

**National technical  
approval (abZ)  
General construction  
technique permit (aBG)**

Number:

**Z-14.7-557**

Period of validity:

from: **January 5, 2022**

to: **January 5, 2027**

Applicant:

**Jakob AG**  
3555 Trubschachen  
SWITZERLAND

Subject of this approval:

**Rope net constructions Jakob Rope Systems Webnet**

The above-mentioned subject of regulation is hereby generally approved/permitted by the German technical approval body, the "Deutsches Institut für Bautechnik" (DIBt).

This notice comprises eight pages and 16 appendices.

The subject first received the national technical approval on January 5, 2012.

## **I GENERAL PROVISIONS**

- 1 With this notice, the usability or applicability of the subject of approval for the purposes of the federal building regulations is evidenced.
- 2 This notice does not replace the permits, approvals and certificates required under law for the implementation of construction projects.
- 3 This notice is issued without prejudice to the rights of third parties, in particular private property rights.
- 4 Without prejudice to further provisions in the "Special Provisions", copies of this notice must be made available to the user of the subject of approval. In addition, the user of the subject of approval must be informed that this notice must be available at the place of use or application. Upon request, copies must also be made available to the authorities involved.
- 5 This notice must only be reproduced in full. Using an extract of the publication requires the consent of the DIBt. Text and drawings from advertising materials must not contradict this notice, translations must contain the note "Vom Deutschen Institut für Bautechnik nicht geprüfte Übersetzung der deutschen Originalfassung".
- 6 This notice is granted on a revocable basis. The provisions may be supplemented and amended retrospectively, in particular where new technical knowledge requires it.
- 7 This notice relates to the information provided and documents submitted by the applicant. A change in this basis is not covered by this notice and must be reported to the DIBt without delay.

## II SPECIAL PROVISIONS

### 1 Subject of regulation and scope of use resp. scope of application

The subject of approval are prefabricated rope nets with associated fastening components with the designation "Jakob Rope Systems Webnet" (see Appendices 1 to 3).

The rope nets consist of stainless steel ropes (net ropes and lacing ropes) and associated sleeves for the connection and redirection of the ropes (net sleeves "Inox" and "Micro", loose sleeves and Webnet eye ends). As an alternative to using sleeves, the rope nets can also be produced without sleeves by weaving the net ropes.

The rope nets are attached to perimeter ropes or frames with lacing ropes. The attachment and anchoring of perimeter ropes is carried out via appropriate end anchoring components or end fittings. Frames are fastened with associated frame holders and frame clamps. Rope nets with a rope diameter of 1.5 mm or 2.0 mm and mesh aperture from 25 mm to 120 mm can also be attached to longitudinally slotted frame profiles with an internal edge connection ("Invis" / without lacing rope).

The opening angle of the rope net meshes is between 30° and 90°. The mesh aperture may be between 20 mm and 120 mm and must be determined according to the rope diameter, sleeve and intended use, taking into account the information provided in this notice.

The rope nets with the associated fastening components may be installed vertically and horizontally and may be used as railing infills or fall protection for people in accordance with DIN 18008-4<sup>1</sup> in accordance with the information in Appendices 14 to 16. Further areas of application are e.g rope net constructions for animal enclosures or facades.

The Technical Building Regulations apply in accordance with the information provided in this notice.

### 2 Provisions for the construction product

#### 2.1 Properties and composition

##### 2.1.1 Ropes (net ropes, lacing ropes)

For the net and lacing ropes, the details in DIN EN 10264-4<sup>2</sup>, DIN EN 12385-4<sup>3</sup>, DIN EN 12385-10<sup>4</sup> and Appendix 13, Table 13.1 apply.

##### 2.1.2 Perimeter rope

For the perimeter ropes the details in DIN EN 10264-4<sup>2</sup>, DIN EN 12385-4<sup>3</sup>, DIN EN 12385-10<sup>4</sup> and Appendix 13, Table 13.1 apply.

1	DIN 18008-4:2013-04	Glass in Building - Design and construction rules - Part 4: Additional requirements for barrier glazing
2	DIN EN 10264-4:2012-03	Steel wire and wire products - Steel wire for ropes - Part 4: Stainless steel wire
3	DIN EN 12385-4:2008-07	Steel wire ropes - Safety - Part 4: Stranded ropes for general lifting applications
4	DIN EN 12385-10:2008-07	Steel wire ropes - Safety - Part 10: Spiral ropes for general structural applications

### 2.1.3 Net sleeves, loose sleeves , Webnet eye ends

The net sleeves, loose sleeves and Webnet eye ends according to Appendix 4 are made of stainless steel material number 1.4404 according to DIN EN 10088-3<sup>5</sup> with a minimum tensile strength of 500 N/mm<sup>2</sup>. Detailed information on the dimensions is stored at the DIBt<sup>6</sup>.

### 2.1.4 End fittings of perimeter ropes (turnbuckles with clevis, clevis and external thread)

The end connection of perimeter ropes is carried out with the following end fitting components:

- Turnbuckle with clevis according to Appendix 10,
- Clevis according to Appendix 11 and/or
- External thread according to Appendix 12.

The end fitting components are made of stainless steel of material class 1.4401 according to DIN EN 10088-3<sup>5</sup> with a minimum tensile strength of 500 N/mm<sup>2</sup> and are swaged with the rope ends of the perimeter ropes. The clevis and turnbuckle with clevis have metric ISO threads M10 to M36 according to the standards of the DIN 13 series. For the thread tolerances, the specifications in the corresponding standards of the DIN 13 series apply.

### 2.1.5 Frame

The frames are made of hollow round profiles (RR) or square hollow profiles (QHP) made of steel of grade S355 according to DIN EN 10210-1<sup>7</sup> or DIN EN 10219-1<sup>8</sup> or of stainless steel (suitable for hollow sections) according to DIN EN 1993-1-4<sup>9</sup> or national technical approval Z-30.3-6 with a minimum yield strength of 200 N/mm<sup>2</sup> and a minimum tensile strength of 500 N/mm<sup>2</sup>. For the dimensions, the information in Appendices 14 to 16 applies. Alternatively, frame profiles may also be used which have at least equivalent mechanical material properties, the same loading capacity, but no greater bending stiffness compared to the frame profiles listed in Appendices 14 to 16 in the respective application.

### 2.1.6 Frame clamps, frame holders

The frame clamps and frame holders are made of stainless steel of material class 1.4401 according to DIN EN 10088-3<sup>5</sup> with a minimum tensile strength of 500 N/mm<sup>2</sup>. The dimensions are provided in the Appendices 8 and 9. Detailed information on the geometry and dimensions is stored at the DIBt<sup>6</sup>.

## 2.2 Manufacturing and marking

### 2.2.1 Manufacturing of the rope nets

Exact information for the manufacturing of the rope nets is stored at the DIBt<sup>6</sup>.

