

# **Application Guide for CMJ Registration Scheme**



**September 5, 2022**

**Japan Quality Assurance Organization**

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## 1. Introduction

### 1-1. About JQA

Japan Quality Assurance Organization (JQA) was established as an incorporated foundation in accordance with the Article 34 of the Civil Code in 1957, and it was then converted to a general incorporated foundation in accordance with the Three Laws Related to Public Corporation System Reform in April 1, 2011.

JQA is operated with operating revenues derived mainly from service charges, and it conducts business as a third-party body for testing, inspection and certification while ensuring fairness and neutrality.

For an overview of JQA and certification, registration and testing, etc. performed by JQA, go to the JQA website: <https://www.jqa.jp>

### 1-2. CMJ Registration Scheme

CMJ Registration Scheme is a scheme for prior assessment (testing and factory inspections) and registration of components and materials to facilitate efficient and economical testing and certification of electrical products. Even after registration, follow-up is conducted every year to continuously ensure compliance. Using components or materials registered in this registration scheme will allow you to confirm beforehand that corresponding components or materials conform to the technical standards of Electrical Appliances and Material Safety Act, to reduce the quality control costs for the corresponding components and materials necessary for manufacturers and importers of electrical products, and to utilize testing of components and materials in multiple certification bodies (registration inspection bodies for Electrical Appliances and Material Safety Act and S-Mark certification bodies).

For further information, access to the Steering Council of Safety Certification for Electrical and Electronic Application and Parts of Japan (SCEA) website:

<http://www.s-ninsho.com/index.html>

### 1-3. JQA's Certification Qualification for CMJ Registration

JQA started CMJ Registration as a certification body of the CMJ Registration scheme in 1990.

## 2. JQA Services

JQA conducts assessment of applied components and materials based on testing standards, and it inspects the factories that manufacture them.

JQA receives applications from manufacturers or importers of components and materials. If you are a manufacturer or you make an application on behalf of an importer, please submit a letter of attorney.

JQA may refuse to accept the application or may suspend the assessment of the certification in the following cases.

- (1) When it is difficult for JQA to technically support the application content;
- (2) When the application content involves illegal acts, acts against public order and morality, anti-social acts, other acts affecting JQA's business in some other way, or submissions from organizations or groups that are likely to perpetrate such acts;
- (3) When the applicant sustains deteriorating assets or credibility, or that is likely to occur;
- (4) When the applicant has failed to submit testing samples deemed necessary by JQA; and
- (5) When JQA deems an application to be inappropriate for some other reason.

### 2-1. CMJ Registration items by JQA

Components and materials to be CMJ-registered by JQA include components (equipment switches, radio interference suppression capacitors) and materials (fire-retardant test and electric strength test for sheathed equipment wire). Refer to Table 1 CMJ Registration Types and Registration Bodies in Appendix 1.

### 2-2. Data Utilization

- (1) Utilization of product testing data

We utilize as testing data for CMJ Registration the testing reports issued by Japan Electrical Safety & Environmental Technology Laboratories (JET), testing reports issued in accordance with IECEE (CB certification) scheme, testing reports issued by JQA in other certifications and testing, or testing reports for products certified by our partnership bodies.

If there is testing data that you want us to utilize, specify it in the application form.

- (2) Utilization of initial factory inspection data

We utilize as initial factory inspection data the factory inspection reports issued by JET, the factory inspection reports issued by JQA in other certifications and testing, the factory inspection reports issued of other agencies that have tie-ups with JQA, or the factory inspection reports of agencies already registered with JQA.

If there is a factory inspection report that you want us to utilize, specify it in the application form.

### 2-3. Rights and Duties of Applicants

For rights and duties of applicants, refer to "Terms of Agreement for Applications regarding Testing and Certification Services" in the application form.

Rights and duties of certification of certification holders after CMJ registration are described separately.

### 2-4. Complaints and Objections against CMJ Registration in JQA

JQA will in good faith and based on the rules, respond to complaints from applicants and others concerning the CMJ registration scheme in general, objections against the judgment for certification, or complaints and so on from other interested parties.

If you have an objection, lodge it with JQA no later than 45 days after the event occurs. JQA will give a reply no later than three months after the allegation is received.

### 3. Procedures

Figure- 1 in Appendix 2 shows the flow from application for CMJ Registration Scheme to completion of CMJ Registration.

#### 3-1. Application

Fill in “JQA Application for Testing/Certification Services” and “CMJ Registration (Wires) Form”, and then send them to one of the following destinations by postal mail, e-mail, or Fax. Those application forms are available on the JQA website.

[http://www.jqa.jp/english/safety/action/application/cmj\\_wires.html](http://www.jqa.jp/english/safety/action/application/cmj_wires.html)

Send the following documents.

Necessary document	Application content
	Wires
JQA Application for Testing/Certification Services	○
CMJ Registration (Wires) Application	○
Type Classification table for equipment wires	○ ※1
Factory inspection report (Section B Questionnaire)	○ ※2
Construction Table and Cross Section	○
Factory Inspection Report	※3
Letter of Attorney	※4

Remarks: ※1 Type classification of wires is explained in Appendices 3, 4 and 5 in this guide.

※2 Only at new application or changing registered information

※3 Only if applicable

※4 Letter of attorney is required only if an application is made by the attorney of an applicant.

If an additional document is required in the assessment of S-JQA mark certification, we will give you notification of it.

Sending destination:

Japan Quality Assurance Organization Safety & EMC Center Sales Div.  
 FAX: +81(0)42-679-0170  
 E-mail: [jtp-safety-cstm@jqa.jp](mailto:jtp-safety-cstm@jqa.jp)  
 TEL: +81(0)42-679-0246  
 Address: 4-4-4, Minamiosawa, Hachioji-shi, Tokyo, 192-0364, Japan

Or

Japan Quality Assurance Organization KITA-KANSAI Testing Center Sales Div.  
 FAX: +81(0)72-728-6848  
 E-mail: [kita-customers@jqa.jp](mailto:kita-customers@jqa.jp)  
 TEL: +81(0)72-729-2244  
 Address: 1-7-7, Ishimaru, Mino-shi, Osaka, 562-0027, Japan

### **3-2. Testing of Components and Materials and Initial Factory Inspections**

#### **(1) Testing of components and materials**

Appendix 6 "Testing Standards of Components and Materials That Can be Registered by Manufacturers and Importers of Components and Materials" shows testing standards for components and materials that can be registered in JQA. JQA will conduct testing of components and materials in accordance with the above table. If there is a difference between the above standards and the applicable standards specified in the application form, JQA will give you notification of it.

If non-conformities to applicable standards are found during testing of components and materials, JQA will notify the applicant of the non-conformities. If the applicant receives a report of non-conformities, the applicant will verify the content and then take corresponding actions such as taking corrective actions and withdrawing such application, etc. within a given period.

#### **(2) Initial factory inspections**

Factories that are not registered in CMJ Registration scheme must be assessed via the CENELEC method (factory inspection method employed by European bodies) to determine whether products are manufactured under an appropriate quality control system.

If the initial factory inspection reveals non-conformities to requirements, JQA will conduct necessary inspections again after an application for improvement is made.

#### **(3) Routine factory inspection**

Routine factory inspection is conducted annually to verify that registered products are adequately manufactured in compliance with the requirements of Optional Registration System for components and Materials used in Electrical Appliances (CMJ). This is conducted by visiting only.

Details : Verification that the quality control system checked during the pre-license factory inspection is maintained and that changes to the control system, if any, are adequate, and testing on selected samples of registered products.

