Matrix
specialty lubricants

CLEANERS

Matrix Specialty Lubricants

Matrix Specialty Lubricants is a company based in The Netherlands, producing and marketing specialty lubricants and greases.

Matrix Specialty Lubricants was created by a nucleus of industry specialists with a collective experience of many years working for major oil companies. Our vision is to harness new technology and, with the expertise of our chemists, provide the correct lubricant for each application. It is just a matter of knowledge.

Specific product information is available in our brochures and most of the technical data sheets can be found on our website:
www.matrix-lubricants.com. Our main products are divided into groups with the most common being presented in our brochures. The most up to date information can always be found on our website.

ISO 9001:2015

Bio Lubricants

This group of products includes biodegradable hydraulic, gear, and other lubricants as well as a range of greases and concrete mould release agents. High performance, long life, low toxicity and biodegradabilty are key factors within this product group.

Compressor, Vacuum and Refrigeration Fluids

A comprehensive range of gas and refrigeration compressor fluids providing long life and low maintenance costs in combination with high efficiency. The range consists of mineral, and synthetic (hydro treated, PAO, POE, Alkyl Benzenes, Di-Ester, Ester, PAG, PFPE) based lubricants with performance up to 12.000 hour drain intervals.

Food Grade Lubricants

A complete range of fluids, lubricants and greases for applications whenever a food grade lubricant is required. The high performance Foodmax® line is NSF and InS approved and includes a range of spray cans.

Industrial Specialty Products

This product group includes a range of specialty chain lubricants, gear oils, transformer oils and many more products. All the products exceed performance expectations contributing to lower maintenance costs.

Greases and Pastes

An extensive range of specialty greases and pastes, including polyurea, calcium sulphonate, aluminium, barium, silicon, inorganic and PFPE. By using the latest technology and materials we are able to provide high performance and problem solving products.

Metal Working Fluids and Rust Preventatives

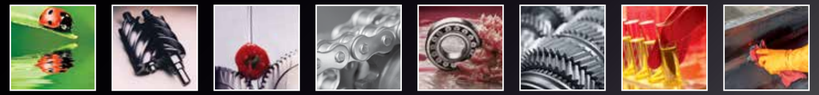
This line of products includes the latest technology soluble metal working fluids, neat cutting oils, cold and hot forging, quenching, drawing and stamping products.

Specialty Base Oils and Dispersions

These base oils are used in the formulation of metalworking fluids, biodegradable hydraulic fluids, top tier 2 stroke engine oils, mould release agents and many more. They include DTO, TOFA and various types of esters. Another range includes both technical and pharmaceutical white oils. The Matrix line of D-MAX colloidal dispersions contains products based on graphite, MoS2, PTFE and Boron Nitride (hBn). These can be used as additives, lubricants and processing products.

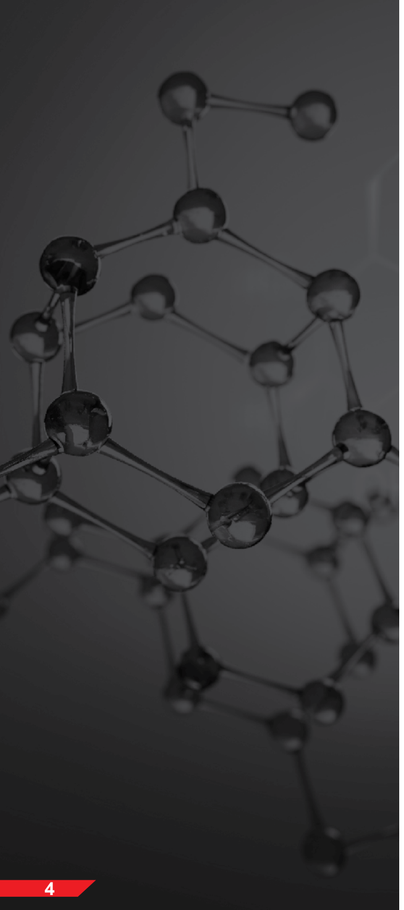
Cleaners

A range of process and workplace cleaners, both for the industry as well as for food processing plants. The cleaners for the Food Industry are NSF H-1, C-1 and K-1 approved.



Introduction

This brochure highlights and illustrates the Cleaners and Cleaner related products Matrix has in its portfolio. The line of cleaners is based on many different types of chemistry under the name Cleanmax and Foodmax Clean (food grade cleaners). The explanation and selection tables should allow you to select the right cleaner for the right job but please do not hesitate to ask for help or advise.



Testing is knowing

Although knowledge is power the only way to really know if a cleaner works is to try them. Samples can be made available on request. Please contact your local dealer or Matrix direct.

The nature of cleaning agents

Cleaning is the physical removal of grease, oil, dirt and debris (soil) from surfaces of for example equipment.

Cleaning agents are chemicals, as are soils. As soils are usually chosen for their properties in some operations (e.g. lubrication, heat transfer, cutting, etc.) so are cleaning agents chosen for their performance in process cleaning equipment.

