

Scottish Water Pumpset Lifting Chains

General definition and specification (Lifting accessories)

Stainless Steel grade 50 (316) Pump lifting chain sling (welded construction).

The construction of a standard pump sling will be as follows:

The chain sling is to be manufactured with a master link at each end and at every metre interval. (Allowing for variations in chain pitch see drawing).

The size range will be to suit lifting (Working Load Limit) capacities and chain diameters 500kg (5mmdia) / 1000kg (7mm Dia) / 2000kg (10mm dia) / 3200kg (13mm dia) / 5000kg (16mm dia).

To be used in the uniform load method of rating as a single leg.

The sling (lifting chain) will comply in all respects with the requirements of the Supply of machinery (safety) regulations 98/37/EC.

Regulations 1994). Specifically to section 4.1.2.5 section (b) which states that only welded short link chain must be used for lifting.

See attached drawing for guidance.

Material and standards on which the slings are based:

Chain and components: 1.4404 (AISI 316L) for chain and 1.4571 (AISI 316Ti) for forged components,

Chain: Grade 50. 316 Stainless steel; based on EN 818 -2 non- calibrated lifting chain (short link)

Components based on EN 1677 forged steel components for lifting slings and also the Machinery directive 98/37/EC.

Mechanical properties:

Breaking Stress 500N/mm²

Breaking elongation 25%

Stress at MTF (manufacturers test force) 250 N/mm²

Stress at WLL (working load limit) 125 N/mm²

Minimum Factor of Safety 4:1

Marking of components and chain

All components and chain used in the construction of the lifting chain shall be marked with Manufacturers Name or mark, country of origin, grade or type of material, batch or traceability code as required in 98/37/EC Machinery directive.

Marking of the completed lifting sling

The completed sling will show the following particulars:

In general this will be marked on to a tag of an accepted format in the shape of a five pointed star (grade 50) manufactured from a compatible material (stainless steel) fixed permanently to the lifting sling.

This tag will have the following information

- 1) Identification of the manufacturer (Name or Symbol or recognized mark).
- 2) Identification of material or grade i.e. grade 50, 316 Stainless.
- 3) Nominal chain size and number of legs

4) Working load limit (WLL) in kilograms.

5) Serial number of the sling.

6) Year of manufacture.

Following final testing and thorough inspection by a competent person, a **CE mark** should be affixed to sling by stamping of the tag.

**Important note: Cold stamping of the master links should be avoided to eliminate stress cracking of the component.*

Please see the table below as our suggested specification for Stainless steel (316 Marine grade) tested and certified Dee shackles Type 'A' screw pin. Which if used as the general specification requirements by your company will ensure that a standard lifting shackle will comply with the regulations.

The shackles will have the following information

1) Identification of material or grade i.e.316 Stainless.

2) Nominal size

3) Working load limit (WLL) in tonnes.

4) Batch number of the shackle.

5) CE marking

EC Declaration of conformity and Manufacturer's Certificate* is to be issued.

Standard A type screw pin Dee shackle

| Code | WLL tonnes | Body Dia mm | Pin Dia mm | Pitch/ Inside length | Jaw width mm |
|------|------------|-------------|------------|----------------------|--------------|
| SSD1 | 1 | 10 | 11 | 32 | 17 |
| SSD2 | 2 | 12 | 16 | 41 | 20 |
| SSD3 | 3 | 16 | 20 | 52 | 26 |
| SSD4 | 4 | 20 | 22 | 62 | 32 |
| SSD5 | 5 | 22 | 26 | 72 | 36 |

Or as an alternative

Safety Pin chain link Dee shackle (A type screw pin longer length with split pin), and with captivating pin (allowing the shackle to be made captive to the chain with out welding) can be retro fitted to existing chains.

| Code | WLL tonne | Body mm d1 | Pin mm d2 | Pitch mm L | Jaw mm w | a mm | b mm | c mm |
|-----------|-----------|------------|-----------|------------|----------|------|------|------|
| CLS- 1T | 1 | 9.5 | 12.5 | 40 | 20 | 23 | 2 | 15 |
| CLS- 2T | 2 | 15.8 | 19 | 64 | 32 | 38 | 4 | 22 |
| CLS 3.2-T | 3.2 | 19 | 22 | 76 | 38 | 44 | 4 | 28 |
| CLS- 5T | 5 | 22 | 25 | 102 | 51 | 64 | 4 | 34 |

EC Declaration of conformity and Manufacturer's Certificate* is to be issued together with a copy of the manufacturers safe use instructions.