5	DIN EN 10088-3:2014-12	Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes
6	Document stored with DIBt dated December 13, 2021	
7	DIN EN 10210-1:2006-07	Hot finished structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions; in conjunction with DIN EN 10210-2:2019-07
8	DIN EN 10219-1:2006-07	Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions; in conjunction with DIN EN 10219-2:2019-07
9	DIN EN 1993-1-4:2015-10	Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels; in conjunction with DIN EN 1993-1-4/NA:2017-01

## 2.2.2 Marking

The packaging of the rope nets must be marked by the manufacturer with the conformity mark (Ü-mark) according to the conformity mark-regulations of the federal states. Marking may only be carried out if the conditions laid down in section 2.3 are met.

The marking must indicate the manufacturing plant, the year of manufacture, the name of the construction product and the material of the individual components.

## 2.3 Confirmation of conformity

### 2.3.1 General information

The confirmation of the conformity of the construction product with the provisions of this national technical approval must be carried out for each manufacturing plant with a declaration of conformity from the manufacturer on the basis of a factory production control and a certificate of conformity from a certification body recognized for this purpose, as well as regular external monitoring by a recognized inspection body in accordance with the following provisions.

For the issuance of the certificate of conformity and the external monitoring, including the product tests to be carried out, the manufacturer of the construction product must engage a certification body recognized for this purpose as well as a recognized monitoring body for this purpose.

The manufacturer must submit the declaration of conformity by marking the construction products with the conformity mark (Ü-mark) with reference to the intended use.

The DIBt must be provided with a copy of the certificate of conformity issued by the certification body.

The DIBt must also be provided with a copy of the initial test report.

### 2.3.2 Factory production control

A factory production control must be set up and carried out in each manufacturing plant. Factory production control is understood to be the continuous monitoring of production to be carried out by the manufacturer, through which the manufacturer ensures that the construction products manufactured comply with the provisions of this general construction approval.

Factory production control shall include at least the measures listed below.

- Ropes, perimeter ropes

The dimensions required in section 2.1 shall be checked with each delivery. Proof of the material properties required in clause 2.1 must be provided via an acceptance test certificate 3.1 in accordance with DIN EN 10204<sup>10</sup>. The technical terms of delivery according to DIN EN 10264-4<sup>2</sup>, DIN EN 12385-4<sup>3</sup> and DIN EN 12385-10<sup>4</sup> must be taken into account.

- Net sleeves, loose sleeves, Webnet eye ends, end fittings

The dimensions and tolerances required in section 2.1 shall be checked with each manufactured batch. Proof of the material properties required in clause 2.1 must be provided via an acceptance test certificate 3.1 in accordance with DIN EN 10204<sup>10</sup>.

<sup>10</sup> DIN EN 10204:2005-01 Metallic products - Types of inspection documents

- Verification of the values of load capacity and swaged elements

The values of the load capacity of the individual meshes, edge connections and the perimeter ropes and the swaged elements (rope with sleeve, rope with Webnet eye ends, rope with clevis or turnbuckle as well as end connection of the lacing ropes) shall be checked regularly by tensile tests on single meshes, edge connections and perimeter ropes with the associated sleeves and end fittings. The type, scope and frequency of these tests must be coordinated during the initial inspection (see section 2.3.3) with the monitoring body involved in external monitoring and the DIBt.

The results of the factory production control shall be recorded and evaluated. The records must contain at least the following information:

- Name of the construction product or the starting material and components
- Type of control or inspection
- Date of manufacture and testing of the construction product or starting material or components
- Result of the controls and inspections and comparison with the requirements
- Signature of the person responsible for factory production control.

The records shall be kept for at least five years and submitted to the monitoring body involved in external monitoring. They must be submitted to the DIBt and the responsible building supervisory authority on request.

If the test result is insufficient, the manufacturer must immediately take the necessary measures to remedy the defect. Construction products that do not comply with the requirements shall be handled in such a way as to avoid confusion with compliant products. After the defect has been remedied, the relevant inspection must be repeated immediately - as far as technically possible - and necessary to prove that the defect has been remedied.

### **2.3.3 External monitoring**

In each manufacturing plant, the factory production control must be checked regularly by means of external monitoring, but at least twice a year.

As part of external monitoring, an initial test of the construction product shall be carried out and random tests of the properties of the construction products required in Section 2.1 shall be carried out. The minimum thread insertion depth specified in Appendix 10 shall be checked. Details of the initial examination are stored at the DIBt.

Sampling and testing are the responsibility of the recognized body. The values measured during external monitoring must prove that the requirements are met in each case.

The results of the certification and external monitoring must be kept for at least five years. They must be submitted by the certification body or the monitoring body to the DIBt and the responsible building supervisory authority on request.

## **3 Provisions for planning, design and execution**

### **3.1 Design**

#### **3.1.1 General information**

In addition to the following information, the information on the design in section 3.2 and on the execution in section 3.3 shall be taken into account in the planning.

The rules set out in DIN EN 1993-1-4<sup>9</sup>, DIN EN 1993-1-11<sup>11</sup>, in the associated codes and in the national technical approval No. Z-30.3-6 apply, unless otherwise specified in this notice.

### 3.1.2 Perimeter ropes

In the case of edge connections with perimeter ropes, suitable design measures must be taken to ensure that the clevis can pivot freely in the rope net plane even in the event of large deformations of the perimeter ropes, so that no unacceptable bending stresses occur in the clevis.

The perimeter ropes 6x19+WC with a diameter of 6, 8, and 10 mm may be redirected in accordance with the conditions set out in Appendix 13.

### 3.1.3 Lacing ropes

The diameter of the lacing rope shall be greater than the diameter of the net rope, the assignment according to Table 4.2 Appendix 4 must be observed.

The ends of the lacing ropes must be pressed together with two loose sleeves in accordance with section 2.1.3 in accordance with the requirements of section 3.3.

### 3.1.4 Corrosion resistance

The rope nets are to be classified in the corrosion resistance class (CRC) II according to DIN EN 1993-1-4<sup>9</sup>.

## 3.2 Dimensioning

### 3.2.1 General information

The design concept specified in DIN EN 1993-1-11<sup>11</sup> applies to the verification of structural safety of the rope nets.

For the verification of structural safety of the round tube frames as well as the verification of load application and transmission into the substructure, the Technical Building Regulations must be observed.

The design concept specified in DIN 18008-4<sup>1</sup> applies to the verification of impact resistance of bearing structures. The characteristic load capacity of each bracket shall be at least 2.8 kN.

### 3.2.2 Modulus of elasticity EQ of the ropes and perimeter ropes

The specifications in DIN EN 1993-1-11<sup>11</sup> apply.

### 3.2.3 Verification of fall protection / railing infill

The verification of fall protection and the usability of the rope nets as a railing infill shall be deemed to have been proven in accordance with the specifications of Annexes 14 to 16 in compliance with the Technical Building Regulations and information provided in this notice.

## 3.3 Installation

The manufacturer must prepare instructions for the installation of the prefabricated rope nets and hand them over to the construction company. Installation must only be carried out by trained personnel.

Before installation, all individual components of the rope nets must be checked to be in flawless condition. Damaged parts must not be used.

The use of rope nets with edge connection via net rope loops (so-called "closed nets") is not permitted.

