

lubrication is the method or technique used to apply a layer of lubricant between two moving surfaces. its main purpose is to reduce friction and wear between them, and can separate them partially or completely.

failures related to poor equipment lubrication are one of the main factors that lead companies to have high maintenance costs. in other words, premature replacement of components, unplanned maintenance and loss of productivity. many companies do not perform industrial lubrication correctly. this is because they do not have knowledge about lubricants, methods, tools or even a lubrication plan for the equipment.

for this reason, we decided to create a complete guide on the subject. do you want to know everything about industrial lubrication ?

in this article you will see:

what are industrial lubricants?

what is the function of industrial lubricants?

what are the types of industrial lubricants?

what are the main industrial lubrication methods?

classification of lubricants?

industrial lubrication tools

correct storage method and more.

but what is industrial lubrication?

industrial lubrication is a maintenance technique that involves applying lubricant between the components of a machine. this reduces friction between the contact surfaces due to the film that favors the movement of the components, thus reducing wear and increasing the useful life of the machine.

that is why it is very important to choose the right lubricant, method, tools and know the technical aspects of application to the equipment.

what are industrial lubricants?

industrial lubricant is a substance applied between two surfaces – fixed and mobile or two mobile surfaces – capable of forming a protective film. the main function of this layer is to reduce friction and wear between the parts in contact.

it is made from a mixture of oils and additives. a combination that allows us to determine its properties, performance and useful life.

it is used in various mechanical transmission components such as: reducer, motor, rotor, bearing , gear, bearings and chain.

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what is industrial lubrication used for? what is its function?

the main function of industrial lubrication is to reduce friction between the contact surfaces of equipment parts. to do this, a lubricant (oil or grease) is applied to form a thin, viscous film that prevents wear. this promotes movement, ensures the useful life of the equipment and increases its performance.

for this reason, the quality of the industrial lubricant is essential to guarantee durability and safety in the process.

furthermore, the lubricating fluid must be monitored and its maintenance must be carefully planned and carried out.

why lubricate your equipment?

studies show that 34% of rotating equipment failures are due to lubrication problems.

especially the lack or excess of lubricant and chemical incompatibility .

many professionals do not know how to choose the right grease . furthermore, 14% of failures occur due to system contamination .

so, we reached 50% of corrective maintenance due to lubrication problems.

regularly lubricating equipment components brings benefits such as:

reduce noise;

prevent temperature rise;

reduce friction between parts;

minimize vibrations;

premature oxidation or corrosion ;

avoid premature breakages;

regulate heat exchange between components.

as a result, machine availability increases and your equipment will be more productive.

how important is lubrication in industrial maintenance?

industrial lubricants play a very important role in maintenance . they protect components and increase the useful life of equipment and machines.

oils and greases are capable of preventing damage caused by high temperatures, vibrations, corrosion, oxidation and friction.

if we consider that the maintenance sector is primarily responsible for ensuring that equipment is fully operational, lubrication is one of the pillars for achieving total quality.

it is no wonder that many companies fail to act only when their equipment breaks down. the adoption of predictive techniques and analyses to anticipate potential failures is gaining ground every day.

but to do this, you need to have the right tools, choose the correct type and method to use industrial lubricants.

industrial lubrication tools

main lubrication tools are:

manual grease gun

one-handed grease gun

grease pumps

grease test kit

grease meter

oil check monitor

oil levelers

automatic lubricators

check out our full range of skf tools for industrial lubrication .

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classification of industrial lubricants.

in industry, industrial lubricants are classified according to their physical state. thus, they are divided into:

liquids;

pasty;

solids;

gaseous.

liquid industrial lubricants

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liquid lubricants are composed of base oil and additive.

ideal for applications that require high speed and high load. they have low viscosity and, as a result, low friction loss.

in addition, using liquid lubricants also produces a low temperature rise in the transmission system components .

industrial paste lubricants or greases

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grease is a type of pseudoplastic fluid , composed of base oil, additives and thickeners.

thickeners are solid particles, finely dispersed in the grease. their function is to increase the viscosity of the oils.

it is one of the most versatile components in industrial lubrication .

applicable over a wide range of temperatures, speeds and loads. it is also more resistant to environments with contaminants.

solid industrial lubricants

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the solid lubricant is inserted between the surfaces of the parts that work in friction.

it has the ability to deform under shear more easily than surfaces.

solid lubricants are used in extreme conditions . durability is increased by the addition of binding elements that provide a thicker and more resistant film.

gaseous industrial lubricants

the use of gaseous lubricants occurs when the lubricating films must be extremely thin . the gases normally used as lubricants are nitrogen and helium .

they can operate over a wide temperature range and provide very low friction between parts due to their low viscosity. however, they have low load capacity and require parts with very precise finishes.

its application occurs, for example, in aerostatic bearings .

