

**FERRULES**



**ZEN® Ferrules according to EN 13411-3**

Nominal Rope Ø mm	Measured Rope Ø mm min.	FERRULES TO BE USED ACCORDING TO EN 13411-3	
		single layer round strand ropes with fibre core and metallic cross-sectional area C min 0,283 factor up to 0,487	single layer round strand ropes with WPC and cotton resistant strand ropes C greater 0,487 up to 0,613 max 0,819
2,5	2,5	2,5	-
3	2,8	3	3,5
3,5	3,3	3,5	4
4	3,8	4,3	4,5
4,5	4,4	4,8	5
5	4,9	5,4	5
5,5	5,9	6	6,5
6	6,0	6,4	7
6,5	6,5	6,9	7
7	7,0	7,4	8
8	8,0	8,4	9
8,5	8,9	9	10
9	9,6	9,9	10
10	10,0	10,5	11
11	11,0	11,6	12
12	11,7	12,3	13
13	12,7	13,3	14
14	13,9	14,5	16
15	15,0	15,9	16
16	16,0	16,9	18
17	17,0	17,9	18
18	18,0	18,9	20
19	19,0	19,9	22
20	20,0	21,0	24
22	22,0	23,1	24
24	24,0	25,2	26
26	26,0	27,3	28
28	28,0	29,4	30
30	30,0	31,5	32
32	32,0	33,6	34
34	34,0	35,7	36
36	36,0	37,8	38
38	38,0	39,9	40
40	40,0	42,0	44
44	44,0	46,2	48
48	48,0	50,4	52
52	52,0	54,6	56
56	56,0	58,8	60
60	60,0	63,0	-

For accommodation of steel wire ropes with a higher tensile grade than 1800 N/mm<sup>2</sup> (Rm) please refer to our technical department.

**XL-FERRULES**



**XL & Z-FERRULES**

Steel core - metallic ropes with 1770 N/mm <sup>2</sup> grade	Type XL		Type Z	
	min.	max.	Prepared Ferrule Diameter Ø mm	Tolerance mm
46,3	50,7	45,6	XL 52	+2,1
50,8	54,3	49,0	XL 54	+2,3
54,4	58,2	51,6	XL 56	+2,4
58,3	61,9	55,3	XL 60	+2,5
62,0	65,8	59,3	XL 64	+2,6
65,9	69,7	63,5	XL 68	+2,8
69,8	73,6	67,0	XL 72	+3,0
73,7	77,4	71,3	XL 76	+3,2
77,5	81,3	74,6	XL 80	+3,3
81,4	85,2	78,9	XL 84	+3,5
85,3	89,1	82,2	XL 88	+3,6
89,2	93,1	86,6	XL 90	+3,8
93,2	97,1	90,2	Z 94	+3,8
96,2	101,5	93,2	Z 102	+3,8
101,6	105,8	98,3	Z 108	+3,8

For accommodation of steel wire ropes with a higher tensile grade than 1800 N/mm<sup>2</sup> (Rm) please refer to our technical department.

**SWAGING & MARKING**



**1. Wire rope parameters**  
Confirm actual wire rope diameter by measuring the diameter in accordance with Fig. 1. Check rope construction, tensile grade, and metal type. The rope should be secured by an appropriate method, ensuring that the rope and remains in lay.



**2. Preparation of rope end**  
Confirm actual wire rope diameter by measuring the diameter in accordance with Fig. 1. Check rope construction, tensile grade, and metal type. The rope should be secured by an appropriate method, ensuring that the rope and remains in lay.



**3. Alignment and condition of the tooling**  
Ensure that the die faces are correctly aligned. Lubricate die bore with soft mineral grease. The cutting edge to no longer assure an accurate swaging procedure according to EN 13411-3 and should be removed from service.



**4. Before swaging**  
Insert the wire rope into the female and from the eye to the required length. In a soft eye the eye shall be at least 1/5 times the normal length. The eye diameter D should be the guide value of how far the dead end of the rope protrudes out of the female before swaging.



**5. Pressing**  
Ensure that the ferrule is truly vertical within the die bore and that the die faces are correctly aligned. The pressure according to splice requirement. Do not overpress. Cease pressing immediately when the die faces meet.



**6. After swaging**  
After swaging the rope 'dead-end' should protrude from the splice by up to half of the rope diameter. The protruding end should be cut off between the thumb end and the wire rope diameter D. For thimbles with a diameter D, the protruding end should be cut off between the thumb end and the wire rope diameter D. Where the rope end has been secured by an annealing process the 'dead end' should protrude by one rope diameter (D).



**7. Temperature limits and safety**  
Limits of safe working temperature for aluminum ferrules:  
a) Fibrecore -40°C up to +100°C.  
b) Steelcore -40°C up to +150°C.  
Our ZEN® ferrule-secured system is in accordance with the type testing procedure of EN 13411-3 for steel wire ropes defined in EN 12385-4.



**8. Marking according to EN 13414 - 1**  
a) The splicing manufacturer's identification mark.  
b) Numbers and/or letters identifying the rope with the certificate conforming to the working load limit.  
c) Any legal marking.  
**Note:** Within the European Union this means CE marking.



**9. Marking according to EN 13414 - 1 for multi-leg sling**  
a) The sling manufacturer's identification mark.  
b) Numbers and/or letters identifying the sling with the certificate conforming to the working load limit and the angles applicable, i.e. the WLL of 1:45 to vertical and vertical, applicable.  
c) Any legal marking.  
**Note:** Within the European Union this means CE marking.



**10. We offer a simple marking system with text according to customers' specifications.**  
Available sizes:  
Type 1 for ZEN® 8  
Type 2 for ZEN® 18  
Type 3 for ZEN® 20-80  
XX € 2700 KG 16  
Marking sample acc. to EN 13414-1



6,000 kN Swager



12,500 kN Swager



20,000 kN Swager



40,000 kN Swager



250 kN Mobile Swager



316 kN Swager



415 kN PLUS Swager

600 kN Swager



1,500 kN PLUS Swager



3,000 kN Swager



316 kN Swager



415 kN PLUS Swager



600 kN Swager



1,500 kN PLUS Swager

3,000 kN Swager



DNVGL QUALITY PARTNER CERTIFICATION ISO 9001  
AEO Authorized Economic Operator  
OS-certified since 1995  
Certificate No. OS-1019111



1) Download QR-code swager from the internet.  
2) Change to the internet a QR-code capable mobile phone.



Flame Eye Sleeve  
Sleeve Female  
Aluminum Round Ferrule  
Copper Round Ferrule  
ST Steel Ferrule  
Steel Ferrule  
Stainless Steel Ferrule  
Copper Ferrule  
XL Ferrule  
ZEN® Ferrule Form C  
ZEN® Eye Sleeve

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