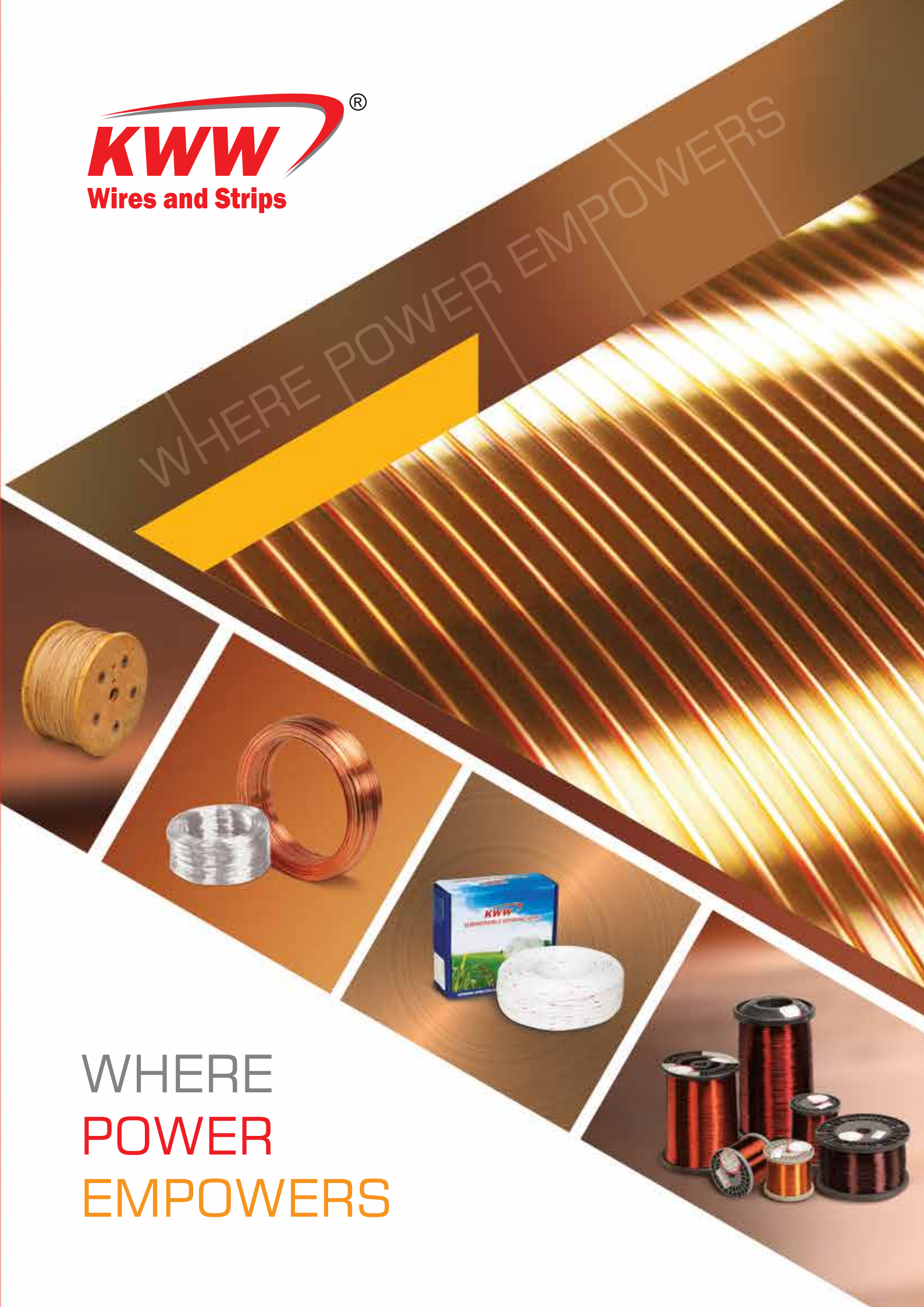
KWW®

Wires and Strips



WHERE POWER EMPOWERS

ABOUT US

Khaitan Winding Wire Pvt. Ltd. (KWW) was incepted in the year 1995. Since then, the company has established itself as the most acknowledged manufacturer and supplier of superlative quality of Enamelled Winding Wire made of Copper & Aluminium and Submersible Winding Wire.