<sup>11</sup> DIN EN 1993-1-11:2010-12 Eurocode 3: Design of steel structures - Part - 1-11: Design of steel structures - Part 1-11: Design of structures with tension components in conjunction with DIN EN 1993-1-11/NA:2010-12

Swaging of the net sleeves and loose sleeves or Webnet eye ends in accordance with sections 2.1.3 and 3.1.3 on site is only permitted by trained personnel with "Battery-powered swaging tool type 30570" from Jakob AG.

In the case of perimeter ropes, the minimum thread insertion depth of the final anchor (measurement "c" according to Appendix 10) must be checked and complied with.

The person responsible for the assembly must state in a note that all connections with threads have been checked for compliance with the minimum thread insertion depth.

In order to confirm the conformity of the rope net constructions "Jakob Rope Systems Webnet" with the national technical approval covered by this notice, the construction company must submit a declaration of conformity in accordance with articles 16a (5) in conjunction with 21 (2) MBO.

#### **4 Provisions for use, upkeep and maintenance**

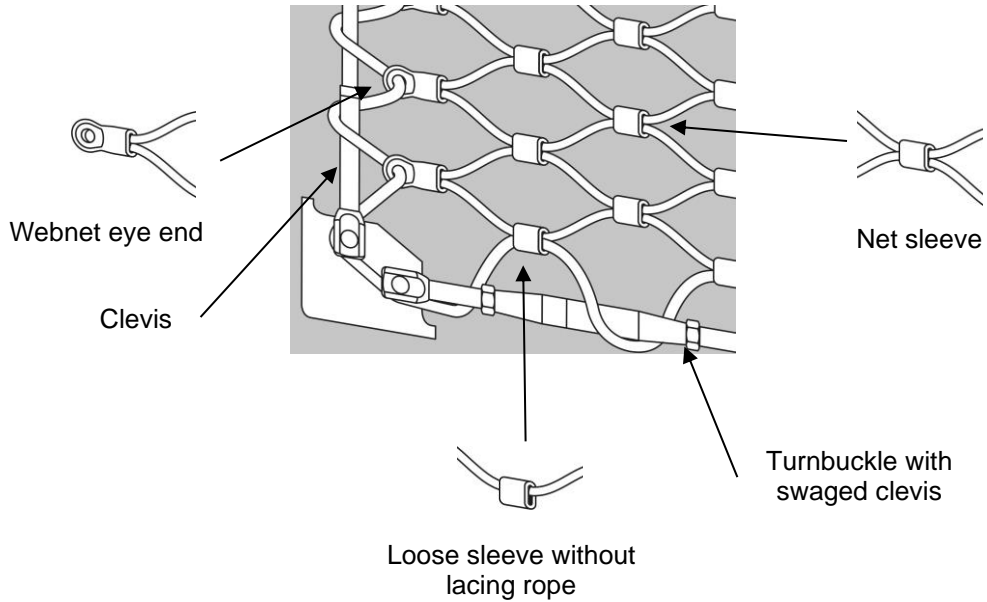
In the case of fall protection systems, the components must be regularly inspected for damage, functionality and any corrosion damage present after installation. The inspections must be recorded.

Dr.-Ing. Ronald Schwuchow  
Head of division

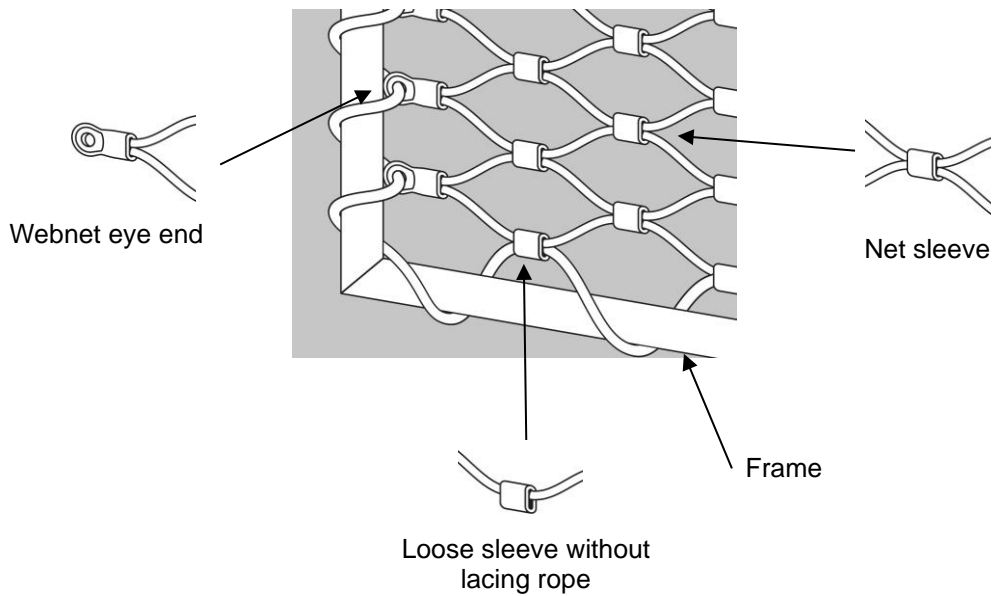
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Bertram



