

6D-15 Branch Line Plastic Guard (C-rank)



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Revised (08) on September 14, 2011
Implemented on October 14, 2011

Power Distribution Div. (Main Dept.)

TEPCO Power Grid, Inc.

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1. Scope

This article is used for protecting the ground branch lines which easily hinder the traffics.

2. Related standards

2.1 Japanese Industrial Standards

- (1) JIS K 6922-2 (1997) Materials for plastic - polyethylene (PE) molding and for extrusion -
Part 2: How to make specimens and how to obtain properties
- (2) JIS K 7102 (1981) Methods to test color-fastness for carbon arc lamplight of colored plastic materials

2.2 Our specifications

- (1) 6A-2 Galvanized Steel-twisted Wire
- (2) 6D-30 Placing Anchors for Branch Lines
- (3) 6D-31 Anchors for Hard Foundation
- (4) 6D-35 Screw Anchors for Branch Lines
- (5) 6E-66 Branch line poles
- (6) 6E-69 Winding Grip

3. Category

This article shall be categorized in one type as listed in Appended Table 1.

4. Structure and materials

4.1 General item

When this article is inserted to a ground branch line, it shall be structured as being easily unremovable and uniform in thickness, and free from harmful curve or torsion, or cracks on the inner/outer surfaces. In addition, it shall not be faded or deformed for a long-time use.

4.2 Shape and dimensions

This article's pipe body shall be made in shape and dimensions as a standard as shown in Appended Figure 1. In addition, a point where dimensions or tolerances are not specified shall be allowed as far as it is usable.

4.3 Specification in main structural parts

- (1) This article shall consist of upper pipe, lower pipe and joint part with barrel-divided over the entire length so as to be possibly inserted to the ground branch lines after facility construction. In addition, the upper pipe shall be firmly connected with the joint part, and the lower pipe shall be firmly coupled with the joint part.
- (2) The upper and lower pipes shall have band-shaped clamps and anchors to prevent the barrel division from opening. In addition, the joint part shall have a built-in branch line retention mechanism and accessory anchors to stably retain the ground branch lines.
- (3) The pipe body shall be practically straight and uniform in thickness. Its upper pipe shall be cut out at the

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upper end in V-shape and its lower pipe shall be cut out at the lower end diagonally. In addition, it shall have a mechanism that can stably retain 6A-2 (Galvanized Steel-twisted Wire) by retainers at the position longer than 850mm from the bottom end in the pipe. And it shall be possibly structured to conceal 6D-30 (Placing Anchors for Branch Lines), 6D-31 (Anchors for Hard Foundation), 6D-35 (Screw Anchors for Branch Lines), 6E-66 (Guy Rod) and thimbles.

- (4) A synthetic resin product, composing this article, shall be manufactured by using excellent weatherproof materials with strength equal to or higher than polyethylene resin.

It will be allowed in the black layer, however, to use a combination of recycled materials collected from our removed power distribution equipment parts.

- (5) The joint part inside shall be made in a taper shape that rarely frays, even if its tip 6E-69 (Winding Grip) touches.
- (6) The upper and lower pipes shall be structured in two layers and the outer layer shall be made in yellow (Munsell symbol 2.5Y8/12) polyethylene.

5. Performance

5.1 Material stretch performance

Material stretch tests shall be carried out on the upper or lower pipes and the joint part according to Table 1.

Table 1

Stretch strength (MPa)	9.81 or more
Spread (%)	350 or more

5.2 Low-temperature impact resistance performance

Neither crack nor break shall occur when low-temperature impact resistance tests are carried out.

5.3 Load-resistant performance

No anchor shall deviate from the branch line, when load-resistant tests are carried out.

5.4 Impact-resistant performance

No anchor shall deviate from the branch line, when impact-resistant tests are carried out.

5.5 Weatherproof performance

No remarkable fading shall be noticed, when weatherproof tests are carried out on the upper or lower pipes and the joint part. In addition, after testing, the specimens shall meet details of Table 1 in Para. 5.1 Material stretch performance.

6. Nameplate contents and indicating method

Indicate the following items on an easy-to-see point of the upper side of this article by not easily disappearing means.

- (1) Manufacturer's name or its abbreviation
- (2) Manufacturing year (shown in Christian era)

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7. Test Method

7.1 Structural inspection

Inspect whether the appearance, structure and dimensions conform to these specifications or not.

7.2 Material stretch test

In accordance with JIS K 6922-2 "Materials for plastic - polyethylene (PE) molding and for extrusion - Part 2: How to make specimens and how to obtain properties," conduct stretch tests at a stretch speed of 200 mm/min.