If unsatisfactory findings that require corrective action are made during the inspection, repeat inspection is conducted, if corrective action cannot be confirmed, registration may be cancelled.

##### **(3)-1 Sample selection for testing**

During Routine Factory Inspections, samples are in principle selected randomly from 10% of the number of registered series (rounded off) for flammability test.

In the case of registration including high-voltage dielectric strength test, samples are selected for each series for high-voltage dielectric strength test.

If samples of registered series are not available during factory inspections, due to small production etc., they can be selected from samples for quality control test or in stock, produced after the last factory inspection. Such samples must be kept in an environment that will not affect the quality of the wire.

##### **(3)-2 Number of samples to be selected**

For flammability test: Three samples at length of 50cm per series

For high-voltage dielectric strength test : One sample at length of 5m per series

(Only for registration including high-voltage dielectric strength test)

### **3-3. Conclusion of Contract**

A contract for CMJ Registration scheme will be concluded.

### **3-4. Determination of registration**

After validating the results of testing of components and materials and initial factory inspections, JQA certification implementation division will determine CMJ registration.

### **3-5. Issuing of Registration Certificate**

If there is deemed to be conformity in the determination of registration, JQA will issue the registration certificate. The registration certificate will be sent together with an invoice for costs incurred in the application

#### **\*Modification or withdrawn of application**

If you modify or withdraw an application after acceptance, inform us accordingly.

## **4. Indication on CMJ-Registered Components and Materials**

“CMJ Mark” is a mark indicated as a proof of registration in accordance with CMJ Registration scheme on the component or a material by the registrant. See Appendix 7 “CMJ Mark” for details on the indication.

## **5. Rights and Duties of CMJ Registrants**

CMJ registrants may manufacture and ship components and materials that carry the CMJ mark.

Maintaining the registration requires annual maintenance costs, and requires periodical factory inspection and sampling testing once a year.

If a CMJ-registered product causes an accident or trouble in the market, report to JQA about that condition. For other rights and duties of CMJ registrants, refer to the contract.

## **6. Suspension, Cancellation or Termination of CMJ Registration**

The registration will be suspended, canceled or terminated in the following cases.

JQA will notify the registrant in writing prior to the implementation:

- (1) When requirements (e.g., conformity with technical standards) for continuous registration are not met.
- (2) When the registrant has failed to report the necessary information (e.g., modification of components, materials or factory), or has provided false report;
- (3) When the registrant has used the CMJ mark even though the registration was canceled;
- (4) When the registrant indicates CMJ marks on components and materials other than registered ones;
- (5) When the registrant has breached the performance of a contract clause, and has failed to correct the breach despite reminder.

## **7. Costs**

Costs consist of the following items.

### **(1) Registration fee**

This is the basic service cost of applications for new registration (series) and registration modification (series). See Appendix 8 for classifications of series.

### **(2) Testing fee**

This is the cost of testing of components and materials. (Validation fee for utilizing testing data is also included.)

(3) Initial factory inspection fee

This is the cost of the initial inspection of factories manufacturing components and materials.

(4) Travel cost of business trip

This is the cost of travel for on-site assessment. This is calculated in accordance with JQA regulations.

(5) Registration maintenance cost

This is the cost of registration maintenance for one year (April 1 to March 31).

Registration maintenance cost is: Registration maintenance base cost + Periodical factory inspection fee + Sampling testing fee.

(a) Registration maintenance base cost is calculated by the number of series for registered components and materials, and is charged at the beginning of every fiscal year.

(b) Periodical factory inspection fee

This is the cost of visiting inspection in the registered factory. The cost is charged after the visiting inspection every year.

(c) Sampling testing fee

This is the cost of sampling test of components and materials. Sampling is performed when visiting the factory every year.

The cost is charged together with the periodical factory inspection fee.

Examples of costs

(1) Initial application for CMJ registration (New application)

Registration fee + Testing fee + Travel cost of business trip

(2) Application for modification

Registration fee + Testing fee

(3) Application for withdrawal of all registration

Free of charge (This cost is included in the registration maintenance cost)

(4) Registration Maintenance of registration

Registration Maintenance base cost + Periodical factory inspection fee + Travel cost of business trip + Sampling testing fee

Contact information:

Japan Quality Assurance Organization Safety & EMC Center Sales Div.

FAX: +81(0)42-679-0170

E-mail: [jtp-safety-cstm@jqa.jp](mailto:jtp-safety-cstm@jqa.jp)

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Japan Quality Assurance Organization KITA-KANSAI Testing Center Sales Div.

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TEL: +81(0)72-729-2244

Address: 1-7-7, Ishimaru, Mino-shi, Osaka, 562-0027, Japan



CMJ Registration Types and Registration Bodies

Table 1 CMJ Registration Types and Registration Bodies

Registration item		Registration body
Components	Thermostat	JET
	Radio interference suppression capacitor	JET/JQA
	Phase advance capacitor for motor	JET
	Equipment switch	JET/JQA
	Current fuse	JET
	Anti-tracking plug	JET
Materials	Confirmation test of upper limit in operation temperature for insulation material	JET
	Ball pressure test for thermoplastic resin	JET
	0.1mm VICAT softening temperature test	JET
	Horizontal burning test of synthetic resin for outer case	JET
	Vertical burning test of laminates for printing	JET
	Vertical burning test of synthetic resin material	JET
	Glow-wire test	JET
	Tracking resistance (Only for the materials of the power plug)	JET
	Fire-retardant test for sheathed equipment wire (F mark) and electric strength test (K mark)	JQA

