

6.3 In addition to the inspection described in 6.1 and 6.2, inspection on austenitic grain size, non-metallic inclusions, decarburization, and other particular item may be specified, if necessary.

In this case, the purchaser shall previously deliberate with the manufacturer on the inspection items, method of sampling, method of test, and criteria on acceptance. However, test piece, method of test, etc. for the inspection on the austenitic grain size, non-metallic inclusions, and decarburization shall comply with the appropriate standard of the following:

JIS G 0551

JIS G 0555

JIS G 0558

7. Marking

The wire rods having passed the inspection shall be marked clearly with the following particulars on each coil by a suitable means. However, when approved by the purchaser, the particulars mentioned below may be partially omitted.

- (1) Class symbol
- (2) Heat number or inspection number
- (3) Diameter of wire rod
- (4) Manufacturer's name or its abbreviation

8. Report

The manufacturer shall submit the purchaser the test results on the specified items when so requested by the purchaser.

Carbon Steel Wire Rods for

Cold Heading and Cold Forging*

1. Scope

This Japanese Industrial Standard specifies the carbon steel wire rods, hereinafter referred to as the "wire rods", to be used mainly for the manufacture of carbon steel wires by cold heading and cold forging.

2. Classification and Symbol

The wire rods shall be classified into 6 classes of rimmed steel, 10 classes of aluminum killed steel and 21 classes of killed steel, and their symbols shall conform to Table 1.

3. Chemical Composition

The chemical composition of the wire rods shall be determined by the ladle analysis, and the values obtained shall conform to Table 1.

4. Appearance and Sizes

4.1 The wire rods shall be free from any defects harmful to use.

4.2 The standard diameters of the wire rods shall conform to Table 2.

Table 2. Standard Diameters

Unit: mm

5.5,	6,	6.4,	7,	8,	9,	9.5,	10,	11,	12,	13,	14,	15,
16,	17,	18,	19,	20,	22,	24,	25,	26,	28,	30,	32	

4.3 The tolerance on diameter and out-of-round of the wire rods shall conform to Table 3.

Table 3. Tolerance on Diameter and Out-of-Round

Unit: mm

Diameter	Tolerances	Out-of-round ⁽¹⁾
Under 16	± 0.4	0.5 max.
16 and over	± 0.5	0.6 max.

Note ⁽¹⁾ Out-of-round is defined as the difference between the maximum and the minimum values of diameter at the same cross section of the wire rod.

5. Decarburized Depth

The mean decarburized depth of the wire rods of SWRCH 30 K to SWRCH 50 K shall conform to Table 4, when specified by the purchaser.

Table 1. Chemical Composition

Class symbol	Chemical composition %						Remarks
	C	Si	Mn	P	S	Al	
SWRCH 6R	0.08 max.	-	0.60 max.	0.040 max.	0.040 max.	-	Rimmed steel
SWRCH 8R	0.10 max.	-	0.60 max.	0.040 max.	0.040 max.	-	
SWRCH 10R	0.08 to 0.13	-	0.30 to 0.60	0.040 max.	0.040 max.	-	
SWRCH 12R	0.10 to 0.15	-	0.30 to 0.60	0.040 max.	0.040 max.	-	
SWRCH 15R	0.13 to 0.18	-	0.30 to 0.60	0.040 max.	0.040 max.	-	
SWRCH 17R	0.15 to 0.20	-	0.30 to 0.60	0.040 max.	0.040 max.	-	
SWRCH 6A	0.08 max.	0.10 max.	0.60 max.	0.030 max.	0.035 max.	0.02 min.	Aluminum- killed steel
SWRCH 8A	0.10 max.	0.10 max.	0.60 max.	0.030 max.	0.035 max.	0.02 min.	
SWRCH 10A	0.06 to 0.13	0.10 max.	0.30 to 0.60	0.030 max.	0.035 max.	0.02 min.	
SWRCH 12A	0.10 to 0.15	0.10 max.	0.30 to 0.60	0.030 max.	0.035 max.	0.02 min.	
SWRCH 15A	0.13 to 0.18	0.10 max.	0.30 to 0.60	0.030 max.	0.035 max.	0.02 min.	
SWRCH 16A	0.13 to 0.18	0.10 max.	0.60 to 0.90	0.030 max.	0.035 max.	0.02 min.	
SWRCH 18A	0.15 to 0.20	0.10 max.	0.60 to 0.90	0.030 max.	0.035 max.	0.02 min.	
SWRCH 19A	0.15 to 0.20	0.10 max.	0.70 to 1.00	0.030 max.	0.035 max.	0.02 min.	
SWRCH 20A	0.18 to 0.23	0.10 max.	0.30 to 0.60	0.030 max.	0.035 max.	0.02 min.	
SWRCH 22A	0.18 to 0.23	0.10 max.	0.70 to 1.00	0.030 max.	0.035 max.	0.02 min.	
SWRCH 10K	0.08 to 0.13	0.10 to 0.35	0.20 to 0.60	0.030 max.	0.035 max.	-	Killed steel
SWRCH 12K	0.10 to 0.15	0.10 to 0.35	0.30 to 0.60	0.030 max.	0.035 max.	-	
SWRCH 15K	0.13 to 0.18	0.10 to 0.35	0.30 to 0.60	0.030 max.	0.035 max.	-	

