Product Approval Certificate

Name: Grade 180 direct-solderable polyurethane enameled copper litz wire
Model: LZ 2 UEWHS

Supplier Confirmation Section		
Quality Confirmation:	Shi Chuan	
Project Confirmation:	Liu Xile	
Verification confirmed:	Li Kun	
Final review: (Official seal of the Engineering Department)		
Customer Confirmation Section		
Final confirmation result	Oral qualification	☐ Unqualified
Quality Confirmation:		
Technical confirmation:		
Project Confirmation:		
Final review: (Official seal of the Technical Department)		

Released on December 17 , 2025
Implemented on December 17 , 2025

Grade 180 direct-solderable polyurethane enameled copper litz wire

1 Revise resume

Version	Revision time	Revisions
A1	2025-12-17	Newly formulated

Grade 180 direct-solderable polyurethane enameled copper litz wire

Ⅰ. Product Implementation Standards (Reference)

This standard refers to GB/T6109 IEC 60851.

Ⅱ. Product model and specifications

model	Specification	Product Name
LZ2UEWHS	Conductors : (See Table 1)	Grade 180 direct-solderable polyurethane enameled copper litz wire

Ⅲ: Usage Features

This product uses a 180-grade direct-solderable polyurethane insulation layer.

IV: Specifications and Parameters Table (surface 1)

Product Name/Model	Specification		Enameled single wire				stranded wire						
			Conductor diameter (mm)	minimal coating thickness Dual testing (mm)	Maximum outer diameter (mm)	Maximum conductor resistance at 20℃ (Ω/ km)	twisting method	Twisting	Number of stands	Number of twists/m	insulation destroy Voltage (≥V)	Maximum conductor resistance 20℃ (Ω/ km)	Maximum Outer diameter (mm)
LZ 2UEWH	0.08*	3	0.08±0.003	0.014	0.101	3778	Twisted	(S)	3	200±10	850	1297.11	0.21
LZ 2UEWH	0.08*	8	0.08±0.003	0.014	0.101	3778	Twisted	(S)	8	110±10	850	486.42	0.34
LZ 2UEWH	0.10*	6	0.10±0.003	0.016	0.125	2381	Twisted	(S)	6	95±10	950	408.74	0.35
LZ 2UEWH	0.10*	7	0.10±0.003	0.016	0.125	2381	Twisted	(S)	7	95±10	950	350.35	0.38
LZ 2UEWH	0.10*	8	0.10±0.003	0.016	0.125	2381	Twisted	(S)	8	95±10	950	306.55	0.41
LZ 2UEWH	0.10*	9	0.10±0.003	0.016	0.125	2381	Twisted	(S)	9	95±10	950	272.49	0.43
LZ 2UEWH	0.10*	10	0.10±0.003	0.016	0.125	2381	Twisted	(S)	10	90±10	950	245.24	0.46
LZ 2UEWH	0.10*	12	0.10±0.003	0.016	0.125	2381	Twisted	(S)	12	90±10	950	204.37	0.50

LZ 2UEWH	0.10*	13	0.10±0.003	0.016	0.125	2381	Twisted	(S)	13	85±10	950	188.65	0.52
LZ 2UEWH	0.10*	14	0.10±0.003	0.016	0.125	2381	Twisted	(S)	14	85±10	950	175.17	0.54
LZ 2UEWH	0.10*	15	0.10±0.003	0.016	0.125	2381	Twisted	(S)	15	83±10	950	163.50	0.56
LZ 2UEWH	0.10*	18	0.10±0.003	0.016	0.125	2381	Twisted	(S)	18	83±10	950	136.25	0.61
LZ 2UEWH	0.10*	20	0.10±0.003	0.016	0.125	2381	Twisted	(S)	20	80±10	950	122.62	0.65
LZ 2UEWH	0.10*	22	0.10±0.003	0.016	0.125	2381	Twisted	(S)	22	80±10	950	111.47	0.68

