

PRODUCTS SPECIFICATION

TYPE INSULATED CLOSED END CONNECTORS

PART NO. CE

ISSUED MAY 2, 1979
REVISED OCTOBER 31, 2003

NICHIFU TERMINAL INDUSTRIES CO., LTD.



Q. A. DEPT.	TECHNICAL DEPT.	
APPROVED	CHECKED	PREPARED
H. Kurwaka.	<i>[Signature]</i>	J. Kitsuhashi

1. SCOPE This specification specifies insulated closed-end connectors (hereafter referred to as the connectors) are manufactured by Nichifu Terminal Industries Co., Ltd. which are clamped from the outer surface of connector insulation according to crimp style connection by using the connecting tool specified by the connector manufacturer (hereafter referred to as the tools) for mutual connection of P.V.C. insulated annealed copper stranded or solid wires mainly used for internal wiring of household appliances (hereafter referred to the wires).

2. TYPE, PART NO. AND APPLICABLE TOOLS Given in Table 1.

Table 1

TYPE	PART NO. ^D	WIRE RANGE		MATERIAL		APPLICABLE TOOLS	
		mm ²	AWG	SLEEVE	INSULATOR	HAND/OTHERS	PNEUMATIC
INSULATED CLOSED END CONNECTORS	CE 1	0.5~1.75	22-16	OXYGEN FREE COPPER (Tin Plating)	NYLON	NH 37, NBC 55	NA 3(N3 34)
	CE 2	1.0~3.0	16-14			NH 37, NH 36B, NH 63, NBC 55	NA 3(N3 34)
	CE 5	2.5~6.0	12-10			NH 37, NH 36B, NBC 55	NA 3(N3 14)
	CE 8	4.0~9.0	8			NH 36, NH 36B	NA 3(N3 36)

NOTE^D Add suffix -V0 for insulator material grade UL94 V-0.

3. RATINGS Given in Table 2.

Table 2

PART NO.	RATED VOLTAGE V	RATED CURRENT MAX. A	RATED TEMPERATURE °C	FLAME RETARDANCE
CE 1	300	7	-40 ~ +105	Standard type UL94V-2 Special type UL94V-0
CE 2		12		
CE 5		17		
CE 8		23		

4. PERFORMANCE AND TEST

4.1 TEST CONDITION

- (1) Unless otherwise specified, the tests shall be carried out in a room at the ordinary temperature ($20 \pm 15^\circ\text{C}$) and ordinary humidity ($65 \pm 20\%$) specified in JIS Z8703. However, the tests of 4.6 and 4.7 shall be carried out while the test specimens are kept in still air at a temperature of 15 to 35°C .
- (2) The wires shall be non-plated wires specified in JIS C 3306 or JIS C 3316.
- (3) Combination of testing wires is shown in Table 3.

Table 3

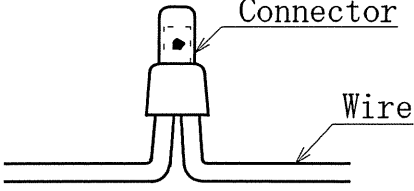
PART NO.	Combination of testing wires mm ² ×number of wires	
	MAX.	MIN.
CE 1	0.75×2	0.3×2
CE 2	1.25×2	0.5×2
CE 5	2.0×3	1.25×2
CE 8	3.5×2+2.0×1	2.0×2

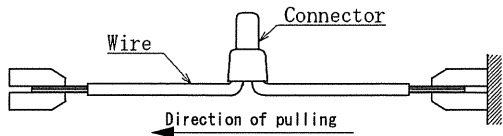
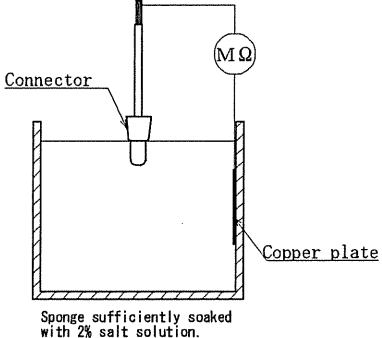
- (4) Test current and tensile load are given in Table 4.
- (5) Performance and test method are given in Table 5.

