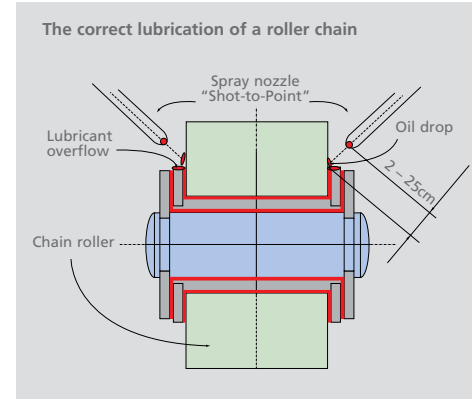
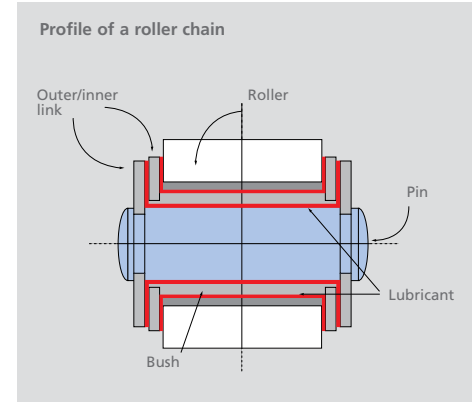




## CHAIN DESIGN

Chain drives provide a reliable way to transmit power, move materials or operate equipment. Typically, a chain drive is made up of a chain and a sprocket. The sprocket may have a single row or multiple rows of teeth. The chain itself is made of individual links with rollers (spindles), bushings and interconnecting links. Like all industrial equipment, chain drives must be matched to their job, properly installed and regularly maintained and lubricated.

An oil film on the outside surface of a chain offers rust protection and minimises wear at the sprocket. However, the critical area of wear occurs inside the chain, between each roller and its accompanying bushing.



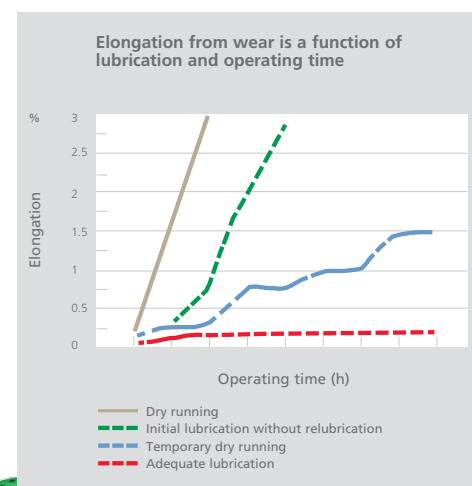
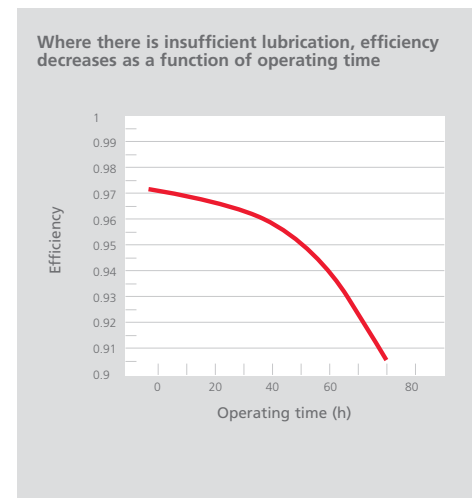
## THE IMPORTANCE OF CHAIN LUBRICATION

Adequate lubrication is crucial for the proper functioning and long service life of a correctly designed chain drive. Poor lubrication of the chain elements can lead to chain failure. As a result, chains that are not sufficiently lubricated cannot be subjected to very high loads. Additionally, a chain can be insufficiently relubricated or cleaned, leading to decreased efficiency – primarily because of damage to the hardened surface and wear. Accordingly, selection of the right lubricant coupled with regular maintenance has positive effects on the service life of chains.