7.3 Low-temperature impact test

Make specimens by sampling about 200 mm along the length from each of the upper and lower pipes of a finished product. Put these specimens and a joint part into the low-temperature tank of -10 degrees Celsius for one hour. Take them out, and immediately put them on the iron test-bed of low-temperature impact test equipment as shown in Figure 1. Let a weight of 10 kg drop from the height of 1 m onto them.

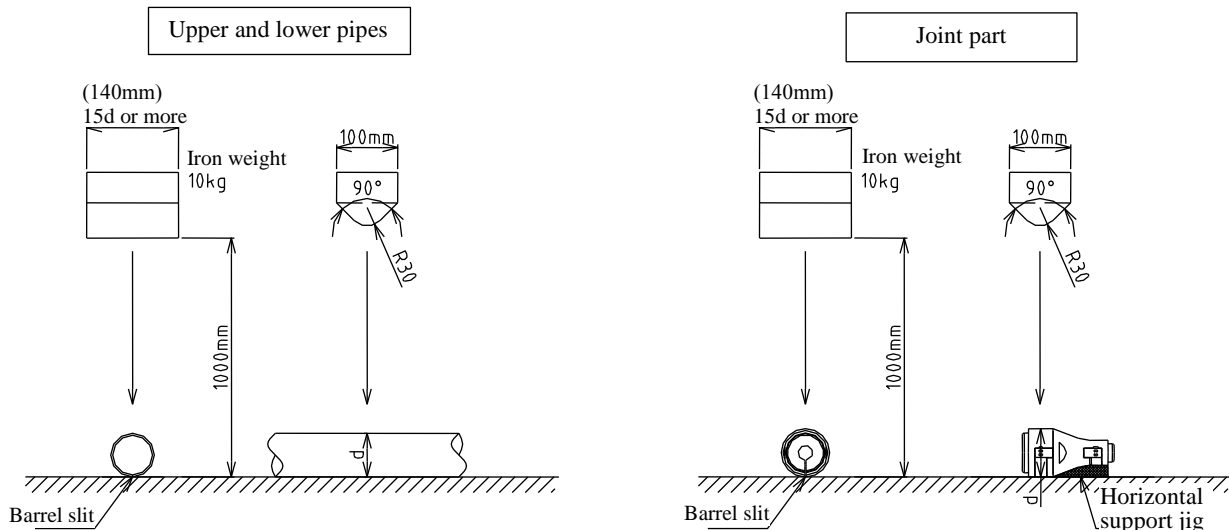


Figure 1 Low-temperature impact test equipment

7.4 Load test

Attach a specimen to the implementation pillar shown in Figure 2 and apply stretch load to the horizontal direction as shown in Table 2.

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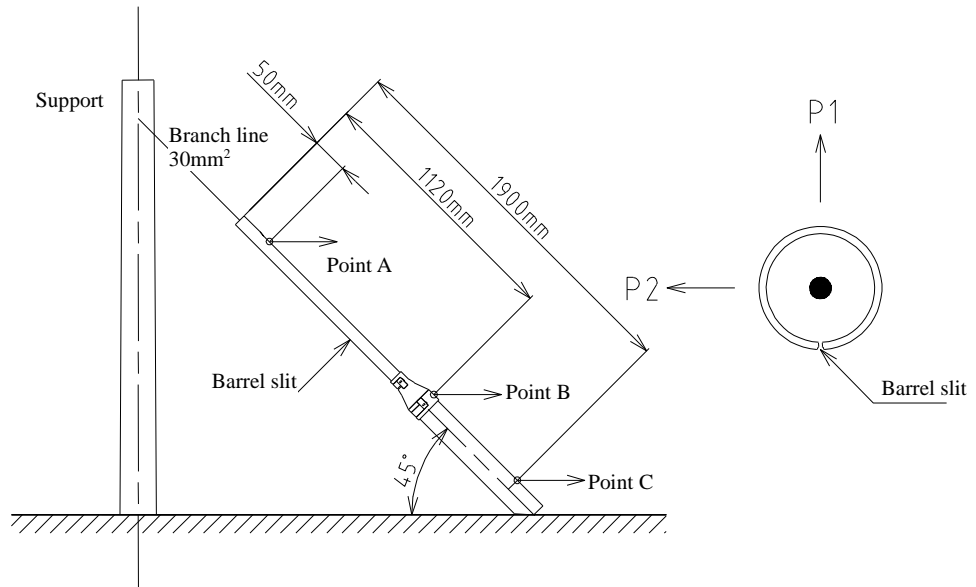