**Example 1: Rope net with perimeter rope**



**Example 2: Rope net with frame**

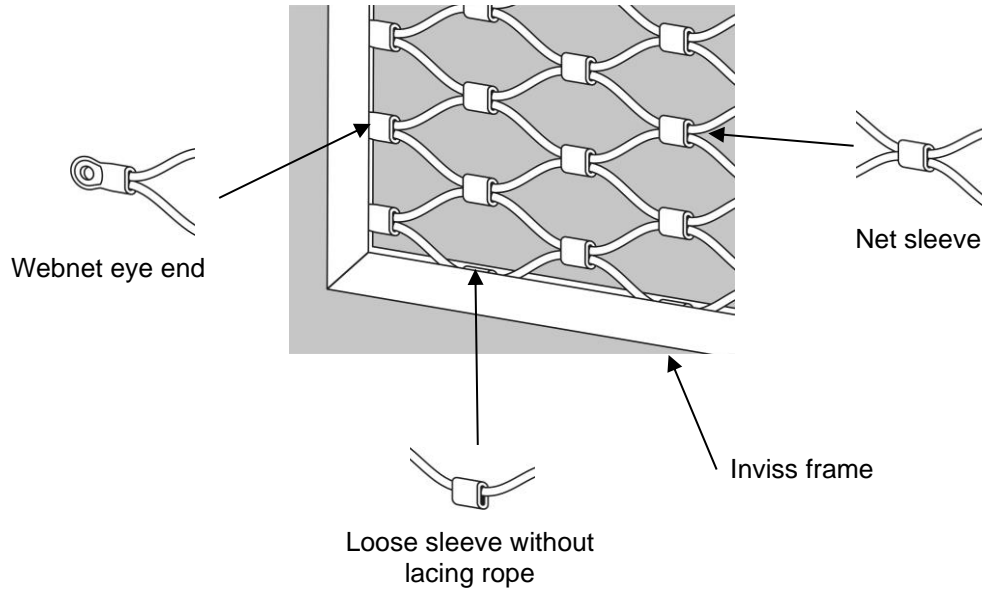


Rope net constructions Jakob Rope Systems Webnet

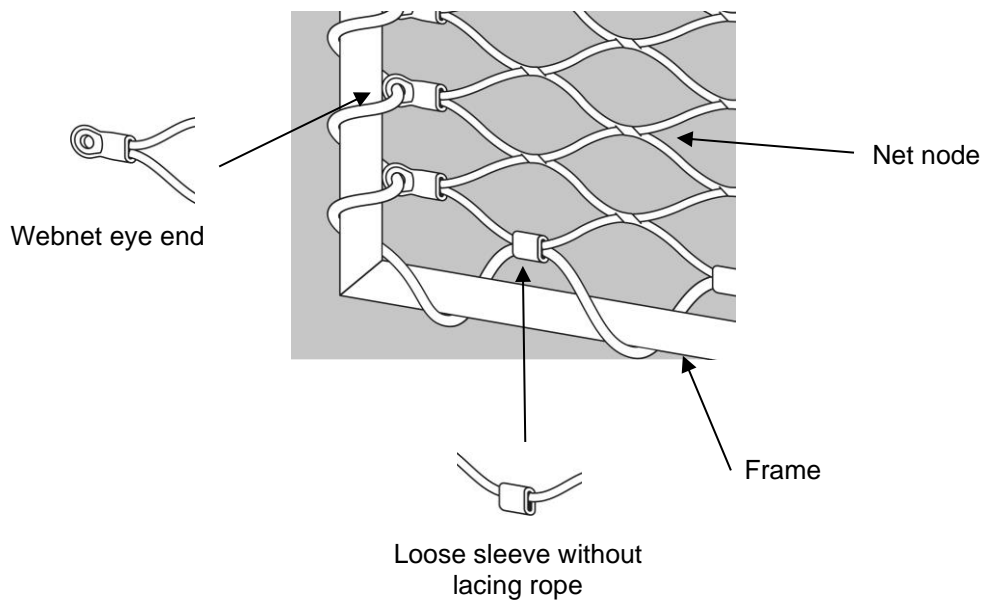
Examples of rope nets

Appendix 1

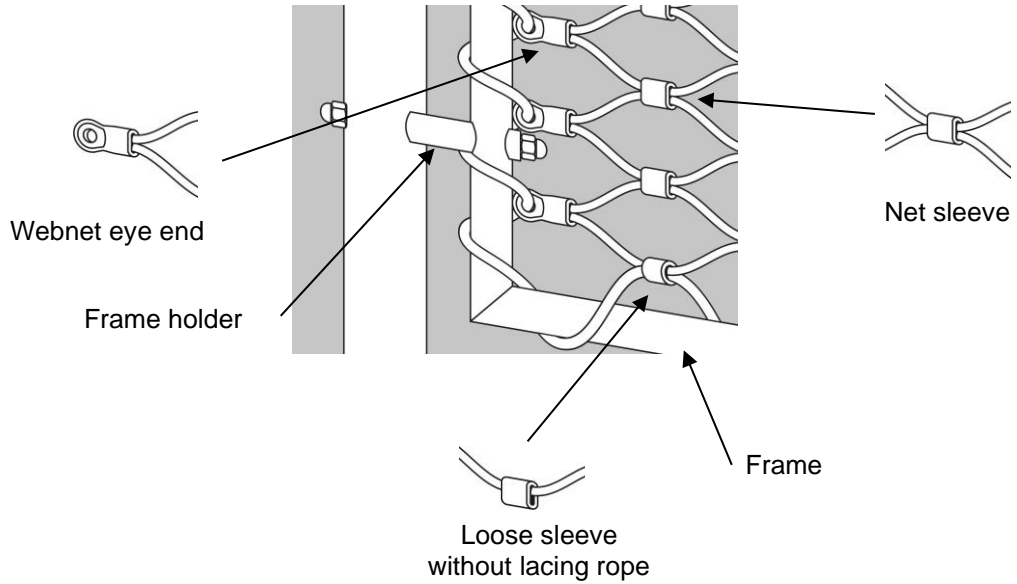
**Example 3: Rope net “Invis” with internal edge connection**



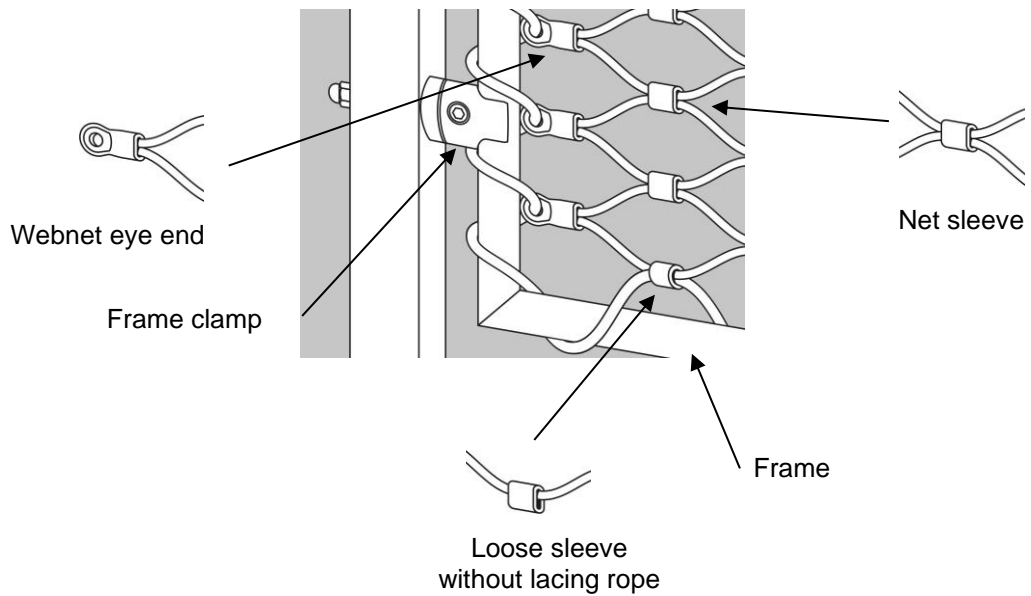
**Example 4: Rope net sleeveless with frame**



**Example 5: Rope net with frame and frame holder**



**Example 6: Rope net with frame and frame clamp**

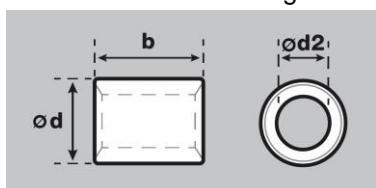


**Table 4.1: Net sleeves**

Designation	Item No.	Material	Rope Ø [mm]	b [mm]	Ød* [mm]	Ød2* [mm]	Net sleeve swaged	
							A [mm]	t ** [mm]
Inox sleeve	30584-0200	1.4404	2.0	10.0	7.0	4.7	9.0	3.5
	30584-0300		3.0	11.0	8.3	6.0	10.8	4.5
Micro sleeve	30584-0150-20		1.5	5.5	-	-	6.0	2.8
	30584-0200-20		2.0	7.5	-	-	7.5	4.0

