FOOD GRADE LUBRICANTS

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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.lubes-portal.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.

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 biodegradability 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 a 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.

Grease and paste
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.

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 include both technical and pharmaceutical white oils.

The Matrix line of D-MAX colloidal dispersions contain products based on graphite, MoS2, PTFE and Boron Nitride (hBn). These can be used as additives, lubricants and processing products.
Food grade lubricants

The food processing industry presents unique challenges to lubricant formulation engineers, lubricant marketers, plant lubrication engineers and equipment designers. It is never desirable for lubricants to be allowed to contaminate raw materials, work-in-progress or finished product, the consequences of a lubricant contaminated product are rarely more acute than in the food processing industry. As such, lubricants used in this industry have requirements, protocols and performance expectations that exceed typical industrial lubricants.

Matrix Specialty Lubricants has developed an extensive range of food grade lubricants which frequently outperform high tech industrial lubricants and greases. Matrix continues to develop and add new products to the existing extensive portfolio. For any special product request do not hesitate to seek the assistance of your local Matrix representative.

NSF and InS are certification bodies which approve lubricants and greases according to various categories. In the overview below you will find an explanation of the most common lubricant approvals.

H-1 Lubricants
Universally applied in applications where incidental contact with food products is likely

HX-1 Lubricants
Use in lubricants with incidental food contact

H-2 Lubricants
Used on operating equipment that is vital to the manufacturing plant, but will not come in contact with food products. Will not contain: Perfume, Pb, Sb, Cd or Ni additives

HT-1 Heat Transfer Fluids
Universally applied in applications where incidental contact with food products is likely

H-3 Soluble Oils
These products are chemically acceptable for applications to hooks, trolleys and similar equipment to clean and prevent rust. Those portions of the equipment that contact edible products must be made free of the mixture before re-use

3-H Release Agents
Lubricants and release agents that will often come in contact with food. Unlike H-1, 3-H lubricants can be used as food additives (the 10 PPM rule does not apply) (i.e. divider oil)
General lubricants
The lubrication of numerous lubrication points found in the food industry.

Hydraulic lubricants
A large proportion of equipment in the food processing industry is operated by hydraulic systems. Although hydraulic systems are used relatively far from the process, the risk of contamination is large because the high operating pressures can cause leakages to travel a long distance. Has developed 3 types of food grade hydraulic fluids to suit specific performance requirements.

Foodmax® Basic
Paraffin food grade oil for general lubrication purposes. Can be used in authorized industrial operations wherever there is the possibility of food contact (for both humans or animals). Foodmax® Basic can be used as a general lubricant in various applications in the food processing industry. Additionally it gives excellent results as general lubricant in the textile, knitwear, food and tin container industry, whenever very high cleanliness level is required.

Foodmax® AW
Foodmax® AW is non toxic and formulated using specially selected highly refined base stocks in combination with the latest additive technology. Foodmax® AW is suitable for applications where incidental contact with food or raw materials is possible during the production process. Due to the very low pour point Foodmax® AW PAO is better suited to low temperature applications in comparison to Foodmax® AW. Foodmax® AW 22 is a higher performance alternative to soap/water mixtures for the lubrication of conveyor belts in the beverage industry.

Foodmax® AW PAO
Foodmax® AW PAO is non toxic and formulated using specially selected synthetic base stocks in combination with the latest additive technology. Foodmax® AW PAO is suitable for applications where incidental contact with food or raw materials is possible during production. Because of its great performance characteristics and carefully chosen additives, Foodmax® AW PAO oils can be used in most applications in the food manufacturing and processing industry.

Foodmax® FRF
Foodmax® FRF is a synthetic food grade fire resistant hydraulic fluid formulated to provide both fire resistance and excellent lubrication. Unlike most water glycol based formulations, Foodmax® FRF is easy to maintain, has an exceptionally long fluid life and offers superior pump protection. No special change out procedures are necessary to switch from a standard mineral oil hydraulic fluid to Foodmax® FRF and, unlike water glycol formulations, pump operation is not required. Its’ exceptional oxidative stability, corrosion resistance, and anti-wear properties make Foodmax® FRF particularly well suited for applications where other fire resistant fluid technologies are restricted. Check out the demonstration video on YouTube or our website searching for Foodmax® FRF.

