

编号 Spec. No. TAYA190111

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产品规格说明书 Specification

客户名称

Customer: _____

产品名称 聚氨酯自粘直焊铜圆漆包线

Commodity: Self-bonding enameled round
copper wire , class 155

产品规格 2SBUE-F 0.02~0.70

Specification: _____

日期 January 11 2020

Date: _____

编制 Originator

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1. 适用范围/Application

本规格书适用于 0.02~0.70 之 2UESB-F 聚氨酯自粘直焊漆包圆铜电磁线。

This specification applies to the self-bonding enameled round copper wire 2UESB-F 0.020~0.70mm.

2. 线型和名称/Description and designation

线型和名称举例，如表 1 所示/See table 1:

表 1/table 1

种类/Product name	名称/Type	规格/Gauge
155 级自粘直焊漆包圆铜线 Self-bonding enameled round copper wire	2UESB-F	0.020~0.70

3. 导体、绝缘层、自粘层和外观/ Conductor/Insulation layer/Self-bonding layer/Surface appearance.

3.1 导体/Conductor

电磁线的导体符合 GB/T 6109.1—2008 之相关规定。

The conductor of enameled wire shall be conform to GB/T 6109.1—2008(Annealed copper wire)

3.2 绝缘层和自粘层/Insulation layer and self-bonding layer

漆膜应均匀被覆盖于导体表面并经烘烤形成漆膜，漆膜不得有裂痕瑕斑，绝缘及自粘性能良好，漆膜对导体无害，有助于附锡性，且具有充分的耐久性。

The varnish uniformly enameled and baked on surface of conductor, without scratched on the surface. The finished wire shall be harmless to conductor, own to good capability of durable and self-bonding, and shall enable soldering without be peeled from the conductor.

3.3 外观/Surface appearance

外观须符合下列要求/Appearance shall be

① 无伤痕。Free from scratches.

② 表明光滑，颜色正当，色泽均匀。Smooth and uniform in luster and color.

③ 于常温下不互粘连。Not sticky under the normal temperature.

④ 于常温下不易用指甲剥落漆膜。The covering of wire is not easily peeled when rubbed by nail tip under the normal temperature.

3.4 温度指数/Temperature index

漆包线绝缘层为聚氨酯，温度指数为 155 级。（温度指数的测定应按照 IEC 60172 之规定进行）

Insulation of wire shall be composed of modified polyurethane resin. The temperature index is 155 (Defined by Thermal Endurance test based on IEC 60172)

4. 参数要求/Parameter requirement

线径导体，导体偏差，最小绝缘厚度，最大外径，直流电阻，符合表 3 要求。

Diameter conductor, conductor deviation, minimum insulation thickness, maximum external diameter, DC resistance, table 3.

5. 特性/Characteristic

按第 6 条的试验方法测试时，应符合表 2 之规定。

The Characteristic shall be as given in table in table 3

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表 2/Table 2

项目 Item	特性 Characteristic	条款 Clause	检测类型 Detection type
表面 Appearance	无裂痕及瑕疵. Smooth	6.1	R
尺寸 Dimensions	符合表 3 规定. See table 3	6.2	T, S
针孔 Pinhole	每 30 米少于 5 个. Less than 5 hole.	6.3	T, S
柔韧性 Flexibility	漆膜无裂痕, 导体不应露出. Film shall no crack through which conductor is visible.	6.4	T, S
附着性 Adherence	漆膜不应粘连 Film shall no crack through which conductor is visible.	6.5	T, S
击穿电压 Breakdown voltage	符合表 3 规定. See table 3	6.6	T, S
软化击穿 Cut-through	200℃ 以上. 200 and over	6.7	T, S
焊锡性 Solderability	焊锡均匀附着导体表面, 无残渣. Solder shall adhere to the conductor uniformly and no scum shall remain.	6.8	T, S
导体电阻 Resistance	符合表 3 规定. See table 3	6.9	T, S
延伸率 Elongation	符合表 3 规定. See table 3	6.10	T, S
粘结强度 Bonding strength	符合表 3 规定. See table 3	6.11	T, S

型式试验—T, 抽样试验—S, 例行检验—R。

Type approval test-T, Pick test-S, Routine inspeciton-R

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6. 测试方法/Test method

6.1 表面/Surface

当漆包线被收在线轴上时，用眼睛观察线表明是否有裂纹或瑕疵存在。

The wire shall be examined, as wound on bobbin, for existence of flaw and stain, by naked eye to determine its appearance.

6.2 尺寸/Dimensions

尺寸测试按照GB/T 6109.1-2008 中第 4 章进行。

Dimension test shall comply with GB/T 6109.1-2008, chapter 4.

6.3 针孔/Pinhole

针孔测试按照GB/T 6109.1-2008 中第 14 章进行。

Pinhole test shall comply with GB/T 6109.1-2008, chapter 14.