**Reference notes*

The correct type of chain to be used for the construction of pump lifting chains as required under the current legislation (The Supply of Machinery (Safety) (Amendment) Regulations 1994). Specifically to section 4.1.2.5 section (b) which states that only welded short link chain must be used for lifting. Short link chain being defined that the pitch of the chain be 3 x that of the chain diameter.

A combined document which is often referred to as the Birth Certificate, and should remain on file for the life of the equipment, it was introduced with the supply of Machinery Regulation 1992 (amended 1994). This document is sent with the goods to the user/ purchaser.

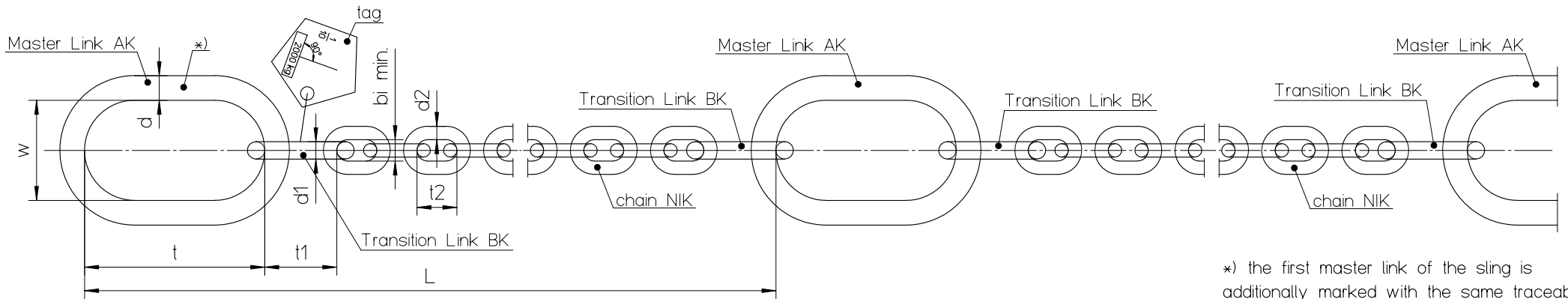
The certificate part of the document is NOT what is called a "Test certificate".

It is no longer a legal requirement to issue proof load test certificates for chain slings when supplied new and issued for the first time.

The law only requires that the sling be issued with an "EC Declaration of conformity "or an" EC declaration of incorporation", and was thoroughly examined by a competent person following manufacture, and a certificate issued to prove such examination also stating that the equipment is safe for use.

This document should have sufficient information about the machine (sling) to ensure complete traceability for all components including details of the original tests of all components used to manufacture the machine (sling).

Part of the Declaration also calls for the equipment to be marked with the CE mark. In the case of chain slings this is an integral part of the chain tag which also conforms with the requirements of the chain sling standard BS EN 818-4 1997 on which the specification for stainless steel grade 50 is based).

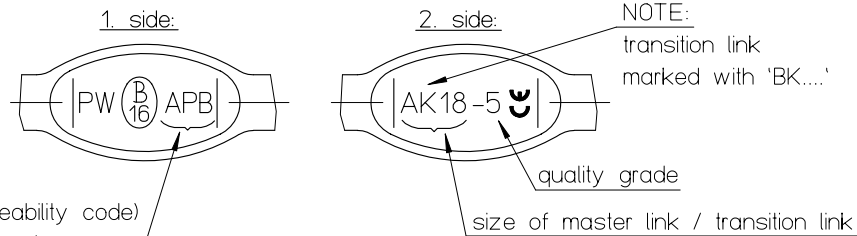


*) the first master link of the sling is additionally marked with the same traceability code as the tag (if the tag gets lost).