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Foodmax® selection table

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Gear lubricants

Gearboxes are seen everywhere in food processing plants. Most of the time they are relatively small and will operate at both low and high temperatures. Depending on the circumstances and type of gearbox the right choice can be made from Foodmax® Gear, Gear PAO or Gear PAG.

Compressor & Vacuumpump

Compressed air and vacuum pumps are vital components in any food production or processing plant. Cleanliness of the equipment, temperature resistance and lifetime of the lubricant can influence the reliability of compressors and vacuum pumps to a great extent.

Foodmax® Gear

Food grade range of lubricants for gears, bearings and transmissions

Foodmax® Gear is a range of lubricants in which a combination of the latest base stock technology together with special additives delivers a very high performance. All base material used for the formulation is non-toxic and food grade. Also suitable as chain oil when a non sticky lubricant is required.

Foodmax® Gear PAO

Range of fully synthetic food grade gear oils, particularly suited for the lubrication of drive chains, conveyor chains, gearboxes and reduction units. Foodmax® Gear PAO 680-1000 contains special additives that extend relubrication intervals. These lubricants can also be used as chain oils. Foodmax® Gear PAO is specially designed for low temperature applications.

Foodmax® Gear PAG

Foodmax® Gear PAG is a synthetic oil with excellent anti wear properties, high stability to oxidation and a low pour point. It is neutral to metals including aluminum alloys and copper. It resists mechanical shearing, is very stable to ageing and has very good viscosity temperature characteristics. Foodmax® Gear PAG is suitable for the most severely loaded gearboxes. Foodmax® Gear PAG is not miscible with other synthetic and mineral fluids.

Foodmax® Air

The superior performance characteristics of Foodmax® Air mean it can be used safely in all types of compressors and vacuum pumps. The product is based on a fully synthetic base oil and specially selected additives. Foodmax® Air has an excellent oxidation stability and long life at very high temperatures. Foodmax® Air 32 can be used as an airline lubricant.

Foodmax® Air PAO

Foodmax® Air PAO oils are food grade, non-toxic synthetic oils developed for all types of compressors used in the food, beverage and pharmaceutical industries.

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## Foodmax® selection table

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- **ISO VG**: International Organization for Standardization Viscosity Grades
- **Kinematic Viscosity 40 °C**: Kinematic viscosity at 40 °C
- **VI**: Viscosity Index
- **Pour Point °C**: Pour point temperature in °C
- **Flash Point °C**: Flash point temperature in °C
- **Airline Lub**: Suitable for airplane lubrication
- **Basic Lub**: Basic lubrication
- **Hydraulic Gear**: Suitable for hydraulic gear
- **Chain**: Suitable for chain lubrication
- **Compressor**: Suitable for compressor lubrication
- **Vacuum Pump**: Suitable for vacuum pump lubrication
- **Temp. Load**: Temperature and load conditions
- **NSF / InS approvals**: NSF and InS approvals
- **High** | **Medium** | **Low** | **High** | **Medium**
Chain & Conveyors lubricants

Food is very often transported in a food production plant using chains and conveyors. As these chains are exposed to water, cleaning agents and extreme temperature variations it is extremely important to select the right product.

Foodmax® Chain
Fully synthetic food grade oil with characteristics that make it particularly suited for the lubrication of drive chains and conveyor chains, gearboxes and reduction units. Contains special additives that extend relubrication intervals significantly; and does not contain any mineral components. Foodmax® Chain can be used in incidental contact with food and raw materials.

