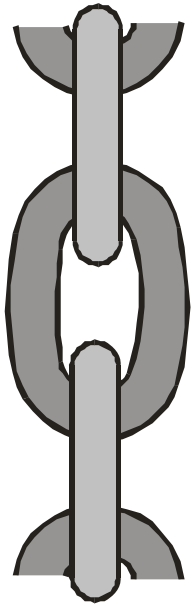
BECHEM
LUBRICATION
TECHNOLOGY

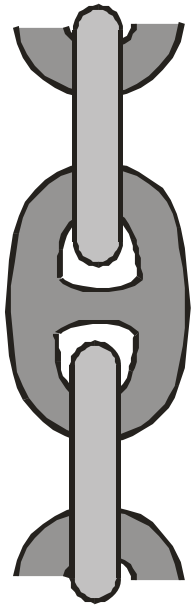
CHAINS

Open-link chains

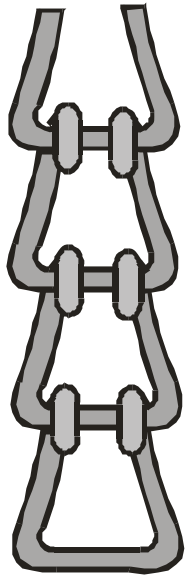
functioning without lubrication



normal open-link chain



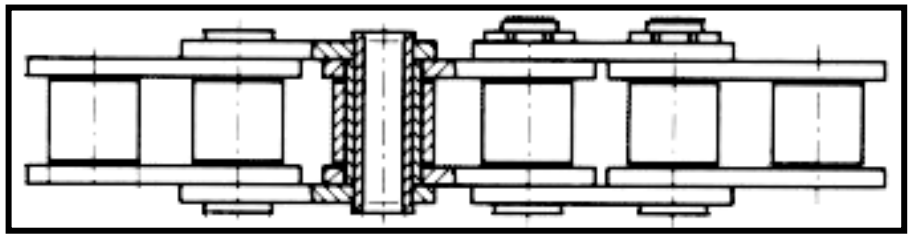
stud-link or anchor chain



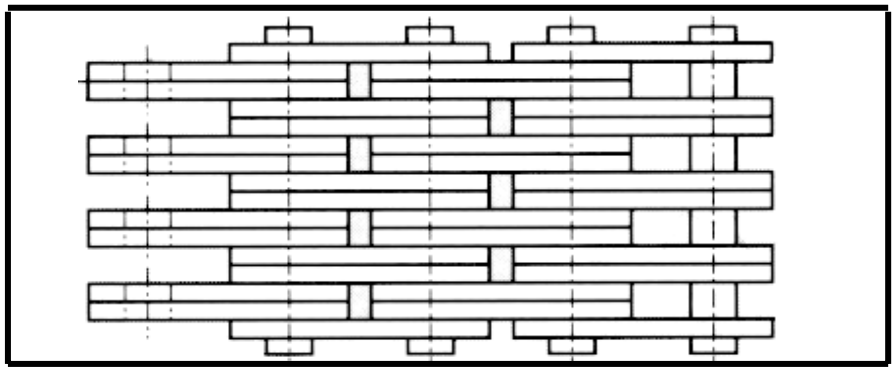
caterpillar-type drive chain (similar to track chains)