To have a stellar presence in the industry KWW is manned by specially trained expert staff who operate proficiently & productively to give the best to all its customers. To deliver products and satisfy the expectations of the customers, the company gives umpteen importance to the quality and for this has installed 'state of the art' machineries and equipments imported from different countries. This along with the adherence to the ethics and core values mounts to the growing recognition and success of the company at large and it has been serving Indian industry since 25 years.

EWW is produced as per IEC, IS, BS, NEMA standard. Our customers are based all over India and includes Large & Medium Electrical equipment manufacturers and retailers for replacement / reparing sector.

VISION, MISSION & VALUES

1. To be a true value leader in manufacturing of Copper & Aluminium Wires and Strips.
2. Be a highly effective, lean and fast-moving organization.
3. Be a great place to work where people are inspired to give their best.

ENAMELLED ROUND COPPER WIRE

KWW has steadily worked to raise the industry standards and has developed a full range of enamelled round copper wire. These wires meet all requirements and applications while providing advanced services to boost manufacturing efficiency.

Particular	Thermal Class	Specification	Size Range
Polyester Enamelled copper wire	130	IS 13730 / IEC 60317 Part - 34:2000	8 SWG to 40 SWG 4.00 mm to 0.120 mm
Modified Polyester Enamelled copper wire	155	IS:13730 / IEC 60317 Part- 3:1996	8 SWG to 40 SWG 4.00 mm to 0.120 mm
Polyesterimide Enamelled copper wire	180	IS:13730 / IEC60317 Part - 8:1996	8 SWG to 40 SWG 4.00 mm to 0.120 mm
Self Solderable (Polyurethane) Enamelled copper wire	155 180	IS:13730/IEC 60317 Part - 20:1993 IS:13730/IEC 60317 Part - 51	21 SWG to 40 SWG 0.80 mm to 0.120 mm 21 SWG to 40 SWG 0.80 mm to 0.120 mm
Poly Vinyl Acetal Enamelled copper wire	105	IS:13730/IEC 60317 Part : 1:1993	8 SWG to 25 SWG 4.00 mm to 0.50 mm
Dual Coated Polyesterimide (Base coat) With Polyamide -imide (Top coat) copper wire	200	IS:13730/IEC - 60317 Part : 13:1993	8 SWG to 40 SWG 4.00 mm to 0.120 mm

- **Packing :** PT-1, PT-4, PT-6, PT-10, PT-25, PT-45, PT-90 & as per customers requirements
- **Application :** Motors - AC/DC, Transformers, Alternators, Relay Coils, White goods appliances, Fans, Light fittings & other electrical & electronic equipments

RECTANGULAR ENAMELLED COPPER STRIPS

In addition to producing enamelled round copper wire, KWW is also a leader in enamelled rectangular copper wires. Our product offerings support the most demanding and specific requirements.

Particular	Thermal Class	Specification	Size Range
Modified Polyester Enamelled Rectangular copper strips	155	IS 13730/IEC 60317 Part - 16:1996	Width - 3 mm to 15 mm, Thick - 1.0 to 4.5 mm Cross section area 5 to 65 sq.mm
Polyesterimide Enamelled Rectangular copper strips	180	IS:13730/IEC 60317 Part- 28:1996	Width - 3 mm to 15 mm, Thick - 1.0 to 4.5 mm Cross section area 5 to 65 sq.mm
Dual coated Polyesterimide (base coat) with Polyamide - imide (Top coat) Enamelled rectangular copper strips	200	IS:13730/IEC 60317 Part- 29:1996	Width - 3 mm to 15 mm, Thick - 1.0 to 4.5 mm Cross section area 5 to 65 sq.mm
Poly Vinyl acetal enamelled Rectangular copper strip	105	IS:13730/IEC 60317 Part- 17:1996	Width - 3 mm to 15 mm, Thick - 1.0 to 4.5 mm Cross section area, 5 to 65 sq.mm

Packing :

Flange Dia (mm) +/- 5mm	Qty (kg)
350	40
400	60
450	90
500	120

Application : Transformers, Traction Motor, Alternator, H.V. Motors & Generators

PAPER INSULATED COPPER / ALUMINIUM WIRES & STRIPS

Paper Insulated Copper / Aluminium Wires & Strips are commonly used for winding coils of transformers and other electrical equipment. We manufacture various types of (single/double/triple/multiple) paper insulated copper / aluminium conductors in accordance with international standards as well as per customer's design requirements.