Foodmax® Chain LT
Foodmax® Chain LT is based on a blend of synthetic hydrocarbons and is inhibited against oxidation to give a long wet film life over a wide temperature range. Foodmax® Chain LT is designed for the lubrication of conveyor chains and bearings running continuously at low temperatures, down to minimum of –40 °C. Foodmax® Chain LT is also suitable for spiral freezers.

Foodmax® Chain HT
Foodmax® Chain HT is based on highly polar biodegradable base oil and is inhibited against oxidation to give a long wet film life at high temperatures. The highly polar molecules strongly adhere to the surface and withstand high temperatures, at the same time separating the moving parts thanks to its highly viscous lubricating film which is maintained at these high temperatures. Foodmax® Chain HT can resist up to 250°C, and is therefore suitable for bread ovens in bakeries.

Foodmax® Mammut Oil 25
Foodmax® Mammut Oil 25 is a food grade product formulated to dissolve sugar from chains, slides and moulds. It has been developed specially for the confectionary market and any application involving sugar. Foodmax® Mammut oil 25 washes sugar off before lubricating and protecting the chain.
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Greases
The use of grease in the food production process is almost endless. This in combination to wet environments, excessive cleaning with chemicals and extreme temperature variations makes choosing the right grease of major importance. In the past, food grade greases were developed to be non toxic and provided minimum performance. The latest generation of Matrix calcium sulphonate food grade greases however are outperforming most high tech industrial grades. Many happy customers report that the performance of these greases are almost too good to be food grade.

Foodmax® Grease ALU-M
Foodmax® Grease ALU-M is a range of HT-base oil aluminum complex greases designed for the lubrication of almost any application which requires a food grade lubricant. The Foodmax® Grease ALU-M series are formulated with complex soap, additive package and authorized solid lubricants. They possess excellent lubricating properties and a high water resistance, perfect when a combination of water and high load resistance is required. Foodmax® Grease ALU-M series can be used in a large variety of applications including bearings operating within a temperature range of -35 to 150 ºC. The speed factor is approx 5 x 105 in the presence of high loads and water.

Foodmax® Grease ASP
Foodmax® Grease ASP 2 is an aluminum complex grease designed for the lubrication of almost any type of application which requires a food grade lubricant. Foodmax® Grease ASP 2 is formulated with a complex soap, synthetic base oil, additive package and solid lubricants. Thanks to the superior resistance to water ASP 2 is very suitable for the lubrication of chains operated in very wet conditions such as food conveyor chains. Foodmax® Grease ASP can resist higher temperatures and loads in comparison to Foodmax® Grease ALU-M.

Foodmax® Grease CAS M2
Foodmax® Grease CAS M 2 is a member of a family of technologically advanced greases which have been developed by complexing modified overbased calcium sulfonates. This technology is characterized by exceptional mechanical stability, high dropping point, high load carrying performance, reduced wear and excellent resistance to water and corrosion. This technology equals and, in many ways, outperforms other premium, high temperature greases such as lithium complex and aluminum complex.

Foodmax® Grease CAS S LS
Foodmax® Grease CAS S 1 LS is a member of a family of technologically advanced greases which have been developed by complexing modified overbased calcium sulphonates. This technology is characterized by exceptional mechanical stability, high dropping point, high load carrying performance, reduced wear, and excellent resistance to water and corrosion. This technology equals and, in many ways, outperforms other premium, high temperature greases such as lithium complex, aluminium complex and polyurea. NLGI 1 is available for better pumpability requirements.

Foodmax® Grease CAS S2 HS
Foodmax® Grease CAS S 2 HS is a member of a family of technologically advanced greases which have been developed by complexing modified overbased calcium sulfonates. This technology is characterized by exceptional mechanical stability, high dropping point, high load carrying performance, reduced wear, and excellent resistance to water and corrosion. This technology equals and, in many ways, outperforms other premium, high temperature greases such as lithium complex and aluminum complex.
Foodmax® Grease TF-S
Foodmax® Grease TF-S is a synthetic food grade grease containing PTFE. The combination of the synthetic base fluid and added solids reduces the friction to a great extent and will provide lubrication under all circumstances including boundary lubrication. Shows excellent compatibility with elastomers and plastics.