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Product Name/Model	Specification		Enameled single wire				stranded wire						
			Conductor diameter (mm)	minimal coating thickness Dual testing (mm)	Maximum outer diameter (mm)	Maximum conductor resistance at 20℃ (Ω/km)	twisting method	Twisting	Number of strands	Number of twists/m	insulation destroy Voltage (≥V)	Maximum Conductor resistance 20℃ (Ω/km)	Maximum Outer diameter (mm)
LZ 2UEWH	0.10*	25	0.10±0.003	0.016	0.125	2381	Twisted	(S)	25	80±10	950	98.10	0.72
LZ 2UEWH	0.10*	30	0.10±0.003	0.016	0.125	2381	Twisted	(S)	30	80±10	950	81.75	0.79
LZ 2UEWH	0.10*	35	0.10±0.003	0.016	0.125	2381	Twisted	(S)	35	80±10	950	70.07	0.85
LZ 2UEWH	0.10*	40	0.10±0.003	0.016	0.125	2381	Twisted	(S)	40	70±10	950	61.31	0.91
LZ 2UEWH	0.10*	45	0.10±0.003	0.016	0.125	2381	Twisted	(S)	45	70±10	950	54.50	0.97
LZ 2UEWH	0.10*	50	0.10±0.003	0.016	0.125	2381	Twisted	(S)	50	65±8	950	49.05	1.02
LZ 2UEWH	0.10*	55	0.10±0.003	0.016	0.125	2381	Twisted	(S)	55	60±8	950	44.59	1.07
LZ 2UEWH	0.10*	60	0.10±0.003	0.016	0.125	2381	Twisted	(S)	60	60±8	950	40.87	1.12
LZ 2UEWH	0.10*	65	0.10±0.003	0.016	0.125	2381	Twisted	(S)	65	60±8	950	37.73	1.16
LZ 2UEWH	0.10*	70	0.10±0.003	0.016	0.125	2381	Twisted	(S)	70	55±5	950	35.03	1.21
LZ 2UEWH	0.10*	75	0.10±0.003	0.016	0.125	2381	Twisted	(S)	75	50±5	950	32.70	1.25
LZ 2UEWH	0.10*	80	0.10±0.003	0.016	0.125	2381	Twisted	(S)	80	50±5	950	30.66	1.29
LZ 2UEWH	0.10*	90	0.10±0.003	0.016	0.125	2381	Twisted	(S)	90	50±5	950	27.25	1.37
LZ 2UEWH	0.10*	100	0.10±0.003	0.016	0.125	2381	Twisted	j(S)	100	45±5	950	24.52	1.44
LZ 2UEWH	0.10*	110	0.10±0.003	0.016	0.125	2381	Twisted	(S)	110	45±5	950	22.29	1.51
LZ 2UEWH	0.10*	120	0.10±0.003	0.016	0.125	2381	Twisted	(S)	120	40±5	950	20.44	1.58
LZ 2UEWH	0.10*	135	0.10±0.003	0.016	0.125	2381	Twisted	(S)	135	40±5	950	18.17	1.68
LZ 2UEWH	0.10*	150	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	150	①80±10 ②35±5	950	16.35	1.77
LZ 2UEWH	0.10*	160	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	160	①80±10 ②35±5	950	15.33	1.83
LZ 2UEWH	0.10*	180	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	180	①80±10 ②35±5	950	13.62	1.94
LZ 2UEWH	0.10*	200	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	200	①70±10 ②30±5	950	12.26	2.04
LZ 2UEWH	0.10*	220	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	220	①70±10 ②30±5	950	11.15	2.15
LZ 2UEWH	0.10*	750	0.10±0.003	0.016	0.125	2381	multiple twists	(S)	750	①80±10 ②35±5 ③20±5	950	3.27	3.96
LZ 2UEWH	0.18*	7	0.18±0.003	0.025	0.217	715.0	Twisted	(S)	7	90±10	1600	105.21	0.64
LZ 2UEWH	0.20*	10	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	10	70±10	1600	59.45	0.84
LZ 2UEWH	0.20*	12	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	12	70±10	1600	49.54	0.92

LZ 2UEWH	0.20*	20	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	20	60±8	1600	29.73	1.19
LZ 2UEWH	0.20*	25	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	25	60±8	1600	23.78	1.33
LZ 2UEWH	0.20*	35	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	35	55±7	1600	16.99	1.58
LZ 2UEWH	0.20*	40	0.20±0.003	0.027	0.239	577.2	Twisted	j(S)	40	55±7	1600	14.86	1.69
LZ 2UEWH	0.20*	45	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	45	50±6	1600	13.21	1.79
LZ 2UEWH	0.20*	50	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	50	50±6	1600	11.89	1.89