Solvents or detergent solutions which provide good rinsing have the following:

- Low surface tension (so they can penetrate into small clearances between components)
- Low viscosity (so frictional pressure drop does not limit flow volume)
- High specific gravity (so lighter materials are easily displaced)
- Either complete miscibility or complete immiscibility with the cleaning agent (so they can dilute or displace the cleaning agent respectively)

Solvents or detergent solutions which provide poor cleaning can be described as follows:

- Having a strong affinity for a soil but having a low holding capacity for it (solubility)
- Only gradually penetrating and swelling the soil and so it can be removed by rinse fluids
- Efficiently dissolving a soil only at a temperature above its boiling point. This is nearly useless, as pressurized contacting equipment is expensive
- Having a low evaporation rate, without regard to its solubility for the soil. After all, any undried cleaning and rinsing solvent is just another soil on the parts

How Solvents and Aqueous cleaners work

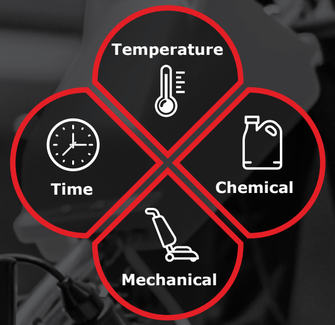
Solvents have been used to clean parts during the past decade. The phase out of the chlorofluoro carbon (CFC) to restrict solvent emissions from solvent cleaning processes in the 1990s resulted in the development of “new” solvents which can comply with the most restrictive emission control regulations. A solvent cleaning process has three steps: wash, rinse and dry.

1. The washing step brings parts and a chosen solvent together. Usually the togetherness means immersion of the parts in solvent. The choice of the solvent is chiefly based on compatibility of the solvent with the soil to be removed. Soil is removed oily when it dissolves in the solvent.
2. The rinsing step brings fresh (or more soil-free) solvent together with the parts, using the same contact method used in the washing step. The aim is to dilute the soil rich solvent. Soiled solvent can’t ever produce perfectly cleaned parts.
3. The drying step means separation of nearly clean solvent from parts. Almost always this is done by the evaporation of the solvent.

Often solvent cleaning is preferred because of the simplicity inherent in the above three steps.

Aqueous cleaning is performed by a combination of the following:

- Detergents to lift the soils from the parts
- Heat to make detergents more compatible with the soils and to soften the soils
- Fluid force to dislodge the soils from the parts and collect the insoluble soils in some removal system
- It is recommendable to rinse with clean water, or the parts will not be clean. If spot-free drying is needed the final rinse of the cleaned parts is with mineral-free water so that evaporation does not leave mineral deposits
- Drying, with forced hot air



4 Factors influencing the effectiveness of cleaning

Choosing between Solvents or Aqueous Cleaners

Without prejudice, either technology can be made to work in the majority of applications. The difference is based on personal preferences where you can take the following parameters into consideration:

- Reliability
- Soil rejection and recovery of cleaning agent
- Operating costs
- Water or air pollution regulations
- Cycle time
- Odor preference
- Soil management
- Final dryness quality

No matter the type of product is used to clean, good cleaning takes a lot of energy. There are four factors that influence the effectiveness of wet chemical cleaning processes;

- Chemical energy, provided by the cleaner
- Mechanical energy, provided by a machine or by hand
- Thermal energy, provided by heating
- Time

Let's look at how all these factors work together.
The cleaner used provides chemical energy. This energy is created by the composition of the cleaner and because of the way the ingredients in the cleaner interact with the pollution. You cannot see it with your eyes, but the molecules in the cleaner are attracted to the pollution.

Next, let's see what happens when we add mechanical energy.

Spraying, rubbing with cloths or brushing all is mechanical energy. The rubbing actions helps to loosen the pollution and free it from the surface. Mechanical energy can be provided by equipment but also by hand.

The final type of energy is thermal energy. Thermal energy means temperature. Increasing the temperature of the cleaner can help speed things along and become more effective.

All three types of energy need the right amount of time to work best. The more one type of energy is used, the less others are needed.

Methods of Cleaning

There are many ways to clean. They include:

- Ultrasonic
- Aqueous Immersion
- High Pressure Spray Washing
- Agitation
- Scrubbing

In the next pages we will describe the different methods of cleaning.

Matrix specialty lubricants

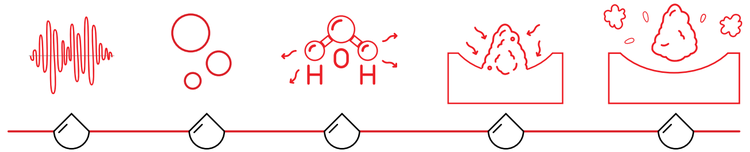
Ultrasonic Cleaning

Ultrasonic cleaning uses sound waves at frequencies above what is audible by the human ear. As the sound wave energy travels through the aqueous cleaning solution, small micron-sized bubbles are formed and quickly grow, storing tremendous amounts of energy and pressure inside. When one of these bubbles reaches an unstable size, it implodes, creating a jet about 1/10th the bubble's size. The jet, traveling at speeds in excess of 400 km/hr., very effectively and efficiently knocks off surface contaminants. This formation and subsequent implosion of bubbles is called cavitation and is what gives ultrasonic cleaning its incredible cleaning power.