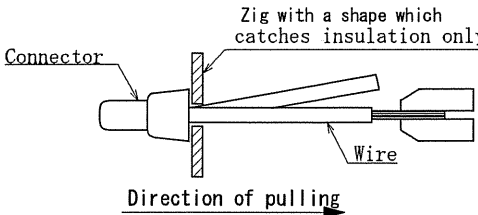
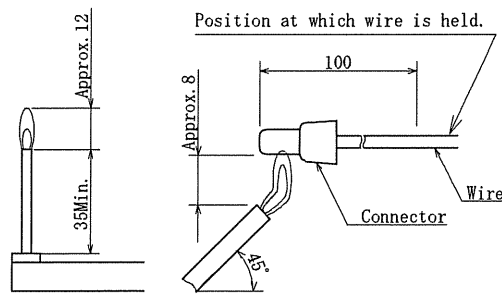
Table 4

Cross-sectional area of wire for performance test mm ²	Temperature test current (AC) A	Overcurrent cycle			Tensile load N
		Temperature test current (AC) A	Current duration s	Rest duration s	
0.3	3	10	1	19	40
0.5	5	17			70
0.75	7	24			100
1.25	12	42			170
2.0	17	60			250
3.5	23	80			450

Table 5

TEST	PERFORMANCE	METHOD
4.2 APPERANCE	Connectors shall be free from scratch, rust, fissure, crack and other trouble detrimental to serve.	Visual examination.
4.3 DIMENSION	Connectors shall comply with the dimensions specified in our drawings.	The dimensions shall be measured by a vernier calliper specified in JIS B 7507 or an apparatus at least equivalent in accuracy.
4.4 PLATING	The thickness of plating shall be more than 1 μ m.	The test shall be carried out on the sleeve according to the test in JIS H 8505. The measurement point shall be the central part of the outside of the sleeve.
4.5 CRIMP STYLE CONNECTION	The specimen shall be free from breakage of insulation, cracking of conductor and other trouble to serve.	After visual examination on the insulator, it shall be examined by magnifying glass x10~ on sleeve and the cross sectional area.
4.6 TEMPERATURE RISE	The temperature rise of crimped joint shall be not more than 20K.	Continuously pass the temperature test current of Table 4 until the temperature of the connector conductor almost stabilizes by the method shown in Fig. 1. <div style="text-align: center;"> <p>Fig. 1</p>  <p>Connector</p> <p>Wire</p> <p>■ : Measuring point</p> </div>
4.7 OVERCURRENT CYCLE	After the specimen is confirmed for performance of 4.6, subjected to the test of 4.7 and then the test of 4.6, the temperature rise shall be not more than 30K.	In the test, pass the overcurrent cycle testing current of Table 4 for the duration and rest the current for the duration shown in the same table by the method shown in Fig. 1. Count the above operation as one cycle, subject the specimen to 100,000 cycles.

TEST	PERFORMANCE	METHOD
4.8 TENSILE STRENGTH	No slip of connector sleeve and wire, break of wire, come out of wire or other trouble detrimental to serve shall occur at the crimped joint.	<p>Apply a tensile load not less than that shown in Table 4 by the method shown in Fig. 2 for 10 s. The pulling speed shall, as a rule, be a constant speed of 25mm/min, and arrange the test assembly so that the tension is applied to the center of wire as possible.</p> <p style="text-align: center;">Fig. 2</p> 
4.9 INSULATION RESISTANCE	The insulation resistance between the surface of insulation and the live part shall be not less than 50MΩ.	<p>In the test, measure the insulation resistance between the electrode and the live part, by the method of Fig. 3, using the 500V insulation resistance tester specified in JIS C 1302.</p> <p style="text-align: center;">Fig. 3</p> 
4.10 DIELECTRIC WITHSTAND VOLTAGE	The specimen shall withstand the test voltage.	In the test, apply a voltage of 1500V between the electrode and the live part for 1 min. by the method of Fig. 3.
4.11 RESISTANCE TO AGING	The specimen shall show no cracking, split, internal blister or other trouble detrimental to serve and shall comply with the provision of 3.5.	<p>In the test, place the specimen connected with wires by crimping and that not connected in a thermostatic chamber at $90 \pm 3^\circ\text{C}$ and allow them to stand for seven days.</p> <p>After tempering treatment, allow the specimen not connected with wire at normal temperature $20 \pm 15^\circ\text{C}$ and normal humidity $65 \pm 20\%$ for about 1 h and carry out the crimp-style connection, visually check conditions of insulation together with the specimens already connected, and then carry out the test of 4.10.</p> <p>* The connector shall be subjected to such tempering treatment that it is allowed to stand in an atmosphere of temperature $40 \pm 3^\circ\text{C}$ and relative humidity $90 \pm 2\%$ for 24 h, before exposure to the normal temperature and normal humidity for 1 h.</p>

