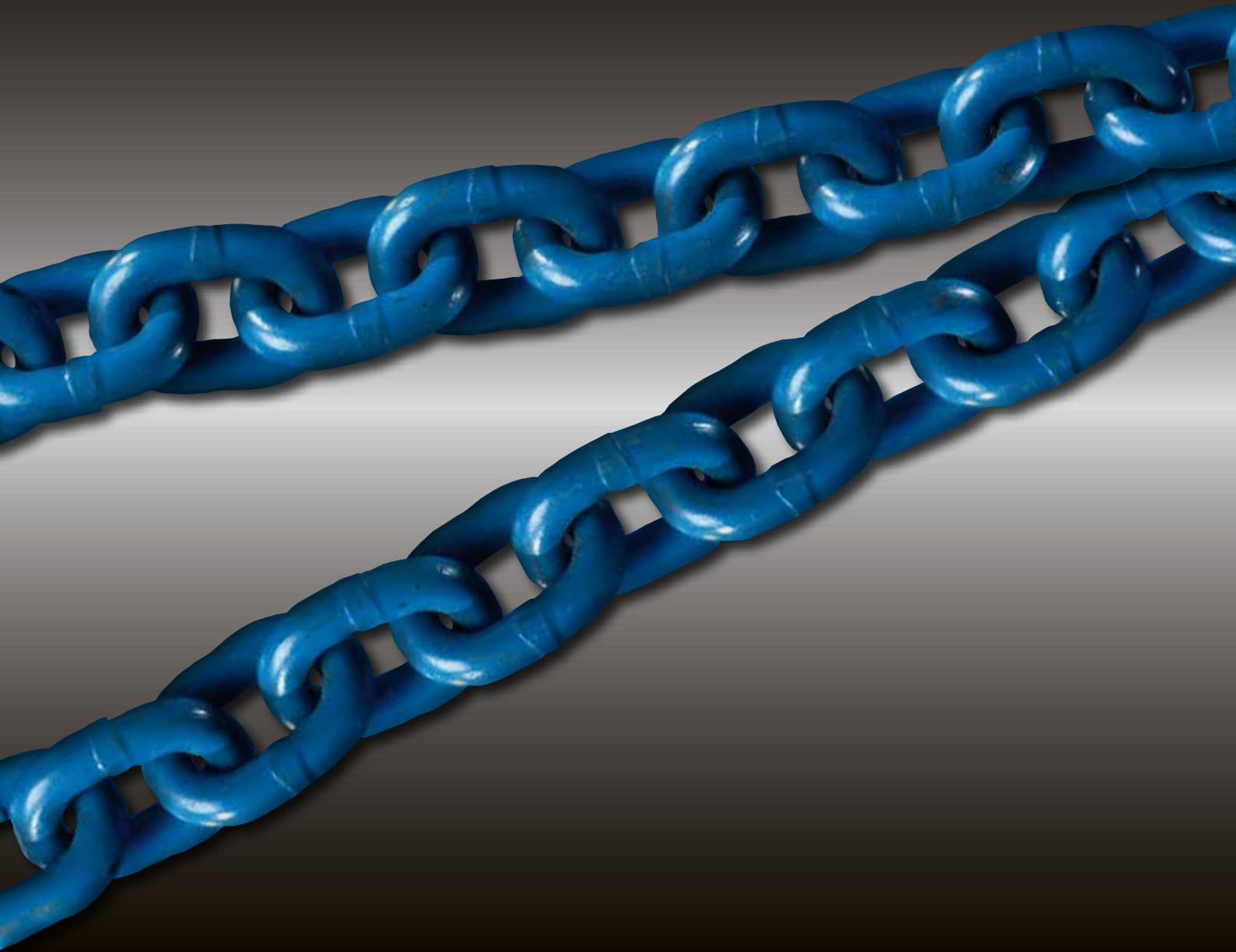


Chain

Grade 10 • Grade 8 • Short Link • Mid-link • Long-link




GUNNEBO
Industries

Chain

| | |
|---|-----|
| Chain, Grade 10 (200), GrabiQ | 5:3 |
| Chain, Grade 10 (400), GrabiQ | 5:3 |
| Chain, Short Link, Grade 8, Classic | 5:3 |
| Chain, Short Link, Grade 8 | 5:4 |
| Chain, Mid-link, Grade 8 | 5:4 |
| Chain, Long-link, Grade 8 | 5:4 |
| Chain, Short Link, Galvanized, Grade 7 | 5:5 |
| Chain, Mid-link, Galvanized, Grade 7 | 5:5 |
| Chain, Long-link, Galvanized, Grade 6/7 | 5:5 |

Technical Information

| | |
|-----------------------------------|-----|
| Chain Manufacturing | 5:6 |
| Safe Use and Extreme environments | 5:7 |
| Definitions | 5:7 |



WARNING:
Failure to read, understand and comply with the following instructions, working load limits and specifications in this publication may result in serious injury or damage to property.



Chain, GrabiQ Grade 10 (200)

Short link, KL

Heat treatment

Quenched and tempered.

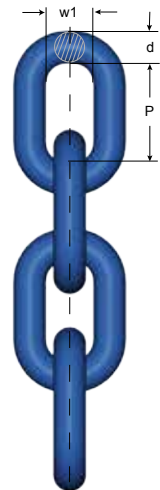
Note! For chain grade 10 (200) the maximum in service temperature is 200°C.

Surface treatment

Painted blue

Fulfills the requirements in:
ASTM A973/A973M-07(2012)
EN 818+2:2008 (WLL +25%,
reduced temperature range)

