrating machinery have to be tightened from time to time.

tile (*eng.*)

Tiles break easily when there is a cavity below them.

tilted (*eng.*)

The water ran down the tilted board.

Time Weighted Average (*chem.*)

Acronym: TWA

TWA is the average amount of an agent's concentration over a specified period of time, usually 8 hours.

tin (*chem.*)

Acronym: Sn

Tin (atomic number 50) is the element with the greatest number of stable isotopes (ten). There are 28 additional unstable isotopes.

tin can, tinned can (*eng.*)

A tin can combines the physical strength and relatively low price of steel with the corrosion resistance of tin. Similar properties can be reached by aluminium, though.

tin pest (*chem.*)

Below 13.2°C, pure tin transforms from the allotrope of white tin (ß-modification, ductile) to grey tin (a-modification, brittle). Eventually, it decomposes to powder, which is known as tin pest.

tissue (*eng.*)

Tissue paper is a special thin, translucent paper that is used for wrapping various items.

titer (*chem.*)

The titer deviated by 12% and had to be discarded.

titrimetric standard (*chem.*)

Benzoic acid (C_6H_5COOH) was used as titrimetric standard.

TLV (*chem.*)

Acronym/Abbreviation referral: see threshold limit value

toe (*eng.*)

Acronym/Abbreviation referral: see tonne of oil equivalent

ton (*eng.*)

The chemicals were transported in a plastic ton.

tongue and groove, key and slot (*eng.*)

Acronym: T&G

Tongue and groove joints are common for fitting together boards of wood, e.g. for a parquet floor.

tonnage (*general*)

Harbour dues are generally based on tonnage.

tonne of oil equivalent (*eng.*)

Acronym: toe

The tonne of oil equivalent (toe) is a unit of energy: It corresponds to 41.87 GJ or 11.63 MWh.

tonne, metric tonne (*eng.*)

Acronym: t, MT

The tonne of trinitrotoluene (TNT, $C_6H_2(NO_2)_3CH_3$, 2,4,6-Trinitrotoluene) is used as a proxy for energy.

tool (*eng.*)

The workers had brought along their own tools.

toothed wheel (*eng.*)

The toothed wheel could withstand a torque of 500 Nm.

torque (*eng.*)

The engine has a torque of 50 Nm at 2,000 rpm.

total costs of ownership (*econ.*)

Acronym: TCO

In an investment project, it is advisable to judge different vendors based on the total costs of ownership of their equipment.

toxic (*chem.*)

Botulinum toxin, a protein which is produced by the bacterium clostridium botulinum, is one of the most toxic naturally occurring substances.

trace analysis (*chem.*)

In trace analysis, detection limits below 1 µg/kg (1 ppb) can sometimes be achieved.

trace constituent (*chem.*)

Ozone (O_3) is a trace constituent of the atmosphere.

trade fair (*eng.*)

A trade fair is a good opportunity to get an overview about competitors.

trademark (*econ.*)

Trademark infringem ents can lead to serious legal action.

trailer (*econ.*)

A trailer is generally an unpowered vehicle pulled by a powered vehicle.

transducer (*eng.*)

A transducer is an electric or electronic device that transforms energy from one manifestation into another, e.g. pressure into a current signal.

transesterification (*chem.*)

Transesterification is the process of exchanging the alcohol group of an ester by a different one according to: R'OH+R"COOR → R"OH+R'COOR. The process is used in the synthesis of polyesters, in which diesters undergo transesterification with diols to form macromolecules. For example, dimethyl terephthalate and ethylene glycol react to form polyethylene terephthalate (PET) and methanol (CH_3OH).

transient (*chem.*)

Radicals are transient species.

transition metal (*chem.*)

Many interesting properties of the transition metals are the result of their partly filled d subshells.

translucent (*eng.*)

Thin metal films are translucent.

transmission (*eng.*)

Power transmission at high voltage is associated with lower losses than at medium voltage.

transmission gear (*eng.*)

The transmission gear accounts for 25% of the total weight of his car.

transmitter (*eng.*)

The pressure transmitter seemed to be defect.

transshipment, transhipment (*econ.*)

Negotiations about a new transshipment center in China failed.

trial (*eng.*)

The trials did not prove his theory.

triangular file (*eng.*)

To finish the corners, she used a triangular file.

trickle bed reactor (*chem. eng.*)

Acronym: TBR

A TBR is a three-phase reactor that consists of flow of liquid and gas with a fixed bed of catalyst. It is often used in the petroleum industry for hydroprocessing of oils.

tripod (*eng.*)

The photographer was looking for his tripod.

tripotic (*chem.*)

