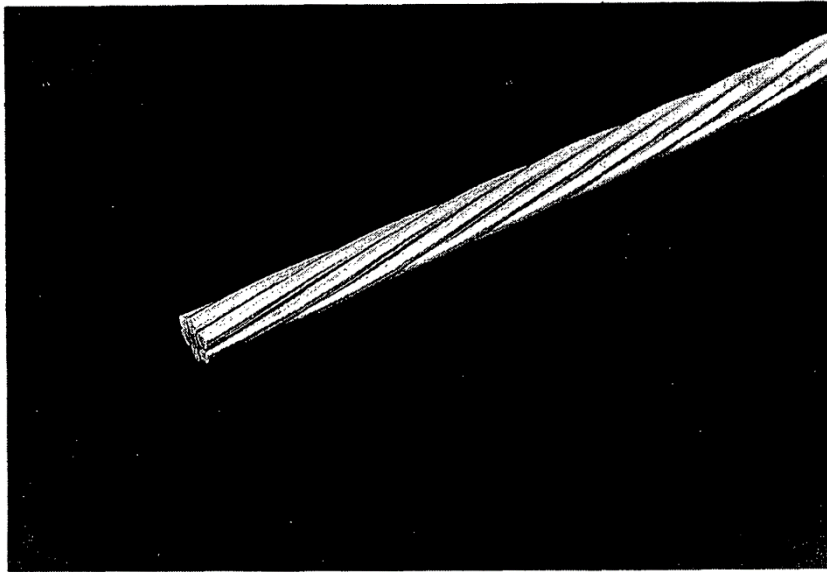


6A-2 Galvanized Steel-twisted Wire



Implemented in May, 1956
Revised (03) in November, 1996

Power Distribution Div. (Main Dept.)

TEPCO Power Grid, Inc.

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1. General

1.1 Scope

This article is mainly used for messenger wires of branch wires, aerial ground wires and aerial cables.

1.2 Classification

According to nominal cross sections, it shall be classified as follows:

22mm², 30mm², 45mm², 90mm²

1.3 Packing

This article shall be packed in bundle winding and its article length shall be specified in Table 1. To avoid steel-twisted wires from separation, firmly bind 3 spots or more by using suitable catching wires. The dimensions of bundle winding shall be 65cm or less in outside diameter and 40cm or more in inside diameter. Treat suitable termination to the terminal of steel-twisted wires and ensure safety during work together with the terminal portion exposing clearly.

In addition, wind colored tapes around the product surface to allow the product classification to be identified as follows:

Nominal cross section	22mm ²	30mm ²	45mm ²	90mm ²
Tape color	Black	Blue	Green	White

1.4 Indication

Tags with the following items indicated must be attached to the appropriate spots of this article after packing:

1. Nomenclature and classification (e.g.; galvanized steel-twisted wire 30mm²)
2. Article length (m)
3. Standard weight (kg)
4. Manufacturer's name
5. Manufacture date (e.g.; April, 1997)

1.5 Related standards

JIS G 3506 (Hard Steel Wire Material)

JIS G 3521 (Hard Steel Wire)

JIS G 3537 (Galvanized Steel-twisted Wire)

JIS H 0401 (Test Method for Fused Galvanization)

2. Structure and Material

2.1 General item

High-quality steel wires shall be used and galvanized with uniform and sufficient fusion on the surface. The surface must be smooth and free from scratches, rusts, cracks or other practical harmful defects with good finish.

2.2 Element wire

Element wires shall be made of galvanized material as specified in JIS G 3506. The tolerance of element wire diameter shall be specified in Table 2 and no joint shall exist for the overall length.

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2.3 Twisted wire

Element wires must be twisted together uniformly and closely to concentric center, and evenly spread for the overall length. The twisted extent shall be 40 ± 5 times that of a standard element wire diameter and the twisted direction shall be inclined to the right in the outer layer.

3. Type Test

3.1 General item

In this test, to determine whether the product is good or bad, one bundle of products of the same classification shall be chosen for a sample. It must be carried out by the following items and pass all the items:

3.2 Structure test

Inspect the appearance and structure of finished products according to Paras. 2.1 - 2.3.