Foodmax® Grease Fluor HT
Foodmax® Grease Fluor HT 2 is a non-flammable white grease developed from a perfluoroalkyl-polyether type oil, with micronised PTFE as thickener and anti-corrosion additive. It is physically and chemically totally inert except for fluorinated solvents and thermal and ionising radiation. All the raw materials used in the manufacturing process appear in the positive list of the FDA (Food and Drugs Administration).

Foodmax® Grease SI
Very adherent silicone grease, designed to provide perfect sealing and regular smooth operation in mono-drive taps. Long lifetime. Perfect water insolubility. Extends the working life and reduces wear of the ceramic disks. Approved by health authorities approval and Water Byelaws Scheme approval per BS-6920.

Foodmax® Assembly Paste
White, non-toxic, grease-like compound with a high solid lubricant content designed for use as an assembly lubricant for lubricating bushes, sliding surfaces, small open plastic or metal gears and anti-seize compound for threaded fasteners. The compound is designed to prevent damage during start up and protect against premature wear during the running-in period.

**NLGI: classifying stiffness of a Grease.**

<table>
<thead>
<tr>
<th>NLGI class</th>
<th>Worked penetration penetration number</th>
<th>General consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>445-475</td>
<td>Liquid</td>
</tr>
<tr>
<td>00</td>
<td>400-430</td>
<td>Mildly liquid</td>
</tr>
<tr>
<td>0</td>
<td>355-385</td>
<td>Semi liquid</td>
</tr>
<tr>
<td>1</td>
<td>310-340</td>
<td>Very weak</td>
</tr>
<tr>
<td>2</td>
<td>265-295</td>
<td>Weak</td>
</tr>
<tr>
<td>3</td>
<td>220-250</td>
<td>Semi solid</td>
</tr>
<tr>
<td>4</td>
<td>175-205</td>
<td>Solid</td>
</tr>
<tr>
<td>5</td>
<td>130-160</td>
<td>Very solid</td>
</tr>
<tr>
<td>6</td>
<td>85-110</td>
<td>Firm</td>
</tr>
</tbody>
</table>
# Foodmax® Grease Selection Table: Behaviour & Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>Grease Type</th>
<th>Behaviour to Physical Agents</th>
<th>Behaviour to Chemical Agents</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Loads</td>
<td>V</td>
<td>Speed</td>
</tr>
<tr>
<td>1</td>
<td>Foodmax® Grease ALU M</td>
<td>AC</td>
<td>SS</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Foodmax® Grease ASP</td>
<td>AC</td>
<td>SS</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Foodmax® Grease CAS M 2</td>
<td>Cas</td>
<td>SS</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Foodmax® Grease CAS S 2 HS</td>
<td>Cas</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Foodmax® Grease Clear</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Foodmax® Grease Fluor HT</td>
<td>PTFE</td>
<td>Pe</td>
<td>P</td>
</tr>
<tr>
<td>7</td>
<td>Foodmax® Grease SI</td>
<td>I</td>
<td>Si</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Foodmax® Assembly Paste</td>
<td>PTFE</td>
<td>SS</td>
<td>P</td>
</tr>
</tbody>
</table>

**Load**: Low, Medium, High  
**Vibration**: Low, Medium, High  
**Environmental**: Cold water, Hot water, Salt water, Vapour water, Alkali, Acid, Hydrocarbons  
**Application**: Bearings, Slider Bearings, Open gears, Closed gears, Chains & Joints, Valves & Taps, Slideways, Joints & Gaskets, Wires

**AC** = Aluminium Complex, **Ca** = Calcium, **Cas** = Calcium Sulphonate, **SS** = Semi Synthetic, **S** = Synthetic, **Si** = Silicon, **Pe** = Perfluorinated, **P** = PTFE, **I** = Inorganic

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Foodmax greases are packed in special cartridges. Due to their special cap you do not touch the grease while using and equipment will stay cleaner. Besides regular grease pumps, Foodmax cartridges can also be used in special guns which make easy and clean application of the grease possible.