TEST	PERFORMANCE	METHOD																		
4.12 FIRMNESS OF INSULATION	The insulation shall not fall down.	<p>In the test, apply a load of 50N gradually in the axial direction by the method shown in Fig. 4 for 10 s.</p> <p>Fig. 4</p> 																		
4.13 FLAME RETARDANCE	The flame remaining time at each operation shall be not more than 15 s and the total sum of flame remaining times shall not exceed 30 s.	<p>Hold the gas burner shown in Fig. 5(a) and the specimen as illustrated in (b) of Fig. 5. Apply the tip of flame to almost center of the insulation for 5 s, then remove the flame, and apply the flame to the same place for 5 s immediately after the remaining flame goes off. Carry out such operation three times.</p> <p>Fig. 5</p>  <p>(a) Gas burner (b) Flame application method</p>																		
4.14 RESISTANCE TO OIL	The insulation shall show no cracking, split, internal blister or other trouble detrimental to serve, and shall meet the provision of 4.10.	In the test, immerse the specimen into the insulation oil of class 1 No. 2 specified in JIS C 2320 heated to $70 \pm 3^\circ\text{C}$ for 4 h, take it out, visually examine conditions of the connector and then carry out the test of 4.10.																		
4.15 RESISTANCE TO CHANGE OF TEMPERATURE	The connector shall show no cracking, split, internal blister or other detrimental to serve and shall meet the provision of 4.10.	<p>Subject the specimen to the total five cycle continuous test under the test conditions shown in Table 6. After completion of the test, carry out the test of 4.10.</p> <p>Table 6</p> <table border="1" data-bbox="989 1780 1444 2038"> <thead> <tr> <th rowspan="2">Step</th> <th colspan="2">Test condition</th> </tr> <tr> <th>Temperature $^\circ\text{C}$</th> <th>Duration min</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1 cycle</td> <td>1</td> <td>-25 ± 3</td> <td>30</td> </tr> <tr> <td>2</td> <td>20 ± 15</td> <td>3</td> </tr> <tr> <td>3</td> <td>85 ± 2</td> <td>30</td> </tr> <tr> <td>4</td> <td>20 ± 15</td> <td>3</td> </tr> </tbody> </table>	Step	Test condition		Temperature $^\circ\text{C}$	Duration min	1 cycle	1	-25 ± 3	30	2	20 ± 15	3	3	85 ± 2	30	4	20 ± 15	3
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	Temperature $^\circ\text{C}$	Duration min																		
1 cycle	1	-25 ± 3	30																	
	2	20 ± 15	3																	
	3	85 ± 2	30																	
	4	20 ± 15	3																	

5. MARKING The following items shall be indelibly marked on an easily visible place of each products.

5.1 MARKING ON PRODUCTS

- (1) Part number, (2) Trade mark, (3) Wire range (AWG), (4) JIS mark (JIS products only),
(5) UL/CSA mark (Listed/Certified products only)

5.2 PACKAGE BOX Add on the provision of 5.1.

- (1) Type, (2) Quantity, (3) Lot No.

6. PACKAGE QUANTITY Given in Table 7.

Table 7

Part No.	Minimum package	Minimum container
CE1, CE2	100pcs/Vinyl bag	1000pcs/cardboard box
CE5, CE8		500pcs/cardboard box

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