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Product Name/Model	Specification		Enameled single wire				Twisting						
			Conductor diameter (mm)	minimal coating thickness Dual testing (mm)	Maximum outer diameter (mm)	Maximum conductor resistance at 20℃ (Ω/km)	twisting method	Twisting	Number of strands	Number of twists/m	insulation destroy Voltage (≥V)	Maximum Conductor resistance 20℃ (Ω/km)	Maximum Outer diameter (mm)
LZ 2UEWH	0.20*	55	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	55	45±5	1600	10.81	1.98
LZ 2UEWH	0.20*	60	0.20±0.003	0.027	0.239	577.2	Twisted	(S)	60	45±5	1600	9.91	2.07
LZ 2UEWH	0.20*	65	0.20±0.003	0.027	0.239	577.2	multiple twists	(S)	65	①70±10 ②35±5	1600	9.15	2.15
LZ 2UEWH	0.20*	70	0.20±0.003	0.027	0.239	577.2	multiple twists	(S)	70	①70±10 ②35±5	1600	8.49	2.23
LZ 2UEWH	0.20*	75	0.20±0.003	0.027	0.239	577.2	multiple twists	(S)	75	①70±10 ②35±5	1600	7.93	2.31
LZ 2UEWH	0.20*	80	0.20±0.003	0.027	0.239	577.2	multiple twists	(S)	80	①70±10 ②35±5	1600	7.43	2.39

V. Technical Requirements and Testing

5.1 Appearance

5.1.1 Spool Appearance

1.1 Unscratched, smooth surface, not easily scratched with a fingernail, even color:

1.2 The strands should be uniformly twisted, and the cross-section should be free of irregularities , i.e., no protruding strands.

1.3 The type, specifications, color, number of strands, and labeling are correct.

Inspection instruments: Visual inspection

3. Inspection method: Visually inspect the color of the finished product, whether the stitching is uniform, and whether the number of strands and markings are correct.

5.1.2 Flat Cable quality

The surface of the line has no serious indentations or protrusions, and there is no serious unevenness in the wiring in the middle.

5.2 Dimensions and Tolerances

5.2.1 conductor

Take a 350mm length of intact, uninsulated conductor and measure 10 points. Take the average value as the bare wire size (it is recommended to use this for wires that are difficult to strip or require high insulation).

(Based on resistance per meter). The difference between the conductor size and the nominal value should not exceed the tolerances given in Table 1.

5.2.2 Measuring tools

For micrometers or optical diameter gauges, the accuracy should be higher than 2 μm when the sample size is greater than 0.200 mm ;when the sample size is small...

When the gauge is 0.200 mm or less, the accuracy of the measuring instrument should be higher than 1 μm . Both mechanical contact measuring instruments and optical non-contact measuring instruments are permitted . If a micrometer is used, the ratio P of its measuring force to the diameter of the measuring base should conform to the provisions of Table 1a. The diameter range of the measuring rod and the measuring base should also conform to the provisions of Tables 1a and 1b.

Table 1a Silk-covered litz wire

Winding wire types	conductor nominal diameter mm	Measuring base diameter mm	Force measurement N
Fiber-coated yarn	–	5 to 8	2-4

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5.2.3 Complete the outer diameter

Note: The measurement methods described below yield practically useful values, not precise outer diameters.

The outer diameter of the wire bundle is the width of the wire bundle layer wound on the conical rod divided by the number of turns. The wire bundle should be tightly wound with a certain tension as shown in Figure 1.

On the cone-shaped rod shown, the tension (N) is 65 times the sum of the nominal cross-sections (mm2) of each conductor in the bundle.

For wire bundles with an outer diameter less than or equal to 0.5 mm, the winding width should not be less than 10 mm; for wire bundles with an outer diameter greater than 0.5 mm, the winding width should not be less than 10 mm.

The diameter should be no less than 20 mm, with a measurement accuracy of 0.5 mm. Measure once. Record the outer diameter, accurate to 0.01 mm.

5.3.1 Flexibility and Adhesion

Fiber-coated enameled round wire

After winding, check the sample with normal vision or a magnifying glass of six times or less to see if the bare conductor or primer layer is exposed.

