

JIS

JAPANESE INDUSTRIAL STANDARD

**Wire ropes — Grips
for rope or wire strand**

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Wire ropes — Grips for rope or wire strand

B 2809-1996

1. Scope This Japanese Industrial Standard specifies wire grips (hereafter referred to as "grip") used for clamping wire ropes or steel wire strands.

- Remarks 1. The text of this Standard shall apply for the forged grip (type F) used for wire ropes specified in JIS G 3525, while Annex 1 shall apply for the casted grip (type MR) used for wire ropes specified in JIS G 3525 and Annex 2 shall apply for the casted grip (type MS) used for steel wire strands specified in JIS G 3537.
2. The standards cited in this Standard are given in the following:
- | | |
|------------|---|
| JIS B 0148 | Glossary of terms for hoists |
| JIS B 0209 | Limits of sizes and tolerances for metric coarse screw threads |
| JIS B 0415 | Dimensional tolerance for steel die forgings (hammer and press forging) |
| JIS B 1181 | Hexagon nuts and hexagon thin nuts |
| JIS B 1256 | Plain washers |
| JIS G 3101 | Rolled steels for general structure |
| JIS G 3525 | Wire ropes |
| JIS G 3537 | Zinc-coated steel wire strands |
| JIS G 5502 | Spheroidal graphite iron castings |
| JIS G 5702 | Blackheart malleable iron castings |
| JIS H 0401 | Methods of test for hot dip galvanized coatings |
| JIS H 8501 | Methods of thickness test for metallic coatings |
| JIS H 8610 | Electroplated coatings of zinc on iron or steel |
| JIS H 8641 | Zinc hot dip galvanizings |

2. Definitions For the purpose of this Standard, main terms and definitions shall follow those specified in JIS B 0148.

3. Type The grip shall be classified as given in Table 1 according to the rope diameter of the wire rope.

The symbol which denotes the type shall be expressed as numerals which correspond to the rope diameter as classified in Table 1 in addition to the letter symbol F to indicate that the method of manufacture is forging.

Table 1. Type

Rope diameter mm	Symbol of type
6.3 8	F 8
9 10	F10
11.2	F12
12 12.5	F12
14	F14
16	F16
18	F18
20 22.4	F20-22
24 25	F24-25
26 28	F26-28
30 31.5	F30-32
33.5 35.5 37.5	F33-38
40 42.5 45	F40-45
47.5 50	F47-50

4. Performance The performance of the grip shall be as given in the following:

4.1 Retainability The grip shall be tested in accordance with 10.1, and the retainability shall comply with the requirements given in (1) and (2).

- (1) When the specimen is held for 3 min applying the retention load, the amount of slip between two wire ropes shall be 3 mm or less.

- (2) When the retention load is removed and the grips are detached, the wires of the wire ropes shall not show any breakage and shall be free from abnormality in the threaded portion and other respective portions of the grip.

4.2 Characteristics of coating The specimen shall be tested in accordance with 10.2, and the characteristics of coating shall comply with the requirements given in (1) and (2).

- (1) After 4 repetitions of copper sulfate test applied for the hot-dipped zinc-coating ⁽¹⁾, it shall not reach an end point.
- (2) Electrolytic zinc-coating shall comply with Ep-Fe/Zn [3-C 2] specified in JIS H 8610.

Note ⁽¹⁾ It involves dry galvanizing.

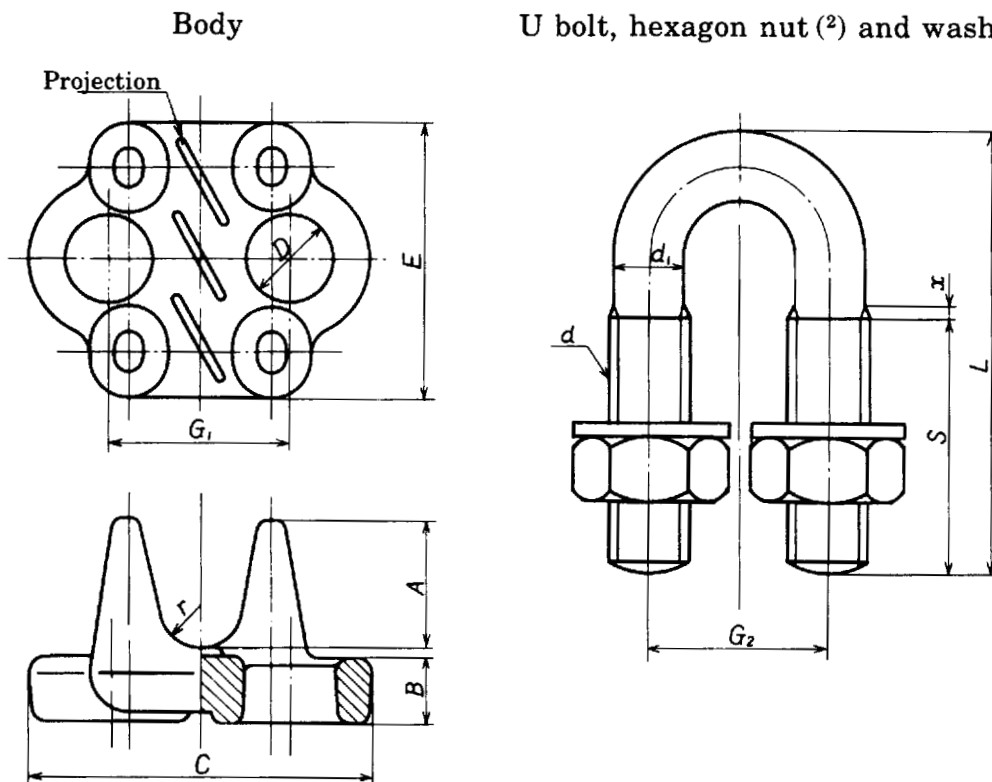
5. Construction The construction of the grip shall consist of a body, U bolt, nut and washer as shown in Fig. 1.