Particular	Specification	Size Range
Paper covered (Electrical grade Imported Kraft paper) Round copper conductor	IS 7404 Part 1:1991	0.8 mm to 4.00 mm
Paper covered (Electrical grade Imported Kraft paper) Rectangular copper conductor	IS 13730/IEC - 60317 Part 27:2018	Width - 3 mm to 25 mm Thick - 1.0 mm to 5.0 mm Cross sectional area 5 to 75 sq. mm
Aromatic Polyamide (Nomex) Paper covered Rectangular Copper conductor Temp-Index 200	IS11174:1984	Width - 3 mm to 25 mm Thick - 1.0 mm to 5.0 mm Cross sectional area 5 to 75 sq. mm
Mica covered Rectangular Copper conductor	As per customers Specification	Width - 3 mm to 25 mm, Thick - 1.0 mm to 5.0 mm Cross sectional area 5 to 75 sq. mm
Polyester Film covered Rectangular Copper Conductor	As per customers Specification	Width - 3 mm to 25 mm Thick - 1.0 mm to 5.0 mm Cross sectional area 5 to 75 sq. mm
Paper covered (Electrical grade Imported Kraft paper) Round aluminium conductor	IS 6162 Part 1:1971	2.00 mm to 4.00 mm
Paper covered (Electrical grade Imported Kraft paper) Rectangular aluminium conductor	IS 6162 Part 11:1971	Width - 3 mm to 25 mm Thick - 1.0 mm to 5.0 mm Cross sectional area 5 to 75 sq. mm

Packing :

Flange Dia (mm) +/- 5mm	Qty (kg)
350	40
400	60
450	90
500	120

Application : Transformers (Dry & oil immersed) Power stabilizers & heavy Electrical Equipments.

Paper winding configuration - Buttlap, overlap and interleaved

BARE COPPER / ALUMINIUM WIRE & STRIPS

Particular	Specification	Size Range
Bare Copper/Aluminium Wires (Anealed or Hard)	IS 4412	1.0 mm to 6.00 mm
Bare Copper/Aluminium Strip	IS 1897 / IS 6160	Width - 3 to 45 mm, Thickness - 1.0 mm to 10 mm Cross Sectional area - 5 to 250 sqmm

Packaging : Wires & Strips : 40 kg to 100 kg Bundle / spool

Application :

- Bare copper wire : Bunched conductor, wire rope, cable, cotton, paper & Fibre Glass covered insulation & various types of electrical & Electronic equipments.
- Bare Copper Strips : For paper, Nomex and Fibre glass insulation which is used in transformer industry and switch-gear, Control panel and other types of Electrical Equip-ments
- Electical Conductivity (IACS@20^{0}C) - 100% minimum for annealed wire

ALUMINIUM FOIL

Foil thickness	0.75mm to 3.00mm
Foil width	Upto 30mm
Product form	Coil
Coil ID (As Per Costumer Req.)	200mm+/-5mm
Coil OD (As Per Costumer Req.)	660mm+/-5mm
Coil Weight (As Per Costumer Req.)	15.5Kg approx.(Depends on OD)

Packaging : In coil & bobbin

Application : Inverter & Transformer Industries

SUBMERSIBLE WINDING WIRE

"KWW" Winding Wires have excellent electrical, mechanical, thermal and chemical properties. We manufacture poly wrapped winding wire made out of continuous Cast Copper Rod for submersible pump motors which are insulated with best quality Polyster and biaxially oriented Poly-propylene films. The Copper Conductor of 99.99% purity and high conductivity is drawn and annealed to stringent specifications.