Link chains

Load chains



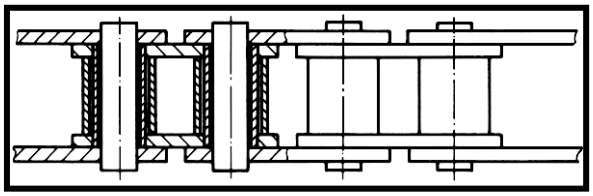
liner chain



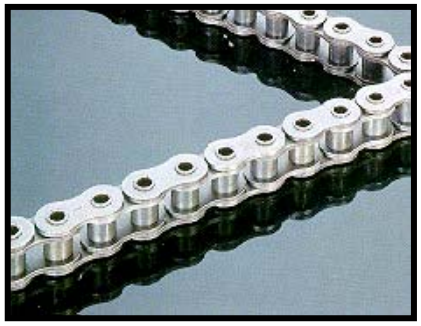
Fly-frame chain
without chain sprockets

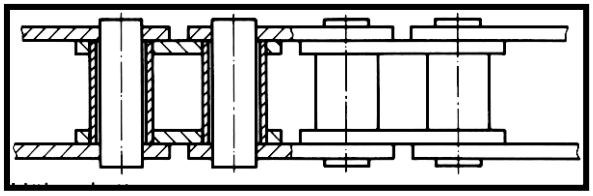
Link chains

Drive chains

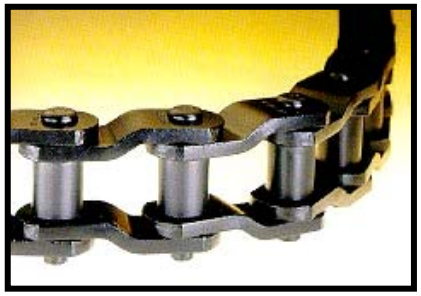


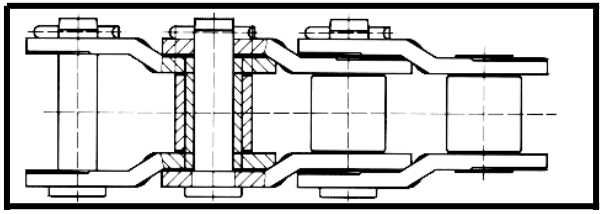
roller chain





bush chain

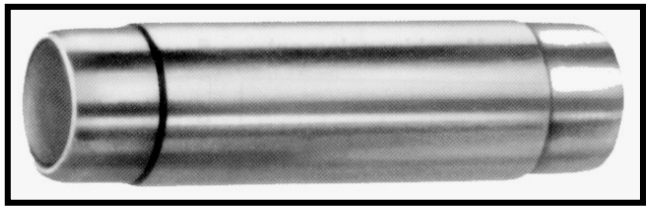




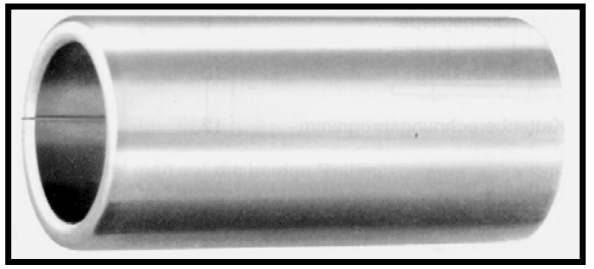
rotary chain

Construction of roller chains

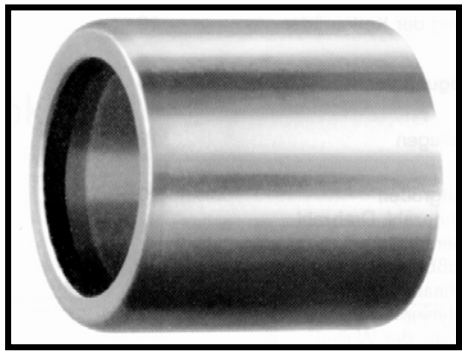
Pin



Bushing



Roller



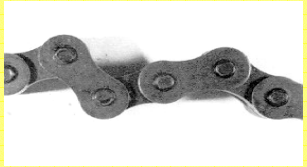
Side bar or plate

Chain failures and their reasons

Noise

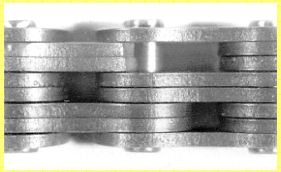
Inadequate lubrication causes metallic friction which effects grating and squeaking.

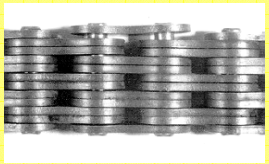
Stiff Joints



After leaving the sprocket wheel the chain does not get back to its stretched length. Reasons are cold seizing, corrosion of the joint or residues of unsuitable lubricants, caused by insufficient or wrong lubrication.

Broken Pins and Side Bars



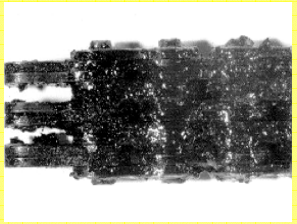


Often by overloading or corrosion in the chain joint

Rust on Surface and Joint

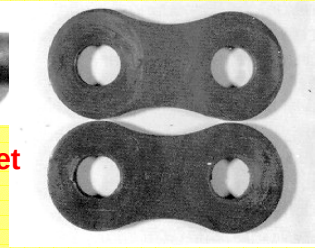
Reasons are inadequate lubrication or insufficient corrosion protection.

