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(JWPA)

Low carbon steel wires

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Contents

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Wire Products Association (JWPA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS G 3532** : 2000 is replaced with this Standard.

However, **JIS G 3532** : 2000 may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until August 20th, 2011.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public or utility model right. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, or utility model right.

Low carbon steel wires

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of ISO 10544 published in 1992 with some modifications of the technical contents.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JB. And, Annex JA is the matter not stated in the original International Standard.

1 Scope

This Standard specifies the ordinary low carbon steel wire, low carbon steel wire for nail manufacturing, annealed low carbon steel wire and cold-reduced steel wire designed for the reinforcement of concrete or for use in welded fabric (hereafter referred to as "wire").

NOTE: The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 10544 : 1992 *Cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 5508 *Nails*

JIS G 3505 *Low carbon steel wire rods*

JIS Z 2241 *Metallic materials–Tensile testing–Method of test at room temperature*

NOTE : Corresponding International Standard : ISO 6892-1 *Metallic materials–Tensile testing–Part 1: Method of test at room temperature* (MOD)

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 ordinary low carbon steel wire

the wire of circular cross-section produced by cold-working the steel wire rod which conforms to **JIS G 3505**

3.2 annealed low carbon steel wire

the wire of circular cross-section produced by annealing after cold-working the steel wire rod which conforms to **JIS G 3505**

3.3 low carbon steel wire for nail manufacturing

the wire of circular cross-section for use in the manufacture of nails, produced by cold-working the steel wire rod which conforms to **JIS G 3505**

3.4 cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric

the wire of circular cross-section or deformed one mainly used for the welded steel fabric and for the reinforcement of concrete, produced by cold-working the steel wire rod which conforms to **JIS G 3505** (see **3.5** to **3.7**)

3.5 plain wire

the wire of circular cross-section with smooth surface

3.6 deformed low carbon steel wire (ribbed wire)

the wire with a regular pattern of surface protrusions (ribs) of two or more rows designed to enhance its bond properties with concrete

3.7 deformed low carbon steel wire (indented wire)

the wire with a regular pattern of surface indentations of two or more rows designed to enhance its bond properties with concrete

3.8 core

the part of a cross-section of the deformed low carbon steel wire that contains neither ribs nor indentations

3.9 rib height

the distance from the highest point of the rib to the surface of the core, to be measured vertical to the wire axis

3.10 rib inclination

the angle of inclination of the rib to the direction of the wire axis

3.11 rib spacing

the distance between the centres of two consecutive transverse ribs measured parallel to the direction of the wire axis

3.12 transversal ribless perimeter

the sum of the parts of circumference of the core obtained when the ribbed wire is projected on a plane perpendicular to the direction of the wire axis

3.13 inclination of indentation

the angle of inclination of the indentation to the direction of the wire axis

3.14 indentation spacing

the distance between the centres of two consecutive indentations measured parallel to the direction of the wire axis

3.15 transversal indentationless perimeter

the sum of the parts of circumference of the core obtained when the indented wire is projected on a plane perpendicular to the direction of the axis

3.16 nominal wire diameter

the diameter of the deformed low carbon steel wire obtained by calculation

3.17 nominal cross-sectional area

the cross-sectional area equivalent to the area of a plain wire of the nominal diameter

3.18 mass per unit length

nominal cross-sectional area × unit length × density of steel

4 Classification, symbol and applicable wire diameter

Wires are classified into four types: the ordinary low carbon steel wires, the low carbon steel wire for nail manufacturing, the annealed low carbon steel wires and the cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric, according to the manufacturing method and the intended use, and further the ordinary low carbon steel wires are sub-classified into two classes according to their quality characteristics, and cold-reduced steel wires for the reinforcement of concrete and the manufacture of welded fabric are sub-classified into four classes according to the configuration and quality characteristics; and the symbol and applicable wire diameter thereof shall be as given in table 1.