Sl. No	Nominal Conductor Diameter (mm)	Tollerance + (mm)	Nominal Resistance Ohms/KM At 20°C	Over All Diameter (mm)	Weight of Poly Wrapped (kg/km)	Elongation Minimum (%)
1	0.40	0.004	137.15	0.70	1.467	24
2	0.50	0.005	87.78	0.80	2.154	25
3	0.60	0.006	60.96	0.90	2.980	26
4	0.70	0.007	44.78	1.00	3.946	28
5	0.80	0.008	34.29	1.10	5.052	28
6	0.90	0.009	27.09	1.20	6.298	29
7	1.00	0.010	21.94	1.30	7.683	30
8	1.10	0.011	18.14	1.50	9.208	30
9	1.20	0.012	15.24	1.60	10.873	31
10	1.30	0.013	12.98	1.70	12.678	32
11	1.40	0.014	11.20	1.80	14.891	32
12	1.50	0.015	9.75	1.90	16.989	32
13	1.60	0.016	8.57	2.00	19.227	32
14	1.70	0.017	7.59	2.10	21.605	32
15	1.80	0.018	6.77	2.20	24.122	32
16	1.90	0.019	6.08	2.30	26.780	32
17	2.00	0.020	5.49	2.50	29.576	33
18	2.10	0.021	4.98	2.60	32.513	33
19	2.20	0.022	4.53	2.70	35.589	33
20	2.30	0.023	4.15	2.80	38.850	33
21	2.40	0.024	3.81	2.90	42.161	33
22	2.50	0.025	3.51	3.00	45.656	33
23	2.60	0.026	3.25	3.10	49.291	34
24	2.70	0.027	3.01	3.20	53.066	34
25	2.80	0.028	2.80	3.30	56.980	34
26	2.90	0.029	2.61	3.40	61.035	34
27	3.00	0.030	2.44	3.50	65.228	34

Features :

- Less current leakage - No air gap between the films
- Each coil tested at 3500V
- Heat shock test - At 150°C
- Manufactured by ultra modern automatic plant as per IS 8783 (Part-4/Sec-3)

Application : Used in submersible pumps motor of all sizes for Domestic and Industrial applications.

ENAMELLED ROUND ALUMINIUM WIRE

With the growth in demand for Enamelled Aluminium Wire, Khaitan Winding Wire Pvt. Ltd. has ventured into manufacturing of Enamelled Aluminium Wire.

To deliver products and services which conform to international standards and satisfy the expectations of the customer, the Company gives umpteen importance to the quality and for this, the Company has installed "state of the art" machineries & equipments which includes Rod Break down machine and inline drawing cum enamelling machine with ultrasonic cleaner imported from different countries.

Particular	Thermal Class	Specification	Size Range
Polyester Enamelled round aluminium wire	130	IS 13730 / IEC 60317 Part - 9:2000	10 SWG to 27 SWG 3.50 mm to 0.4 mm
Modified Polyester Enamelled round aluminium wire	155	IS:13730 / IEC 60317	10 SWG to 27 SWG 3.50 mm to 0.4 mm
Polyesterimide Enamelled round aluminium wire	180	IS:13730 / IEC 60317 Part - 15:1996	10 SWG to 27 SWG 3.50 mm to 0.4 mm
Self Solderable (Polyurethane) Enamelled round aluminium wire	155	IS:13730 / IEC 60317	10 SWG to 27 SWG 3.50 mm to 0.4 mm
Dual Coated Polyesterimide (Base coat) With Polyamide -imide (Top coat) round aluminium wire	200	IS:13730 / IEC - 60317 Part - 25:1993	10 SWG to 27 SWG 3.50 mm to 0.4 mm

Enamelled aluminium wire is produced as per IEC, IS, BS, NEMA standards. Our customers are based all over India and includes large & medium Electrical equipment manufacturers and retailers for replacement/ repairing sector.

- **Packing:** PT-15, PT-25, PT-35, PT-45, PT-90 & as per customers requirement.
- **Application:** Electrical Motors / Transformers / Automobile / Home Appliances / Light Fittings / Fans / Pump & Other Electrical & Electronic Equipments.