3.3 Stretch test

The stretch tests for steel-twisted wires and element wires are carry out by the following contents:

(1) Sample

Prepare three steel-twisted wires and three element wires.

(2) Stretch test for steel-twisted wires

1. The clearance to grasp specimens shall be 40 times more than a standard outer diameter of steel-twisted wires.
2. The stretch load values shall be specified in Table 1.

(3) Stretch test for element wires

1. Carry out stretch tests by clearly expressing 200mm of gauge length in the element wire. The tensile strength and the extension shall be specified in Table 2.
2. Measure the extension by checking up the cut-off portion and express it in percentage for the gauge length before testing.
3. When a specimen is cut off within 25mm from the gauge point in the gauge point or out of the gauge point, and does not fit to specifications, invalidate the specimen, take another specimen and examine it again.

3.4 Torsion test

Take three samples of element wires and firmly grasp both ends of the samples at the gap of 100 times of the standard element wire diameter. When turning them at a constant rotational speed while applying tension to them at the extent of no slack, the number of times leading to cut-off must conform to Table 2.

3.5 Galvanization test

(1) Adhesion quantity test

When tests are carried out by assuming the case of 3.2 antimony chloride method (b) wires in JIS H 0401, they must conform to Table 3.

(2) Winding test

In accordance with Para. 5.4 Winding Test in JIS H 0401, nothing of break, crack or peeling-off shall occur to the zinc layer, a wire is wound six times around a cylinder having the multiple of diameter of a standard diameter as shown in Table 3.

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4. Manufacture Process Inspection

In the case of Type Test, it is intended to verify whether products are exactly the same as test articles that were used in type tests and are being produced in a production process. A series of inspections, therefore, on design, quality control of materials, manufacture process, product management are carried out as a general rule.

5. Acceptance Test

This test aims at deciding whether a product is acceptable or not and shall be carried out for the following items: It must pass all the items. However, we may skip part of test items on account of our circumstances.

In addition, the quantity of tests shall be chosen as follows:

Acceptance test item	Quantity of tests
Structure test	Total number
Stretch test Torsion test Galvanization test	One per twenty bundles

6. Supplementary Item

6.1 Supplementary specifications item

Even if there is an item that are not described in these specifications, what has to be possessed as a finished product shall be included in these specifications as a matter of course.

6.2 Quality control

The technical documentation shall be attached to manufacturing specifications by clearly describing quality control systems (responsibility system, quality control standards, etc.) and inspection systems (inspection items, inspection criteria, inspection methods, etc.).

6.3 Incurrence of samples

Samples shall be incurred by suppliers.

6.4 Others

- (1) When we admit to be necessary, tests same as type tests in detail, dismantling inspections and manufacture process inspections shall be possibly carried out by extracting any quantity from supplies.
- (2) In delivering, the in-house test reports must be submitted to us.
- (3) When there are considerable profits in production or use by modifying part of these specifications, this modification may be allowed with our approval.

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Table 1 Performance of galvanized steel-twisted wires

Nominal cross section (mm ²)	Structure Wire numbers Wire diameter (lines/m)	Calculated outside diameter (mm)	Calculated cross section (mm ²)	Stretch load (kN or more)	Standard length (m)
22	7/2.0	6.0	22.0	24.8	300
30	7/2.3	6.9	29.1	32.8	200
45	7/2.9	8.7	46.2	52.2	150
90	7/4.0	12.0	88.0	99.1	100

Table 2 Performance of element wires

Nominal cross section (mm ²)	Diameter (mm)	Tolerance (mm)	Calculated cross section (mm ²)	Stretch load (kN or more)	Stretch strength (km/mm ²)	Extension (%)	Twisted times (Times or more)
22	2.0	0.06	3.14	3.85	1.23 or more	3	16
30	2.3	0.06	4.15	5.09			
45	2.9	0.08	6.61	8.10			
90	4.0	0.10	12.56	15.40		4	14

Table 3 Galvanization tests

Nominal cross section (mm ²)	Adhesion quantity (g/m ² or more)	Multiple of cylinder diameter for winding tests (Times)
22	160	15
30	200	
45	230	
90	250	

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