Table 1 Wire types, symbol and applicable wire diameter

Unit: mm

Wire type	Cross section	Symbol	Applicable wire diameter [a]	Example of appliction
Ordinary low carbon steel wire	Circular	SWM-B	0.10 and over up to and incl. 18.0	For general purpose
		SWM-F		For post-coating [b], and for welding [c]
Low carbon steel wire for nail manufacturing		SWM-N	1.60 and over up to and incl. 6.65	For nail
Annealed low carbon steel wire		SWM-A	0.10 and over up to and incl. 18.0	For general purpose and for wire fabrics
Cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric		SWM-P	2.60 and over up to and incl. 18.0	For welded steel wire fabrics For concrete reinforcement
		SWM-C		
Ribbed wire	Deformed	SWM-R	4.0 and over up to and incl. 16.0	
Indented wire		SWM-I		

Notes [a] In the case of ribbed wire and indented wire, the applicable range is expressed as the nominal diameter.

[b] The wire which shall be coated on their surfaces by electrolytic or chemical plating means after drawing.

[c] The wire which will be subjected to the spot welding or upset welding.

5 Material

The material used for wires shall be the wire rod which conforms to JIS G 3505.

6 Manufacturing method

The manufacturing method of wires shall be as given in the following.

a) The material shall be subjected to cold-working for producing the ordinary low carbon steel wire and low carbon steel wire for nail manufacturing. Intermediate annealing may be applied to the wire of less than 1.8 mm diameter.

b) The material shall be cold-worked followed by annealing for producing the annealed low carbon steel wire. Intermediate annealing may be applied to the wire of less than 1.8 mm diameter.

c) The material shall be subjected to cold-working for producing the cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric.

7 Mechanical properties

7.1 Mechanical properties for ordinary low carbon steel wire SWM-B

The tensile strength for the wire SWM-B shall conform to table 2.

7.2 Mechanical properties for ordinary low carbon steel wire SWM-F

The tensile strength for the wire SWM-F shall conform to table 2.

7.3 Mechanical properties for low carbon steel wire for nail manufacturing SWM-N

The tensile strength for the wire SWM-N shall conform to table 2.

7.4 Mechanical properties for annealed low carbon steel wire SWM-A

The mechanical properties for the wire SWM-A shall be as given in the following.

a) The tensile strength for the wire SWM-A shall conform to table 2.

b) As to the torsion characteristic for the wire SWM-A, the wire shall not show fractures when also the wire is turned up to the specified numbers given in table 2.

7.5 Mechanical properties for cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric SWM-P

The mechanical properties for the wire SWM-P shall be as given in the following.

a) The tensile strength and contraction for the wire SWM-P shall conform to table 2.

b) As to the bendability for the wire SWM-P, any fractures and/or cracks in the bent portion shall not be found by the naked eye.

7.6 Mechanical properties for cold-reduced steel wires for the reinforcement of concrete and the manufacture of welded fabric SWM-C, SWM-R and SWM-I

The mechanical properties for the wires SWM-C, SWM-R and SWM-I shall be as given in the following. The test piece may be heated to 100 °C and then cooled freely in the atmosphere to the testing temperature by agreement between manufacturer and purchaser.

a) The tensile strength, yield point or 0.2 % proof stress and elongation [1] for the wires SWM-C, SWM-R and SWM-I shall conform to table 2.

Note [1] The value of elongation after fracture, when the gauge length is 5 times wire diameter or the nominal wire diameter.

b) As to the bendability for the wires SWM-C, SWM-R and SWM-I, any fractures and/or cracks shall not be found in the bent portion by the naked eye.

Table 2 Mechanical properties (tensile strength, torsion characteristic, contraction, yield point or 0.2 % proof stress elongation)