1. Take a Matrix Cartridge  
2. Pull off the strap from the cap  
3. The cap will become a piston  
4 & 5. Pull off the cap on the other side of the cartridge
# Foodmax® Grease Selection Table: Temperature Range & NLGI Classifications

<table>
<thead>
<tr>
<th>Product</th>
<th>NSF / InS Approvals</th>
<th>NLGI</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodmax® Grease ALU M</td>
<td>H1</td>
<td>0</td>
<td>-70</td>
</tr>
<tr>
<td>Foodmax® Grease ASP</td>
<td>H1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Foodmax® Grease CAS-M2</td>
<td>H1</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>Foodmax® Grease CAS-S2 LS</td>
<td>H1</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>Foodmax® Grease CAS-S2 HS</td>
<td>H1</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Foodmax® Grease TF-S</td>
<td>H1</td>
<td>0</td>
<td>220</td>
</tr>
<tr>
<td>Foodmax® Grease Fluor HT</td>
<td>H1</td>
<td>0</td>
<td>280</td>
</tr>
<tr>
<td>Foodmax® Grease SI</td>
<td>H1</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Foodmax® Assembly Paste</td>
<td>H1</td>
<td>0</td>
<td>1000</td>
</tr>
</tbody>
</table>

---

X = as an anti-seize

4 & 5: Pull off the cap on the other side of the cartridge.
6: Click on the special nozzle.
7: Place the cartridge and nozzle in the grease gun.
8: The gun and cartridges are ready for clean operation.
9: Use the closing cap to avoid contamination.
Miscellaneous food grade

In this section you will find food grade heat transfer fluids. They very often represent a high risk of causing contamination since a leakage may not be discovered for a long time. Also includes general purpose products such as Foodmax® Silicon oils, Foodmax® DDO and Foodmax® Clean.

Foodmax® DDO
Foodmax® DDO is produced from highly refined vegetable based oil and special additives to warrant a trouble free operation when used as a dough divider oil.

Foodmax® HTF 32
Foodmax® HTF (Heat Transfer Fluid) fluids are made with food grade synthetic base fluids. They are formulated to be very thermally and oxidative stable and are further enhanced with proprietary additives that greatly extend their life over normal and other synthetic food grade heat transfer fluids. They provide exceptional performance in a number of food related heat transfer applications.

Foodmax® Silicon
Foodmax® Silicon are special fluids developed to lubricate applications which suffer from high temperatures and where water and other contaminants are found. Foodmax® Silicon can also be used as heat transfer fluids in circulating systems and hot bath applications.

Characteristics

<table>
<thead>
<tr>
<th>Foodmax®</th>
<th>ISO VG</th>
<th>Pour Point °C</th>
<th>Flash Point °C</th>
<th>NSF / InS approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodmax® DDO</td>
<td>46</td>
<td>6</td>
<td>&gt;260</td>
<td>3H, H1</td>
</tr>
<tr>
<td>Foodmax® HTF 32</td>
<td>32</td>
<td>223</td>
<td>H1, HT1</td>
<td></td>
</tr>
<tr>
<td>Foodmax® Silicon 50</td>
<td>50</td>
<td>&lt; -50</td>
<td>&gt;300</td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® Silicon 100</td>
<td>100</td>
<td>&lt; -50</td>
<td>&gt;300</td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® Silicon 10000</td>
<td>200</td>
<td>&lt; -50</td>
<td>&gt;300</td>
<td>H1</td>
</tr>
</tbody>
</table>

Foodmax® Clean
Foodmax® Clean is a general purpose cleaner and degreaser formulated from a citrus derivative which is non toxic, biodegradable and InS C1 approved.
Foodmax® Spray
Aerosols are easy to use and allow mechanics to apply lubricants and greases at the right concentration in the correct location.