| Type | WLL | Master Link AK | | Transition Link BK | | chain type NIK | | segment length L [mm] |
|------|------|----------------|-----------------|--------------------|----------------|-------------------|---------------|-----------------------|
| | | code | d x t x w | code | d1 x t1 x w1 | d2 x t2 x bi min. | links/segment | |
| 5 | 500 | AK10 | 10 x 80 x 50 | BK7 | 7 x 36 x 16 | 5 x 16 x 7,5 | 53 | 1000 |
| 7 | 1000 | AK13 | 13 x 110 x 60 | BK9 | 9 x 44 x 20 | 7 x 21 x 9,53 | 37 | 975 |
| 10 | 2000 | AK18 | 18,5 x 135 x 75 | BK13 | 13 x 54 x 25 | 10 x 30 x 13,5 | 25 | 993 |
| 13 | 3200 | AK22 | 23 x 160 x 90 | BK16 | 16,5 x 70 x 34 | 13 x 39 x 17,5 | 17 | 963 |
| 16 | 5000 | AK26 | 27 x 180 x 100 | BK20 | 19,5 x 85 x 40 | 16 x 48 x 21,5 | 13 | 974 |

NOTE:
With the traceability code on the tag every single part of the sling is retraceable!

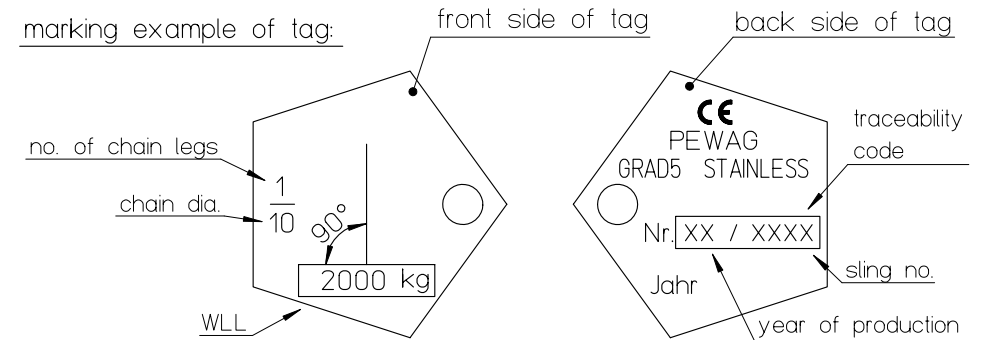
marking example of master link AK and transition link BK:



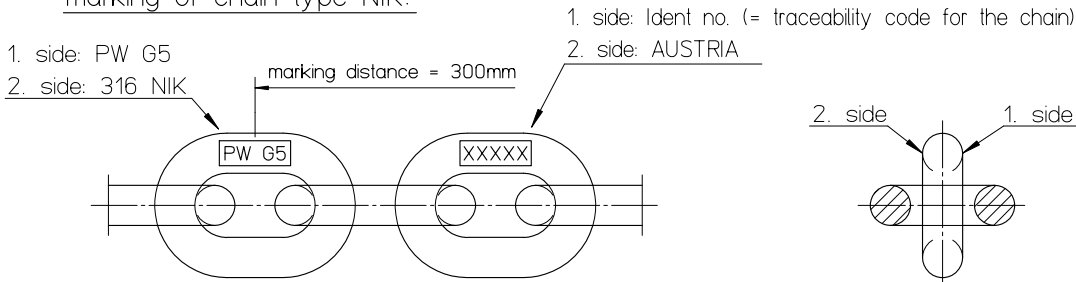
batch code (traceability code) consisting of 3 numbers:

- A = year of production (A=2000)
- P = manufacturer sign (P = pewag)
- B = production lot

marking example of tag:



marking of chain type NIK:



| ITEM | DESCRIPTION | No.Off | MATERIAL | STANDARD | COMMENT |
|---|--------------------|--|----------|---|----------------|
| DIMENSIONS WITHOUT TOLERANCE ACCORDING TO ISO 2768-m | | | | | |
| THIS DESIGN IS THE PROPERTY OF PEWAG AND IS ONLY ALLOWED TO BE USED BY EXPRESS PERMISSION AND LICENCE FROM PEWAG. | | PROJECT: | | Surface | SCALE: 1 : 1 |
| | | CAD | | DATE | NAME |
| | | DRAWN | | 14.8.96 | GRJ |
| | | CHKD. | | | |
| | | RELS.D. | | | |
| | | <p style="text-align: center;">pewag austria GmbH</p> <p style="text-align: center;">pewag</p> <p style="text-align: center;">GRAZ - KAPFENBERG</p> | | <p style="font-size: 2em;">pump lifting sling</p> | |
| | | | | | |
| 1 | drg. comp. revised | 7.6.06 | GRJ | | |
| AFFIX | REVISIONS | DATE | NAME | ORIGIN: | REPLACING 7896 |
| | | | | REPLACED BY | |