



**Řetězárna a.s.®**

**Medium tolerance chains for  
for chain slings – Grade 10**

**according to  
PN 46-19**

**MANUFACTURER:** Řetězárna a.s.  
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**OPERATING, FITTING AND MAINTENANCE INSTRUCTIONS**

**1. INTRODUCTION**

Welded chains for chain slings, Grade 10, are noted for their high quality, high utility value and long life. They are manufactured with utmost care and concern for operational safety.

These operating and maintenance instructions contain the most important information for users of our chains.

Safe operation and long life of the chains are subject to compliance with these instructions.

All operating personnel as well as personnel responsible for inspections and storage of the chains must be familiar with the instructions. If the chain is a part of another type of chain sling, installation must observe the instructions for the given chain sling.

**2. SELECTING A CHAIN FOR A CHAIN SLING**

Chains are selected for specific chain slings according to their load-bearing capacity in the standard PN 46-19. Our chains can be combined with all elements from other manufacturers which meet the relevant EN standards. It is forbidden to combine parts from different strength grades!

**2.1. LOAD-BEARING CAPACITY**

The maximum load-bearing capacity for which a chain can be used (see Table 1).

Table 1: Mechanical properties of chains

<b>Chain</b> Chain size d x p mm	<b>Load-bearing capacity</b> WLL t	<b>Test load</b> MPF kN	<b>Breaking strength</b> BF kN
5 x 15	1	24.5	39.3
6 x 18	1.4	35.3	56.5
7 x 21	1.9	48.1	77.0
8 x 24	2.5	62.8	101
10 x 30	4	98.2	157
13 x 39	6.7	166	265
16 x 48	10	251	402
18 x 54	12.5	318	509
19 x 57	14	354	567
20 x 60	16	393	628
22 x 66	19	475	760
26 x 78	26.5	664	1060
32 x 96	40	1005	1610

### 2.1.1. Use at various temperatures

The chain may only be used within the temperature range specified in Table 2. If the chain is used within the permissible temperature range specified in Table 2, its load-bearing capacity is not reduced permanently when it returns to normal temperature. However, if the temperature of 200°C is exceeded, the chain must be put out of operation.

Table 2:

Ambient temperature in °C	from -40° to +200°C	above 200°C
The load-bearing capacity is reduced to:	100%	use inadmissible

### 2.1.2. Adverse conditions

Use in adverse conditions (e.g. chemical or abrasive environment) must be consulted with the manufacturer.

### 2.1.3. Additional surface treatment

The manufacturer is not responsible for any chain damage or for any change of its mechanical properties caused by additional surface treatment (such as coating with various materials, etc.) applied by the customer.

It is forbidden to have Grade 10 chains galvanized, hot-dip galvanized, phosphated, etc.

Mechanical properties are guaranteed only in the condition in which the chain was supplied to the customer.

## 2.2. MANUFACTURER'S CERTIFICATE

With every delivery, the customer receives a test certificate in accordance with the standard ČSN EN 10 204-3.1, containing the following information: manufacturer information, product identification, quantity, dimensions, results of required tests.

Mechanical properties are guaranteed only in the condition in which the chain was supplied to the customer.

## 2.3. DESIGNATION

Each reel is labelled with the identification of the manufacturer, the thickness of the chain, the number of the production batch, the length of the chain and the number of pieces in the reel. Only chains of an identical length can be included in one reel.

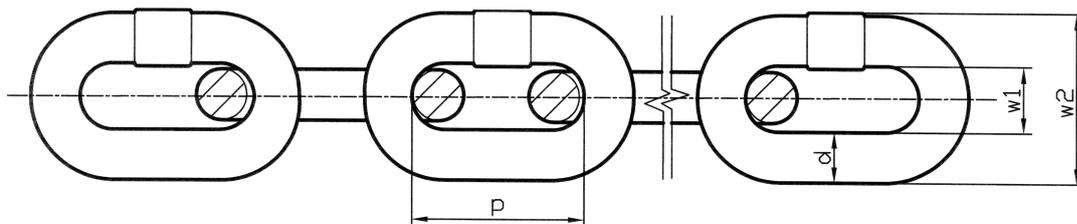
The chains are marked with the Grade **10** mark, the manufacturer's mark and the code for backtracking, all repeated on at least every 1 m of the chain.

## 2.4. STORAGE

Store the chains in a dry place.

## 3. DIMENSIONS, DESIGNATION

### 3.1. Dimensions



p - pitch; d - diameter; w1 - inner width outside the weld; w2 - outer width across the weld; see Table 3

The diameter at the weld must not exceed  $1.1 \times d_n$  and at the same time should not be lower than the actual diameter of the surrounding material. The length dimensionally affected by welding shall not be higher than  $0.6 \times d_n$  on either side from the centre of the link.