Table 1 (Continued)

Class symbol	Chemical composition %						Remarks
	C	Si	Mn	P	S	Al	
SWRCH 16K	0.13 to 0.18	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	Killed steel
SWRCH 17K	0.13 to 0.20	0.10 to 0.35	0.30 to 0.60	0.030 max.	0.035 max.	-	
SWRCH 18K	0.15 to 0.20	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 20K	0.18 to 0.23	0.10 to 0.35	0.30 to 0.60	0.030 max.	0.035 max.	-	
SWRCH 22K	0.18 to 0.23	0.10 to 0.35	0.70 to 1.00	0.030 max.	0.035 max.	-	
SWRCH 24K	0.19 to 0.25	0.10 to 0.35	1.35 to 1.65	0.030 max.	0.035 max.	-	
SWRCH 25K	0.22 to 0.28	0.10 to 0.35	0.30 to 0.60	0.030 max.	0.035 max.	-	
SWRCH 27K	0.22 to 0.29	0.10 to 0.35	1.20 to 1.50	0.030 max.	0.035 max.	-	
SWRCH 30K	0.27 to 0.33	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 33K	0.30 to 0.36	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 36K	0.32 to 0.38	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 38K	0.35 to 0.41	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 40K	0.37 to 0.43	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 41K	0.36 to 0.44	0.10 to 0.35	1.25 to 1.65	0.030 max.	0.035 max.	-	
SWRCH 43K	0.40 to 0.46	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 45K	0.42 to 0.48	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 48K	0.45 to 0.51	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	
SWRCH 50K	0.47 to 0.53	0.10 to 0.35	0.60 to 0.90	0.030 max.	0.035 max.	-	

Table 4. Mean Decarburized Depth Unit: mm

Diameter	Ferrite decarburized depth	Total decarburized depth
10 and under	0.04 max.	0.15 max.
Over 10 to 16 incl.	0.05 max.	0.20 max.
Over 16 to 22 incl.	0.06 max.	0.25 max.
Over 22	0.07 max.	0.30 max.

6. Tests

6.2 Decarburization Detection Test The method of test shall comply with the specification of 4. in JIS G 0558.

In this case, the decarburized depth of the cross section of the wire rod shall be measured at four points where the circumference is equally divided in reference to the point of the maximum decarburized depth, and the mean value of the decarburized depth shall be taken.

7. Inspection

7.1 The chemical composition shall be determined by the test specified in 4. and the results shall comply with the requirements of 3.

7.2 The results of tests on appearance and sizes shall comply with the requirements of 4.

7.3 One test piece for the decarburized depth shall be taken from each lot of the same heat rolled to the same dimension, and shall be tested in accordance with the requirement of 6.2 to conform the specification in 5.

7.4 In addition to the inspection described in 7.1 to 7.3, inspection on austenitic grain size, non-metallic inclusions, and other particular items may be specified, if necessary.

In this case, the purchaser shall previously deliberate with the manufacturer on the inspection items, method of sampling, method of test and criteria on acceptance. However, the test pieces, method of test, etc. in the inspection on the austenitic grain size and non-metallic inclusions shall comply with the appropriate standard of the following:

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- (1) Class symbol
- (2) Heat number or inspection number
- (3) Diameter of wire rod
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9. Report

The manufacturer shall submit the test results on the specified items when so requested by the purchaser.

Testing Methods for Steel Tire Cords

1. Scope

This Japanese Industrial Standard specifies the testing method for steel tire cords (hereinafter referred to as cords).

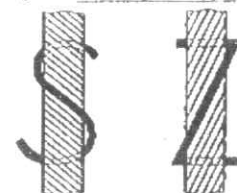
Remark: The units and numerical values given in { } in this standard are in accordance with the conventional system of units and are appended for reference.

2. Definitions

For the purposes of this standard, the following definitions apply:

- (1) element wire Single wire composing a cord.
- (2) strand Small cord made of several ply element wires.
- (3) steel tire cords Cord composed of one or plural strands.
- (4) core Element wire or strand to be used as the center in the cord.
- (5) inner sheath Layer of the element wires of the core and the surface layer, or of the element wires lying midway of the strand, or of the strand. This shows the midway layer of three layer construction of 3 + 9 + 15 and the like.
- (6) outer sheath Layer of the element wires or the strands, which lie on the surface of cord.
- (7) lapping Element wires wound on the cord spirally.
- (8) cord diameter Diameter of the circumscribed circle of cord. There are the case including the lapping and the case excluding it (mm).
- (9) diameter of element wire (mm)
- (10) twisting direction Direction in which the cord, strand or lapping is twisted. This direction is given by S or Z as shown in Fig. 1.

Fig. 1 Twisting Direction



S-shaped twist Z-shaped twist