

Low Carbon Steel Wire Rods *

1. Scope

This standard covers low carbon steel wire rods to be used for the manufacture of iron wire, telegraph wire, armoured cable wire, galvanized wire strands, etc., with the exception that wire rods for core wire of coated electrodes shall be excluded.

2. Classification and Symbol

The wire rods shall be classified into 8 classes, and their symbols shall be as shown in Table 1.

3. Chemical Composition

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

Table 1. Chemical Composition

Symbol of class	Chemical composition %			
	C	Mn	P	S
SWRM 6	0.08 max.	0.60 max.	0.045 max.	0.045 max.
SWRM 8	0.10 max.	0.60 max.	0.045 max.	0.045 max.
SWRM 10	0.08 ~ 0.13	0.30 ~ 0.60	0.045 max.	0.045 max.
SWRM 12	0.10 ~ 0.15	0.30 ~ 0.60	0.045 max.	0.045 max.
SWRM 15	0.13 ~ 0.18	0.30 ~ 0.60	0.045 max.	0.045 max.
SWRM 17	0.15 ~ 0.20	0.30 ~ 0.60	0.045 max.	0.045 max.
SWRM 20	0.18 ~ 0.23	0.30 ~ 0.60	0.045 max.	0.045 max.
SWRM 22	0.20 ~ 0.25	0.30 ~ 0.60	0.045 max.	0.045 max.

Remark: If killed steel is specified, K shall be added at the end of the symbol of class.

Example: SWRM 10 K

4. Appearance and Size

4.1 The wire rods shall be free from injurious defects in use.

4.2 The preferred diameters for the wire rod shall be as given in Table 2.

Table 2. Preferred Diameters

Unit: mm	
5.5, 6, 7, 8, 9, 9.5, 10, 11, 12, 13, 14, 15, 16, 17, 19	

4.3 The tolerances on diameter and out-of-round of the wire rod shall be as given in Table 3.

Table 3. Tolerances and Out-of-Round

Unit: mm

Tolerance	Out-of-round (%)
± 0.5	0.6 max.

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

5. Electric Conductivity

The electric conductivity of the wire rods of SWRM 6 or SWRM 8 to be used for telegraph wire shall be not less than 11 %.

6. Tests

6.2 Electric Conductivity Test The method of test shall comply with the provisions of 6. in JIS C 3002-Testing Methods of Electric Copper Wires.

The formula for calculation shall be as follows:

$$\text{Electric conductivity (\%)} = \frac{C}{R_m \times \frac{m}{l^2}} \times 100$$

$$R_m = R_t (1 + R(20 - t))$$

where,

R_m : value of electric resistance at 20°C (Ω)

R_t : value of electric resistance at t°C (Ω)

m : weight (g)

l : length (m)

t : measured temperature (°C)

R : constant = 0.005

C : constant = 0.13448

8. Marking

The wire rods having passed the inspection shall be marked clearly on each coil with the following items. However, when approved by the purchaser, the items mentioned below may be partly omitted.

- (1) Symbol of class
- (2) Charge number or inspection number
- (3) Diameter of wire rod
- (4) Manufacturer's name or trade mark

9. Reports

When requested by the purchaser, the manufacturer shall submit the test results on the specified items to the purchaser. If killed steel is designated, the silicon content shall be added in the test results.