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TO: _____

PRODUCTS SPECIFICATION

TYPE _____ INSULATED TERMINAL , RING _____

PART NO. _____ TMEX _____

ISSUED ON SEPTEMBER 8, 2016

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NICHIFU TERMINAL INDUSTRIES CO., LTD.
TECHNICAL SECTION, TECHNICAL DEPT.



APPROVED	CHECKED	CHECKED	PREPARED
<i>T. Ohba</i>	<i>M. Nakazato</i>	<i>S. Teramoto</i>	<i>m. tatsumi</i>
T. Ohba	M. Nakazato	S. Teramoto	M. Tatsumi

1. SCOPE This product specification is prepared by NICHIFU TERMINAL INDUSTRIES CO., LTD. for insulated crimp-type terminals that are crimped over their insulation (hereafter referred to as insulated crimp-type terminal, or terminal in general). The terminals are intended for connection of annealed copper stranded or solid wires principally used as internal wiring of electric power machines and apparatus, and wiring between such machines and apparatus, in such a manner that the terminals are connected to the ends of wires using crimping tools assigned by NICHIFU.

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

Table 1

TYPE	PART NO.		WIRE RANGE		APPLICABLE TOOL			
	INSULATOR SYMBOL	NOMINAL SIZE	STRANDED WIRE mm ²	AWG	HAND TOOL	PNEUMATIC TOOL		
						BODY	HEAD	APPLICATOR
INSULATED RING TERMINAL FOR COPPER CONDUCTORS	TMEX	0.3	0.2~ 0.5	24-20	NH 5 NH 32	NA 3 NA 10	N3 5 N10 10	— N10AP-T (-TM)
		1.25	0.3~ 1.65	22-16	NH 11 NH 32	NA 3 NA 10	N3 11 N10 11	— N10AP-T (-TM)
		2	1.04~ 2.63	16-14	NH 12 NH 32	NA 3 NA 10	N3 12 N10 12	— N10AP-T (-TM)
		5.5	2.63~ 6.64	12-10	NH 13	NA 3 NA 10	N3 13 N10 13	— N10AP-T (-TM)

NOTE ¹⁾ Nominal size without stud hole size.

3. RATINGS Given in Table 2

Table 2

Rated Voltage	600 V
Rated current	Refer to Amperage rating
Insulation Maximum Temperature	120°C (MAX)
Flame Retardant	UL94V2

4. MATERIAL Given in Table 3

Table 3

TYPE	TERMINAL	INSULATION CAP
MATERIAL	OXYGEN FREE COPPER (TIN PLATED)	POLYCARBONATE

5. PERFORMANCE AND TEST

5.1 TEST CONDITIONS

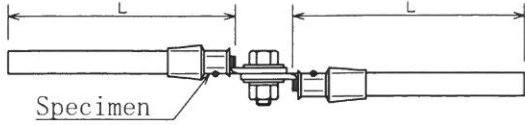
- (1) Unless otherwise specified, the tests shall be carried out in a room at ordinary temperature ($20 \pm 15^\circ\text{C}$) and ordinary humidity ($65 \pm 20\%$), as specified in JIS Z 8703. The tests of 5.6 and 5.7 shall be carried out by maintaining the specimens in draft free air at $15 \sim 35^\circ\text{C}$.
- (2) Copper stranded wires used for the tests are specified in JIS C 3306 (PVC insulated wire).
- (3) For the tests, the appropriate current and tensile load given in Table 4 shall be used. Test performance and manner are given in Table 5.