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what types of lubricants are there?

in industrial lubrication, the three main types of lubricants are:

mineral lubricant

mineral oil lubricants come from the refining of crude oil. they are cheaper than synthetic oils, but have limited properties.

for example, their viscosity varies more with temperature and they contain substances that generate impurities. for this reason, they are changed more frequently than synthetic ones .

synthetic lubricant

synthetic lubricants are the product of the chemical modification of petroleum. this is a more complex process than the refining applied to mineral lubricants.

therefore, synthetic oils are more expensive. however, they have higher quality in their physical-chemical properties.

synthetic lubricant has a greater capacity to neutralize acids , its viscosity is more stable and its lubricating film is more resistant to pressure.

semi-synthetic lubricant

semi-synthetic lubricants are made from a mixture of 100% synthetic lubricants with mineral lubricants.

they have intermediate characteristics between synthetic and mineral lubricants, both in terms of physical and chemical properties and price and lubrication change time.

how important is industrial lubricant?

in addition to reducing friction and wear, the use of lubricants has other benefits. these include:

temperature control : absorbing the heat generated by friction between contact surfaces. it also helps in the cooling of industrial transmission systems.

sealing : greases prevent the entry of foreign solid particles. while oils prevent the entry of other fluids (liquids or gases) into the components. the sealing effect also prevents loss of engine pressure .

corrosion protection and oxidation resistance : lubricants prevent corrosive materials from coming into direct contact with metal parts.

cleaning of parts : removal of contaminants carried by lubricants during operation.

power transmission in hydraulic systems : power is transmitted with minimal loss through lubricating fluids.

shock reduction : the lubricating film has the ability to absorb the energy of impact between solid surfaces.

industrial lubrication and the composition of lubricants.

the basis of lubricants is the base oil. it makes up between 75% and 99% of the final product. it determines the viscosity of the lubricant. in this way, base oils are combined to achieve the desired viscosity.

lubricants also receive additives to improve physical or mechanical properties in certain applications.

the most common additives are:

detergents

detergents react with corrosive acids, sludge and other substances creating byproducts that contaminate the oil and keep them soluble in the lubricant.

dispersants

dispersants keep lubricants free from oil reactions with other dispersed substances. this prevents them from forming deposits and keeps the internal surface of the equipment clean.

anti-corrosive and anti-rust

they prevent the metal parts of the pieces from corroding due to contact with the lubricant.

anti-rust additives bind to the metal material, forming a protective film. this film serves to protect the metal parts from attack by water and salts dissolved in it, which cause rust.

anticorrosives act by neutralizing acids that are formed, for example, by sulfur and nitrogen present in fuels.

antifoaming agent

the antifoam acts in two ways:

prevent the formation of persistent foams inside the lubricant and

accelerate the collapse of the bubbles that are already present in it.

the foam forms due to the agitation of the oil, which ends up mixing with the air.

bubbles are harmful because they cause flaws in the oil film that coats the surface of the lubricated part.

as a result, the surfaces are left unprotected at the points of the bubbles. in other words, they are vulnerable to direct contact between them.

demulsifiers

emulsions are mixtures of liquids that, in principle, are immiscible. in other words, they do not mix.

lubricants, which are oil-based, can end up being contaminated by other liquids, such as water.

thus, demulsifiers serve to separate these two substances and ensure the quality of the lubricant.

high pressure support and wear protection additives in lubrication

if the pressure inside the lubricated components is too high, it leads to the rupture of the protective film formed by the lubricant on the solid surface of the part.

when this happens, extreme pressure additives react with these surfaces to form a protective replacement film that protects the part.

the action of wear protection additives is similar, also producing a protective film that prevents direct contact between the surfaces of the parts.

lubrication of components in transmission systems.

see below how bearings, bushings, chains and gears are lubricated.

bearing lubrication

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lubrication extends the life of bearings and can be done with grease or lubricating oils. grease lubrication systems are simpler and cheaper than oil systems.

however, first, you need to know which of the two is most suitable for your type of bearing .

bearing grease has the advantage of improving the sealing of the part and being firmer and more stable. in addition, it is more difficult for it to drip and leak.

however, oils have the advantages of being easier to distribute throughout the bearings and also easier to drain and refill.

find out more in our article: bearing lubrication .

bearing lubrication

a bearing can also be lubricated with grease or oil.

