

TAI-I ELECTRIC WIRE&CABLE CO., LTD.

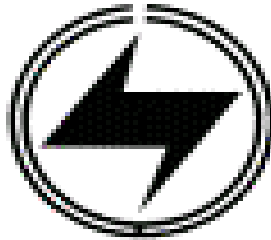
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SPECIALIZING IN MANUFACTURING OF
VARIOUS OF MAGNET WIRES

NO 25 TA TUNG ROAD
FENGSHAN,HUKOU.
HSINCHU HSIEN,TAIWAN,
R.O.C

REGISTERED



TRADE MARK

Spec NO:2015014

Date:JUL.07.2015

SPECIFICATION

**FOR
EIW**

Polyesterimide Enameled copper wire

Applicable Standard :IEC 60317-8

JIS C 3216

Submitted by

Approved by

TAI-I ELECTRIC WIRE&CABLE CO., LTD.

Mu-ming Huang
Chief of Technical Division



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1. Scope

This Standard specifies *EIW* enameled copper wires to be used in windings and wirings of electric machines and apparatus, electric communication equipment, electronic equipment and electrical instruments.

2. Classes and Symbols

The wires are classified according to the conductor and thickness of film, and the classes and symbols shall be as Table 1.

Table 1

Grade	Symbol	Size (mm)
Grade 1 EIW enameled copper wire	Gr1 EIW	0.05~2.24
Grade 2 EIW enameled copper wire	Gr2 EIW	0.05~2.24

3. Thermal Class

UL approved NO E85640

TI : 180°C

4. Characteristics

The characteristics of the wires shall comply with Table 2, when tested in accordance with 6.

Table 2

No	Test items	Characteristics		Test Method		
				Test requirements	Clause used	
1	Dimensions	Comply with Attached Table 2		————	6.2	
2	Pin hole	Grade 1	Grade 2	L=6M	6.3	
		5 Max.	3 Max.			
3	Flexibility	The coating shall show no crack on the conductor		Nominal Diameter (mm)	Mandrel Winding	6.4
				0.05~1.60	1D	
4	Adhesion	The coating shall show no crack on the conductor		————	6.5	



No	Test items	Characteristics	Test Method		
			Test requirements	Clause used	
5	Resistance to abrasion	Comply with IEC 60317-0-1 Table 2	_____	6.6	
6	Breakdown Voltage	Comply with Attached Table 5	_____	6.7	
7	Cut through	300°C Min	No failure shall occur within 2 min.		
8	Heat shock resistance	The Coating shall show no crack on the conductor	Nominal diameter(mm)	Stretched or mandrel	6.9
			0.05~1.60	Comply with IEC 60317-0-1	
			Heated 1/2Hr at 200±5°C		
9	Continuity	Comply with IEC 60317-0-1	The number of faults per 30m of wire shall not exceed the values given in Table3		
10	Conductor Resistance	Comply With Attached Table 5	_____	6.11	
11	Elongation	Comply With Attached Table 5	_____	6.12	
12	Springiness	Comply With Attached Table 5	_____	6.13	

5. Conductor, Insulating Film and Appearance



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5.1 Conductor

The conductor shall be copper wire specified in JIS C 3103-Annealed Copper Wires for Windings of Electric Machines.

5.2 Insulating Film

The insulating film of the wire shall be made by baking Polyesterimide insulating varnish for enamelled wires on the conductor uniformly and perfectly. The film shall be harmless to the conductor and shall have sufficient durability.

6. Testing Methods

6.1 Appearance

This shall comply with JIS C 3216 Testing Methods for Enamelled Copper and Aluminum wires.

6.2 Dimensions

This shall comply with the R20 and R40 Table of IEC 60317-0-1

6.3 Pinhole

This shall comply with 7 of JIS C3216--5.

6.4 Flexibility

This shall comply with 8 of IEC 60317-8.

6.5 Adhesion

This shall comply with 8 of IEC 60317-8.

6.6 Resistance to abrasion

This shall comply with 11 of IEC 60317-8.

6.7 Breakdown Voltage

This shall comply with 13 of IEC 60317-8.

6.8 Cut through

This shall comply with 10 of IEC 60317-8.

6.9 Heat shock resistance

This shall comply with 9 of IEC 60317-8.

6.10 Continuity

This shall comply with 14 of IEC 60317-8.

Continuity of insulation (nominal conductor diameters up to and including 1,600 mm)

The number of faults per 30m of wire shall not exceed the values given in table 3.



Table 3 – Continuity of insulation

Nominal conductor Diameter Mm		Maximum number of faults Per 30m		
Over	Up to and including	Grade 1 and grade 1B	Grade 2 and grade 1B	Grade 3
-	0.050	60	24	-
0.050	0.080	60	24	3
0.080	0.125	40	15	3
0.125	1.600	25	5	3

6.11 Conductor resistance

This shall comply with 5 of IEC 60317-8.