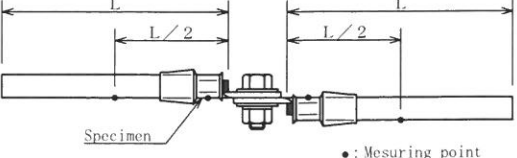
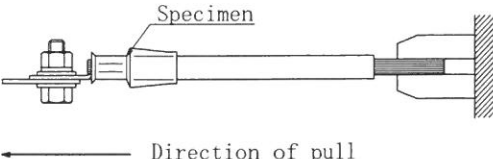
Table 4

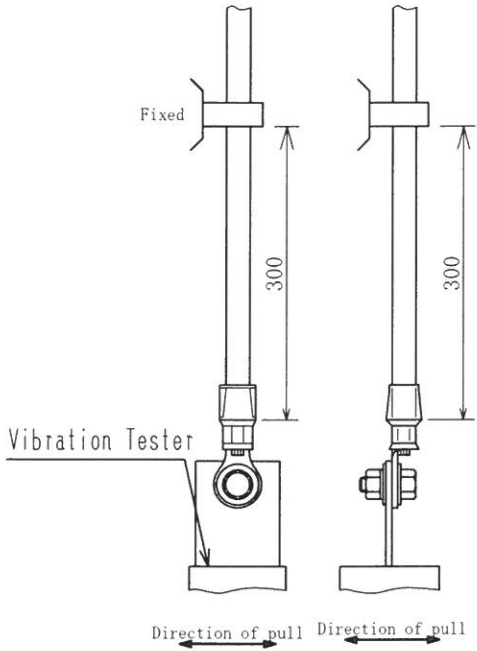
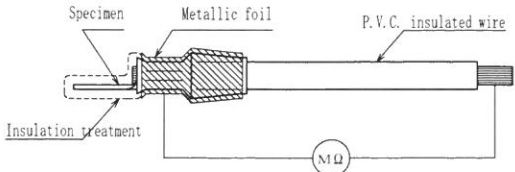
Nominal Size	Sectional area of P. V. C. insulated wire for performance test mm ²	Temperature test current A	Cyclic heating		Test current for withstanding overcurrent A	Tensile load N
			Test current A	Test duration Min		
0.3	0.2	5	8	30	25	30
	0.5	12	19		50	70
1.25	0.3	8	12		30	40
	1.25	19	30	45	160	200
2.0	1.25				250	290
	2.0				450	540
5.5	3.5	37	58		700	780
	5.5	48	76			

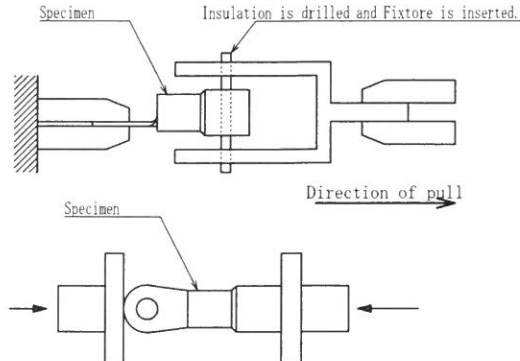
NOTE ²⁾ Tensile load for nominal size 1.25 & 2, and stud size less than 3.5mm should be 100N.