| Art. no. Box | Code | WLL tonnes | d nom. mm | P» mm | w1» mm | Weight kgs/m | MPF kN | Breaking force kN |
|---------------------|-----------------|---------------|-----------------|----------|-----------|-----------------|-----------|-------------------------|
| Z802300 - 1 x 200 m | KLA 6-10 (200) | 1.5 | 6 | 18 | 8.5 | 0.8 | 36.8 | 58.9 |
| Z802337 - 1 x 200 m | KLA 7-10 (200) | 1.95 | 7 | 21 | 10.0 | 1.1 | 48 | 77 |
| Z802301 - 1 x 200 m | KLA 8-10 (200) | 2.6 | 8 | 24 | 11.0 | 1.4 | 63 | 102 |
| Z802302 - 1 x 100 m | KLA 10-10 (200) | 4.0 | 10 | 30 | 14.0 | 2.3 | 98 | 158 |
| Z802303 - 1 x 100 m | KLA 13-10 (200) | 6.8 | 13 | 39 | 17.7 | 3.8 | 166 | 268 |
| Z802304 - 1 x 100 m | KLA 16-10 (200) | 10.3 | 16 | 48 | 21.9 | 5.6 | 251 | 402 |
| Z802305 - 1 x 50 m | KLA 20-10 (200) | 16.0 | 20 | 60 | 27.0 | 9.4 | 393 | 630 |
| Z802246 - 1 x 50 m | KLA 22-10 (200) | 20.0 | 22 | 66 | 29.0 | 11.9 | 491 | 785 |
| Z802248 - 1 x 50 m | KLA 26-10 (200) | 27.0 | 26 | 78 | 35.0 | 16.4 | 664 | 1062 |
| Z802440 - 1 x 25 m | KLA 32-10 (200) | 40.0 | 32 | 96 | 41.6 | 25.8 | 981 | 1610 |



Chain, GrabiQ Grade 10 (400)

Short link, KL

Heat treatment

Quenched and tempered.

Note! For chain grade 10 (400) the maximum in service temperature is 400°C.