Contaminants frequently removed with ultrasonic cleaning include, but are not limited to:

- Buffing and polishing compounds
- Cutting Oils from machining operations
- Paraffin based RPs
- Cleaning greases and sludge from rebuilt components
- Metal chips
- Dirt and debris

Working principle of ultrasonic cleaning



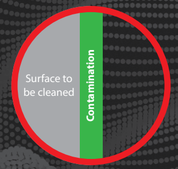
Generate ultrasonic waves by the current

Cavitation occurs in water

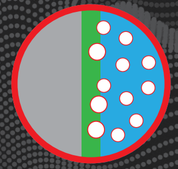
Water molecules are constantly breaking to produce energy

Energy water waves constantly impact the surface of objects

Destroy and strip the attached dirts

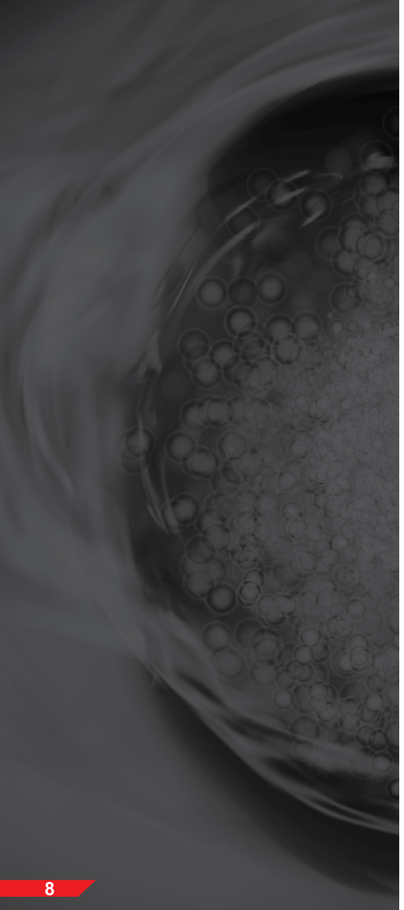


Before



During ultrasonic cleaning

After



Aqueous Immersion

Immersion cleaning is the process by which the parts to be cleaned are placed in the cleaning solution to come in contact with the entire surface of the parts. It is the most effective degreasing method, even if not the fastest one.

An aqueous parts washer is a safe and effective waste-based solution that, unlike petroleum-based solvents, are typically non-flammable and contain little or no VOC's. It is an alternative to solvent parts cleaning and eliminates the need for harmful cleaning solutions. Aqueous parts washers use water-based chemicals. Instead of dissolving grease and solids, aqueous cleaners rely on heat, agitation, and soap action to break dirt into smaller particles.

A simple method of applying mechanical energy to immersion cleaning procedures is to move the parts through the cleaning liquid by vertical agitation. The repeated up and down motion is effective in cleaning simple parts, such as workpieces without blind holes, undercuts and/or drill holes.

Another type of part agitation, which is used in aqueous and solvent cleaning processes in closed machines, is to slew or to rotate the parts. In this case, the workpieces are usually cleaned stacked or bulked in baskets. In order to avoid damage of the workpieces through part-on-part or part-on-basket contact special washing meshes can be placed in the basket as intermediate layers.

More effective is the pressurized flow cleaning procedure, also called injection flood washing process. The cleaning basket is also flooded with the cleaning liquid and usually turned as well. At the same time, pumps draw fluid out of the cleaning bath and subsequently inject it back into the bath at high pressure levels through nozzles located underneath the fill level. This results in strong currents that wash over and around the workpieces and remove contaminants from surfaces, blind holes, cavities and recesses.

High Pressure Spray Washing

High Pressure spray washing is comparable to an industrial dishwasher. This part washing technique employs high pressure sprayers positioned around an internal wash chamber and provides high amounts of mechanical energy to push soils. This technique can provide operators with a much faster clean-time, but it's critical for users to choose cleaners that are formulated for high pressure spray with sufficient defoaming properties.
In spray cleaning processes, contamination is partially dissolved or emulsified by the cleaning media - usually an aqueous agent - and partially washed away by the kinetic energy of the spray jet. So mechanical energy here results from the pressure at which the medium is sprayed onto the surface to be cleaned. Depending on the application, working pressure can be as high as 25 bar. High-pressure applications, which range from 150 bar up to more than 2,000 bar allow for cleaning and deburring in a single step. The only real disadvantage to using this method is when trying to clean parts that include hidden grooves and curves or where internal surfaces require cleaning, as it will not prove effective.

Cleaning by Agitation

A simple method of applying mechanical energy to immersion cleaning procedures is to move the parts through the cleaning liquid by vertical agitation. The repeated up and down motion is effective in cleaning simple parts, such as workpieces without blind holes, undercuts and/or drill holes.
Another type of part agitation, which is used in aqueous and solvent cleaning processes in closed machines, is to slew or to rotate the parts. In this case, the workpieces are usually cleaned stacked or bulked in baskets. In order to avoid damage of the workpieces through part-on-part or part-on-basket contact special washing meshes can be placed in the basket as intermediate layers.