Dirtiness



At heavily soiled chains the oil only can partially and not completely penetrate into the chain joints.

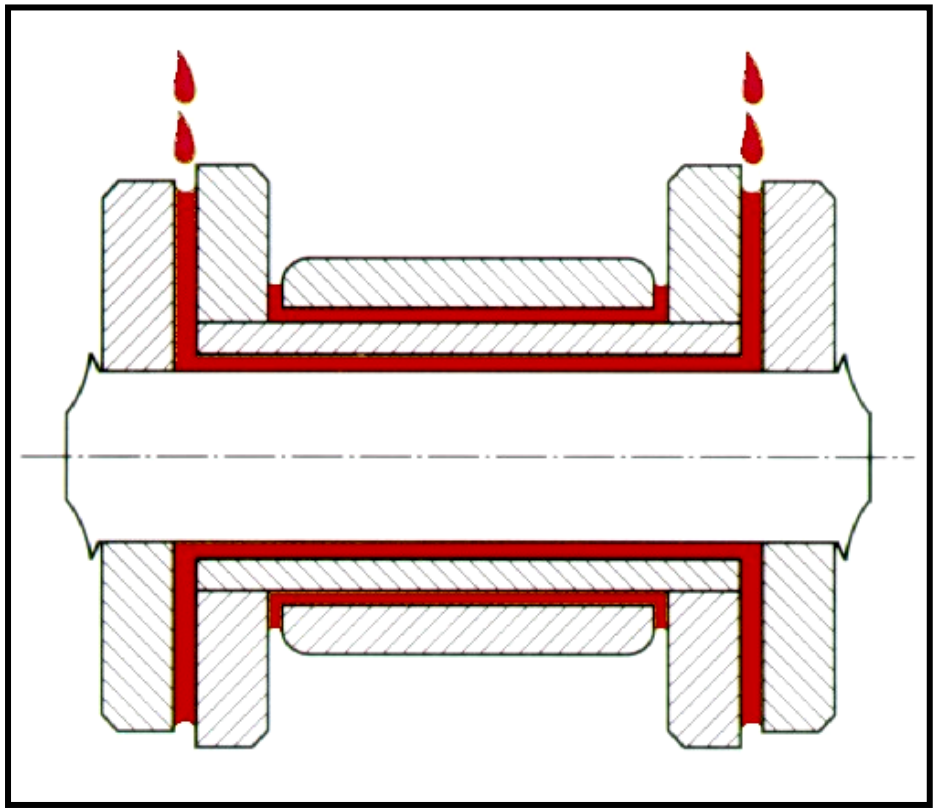
Elongation of Chains



Already with a 3% elongation, the sprocket has no more chance to gear in perfectly.

Even with optimal lubrication, chain stretching will occur after long operation time. However with an adequate lubrication the lifetime is 60 times longer than at dry running