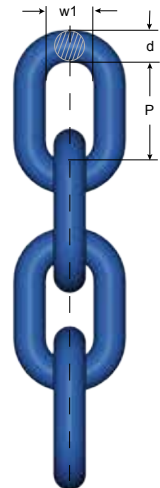
Surface treatment

Painted blue

Fulfills the requirements in:
EN 818-2:2008 (WLL+25%,
material dimension \varnothing +10%)

Note: This chain is marked with "8+" in addition to the marking required by the machine directive

| Art. no. Box | Code | WLL tonnes | d nom. mm | P» mm | w1 » mm | Weight kgs/m | MPF kN | Breaking force kN |
|---------------------|-----------------|---------------|-----------------|----------|---------------|-----------------|-----------|-------------------------|
| Z802306 - 1 x 200 m | KLA 6-10 (400) | 1.5 | 6.6 | 18 | 8.9 | 1.0 | 36.8 | 58.8 |
| Z802307 - 1 x 200 m | KLA 8-10 (400) | 2.5 | 8.8 | 24 | 11.2 | 1.7 | 63 | 102 |
| Z802308 - 1 x 100 m | KLA 10-10 (400) | 4.0 | 11.0 | 30 | 14.4 | 2.6 | 98 | 158 |
| Z802309 - 1 x 100 m | KLA 13-10 (400) | 6.7 | 14.3 | 39 | 19.2 | 4.5 | 166 | 268 |
| Z802310 - 1 x 100 m | KLA 16-10 (400) | 10.0 | 17.3 | 48 | 23.0 | 6.7 | 251 | 402 |



5

Chain, Classic Grade 8

Short link, KL

Heat treatment

Quenched and tempered.

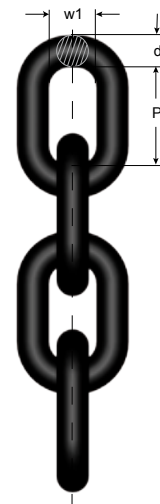
Heat treatment

Painted black (KLB)

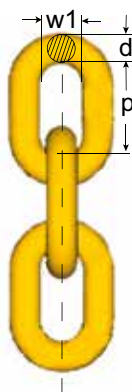
Painted yellow (KLU)

Fulfills the requirements in:
EN 818-2:2008, AS 2321:2014,
ASTM A391/A 391M-07 (2012)

| Art. no. Box | Code | WLL tonnes* | d nom. | P | w1 | Weight kgs/m | Manufacturing proof force kN | Breaking force kN |
|---------------------|-----------|----------------|-----------|----|------|-----------------|------------------------------------|----------------------|
| Z802174 - 1 x 200 m | KLB 6-8E | 1.12 | 6 | 18 | 8.5 | 0.8 | 28.3 | 45.2 |
| Z802175 - 1 x 200 m | KLB 7-8E | 1.57 | 7 | 21 | 10.0 | 1.1 | 38.5 | 62 |
| Z802176 - 1 x 200 m | KLB 8-8E | 2.0 | 8 | 24 | 11.0 | 1.4 | 50.3 | 80.6 |
| Z802156 - 1 x 100 m | KLB 10-8E | 3.2 | 10 | 30 | 14.0 | 2.3 | 79 | 130 |
| Z802157 - 1 x 100 m | KLB 13-8E | 5.4 | 13 | 39 | 17.7 | 3.8 | 133 | 214 |
| Z802177 - 1 x 100 m | KLB 16-8E | 8.2 | 16 | 48 | 21.9 | 5.6 | 201 | 322 |
| Z801203 - 1 x 100 m | KLB 19-8E | 11.6 | 19 | 57 | 27.0 | 7.8 | 284 | 457 |
| Z801228 - 1 x 50 m | KLB 22-8E | 15.5 | 22 | 66 | 29.5 | 10.6 | 380 | 610 |
| Z801231 - 1 x 50 m | KLB 26-8E | 21.6 | 26 | 78 | 35.0 | 14.8 | 531 | 850 |
| Z801232 - 1 x 25 m | KLB 32-8E | 32.8 | 32 | 96 | 41.6 | 21.6 | 804 | 1300 |