Cleaning by Scrubbing

Floors are often cleaned by scrubbing using scrubbing equipment. The mechanical cleaning part plays a larger role in this way of cleaning. Scrubbing is also used by brushes in for example parts cleaners.

Cleaners Selection Table 1/2

	Product	Available packaging								Composition Type	Characteristics							Type of Pollution				Suitable for	Not Suitable for		Application	Remarks	Remarks	Application									Biodegradable	NSF	Approvals
		400 ml spray	Can with wipes	500 ml trigger	4 liter refill for dispenser	4 liter with pump	5 liter can	20 liter can	200 liter drum		Colour	Flashpoint C°	pH	Refractometer Index	Odor	Emulsion	Foaming	Dirt	Oil	Grease	Other pollution						Washingmachine	High Pressure	Steam machine	Spraying	Dipping	Circulation	Ultrasonic Cleaning	Manual (brushing/rubbing)			
FOOD GRADE	**Foodmax Clean**	■						■	■	D-Limonene	Colorless	125 & Flammable Aerosol			Citrus	N	N		x	x	Stickers, label, paint & glue remover	Machine & parts			Heavy duty cleaner to remove oil, grease, polymer compounds. Machinery, walls, wood, leather, fiberglass, stainless steel, cement, motors, door panels, road tar, floors, oxidation, carpets, glass	Works very well to remove paper labels and glue	Heavy duty cleaner also suitable for aluminium, leaves no stains. Deodorizes as it cleans				■	■	■			■	yes	C1	Kosher & Halal
FOOD GRADE	**Foodmax Clean S**	■						■	■	Solvent	Colorless	>40 & Flammable Aerosol			None	N	N		x	x		Machine & parts	Long term contact with plastics		Cleaner suitable to remove organic and oil based materials like lubricants, dirt and filth.	Acetone & silicone free					■	■	■			■	no	K1	Kosher & Halal
FOOD GRADE	**Foodmax Clean Ultra**							■	■	Solvent	Colorless	62			None	N	N	x	x	x		Machine & parts	Long term contact with plastics		Safe readily biodegradable alternative to solvents like kerosene, mineral spirits and dearomatised solvents	Evaporates without leaving residues	Dry cleaning fluid				■	■	■	■	■	■	yes	H1	Kosher & Halal
FOOD GRADE	**Foodmax Clean E**	■								Solvent	Colorless	Flammable Aerosol			None	N	N	x	x	x	Dust	Electronics, circuit boards			Degreaser for electrical contacts. Dries rapidly leaving no residues. Suitable for control panles, electric motors, electrical contacts	Cleaning can be done while equipment is under power	Leaves no stains, can alos be used as a very quick drying general purpose cleaner				■						no	K2	Kosher & Halal
FOOD GRADE	**Foodmax 1001 HE-2**							■	■	Solvent	Transparant Yellowish	68			None	N	N	x	x	x		Steel & aluminium parts	Long term contact with plastics		Powerfull cleaner leaving no residues. Can be used in food production areas where incidental contact is possible	Leaves no stains					■	■	■				no	H1	Kosher & Halal
FOOD GRADE	**Foodmax DWF**	■						■	■	Solvent	Colorless	68 & Flammable Aerosol			Typical	N	N		x	x		Steel, aluminium, plastic			General purpose cleaning and polishing fluid	Dewatering properties, protects against rust for a short period					■	■	■					H1	Kosher & Halal
FOOD GRADE	**Foodmax Clean BIO**			■				■	■	Aqueous	Whitish	Non flammable	12	7.5-8.5	Typical	Y	N	x	x	x		Equipment, machine parts, work areas, tools, surfaces before painting			True Multi functional cleaner suitable for pollutants like grease (animal, vegatable and mineral), oils, organic deposits, glue and combustion residues.	Becomes more effective at elevated temperatures (between 40-70°C). Suitable for floor cleaning and floor cleaning equipment (low foaming). Removes air pollution on window frames.	Anti bacterial properties	■	■		■	■	■	■		■	yes	A1	Kosher & Halal
FOOD GRADE	**Foodmax Clean Wipes**		■								Whitish	> 93	7		Light citrus			x	x	x	Paint	Equipment, machine parts, work areas, tools, hands and many other surfaces			Strong two-sided cleaning wipes containing a powerful cleaner in a resealable container	Effectively removes heavy pollutions like oil, greases, tar, PU foam, resin, soot, grass stains, paint, ink, marker, toner and graffiti.											A1	