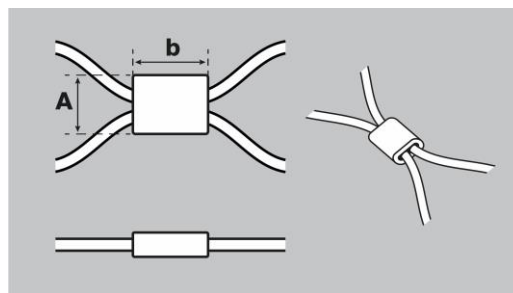
\* unswaged

\*\* thickness in the swaged condition



**Table 4.2: Loose sleeves**

Net rope Ø [mm]	Lacing rope Ø [mm]	Material	A* [mm]	b [mm]	t** (approx.) [mm]
1.5	2.0	1.4404	7.0	5.5	3.5
2.0	2.5		8.3	7.5	4.8
3.0	4.0		10.3	11.0	6.5
4.0	5.0		16.0	13.0	7.5
5.0	6.0		19.0	20.0	8.5

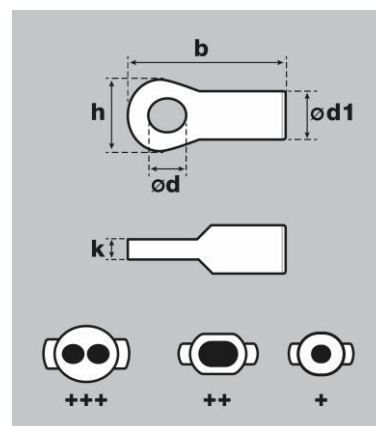


\* unswaged

\*\* thickness in the swaged condition

**Table 4.3: Webnet eye ends**

Item No. 30880-	Material	Rope Ø [mm]	b [mm]	Ød [mm]	h [mm]	k [mm]	Ød1* [mm]
0150-01 ++ 0150-02 +	1.4404	1.5	16.0	3.0	8.2	3.0	6.0
0200-01 ++ 0200-02 +		2.0	20.0	4.5	10.0	3.0	7.0
0300-01 +++ 0300-02 +		3.0	30.0	6.0	14.0	5.0	10.0
0400-01 +++ 0400-02 +		4.0	48.0	7.0	18.0	6.0	14.0
0500-01 +++ 0500-02 +		5.0	65.0	9.0	22.0	6.0	16.0



\* unswaged

Rope net constructions Jakob Rope Systems Webnet

Material and geometry  
 Net sleeves, loose sleeves and Webnet eye ends

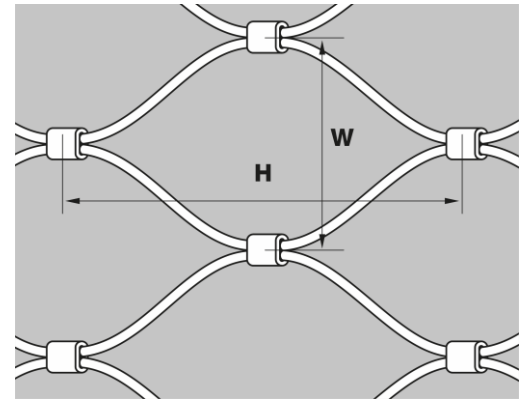
Appendix 4

**Table 5.1: Net structure and dimensions for nets with Inox sleeves**

Sleeve type	Ø Circular wire strand rope	Mesh apertures [mm]
Inox	2.0 mm 6x7+WC 3.0 mm 6x19+WC	40 to 120 40 to 120

**Table 5.2: Mesh geometry for standard mesh angle 60°, Inox sleeves**

Item No.	Rope Ø [mm]	Mesh aperture W* [mm]	Mesh height H* [mm]
20256-0200-040	2.0	40	75.1
20256-0200-050		50	90.5
20256-0200-060		60	106
20256-0200-070		70	124
20256-0200-080		80	141
20256-0200-100		100	175
20256-0200-120		120	209
20256-0300-040	3.0	40	74.8
20256-0300-050		50	90.5
20256-0300-060		60	106
20256-0300-070		70	124
20256-0300-080		80	141
20256-0300-100		100	175
20256-0300-120		120	209



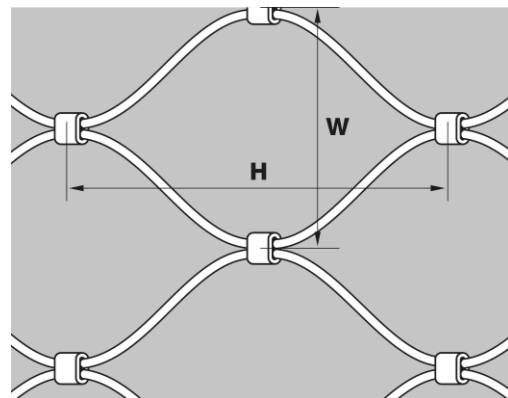
\* The values provided apply for the standard mesh angle of 60°. With other mesh angles, the mesh height will vary.

**Table 6.1: Net structure and dimensions for nets with micro sleeves**

Sleeve type	Ø Circular wire strand rope	Mesh apertures [mm]
Micro	1.5 mm 6x7+WC 2.0 mm 6x7+WC	25 to 120 40 to 120

**Table 6.2: Mesh geometry for standard mesh angle 60°, micro sleeves**

Item No.	Rope Ø [mm]	Mesh aperture W* [mm]	Mesh height H* [mm]
20261-0150-025	1.5	25	45.5
20261-0150-030		30	60.7
20261-0150-035		35	68.0
20261-0150-040		40	75.2
20261-0150-050		50	91.4
20261-0150-060		60	107.8
20261-0150-070		70	124.8
20261-0150-080		80	141.5
20261-0150-100		100	175.3
20261-0150-120		120	210.4
20261-0200-040	2.0	40	74.9
20261-0200-050		50	91.1
20261-0200-060		60	107.5
20261-0200-070		70	124.1
20261-0200-080		80	141.0
20261-0200-100		100	175.2
20261-0200-120		120	209.8



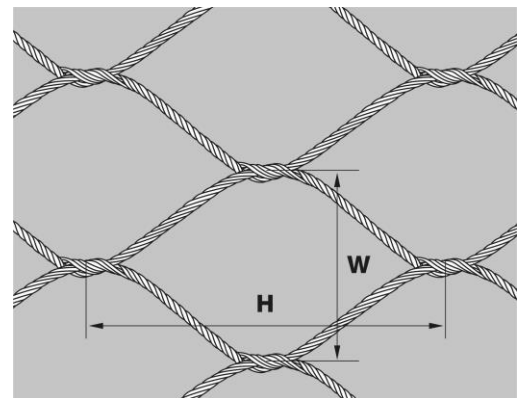
\* The values provided apply for the standard mesh angle of 60°. With other mesh angles, the mesh height will vary.