Flowchart to Receipt of CMJ Registration Certificate

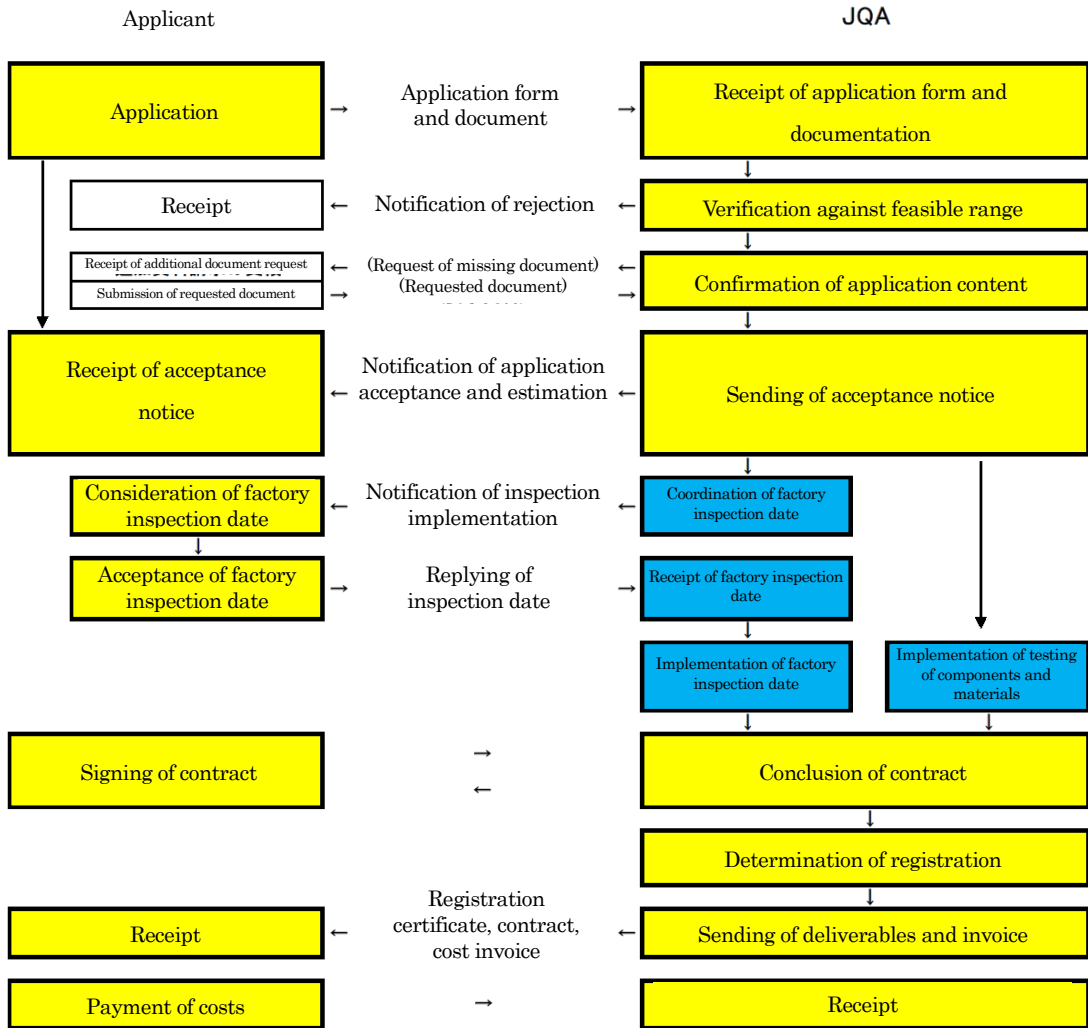


Figure- 1

Type Classification of Equipment Wires

Table 2: Type Classification Table for Equipment Wires

Name of equipment wire	Classification (Enter any relevant number from the list below.)												
	A	B	C	D	E	F	G	H	I	J	K	L	M

Name of equipment wire:

Type of wire (1.General wire 2.Composite wire 3.Tubing 4.General high-voltage wire 5.Composite high-voltage wire)

**Example of Classification**

	<p>General wire: conductor 1, 18AWG, Insul PVC (soft), 0.9mm thick, Inner sheath and shield are none, yellow and green color of sheath. In this case, this wire's classification as follows.</p>																																								
	<table border="1"> <tr> <th rowspan="2">Name of equipment wire</th> <th colspan="13">Classification (Entre any relevant No. form the list below.)</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>H</th> <th>I</th> <th>J</th> <th>K</th> <th>L</th> <th>M</th> </tr> <tr> <td>e.g.) General wire</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	Name of equipment wire	Classification (Entre any relevant No. form the list below.)													A	B	C	D	E	F	G	H	I	J	K	L	M	e.g.) General wire	1	2	2	2	2	2	0	0	3	0	0	0
Name of equipment wire	Classification (Entre any relevant No. form the list below.)																																								
	A	B	C	D	E	F	G	H	I	J	K	L	M																												
e.g.) General wire	1	2	2	2	2	2	0	0	3	0	0	0	0																												

Name of equipment wire	Classification (Entre any relevant No. form the list below.)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
e.g.) General wire	1	2	2	2	2	2	0	0	3	0	0	0	0

	<p>General wire: conductors 2, 26AWG, Insul Cross-linked vinyl, 0.1mm thick, including Inner sheath , Outer sheath : PVC (soft), 0.3mm thick, charcoal color of sheath. In this case, this wire's classification as follows.</p>																																								
	<table border="1"> <tr> <th rowspan="2">Name of equipment wire</th> <th colspan="13">Classification (Entre any relevant No. form the list below.)</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>H</th> <th>I</th> <th>J</th> <th>K</th> <th>L</th> <th>M</th> </tr> <tr> <td>e.g.) General wire</td> <td>2</td> <td>1</td> <td>3</td> <td>1</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	Name of equipment wire	Classification (Entre any relevant No. form the list below.)													A	B	C	D	E	F	G	H	I	J	K	L	M	e.g.) General wire	2	1	3	1	2	1	2	1	2	0	0	0
Name of equipment wire	Classification (Entre any relevant No. form the list below.)																																								
	A	B	C	D	E	F	G	H	I	J	K	L	M																												
e.g.) General wire	2	1	3	1	2	1	2	1	2	0	0	0	0																												

Name of equipment wire	Classification (Entre any relevant No. form the list below.)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
e.g.) General wire	2	1	3	1	2	1	2	1	2	0	0	0	0

Description of Classification Item:

- A. Number of conductors :                      Number of conductors
  1. 1
  2. Between 2 and 7 inclusive
  3. Exceeding 7
  
- B. Cross-sectional area of the conductor :      Cross-sectional area of the conductor
  1. 0.13mm<sup>2</sup> (AWG26) or less
  2. Between 0.13mm<sup>2</sup> (AWG26) (exclusive) and 0.5mm<sup>2</sup> (AWG20) (inclusive)
  3. Exceeding 0.5mm<sup>2</sup> (AWG20)
  
- C. Insulation material :                              An item that directly constitutes the conductor. A constituent material in the case of tubing
 

<ol style="list-style-type: none"> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol>	<ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Others</li> </ol>
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- D. Insulation thickness :                              This will be the average taken from the average values of t1 and of t2, where t1 is the minimum length and t2 is the length on the opposite side, measured on each of five cross-sectional surfaces perpendicular to the wire axis. For heat shrinkable tubing, this will be the value measured before shrink.
  1. 0.6mm or less
  2. Between 0.6mm (exclusive) and 1.2mm (inclusive)
  3. Exceeding 1.2mm
  
- E. Inner sheath :    Insulating material other than insulation and outer sheath, excluding tape and inclusion.
  1. With
  2. Without

- F. Shield : Object provided to shield the influence of electric field and magnetic field.
1. With
  2. Without
- G. Outer sheath material : Insulating material at outermost jacket, with double or more sheathed.
- |                              |                                     |
|------------------------------|-------------------------------------|
| 0. N/A                       | 7. Chloroprene rubber               |
| 1. PVC (semihard)            | 8. Ethylene-propylene rubber        |
| 2. PVC (soft)                | 9. Silicon rubber                   |
| 3. Cross-linked vinyl        | 10. Chlorinated polyethylene rubber |
| 4. Polyethylene              | 11. Glass braid(*1)                 |
| 5. Cross-linked polyethylene | 12. Others                          |
| 6. Fluorine resin            |                                     |
- H. Outer sheath thickness : Thickness of the outermost sheath
0. N/A
  1. 0.6mm or less
  2. Between 0.6mm (exclusive) and 1.2mm (inclusive)
  3. Exceeding 1.2mm
- I. Color of outermost material : The color of the outermost sheath for double or more sheathed wire, and the color of insulation for other wires. Colors of characters, symbols, etc. printed on the surface are not included.
1. Light color ((semi-)transparent, white, yellow, grey, pink, sky blue (light blue), red, orange, bright green)
  2. Dark color (black, charcoal, dark brown, blue, purple, green, brown)
  3. Mixed color (\*2)
- J. Outer diameter : For a wire with round cross-section, this will be an average of values directly measured at Two points on the same plane perpendicular to the wire axis. For other wires, this will be long diameter of the same plane perpendicular to the wire axis.
0. N/A
  1. 6mm or less
  2. Between 6mm (exclusive) and 12mm (inclusive)
  3. Exceeding 12mm
- K. Inner diameter/dimension : This will be the average of values measured at two or more points in a longitudinal direction of tubing. For heat shrinkable tubing, this will be the average of values measured before shrink.
0. N/A
  1. 3mm or less
  2. Between 3mm (exclusive) and 6mm (inclusive)
  3. Between 6mm(exclusive) and 10mm (inclusive)
  4. 10mm or more
- L. Outer diameter of high-voltage cable : Outer diameter of cable
0. N/A
  1. 3.82mm or less
  2. Between 3.82mm (exclusive) and 5.08mm (inclusive)
  3. Exceeding 5.08mm
- M. Maximum voltage of high-voltage cable : Maximum voltage of cable
0. N/A
  1. Between 2.5kV and 10kV inclusive
  2. Between 10kV (exclusive) and 40kV (inclusive)
  3. Exceeding 40kV