Actual or nominal wire diameter	Symbol of wire type												
	SWM-B	SWM-F	SWM-N	SWM-A		SWM-P		SWM-C			SWM-R, SWM-I		
	Kind of quality characteristic	Kind of quality characteristic	Kind of quality characteristic	Kind of quality characteristic		Kind of quality characteristic		Kind of quality characteristic			Kind of quality characteristic		
	Tensile strength	Tensile strength	Tensile strength	Tensile strength	Torsion characteristic	Tensile strength	Contraction	Yield point or 0.2 % proof stress	Tensile strength	Elongation	Yield point or 0.2 % proof stress	Tensile strength	Elongation
mm	N/mm²	N/mm²	N/mm²	N/mm²	cycle	N/mm²	%	N/mm²	N/mm²	%	N/mm²	N/mm²	%
0.10 and over to and excl.1.30	—	—		—	—								
1.30 and over to and excl. 1.80			740 to 1 270										
1.80	590 to 1 270	320 to 1 270		260 to 590	61								
2.00					55								
2.30					48								
2.60	540 to 1 130		690 to 1 130		42	540 min.	30 min.	440 min.	540 min.	8 min.			
2.90					36								
3.20					33								
3.50	440 to 1 030		590 to 1 030		30								
4.00					27								
4.50			540 to 930		24						440 min.	540 min.	8 min.
5.00	390 to 930				22								
5.50					20								
6.00			490 to 880		17								
6.50					14								
7.00													
7.50					11								
Over 7.50 up to and incl. 16.00	320 to 880				—								
Over 16.00 up to and incl. 18.00													
Example of application	For general purpose	For post-coating and for welding	For nail	For general purpose and for wire fabrics		For welding steel wire fabrics and concrete reinforcement							

NOTE 1 As for the actual or nominal wire diameter not given in this table , the value of the nearest larger wire diameter in this table shall be applied.
NOTE 2 As for the wire marked with bar (—) in this table, it indicates that the mechanical properties are not be specified. As for the wires marked with slush (／) , there is no prescription herein since no wires in such range are produced.
NOTE 3 1 N/mm² = 1 MPa

8 Shape, dimension, mass and their tolerances

8.1 Shape and dimension of plain wires

Materials used for spray seats shall be as follows.

a) The shape of cross-section for the plain wires shall be circular.

b) The preferred diameter for the plain wires shall be as given in table 3.

Table 3 Preferred wire diameter of plain wire

Unit: mm

0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.35
0.40	0.45	0.50	0.55	0.62	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80
2.00	2.30	2.60	2.90	3.20	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00
7.50	8.00	8.50	9.00	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0

c) The tolerances on the wire diameter of the plain wires shall be determined according to 11.5 and the results shall conform to table 4. Those for SWM-N, however, shall be in accordance with JIS A 5508.

Table 4 Tolerances on wire diameter of plain wire

Unit: mm

Wire diameter	SWM-B SWM-F	SWM-A	SWM-P SWM-C
0.35 and under	±0.01	±0.01	
Over 0.35 up to and incl. 0.80	±0.02	±0.02	
Over 0.80 up to and incl. 2.00	±0.03	±0.04	
Over 2.00 up to and incl. 2.90	±0.04	±0.06	±0.06
Over 2.90 up to and incl. 3.20			±0.08
Over 3.20 up to and incl. 4.00	±0.05	±0.08	
Over 4.00 up to and incl. 6.00			±0.10
Over 6.00	±0.06	±0.10	±0.13
NOTE: As for the wires marked with a slash in this table, there is no prescription since no wire is produced.			

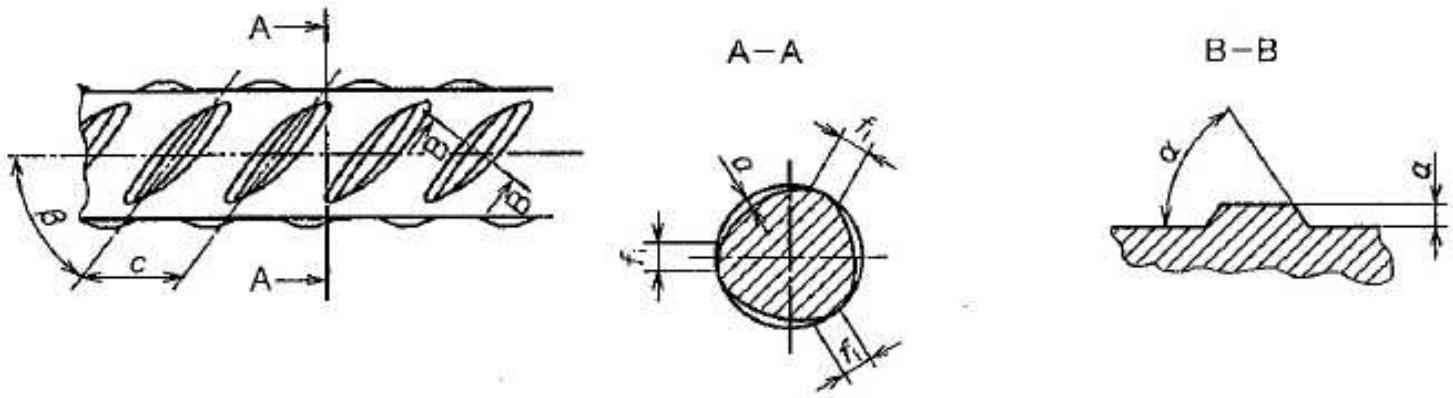
8.2 Shape of deformed low carbon steel wires