6. Shape and dimensions

6.1 Shape The shape of the grip shall be as shown in Fig. 1.

6.2 Dimensions The dimensions of the grip shall be as given in Table 2. For the fitting quality of screw threads of the U bolt and nut, JIS B 0209 shall be applied, and tolerance classes 8g and 7H shall be applied for the U bolt and nut, respectively.

Fig. 1. Shape

U bolt, hexagon nut ⁽²⁾ and washer

Note ⁽²⁾ The nut shall be the hexagon nut, grade C specified in JIS B 1181 or equivalent one thereto. When the hexagon nut, grade C is used, the finished circular washer specified in JIS B 1256 shall be used at the same time. For the time being, however, the nut class 1 specified in Annex of JIS B 1181 (hexagon nuts which are not based on ISO 4032 to 4036 and ISO 8673 to 8675) may be used.

Table 2. Dimensions

Unit: mm

Type	Body												U bolt							
	A		B		C	D		E	G ₁		r		Designation of screw thread (d)	G ₂		L		S		
	Basic size	Tolerance	Basic size	Tolerance	Basic size	Basic size	Tolerance	Basic size	Basic size	Tolerance	Basic size	Tolerance		Basic size	Tolerance	Basic size	Tolerance	Basic size	Tolerance	
F 8	12	+ 0.5 - 1.5	6	+ 1.0 - 0.3	36	10	± 0.5	31	18	± 0.5	4.5	± 0.5	M 8	18	± 1.0	40	± 1.5	20	± 1.5	
F10	15		7		45	12		35	22		5.5		M10	22		50		28		
F12	18		8		51	14.5		39	26		6.5		M12	26		60		35		
F14	21		9		53	14.5		45	28		7.5		M12	28		65		40		
F16	24		10		60	16.5		48	32		8.5		M14	32		75		45		
F18	25	+ 0.5 - 2.5	11	+ 1.5 - 0.3	62	16.5		53	34		9.5		M14	34		80		50		
F20-22	31		12		78	21.5	± 0.8	62	44	± 1.0	12	± 1.0	M18	44	± 1.5	100	± 2.0	60	± 2.0	
F24-25	34		13		86	23.5		68	48		13.5		M20	48		110		65		
F26-28	39		14	+ 1.5 - 0.4	94	25.5		75	54		15		M22	54		120	± 2.5	70	± 2.5	
F30-32	42		15		98	25.5		79	58		17		M22	58		130		75		
F33-38	49	+ 1.0 - 3.0	16	+ 2.0 - 0.4	120	31.5	± 1.0	93	70	± 1.5	20		M27	70	± 2.0	150	± 3.0	85	± 3.0	
F40-45	53		19	+ 2.0 - 0.5	136	34.5		100	80		24.5	± 2.0	M30	80		175	± 3.5	95	± 3.5	
F47-50	60		21		150	37.5		115	89		27		M33	89		195		100		

Remarks 1. The diameter d_1 of the unthreaded portion shall generally be almost equal to the pitch diameter of the screw thread.

2. The letter "x" represents the length of the incomplete threaded portion which is about two threads.

3. The tolerances on dimensions C and E shall conform to the requirements of the common grade specified in JIS B 0415.

Informative reference: The theoretical mass of the grip is given in Informative reference Table 1.

Informative reference Table 1. Mass
Unit: g

Type	Theoretical mass
F 8	75 to 85
F10	140 to 150
F12	210 to 230
F14	250 to 270
F16	370 to 400
F18	430 to 460
F20-22	700 to 810
F24-25	1000 to 1100
F26-28	1400 to 1500
F30-32	1500 to 1700
F33-38	2600 to 2900
F40-45	3900 to 4400
F47-50	5400 to 6100

7. Appearance The surfaces of the grip body, U bolt and nut shall be smooth, and free from harmful defects such as crack, flaw, burr and mismatch, and the surface being subjected to surface treatment shall be free from such defects as blister, flaw and exposure of substrate.