Short Link Chain KLFU, Grade 8



Heat treatment

Quenched and tempered,
Stress relieved

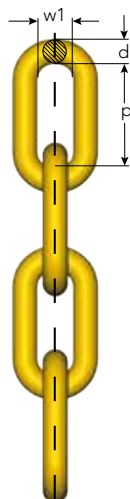
Surface treatment

Painted yellow

Not for lifting purposes

| Art. no. | Code | Link dimensions (mm) | | | Weight kgs/m | Min. breaking load (tonnes) | Delivery length |
|----------|-----------|----------------------|--------------|---------------|-----------------|-----------------------------------|--------------------|
| | | d nom. mm | P » mm | w1 » mm | | | |
| Z802330 | KLFU-10-8 | 10 | 30 | 14.0 | 2.2 | 12.6 | 1 x 100 m |
| Z802331 | KLFU-13-8 | 13 | 39 | 17.6 | 3.7 | 21.4 | 1 x 100 m |
| Z801146 | KLFU-16-8 | 16 | 48 | 21.5 | 5.8 | 32.2 | 1 x 100 m |
| Z327377 | KLFU-19-8 | 19 | 57 | 27.0 | 8.0 | 45.4 | 1 x 100 m |
| Z327385 | KLFU-22-8 | 22 | 66 | 30.0 | 11.0 | 61.0 | 1 x 50 m |
| Z801505 | KLFU-26-8 | 26 | 78 | 35.0 | 14.8 | 86.0 | 1 x 50 m |

Mid-link Chain MLFU, Grade 8



Heat treatment

Quenched and tempered,
Stress relieved

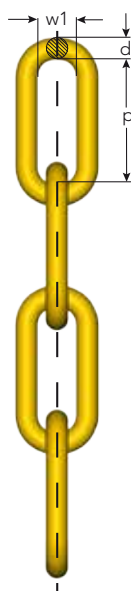
Surface treatment

Painted yellow

Not for lifting purposes

| Art. no. | Code | Link dimensions (mm) | | | Weight kgs/m | Min. breaking load (tonnes) | Delivery length |
|----------|-----------|----------------------|--------------|---------------|-----------------|-----------------------------------|--------------------|
| | | d nom. mm | P » mm | w1 » mm | | | |
| Z802332 | MLFU-10-8 | 10 | 40 | 14.4 | 2.0 | 12.6 | 1 x 100 m |
| Z802333 | MLFU-13-8 | 13 | 55 | 20.2 | 3.3 | 21.4 | 1 x 100 m |
| Z800564 | MLFU-16-8 | 16 | 65 | 20.5 | 5.0 | 32.2 | 1 x 100 m |
| Z800476 | MLFU-19-8 | 19 | 75 | 29.0 | 7.1 | 45.4 | 1 x 100 m |
| Z800661 | MLFU-22-8 | 22 | 88 | 30.0 | 9.4 | 61.0 | 1 x 50 m |
| Z801770 | MFLU-26-8 | 26 | 91 | 34.0 | 13.9 | 86.0 | 1 x 50 m |

Long-link Chain LLU, Grade 8



Heat treatment

Quenched and tempered,
Stress relieved

Surface treatment

Painted yellow

Not for lifting purposes

| Art. no. | Code | Link dimensions (mm) | | | Weight kgs/m | Min. breaking load (tonnes) | Delivery length |
|----------|----------|----------------------|---------|----------|-----------------|-----------------------------------|--------------------|
| | | d mm | p mm | w1 mm | | | |
| Z801934 | LLU-9-8 | 9 | 53 | 14.3 | 1.4 | 10.2 | 4 x 100 m |
| Z801935 | LLU-11-8 | 11 | 64 | 18.5 | 2.1 | 15.4 | 4 x 100 m |
| Z801936 | LLU-13-8 | 13 | 80 | 21.1 | 2.9 | 21.4 | 3 x 100 m |
| Z802160 | LLU-16-8 | 16 | 100 | 27.0 | 4.6 | 32.2 | 1 x 100 m |
| Z601983 | LLU-19-8 | 19 | 100 | 27.0 | 6.5 | 45.4 | 1 x 100 m |
| Z700526 | LLU-22-8 | 22 | 120 | 35.0 | 8.7 | 61.0 | 1 x 50 m |