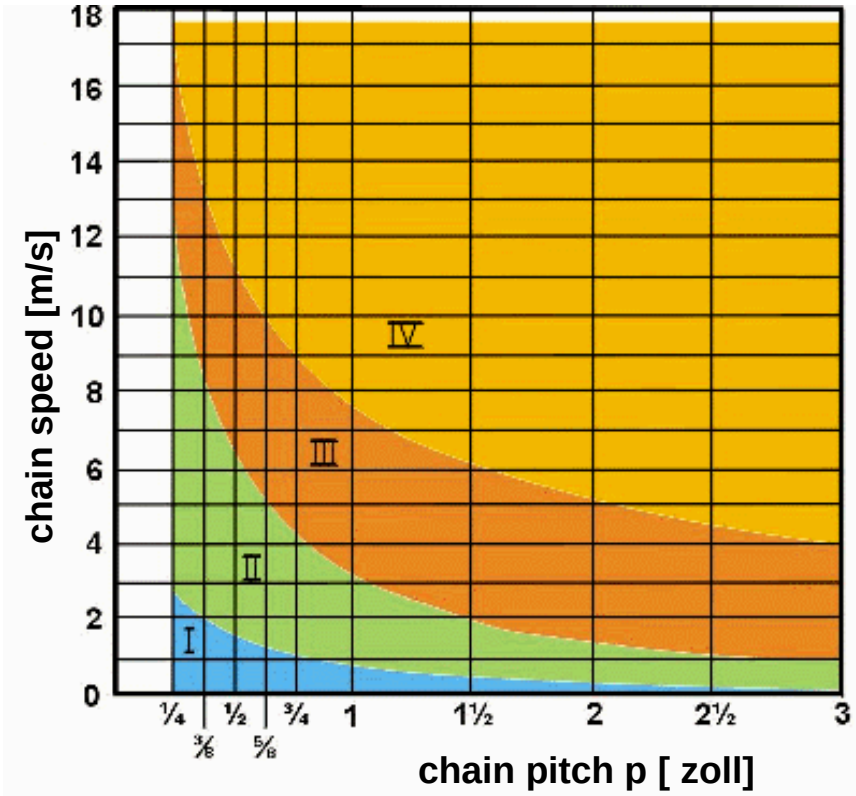
Lubricant requirements



- Lubricating performance
- Wear protection
- Penetrative and clearance fitting ability
- Noise suppression
- Corrosion protection
- Adhesive ability
- Temperature stability
- Resistance to media
- Food grade property
- Environmentally safe