## Definitions of Type Classifications (See Appendix4 and 5 in details):

- (1) Insulation  
Insulation shall be a covering applied directly over the conductor. It shall be tubing material if the product is insulating tubing.
- (2) Thickness of insulation (How to calculation with Appendix4)
  1. Cut the electric wire of the equipment at 5 points perpendicular to the wire axis and use it as a sample for measurement.
  2. Define the minimum thickness of the insulating coating as (t1) and the thickness on the opposite side as (t2), measure 5 samples each, and calculate the average value of each. These are defined as (t1') and (t2').
  3. Let the average value of (t1') and (t2') be "the average thickness of the wire".  
Note: The thickness of the heat shrinkable tube must be measured before shrinkage.
- (3) Inside diameter  
The inside diameter shall be the average of those measured at two or more locations along the tube. The inside diameter of heat-shrinkable tubing shall be the average value measured before shrinkage.
- (4) Inner sheath  
The inner sheath is an insulation other than the conductor insulation and the outer sheath, and it does not include tapes and things lying in between.
- (5) Shield  
The shield is put in a product so that it is not affected by an electric field or magnetic field.
- (6) Outside diameter  
For round constructions of equipment wires, the outside diameter shall be the average of values measured at two points cut at a right angle to the wire axis. For other constructions, it shall be the longer diameter of the same surface cut at a right angle to the wire axis.
- (7) Outer sheath  
The jacket shall be the outermost insulation of an equipment wire with two or more insulating coverings.
- (8) Color of outermost material  
For an equipment wire with two or more insulating coverings, the color of the outermost insulation shall be the color of the outer sheath. For an equipment wire with one insulating cover, the color of the outer sheath shall be the color of the insulating cover itself. The color of letters or codes printed on the product surface shall not be considered to be part of the outer sheath.
- (9) Mixed colors  
"Mixed colors" means mixture of 1. dark and 2. light color covers in an equipment wire.
- (10) Glass braid  
A glass braid is a glass fiber processed in the shape of tubing or the processed glass fiber soaked with vanishes etc.

Table 3: Type Classification of General Wires/General High-voltage Wires

Code	Item	Classification		
A	Number of conductors	<ol style="list-style-type: none"> <li>1. 1</li> <li>2. Between 2 and 7 inclusive</li> <li>3. Exceeding 7</li> </ol>		
B	Cross-sectional area of the conductor	<ol style="list-style-type: none"> <li>1. 0.13mm<sup>2</sup> (AWG26) or less</li> <li>2. Between 0.13mm<sup>2</sup> (AWG26) (exclusive) and 0.5mm<sup>2</sup> (AWG20) (inclusive)</li> <li>3. Exceeding 0.5mm<sup>2</sup> (AWG20)</li> </ol>		
C	Insulation material	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <ol style="list-style-type: none"> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol> </td> <td style="width: 50%; border: none;"> <ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Others</li> </ol> </td> </tr> </table>	<ol style="list-style-type: none"> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol>	<ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Others</li> </ol>
<ol style="list-style-type: none"> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol>	<ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Others</li> </ol>			
D	Insulation thickness	<ol style="list-style-type: none"> <li>1. 0.6mm or less</li> <li>2. Between 0.6mm (exclusive) and 1.2mm (inclusive)</li> <li>3. Exceeding 1.2mm</li> </ol>		
E	Inner sheath	<ol style="list-style-type: none"> <li>1. With</li> <li>2. Without</li> </ol>		
F	Shield	<ol style="list-style-type: none"> <li>1. With</li> <li>2. Without</li> </ol>		
G	Outer sheath material	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <ol style="list-style-type: none"> <li>0. N/A</li> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol> </td> <td style="width: 50%; border: none;"> <ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Glass braid(*1)</li> <li>12. Others</li> </ol> </td> </tr> </table>	<ol style="list-style-type: none"> <li>0. N/A</li> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol>	<ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Glass braid(*1)</li> <li>12. Others</li> </ol>
<ol style="list-style-type: none"> <li>0. N/A</li> <li>1. PVC (semihard)</li> <li>2. PVC (soft)</li> <li>3. Cross-linked PVC</li> <li>4. Polyethylene</li> <li>5. Cross-linked polyethylene</li> <li>6. Fluorine resin</li> </ol>	<ol style="list-style-type: none"> <li>7. Chloroprene rubber</li> <li>8. Ethylene-propylene rubber</li> <li>9. Silicon rubber</li> <li>10. Chlorinated polyethylene rubber</li> <li>11. Glass braid(*1)</li> <li>12. Others</li> </ol>			
H	Outer sheath thickness	<ol style="list-style-type: none"> <li>0. N/A</li> <li>1. 0.6mm or less</li> <li>2. Between 0.6mm (exclusive) and 1.2mm (inclusive)</li> <li>3. Exceeding 1.2mm</li> </ol>		
I	Color of outermost material	<ol style="list-style-type: none"> <li>1. Light color ((semi-)transparent, white, yellow, grey, pink, sky blue (light blue), red, orange, bright green)</li> <li>2. Dark color (black, charcoal, dark brown, blue, purple, green, brown)</li> <li>3. Mixed color (*2)</li> </ol>		
J	Outer diameter			
K	Inner diameter/dimension			
L	Outer diameter of high-voltage cable	<ol style="list-style-type: none"> <li>0. N/A</li> <li>1. 3.82mm or less</li> <li>2. Between 3.82mm (exclusive) and 5.08mm (inclusive)</li> <li>3. Exceeding 5.08mm</li> </ol>		
M	Maximum voltage of high-voltage cable	<ol style="list-style-type: none"> <li>0. N/A</li> <li>1. Between 2.5kV and 10kV inclusive</li> <li>2. Between 10kV (exclusive) and 40kV (inclusive)</li> <li>3. Exceeding 40kV</li> </ol>		

Note) \*1: Glass braid is glass fiber that is processed in tubular form or that is impregnated with varnish.

\*2: Mixed color means that the same wire contains classifications of color of outermost material, 1) Light color and 2) Dark color.

Table 4: Type Classification of Composite Wires/Composite High-voltage Wires

Code	Item	Classification
A	Number of conductors	1. 1 2. Between 2 and 7 inclusive 3. Exceeding 7
B	Cross-sectional area of the conductor	
C	Insulation material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Others
D	Insulation thickness	
E	Inner sheath	1. With 2. Without
F	Shield	1. With 2. Without
G	Outer sheath material	0. N/A 1. PVC (semihard) 2. PVC (soft) 3. Cross-linked PVC 4. Polyethylene 5. Cross-linked polyethylene 6. Fluorine resin 7. Chloroprene rubber 8. Ethylene-propylene rubber 9. Silicon rubber 10. Chlorinated polyethylene rubber 11. Glass braid(*1) 12. Others
H	Outer sheath thickness	0. N/A 1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
I	Color of outermost material	1. Light color ((semi-)transparent, white, yellow, grey, pink, sky blue (light blue), red, orange, bright green) 2. Dark color (black, charcoal, dark brown, blue, purple, green, brown) 3. Mixed color (*2)
J	Outer diameter	0. N/A 1. 6mm or less 2. Between 6mm (exclusive) and 12mm (inclusive) 3. Exceeding 12mm
K	Inner diameter/dimension	
L	Outer diameter of high-voltage cable	0. N/A 1. 3.82mm or less 2. Between 3.82mm (exclusive) and 5.08mm (inclusive) 3. Exceeding 5.08mm
M	Maximum voltage of high-voltage cable	0. N/A 1. Between 2.5kV and 10kV inclusive 2. Between 10kV (exclusive) and 40kV (inclusive) 3. Exceeding 40kV

Note) \*1: Glass braid is glass fiber that is processed in tubular form or that is impregnated with varnish.