**Table 7.1: Net structure and dimensions for sleeveless nets**

Sleeve type	Ø Circular wire strand rope	Mesh apertures [mm]
Sleeveless	1.5 mm 6x7+WC	30 to 120
	2.0 mm 6x7+WC	40 to 120
	3.0 mm 6x19+WC	40 to 120
	4.0 mm 6x19+WC	40 to 120
	5.0 mm 6x19+WC	100 to 120

**Table 7.2: Mesh geometry for standard mesh angle 60°, sleeveless**

Item No.	Rope Ø [mm]	Mesh aperture W* [mm]	Mesh height H* [mm]
20260-0150-030	1.5	30	60.2
20260-0150-040		40	74.8
20260-0150-050		50	89.7
20260-0150-060		60	105.7
20260-0150-070		70	124.6
20260-0150-080		80	139.6
20260-0150-100		100	174.6
20260-0150-120		120	208.5
20260-0200-040	2.0	40	74.8
20260-0200-050		50	88.3
20260-0200-060		60	105.7
20260-0200-070		70	122.5
20260-0200-080		80	139.5
20260-0200-100		100	173.3
20260-0200-120		120	207.3
20260-0300-040		3.0	40
20260-0300-050	50		88.3
20260-0300-060	60		105.7
20260-0300-070	70		122.5
20260-0300-080	80		139.5
20260-0300-100	100		173.3
20260-0300-120	120		207.3
20260-0400-040	4.0		40
20260-0400-050		50	88.3
20260-0400-060		60	105.7
20260-0400-070		70	122.5
20260-0400-080		80	139.5
20260-0400-100		100	173.3
20260-0400-120		120	207.3
20260-0500-100		5.0	100
20260-0500-120	120		207.3

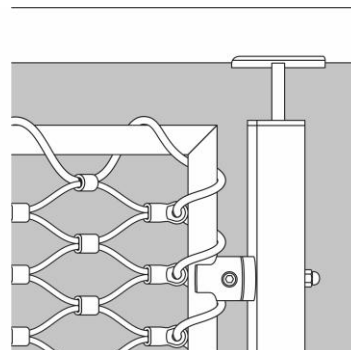
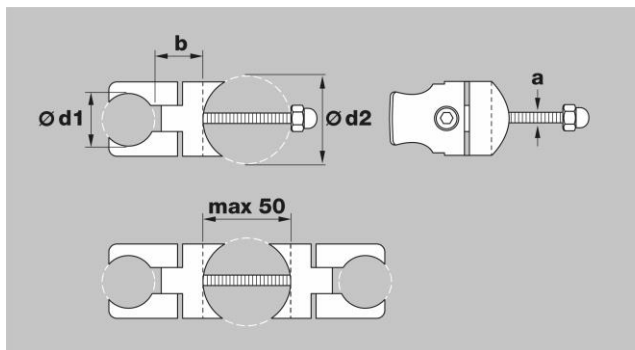


\* The values provided apply for the standard mesh angle of 60°. With other mesh angles, the mesh height will vary.

**Frame clamps**

Frame clamp  
single-sided

Frame clamp  
two-sided

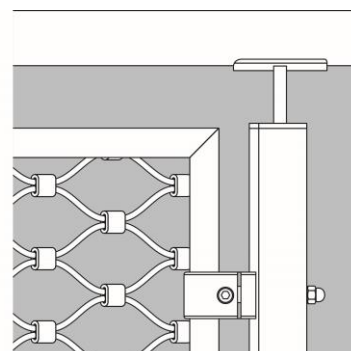
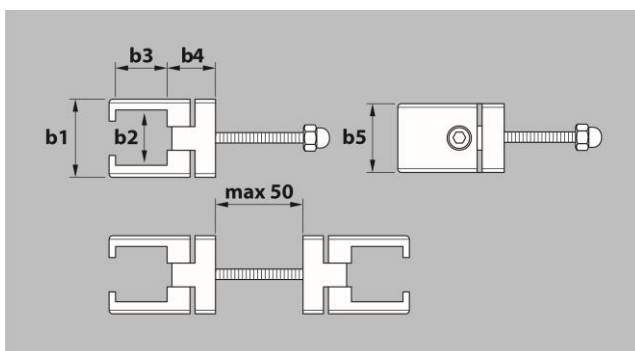


**Table 8.1: Material and dimensions of round frame clamp, spacing 25 mm**

Item No.	Material	a	b [mm]	Ø d1 [mm]	Ø d2 [mm]
30917-0017-xx	1.4401	M6	25	17.2	33
30917-0026-xx		M6	25	26.9	42

Frame clamp  
single-sided

Frame clamp  
two-sided



**Table 8.2: Material and dimensions of rectangular frame clamp, spacing 25 mm**

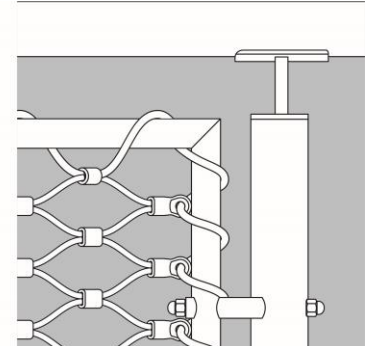
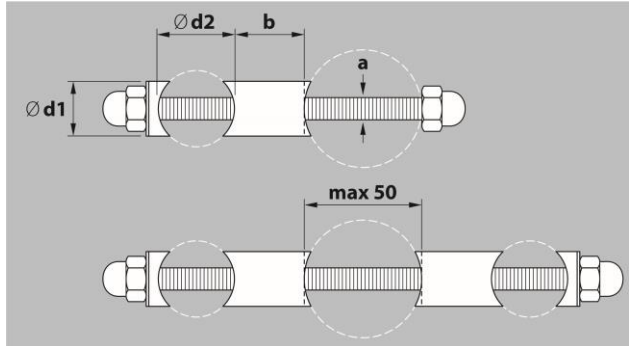
Item No.	Material	a	b1 [mm]	b2 [mm]	b3 [mm]	b4 [mm]	b5 [mm]
30917-0020-01/02	1.4401	M6	30	20	20	25	30
30917-0030-01/02		M6	40	30	30	25	30



**Frame holder**

Frame holder  
single-sided

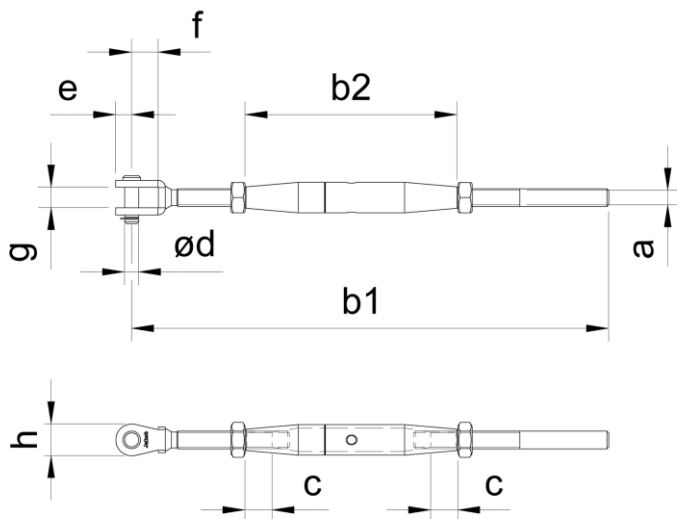
Frame holder  
two-sided



**Table 9.1: Material and dimensions of frame holders, spacing 25 mm**

Item No.	Material	a	b [mm]	$\varnothing d1$ [mm]	$\varnothing d2$ [mm]
30917-0017-xx	1.4401	M6	25	13	17.2
30917-0026-xx		M8	25	18	26.9
30917-0033-xx		M8	25	18	33.7
30917-0042-xx		M8	25	18	42.4