CORONA RESISTANT WINDING WIRES

In inverter driven motors, excessive surges and voltage peaks during speed variation, creates corona discharge in the stator windings, which induce extra thermal stress on the insulation, causing excessive thermal ageing there by weakening and even decomposing of the insulation, leading to premature failure of motors. Corona induced failure is a typical phenomenon. Improved dielectric materials having resistance to corona discharge-induced deterioration would therefore be highly necessary.

PROCESSING OF CORONA RESISTANT ENAMELED WIRES

Dual coated wire, with Ployesterimide as the base coat and Polyamidemide as the topcoat has been the most commonly used for applications up to thermal class 200. As discussed earlier, even these types of wire are susceptible to corona related failures. In order to overcome this deficiency, base coat is replaced with special corona resistant enamel.

- Basecoat of corona resistant wire enamel class 200° C
- Middle coat of corona resistant enamel class 200° C
- Top coat of polyamide-imide (PAI) class 200° +

We process corona resistant wire in the range 3 mm to 0.63 mm. These corona resistant wires are tested for higher proof voltage and at elevated temperatures. These are certain guide lines about the voltage endurance test by RDSO. Our product conforms to requirements of standards.

Comparison of test result for 1.12 mm winding wire without impregnation

Sr. No	Tests	Test Method	DC Wire	Corona Resistant Wire
1	Cut through, 320°C, 2 min	IEC 60317 Part-13	Passes	Passes
2	Cut through, 400°C, 2 min	Special Test	Passes	Withstands > 5min
3	Break down voltage, KV	IEC 60317 Part-13	11.0	12.0
4	Break down voltage at 200°C	IEC 60317 Part-13	1.0	11.0
5	Proof Voltage, 2.0 KV for 72hrs	Special Test	2/3 Passes	3/3 Samples Passes
6	Heat Shock 3xd, 220°C, 30 min	IEC 60317 Part-13	Passes	Passes
7	Heat Shock 3d, 240°C, 30 min.	Special Test	Passes	Passes
8	Heat Shock 1xd, 260°C, 30 min.	Special Test	2/3 Passes	Passes

From our evaluation which includes the above test results we found this special coated wire is having a higher lifetime compared to traditional DC wire (PEI+PAI), since this wire could with stand higher proof voltage of 2.0KV which is also the indirect effect of voltage surges and peaks under inverter drives.

SUPER ENAMELED ALUMINUM STRIPS

INTRODUCTION

Uncertainty and higher metal cost in copper have raised the need for alternate conductor metal in various electrical applications. Aluminum being the next good conductive material is most popular as replacement of copper. In certain applications like transformer windings this transition is happening rapidly. We proudly announce the addition of Super Enameled Aluminum Strips in the global product range. The manufacturing of bare aluminum strips is critical process, being the soft metal characteristics of aluminum. We have most advanced technique machinery to make the aluminum conductors with precision controls in conductor dimensions and better surface properties. At the same time the insulation strength and flexibility has to be excellent to withstand the winding stresses bending / shaping etc. We provide very special attention towards the flexibility and adherence of the insulation film of enameled strips.

PRODUCT RANGE

Width	15 mm Max	3.00 mm Min
Thickness	5 mm Max	1.5 mm Min
Cross section Area	75 mm2 Max	5 mm2 Min

SPECIFICATION

PVA Class 105	IEC 60317-67, NEMA MW 18A
PVA Class 120	IEC 60317-68
Dual Coat Class 200	IEC 60317-73
Dual Coat Class 220	IEC 60317-69, NEMA MW 36A
Polyester-imide Class 180	IEC 60317-74

Advantages

- Automated machines for Aluminum strip making enameling
- Online quality monitoring through blister and pin hole detectors
- Variety of class of insulations and variety in packing spools
- Stringent test procedures for consistent quality

GLASS FIBRE/DAGLAS COVERED WIRE/STRIPS

Glass fibre-lapped conductors (bare or enamelled) are very suitable for windings of electric motor stators, generators, special transformers and high voltage motors heavy magnet coils etc. In general this insulation can be applied, where high mechanical strength and high insulation properties are required. Most common application is in traction motors. It exhibits a very high degree of mechanical and thermal stability; either for class F and H insulation, when impregnated with polyester, polyester-imide or epoxy based impregnating varnishes.