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when lubricating bearings with grease, the covers must be removed for cleaning.

important: the grease gun must be cleaned before applying new grease.

when lubricating with oil, the lubricant level must always be monitored and topped up when it is low.

when changing the oil, you need to drain all the old oil and wash the assembly with the new oil.

chain lubrication

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an industrial chain has lubrication points that are difficult to access. for this reason, it is difficult for lubricant to reach all the necessary parts of the component.

however, the lack of lubrication at these points causes wear and reduces the chain's useful life.

therefore, chain lubrication must be done with suitable tools.

for example, aerosols with applicator nozzles for chains. this prevents the lack of lubrication in less accessible points.

gear lubrication

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gears can be lubricated with grease or oil . however, there are two methods for applying oil. we will show you both below.

grease can be used in both open and closed gear systems, as long as they run at low speeds.

regarding temperature conditions, load and other operating factors, the manufacturer's catalog should be consulted to find out which is most appropriate in each case.

oil lubrication can occur in two ways:

splash lubrication : this is used in closed systems, when the rotation of the gear over the lubricant causes it to be splashed onto the gear and bearing assembly. the minimum tangential speed for this method to work must be 5 m/s.

forced circulation lubrication : in this method the gear teeth are lubricated through a system with an oil pump ( automatic lubricator ). the oil can be applied by dripping, spraying, or by mist, when it is mixed with compressed air.

mechanical lubrication methods: application of lubricants.

the method of industrial lubrication and application of lubricant depend on 3 factors:

whether oil or grease will be used,

viscosity and

the amount of lubricant.

there are six main methods:

industrial gravity lubrication

it is done manually using oil cans, a cup with a needle or a cup with a dropper.

for all three lubrication methods, the lubricant falls onto the component by the action of gravity.

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industrial capillary lubrication

this method uses the capillary action of tow, pads or wicks of fibrous material.

in this way, the oil is slowly deposited on the lubricated part.

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mechanical industrial splash lubrication

the splash lubrication method was previously mentioned for gear lubrication. however, it can also be used in systems that do not have gears.

in this case, other elements are mounted on the shaft to spray the lubricating oil, such as a ring, chain, or collar with grooves.

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mechanical industrial lubrication by immersion

the parts to be lubricated are immersed in an oil bath to carry out this method.

excess oil lubricates other parts, and its level must be monitored and controlled at all times. in addition to lubricating, the oil also cools the part.

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by forced lubrication system

the forced lubrication system uses a pump and has two methods: loss or circulation system.



in the first case, the pumped oil is discharged over the parts in an open system. in the second, it falls back into a reservoir and recirculates through the system.

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industrial grease lubrication

the difference between this method and the others is that grease is used as a lubricant, not oil.

grease can be applied manually using a manual grease gun , grease gun or hand pump. these are the most suitable tools when you want to ensure the quality of the application.

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discover the main skf tools that help with the correct lubrication of your components.

main errors in industrial lubrication and how to avoid them.

these are the main mistakes made during mechanical lubrication and how to avoid them:

insufficient industrial lubrication

this problem is probably the easiest to identify, as poorly lubricated parts overheat and make noise. insufficient lubrication can lead to bearing failure , for example.

the way to avoid this problem is to monitor the bearing or other component in use to check that there is no loss of lubricant due to leakage.

excessive industrial lubrication

a lack of lubricant can cause problems, but adding too much lubricant is not the solution. too much lubricant can cause the part to move out of place and also cause failures.

on sealed components, if excess grease is applied with a gun, the pressure can lead to seal failure.

therefore, when applying a lubricant, the professional must pay attention to both the minimum and maximum limits indicated by the manufacturers.

mechanical industrial lubrication with the wrong lubricant

the wrong lubricant can lead to equipment failure. equipment is designed with certain types of lubricants because it depends on their physical and chemical properties to work properly. using the wrong lubricant can even void the equipment's warranty .

to avoid this problem, the personnel responsible for lubrication must know which lubricants are suitable for the type of equipment in question.

lubricant mixture

improper mixing of lubricants leads to problems similar to those of using the wrong lubricant, due to changes in the lubricant's properties.

therefore, it is important to know whether mixing lubricants is permitted and whether it can be used on equipment being maintained.

## lubricant contamination

contaminants can damage equipment, leading to catastrophic failures. they can also be difficult to remove and can be an expensive operation to clean up.

contamination can be avoided with a contaminant prevention and monitoring plan. the main contaminants are dirt and particles from the workshop environment or suspended in the air, and particulate matter that arises from wear and tear on the equipment itself.

## incorrect use of industrial lubrication tools

manual lubrication tasks can be challenging due to the large number of lubrication points throughout a plant. additionally, most of these points have varying lubrication requirements.

lubrication tools must be used that make the job easier. above all, they must meet the needs of the lubrication plan and reduce the risk of failure.

## care in the storage of industrial lubricants

lubricant storage requires care both when receiving and storing them.

### receipt

the product received must match the description on the invoice;

packaging seals must be intact;

drums can only be rolled for short distances;

remove lubricant drums from transport vehicles using appropriate equipment, such as forklifts and hoists;

if there is no suitable equipment, slide the drums down a ramp.

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unloading oil drum using a ramp. do not drop the drum even if there is a buffer or protection underneath.

### storage

heavy objects should not be stored on buckets or lubricant cans;

store upright whenever possible;

use standardized pallets to store large-volume packages;

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lubricant drums on pallets.

prevent agents that are harmful to the quality and integrity of the lubricant from contaminating or deteriorating the product. these agents are:

water;

impurities;

other lubricants;

other products;

extreme temperatures;

very long storage time