6.12 Elongation

This shall comply with 6 of IEC 60317-8.

6.13 Springiness

This shall comply with 7 of IEC 60317-8.

7. Inspection

Inspection shall be made on the following items by the testing methods of 6.

- (1) Appearance
- (2) Dimensions
- (3) Pinhole
- (4) Flexibility
- (5) Adhesion
- (6) Resistance to abrasion
- (7) Breakdown voltage
- (8) Cut through
- (9) Heat shock resistance
- (10) Continuity of insulation
- (11) Conductor resistance
- (12) Elongation
- (13) Springiness

8. Packaging and Net Weight per coil

8.1 Packaging

The wire shall be wound, without slackness or tangle, on a



bobbin of suitable size according to the conductor diameter, or shall be coiled in a container of suitable size without tangle, and shall be suitably packaged so as not to be damaged or entangled in transportation.

8.2 Net Weight per Coil

The net weight per coil shall comply with Table 4.

Table 4

Conductor diameter (mm)	Bobbin type	Net weight Per coil (kg)	Take up minimum weight
0.05~0.15	PT-4	4±1	0.8
0.10~0.32	PT-10	10±5	4
0.16~0.35	PT-15	15±5	8
0.35~2.24	PT-25	25±7	18
0.50~2.24	PT-90	90±15	50

9. Designation of Product

The product shall be designated by the class and conductor diameter, or by the symbol and conductor diameter.

Example : Grade 1 EIW enameled copper wire 0.50mm or Gr1 EIW 0.50mm

10. Marking

The bobbin or container shall be marked at a suitable place with the following items :

- (1) Class or symbol
- (2) Conductor diameter
- (3) Manufacturing Number
- (4) Net weight
- (5) Manufacturer's name or mark
- (6) Year and month of manufacturing

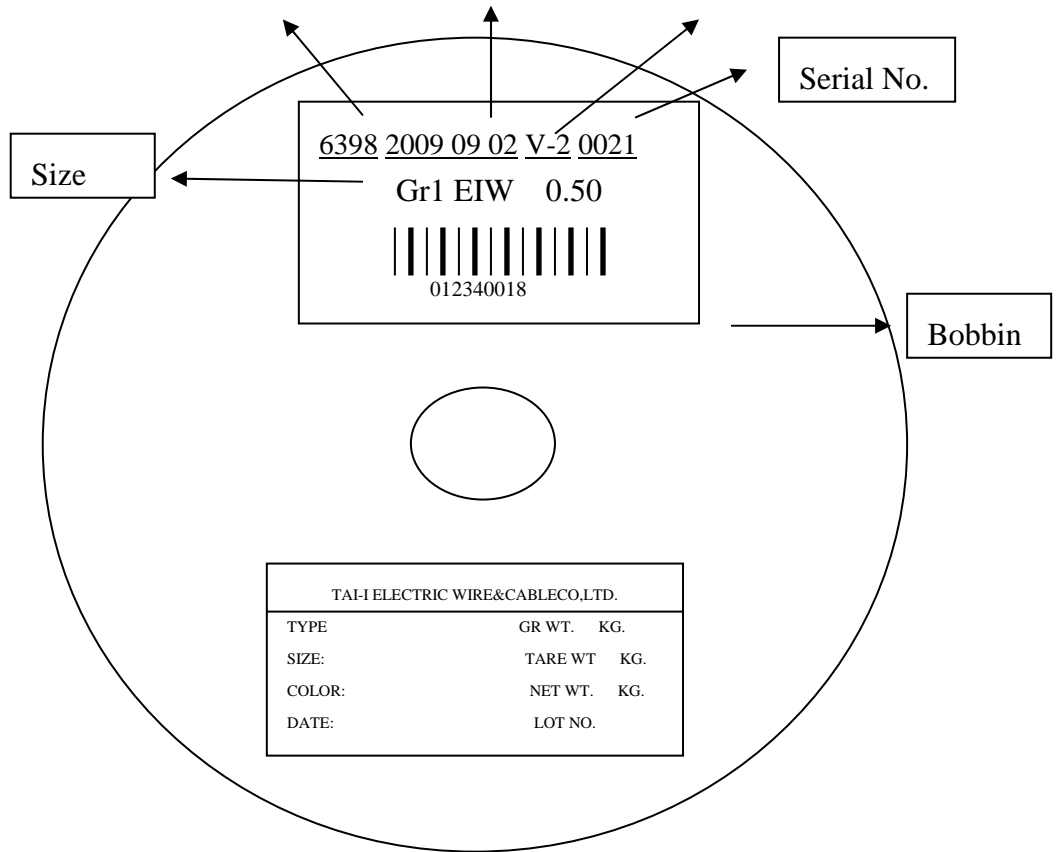
Lot No.