Citric acid (2-hydroxypropane-1,2,3-tricarboxylic acid, $C_6H_8O_7$) is a weak organic acid. It is triprotic.

trituration (*pharm.*)

Trituration, a process in homeopathy, is the grinding of powders in a mortar with a pestle.

trityl (*chem.*)

In organic chemistry, a trityl group is a triphenylmethyl group Ph_3C (example: triphenylmethyl chloride = trityl chloride).

troy ounce (*eng.*)

Acronym: ozt, oz (tr)

One troy ounce (ozt) weighs 31.10g, which is approx. 10% more than the avoirdupois ounce (oz), which is 28.35 g.

truncated cone (*sci.*)

The foundation of the building looks like a truncated cone.

tubular heat exchanger (*chem. eng.*)

The tubular heat exchanger could be cleaned faster than the previously installed plate heat exchanger.

tungsten (*chem.*)

Acronym: W

Of all pure metals, tungsten has the highest melting point with 3422 °C.

turbid (*eng.*)

The solution is passed through a filter to remove the turbid appearance.

turbulence (*eng.*)

The Reynolds number describes the transition from a laminar to a turbulent flow.

turn key, turnkey (*chem. eng.*)

A turn key installation of a (chemical) plant is a lump sum contract under which the contractor engineers, delivers and installs the facility until it is ready for operation.

turnaround (*chem. eng.*)

Acronym: TA

A turnaround is a scheduled stop of a plant for maintenance purposes. The plant is brought to a safe status, including making it gas -free to allow work in relevant areas.

turnbuckle (*eng.*)

A turnbuckle is a device for adjusting the tension or length of ropes and cables.

turnover (*econ.*)

The company's turnover quadrupled wi thin 2 years.

turnover rate (*econ.*)

The turnover rate could be accelerated from 40 to 25 days.

turnstile (*general*)

A turnstile cannot be used as an emergency exit.

tuyère (*chem. eng.*)

Blast furnaces have several tuyères through which the hot blast is injected into the furnace. Tuyères are usually made from copper (melting point 1084 °C) and cooled by a water jacket.

TWA (*chem.*)

Acronym/Abbreviation referral: see Time Weighted Average

tweezers (*sci.*)

The scientist carefully picked up the sample with his tweezers.

twenty-foot container, 20-ft container (*eng.*)

The capacity of a container ship is measured in Twenty -foot Equivalent Unit (TEU), which is the number of standard 20-foot containers that it can carry. One 20-ft container measures 20 × 8.0 × 8.5 feet (6.1 × 2.4 × 2.6 m^3). Most containers used today measure 40 feet (12 metres) in length.

twist (*eng.*)

An inlet valve is designed to give some twist to the gas entering the combustion chamber.

UEL (*chem.*)

Acronym/Abbreviation referral: see upper explosive limit

UL (*chem. eng.*)

Acronym/Abbreviation referral: see Underwriters Laboratories

unambiguous (*general*)

Asbestos was unambiguously proven to be a cancerogen.

unbreakable (*eng.*)

Laboratory glassware made out of virtually unbreakable glass would be very handy.

undergraduate (*sci.*)

The lecture was easy to understand for undergraduate students.

underground mining (*eng.*)

Underground mining is carried out in depths exceeding 3,700 meters, for instance in the Savuka gold mine in South Africa.

underpressure (*eng.*)

Silos are normally designed to withstand an underpressure of 10 mbar.

Underwriters Laboratories (*general*)

Acronym: UL

UL is an American product safety testing and certification organization. It evaluates products and materials for compliance to specific requirements, and permits acceptable products to carry a UL certification mark, as long as they remain compliant with the standards. Such products are said to be "UL Listed".

undiluted (*chem.*)

The student poured undiluted glycerine into the flask.

uniform (*general*)

The company follows an engineering policy so that all plants have uniform safety systems.

uninterrupted power supply, uninterruptile power supply (*eng.*)

Acronym: UPS

The UPS was designed to supply power for 15 minutes.

union (*econ.*)

Unions in Scandinavia are very powerful.

unit (*chem.*)

The SI unit of length is meter (m).

unit operation (*chem.eng.*)

Mixing, crystallisation, adsorption and drying are unit operations.

United States Adopted Name (*pharm.*)

Acronym: USAN

United States Adopted Names are unique nonproprietary names assigned to pharmaceuticals marketed in the United States. An example is paracetamol (INN), which is called acetaminophen (USAN) in the US.

unload, to (*eng.*)

The cargo was unloaded from the ship.

unskilled worker (*general*)

By following training courses, the unskilled worker qualified himself for a better job.

untight (*eng.*)

Untight pipelines can contaminate the environment.

upmanning (*econ.*)

The additional orders of the last months necessitated upmanning of the plant by 10%.

upper explosion limit (*chem.*)

Acronym/Abbrevation referral: see upper explosive limit

upper explosive limit (*chem.*)

Acronym: UEL

The UEL of hydrogen is ~77%.

upright (*eng.*)

The steel structure was brought into an upright position.