To achieve effective chain lubrication, the following factors should be considered:

- Correct viscosity of the lubricating oil
- Fluidity of the lubricating oil over its application cycle
- Relubrication intervals
- Right quantity dispensed at the right place at the right time
- Application method
- Temperature range of the application

When wear occurs in the chain link, the chain becomes elongated. A 3% elongation caused by wear normally signals the end of a chain's service life.



# OUR HIGH PERFORMANCE LUBRICANTS EXTEND CHAIN LIFE AND BOOST YOUR PRODUCTIVITY

## CHAIN LUBRICANT APPLICATIONS

Typically, chain components include roller, bushing, pins and links. Straight link chains are defined according to their type and design. There are also a number of chains that are not standardised, such as inverted tooth chains and detachable chains. These play an important part in various applications.

Chains are normally used as:

- Transport chains in the automotive and food industry and in the production of engineered wood, fibreglass board, etc.
- Hoisting chains in forging, rolling mills and fork lift trucks
- Timing chains in car engines and machine tools

Chains and chain drives have to fulfil the following special requirements:

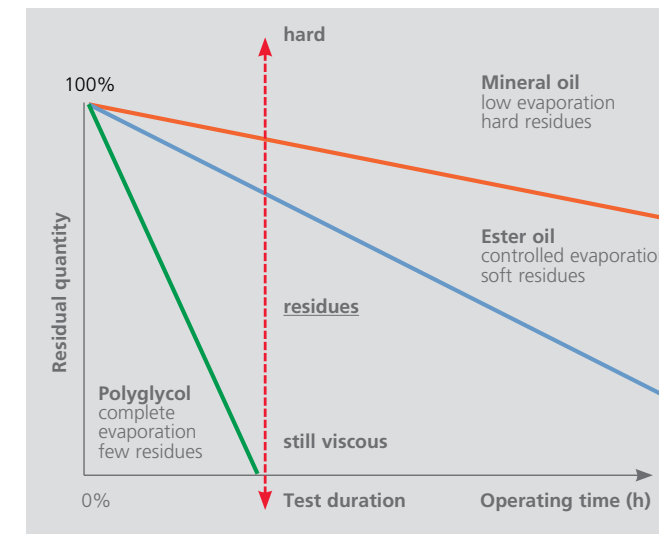
- Transmission without slip
- Space-saving construction
- Application at high and low temperatures
- Sturdiness during operation
- Ease of handling and lubrication
- Chain efficiency of between 93% and 98%

Chain lubricants are not defined according to DIN or ASTM but nevertheless have to be of high quality. The properties of Castrol chain lubricants contribute to optimum lubrication of the chain, and therefore minimise friction and resulting wear. We supply chain lubricants to meet high demands in a wide range of industry environments.



Joint contact pressure N/mm <sup>2</sup>	Chain speed (m/s)				
	1	1-5	>5	<5	>5
<10	32	46	68	32	46
10-20	46	68	100	46	68
20-30	68	100	150	68	100
	Manual or drip-feed lubrication			Splash lubrication	

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



Evaporation behaviour of the various base oils

# QUALITY AND RELIABILITY FROM START TO FINISH

## HIGH-PERFORMANCE CHAIN LUBRICANTS TO SUIT DIFFERENT ENVIRONMENTAL CONDITIONS

### HIGH TEMPERATURES

During applications in the high temperature range – at operating temperatures exceeding 150°C (300°F) – no residues (coking) should form on the chain that would impair its trouble-free operation. As lubricants evaporate at high temperatures, they should retain a fluid phase for as long as possible. The level of remaining residues should be as low as possible.

Castrol chain lubricants are designed to perform and keep performing at high temperatures such as Castrol Viscogen KL, Castrol Viscogen KLK.

### DUSTY ENVIRONMENTS

Some lubricants leave a wet, sticky surface that attracts and binds even the softest dust to create a paste that reduces the speed of the chain, increases power requirements and rapidly abrades and shortens the life of sprockets, links and bushings. Normal operating practice in many dusty environments in metals, cement, paper or flour mills has been to run the chains dry. Excessive wear, downtime and lost production are the result.