Date of Production

Machine No.



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TAI-I ELECTRIC WIRE&CABLECO,LTD.			
TYPE:Gr1 EIW	GR WT.	26.95 KG.	
SIZE: 0.500	TARE WT	0.78 KG.	
COLOR:N	NET WT.	26.17 KG.	
DATE: 12/19/09			
NO 31019965			

IF THERE IS ANY QUESTIONS OCCURRED ON WIRES , PLEASE SUBMIT THESE TWO LABELS TO US FOR FURTHER INVESTIGATION. THANKS.

OBMW2

MAY 16,2003



TAI-I ELECTRIC WIRE & CABLE CO.,LTD

Magnet Wire-Component

E85640**TAI-I ELECTRIC WIRE&CABLE CO LTD****10TH FL 129 MING SHENG EAST RD · SEC 3 TAIPEI TAIWAN**

Mtl Dsg	Coat Typ			ANSI Type(+)	TI _c Temp ^{°C}	
	BC	OC				
UEWE	Polyurethane	Polyamide		MW28C	130	
UEW	Polyurethane			MW75C	130	
PEW	Polyester	---		MW5C	155	
PEWN	Polyester	Polyamide		MW24C	155	
FTW	Polyester	---		MW5C	155	
FTW E	Polyester	Polyamide		MW24C	155	
EIW	Polyester-imide	---		MW30C	180	
EIW.H	Polyester-imide	Polyamide-imide		MW35C	200	
DFW F	Polyester-imide	Polyamide-imide		MW73C	200	
AIW	Polyamide-imide	---		---	220	
UEWF-E	Polyurethane	Polyamide		MW80C	155	
UEWF	Polyurethane	---		MW79C	155	
UEWB	Polyurethane	---		MW75C	130	
AIW-C	Polyamide-imide	---		---	220	
EIWHA	Polyester(amide)(imide)	Polyamide-imide		MW35C	200	
FTWH	Polyester(amide) (imide)	Polyamide-imide		MW35C MW73C	200	
SMEIW	Polyester-imide	---		MW77C	180	
		Basecoat	Middlecoat	Topcoat	ANSI(Type+)	Temp ^{°C}
FBWHA	Polyester-imide	Polyamide-	Polyamide	---	200	
FBWHC		imide				

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Attached Table 5- Dimension Table of <i>EIW</i> (IEC)											
Conductor		Grade 1 (Gr1 <i>EIW</i>)		Grade 2 (Gr2 <i>EIW</i>)		Dielectric Breakdown (V)		Maximum conductor resistance Ω/m (20°C)	Elongation %	Springiness \leq^0	
Diameter (mm)	Tolerance (mm)	Minimum Increase due to The Insulation (mm)	Maximum overall diamter (mm)	Minimum Increase due to The Insulation (mm)	Maximum overall diamter (mm)	Grade 1	Grade 2			Grade 1	Grade 2
0.05	± 0.003	0.007	0.060	0.012	0.066	300	600	9.489	10	—	—
0.056	± 0.003	0.007	0.067	0.012	0.074	325	650	7.565	10	—	—
0.06	± 0.003	0.007	0.073	0.012	0.080	375	700	6.756	12	—	—
0.071	± 0.003	0.007	0.084	0.012	0.091	425	700	4.747	13	72	82
0.080	± 0.003	0.007	0.094	0.014	0.101	425	850	3.703	14	70	80
0.090	± 0.003	0.008	0.105	0.015	0.113	500	900	2.900	15	67	77
0.10	± 0.003	0.008	0.117	0.016	0.125	500	950	2.333	16	64	73
0.110	± 0.003	0.009	0.128	0.017	0.137	1300	2700	1.917	17	64	73
0.112	± 0.003	0.009	0.130	0.017	0.139	1300	2700	1.735	17	64	73
0.120	± 0.003	0.010	0.138	0.019	0.147	1500	2800	1.604	17	62	70
0.130	± 0.003	0.011	0.150	0.021	0.160	1600	3000	1.361	18	59	67
0.140	± 0.003	0.011	0.160	0.021	0.171	1600	3000	1.170	18	59	67
0.150	± 0.003	0.012	0.171	0.023	0.182	1700	3200	1.016	19	59	67
0.160	± 0.003	0.012	0.182	0.023	0.194	1700	3200	0.890	19	59	67
0.170	± 0.003	0.013	0.194	0.025	0.205	1700	3300	0.787	20	57	65
0.180	± 0.003	0.013	0.204	0.025	0.217	1700	3300	0.701	20	57	65
0.190	± 0.003	0.014	0.216	0.027	0.228	1800	3500	0.628	21	54	62