Short Link Chain - KLFZ, Grade 7

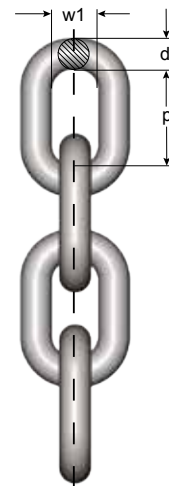
Heat treatment
Quenched and tempered

Surface treatment
Hot Dip Galvanized (HDG)

Not for lifting purposes

| Art. No | Code | Link dimensions (mm) | | | Min. breaking load (tonnes) | Weight kgs/m | Delivery length |
|---------|-----------|----------------------|--------|---------|-----------------------------|--------------|-----------------|
| | | d nom. mm | P » mm | w1 » mm | | | |
| Z800666 | KLFZ-10-7 | 10 | 30 | 14.0 | 11 | 2.2 | 1 x 100 m |
| Z802329 | KLFZ-13-7 | 13 | 39 | 17.2 | 18 | 3.7 | 1 x 100 m |
| Z801644 | KLFZ-16-7 | 16 | 48 | 21.5 | 28 | 5.8 | 1 x 100 m |
| Z801409 | KLFZ-17-7 | 17 | 48 | 23.2 | 30 | 6.4 | 1 x 100 m |
| Z801407 | KLFZ-19-7 | 19 | 57 | 27.0 | 40 | 8.0 | 1 x 100 m |

Fulfills requirements in: EN 1461:2009 (Average surface thickness 85 µm)



Mid-link Chain MLFZ, Grade 7

Heat treatment
Quenched and tempered

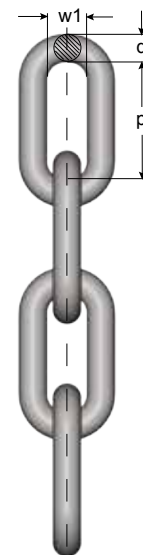
Surface treatment
Hot Dip Galvanized (HDG)

Not for lifting purposes

| Art. No | Code | Link dimensions | | | Min. breaking load (tonnes) | Weight kgs/m | Delivery length |
|---------|-------------|-----------------|--------|---------|-----------------------------|--------------|-----------------|
| | | d nom. mm | P » mm | w1 » mm | | | |
| Z802455 | MLFZ 10-6** | 10 | 40 | 14.4 | 10 | 2.0 | 1 x 100 m |
| Z802335 | MLFZ-13-7 | 13 | 55 | 20.2 | 18 | 3.3 | 1 x 100 m |
| Z801645 | MLFZ-16-7 | 16 | 65 | 20.5 | 28 | 5.0 | 1 x 100 m |
| Z801477 | MLFZ-19-7 | 19 | 75 | 29.0 | 40 | 7.1 | 1 x 100 m |

Fulfills requirements in: EN 1461:2009 (Average surface thickness 85 µm)

** Average surface thickness 70 µm



5

Long Link Chain LLZ, Grade 6

Heat treatment
Quenched and tempered

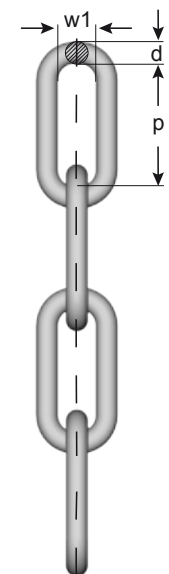
Surface treatment
Hot Dip Galvanized (HDG)