Figure 2 Load test equipment

Table 2

Stretch position	Stretch direction	Load (N)	Remarks
50 mm from top (Point A)	Barrel slit and 180 degrees	490	P1 ←
	Barrel slit and 90 degrees	490	P2 ←
1120 mm from top (Point B)	Barrel slit and 180 degrees	441	P1 ←
	Barrel slit and 90 degrees	441	P2 ←
1900 mm from top (Point C)	Barrel slit and 180 degrees	441	P1 ←
	Barrel slit and 90 degrees	441	P2 ←

7.5 Impact test

Attach a sample to the impact test equipment, as shown in Figure 3, with the barrel slit upward. Let a weight of 10 kg drop from the position of 1 m high to Points A, B and C respectively. Point C shall not be set, however, on the diagonal cut-out section of lower pipe. Ensure to let it drop to the sample.

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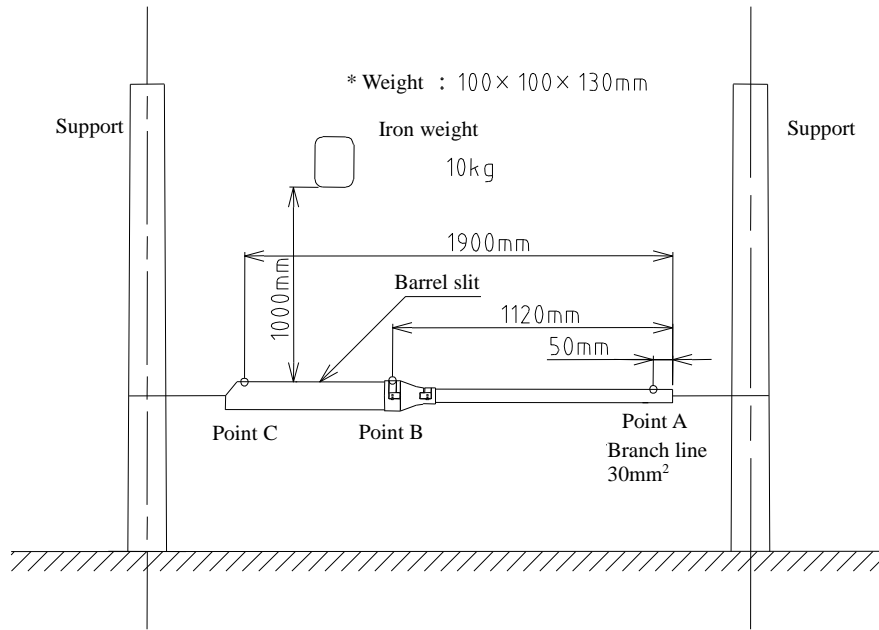


Figure 3 Impact test equipment

7.6 Weatherproof test

Regarding upper or lower pipes and a joint part, make specimens with 120 mm in length and 30 mm or more in width out of a finished product or an equivalent sample. Irradiate for 2,000 hours by operational methods specified in JIS K 7102 (Methods to test color-fastness for carbon arc lamplight of colored plastic materials). At this moment, record a deterioration status before testing and for each progress of every 500 hours in color photos. Take photos of both irradiated samples and specimens before testing side by side, as well as verify that no remarkable fading is noticed, and report them to us.

8. Test

8.1 General item

This article must pass all the provisions in Chapters 4 through 6 by conducting "8.2 Type test," "8.3 Manufacturing process inspection" and "8.4 Acceptance inspection" by the test method in Chapter 7.

8.2 Type test

Type tests shall be conducted for products or specimen manufactured at the same condition as products. It must pass all of the following items:

- (1) Structural inspection
- (2) Material stretch test
- (3) Low-temperature impact test
- (4) Load test
- (5) Impact test
- (6) Weatherproof test

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8.3 Manufacturing process inspection

In conducting type tests, as a rule, a series of inspections are implemented for design, quality control of materials, manufacturing process, product management. As a result of inspection, it shall be confirmed that articles which are exactly the same as the test product, used in type tests, are produced in a production process.

8.4 Acceptance inspection

Acceptance inspection shall be conducted by witnessing when delivery destination directs by means specified in "8.2 Type test." In addition, concrete test items and sampling rates shall be determined by discussing with the delivery destination. Moreover, when no acceptance inspection is conducted by witnessing, the manufacturer shall conduct its in-house tests determined by discussing with us beforehand, and submit to the delivery destination as test result reports.

9. Others

9.1 General item

- (1) When we recognize it as necessity, we may conduct the same test as type examination in inspecting quality control. Moreover, we can carry out inspection for manufacturing process.
- (2) When a considerable profit arises in use or manufacture by changing a part of these specifications or approval specifications, it will be allowed to change it with our approval.

9.2 Burdening of test articles

The expenses on tests and test articles shall be incurred by the manufacturer.