Turnbuckle with clevis swaged



c: Thread insertion depth of the rope  
 or the clevis in the turnbuckle  
 $c \geq 1.5 \times \text{thread diameter}$

Table 10.1: Material and dimensions turnbuckle with clevis swaged

Item No.	Rope Ø [mm]	Material	a	b1 [mm]	b2 [mm]	Ød [mm]	e [mm]	f [mm]	g [mm]	h [mm]	(+) tensioning length (-) [mm]
30870-0600	6.0	1.4401	M10	269	120	8	9	15	11	18	20 54
30870-0800	8.0		M12	355	150	12	14	26	14	26	34 70
32870-0800-01				411	160	12	15	24	14	31	41 64
30870-1000	10.0		M16	458	190	14	18	32	22	34	42 84
32870-1000-01				482	180	16	20	30	18	40	39 70
30870-1200	12.0		M20	554	220	19	23	43	24	43	50 98
32870-1200-01				558	200	20	24	38	22	48	36 76
32870-1400-01	14.0		M24	678	240	25	29	47	26	58	44 92
30870-1600	16.0			573	212	25	35	40	25	63	44 82
32870-1600-01				700	240	25	29	47	26	58	44 92
32870-1900-01	19.0		M30	850	300	32	38	60	32	75	56 118
32870-2200-01	22.0			878	300	32	38	60	32	75	56 118
32870-2600-01	26.0		M36	971	320	36	45	65	38	90	48 120

Item group 30870 may only be used in conjunction with circular wire strand ropes.

**Swaged clevis**

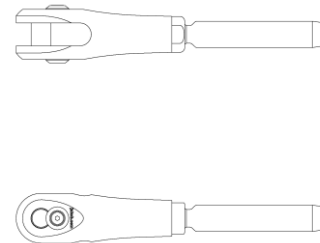
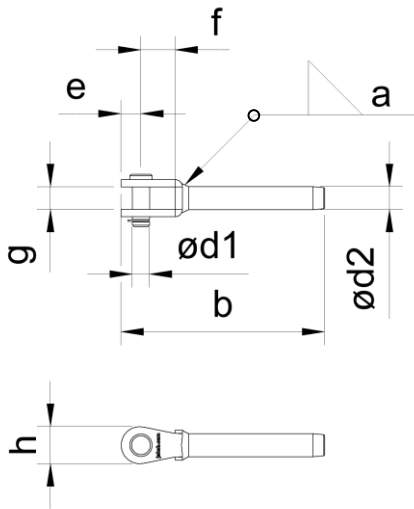


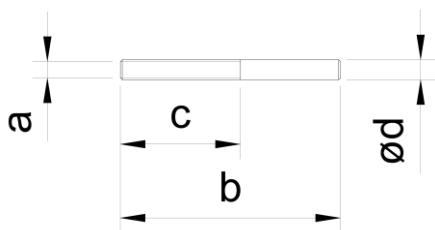
Illustration clevis item group 32881

**Table 11.1: Material and dimensions swaged clevis**

Item No.	Rope Ø [mm]	Material	b [mm]	Ød1 [mm]	Ød2 [mm]	e [mm]	f [mm]	g [mm]	h [mm]	Weld seam a [mm]
30881-0600	6.0	1.4401	113	9.5	12.7	11	19	12.5	20.5	4
30881-0800	8.0		144	12	16	14	26	15	26	5
32881-0800-01			174	12	16.1	15	24	14	31	-
30881-1000	10.0		165	14	18	18	32	22	34	5
32881-1000-01			218	16	17.9	20	30	18	40	-
30881-1200	12.0		205	16	20	18	32	22	34	6
32881-1200-01			268	20	21.4	24	38	22	48	-
32881-1400-01	14.0		321	25	25	29	47	26	58	-
30881-1600	16.0		285	25	28.2	35	40	25.4	63	6
32881-1600-01			338	25	28.2	29	47	26	58	-
32881-1900-01	19.0		408	32	34.5	38	60	32	75	-
32881-2200-01	22.0		437	32	40.5	38	60	32	75	-
32881-2600-01	26.0		501	36	46	45	65	38	90	-

Item group 30881 must only be used in conjunction with circular wire strand ropes.

**Swaged external thread**



**Table 12.1: Material and dimensions swaged external thread**

Item No. right-hand thread	Item No. left-hand thread	Rope Ø [mm]	Material	a	b [mm]	c [mm]	Ø d [mm]
30850-0600-030	30855-0600-030	6.0	1.4404	M10	80	30	10
30850-0600-060	30855-0600-060				110	60	10
30850-0600-080	30855-0600-080				130	80	10
30850-0800-080	30855-0800-080	8.0		M12	157	80	13
30850-0800-120	30855-0800-120				197	120	13
32850-0800-01	32855-0800-01				175	80	16.1
30850-1000-110	30855-1000-110	10.0		M16	210	100	18
32850-1000-01	32855-1000-01				205	90	17.9
30850-1200-120	30855-1200-120	12.0		M20	255	120	20
32850-1200-01	32855-1200-01				235	100	21.4
32850-1400-01	32855-1400-01	14.0		M24	282	120	25
30850-1600-120	30855-1600-120	16.0			283	120	27
32850-1600-01	32855-1600-01				300	120	28.2
32850-1900-01	32855-1900-01	19.0		M30	362	150	34.5
30850-2000-150	30855-2000-150	20.0			341	150	32
32850-2200-01	32855-2200-01	22.0			390	150	40.5
32850-2600-01	32855-2600-01	26.0		M36	420	160	46

Item group 30850 must only be used in conjunction with circular wire strand ropes.

**Table 13.1: Net ropes, lacing ropes, perimeter ropes**

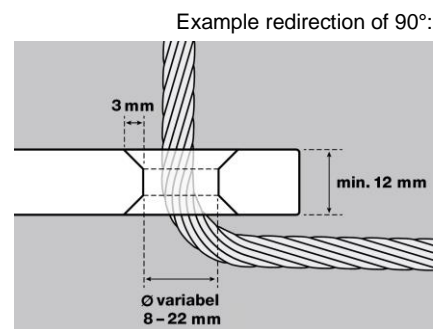
Rope type	Rope design	Rope $\varnothing$ [mm]	Loss factor $k_u$ redirected perimeter rope	Material of the individual wire strands	Wire tensile strength [N/mm <sup>2</sup> ]			
Net ropes, lacing ropes	Circular wire strand rope with steel core 6x7+WC	1.5	/	1.4401	≥ 1570			
		2.0						
		2.5						
	Circular wire strand rope with steel core 6x19+WC	3.0						
		4.0						
Circular wire strand rope with steel core 6x19+WC	5.0							
	6.0							
Lacing rope	Circular wire strand rope with steel core 6x19+WC	6.0						
Perimeter ropes	Circular wire strand rope with steel core 6x7+WC	6.0						
		8.0						
	Circular wire strand rope with steel core 6x19+WC	6.0	0.81					
		8.0	0.62					
		10.0	0.75					
		12.0						
		16.0						
	Open spiral strand rope (OSS) 1x19 ( $\varnothing$ 26 1x37)	20.0						
		8.0						
		10.0						
		12.0						
		14.0						
		16.0						
		19.0						
		22.0						
26.0								

**Redirection of perimeter ropes:**

Perimeter ropes with 6x19+WC construction with a diameter of 6, 8 or 10 mm are permitted to be redirected up to 180° under the following conditions:

- Deflection via tabs with a minimum thickness of 12 mm, hole on both sides at least 3 mm x 45° chamfered according to diagram on the right
- Alternatively, by bolt or ring screw with minimum diameter 12 mm at the redirection point

In this case, the permissible tensile force for the perimeter rope must be reduced by the loss factor  $k_u$  set out in Table 13.1, with this factor being applied in addition to the other reduction factors (e.g. Loss factor  $k_e$  according to DIN EN 1993-1-11:2010-12 for end connections).