Selection of a lubricant

Guideline for the recommended way of lubrication



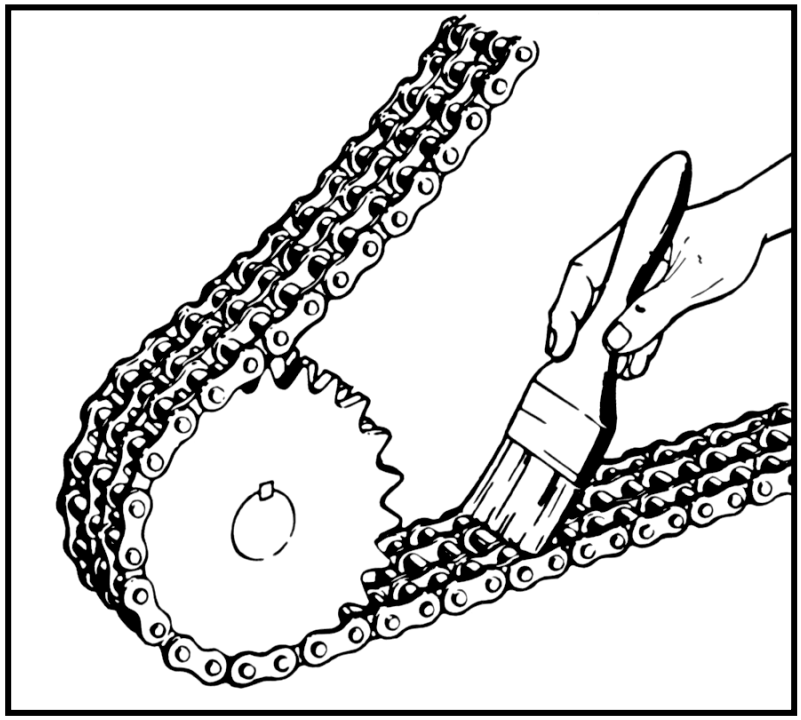
IV. Pump lubrication

III. Splash lubrication

II. Drip-feed lubrication

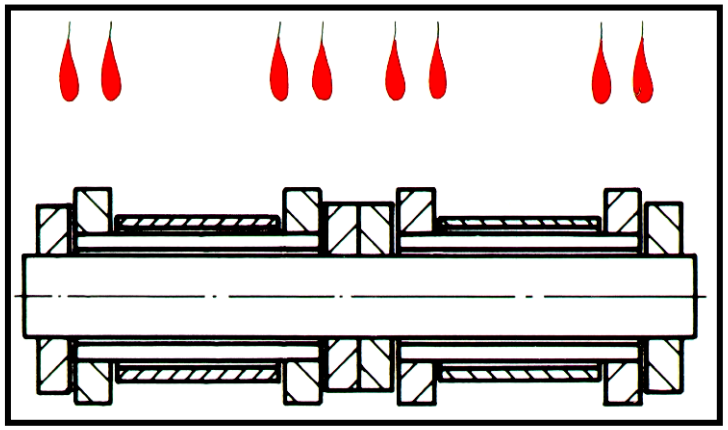
I. Hand lubrication

Hand lubrication



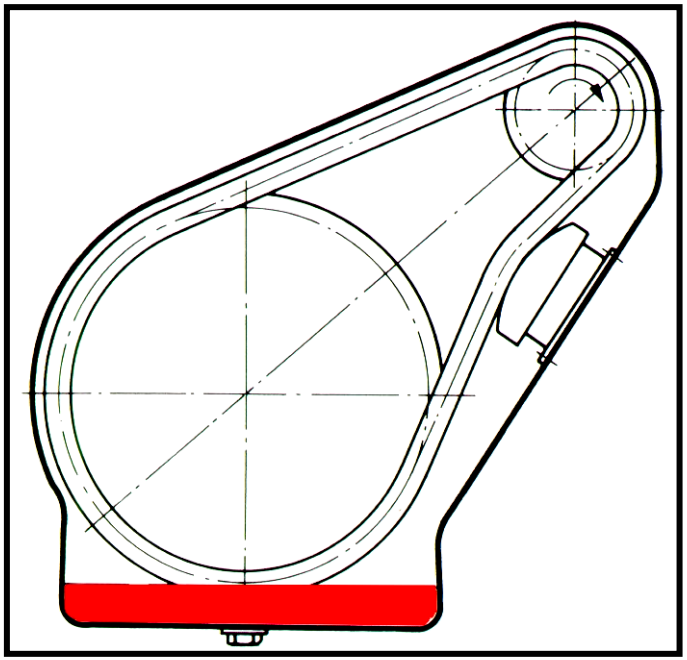
Lubrication by an oil can or a brush is a very unsure method.
It is not useful for continuous operation and therefore only suitable for driving units of minor importance and slow chain speeds.

Drip-feed lubrication



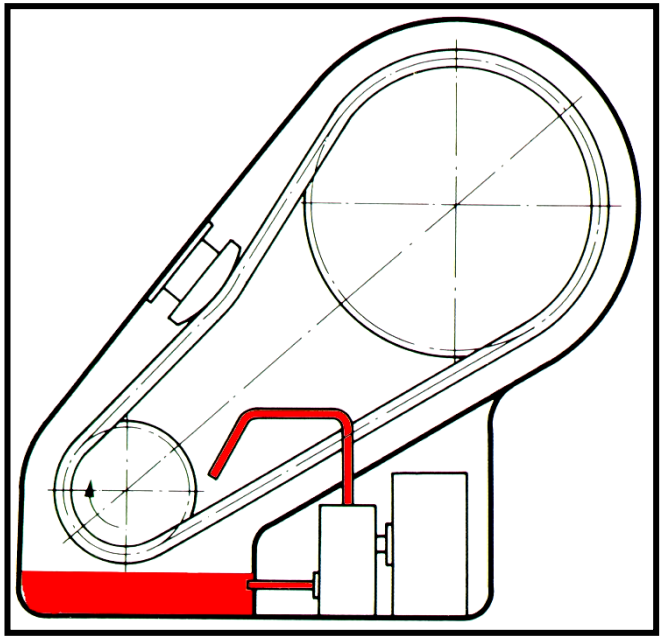
Lubrication by wick, needle or drip oiler is suitable for driving units with low stress. In order that the lubricant will attain the linkages, the dripping pipes outlets have to be placed above the pin row.

Splash lubrication in an oil bath



A chain protection case has a soundproofing effect. Its dimension should be such big, that the elongated chain does not beat against the walls. The chain pins should immerse into the bath not more than to the rollers or bushings. At the oil bath there is no loss of the lubricant.