6.4 柔韧性/Flexibility

柔韧性测试按照GB/T 6109.1-2008 中第 8 章进行。

Flexibility test shall comply with GB/T 6109.1-2008, chapter 8.

6.5 附着性/Adherence

线与线之间不应粘连在一起，在线轴上用眼睛观察是否存在。

Adherence test shall comply with GB/T 6109.1-2008, chapter 8.

6.6 击穿电压/ Dielectric breakdown

击穿电压的测试按照GB/T 6109.1-2008 中第 13 章进行。

Dielectric breakdown test shall comply with GB/T 6109.1-2008, chapter 13.

6.7 软化击穿/Cut through

软化击穿的测试按照GB/T 6109.1-2008 中第 9 章进行。

Cut through test shall comply with GB/T 6109.1-2008, chapter 9.

6.8 焊锡性/Solderability

焊锡的测试按照GB/T 6109.1-2008 中第 17 章。

锡槽温度 (400~420) ±5 °C，浸入时间最大为 2s。Solderability test shall comply with GB/T 6109.1-2008, chapter 9.

The temperature of solder shall be maintained at (400~420) ±5°C.

6.9 导体电阻/Conductor resistance

导体电阻的测试按照GB/T 6109.1-2008 中第 5 章进行。

Conductor resistance test shall comply with GB/T 6109.1-2008, chapter 5.

6.10 延伸率/Elongation

延伸的测试按照GB/T 6109.1-2008 中第 6 章进行。

Elongation test shall comply with GB/T 6109.1-2008, chapter 6.

6.11 粘结强度/Tensile strength

粘结强度的测试按照GB/T 6109.1-2008 中第 18 章进行。

粘结温度推荐为 200~240°C。

Tensile strength test shall comply .

Bonding temperature recommended as 200~240°C.

6.12 再软化温度/Resoftening temperature

当绕制好的线圈在温度达到 170±5°C时，自粘层会逐渐软化变形。

When the winding coil reaches 170 ±5 °C, the self-adhesive layer will gradually soften and deform.

表 3/table 3

规格 Conductor [mm]	尺寸 [mm]				直流 电阻 Conductor resistance [Ω/m] (20℃)	击穿 电压 Min Dielectric break down voltage [V]	延伸率 Min Elongation [%]	粘结 强度 Min Bonding strength [g]
	导体公差 Tolerance [mm]	最小绝缘 层增量 Min film thickness [mm]	最小自粘 层增量 Min self-bonding thickness [mm]	最大完成 外径*1 Overall diamete r Max [mm]				
0.020	±0.001	0.0010	0.0010	0.032	53.8~57.4	700	6	3
0.025	±0.001	0.0020	0.0020	0.037	34.2~36.8	700	10	5
0.030	±0.001	0.0020	0.0020	0.042	22.8~26.2	700	12	5
0.035	±0.001	0.0020	0.0020	0.049	16.9~19.0	700	12	5
0.040	±0.001	0.0020	0.0020	0.055	13.0~14.5	700	14	5
0.045	±0.001	0.0020	0.0020	0.060	10.3~11.4	700	14	8
0.050	±0.002	0.0030	0.0030	0.069	8.11~9.53	700	16	8
0.055	±0.002	0.0030	0.0030	0.073	6.75~7.83	700	16	8
0.060	±0.002	0.0030	0.0030	0.078	5.71~6.53	700	17	8
0.065	±0.002	0.0030	0.0030	0.084	4.89~5.54	700	17	8
0.070	±0.002	0.0030	0.0030	0.090	4.23~4.75	700	18	8
0.075	±0.002	0.0030	0.0030	0.096	3.70~4.13	700	18	10
0.080	±0.002	0.0030	0.0030	0.101	3.18~3.64	700	20	10
0.090	±0.002	0.0030	0.0030	0.113	2.51~2.87	700	20	10
0.100	±0.002	0.0030	0.0030	0.125	2.04~2.33	700	20	10
0.11	±0.002	0.0040	0.0040	0.135	1.68~1.93	1500	20	10
0.12	±0.002	0.0040	0.0040	0.147	1.41~1.62	1500	20	10
0.13	±0.002	0.0040	0.0040	0.157	1.21~1.38	1500	20	10
0.14	±0.002	0.0040	0.0040	0.167	1.04~1.19	1500	20	10
0.15	±0.002	0.0040	0.0040	0.177	0.90~1.04	1500	20	10
0.16	±0.002	0.0040	0.0040	0.189	0.79~0.91	1500	20	15
0.17	±0.002	0.0040	0.0040	0.199	0.70~0.80	1500	20	15
0.18	±0.002	0.0040	0.0040	0.211	0.63~0.72	1500	20	15