\*2: Mixed color means that the same wire contains classifications of color of outermost material, 1) Light color and 2) Dark color.

Table 5: Type Classification of Tubing

Code	Item	Classification
A	Number of conductors	
B	Cross-sectional area of the conductor	
C	Insulation material	1. PVC (semihard) 2. PVC (soft) 3. Cross-linked PVC 4. Polyethylene 5. Cross-linked polyethylene 6. Fluorine resin 7. Chloroprene rubber 8. Ethylene-propylene rubber 9. Silicon rubber 10. Chlorinated polyethylene rubber 11. Glass braid(*1) 12. Others
D	Insulation thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
E	Inner sheath	
F	Shield	
G	Outer sheath material	
H	Outer sheath thickness	
I	Color of outermost material	1. Light color ((semi-)transparent, white, yellow, grey, pink, sky blue (light blue), red, orange, bright green) 2. Dark color (black, charcoal, dark brown, blue, purple, green, brown) 3. Mixed color (*2)
J	Outer diameter	
K	Inner diameter/dimension	0. N/A 1. 3mm or less 2. Between 3mm (exclusive) and 6mm (inclusive) 3. Between 6mm(exclusive) and 10mm (inclusive) 4. 10mm or more
L	Outer diameter of high-voltage cable	
M	Maximum voltage of high-voltage cable	

Note) \*1: Glass braid is glass fiber that is processed in tubular form or that is impregnated with varnish.

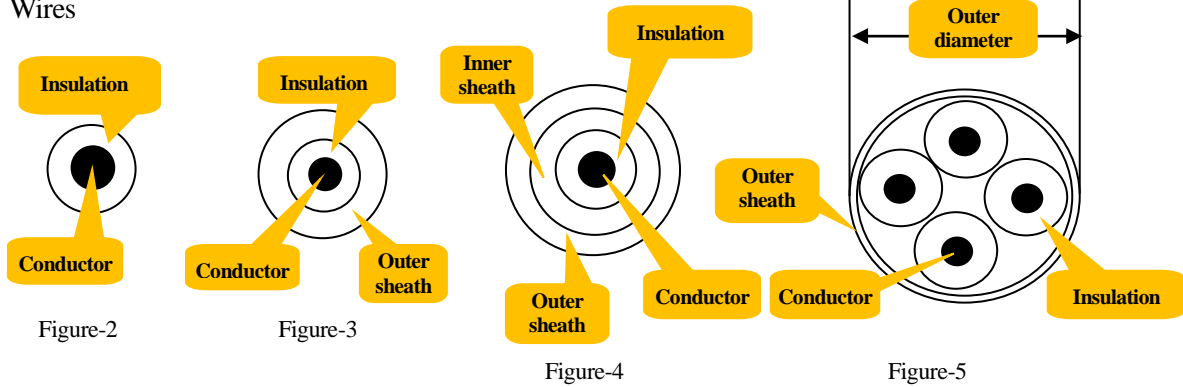
\*2: Mixed color means that the same wire contains classifications of color of outermost material, 1) Light color and 2) Dark color.



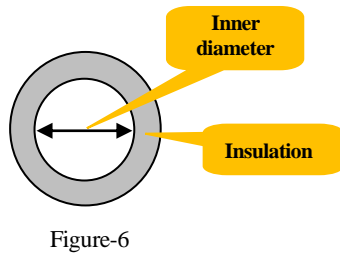
Examples of Explanatory Figures for Type Classification Classifications

<Cross-sectional area>

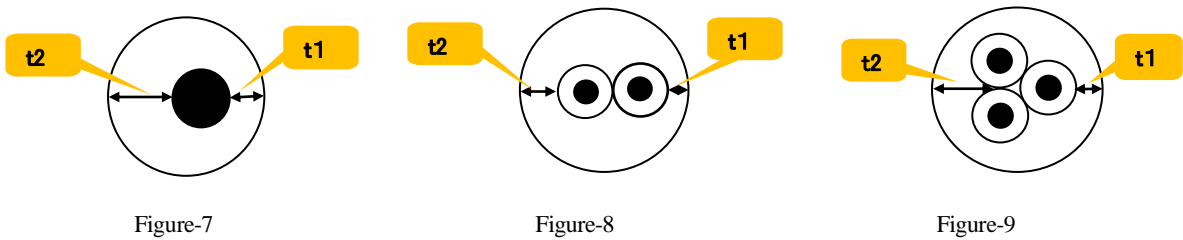
Wires



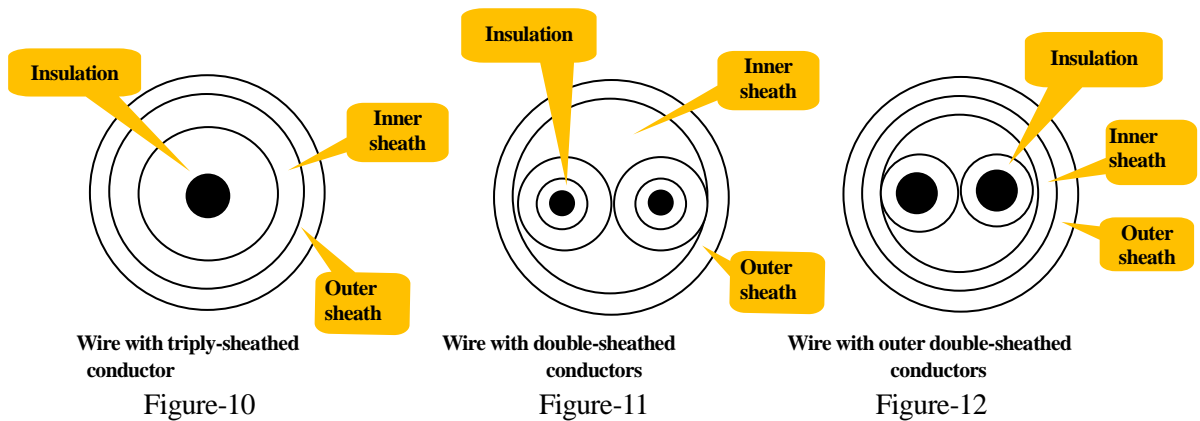
Tubing



(1) Examples of measurement points t1 and t2



(2) Examples of “wires with inner sheath”



(3) Examples of “wires without inner sheath”

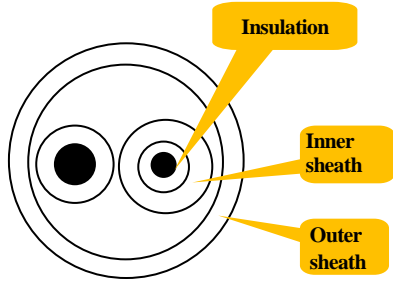
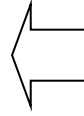
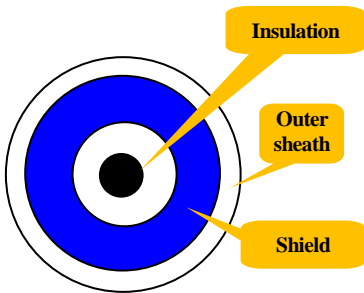