8. Material The material of the grip body, U bolt, nut and washer shall comply with the requirements of SS400 specified in JIS G 3101, otherwise, it shall be equivalent to or superior to the aforementioned quality.

9. Method of manufacture

9.1 Grip body The grip body shall be formed by forging.

9.2 Surface treatment The surface treatment shall be as given in the following:

- (1) When metallic coating is conducted, the hot-dipped zinc-coating ⁽¹⁾ specified in JIS H 8641, electrolytic zinc-coating specified in JIS H 8610, or the like shall be applied.
- (2) For the fitting quality of screw threads for the U bolt and nut being subjected to electrolytic zinc-coating, JIS B 0209 shall be applied. In this case, 8g and 7H shall be applied for the U bolt and nut, respectively. However, for the fitting quality of screw threads being subjected to hot-dipped zinc-coating, it shall be agreed between the purchaser and supplier. In this case, the threaded portions of the U bolt and nut shall be capable of engaging without difficulty.

10. Test10.1 Tensile test Tensile testing shall follow the procedure mentioned below:

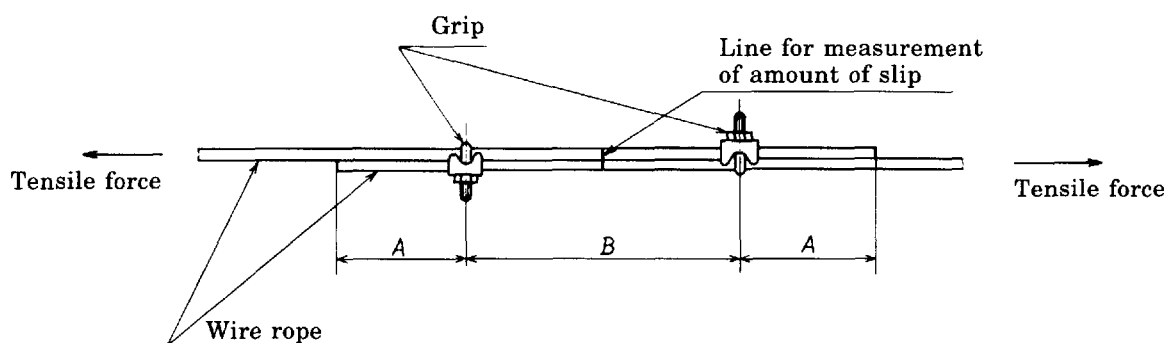
- (1) Set two uncoated grips ⁽³⁾ to the wire ropes ⁽⁴⁾ having a diameter to which the grips are used, as shown in Fig. 2. In this case, set the grips directly to the two wire ropes, otherwise, stick a tape, etc. between the grips and the wire ropes, and draw the lines in common with the two wire ropes at midpoint of *B* as shown in Fig. 2.

Notes ⁽³⁾ No oil or the like shall be adhered onto the threaded portions and friction surface of the nut.

⁽⁴⁾ 6 strands of 24 wires, metallic coating, ordinary lay-Z twist, specified in JIS G 3525.

- (2) Clamp with tightening torque given in Table 3, apply slowly tensile force to both ends of the wire ropes, and reclamp with tightening torque given in Table 3 when the tensile force has reached the value given in Table 3.
- (3) Further increase slowly the tensile force, and hold for 3 min at the retention load given in Table 3, then measure the amount of slip produced after reclamping between two wire ropes. The amount of slip shall be determined by the separated distance between the common lines drawn in (1) caused by the load.
- (4) Then, remove the load, detach the grips, and examine whether any breakage of the wire of the wire ropes and any abnormality in the threaded portion or other respective portions of the grip are produced or not.

Fig. 2. Tensile test



Unit: mm

Type	A	B
F8 to F14	70	150
F16 to F47-50	100	200

Table 3. Retention load

Type	Retention load kN	Tightening torque and retightening torque N·m	Tensile force dur- ing reclamping kN
F 8	8.5	17	6
F10	14	30	9
F12	20	45	12.5
F14	28	67	18
F16	36	106	23
F18	43	106	30
F20-22	60	250	45
F24-25	63	335	53
F26-28	85	425	71
F30-32	106	425	95
F33-38	150	630	132
F40-45	200	850	180
F47-50	250	1250	224

10.2 Zinc-coating test The copper sulfate test for hot-dipped zinc-coating⁽¹⁾ shall comply with the requirements specified in JIS H 0401.

The thickness test for electrolytic zinc-coating shall comply with the requirements specified in JIS H 8501.

For those tests, take a product itself as a specimen.

11. Inspection

11.1 The construction of the grip shall conform to the requirements specified in 5.

11.2 The shape and dimensions of the grip shall conform to the requirements specified in 6.

11.3 The appearance of the grip shall be inspected visually, and conform to the requirements specified in 7.

11.4 The surface treatment applied for the grip shall conform to the requirements specified in 9.

11.5 The performance of the grip, when tested in accordance with 10., shall conform to the requirements specified in 4.

11.6 The sampling scheme for inspection shall be agreed between the purchaser and supplier.