MANUFACTURING RANGE (IN MM)

Glass Fibre Covered Copper / Aluminium Wire & Strips.

Width		Thickness		Cross Section Area (sq. mm.)	
Min.	Max.	Min.	Max.	Min.	Max.
4	25	2	6	8	100

Nominal width of conductor		Increase in Dimension (mm)							
		Glass fiber wound over bare conductor				Glass fiber wound over Grade-2 enameled			
		Single Covering		Double Covering		Single Covering		Double Covering	
Over	Up to and including	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
-	3.15	0.13	0.20	0.20	0.32	0.24	0.36	0.31	0.48
3.15	6.30	0.14	0.22	0.22	0.37	0.25	0.38	0.34	0.52
6.30	12.50	0.16	0.23	0.25	0.41	0.27	0.44	0.36	0.56
12.50	16.00	0.18	0.32	0.27	0.45	0.28	0.48	0.38	0.61

SPECIFICATONS

CLASS : 155°	IEC 60317-32 (IS 13730-32)
CLASS : 180°	IEC 60317-31 (IS 13730-31)
CLASS : 200°	IEC 60317-33 (IS 13730-33) (NEMA 41, 43 & 50)

APPLICATIONS

- Electric Stator Motors
- Special Transformers
- High Voltage Motors Magnet Coils
- Generators

QUALITY

The company has an excellently designed in-house quality testing department where latest machinery and equipment are installed for effective quality assurance. It aims to enlarge its capability continuously in the value chain and become the most preferred player with commitment to quality, safety, environment, cost economics and delivery. A great combination of technology, information, experience & qualified manpower gives us that extra edge to be among the leaders in this sector. Training programs are held from time to time to improve the quality consciousness & skills of the workforce. Moreover, all of our employees necessarily abide by the principles & procedures set by the "Handbook of Quality Assurance" in order that all products are in compliance with customer requirements and national and international standards & law.

CERTIFICATES


DNV

MANAGEMENT SYSTEM CERTIFICATE

Khaitan Winding Wire (P) Ltd.

ISO 9001:2015

IATF 16949:2016 ISO 9001:2015 ROHS


DNV

MANAGEMENT SYSTEM CERTIFICATE

Khaitan Winding Wire Pvt. Ltd.

IATF 16949:2016


CERTIFICATE

KHAITAN WINDING WIRE (P) LTD.

ACCREDITATION

Commitment expects recognition. We have bagged the prestigious ISO 9001:2015, UL & IATF 16949:2016. ROHS certification and our products also boast of the ISI marks. Moreover, we are awarded BBB- rating by Brickwork.

IS:13730 (PART-3)

IS:13730 (PART-8)

ISO 9001 REGISTERED DNV Certification BV

File no. E 317640

RDSO Transforming Railways

FRAMEWORK

Moving from strength to strength with persistence and commitment the company has installed most modern plant & machineries for drawing as well as enamelling of copper & aluminium wires and strips.

The company is also equipped with latest material handling equipments like Crane, Forklift etc. for easy handling of materials. Weighment and packing of material is done through computerize barcode labeling.

The company visualizes to benchmark itself against global standards and be in alignment with world class standards in all it activities from Selecting equipments to manpower, maintenance, manufacturing & after sales service. To produce concentric conductors, free from surface defects and excellent mechanical properties, low oxy electrolytic grade copper is drawn in tandem high speed RBD with in line resistance annealing machine. The best available wire enamels are used to impart di-electric strength & corrosion resistance while systematic periodic & preventive maintenance enable us to live up to high Corporate standards & delivery commitments.