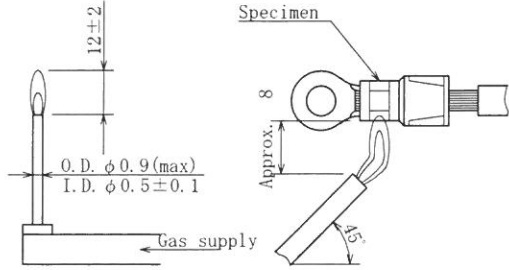
Table 5

ITEM	PERFORMANCE	TEST METHOD
5.2 APPEARANCE	The specimens must be free from scratches, rust, splits, cracks, or other defects detrimental to service.	Examined visually.
5.3 DIMENSION	The specimens must have the appropriate dimensions given in our drawings.	Examined using vernier calipers specified in JIS B 7507 or measuring apparatus at the least equivalent in accuracy.
5.4 METALLIC COATING	Thickness: Metallic coating of terminal shall be over 1 μ m.	The test is carried out by using the Electrolytic measuring method specified in JIS H8501 or fluorescent X-ray test method. Measuring position is at the tongue.
5.5 SECURENESS OF CRIMPED JOINT	The specimen must be free from cracks or splits on brazed part.	The surface of crimp and cross section is examined by using a magnifying glass at the least x 10.
5.6 TEMPERATURE RISE	Crimp joint shall not exceed 30K when the specimens are tested.	<p>The specimens shall be connected in series as illustrated in Fig.1. Test current specified in Table 4 is passed continuously until the temperatures of measuring points are stabilized. Temperatures shall then be measured.</p> <p style="text-align: center;">Fig. 1</p>  <p style="text-align: right;">∴ Measuring point</p>

ITEM	PERFORMANCE	TEST METHOD
5.7 CYCLIC HEATING	Temperature rise at the 25 th cycle must not be higher than the temperature of the connected wire. Temperature rise at the 125 th cycle shall not exceed the temperature rise at the 25 th cycle plus 8K.	<p>The specimens are assembled as illustrated in Fig.2. Test current specified in Table 4 is passed through the specimens for the duration specified in the same table and rested for the same duration as one cycle.</p> <p>The specimens shall be subjected to 125 cycles.</p> <p style="text-align: center;">Fig. 2</p>  <p style="text-align: right;">●: Measuring point</p>
5.8 RESISTANCE TO OVERCURRENT	The specimens must be free from melting, deformation, wire pull off, or other troubles detrimental to service, and shall comply with provisions of 5.9.	<p>The test current for overcurrent resistance specified in Table 4 is passed for 2 sec. In this procedure, the current must have a crest value equal to 2.5 times the test current at the first half cycle. The test frequency must be in the range of 80% to 120% of the usage frequency (60Hz).</p> <p>An oscillograph is used for measuring the test current, expressed in the value obtained from the below equation.</p> $I_t = \sqrt{\frac{1}{T} \int_0^T i^2 dt}$ <p>i: instantaneous current of short duration (A) T: 2 sec.</p>
5.9 TENSILE STRENGTH	The specimens must be free from wire slip off, breakage, deformation or other troubles detrimental to service at crimp joints of terminal and wire.	<p>The appropriate tensile load or over, as in Table 4, is applied to the specimens for 10 sec., as illustrated in Fig.3.</p> <p style="text-align: center;">Fig. 3</p>  <p style="text-align: center;">← Direction of pull</p>

ITEM	PERFORMANCE	TEST METHOD
5.10 VIBRATION FATIGUE	Specimens shall be free from breakage, wire pull off, cracks, or other troubles detrimental to service at the crimped joints of terminals and wire, and shall comply with the provision of 5.9.	<p>The assembled specimen is fixed at a point 300mm apart from the terminal, and vibration is applied in the two directions as illustrated in Fig. 4.</p> <p>Vibration is continuously applied for 8H, at a vibration frequency of 33Hz with a single-side amplitude of 1.5mm.</p> <p>The direction of vibration applied to specimen is changed as shown in Fig. 4, and such operation is carried out 2 times in each direction, for total of 32H.</p> <p style="text-align: center;">Fig. 4</p>  <p>The diagram shows two side views of a specimen being tested. In both views, the specimen is fixed at a point 300mm away from the terminal. The left view shows the specimen being pulled to the left, and the right view shows it being pulled to the right. The vibration is applied in these two directions. The terminal is labeled 'Fixed' and the distance is marked as '300'. The vibration is applied by a 'Vibration Tester' which is connected to the specimen. The direction of pull is indicated by arrows at the bottom.</p>
5.11 INSULATION RESISTANCE	The resistance measured between the surface of insulation and the charged part shall not be less than 100 MΩ.	<p>As illustrated in Fig. 5, metallic foil is wrapped closely to the insulation, covering the entire crimping surface as an electrode. The insulation resistance between the electrode and the charged part is measured with a 500V insulation resistance tester.</p> <p style="text-align: center;">Fig. 5</p>  <p>The diagram shows a specimen with a crimped joint. A metallic foil is wrapped around the insulation on the crimped joint. The foil is connected to a P.V.C. insulated wire, which is then connected to a meter (MΩ). The insulation treatment is also indicated.</p>

