

 <b>Řetězárna a.s.<sup>®</sup></b>	<b>Medium tolerance chains for chain slings – Grade 8</b>	<b>according to ČSN EN 818-2, TP</b>
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## OPERATING, FITTING AND MAINTENANCE

### 1. INTRODUCTION

Welded chains for chain slings of Grade 8 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 specified in the standard ČSN EN 818-4. Our chains can be combined with all elements from other manufacturers, which meet the relevant EN standards. It is forbidden to combine parts of different strength grades!

#### 2.1. LOAD-BEARING CAPACITY

The maximum load-bearing capacity for which a chain can be used is defined in Table 2.

##### 2.1.1. Use under various temperatures

The load-bearing capacity of the chain must be reduced when used under operating temperatures exceeding 200°C. If the chain is used within the permissible temperature range specified in Table 1, its load-bearing capacity is not reduced permanently when it returns to normal temperature. However, if the temperature 400°C is exceeded, the chain must be put out of operation.

Table 1: Temperature limits

Ambient temperature °C	from -40° to +200°C	from 200° to 300°C	from 300° to 400°C	over 400°C
The load-bearing capacity is reduced to:	100%	90%	75%	use inadmissible

Table 2: Mechanical properties of chains

<b>Chain</b>	<b>Load-bearing capacity</b>	<b>Test load</b>	<b>Breaking strength</b>
Chain size d x p Mm	WLL t	MPF kN	BF kN
4 x 12	0.5	12.6	20.1
5 x 15	0.8	19.6	31.4
6 x 18	1.12	28.3	45.2
7 x 21	1.5	38.5	61.6
8 x 24	2	50.3	80.4
10 x 30	3.15	78.5	126
13 x 39	5.3	133	212
16 x 48	8	201	322
18 x 54	10	254	407
19 x 57	11.2	284	454
20 x 60	12.5	314	503
22 x 66	15	380	608
23 x 69	16	415	665
25 x 75	20	491	785
26 x 78	21.2	531	849
28 x 84	25	616	985
32 x 96	31.5	804	1,290
36 x 108	40	1,020	1,630
38 x 114	45.6	1,140	1,820

### 2.1.2. Adverse conditions

Use in adverse conditions (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 galvanizing, hot-dip galvanizing, phosphating, coating with various materials, etc.) applied by the customer.

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. MARKING

Each reel is labelled with the identification of the manufacturer, the "CE" mark, 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 8 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, dustfree place.

## 3. CHAIN USE

### 3.1. 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.

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

Load-bearing capacities specified in the standard (see Table 2) 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.

### 3.3. CHAINS FOR CHAIN SLINGS

Grade 8 medium tolerance welded chain is used mostly in Grade 8 chain slings. Due to its size and design it is not suitable for use in hoists 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.

### 3.4. CHAIN LIFE IN TERMS OF FATIGUE

Our products are designed for approx. 20,000 work cycles as chain slings with variable use. When the number of load cycles is exceeded, the high dynamic load may damage the chain and it must be replaced.

When it is necessary to achieve a higher number of load cycles, it is possible to use larger nominal chain sizes or to reduce the permissible load.

## **4. MAINTENANCE**

### **4.1. 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 8 chain (see markings on the chain).

### **4.2. STANDARD INSPECTION DURING OPERATION**

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

### **4.3. 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 week or before every start-up of the hoist. 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 marking 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.

### **4.4. 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- Wear 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
- Notches, dents, cracks, deep corrosion, change of colour due to high temperature; shallow circular dents on surfaces with low tensile stress shall most likely not be defects; deep dents and sharp transversal dents are inadmissible.

### **4.5. REPAIRS AND MODIFICATIONS OF CHAINS**

Grade 8 welded chains may only be repaired by the manufacturer. If chains are subjected to additional surface treatment (such as zinc coating), their load-bearing capacity may decrease or some of

their other properties may change. It is therefore always necessary to consult such changes with 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!

## **5. 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. 125/97 Coll. - waste classification: "O" - Other).