Measure three samples. Any exposed bare conductors or primer layers should be recorded in the report.

5.4.1 resistance

The DC resistance of the conductor shall be expressed as the value measured at 20 ° C. A DC resistance tester with an accuracy of better than 0.5% shall be used for testing. For a 1-meter sample, the maximum DC resistance measured at 20 ° C shall not exceed the calculated value derived from the minimum allowable cross-sectional area of the conductor—which is determined by the minimum thickness, minimum width, and maximum corner radius of the conductor. The electrical conductivity values are listed in Table 2.

Only one measurement is required. If the test temperature differs from 20 ° C, the DC resistance at 20 ° C ( ) shall be calculated using the following formula:

$$R20 = Rt / 1 - \alpha (t-20)$$

t Actual temperature during measurement. α Temperature coefficient, unit:

Within the range of 15◦ C~ 25◦ C, the temperature coefficient shall be α.

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$$20 = 3.96 \times 10 - 3\,K - 1$$

Table **2- Resistivity**

tensile strength		Maximum resistivity
tensile strength N . mm - 2	tolerance	Ω • mm2 • m- 1
80	- 0/+30%	1/58
120	- 0/+20%	1/58
150	- 0/+20%	1/58
180	- 0/+20%	1/57,5

5.4.2 Breakdown Voltage

Take a straightening sample approximately 350mm long, remove the insulation from one end, and then place it on a 25mm round rod. (Nominal thickness 2.50mm and...)

The following describes the testing process for a 25mm diameter round bar with its wide side bent. The sample is placed in the container of the breakdown voltage tester, surrounded by at least 5mm thick metal balls. The sample is covered with at least 90mm of metal balls (not exceeding 2mm in diameter), and the test values are recorded. When testing at room temperature, at least four out of five samples should not break down at voltages not less than or equal to those given in Table 7 , and the fifth should not break down at 50% below the specified value. When required by the customer, the conductor should be tested at a high temperature.

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5.4.3 Water needle hole

Testing Instrument: Pinhole Tester

Take a sample of approximately 1.5 meters for conductors with a diameter of ≤ 0.06 mm, and approximately 6 meters for conductors with a diameter of ≥ 0.07 mm. Immerse a 1-meter segment of the ≤ 0.06 mm sample and a 5-meter segment of the ≥ 0.07 mm sample without bending or stretching into the test solution, which consists of 3% isopropyl alcohol and 2% sodium chloride solution. Apply a 12V DC voltage for 1 minute and inspect the number of pinholes generated.

Ⅵ. Packing

1. PT-4 spools are packed in boxes of 4, with protective partitions between the spools. PT-10 spools are packed in boxes of 2. Each spool must be a finished product.

The line segment (without connecting to the second segment) is tightly packaged using PE film.

2. Inspect the instruments: Visual inspection.

3. Inspection method: Visually inspect whether there are protective partitions inside the box, and whether the weight of the label and the contents of the outer box meet the requirements.

4. Each delivery pallet should be labeled with the following information:

The size label and measurement on the spool, and the product name label identify the following information.

（1）Manufacturer's name and/or trademark （2）Model and specifications
（3）Production machine （4）Production date

（5）Production number （6）Net weight

（7）Inspection worker number (8) Compliance label

(9) Environmental label

Ⅶ. Issuance of wire inspection reports

One copy is issued for each specification per batch of goods, or as per customer requirements.

Ⅷ. Environmentally harmful substances

the requirements of document ZH-QP-40/B5 issued by Tinajin Rvyuan Electric Material Co.,Ltd.

Ⅸ. Inspection Rules

1. Paint film cracking: refers to a crack in the paint film that exposes the copper conductor.

Loss of adhesion of paint film: This means that after the test, the paint film can be peeled off the sample without any difficulty.

2. General provisions:

2.1 During the test, the temperature was 15℃ ~35℃., Relative humidity is 45% ~ 75%The sample was stabilized for a sufficient period of time under this environment.

2.2 During the test, the enameled wire specimen shall not be subjected to any tension or excessive bending.

3. Sampling method:

MIL-STD-105E(II) is used for full inspection.

X. Storage conditions

The temperature in a typical warehouse is controlled between 15℃ and 35℃., The shelf life is one year under the condition of relative humidity of 45% to 75% .