As to the shape, the deformed low carbon steel wires shall have two or more rows of protrusions or indentations oriented regularly on the surface, and further meet the following specifications.

a) The ribbed wires shall conform to the following conditions.

1) The ribbed wires shall have two or more rows of transverse ribs equally distributed around the perimeter with a substantially uniform rib spacing not greater than $0.8 \times d$ (d is the nominal diameter). However, as for rib spacing, Annex JA may be applied under the agreement between the manufacturer and the purchaser.

Figure 1 shows an example of a ribbed wire with three rows.



β : Rib inclination
c : Rib spacing
f_1 : One-third of transversal ribless perimeter (for three rows)
a : Rib height
α : Rib flank inclination

Figure 1 Example of ribbed wire with three rows

2) The projected area coefficient f_r of a rib shall be calculated using the formula:

$$f_r = \frac{K \times F_R \times \sin\beta}{\pi \times d \times c}$$

where, K : number of rib rows
F_R : projected area of single rib on the plane (mm^2)
β : rib inclination (°)
d : nominal wire diameter (mm)
c : rib spacing (mm)

3) The projected area coefficient f_r of a rib shall conform to table 5.

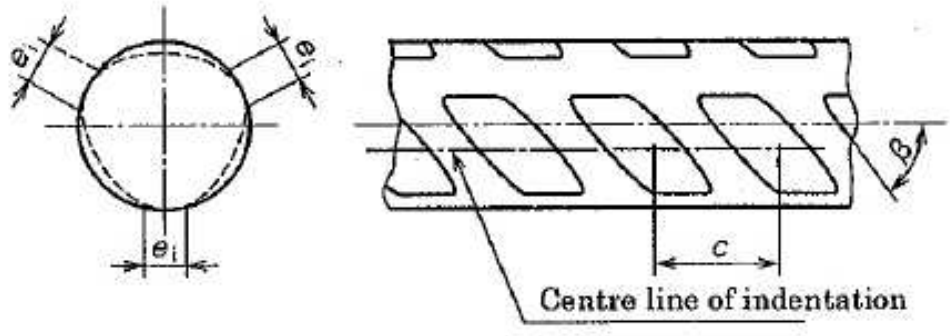
Table 5 Projected area coefficient of a rib

Nominal wire diameter mm	Projected area coefficient f_r of a rib
4 or over to and excl. 5	0.036 or over
5 or over to and incl. 6	0.039 or over
Over 6 to and incl. 8	0.045 or over
Over 8 to and incl. 10	0.052 or over
Over 10 to and incl. 16	0.056 or over

b) The indented wires shall conform to the following conditions.

1) The indented wires shall have two or more rows of indents which are distributed equally in the transversal perimeter and longitudinal direction.

Figure 2 shows an example of an indented wire with three rows.



β : Inclination of indentation
e_i : One-third of transversal indentless perimeter (for three rows)
C : Indentation spacing

Figure 2 Example of indentation wire with three row

2) The projected area coefficient f_p of an indentation shall be calculated using the formula:

$$f_p = \frac{K \times F_p \times \sin\beta}{\pi \times d \times c}$$

where, K : number of indentation rows
F_p : projected area of single indentation on the plane (mm^2)
β : inclination of indentation (°)
d : nominal wire diameter (mm)
c : indentation spacing (mm)

3) The projected area coefficient f_p of an indent shall conform to table 6.