Not for lifting purposes

| Art. No | Code | Link dimensions (mm) | | | Min. breaking load (tonnes) | Weight kgs/m | Delivery length |
|---------|------------|----------------------|--------|---------|-----------------------------|--------------|-----------------|
| | | d nom. mm | p » mm | w1 » mm | | | |
| Z802453 | LLZ-9-6** | 9 | 53 | 14.3 | 7.8 | 1.4 | 1 x 100 m |
| Z802454 | LLZ-11-6** | 11 | 64 | 18.5 | 11.6 | 2.1 | 4 x 100 m |
| Z800682 | LLZ-13-6 | 13 | 80 | 21.1 | 16.3 | 2.9 | 3 x 100 m |
| Z802207 | LLZ-13-6 | 13 | 80 | 21.1 | 16.3 | 2.9 | 1 x 229,5 m |
| Z801567 | LLZ-16-6 | 16 | 100 | 27.0 | 24.7 | 4.6 | 1 x 100 m |
| GS1073 | LLZ-16-6 | 16 | 100 | 27.0 | 24.7 | 4.6 | 1 x 200 m |
| Z801458 | LLZ-19-6 | 19 | 100 | 27.0 | 34.8 | 6.5 | 1 x 120 m |
| Z801887 | LLZ-22-6 | 22 | 120 | 35.0 | 46.6 | 8.7 | 1 x 50 m |
| Z802447 | LLZ-25-6 | 25 | 140 | 39.0 | 60.0 | 12.0 | 1 x 50 m |

Fulfills requirements in: EN 1461:2009 (Average surface thickness 85 µm)

** Average surface thickness 70 µm



Technical Information

Chain Manufacturing - Quality and Strength Requirements

Chains are divided into grades based on minimum nominal breaking stress.

| Chain Grade | Surface treatment | Code | Minimum breaking stress N/mm ² | Load factors | | | Typical use |
|-------------|---------------------|------|---|--------------|-----|----------------|--|
| | | | | WLL | MPF | Breaking force | |
| 8 | Yellow U Black B | KL | 800 | 1 | 2.5 | 4 | General lifting (KL), Container lashing (LL). Extra heavy towing (ML), Lashing (KL, LL). Fishing (KL, ML, LL) |
| | | ML | 800 | - | 1 | 4 | |
| | | LL | 800 | - | 1 | 4 | |
| 10 | Blue A | KL | 1000 | 1 | 2.5 | 4 | General lifting |

Testing and Quality Control- GrabiQ & Classic Chain (Grade 10 & 8)

In each step of the manufacturing of the chain, our systematic quality monitoring will ensure the highest safety and the longest life span in the product. Here are some especially important aspects of quality:

Material

The incoming material is supplied with test certificates only from qualified manufacturers and according to our stated material specifications.

Manufacturing

During forming and welding, the operators continuously control that the links meet the specified dimensions both before and after welding.

Single link samples are continuously mandrel tested on the weld. Shape, dimensions and deburring are then inspected visually.

Sample lengths are heat treated and then destruction load tested. Following these tests, the chain is heat treated.