9.3 Submission of documents

The manufacturer must submit the following documents in applying for type examination.

- (1) Manufacturing specifications (including appearance and structural drawings)
- (2) Method for attaching branch lines
- (3) Test result report
- (4) Quality control method

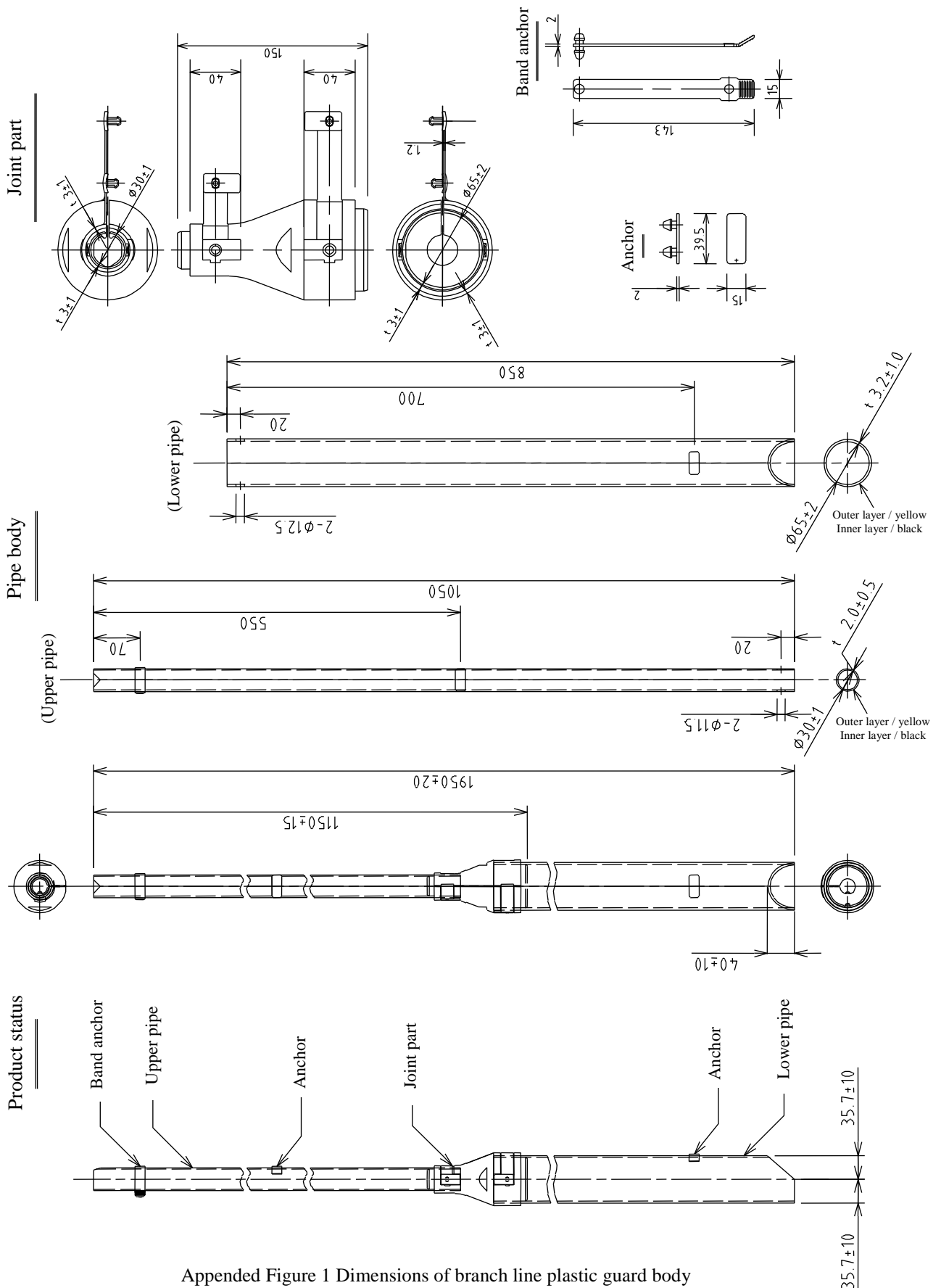
9.4 Packing

Make one bundle out of ten lines, combine the joint part with the upper pipe, put both of them into the lower pipe and pack both ends with paper boxes to avoid damages during transportation. Clearly describe the following items on the surface:

- (1) Nomenclature
- (2) Quantity
- (3) Manufacturer's name
- (4) Date of manufacture (shown in Christian era)

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[Unit: mm]



Appended Figure 1 Dimensions of branch line plastic guard body

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