Figure-13



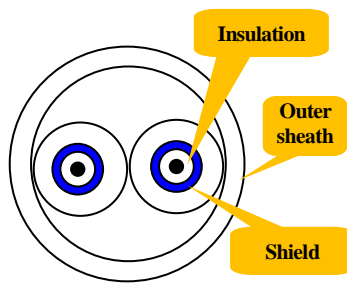
Wire containing the mixture of inner sheathed conductor and non inner sheathed conductor, both of which are covered by outer sheath

(4) Examples of “wires with shield”



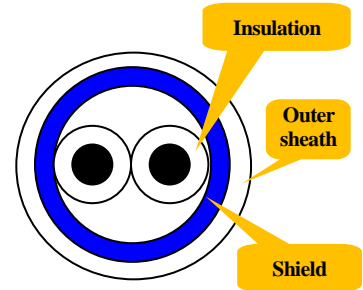
Wire with shielded conductor

Figure-14



Wire with shielded conductors

Figure-15



Wire with overall shielded conductors

Figure-16

(5) Examples of “without shield”

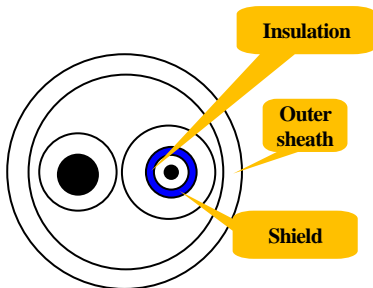
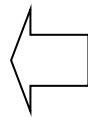


Figure-17



Wire containing shielded and non-shielded conductors

Classification of General Wires and Composite Wires

1. General wire refers to either of the following category a or b.

- a. Wires with single conductor
- b. Wires with multiple conductors as shown below.
  - (1) Wires with outer sheath (Fig. 17)

Wires classified under the following category A or B and have the same classification in the type classifications of general wires where the wires are classified by cross-sectional area of the conductor, insulation material, insulation thickness, inner sheath, shield, outer sheath material, and outer sheath thickness out of type classification items for general wire.

A. Respective wires with the overall outer sheath removed (Fig. 17a)

B. Respective wires with any inner sheath covering wires (if any) removed after the overall sheath covering the individual wires is removed (Fig. 17b)

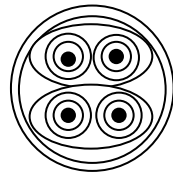


Figure-18

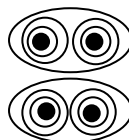


Figure-18a

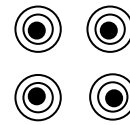


Figure-18b

(2) Wires without outer sheath (Figure- 18)

Each of the wires (A, B, C and D in Figure- 18) with the same classifications in the type classification of general wires where the wires are classified by cross-sectional area of the conductor, insulation material, insulation thickness, inner sheath, shield, outer sheath material, and outer sheath thickness out of type classification items for general wire.

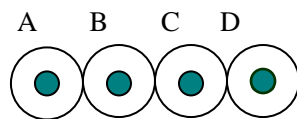


Figure-19

2. Composite wire refers to a wire other than general wires and tubing.

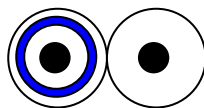


Figure-20

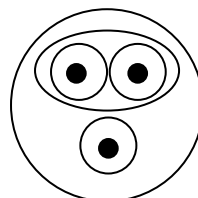


Figure-21

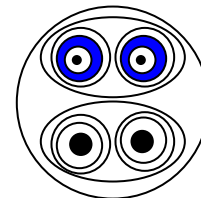


Figure-22

Testing Standards of Components and Materials That Can be Registered  
by Manufacturers and Importers of Components and Materials

Table 6: Testing Standards of Components and Materials

Registration item		Testing standards
Component	Radio interference suppression capacitor	JIS C 5101-14(IEC 60384-14)
	Equipment switch	JIS C 4526-1(IEC 61058-1)
Material	Fire-retardant test for sheathed equipment wire (F mark) and electric strength test (K mark)	“Fire-retardant testing method used for electrical appliances” (F mark) and Appendix 8: 1(10)-2(2) (K mark) established by the Electrical Appliances and Materials Research Committee See Appendix 6-1

Method for Flammability Test on Equipment Wires Under Optional Registration System for  
Components and Materials used in Electrical Appliance (CMJ).

1. Objectives

This testing method is designed to confirm the safety against flammability of built-in insulation wires for use in television receivers, electronics-based toys and other electronics-based playing appliances under the CMJ.

2. Testing equipment

In principle, tests shall be conducted at a no-wind site with the ranges of room temperature 15-35°C, humidity 45-75% RH, atmospheric pressure 860-1,060m bar.

3. Testing unit

(1) Testing box

About 310mm wide, 360mm deep and 610mm high metal box with its top and front open.

(2) Testing burner

Bunsen or tirrill burner with inside diameter.

Above 8.5mm but below 11.5mm and with a  $100 \pm 10$ mm long tube.

(3) Testing gas

Gas of about 1000 BTU/ft<sup>3</sup> or No. Class 1 No.1 gas specified in JIS K2240 (2013) "Liquefied Petroleum (LP) Gas".

(4) Stand

Stand provided with clamps or any other equivalent units capable of vertically holding a specimen.

(5) Display flag

One equivalent to class 2 No.1 specified in JIS Z1511 (1975) "Paper Gum Tapes (For Packaging).

(6) Stopwatch or other clock unit

(7) Dry absorbent cotton

4. Specimen and its mounting

(1) Specimen

About 450mm long object wound with a 12.7mm wide indicator flag, which is set 19mm extruded. Meanwhile, in the case of tubing, it shall be inserted with a conductor listed below. Wound with a 12.7mm wide indicator flag, then set 19mm extruded. In the case of heat-shrinkable tubing, shrunk tubing as specified, similarly wound with an indicator flag shall be used.

Inside diameter of tubing (mm)	Wire diameter of inserted conductor (Piano wire) (mm)
Above 0.81mm	0.74
Above 0.44mm and below 0.81mm	0.41
Below 0.44mm	0.25

(2) Mounting

Specimen shall be vertically set in the center of the testing box by fixing its upper and lower ends, with 5mm thick absorbent cotton or thicker put over the base of the testing box.

It shall be set so that tip of reducing flame of a testing flame touches a spot about 230mm away from upper end of the absorbent cotton, and 75mm away from lower end of the specimen.

Also, it shall be mounted so that lower end of the indicator flag shall be located 255mm upward from the spot that tip of the reducing touches (See Figs 1 and 2.).

5. Testing flame and how to apply flame

Testing gas and air is fed to a burner, which is vertically set to produce an about 130mm long oxidizing flame with an about 35mm long reducing flame. Then tip of the reducing flame shall be applied at an angle of 20° vertically.

In the case of wires having short/long diameters, the flame shall be applied to a broad-breath plane.

6. Test

(1) To a specimen prepared as specified in 4(1) and mounted as specified in 4(2), a testing flame adjusted as specified in 5 is applied for 15 seconds, followed by a 15 seconds pause. These operations shall be repeated five times. However, if the flame resulting from burning specimen does not go out within the pause, application of a testing flame shall be stopped. It can be resumed once the flame of burning specimen goes out.