FOOD GRADE	**Foodmax Clean Wipes Plus**		■								Orange	> 93	7		Light citrus			x	x	x	Paint	Equipment, machine parts, work areas, tools, hands and many other surfaces			Strong two-sided cleaning wipes containing a powerful cleaner in a resealable container	Effectively removes heavy pollutions like oil, greases, tar, PU foam, resin, soot, grass stains, paint, ink, marker, toner and graffiti.	Foodmax Clean Wipes Plus has additional rubbing power compared to Foodmax Clean Wipes										A1	
	Performance Clean Foam	■								Foam	Transparant	Flammable Aerosol	9.5-10.5		Characteristic		Y	x	x	x	Smoke & ink	Industrial workplace environments, counters, wall tiles, furniture, car parts, doors, whiteboards, sanitary fittings, kitchen cupboards, garden furniture	Untreated metals		White boards, kitchen closets, food production equipment	The creation of foam ensures long contact time for effective cleaning. Performance Foam does not drip even on vertical surfaces					■					■	no		
	Performance Clean Contact	■								Solvent	Transparant	Flammable Aerosol		1.370	Characteristic	N	N	x	x	x		Sensitive electronics, electronic equipment, switches, batteries, contact points, printed circuit board switches, multiple sockets			High quality spray to clean electrical contacts. Performance Clean Contact removes oil, dirt, dust, residues and condensation from sensitive electronics, switches and equipment	Powerfull jetspray, high dissolving properties, dries very qick, leaves no residues, non-conductive, non-corrosive	Safe for plastics & rubbers					■				■	no		
	Performance Clean Stainless	■								Oil	Transparant White	Flammable Aerosol			Lemon	N	N	x	x		Fingerprints	Microwaves, refrigerators, sinks, stainless steel trashcans, counters, terrace heating, extractor hoods, garden lightening			High quality spray to quickly clean shine & protect stainless steel parts. Effectively eliminates surface fingerprints, grease, streaks, residues and haze.	Restores and intensifoes the gloss of stainless steel					■				■	■	no		
	Performance Clean Window	■								Water	Transparant	Flammable Aerosol	9.5-10.5		Characteristics	Y	Y	x				Windows (glass & plastic), mirrors, whiteboards, counters, furniture			High quality spray to clean windscreens and mirrors	High dissolving properties, streak free, leaves no residues					■				■	■	no		
	Performance Citrus Clean	■								Citrus Terpene	Transparant	Flammable Aerosol			Lemon	N	N	x	x	x	Stickers, label, paint & glue remover	Powerful cleaner based on citrus to remove grease, tar, oil, wax, ink, resin, stickers and residues of glue from parts of treated and untreated metal, stainless steel, fiberglass, aluminium, concrete, wood, stone and various types of plastic.			Machine parts, garden tools, garden furniture, wooden parts, windows, floors & walls, axels, grills, stove tops	Removes labels & stickers	Deodorizes as it cleans				■				■	■	no		
	Performance Clean BC	■								Aliphatic Hydocarbons	Colorless	Flammable Aerosol				N	N	x	x	x		Matrix Performance Clean BC does not leave residues, is not conductive and non-corrosive. Rapidly removes oil, grease, brake fluid and other contaminants from parts. Ideal for industrial repairs and assemblies.	Polished & plastic parts		Machine parts, brakes	Powerful quick drying cleaner and degreaser with high dissolving properties					■				■	■	no		
	Cleanmax BC						■		■	Aliphatic Hydocarbons	Colorless	-12				N	N	x	x	x		Matrix Performance Clean BC does not leave residues, is not conductive and non-corrosive. Rapidly removes oil, grease, brake fluid and other contaminants from parts. Ideal for industrial repairs and assemblies.	Polished & plastic parts		Machine parts, brakes	Powerful quick drying cleaner and degreaser with high dissolving properties					■	■			■	■	no		