Forced-feed circulatory lubrication



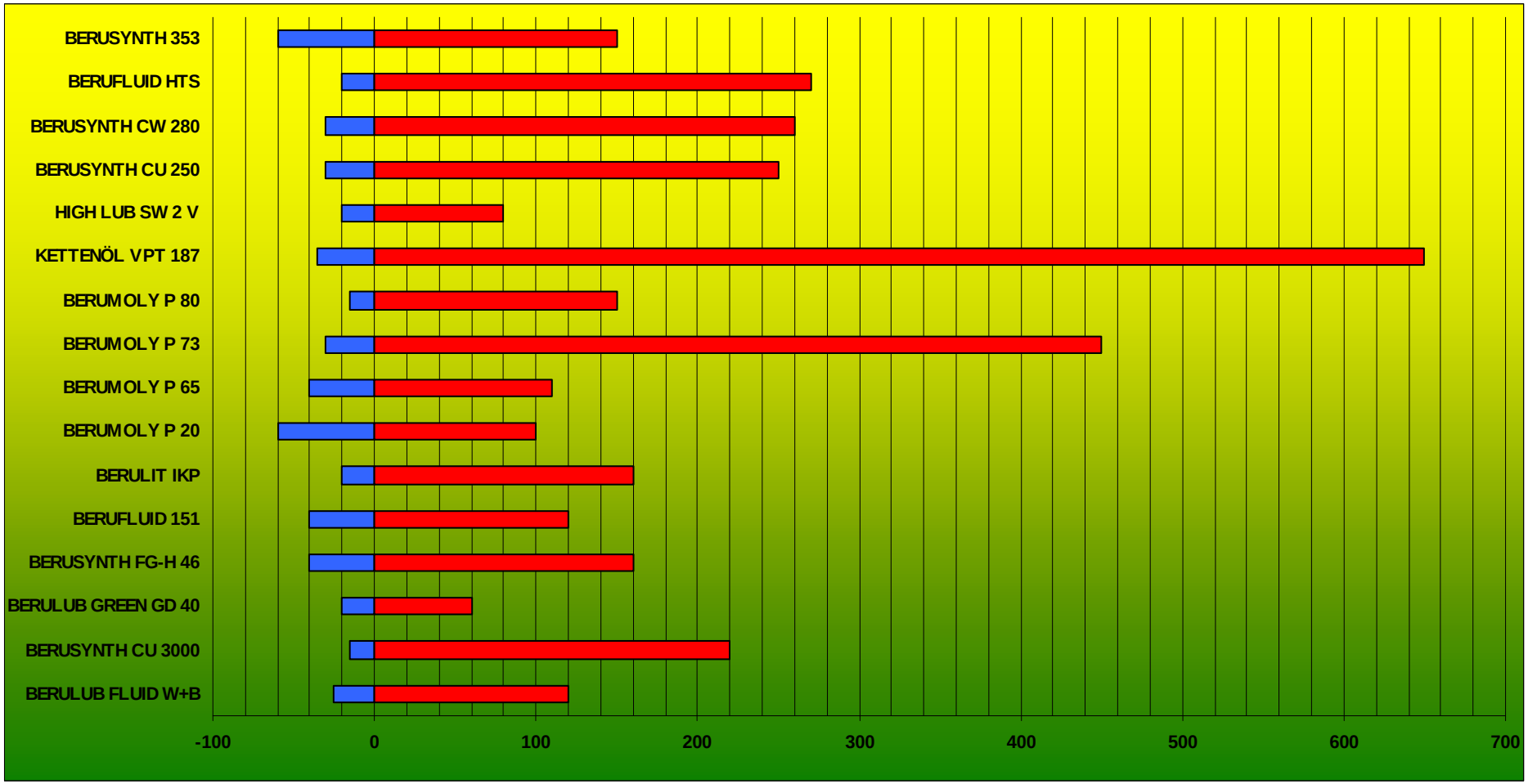
Used for fast running chains and subject to high loads.
Oil feeding may be carried out by connecting it to an already installed pressure oil pipe or a pump. The oil spurts from the pipe on the whole width of the chain on the inner side of the pulling strand and in direction of the course.