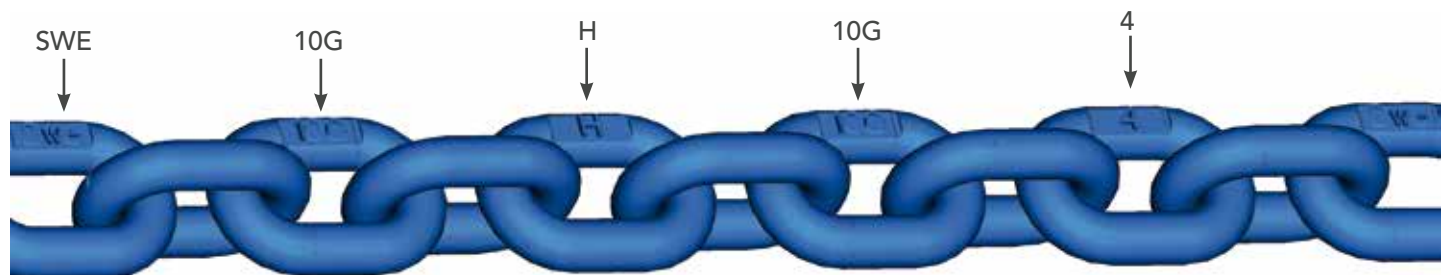
Hardening and tempering is carried out continuously in computer controlled induction furnaces with regular samplings.

Proof Force

The entire chain is test loaded. The manufacturing proof force for short link chain is 2.5 times the permitted working load limit. This gives the chain high safety in use. The chain is then visually inspected and cut into delivery lengths. A sample is taken from every length and tested to destruction. Dimensions and shape are also checked. All results are documented.

Marking and Traceability

The international standards for lifting chain require that the chain is marked with Grade and Manufacturers ID. On our chain we stamp "SWE - 10G - H - 10G - 4", where the "H" and the "4" is the combination for the traceability code. In case of the unlikely event of chain failure, we can trace the specific chain link back to the very batch and raw material as well as the year and place of manufacture. Each individual delivery length also has its unique batch number.



Use

- Never lift with a twisted chain.
- Use shortening hooks, knotting is not allowed.
- Use edge protectors to prevent sharp edges from damaging the chain.

Maintenance

Periodic thorough examination must be carried out at least every 12 months or more frequently according to local statutory regulations, type of use and past experience.

1. Overloaded chain slings must be taken out of service.
2. Chain and components including load pins which have been damaged, deformed, elongated, bent or showing signs of cracks or gouges shall be replaced. Carefully grind away small nicks and burrs.
3. Additional testing by magnetic particle inspection and/or proof loading at max. 2 x WLL may be carried out. The wear of the chain and component shall in no place exceed 10% of the original dimensions.
4. The chain link wear - max. 10% - is defined as the reduction of the mean diameter measured in two directions.

Severe Environment

Chain and components must not be used in alkaline (>pH10) or acidic conditions (<pH6). Comprehensive and regular examination must be carried out when used in severe or corrosive inducing environments. In uncertain situations consult your Gunnebo Industries dealer.

Extreme Temperature Conditions

The in service temperature effects the WLL as following :

| Temperature (°C) | Reduction of WLL | | | |
|---------------------|----------------------|----------------------|---------------------|----------------------------|
| | Grade 10 chain (400) | Grade 10 chain (200) | Grade 10 components | Grade 8 chain & components |
| -40 to +200 °C | 0 % | 0 % | 0 % | 0 % |
| +200 to +300 °C | 10 % | Not allowed | 10 % | 10 % |
| +300 to +400 °C | 25 % | Not allowed | 25 % | 25 % |

After short heat exposure, maximum one hour, the sling reverts to its full capacity. Upon return to normal temperature, the sling reverts to its full capacity within the above temperature range. Chain slings should not be used above or below these temperatures. **For chain grade 10 the maximum in service temperature is 200° C.**

Definitions

Proof force:

Each individual chain link is tested to the Manufacturing Proof Force (MPF) level before delivery. The MPF level is 2.5 times the WLL, equal to 62.5% of the Minimum Breaking Force.

Breaking force (BF):

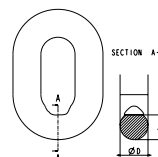
The highest static force a chain is exposed to during test loading before breaking.

Working load limit (WLL):

The maximum permitted load on a lifting chain under normal (vertical) lifting conditions.

Total ultimate elongation:

The elongation of the test item, relative to the original length, at the moment of breaking.



$$\frac{D+d}{2} > 0,9d_n$$