Edge spacings of the hole according to DIN EN 1993-1-8:2010-12.

Alternatively, the tab may be oriented in the direction of the angle bisector.

Rope net constructions Jakob Rope Systems Webnet

Ropes (lacing ropes, net ropes), perimeter ropes

Appendix 13

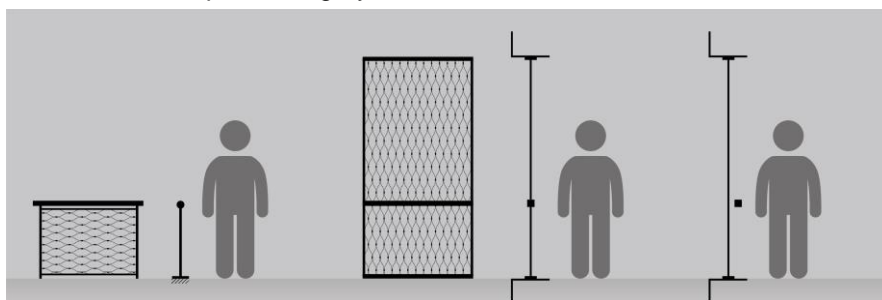
**Table 14.1: Systems approved for use as vertical fall protection:  
 Based on DIN 18008-4:2013-07 Category C (railing infill panels)**

Nominal diameter net rope [mm] / sleeve	Mesh aperture range [mm]	Edge connection / geometry	Minimum area size [m] x [m]
1.5 / Micro	25 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 17.2 x 1.6	1.0 x 0.8
	25 to 100	Invis QHP 20 x 1.5 to QHP 40 x 3	
2.0 / Micro	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 17.2 x 1.6	
	40 to 100	Invis QHP 20 x 1.5 to QHP 40 x 3	
2.0 / Inox	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 17.2 x 1.6	
	40 to 100	Invis QHP 20 x 1.5 to QHP 40 x 3	
1.5 / sleeveless	30 to 100	Frame RR 17.2 x 1.6 Invis QHP 20 x 1.5	
2.0 / sleeveless	40 to 120	Frame RR 17.2 x 1.6 Invis QHP 20 x 1.5 to QHP 40 x 3	

For the perimeter rope the rope designs according to Table 13.1 are permitted.  
 The configurations listed in Table 15.1 are also permissible for applications according to category C based on DIN 18008-4:2013-07.

RR: Round tube  
 QHP: Square hollow profile

Installation examples Category C based on DIN 18008-4:2013-07:



Rope net constructions Jakob Rope Systems Webnet

Systems approved for use as vertical fall protection  
 Category C

Appendix 14

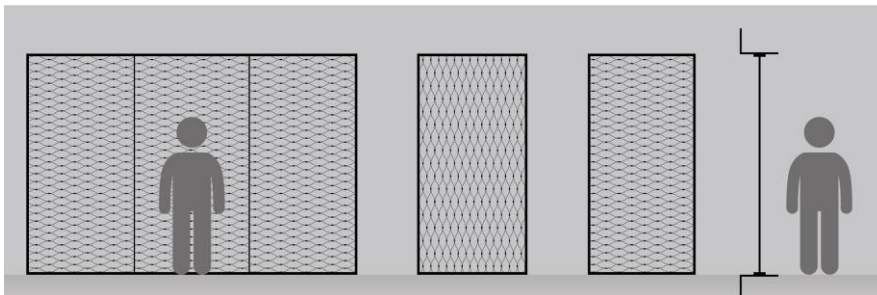
**Table 15.1: Systems approved for use as vertical fall protection:  
 Based on DIN 18008-4:2013-07 Category A**

Nominal diameter net rope [mm] / sleeve	Mesh aperture range [mm]	Edge connection / geometry	Minimum area size [m] x [m]
1.5 / Micro	100 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 8 mm	1.0 x 2.5
2.0 / Micro	100 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 8 mm	
2.0 / Inox	100 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 8 mm	
1.5 / Micro	25 to 80	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	1.0 x 0.8
2.0 / Micro	40 to 80	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
2.0 / Inox	40 to 80	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
3.0 / Inox	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
1.5 / sleeveless	30 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm	
2.0 / sleeveless	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
3.0 / sleeveless	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
4.0 / sleeveless	40 to 120	Perimeter rope $\varnothing$ 8 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
5.0 / sleeveless	100 to 120	Perimeter rope $\varnothing$ 10 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	

For the perimeter rope the rope designs according to Table 13.1 are permitted.  
 The configurations listed here are also permissible for applications according to category C based on DIN 18008-4:2013-07.

RR: Round tube

Installation examples Category A based on DIN 18008-4:2013-07:



Rope net constructions Jakob Rope Systems Webnet

Systems approved for use as vertical fall protection  
 Category A

Appendix 15

**Table 16.1: Systems approved for use as horizontal fall protection:**

Nominal diameter net rope [mm] / sleeve	Mesh aperture range [mm]	Edge connection / geometry	Minimum area size [m] x [m]
2.0 / Micro	40 to 60	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm	1.0 x 1.0
	40 to 80	Frame RR 26.9 x 2 to RR 42.4 x 2	
2.0 / Inox	40 to 60	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm	
	40 to 80	Frame RR 26.9 x 2 to RR 42.4 x 2	
3.0 / Inox	40 to 120	Perimeter rope $\varnothing$ 6 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	
2.0 / sleeveless	40 to 50	Frame RR 26.9 x 2 to RR 50 x 5	
3.0 / sleeveless	40 to 100	Perimeter rope $\varnothing$ 8 mm to $\varnothing$ 26 mm Frame RR 26.9 x 2 to RR 50 x 5	

For the perimeter rope the rope designs according to Table 13.1 are permitted.

RR: Round tube

With identical edge connections, larger net rope diameters up to max. 5 mm and / or smaller mesh apertures may be used.

For systems used as horizontal fall protection, the meshes must be oriented parallel to the long side.

Edge structures must be supported/stabilized every 2.5 m.

Rope net constructions Jakob Rope Systems Webnet

Systems approved for use as horizontal fall protection

Appendix 16