Cleaners Selection Table 2/2

Product	Available packaging									Composition Type	Characteristics							Type of Pollution				Suitable for	Not Suitable for		Application	Remarks	Remarks	Application										Biodegradable	NSF	Approvals
	400 ml spray	Can with wipes	500 ml trigger	4 liter refil for dispenser	4 liter with pump	5 liter can	20 liter can	200 liter drum			Colour	Flashpoint C°	pH	Refractometer index	Odor	Emulsion	Foaming	Dirt	Oil	Grease	Other pollution						Washing/scrub machine	High Pressure	Steam machine	Spraying	Dosing	Circulation	Ultrasonic Cleaning	Manual (brushing/rubbing)			
Cleanmax Condenser						■			Corrosion inhibitors, alkaline substances, silicates, solvents, and a very strong set of the highest quality non-ionic surfactants	Pale yellow	Non flammable	13.4		Neutral, Ocean Breeze, Green tea	Y	N	x	x	x	Eliminates bad odors	Cleanmax Condenser is a cleaner for professional use that very effectively cleans the condensers of outdoor air conditioning units.			Outdoor air conditioning and refrigeration units	Improves the efficiency of air conditioning units	Lower energy consumption after cleaning				■				■	no		PZH (Polish NSF)
Cleanmax Evaporator						■			Corrosion inhibitors, alkaline substances, silicates, solvents, and a very strong set of the highest quality non-ionic surfactants	Pale yellow	Non flammable	12.7		Neutral, Ocean Breeze, Green tea	Y	N	x	x	x	Eliminates bad odors	Cleanmax Evaporator is a cleaner for professional use that can be indoors			Air conditioning equipment - indoor units, air filters, evaporators, air-conditioning ducts and other industrial surfaces and equipment.	Improves the efficiency of air conditioning units	Lower energy consumption after cleaning				■				■	no		PZH (Polish NSF)
Cleanmax Biopower						■			The formulation is based on a mixture of cationic and non-ionic surfactants, alkali and excipients	Pale yellow	Non flammable				Y	N	x	x	x		Cleanmax Biopower is an alkaline cleaner for professional use. It has a strong degreasing power, dissolves heavy dirt & debris which other standard cleaners cannot remove.			Chilled display cases, kitchen and catering equipment, condensers, all-purpose use.	Effectively removes fat, protein and deposits, dissolves cakes and heavy dirt		■	■		■				■	yes		PZH (Polish NSF)
Cleanmax Spray							■	■	Solvent & Tensides	Colorless	62				Y	Y	x	x	x	Water	Iron, aluminum & alloys			Solvent degreaser capable of absorbing water and water based materials. Cleanmax Spray can be used to change from oil based hydraulics to water/glycol based hydraulics and reverse.	Solvent based cleaner containing tensoactive components which allow water to emulsify in the cleaning fluid												
Cleanmax 1313							■	■	Alkali	Pale yellow	Non flammable	9 (@ 5% solution)	2.5		Y	low	x	x	x		Suitable to remove oils, metal working fluids, dirty and dusty environments, grease in industrial vehicles, trains, trucks, cars, parts and components.			High pressure, low foaming cleaner high pressure washing machines used in metal working processes	Can be diluted with water. 5% concentration is recommended for general cleaning. Concentration to be controlled by refractometer		■	■		■	■	■		■			
Cleanmax Bio HD							■		Alkali		Non flammable				Y	low	x	x	x	Carbon deposits				Very active alkali all-round cleaner to clean surfaces, pumps, chains, pipes and floors. Very suitable for high temperature chain cleaning (carbon deposits).	Biodegradable	Can be used in steam or high pressure cleaners (1:9), spraying (1:7) or manually (1:1), cleans effectively when diluted with both warm and cold water.	■	■	■	■						yes		
Cleanmax CCT							■	■	Synthetic	Amber	180				N	N	x			Carbon deposits, lacquering as a result of oxidated oils				Concentrated system cleaner for hydraulic, heat transfer, gear and circulation systems without requiring a mayor shutdown		Cleanmax CCT can be added to the existing fluid at a rate up to 10% (depending on the pollution) for a longer period. Fluid can be normally operated allowing the cleaning process to work						■						
Cleanmax PAG							■	■	Esters & PAG	Yellowish	240				N	N	x			Sludge & varnish		Systems filled with mineral oils and or PAO		Based on Esters and PAG, Cleanmax PAG cleans circuits, pipes and sumps. Removes oil and sludge deposits	Cleanmax PAG need to be mixed with the PAG in the system in a proportion of 10%. Leave in the system for 12 to 48 hours							■						
Airtop Clean							■	■	Synthetic	Yellowish	180				N	N	x			Oxidation deposits from compressor lubricants				Concentrated cleaner for compressors & vacuumpumps		Airtop Clean can be added to the existing fluid at a rate up to 10% (depending on the pollution) for a longer period. Fluid can be normally operated allowing the cleaning process to work						■						
Sol Clean							■	■	Aqueous	Yellowish	Non flammable	12 @ 1%			Y	Low	x	x	x	Fungi & bacteria	Cleaning & desinfection of systems working with aqueous emulsions	Yellow metals with a concentration over 1%				Should be mixed directly into the contaminated emulsion 1-3%.						■						
Fluorsol X						■	■		Fluorinated	Colorless	34				Ether	N	N	x	x	x	Fluorinated oil & greases	Parts covered in fluorinated lubricants			Glass, Plastic, all metals, washing of electric & electronics,	Can also be used to disperse fluorinated greases and oils					■	■		■					
Cleanmax Hand AM				■	■				Neutral	Beige	Non flammable	6.5		Characteristic				x	x	x	Paint		People who are allergic to almonds and walnuts			Solvent free mild hand soap, contains sweet almond oil as skin care agent	Available in 4 liter with pump or 4 liter refill for wall dispenser												
Cleanmax Hand CT				■	■				Citrus	Yellow	Non flammable	6-6.5		Citric				x	x	x	Paint	Food industry				Solvent free hand soap, skin friendly abrasives	Available in 4 liter with pump or 4 liter refill for wall dispenser												

Glossary of terms

Additive
A chemical added in small quantities to a product to improve certain properties. Among the more common petroleum product additives are: oxidation inhibitors for increasing the product's resistance to oxidation and for lengthening its service life; rust and corrosion inhibitors to protect lubricated surfaces against rusting and corrosion, demulsifiers to promote oil-water, separation, VI improvers to make an oil's viscosity less sensitive to changes in temperature, pour-point depressants to lower the cold temperature fluidity of petroleum products, oiliness agents, anti-wear agents, and EP additives to prevent high friction, wear, or scoring under various conditions of boundary lubrication, detergents and dispersants to maintain cleanliness of lubricated parts, anti-foam agents to reduce foaming tendencies, and tackiness agents to increase the adhesive properties of a lubricant, improve retention, and prevent dripping or spattering.

Anhydrous
Free of water, especially water of crystallization.

Anti-Foam Agent
An additive that causes foam to dissipate more rapidly. It promotes the combination of small bubbles into large bubbles which burst more rapidly.