Table 6 Projected area coefficient of an indent

Nominal wire diameter mm	Projected area coefficient f_p of a indent
4 or over to and excl. 5	0.007 or over
5 or over to and incl. 6	0.008 or over
Over 6 to and incl. 8	0.010 or over
Over 8 to and incl. 10	0.013 or over
Over 10 to and incl. 16	0.014 or over

8.3 Nominal wire diameter, nominal cross-sectional area, mass and tolerances of deformed low carbon steel wires

The nominal wire diameter, nominal cross-sectional area, mass and tolerances of deformed low carbon steel wires shall be as follows.

a) The nominal wire diameter, nominal cross-sectional area and mass per unit length for the deformed low carbon steel wires shall be as given in table 7.

b) The tolerances on mass per unit length shall conform to table 7.

Table 7 Nominal wire diameter, nominal cross-sectional area, mass and tolerances of deformed low carbon steel wires

Nominal wire diameter mm	Nominal cross-sectional area mm2	Mass per unit length [a] kg/m	Tolerances on mass per unit length [b] %
4	12.6	0.099	±9
5	19.6	0.154	
6	28.3	0.222	±8
7	38.5	0.302	
8	50.3	0.395	
9	63.6	0.499	±5
10	78.5	0.617	
11	95.0	0.746	
12	113.1	0.888	
13	132.7	1.042	
14	153.9	1.208	
15	176.7	1.387	
16	201.1	1.579	

Note [a] The mass per unit length of nominal wire diameter which is not given in this table shall be obtained according to the following formula (to be rounded of to 4 significant figures).

$$d^2 \times 0.785\,4 \times 7\,850 \times \frac{1}{10^6}$$

where, d: nominal wire diameter (mm)

[b] For intermediate nominal wire diameters, the value of the next larger size in this table shall be applied. (Example: The tolerance on mass per unit length for the wire of 8.5 mm in diameter is ± 5 %.)

8.4 Rib height and rib inclination of deformed low carbon steel wires

As for rib height and rib inclination, Annex JA may be applied under the agreement between the manufacturer and the purchaser.

9 Surface conditions

The wire of SWM-F shall be free from residual film [2] or adhered matters on the surface which will be detrimental to the post-coating or welding.

Note [2] The film of lubricant used for cold-working being on the surface of the wire.

10 Appearance

Appearance are visually confirmed, and the surface of the wire shall be free from such defects as rust, flaw and crack that are detrimental to practical use. For the wire SWM-A of annealed quality, however, requirements for mill scale may not be applied.

11 Test

11.1 Sampling method of test pieces

The sampling method of test pieces shall be as given in the following.

a) Each one of the test pieces for tensile test, bend test and torsion test shall be taken respectively from one end of coil representing the lot produced under the same condition.

NOTE: The lot produced under the same condition means the material produced of steel wire by the same fabricating condition from the same type symbol of wire rod.

b) The test piece shall be No. 9 test piece (type 9A or 9B) of Annex C or Annex D of **JIS Z 2241**.

11.2 Tensile test

The tensile test shall be as given in the following.

a) The test method shall be as specified in **JIS Z 2241**.

b) The gauge length to determine the elongation for the cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric shall be 5 times the diameter or the nominal wire diameter regardless of the requirements of **11.1 b)**.

c) When the test piece for tensile testing fractures at a gripped potion, the test shall be invalidated, and a retest may be carried out on the test piece newly taken from the same coil.

11.3 Bend test

As to the bend test for the cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric, the test piece shall be bent to an angle between 160° and 180° around a cylinder or roller by suitable means. The diameter of the cylinder or roller shall be not more than three times the wire diameter.