Lubricant Selection

Guideline for the recommended ISO viscosity of Chain Oils

Joint surface pressure (N/mm^2)	Chain speed (m/s)				
	1	1 to 5	> 5	< 5	> 5
	ISO VG class manual or drip lubrication			ISO VG class splash lubrication	
< 10	32	46	68	32	46
10 to 20	46	68	100	46	68
20 to 30	68	100	150	68	100

Temperature range of BECHEM chain lubricants

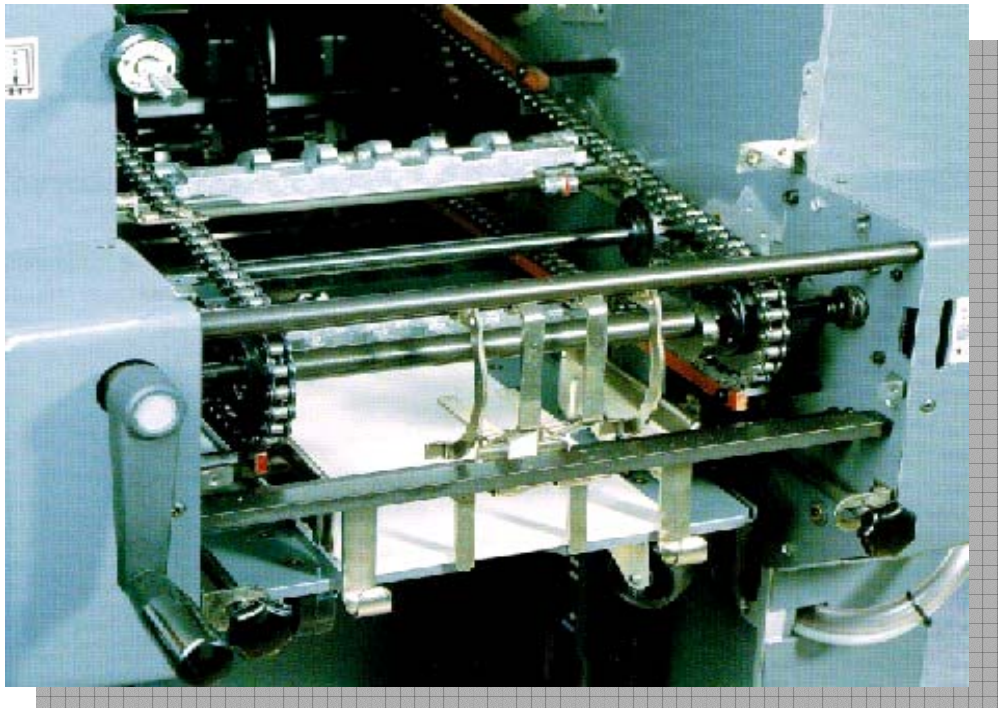


BECHEM chain lubricants

Operating conditions	Temperature range (°C)	BECHEM product	Base oil	Solid lubricant	Kin. Visc. at 40°C (mm^2/s)	Main industries
small chains, ambient temperature, dust, moisture	-40 to +110	BERUMOLY P 65	mineral	MoS2	2	Cement, Mining
heavily loaded chains, ambient temperature, water, steam, aggresive chemicals	-15 to +150	BERUMOLY P 80	mineral / synthetic	MoS2	12	Construction
large chains, heavily loaded, dust	-20 to +160	BERULIT IKP	mineral	Graphite	100	Mining
high temperature, medium load, lubricating system	-30 to +450	BERUMOLY P 73	synthetic	MoS2	100	Ceramic
very high temperature, high load, manual lubrication or special systems	-35 to +650	KETTENÖL VPT 187	synthetic	MoS2	semifluid	Steel
very high temperature, medium load, lubricating systems	-30 to +250	BERUSYNTH CU 250	synthetic		250	Textile, Rubber
very high temperature, high load, lubricating systems	-30 to +260	BERUSYNTH CW 280	synthetic		280	MDF Plants
agressive chemicals, water, ambient temperatures	-20 to +80	HIGH LUB SW 2-V	mineral		liquid	Ship buiding, Habour
open chains, high speed, water, steam, aggresive chemicals	-15 to +220	BERUSYNTH CU 3000	synthetic		3000	Food and beverage
precision chains, multi-purpose, ambient temperatures	-40 to +160	BERUSYNTH FG-H 46	synthetic		46	Food and beverage
multi-purpose, ambient temperatures	-25 to +120	BERULUB FLUID W+B	mineral		67	Mechanics, Food

Example of a lubricant application

Chains in packaging equipment industries lubricated by BERUSYNTH FG-H 46



Example of a lubricant application

Chains in the surgical rubber glove industries lubricated by BERUSYNTH CU 250