Anti-Oxidant
A chemical added in small quantities to a petroleum product to increase its oxidative resistance in order to prolong its storage and/or service life. The additive activates in two ways: by combining with the peroxides formed initially by oxidation paralyzing their oxidizing influence, or reacting with a catalyst to coat it with an inert film.

Anti-Wear Agent
An additive that minimizes wear caused by metal-to-metal contact by reacting chemically with the metal by forming a film on the surfaces under normal operating conditions.

Acid Number
Also referred to as NEUT or NEUTRALIZATION number: the specific quantity of reagent required to 'neutralize" the acidity or alkalinity of a lube oil sample. In service, the oil will, in time, show increasing acidity as the result of oxidation and, in some cases, additive depletion. Though acidity is not, of itself, necessarily harmful, an increase in acidity any be indicative of oil deterioration, and NEUT number is widely used to evaluate the condition of an oil in service. The most common measurement is ACID NUMBER, the specific quantity of KOH (potassium hydroxide) required to counterbalance the acid characteristics. How high an acid number can be tolerated depends on the oil and the service conditions, and only broad experience with the individual situation can determine such a value.

Auto-Ignition Temperature
Minimum temperature at which a combustible fluid will burst into flame without the assistance of an extraneous ignition source. This temperature is typically several hundred degrees higher than the flash and fire point.

Base Oils
Base stocks or blends used as an inert ingredient in the manufacturing of automotive and industrial lubricants.

Base Stocks
Refined petroleum oils that can either be blended with one another or supplemented with additives to make lubricants.

Base Oil Viscosity in a Grease
Because oil does the lubricating in a grease, and viscosity is the most important property of the lubricant, the viscosity of the base oil needs to be designed correctly for the application.

Boundary Lubrication
A form of lubrication effective in the absence of a full fluid film. Made possible by the inclusion of certain additives in the lubricating oil that prevent excessive friction and scoring by forming a film whose strength is greater than that of oil alone. These additives include oiliness agents, compounded oils, anti-wear agents, and extreme pressure agents.

Carbon Residue
Coked material formed after lubricating oil has been exposed to high temperatures.

Copper Strip Corrosion
Evaluation of a product's tendency to corrode copper or copper alloys. ASTM D130. Test results are based on the matching of corrosion stains.

Corrosion Inhibitor
A lubricant additive for protecting surfaces against chemical attack from contaminants in the lubricant.

Compatibility of a Grease
This is one of the most important grease properties. Whenever two incompatible thickeners are mixed, grease usually becomes soft and runs out of the bearing. When mixing different thickener types, consult supplier on compatibility. Some incompatible thickeners are aluminum and barium soaps, clay and some polyureas.

Consistency
NLGI grade is based on amount of thickener. Consistency describes the stiffness of the grease. NLGI 2 is the most common grade.

Demulsibility
A lubricant's ability to separate from water, an important consideration in the lubricant maintenance of many circulating systems.

Detergent
An additive which chemically neutralizes acidic contaminants in the oil before they become insoluble and fall out of the oil forming sludge. Particles are kept finely divided so that they can remain dispersed throughout the lubricant.

Dropping point
The temperature at which a grease changes from semi-solid to a liquid state under test conditions. It may be considered an indication of the high temperature limitation for application purposes.

Entrainment
Describing a state of an immiscible fluid component. Minute quantities of a fluid (typically water) can be dissolved or absorbed into the oil, but excess quantities can be most harmful to equipment due to the entrainment leaving gaps in the lubricated areas.

Emulsion
A mechanical mixture of two mutually insoluble liquids (such as oil and water).

EP agent
An additive to improve the extreme pressure properties of a lubricant.

Flash Point
Lowest temperature at which the air vapor from a sample of a petroleum product or other combustible fluid will "flash" in the presence of an ignition source. The flash can be seen in the form of a small spark over the liquid.

Fire Point
Lowest temperature at which a combustible fluid will burst into flame in the presence of an extraneous ignition source. Very little additional heat is required to reach the fire point from the flash point.

Foaming
A possible reaction of an oil when mixed with air. This entrained air can result in reduced film strength and performance reduction.

Foam Inhibitor
An additive which causes foam to dissipate more rapidly. It promotes the combination of small bubbles into large bubbles which burst more easily.

Four-Ball Tests
Two test procedures on the same principle. The Four Ball Wear Test is used to determine the relative wear-preventing properties of lubricants operating under boundary lubrication conditions. The Four Ball Extreme Pressure Test is designed to evaluate performance under much higher unit loads.

Hydrocarbons
Compounds of hydrogen and carbon of which petroleum products are typically examples. Petroleum oils are generally grouped into two parts: Naphthenics, which possess a high proportion of unsaturated cyclic molecules; and paraffinic, which possess a low proportion of unsaturated cyclic molecules.

Glossary of terms continued

Hydro Treating
A Gulf patented process used to make lubricant base stocks. In the process, lubricant feedstocks are reacted with hydrogen in the presence of a catalyst at very high temperature (400°C) and pressure (3000 plus psi). The process displaces impurities and unsaturated hydrocarbons.