ITEM	PERFORMANCE	TEST METHOD								
5.12 WITHSTAND VOLTAGE	The specimens must withstand the test voltage.	As illustrated in Fig. 5, AC 3000V (at a frequency of 60 Hz) is applied between the electrode and the charged part for 1 minute.								
5.13 RESISTANCE TO THERMAL AGING	Specimen shall be free from cracks, splits, internal blisters, or other troubles detrimental to service, and shall comply with the provision of 5.12, when subjected to the test.	<p>A connected wire specimen and a non-connected wire specimen are placed in a humidity chamber at the temperature specified in Table 6 and left for 7 days. The non-connected specimen is then left at ordinary temperature and humidity for approx. 1 hour, and then connected with wire by crimping. The condition of insulation is examined visually along with the connected specimen.</p> <table border="1"> <caption>Table 6 Unit °C</caption> <tr> <th rowspan="2">Material of insulator</th><th colspan="2">Test temperature</th></tr> <tr> <th>Non connected Specimens</th><th>Connected specimens</th></tr> <tr> <td>Polycarbonate</td><td>100 ± 3</td><td>136 ± 3</td></tr> </table>	Material of insulator	Test temperature		Non connected Specimens	Connected specimens	Polycarbonate	100 ± 3	136 ± 3
Material of insulator	Test temperature									
	Non connected Specimens	Connected specimens								
Polycarbonate	100 ± 3	136 ± 3								
5.14 SECURENESS OF INSULATION	The insulation must not move over 1.0mm toward any direction within its axial.	<p>Axial load of 25N or more is gradually applied to the insulation of the specimen for 10 sec. in accordance with the procedure shown in Fig. 6.</p> <p>Fig. 6</p> 								

ITEM	PERFORMANCE	TEST METHOD
5.15 FLAME RETARDANCE	Flaming duration in each ignition cycle must not exceed 15 sec. and total flaming duration shall not exceed 30 sec.	<p>As in Fig.7, a gas burner is held under the specimen where the tip of the flame is applied around the center of the insulation for 5 sec. The flame is removed and then immediately applied to the same position for another 5 sec, for 3 times, if the residual flame fades out.</p> <p>Fig. 7</p> 
5.16 OIL IMMERSION	Specimen shall be free from cracks, splits, internal blisters, or other troubles detrimental to service, and shall comply with the provision of 6.12, when subjected to the test.	Specimen is immersed in insulating oil of class 1, No. 2 specified by JIS C 2320, heated at $70 \pm 3^\circ\text{C}$ for 4 hours. When removed from the oil, the condition of the insulation is visually examined.
5.17 COLD CRIMP PROPERTY	Specimen shall be free from cracks, splits, internal blisters, or other troubles detrimental to service in any part, and shall comply with the provision 5.12, when subjected to the test.	The specimen, tool and wire to be assembled are left at temperature of $20 \pm 2^\circ\text{C}$ for over one hour. The wire is then connected, and the assembled specimen is left at temperature of $-55 \pm 5^\circ\text{C}$ for over one hour. The condition is examined visually.

6. Marking The following items shall be indelibly marked on an easily visible place of each product:

6.1 PRODUCT

(1) Nominal size, (2) Trade name, (3) Wire range (AWG)

6.2 PACKING Provision 6.1 and following items shall be marked.

(1) Part name, (2) Part number, (3) Quantity, (4) Lot No.

7. PACKAGE Given in Table 7.

Table 7

	Individual packaging	Inner packaging
Type	Cardboard package plastic box	Cardboard package
Quantity	25pcs 50pcs 100pcs	Individual packaging×10

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