0.200	± 0.003	0.014	0.226	0.027	0.239	1800	3500	0.566	21	54	62
0.210	± 0.003	0.015	0.238	0.027	0.252	1900	3700	0.512	21	51	59
0.224	± 0.003	0.015	0.252	0.029	0.266	1900	3700	0.434	21	51	59
0.230	± 0.004	0.017	0.261	0.029	0.274	2100	3900	0.430	22	49	56
0.250	± 0.004	0.017	0.281	0.032	0.297	2100	3900	0.363	22	49	56
0.270	± 0.004	0.018	0.302	0.033	0.319	2200	4000	0.310	22	47	53
0.280	± 0.004	0.018	0.312	0.033	0.329	2200	4000	0.278	22	47	53
0.290	± 0.004	0.019	0.324	0.034	0.340	2200	4100	0.268	22	47	53
0.310	± 0.004	0.019	0.344	0.035	0.362	2200	4100	0.234	23	50	55
0.320	± 0.004	0.020	0.354	0.035	0.372	2300	4300	0.220	23	48	53
0.330	± 0.004	0.020	0.367	0.037	0.386	2300	4300	0.207	23	48	53
0.340	± 0.004	0.020	0.377	0.038	0.396	2300	4300	0.194	23	48	53
0.350	± 0.004	0.020	0.387	0.038	0.406	2300	4300	0.183	23	48	53
0.370	± 0.005	0.021	0.409	0.039	0.429	2300	4400	0.165	24	45	50
0.400	± 0.005	0.021	0.439	0.040	0.459	2300	4400	0.141	24	45	50
0.450	± 0.005	0.022	0.491	0.042	0.513	2300	4400	0.111	25	44	48
0.500	± 0.005	0.024	0.544	0.045	0.566	2400	4600	0.090	25	43	47
0.550	± 0.006	0.025	0.596	0.047	0.620	2500	4600	0.074	26	41	44
0.560	± 0.006	0.025	0.606	0.047	0.630	2500	4600	0.0715	26	41	44
0.600	± 0.006	0.027	0.649	0.050	0.674	2600	4800	0.062	27	46	50
0.630	± 0.006	0.027	0.679	0.050	0.704	2600	4800	0.05638	27	46	50
0.700	± 0.007	0.028	0.752	0.053	0.779	2600	4800	0.046	28	44	47
0.710	± 0.007	0.028	0.762	0.053	0.789	2600	4800	0.044	28	44	47



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0.800	± 0.008	0.030	0.855	0.056	0.884	2600	4900	0.035	28	41	43
0.850	± 0.009	0.032	0.909	0.060	0.939	2700	5000	0.031	28	45	48
0.900	± 0.009	0.032	0.959	0.060	0.989	2700	5000	0.028	29	45	48
1.000	± 0.010	0.034	1.062	0.063	1.094	2700	5000	0.022	30	42	45
1.060	± 0.011	0.034	1.124	0.065	1.157	2700	5000	0.01995	30	42	45
1.100	± 0.011	0.034	1.164	0.065	1.197	2700	5000	0.018	30	39	41
1.120	± 0.011	0.034	1.184	0.065	1.217	2700	5000	0.01785	30	39	41
1.151	± 0.012	0.035	1.217	0.065	1.250	2700	5000	0.0164	30	39	41
1.180	± 0.012	0.035	1.246	0.067	1.279	2700	5000	0.0156	31	39	41
1.200	± 0.012	0.035	1.266	0.067	1.299	2700	5000	0.0151	31	35	37
1.250	± 0.013	0.035	1.316	0.067	1.349	2700	5000	0.0143	31	35	37
1.290	± 0.013	0.035	1.358	0.067	1.392	2700	5000	0.0131	31	35	37
1.300	± 0.013	0.036	1.368	0.069	1.402	2700	5000	0.0129	32	35	37
1.400	± 0.014	0.036	1.468	0.069	1.502	2700	5000	0.0111	32	32	34
1.500	± 0.015	0.038	1.570	0.071	1.606	2700	5000	0.0097	32	32	34
1.600	± 0.016	0.038	1.670	0.071	1.706	2700	5000	0.0085	32	28	30
1.800	± 0.018	0.039	1.872	0.073	1.909	2700	5000	0.006913	32	—	—
2.000	± 0.020	0.040	2.074	0.075	2.112	2700	5000	0.0056	33	—	—
2.240	± 0.022	0.041	2.316	0.077	2.355	2700	5000	0.004422	33	—	—

