



CHAIN LUBRICANTS

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.



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 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

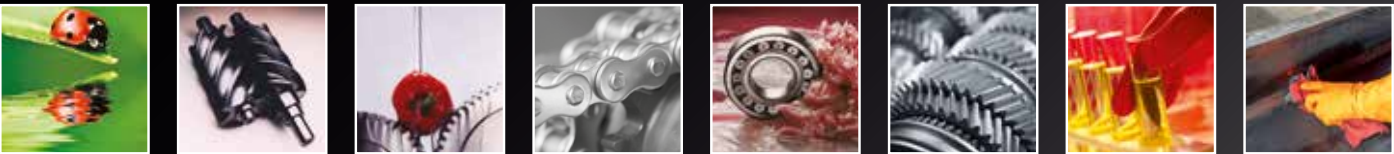
This line of products includes the latest technology soluble metal working fluids, neat cutting oils, cold and hot forging, quenching, drawing and stamping products.

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. Those are NSF H-1, C-1 and K-1 approved.



Chain Lubricants

Chains have been used for ages and can literally be found in any type of industry. Many different types of chains are used and they differ in size and dimension. Although the lubrication of chains is often done with general purpose products, selecting the right and dedicated chain lubricant is valid for a properly functioning chain as well as its lifetime.

Matrix Specialty Lubricants therefore offers a very extensive range since all applications, temperatures and running conditions require a specific approach. We are using the latest base oils and additive technology to formulate chain oils which are outperforming many competitive products in the below mentioned fields.

- Temperature resistance
- Anti-wear properties
- Clean operation
- Energy savings
- Water resistance
- Chemical resistance

By using Matrix Specialty Lubricants chain fluids the equipment operator can achieve;

- Lower overall lubricant consumption
- Extended service intervals
- Increased production and equipment operating reliability
- Decreased maintenance costs
- Longer chain life

Chains

In industrial processes several chain types fulfill numerous functions;

- Drive Chains
found in, for example motorcycles, construction equipment and bikes
- Lifting Chains
found in forklift trucks, elevators, rolling mills and lock gates
- Control Chains
machine tools and positioners
- Transport Chains
found in food and automotive industries and manufacturing of furniture and steel

The lubrication of chains is an interesting challenge because of several reasons;

- Mechanical motion results in mixed and boundary friction
- No hydrodynamic lubrication possible because of low speeds
- The friction points are relatively difficult to access
- Mainly linear contact of the friction parts
- High surface pressures on the friction parts
- Oscillating friction body movements

An oil film on the outside of the chain will protect against corrosion but will not protect against wear inside the chain. It is very important that lubricants that are chosen actually penetrate well and lubricate the roller, bushing from the inside to prevent wear.

Inadequate lubrication of chains will finally lead to excessive wear, which will result in a longer chain and eventually breaking of the chain and increased operating cost (energy consumption). Whether driving a motorbike at high speed or the tenter chain in a textile production company breaks during the production season, in all cases you do not want to be confronted with the results which are very often caused by inadequate lubrication.

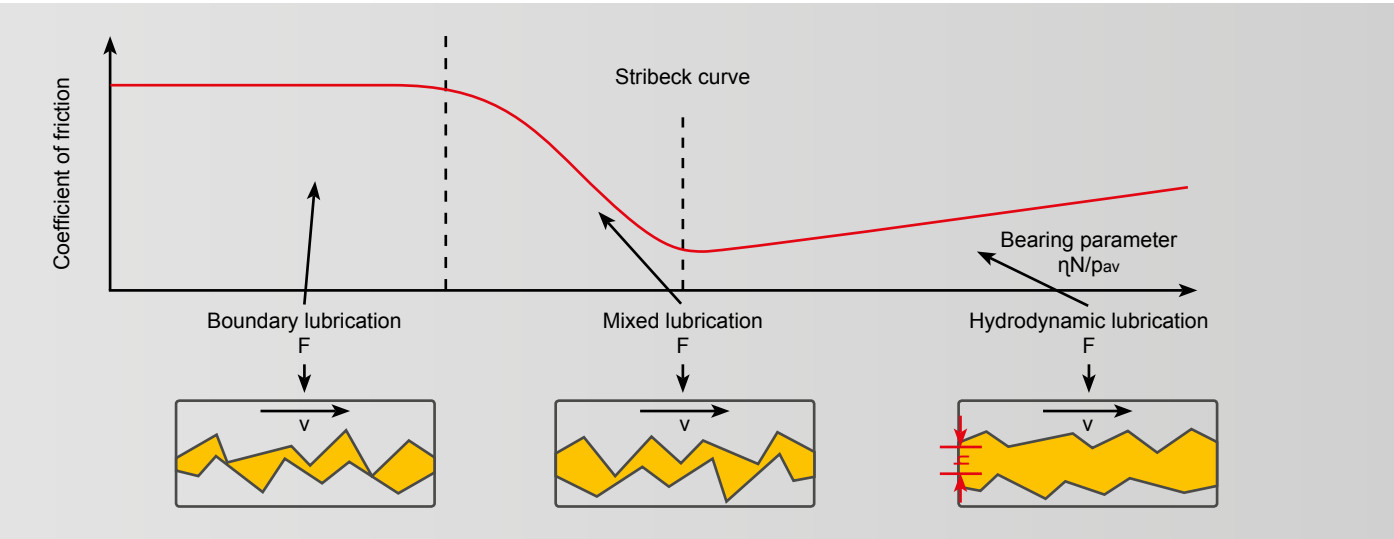
The choice of the right lubricant is vital, the following factors should be considered:

- Correct viscosity (see figure)
- Re-lubrication intervals
- Right quantity and applied to the right place
- Type of application possible
- Temperature range
- Ability of the lubricant to get between the pin and bushings
- Material pairs
- Different chain drive constructions

Standard values for oil viscosity at 40°C according to DIN 8195

Joint Contact Pressure N/mm2	Chain Speed (m/s)				
	1	1 to 5	>5	<5	≥5
	ISO VG Grade				
<10	32	46	68	32	46
10 to 20	46	68	100	46	68
20 to 30	68	100	150	68	100
	manual or drip feed lubrication			splash lubrication	

Almost all chains suffer from intense surface contact, this phenomenon is often referred to as boundary friction; from a lubricants point of view this will result in boundary lubrication. Friction can be reduced to a great extent by chosing the right lubricant for the given circumstances.



Chain lubricants have to be high-performance products and therefore they need to have good technical characteristics. Below the most important are listed and explained in more detail.

Adhesiveness

The ability of a lubricant to stick to the chain. This parameter is very important in case of high-speed chains where the lubricant should not fling off.

Detergency

The ability of the lubricant to clean (dissolve) the residues of used chain oil in the difficult to reach parts of the chain.

High-Temperature Resistance

The ability of a lubricant not to create residues in the chain links at operating temperatures above 140 °C. This parameter is extremely important when chains operate at these temperatures. Using a lubricant which is not suitable for high temperatures will result in residues in the vital parts of the chains.

Corrosion Protection

The ability of a chain lubricant to protect the chain against corrosion is especially important for outdoor and corrosive ambient conditions.

Resistance Against Media

The presence of water, acids and solvents can trigger chemical reactions. Under all circumstances it is important that a lubricant keeps performing the way it should. This parameter is especially important for chains used in the textile, food and paint industry.

Carbon Forming Tendency

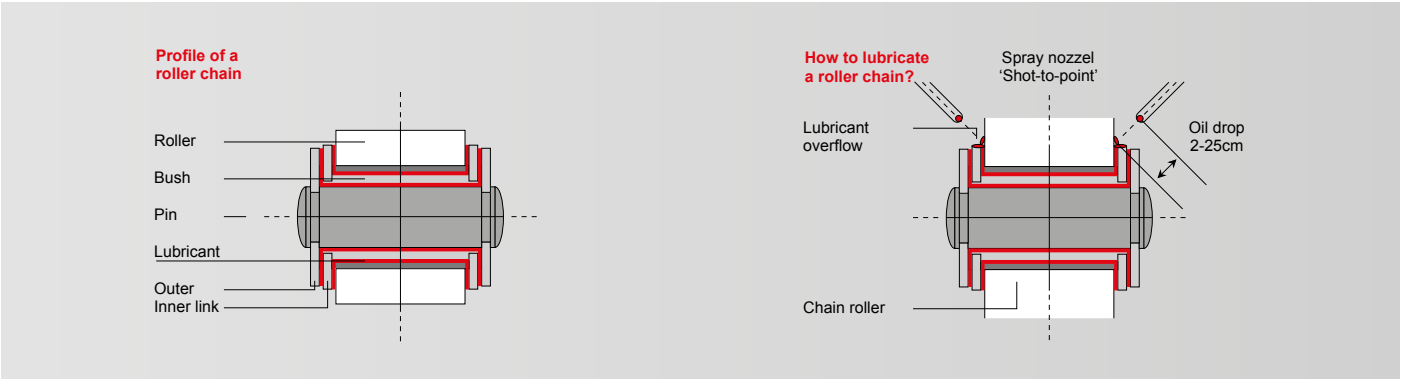
Carbon deposits are created in the chain links at high temperatures. These increase wear and reduce chain lifetime; the lubricant should possess very low carbon forming tendencies at high temperatures.

Wetting Ability


The chain lubricant should have the ability to penetrate in the narrow spaces of the chain links in order to lubricate the chain properly.

Load Carrying Capability

A chain lubricant should be formulated in such a way so that it reduces wear and seizure of the chain parts.