11.4 Torsion test

The torsion test shall be as given in the following.

a) The wires to be subjected to the test shall be straightened by hand or with a wooden hammer, etc., and then cut to approximately 300 mm in length for use as the test piece.

b) As to the test method, both ends of the test piece shall be gripped firmly at an interval of 200 mm, and one gripped end shall be turned up to the specified number given in table 2 while giving tension enough to prevent it from sagging.

c) In the case where the test piece fractures at a gripped portion in testing and the cause of this phenomenon is obviously the inappropriate testing operation, the test shall be invalidated, and a retest may be carried out on the test piece newly taken from the same coil.

11.5 Measurement of wire diameter for plain wires

The wire diameter for plain wire shall be determined by measuring the maximum diameter and the minimum one on the same cross section at as arbitrary part.

11.6 Measurement of mass for deformed low carbon steel wires

The mass per unit length for the ribbed or indented wire shall be determined by

weighing.

12 Inspection

The inspection shall be carried out as follows.

a) The mechanical properties shall conform to the requirements specified in clause 7.

b) The wire diameter or nominal wire diameter, nominal cross-sectional area and mass per unit length shall conform to the requirements specified in clause 8.

c) The surface conditions shall conform to the requirements specified in clause 9.

d) The appearance shall conform to the requirements specified in clause 10.

13 Designation of wires

The wire shall be designated by the wire type, symbol and wire diameter or nominal wire diameter.

Example 1 Ordinary low carbon steel, SWM-B, 4.00

(for the ordinary low carbon steel wire with class symbol SWM-B of 4.00 mm in diameter)

Example 2 Cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric (ribbed wire), SWM-R, 6

[for the cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric (ribbed wire) with class symbol SWM-R of 6 mm in nominal diameter]

14 Marking

The wire having passed the inspection shall be marked with the following details on each coil [3]. And for the ribbed wire or indent wire of cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric, something that indicates the manufacturer at the rolling stage and the label that indicates the name of manufacturer, nominal diameter, cast number or reference number relating to test report and country of origin for each coil or bundle weighing at least 500 kg, by agreement between the manufacturer and the purchaser.

a) Symbol of wire type

b) Wire diameter or nominal wire diameter

c) Net mass

d) Year and month of manufacture or its abbreviation

e) Manufacturer's name or its identifying brand

Note [3] The term "coil" is the wire in coil form.

15 Report

The manufacturer shall submit the test report stating specified items on request by the purchaser.

Annex JA (normative)
Rib height, rib spacing and rib inclination of deformed low carbon steel wire

JA.1 Rib height, rib spacing and rib inclination of deformed low carbon steel wire

The rib height, rib spacing and rib inclination of deformed low carbon steel wire shall satisfy the range specified in table JA.1.

Table JA.1 Rib height, rib spacing and rib inclination of deformed steel wire

Nominal wire diameter mm	Rib height *a* mm	Tolerance of rib height *a* %	Rib spacing *c* mm	Tolerance of rib spacing *c* %	Rib inclination *β* °
4	0.30	±15	4.0	±15	40 or over to and incl. 60
5	0.32				
6	0.40		5.0		
7	0.46				
8	0.55		6.0		
9	0.75		7.0		
10					
11	0.97		8.0		
12					
13					

Annex JB (informative)
Comparison table between JIS and corresponding International Standard