(2) Five specimens shall be tested.

7. All of the five specimens shall satisfy every requirement below:

(1) After the flame application, the flame resulting from burning specimen shall go out within 60 seconds each time.

(2) Burning objects dropping from a specimen shall not cause absorbent cotton to start burning.

(3) Burnt or blackened area after testing the indicator flag shall be less than 25%.

Note: The specified flammability test on equipment wires was sited from “A Report on How to Make flammability test on equipment wires used in Electric Appliances, issued on March 15, 1990, by JAPAN ELECTRIC ASSOCIATION COMMITTEE ON ELECTRICAL APPLIANCE AFFAIRES.

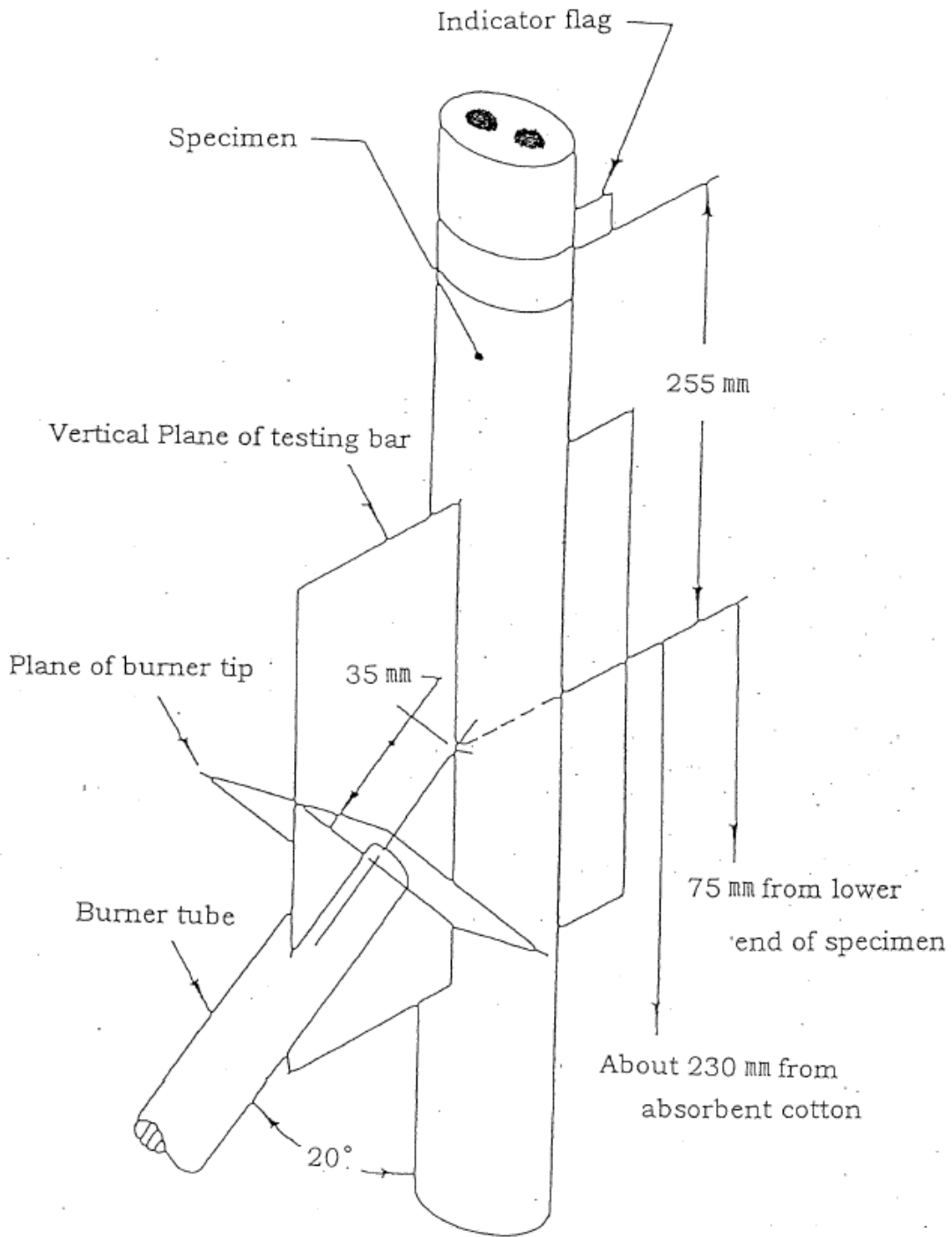


Fig - 1 Wire

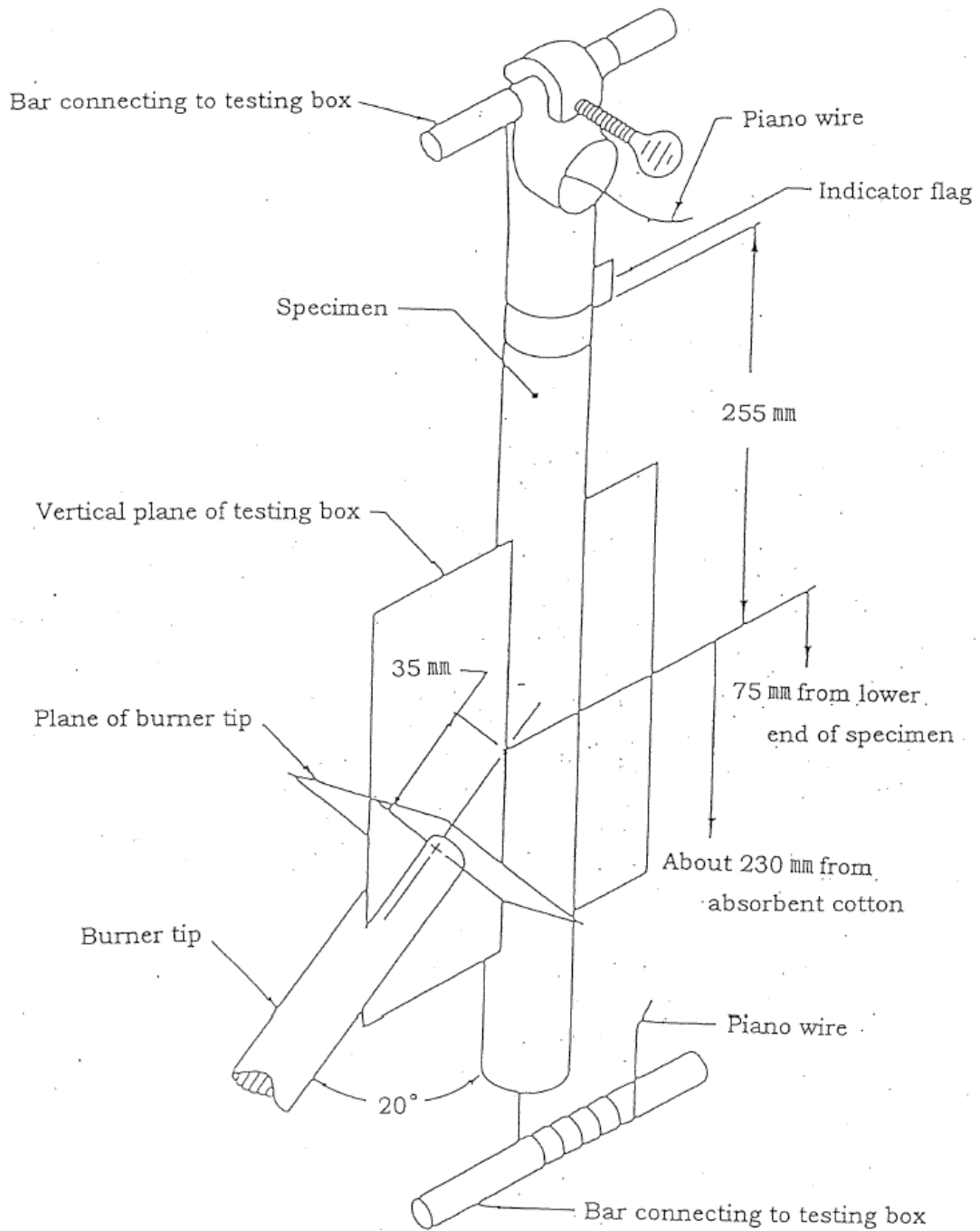


Fig - 2 Tubing



## HOW TO CONDUCT FLAMMABILITY TEST ON EQUIPMENT WIRES USED IN ELECTRIC APPLIANCES : EXPLANATIONS

### Introduction

Discussions were made of testing methods to confirm the safety against flammability of built-in jacketed wires (including tubes) used in electric appliances (television receivers, electronics-based toys and other electronics-based playing appliance).

To examine this testing method, difference among representative methods to check flammability of apparatus - use equipment wires, employed in various countries, are summarized in a “Comparative List of Vertical Combustion Testing Standards for Equipment Wire Vertical Combustion Testing Standards”.

As for IEC, it is omitted this time because it is in the stage of unification of testing methods and consideration of approval testing system. However, given the fact that IEC standards are serving as international testing standards, it appears necessary for us to propose to IEC, not vice versa, ways to deal with trends likely from now on, as well as this testing methods.

Detailed explanations are given below under each item.

### 1. Test Equipment

To increase reproducibility of test results, temperature humidity and atmospheric pressure are specified. The specified figures were taken from the testing conditions for the temperate zone as specified in IEC standards. Also, the brightness of the testing site and availability of exhaust, the former necessary for identifying flame, and the latter for protecting testing staff, are not specified this time, because it is difficult to set forth harmonized specifications.

### 2. Burner

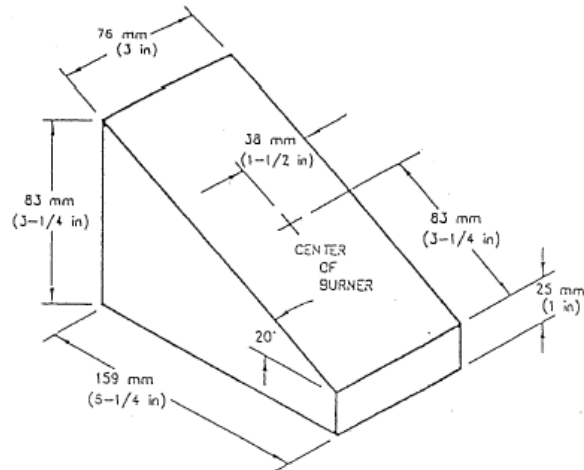
Existing specifications are adopted because the Electrical Apparatus Safety Law Technical Requirements are based on various foreign standards. In addition, length of tube taken from UL and CSA standards is specified.

In the meantime, specifying a testing flame by length could cause human errors to affect test results. IEC is now considering an international unification of burner requirements in the hope of specifying the test flame by gas and air flow. Once the unification is realized, this needs to be revised.

### 3. Burner Stand

To keep an angle between the burner and specimen and also to repeat flame applications, a burner stand can be used.

For your reference, a burner stand specified in UL standard 1581(1988) is illustrated right.



### 4. Expression of Dimensions

Flammability Test on Equipment Wires seems to have been developed by UL in the 1970s. When it was employed by CSA, or introduced into the Electrical Apparatus Safety Law Technical Requirements, fractions were rounded in different way, thus producing gaps among the standards. For this reason, with this testing method, those dimensions which do not appear to affect test results were interpreted to be covered by such standards.