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表 3/table 3

规格 Conductor [mm]	尺寸 [mm]				直流 电阻 Conductor resistance [Ω/m] (20°C)	击穿 电压 Min Dielectric break down voltage [V]	延伸率 Min Elongatio n [%]	粘结 强度 Min Bondin g strengt h [g]
	导体公差 Tolerance [mm]	最小绝缘 层增量 Min film thickness [mm]	最小自粘 层增量 Min self-bondin g thickness [mm]	最大完成 外径*1 Overall diameter Max [mm]				
0.19	±0.002	0.0040	0.0040	0.221	0.56~0.64	1500	20	15
0.20	±0.002	0.0040	0.0040	0.231	0.50~0.58	2000	20	15
0.21	±0.002	0.0050	0.0050	0.241	0.46~0.52	2000	21	20
0.22	±0.002	0.0050	0.0050	0.252	0.39~0.48	2000	21	20
0.23	±0.002	0.0050	0.0050	0.264	0.38~0.44	2000	21	20
0.24	±0.002	0.0050	0.0050	0.274	0.36~0.41	2000	21	20
0.25	±0.002	0.0050	0.0050	0.284	0.33~0.37	2000	21	20
0.26	±0.002	0.0050	0.0050	0.294	0.30~0.34	2000	21	20
0.27	±0.002	0.0050	0.0050	0.305	0.28~0.32	2000	21	20
0.28	±0.002	0.0050	0.0050	0.315	0.26~0.30	2000	21	20
0.29	±0.002	0.0050	0.0050	0.325	0.24~0.28	2000	21	20
0.30	±0.003	0.0050	0.0050	0.337	0.226~0.26	2000	21	25
0.33	±0.003	0.0060	0.0060	0.375	0.186~0.21	3000	22	50
0.35	±0.003	0.0060	0.0060	0.387	0.166~0.19	3000	24	50
0.37	±0.003	0.0060	0.0060	0.419	0.147~0.17	3000	24	50
0.40	±0.003	0.0060	0.0060	0.455	0.126~0.147	3500	25	50
0.45	±0.003	0.0060	0.0060	0.515	0.100~0.115	3500	25	50
0.50	±0.003	0.0060	0.0060	0.571	0.082~0.0926	4000	26	50
0.60	±0.003	0.0060	0.0060	0.680	0.058~0.0636	4000	26	50
0.70	±0.003	0.0060	0.0060	0.790	0.043~0.0464	4000	26	50

8. 每轴线的包装和净重/Packing and Net weight of each bobbin

8.1 每轴线应紧密缠绕在线轴上，不应出现排列松散、乱线等从而影响交货及使用。

Wire shall be wound on the proper bobbin to prevent wire from slackness or tangles.

Proper packing shall be done to prevent wire from damage and tangle of wire during delivery

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8.2 每轴净重/ Net weight of each bobbin

交货的产品净重应符合表 4 的规定。

The standard net weight per bobbin, **minimum** and **maximum** net weight per bobbin shall comply with Table 4.

8.3 关于线头/Coiling in section

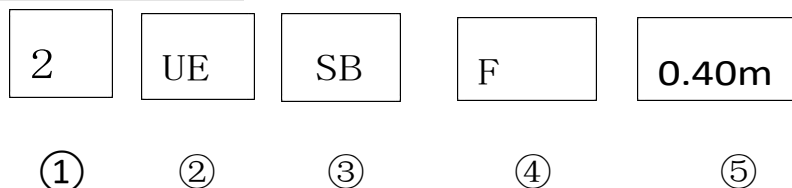
每轴线必须保证只有一个线头。

If wires are wound on a bobbin, the bobbin shall contain one length of wire.

表 4/table 4

规格 Conductor diameter [mm]	每轴净重/Net weight per bobbin [Kg]			盘型 Bobbin
	标准 Standard	最小 Minimum	最大 Maximum	
0.020~0.029	0.3	0.1	0.4	HK76/45
0.030~0.070	1.5	0.5	2	PT-2
0.071~0.25	3	1.5	4	PL/PT-4
0.25 以上	10	5	12	PT-10/PT-15

9. 产品命名/Name of products



- ① 漆膜。paint film
- ② 绝缘层材料。Insulating material
- ③ 自粘层材料。Self-adhesive layer material
- ④ F 级。Gread F
- ⑤ 导体直径。Conductor diameter

10. 标签/. Labeling

每轴线盘标签应包含以下内容/Label shall be attached on the bobbin or package and following items shall be identified on the attached label. :

- ① 规格、型号/Wire type or designation and nominal conductor diameter .
- ② 漆包线净重/Net weight .
- ③ 直流电阻及外径（20℃）/DC resistance and external diameter(20℃)。
- ④ 生产序列号/Production serial number.

11. 引用标准/The quotation form the standard

- ① GB/T 6109-2008 漆包圆绕组/ GB/T 6109-2008 Enamelled circular winding
- ② GB/T 4074-2008 绕组线试验方法/ GB/T 4074-2008 Test methods for winding wires
- ③ IEC 60172 测定漆包线温度指数的试验方法/IEC 60172 Test method for determining

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