Dimensions (mm)			Uniform classification No.
Thickness "d"	Pitch "p"	Width w1/w2 min / max	
5 +0.27/-0.2	15 ±0.5	6.5 / 18.5	317 271 800 050:17
6 +0.32/-0.24	18 ±0.5	8.5 / 22.2	317 271 800 060:17
7 +0.38/-0.28	21 ±0.6	9.1 / 25.9	317 271 800 070:17
8 +0.45/-0.32	24 ±0.7	11 / 29.6	317 271 800 080:17
10 +0.54/-0.4	30 ±0.9	13.5 / 37	317 271 800 100:17
13 +0.69/-0.52	39 ±1.2	16.9 / 48,1	317 271 800 130:17
16 +0.86/-0.64	48 ±1.4	20.8 / 59.2	317 271 800 160:17
18 +1/-0.9	54 ±1.6	23.4 / 66.6	317 271 800 180:17
19 +1.03/-1	57 ±1.7	24.7 / 70.3	317 271 800 190:17
20 +1.08/-1	60 ±1.8	26 / 74	317 271 800 200:17
22 +1.19/-1.1	66 ±2	28.6 / 81.4	317 271 800 220:17
26 +1.38/-1.3	78 ±2.3	33.8 / 96.2	317 271 800 260:17
32 ±1.6	96 ±2.9	41.6 / 118	317 271 800 320:17

Table 3 - Dimensional series.

## 4. CHAIN USE

### 4.1. GENERAL INSTRUCTIONS

The chains must be handled as machine elements. It is especially recommended not to drag chains along the ground, not to subject them to atmospheric effects, not to overload them, and not to perform non-professional repairs on them.

### 4.2. PERMISSIBLE LOAD (LOAD-BEARING CAPACITY)

Load-bearing capacities specified in the standard (see Table 1) apply for general chain use. If the chain is used as a part of a machine, the load-bearing capacity must be specified by the manufacturer of the machine.

The chain must not be overloaded and it must not be subjected to impacts reducing its life.

### 4.3. CHAINS FOR CHAIN SLINGS

Grade 10 medium tolerance welded chain is used mostly in Grade 10 chain slings. Due to its size and design it is not suitable for use in hoists (e.g. block and tackle, etc) or conveyors. When used in chain slings, the chain must not be case-hardened or surface treated in any way which could cause brittle fractures (such as processes involving pickling or passivation in acids).

It is forbidden to combine parts from different strength grades in one chain sling! All parts of the chain sling (if it is assembled by the customer) must be properly certified.

## 5. MAINTENANCE

### 5.1. INSPECTION BEFORE FIRST USE

Before using the chain for the first time, make sure that you have the test certificate from the manufacturer and that the chain is a Grade 10 chain (see markings on the chain).

### 5.2. ROUTINE INSPECTION DURING OPERATION

Regularly inspect the chain integrated in a chain sling to reveal apparent damage, such as twisting, bending, elongation of links, etc.

### 5.3. INSPECTING THE TECHNICAL CONDITION OF CHAINS

During operation, chains are exposed to conditions that may affect their reliability and safety.

It is therefore necessary to check their technical condition on a regular basis. The frequency of inspections should be determined by the owner according to the parameters of the operation in which the chain is used. Chain slings should be inspected by a responsible person at intervals not exceeding 12 months. It is recommended to perform a check every day or before the first use.

If the chain is used as a part of a machine, the frequency of professional inspections must be specified by the manufacturer of the machine according to the parameters of the operation in which the chain is used.

Before a professional inspection, the chain must be cleaned of oil, dirt and rust. Any cleaning method is permissible as long as it does not damage the original metal.

It is forbidden to burn the chain with open flame, dip it in acid or use a method which could cover any cracks or surface defects.

Then the whole length of the chain is inspected in adequate light. During inspections and professional inspections of link chains it is also necessary to check their designation and to search for any external defects of individual links, such as: change of shape, surface condition, degree of wear, change of link thickness and any cracks.

Faulty chains must be put out of operation.

### 5.4. PUTTING CHAINS OUT OF OPERATION

A chain must be put out of operation in case of the following defects:

- Chain elongation (as a result of overloading), or insufficient play between the chain links
- Wear of chain links - caused by foreign objects on the straight section of a chain link
  - Wear caused by mutual contact between the bends of links by more than 10% of the original cross-section
- Cuts, notches, cracks, deep corrosion, heat change in colour, bent, twisted or otherwise distorted links.

### 5.5. REPAIRS AND MODIFICATIONS OF CHAINS

Grade 10 welded chains may only be repaired by the manufacturer. If chains are subjected to additional thermal treatment, their load-bearing capacity may decrease. Such operation may only be performed by the manufacturer. It is forbidden to connect tested chains with wires or screws!

## 6. TRANSPORTATION AND STORAGE

The chains must be transported and stored in such a way as to exclude any negative weather effects and the presence of corrosive substances. Corrosive environment significantly reduces the life of a new chain.

The buyer shall check the chain after its takeover without undue delay and report immediately any apparent defects to the chain supplier. Later claims raised on the basis of apparent defects of the chain will not be accepted by the supplier.

To prevent atmospheric corrosion, PN 46-19 chain can be supplied for handling purposes in a certain treatment (e.g. dyeing).

When chain slings are not used, they should be stored in a suitable rack or on a shelf and protected from weather effects. It is inappropriate to leave them lying freely on the ground, as they could be damaged.

When chain slings are left on the crane hook, they should be hooked into the suspension eye, as to reduce their free swinging and to prevent them from getting caught on anything.

In the case of chains supplied in barrels, they shall be pulled out starting from the end marked with a tag and plastic sleeve, due to the way they are stored in the factory. It is the only free end of the chain; the ends of the

other chains are only marked with a tag (without a plastic sleeve) and they are always fastened to the adjacent chain by wire. As a result, when pulling out the free end, the other chains are also unwound and pulled out subsequently.

## **6. CHAIN DISPOSAL**

Worn and discarded chains are to be disposed of as normal metal waste at a waste collection facility (in accordance with Act no. 185/2001 Coll. on waste as “O” - Other).