UPS (*eng.*)

Acronym/Abbreviation referral: see uninterrupted power supply

upstream (*chem. eng.*)

Fractionated distillation occurs upstream of fuel blending.

urea (*chem.*)

Urea, NH_2CONH_2, is used as a raw material for the production of melamine.

uric acid (*chem.*)

Uric acid, $C_5H_4N_4O_3$, is a heterocyclic compound.

USAN (*pharm.*)

Acronym/Abbreviation referral: see United States Adopted Name

USCSB (*chem.*)

Acronym/Abbreviation referral: see CSB

used paper (*general*)

In many countries, used paper from households is collected and recycled.

utilities (*chem. eng.*)

Typical utilities in a plant are water, compressed air, nitrogen, electricity and steam.

utility boiler (*chem. eng.*)

Utility boilers are used to produce steam.

value (*general*)

The value reported by the lab confirmed the first analysis.

value creation (*econ.*)

In order to offer attractive products, the value creation of a company's customers has to be understood.

value engineering (*chem. eng.*)

By value engineering, the process could be simplified and the investment costs reduced by 5%.

valve (*chem. eng.*)

After the acquisition of the valve manufacturer, the quality of his parts improved.

valve seat (*eng.*)

The valve seat is the surface against which the intake and exhaust valves of an internal combustion engine rest.

valve, instrument (*chem.*)

The instruments were labelled.

vanilla pod (*chem.*)

vanilla bean (AE)

Vanillin (4-hydroxy -3-methoxybenzaldehyde, $C_8H_8O_3$) is contained in vanilla pods.

vaporize, to (*chem.*)
vaporise, to

vaporize, to (AE)

To vaporize a substance, the heat of vaporization (latent heat) has to be supplied.

vapour (*chem.*)

vapor (AE)

Unrefined oil has a high vapour pressure due to the presence of substances like propane.

vapour lock (*eng.*)

vapor lock (AE)

If normal diesel fuel is used in some aircraft engines instead of kerosene, dangerous vapour locks in the fuel lines can occur.

vapour pressure (*chem.*)

vapor pressure (AE)

According to Raoult's law, the vapor pressure of an ideal solution can be derived from the vapor pressure of each chemical component and the mole fraction of the components present in the solution.

variable costs (*eng.*)

The target for this quarter was to cut the variable costs by 5%.

varnish (*chem.*)
A varnish is a transparent, hard, and protective film applied to wood as a protection from environmental effects.

vendor package (*econ.*)
The air supply system should be bought as a complete vendor package.

venom (*chem.*)
The dose of a bee sting is approximately 0.1 mg of venom per "shot".

vent, to (*chem. eng.*)
The exhaust gases are vented outside the production hall.

ventilation (*eng.*)
In production halls, natural ventilation is generally not sufficient.

venting (*chem. eng.*)
Venting of explosion panels has to be directed towards unconfined space.

vertigo (*med.*)
Formaldehyde can cause coughing, dyspnea, headache and vertigo.

vessel (*eng.*)
The vessel was coated with enamel.

vial (*pharm.*)
The vial was filled with 100 ml of hydrochloric acid.

vice (*eng.*)
When it fell onto the floor, the vice left behind a big hole.

visbreak, to (*chem. eng.*)
Peroxides can be used for the visbreaking of polymers.

visbreaking (*chem. eng.*)
Visbreaking is an important process to obtain olefins.

viscous (*eng.*)
The reaction product was so viscous that it could hardly be removed from the flask.

visible (*chem.*)

Visible light ranges from approx 400 nm (red) to 800 nm (blue).

visualisation (*eng.*)

visualization (AE)

The visualisation in the control room was overloaded with information.

vitiate, to (*eng.*)

The river was vitiated by various effluents.

vitiated air pipe (*eng.*)

The vitiated air pipe was 15 m long.

VOC (*chem.*)

Acronym/Abbreviation referral: see volatile organic compounds

volatile (*chem.*)

Hexane is more volatile than octane.

volatile organic compounds (*chem.*)

Acronym: VOC

Trees are an important biological source of VOC; it is known that they emit large amounts of VOC, especially isoprene (2-methyl-1,3-butadiene, C_5H_8) and terpenes ((C_5H_8) n).

volumetric standard (*pharm.*)

A volumetric standard has to be stored in a way that its concentration remains constant.

vortex (*eng.*)

Directly downstream of the hydropower plant, strong vortices could be spotted in the water.