Chain Oil Selection Table

<div></div>		Working Temperature °C																Compatible With							Application					Energy Saving	Remarks and other characteristics					
		-40	-30	-20	-10	0	150	170	200	220	240	250	280	300	500	Solids	Base Oil	Flashpoint	Steel	Copper	Aluminium	Water	Steam	Vapor	Acids	Ammonia	Brushing	Oiler	Vaporizer			Dripping	CLS			
Fluids	Chainmax 100																M	230																Sticky chain oil for lubrication up to 150 degrees °C, provided with good low-noise properties		
	Chainmax 150																M	230																Sticky chain oil for lubrication up to 150 degrees °C, provided with good low-noise properties		
	Chainmax 320																M	235																Sticky chain oil for lubrication up to 150 degrees °C, provided with good low-noise properties		
	Chainmax 460																M	>240																Sticky chain oil for lubrication up to 150 degrees °C, provided with good low-noise properties		
	Chainmax WR 68																M	>200																(Sea)water resistant, non drip, can be applied on wet chains (dewatering properties)		
	Chainmax WR 150																M	>200																(Sea)water resistant, non drip, can be applied on wet chains (dewatering properties)		
	Chainmax WR 460																M	>220																(Sea)water resistant, non drip, can be applied on wet chains (dewatering properties)		
	Chaintop MT 50																S	260															x	Medium and high temperature chain oil, low residue anc clean operation		
	Chaintop MT 100																S	240															x	Medium and high temperature chain oil, low residue anc clean operation		
	Chaintop MT 150																S	210															x	Medium and high temperature chain oil, low residue anc clean operation		
	Chaintop MT 220																S	220																	Medium and high temperature chain oil, low residue anc clean operation	
	Chaintop MT 320																S	225																	Medium and high temperature chain oil, low residue anc clean operation	
	Chaintop XL																S	>260															x	High performance lubrication at extremely high temperatures with minimum residue		
	Chaintop XL 100																S	>260															x	High performance lubrication at extremely high temperatures with minimum residue		
	Chaintop XLE 220																S	290															x	Synthetic high temperature chain and lubricating fluid		
	Chaintop XLG															DL	G	S	>260																Chemically inert, radiation resistant, almost dry lubrication will therefore not attract dust	
	Chaintop CLE																S	300																	Special PAG oil compatible with water based paints and coating. No craters formed if the oil drips on the surface	
Food Grade	Foodmax Chain 68																S	>200																Food grade chain oil, H-1, tacky non drip, very water resistant		
	Foodmax Chain 100																S	>200																Food grade chain oil, H-1, tacky non drip, very water resistant		
	Foodmax Chain 220																S	>240																Food grade chain oil, H-1, tacky non drip, very water resistant		
	Foodmax Chain 460																S	>240																Food grade chain oil, H-1, tacky non drip, very water resistant		
	Foodmax Chain 320 Heavy																S	>240																Food grade chain oil, H-1, contains extensive tackifier package for extra water resistance		
	Foodmax Gear PAO 220																S	>260																Food grade gear and chain lubricant in single point lubricator device		
	Foodmax Gear PAO 1000																S	>265																Fully synthetic food grade gear oils particularly suited for the lubrication of drive chains, conveyor chains, gearboxes and reduction units		
	Foodmax DWF																M	>200																H-1 dewatering chain lubricant		
	Foodmax Chain HT-X																S	>280															x	Food grade high temperature chain oil, H-1, non smoke low residue		
	Foodmax Chain HT-X 220																S	>285															x	Food grade high temperature chain oil, H-1, non smoke low residue		
	Foodmax Chain HT-X 460																S	290															x	Food grade high temperature chain oil, H-1, non smoke low residue		
Foodmax Chain LT																S	>200															x	Food grade low temperature chain oil, H-1			
Foodmax Chain LT-X																S	159															x	Food grade extreme low temperature chain oil, H-1			
Grease	Grease CAS 2 Green																M	n/a																	Water resistant and adhesive chain grease, high loads and low speeds	
	Grease Fluor HT 2																P	S	n/a																High temperature, resistant to chemical agents, vibrations	
	Grease Barium Complex L																M	n/a																	Water and vapour resistant, high load, low speed	
Spray Cans	Performance Chain WR #56																M	260																	(Sea)water resistant, non drip, can be applied on wet chains (dewatering properties)	
	Performance TFD #69																P	S															x		Dry and waxy lubricant with added PTFE. Suitable for use at room temperature only	
	Performance X3 #74																P/Bn	S															x		Sticky chain lubricant, outstanding EP properties	
	Performance WD #71																M																			Penetrating oil
	Foodmax Multi #21																P	S															x		H-1 adherent chain lubricant with added PTFE. Excellent penetrating properties. Also suitable for motorcycle chains	
	Foodmax Extreme #16																P	S															x		H-1 adherent chain lubricant with added PTFE. Excellent penetrating properties. Also suitable for motorcycle chains	
	Foodmax DWF #14																M																			H-1 dewatering chain lubricant
	Foodmax Grease #17																SS																			H-1 chain grease, very suitable at lower temperatures
Foodmax Grease CAS #18																S																x			H-1 chain grease, very suitable at lower temperatures	

Legenda Base Oils & Solids			
Mineral	M	<div></div>	Very suitable
Synthetic	S	<div></div>	Suitable
Semi-Synthetic	SS	<div></div>	Suitable with limits
Graphite	G		
PTFE	P	<div></div>	Short periods
MoS ₂	Mo	<div></div>	Dry lubricant
Boron Nitride	Bn		

Evaporation Behavior of Base Oils