Castrol chain lubricants have changed maintenance practices for the better by providing lubricating solutions for chains operating in dusty environments. Before and after studies show that our lubricants can extend chain life by better penetrating into the working parts of the chain.

The semi-dry lubrication attribute of Castrol chain lubricants provides a very light film, giving the appearance of a dry film. This ensures minimum pickup of abrasive dusts, lint, sand, and other particles, thus eliminating formation of abrasive compounds which can increase wear and shorten chain life.

### WET AND CORROSIVE APPLICATIONS

When applied in wet environments, a lubricant must be insoluble in water and resistant to different types of chemicals such as detergents. Our synthetic ester lubricants have proven very successful in wet and corrosive applications.

### E-COAT PROCESSES OR CATHODIC ELECTRODEPOSITION APPLICATIONS

Our products are useful in applications where lubricants may come into contact with cathodic electrodeposition coatings, such as in automotive paint shops and the metal decorating industries.

Contamination from a dripping lubricant is always a potential risk to production and process baths and can lead to rework and refinishing costs. Using our paint compatible chain lubricants helps minimise contamination and lubricant related "fish eyes" and craters. This is because, should our product drip into a water base process bath, it will simply dissolve and disperse, preventing accumulation and the disruption of coatings or electrodepositions.





# THE EXPERTS IN CHAIN OIL TECHNOLOGY

CASTROL OFFERS YOU A COMPLETE RANGE OF WORLD-CLASS CHAIN LUBRICANTS AND PRODUCT SUPPORT SERVICES DESIGNED TO HELP YOU ACHIEVE:

- LONGER CHAIN LIFE
- OPTIMUM CHAIN PERFORMANCE
- EXTENDED MAINTENANCE INTERVALS
- INCREASED PRODUCTIVITY
- DECREASED MAINTENANCE COSTS
- LOWER OVERALL LUBRICANT CONSUMPTION AND WASTE

We can bring you these powerful benefits by exploiting our global process and applications expertise through our network of engineering and research professionals. It's then all delivered directly to you by our knowledgeable local sales and support teams. Our ultimate goal is to help you achieve optimum performance in your manufacturing environment.

Castrol chain lubricants are formulated using the highest quality raw materials and manufacturing processes to secure your advantage.

These provide:

- Reliable protection against wear
- A cushion against shock loads
- Protection from corrosion
- Longer film life leading to lower consumption
- Less residue formation allowing better housekeeping

## THE CASTROL CHAIN OIL RANGE

RANGE	DESCRIPTION	CHAIN PERFORMANCE (2)	VISCOSITIES AVAILABLE	BASE FLUID	ADDITIVE TYPE	OPERATING TEMPERATURE (3)	FLASH POINT
Viscogen KL	Synthetic chain lubricants designed for high temperature lubrication in severe environments, where the use of mineral oils or conventional synthetic oils would result in excessive wear, carbonisation and residue formation.	✓✓✓	32	Ester	Extreme Pressure/anti-wear	200°C/390°F	230°C/450°F
			100				230°C/450°F
			220				250°C/480°F
			250				250°C/480°F
			1570				220°C/430°F
4030	220°C/430°F						
Viscogen KLK	Synthetic chain lubricants designed for total loss lubrication systems at high temperatures, in applications requiring exceptional wear protection under extreme loading.	✓✓✓	255	Ester	Extreme Pressure/anti-wear	250°C/480°F 250°C/480°F	>260°C/>500°F
			280				>260°C/>500°F

✓  
✓✓  
✓✓✓ Indicates increasing performance

1. Not all products may be available in your country – please contact the sales office in your region.  
2. Chain Performance can be application specific – this does not indicate performance in all applications.  
3. Operating temperatures can be higher depending on application.

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Technical Help Line Australia: 1300 557 998

To make any comments about Castrol Products and services call:  
Customer Service and Orders: 1300 554 890

LUBRICANTS

# CHAIN OILS

YOUR ADVANTAGE IN AN INDUSTRIAL WORLD

IT'S MORE THAN JUST OIL. IT'S LIQUID ENGINEERING.



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