WACC (*econ.*)

Acronym/Abbreviation referral: see weighted average cost of capital

wage garnishment (*econ.*)

He tried to avoid wage garnishment by selling his car.

warehouse (*econ.*)

The insurance company insisted on an upgrade of the fire protection system in the warehouse.

warpage (*eng.*)

Warepage is an undesired shape change of an injection-moulded article due to anisotropic shrinkage during cooling down.

warranty (*econ.*)

For new products, consumers get a warranty for 2 years.

wash bottle (*chem.*)

The wash bottle was used to remove liberated HCl from the reaction.

washer (*eng.*)

Washers are commonly used as spacers. Also, they distribute load more evenly.

waste heat (*chem. eng.*)

Waste heat can be minimized by using cogeneration.

waste incineration (*chem. eng.*)

In a modern waste incineration plant, the flue gas treatment systems are more complex than the plant as such.

waste water (*chem. eng.*)

Wastewater is a collective term for any water which has been contaminated by anthropogenic influence.

water gas (*chem.*)

Water gas is a synthesis gas that contains carbon monoxide and hydrogen. It can be produced by passing steam over red-hot coke.

water jet (*chem.*)

For water jet cutting, plain water jets and abrasive water jets that contain abrasive particles can be used.

water level, spirit level (*eng.*)

The bricklayer used a water level.

water repellent (*pharm.*)

The wall was rendered water- repellent by a PVC coating.

water softening (*pharm.*)

Citric acid ($C_6H_8O_7$) is used in soaps for water softening.

waterproof, watertight (*chem.*)

Standard concrete is not waterproof.

waterproofing (*eng.*)

Waterproofing of the basement was achieved by applying an HDPE membrane to the walls.

wave (*chem.*)

Waves of electromagnetic radiation can travel through vacuum. They propagate at the speed of light (299,792,458 m/s).

wave number (*chem.*)

In contrast to the wavelength, the wave number is directly proportional to the energy of a photon. A wavelength of 10 μm corresponds to a wave number of 1000 cm-1.

wavelength (*chem.*)

Acronym: λ

An acoustic wave in air of 500 Hz has a wavelength of 0.68 m, travelling at 343 m/s (20°C).

wear and tear (*eng.*)

Wear and tear are excluded from vendor warranties.

weathering (*eng.*)

Weathering has turned the wood surface to a greyish color.

wedge (*eng.*)

The door was arrested with a wedge.

weighted average cost of capital (*econ.*)

Acronym: WACC

The WACC is the minimum rate that a company needs to earn on its capital employed (which has different sources: debt and equity). It is the minimum return that a company must earn in order to satisfy its creditors (debt) and owners (equity).

welding (*eng.*)

To ensure a lasting connection, the steel pipes were welded together.

well (*eng.*)

The landlord had the nitrate content in the water from his well measured.

wet steam (*chem.*)

Wet steam reduces the thermal efficiency of a steam engine.

wet, to (*chem.*)

A hydrophobic surface is non-wettable for water.

white collar worker (*econ.*)

The fraction of white collar workers in his company is 35%.

wholesale customer (*econ.*)

Wholesale customers typically benefit from different payment terms than retail customers.

winch (*eng.*)

Winches are used on cranes.

window of opportunity (*econ.*)

A window of opportunity for a certain product only exists for a limited period of time.

wine cellars (*general*)

CO_2 accumulation is a risk in wine cellars.

wing (*eng.*)

Wings provide lift to an aircraft.

wire gauze (*eng.*)

The wire gauze was placed over the Bunsen burner.

wire mesh (*eng.*)

A fine metal and nylon wire mesh can be used as a water filter.

wiring diagram, wiring scheme (*eng.*)

The wiring diagram was printed on A3.

withstand, to (*eng.*)

Polypropylene (PP) can withstand higher temperatures than polyethylenem (PE).

wood drill (*eng.*)

A wood drill is not suitable for concrete.

work in the field, to (*econ.*)

People working in the field need to have a driving licence.

workers' representative (*econ.*)

Last year, the company elected a workers' representative.

workforce (*econ.*)

Our workforce is 50 men strong.

working experience (*general*)

He has gained most of his working experience abroad.

write off, to (*econ.*)

After the fire, the total inventory had to be written off.

year to date (*econ.*)

Acronym: YTD

After the fire, the total inventory had to be written off.

yield stress (*eng.*)

After surpassing the yield stress, a given material will begin to deform plastically. Some of this deformation is permanent.

YTD (*econ.*)

Acronym/Abbreviation referral: see year to date

zinc (*chem.*)

Acronym: Zn

Zinc oxide is a commonly used white pigment.