### 5. Standards for Absorbent Cotton

Technical Requirements of Electrical Apparatus Safety Low and UL standards alike employ absorbent cotton for judging the spread of a fire caused by drops from a specimen. Considering reproducibility of tests, it is recommended to use absorbent cotton, easily available at drug stores in uniform quality, it must be left in a desiccator containing drying agents before use.

### 6. How to apply flame to broad-breadth specimens

At present, broad-breadth equipment wires used in apparatus, known by such names as flat cables and ribbon cables, are becoming increasingly popular. Such being the situations, as a result of examinations of how to apply flame to broad-breadth specimens, it was ruled that, in the case of a broad-breath specimen, a flame shall be applied to its broad-breath plane, because it is the direction where the flame touches the specimen most, and because UL standard also require flame application from that direction.

### 7. Conductor inserted into tubing

Tubing needs to be tested allowing for the state of its actual use. But considering convenience and reproducibility of tests, a testing method to confirm flammability (UW-1) in UL standard 224 “Extruded Insulating Tubing” was adopted.

## Use of “CMJ Mark”

Design of “CMJ Mark” design, etc.

The following mark may be indicated on CMJ-registered products.



Alternatively, “CMJ” in capital letters may be used.

For fire-retardant test (F Mark) and electric strength test (K Mark), the following marks may be indicated on the outer sheath of wires and also CMJ mark may be indicated instead of F mark.

F Mark

“— F —”

K Mark

“— K —”

Followings are also required when “CMJ Mark”, “F Mark” or “K Mark” are indicated.

- Factory name or its abbreviation
- Required on applicable standard

## Series Classification of Wires

Table 7: Series Classification of General Wires

Code	Item	Classification
A	Number of conductors	1. 1 2. Between 2 and 7 inclusive 3. Exceeding 7
C	Insulation material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Others
D	Insulation thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
F	Shield	1. With 2. Without

Table 8: Series Classification of Composite Wires

Code	Item	Classification
A	Number of conductors	1. 1 2. Between 2 and 7 inclusive 3. Exceeding 7
F	Shield	1. With 2. Without
G	Outer sheath material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Glass braid 7. Others
H	Outer sheath thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm

Table 9: Series Classification of Tubing

Code	Item	Classification
C	Insulation material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Glass braid 7. Others
D	Insulation thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
K	Internal diameter	1. 3mm or less 2. Between 3mm (exclusive) and 6mm (inclusive) 3. Between 6mm (exclusive) and 10mm (inclusive) 4. 10mm or more

Table 10: Series Classification of General High-voltage Wires

Code	Item	Classification
A	Number of conductors	1. 1 2. Between 2 and 7 inclusive 3. Exceeding 7
C	Insulation material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Others
D	Insulation thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
F	Shield	1. With 2. Without
L	External diameter of high-voltage wire	1. 3.82mm or less 2. Between 3.82mm (exclusive) and 5.08mm (inclusive) 3. Exceeding 5.08mm

Table 11: Series Classification of Composite High-voltage Wires

Code	Item	Classification
A	Number of conductors	1. 1 2. Between 2 and 7 inclusive 3. Exceeding 7
F	Shield	1. With 2. Without
G	Outer sheath material	1. PVC 2. Polyethylene 3. Fluorine resin 4. Natural rubber 5. Synthetic rubber 6. Glass braid 7. Others
H	Outer sheath thickness	1. 0.6mm or less 2. Between 0.6mm (exclusive) and 1.2mm (inclusive) 3. Exceeding 1.2mm
L	Outer diameter of high-voltage cable	1. 3.82mm or less 2. Between 3.82mm (exclusive) and 5.08mm (inclusive) 3. 5.08mm or more