Hydrodynamic Lubrication
A type of lubrication effected solely by the pumping action developed by the sliding of one surface over another in contact with an oil. Adhesion to the moving surface draws the oil into the high-pressure area between the surfaces, and viscosity retards the tendency to squeeze the oil out. If the pressure developed by this action is sufficient to completely separate the two surfaces, full-fluid-film lubrication is said to prevail.

ISO
International Standard Organization

Load Carrying Ability
Under high-load conditions, high-viscosity base stock is required and usually with an EP additive or solid additive like molybdenum disulfide.

NLGI· classifying stiffness of a Grease
The best way to define the consistency or stiffness of the grease is set out by the NLGI (National Lubricating Grease Institute). A test method defines the following grades according to a level of penetration measured at a temperature of 25°C. The consistency of the grease will change as soon as the temperature of the application will increase or decrease. When temperature falls below 25°C, the NLGI grade rises and the grease will appear more stiff.

On the other hand, as soon as the temperature will go beyond 25°C, the NLGI grade is reduced and the grease becomes less stiff.

Oxidation
A form of chemical deterioration to which all petroleum products are subject to, and involves the addition of oxygen atoms resulting in degradation. It is accelerated by higher temperatures above 25°C, with the rate of oxidation doubling by each 10°C increase. With fuels and lubricant oils, oxidation produces sludges, varnishes, gums, and acids, all of which are undesirable.

Oxidation Inhibitor
A chemical added in small quantities to a petroleum product to increase its oxidation resistance in order to prolong its storage and/or service life. The additive activates in two ways: by combining with the peroxides formed initially by oxidation, paralyzing their oxidizing influence, or reacting with a catalyst to coat it with an inert film.

Oil Separation of a Grease
For a grease to be effective, a small amount of oil must separate from the thickener (usually less than 3%).

Pumpability of a Grease
This is an important property when pumping grease in centralized systems at low temperatures. Most common test is Lincoln Ventmeter.

Pour Point
A widely used low temperature flow indicator, depicted as -15°C above the temperature to which a normal liquid petroleum product maintains fluidity. It is a significant factor in cold weather start-up. Paraffinic oils typically have higher pour points due to the formation of wax crystals, while many other lubricants reach their low pour points through an increase in viscosity.

Rust Inhibitor
A lubricant additive for protecting ferrous (iron and steel) components from rusting caused by water contamination or other harmful materials from oil degradation.

Shear Stress
A unit of frictional force overcome in sliding one layer of fluid along another. This is typically measured in pounds per square foot, with pounds representing the frictional force, and square feet representing the area of contact between the sliding layers.

Shear Stability
Grease needs to maintain its consistency under high shear conditions. The shear stability test measures the softening of grease when sheared for 10,000 or 100,000 double strokes with a grease worker. Loss of less than one NLGI grease grade signifies a stable thickener under high shear conditions.

Sludge
The collective name for contamination in a compressor and on parts bathed by the lubricating oil. This includes decomposition products from the fuel, oil, and particulates from sources external to the compressor.

Solvency
The ability to dissolve into a solution producing a homogeneous physical mixture. The degree of solvency varies along with the rate of dissolution depending on the amount of heat added to the solution.

Synthetic lubricants
Lubricants manufactured by a process, where a chemical conversion or transformation of one complex mixture of molecules into another complex mixture takes place.
Common types of synthetic base oil include: Polyalpha olefins (PAO), Hydrocracked/Hydroisomerized, Unconventional Base Oils (UCBO), Organic Esters, Polyglycols (PAG).

Timken OK load
Measure of the extreme pressure properties of a lubricant.

Thickener for Grease
A grease consists of a base oil, additives and a thickener. There are soap and non-soap thickeners. Each thickener type provides unique characteristics to the grease.

Vapor Pressure
The measure of a liquid's volatility. The higher the pressure at a standard test temperature, the more volatile the sample, and the more readily it will evaporate.

Varnish
A deposit resulting from oxidation and polymerization of fuels and lubricants. Similar to but softer than lacquer.

Viscosity
Measure of a fluid's resistance to flow. This is typically measured as the time required for a standard quantity of fluid at a certain temperature to flow through a standard orifice. The higher the value, the more viscous the fluid. Viscosity varies inversely with temperature, so the measurements are always expressed together. Tests are typically conducted at 40°C and 100°C.

Viscosity Index
The measure of the rate of change of viscosity with temperature. Heating tends to make lubricants thinner, cooling makes them thicker. The higher a VI is on a particular fluid, the less of a change in viscosity there will be over a given temperature range. In determining the VI, two temperatures of viscosity are taken, one at 40°C and the other at 100°C.

Volatility
The property of a liquid that defines its evaporation characteristics. Of two liquids, the more volatile one will boil at a lower temperature and will evaporate faster when both liquids are at the same temperature. The volatility of petroleum products can be evaluated with tests for flash point, vapor pressure, distillation, and evaporation rate.

Water Resistance
Water washout test measures ability of a thickener to remain intact in bearing when submerged in water. Water spray-off measures ability of a thickener to remain in bearing in presence of water spray. Both of these tests measure percent grease removed.

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