Foodmax® Multi Spray
Foodmax® Multi Spray is a very adhesive white food grade lubricant in a spray package. The spray contains a food grade synthetic fluid as well as a 4% food grade solid lubricant (PTFE, commonly known as Teflon). Lubrication of chains, conveyors, slides, joints, mould slides, small bearings or any other application which requires a food grade high performance lubricant. Also suitable for textile, paper and graphic arts, plastic and elevator industry. Also provides excellent performance in motorcycle chain lubrication and in high speed go-kart transmission chains.

Foodmax® Easy Spray
Foodmax® Easy Spray is a universal lubricant for use in food processing equipment where incidental contact with food may occur. Suitable for most applications where medium load resistance is required. Foodmax® Easy Spray can be used as a non sticky general lubricant for chains, bearings and slides with low load, hinges and as a cleaning and conserving agent for stainless steel. Additionally Foodmax® Easy Spray can be used as a food grade mould release oil.

Foodmax® Silicon Spray
Foodmax® Silicon Spray is a silicone based, anti-adherent and lubricating fluid with very high temperature resistance. H1 for use in food processing equipment where incidental contact with food may occur. Excellent lubricant for packaging transport lines and for low load applications. Also suitable as anti adherent for any type of equipment, demoulding of all type of plastics and rubbers and surface polisher.

Foodmax® Grease Spray
Foodmax® Grease Spray is a high performance food grade white grease, sticky and water/steam resistant. Suitable for open gears, slides, conveyors, bearings etc. Also suitable as assembly paste. Temperature range -40 to 180 ºC. NSF-H1 for the use in food processing equipment where incidental contact with food may occur.

Foodmax® DDO Spray
Foodmax® DDO is produced from highly refined vegetable based oil and special additives to warrant a trouble free operation when used as a dough divider oil.

Foodmax® DWF Spray
Foodmax® DWF is a food grade multi-purpose penetrating lubricant with excellent water displacing properties. It is a non-toxic lubricating, penetrating and de-watering lubricant and is ideal for use on light loaded chains, bearings and slides in food and clean environments. Working temperature -30 ºC to 145 ºC.
### Foodmax® Spray Selection Table

<table>
<thead>
<tr>
<th>Foodmax® Spray</th>
<th>Chains</th>
<th>Slides</th>
<th>Open Gear</th>
<th>Penetrating oil</th>
<th>General lubrication</th>
<th>Release agent</th>
<th>Dewatering</th>
<th>Anti-corrosion</th>
<th>NSF / InS approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodmax® Multi Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® Easy Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® Silicon Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® Grease Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1</td>
</tr>
<tr>
<td>Foodmax® DDO Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1, 3H</td>
</tr>
<tr>
<td>Foodmax® DWF Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H1</td>
</tr>
</tbody>
</table>

### Refrigeration

The production of food goes hand in hand with the cooling and freezing of the final product and raw materials. Most food production plants are therefore having all sorts refrigeration equipment in place. Matrix Specialty Lubricants offers a large selection of high quality refrigeration lubricants including POE and PAG and special lubricants for ammonia refrigeration. Please check our Coolmax products in the refrigeration fluids brochure or check the website for more details.
Viscosities can be related horizontally only. For example, the following oils have similar viscosities: ISO 460, AGMA 7 and SAE GEAR OIL 140. The viscosity/temperature relationships are based on 95 VI oils and are usable only for mono grade engine oils, gear oils and other 95 VI oils. Crankcase oils and gear oils are based on 100° C viscosity. The “W” grades are classified on low temperature properties. ISO oils and AGMA grades are based on 40° C viscosity.
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.

Anyhydrous
Free of water, especially water of crystallization.

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.

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.

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 rapidly.

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.
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 250°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 Ventimeter.

**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 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/Hydrosomerized, Unconventional Base Oils (UCBO), Organic Esters, Polyglycols (PAG).

**Timken OK load**
Measure of the extreme pressure properties of a lubricants.

**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 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 400°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.