JIS G 3532 : 2011 *Low carbon steel wires*			ISO 10544:1992 *Cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric.*				
(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
1 Scope	Specifies ordinary low carbon steel wire, low carbon steel wire for nail manufacturing, annealed low carbon steel wire and cold-reduced steel wire for the reinforcement of concrete and the manufacture of welded fabric.		1	Specifies technical requirements for cold-reduced steel wire designed for the reinforcement of concrete or for use in welded fabric.	Addition	**ISO** specifies only for the reinforcement of concrete and **JIS** specifies the other steel wire.	As for standard system of **JIS** and **ISO** are not the same and left as it is.
2 Normative references							
3 Terms and definitions	Main terms are defined.		3	Main terms are defined.	Alteration	Specified items are not the same.	As for standard system of **JIS** and **ISO** are not the same and left as it is.
4 Classification, symbol and applicable wire diameter	The classification, symbol and applicable wire diameter are specified by the manufacturing method and the intended use.		4	Specifies the range of nominal diameter, nominal cross-sectional area and mass divided by length for each wire diameter.	Alteration	Specified item is not the same.	As for standard system of **JIS** and **ISO** are not the same and left as it is.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
5 Material	Specifies the material used for wires.		—	Specifies chemical composition.	Addition	Material is added for JIS.	As for standard system of JIS and ISO are not the same and left as it is.
6 Manufacturing method	Specifies manufacturing method for wires.		—	Does not specifies manufacturing method.	Addition	Manufacturing method is specifies in JIS.	As for standard system of JIS and ISO are not the same and left as it is.
7 Mechanical properties	Specifies the mechanical properties for classification symbols.		7	Specifies the mechanical properties of ribbed wire and indented wire.	Addition	JIS specifies steel wire other than concrete reinforcement wire.	As for standard system of JIS and ISO are not the same and left as it is.
8 Shape, dimension, mass and their tolerances	8.1 Shape and dimension of plain wires		—	No specification.	Addition	JIS specifies steel wire other than concrete reinforcing steel wire also.	As for standard system of JIS and ISO are not the same and left as it is.
	8.2 Shape of deformed low carbon steel wires		5	Shape of ribbed wire and indented wire are specified.	Identical		
	8.3 Nominal wire diameter, nominal cross-sectional area, mass and tolerance of deformed low carbon steel wires		4	Dimension, mass and tolerance are specified.	Identical		
	8.4 Rib height and rib inclination of deformed low carbon steel wires		—	No specification.	Addition	JIS specifies rib height and inclination of rib.	It is a specification between the manufacturer and the purchaser, and then keeps as it is.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
9 Surface conditions	Specifies the surface conditions of wires for post-coating or welding.		—	No specification.	Addition	JIS specifies the surface condition.	As for standard system of JIS and ISO are not the same and left as it is.
10 Appearance	Specifies surface condition.		—	No specification.	Addition	JIS specifies appearance.	As for standard system of JIS and ISO are not the same and left as it is.
11 Test	11.1 Sampling method of test piece 11.2 Tensile test 11.3 Bend test 11.4 Torsion test 11.5 Measurement of wire diameter for plain wires 11.6 Measurement of mass for deformed low carbon steel wires		8.1 8.2 8.3	Tensile test Bend test Rebend test	Addition	JIS specifies steel wire other than concrete reinforcing steel wire also.	As for standard system of JIS and ISO are not the same and left as it is.
12 Inspection	Specifies inspection method.		11	Specifies certification and inspection.	Alteration	JIS specifies inspection method of steel wire other than concrete reinforcing steel wire also.	As for standard system of JIS and ISO are not the same and left as it is.
13 Designation of wires	Specifies designation of wires.		9	Specifies designation	Alteration	ISO specification specifies ISO standard number besides shape and dimension.	It is altered based on the domestic trade customs.
14 Marking	Specifies the items to be marked on the shipping wire.		10.1 10.2	Marking on the wire Marking of bundles or coils	Addition	JIS specifies the marking of steel wire other than concrete reinforcing wire.	As for standard system of JIS and ISO are not the same and left as it is.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
15 Report	Specifies report.		12	Specifies the report detail.	Alteration	ISO specifies the items to be reported on test report, and JIS specifies to submit the result of the purchaser's request items.	It is altered based on the domestic trade customs.
Annex JA (normative)	Specifies rib height, rib spacing and rib inclination of deformed low carbon steel wire.		—	No specification.	Addition	JIS specifies rib height, rib spacing and rib inclination and their tolerances.	It is a specification between the manufacturer and the purchaser, and then keeps as it is.

Overall degree of correspondence between JIS and International Standard (ISO 10544:1992): MOD
NOTE 1 Symbols in sub-columns of classification by clause in the above table indicate as follows: — Identical : Identical in technical contents. — Addition : Adds the specification item(s) or content(s) which are not included in International Standard. — Alteration : Alters the specification content(s) which are included in International Standard.
NOTE 2 Symbol in column of overall degree of correspondence between JIS and International Standard in the above table indicates as follows: — MOD : Modifies International Standard.

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Errata will be provided upon request, please contact:

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