TECHNICAL DATA

Thermal Class	120/E	130/B	155/F		180/H	200/N	
Chemical Base of Enamel	Polyvinyl Acetal	Modified Polyester	Polyurethane Solderable	Modified Polyester	Theic Modified Polyesterimide	Theic Modified Polyesterimide + Polyamideimide	Polyamide-imide
Specification IS IEC Nema 1000	13730-12 60317-12 -	13730-34 60317-34 -	13730-20 60317-20 MW 79C	13730-3 60317-3 MW 5C	13730-8 60317-8 MW 30C	13730-13 60317-13 MW 76C	13730-26 60317-26 MW 81C
Range (mm) SWG	4.00-0.500 8-25	4.00-0.12 8-40	0.800-0.12 21-40	4.00-0.12 8-40	4.00-0.12 8-40	4.00-0.12 8-40	4.00-0.12 8-40
Cut Through ^{0}C	170	240	200	240	300	320	350
Heat Shock ^{0}C	155	155	175	175	200	220	220
Abrasion Resistance	Excellent	Good	Fair	Good	Execellent	Excellent	Excellent
Flexibility/Adherence	Excellent	Good	Good	Good	Execellent	Excellent	Fair
Characteristics	Golden Color Excellent Mechanical Properties and Resistance to Transformer Oil	Brownish Color Excellent Flexibility & Heat Stock	Good Solderability & High Moisture Resistance	Excellent Heat Shok with Balanced Electrical & Mechanical Properties	High Adhesion Heat Shok & Thermal Resistance	Execellent Hermatic Resistance & High Speed Windability	Excellent Thermal Properties, Heat Shock, Abrasion Resistance, Low Coefficient of Friction, Freon Resistance
Application	Oil Filled Transformers, Domestic Appliances, Chokes & Ballasts, filled with resins	Fans, Motor, Transformers, Relay Coils	Electronic Equipment	Electric Motors, Transformers, Appliances, Hand Tools	Hermatic Motors, Transformers, Hand Tools, Motors for Arduous Duties	Dry Type Transformers, Hermatic Motors, Automotive Altemators Solenoids	Hermatic Motors, Oil Filled Transformers, high speed Winding

MAXIMUM PERMISSIBLE WIRE FORCE DURING WINDING

Nominal Conductor Diameter	Maximum Winding Force N*	Nominal Conductor Diameter mm	Maximum Winding Force N*
0.018	0.03	0.224	3.34
0.020	0.05	0.250	4.10
0.022	0.06	0.280	5.05
0.025	0.07	0.315	6.18
0.028	0.09	0.355	7.65
0.032	0.11	0.400	9.46
0.036	0.14	0.450	11.60
0.040	0.17	0.500	13.95
0.045	0.21	0.560	17.05
0.050	0.25	0.630	21.00
0.056	0.30	0.710	25.80
0.063	0.36	0.800	31.70
0.071	0.44	0.900	38.80
0.080	0.54	1.000	46.30
0.090	0.65	1.120	56.00
0.100	0.78	1.250	68.00
0.112	0.95	1.400	82.20
0.125	1.08	1.600	102.00
0.140	1.43	1.800	123.50
0.160	1.81	2.000	147.50
0.180	2.25	2.240	185.00
0.200	2.72	2.500	230.00

*1 N = 102 g

STANDARD SWG SIZE

Nominal Conductor Diameter		Conductor Toler-ance	Fine Covering Grade 1		Medium Covering Grade 2		Thick Covering Grade 3		Conductor Resistance at 20 C for 1 meter (ohms)		
			minimum increase in Dia	maximum overall Dia	minimum increase in Dia	maximum overall Dia	minimum increase in Dia	maximum overall Dia			
SWG	mm	mm	mm	mm	mm	mm	mm	mm	nominal	maximum	minimum
8	4.064	0.041	0.049	4.155	0.092	4.201	0.138	4.245	0.001317	-	-
9	3.657	0.037	0.047	3.745	0.089	3.790	0.134	3.833	0.001627	-	-
10	3.251	0.033	0.046	3.336	0.086	3.380	0.130	3.422	0.002059	-	-
11	2.946	0.030	0.045	3.029	0.084	3.072	0.127	3.112	0.002508	-	-
12	2.642	0.027	0.043	2.722	0.081	2.764	0.123	2.783	0.003118	-	-
13	2.337	0.024	0.042	2.415	0.079	2.455	0.119	2.493	0.003985	-	-
14	2.032	0.020	0.041	2.108	0.077	2.147	0.116	2.184	0.005271	-	-
15	1.829	0.019	0.040	1.903	0.075	1.941	0.113	1.977	0.006506	-	-
16	1.626	0.017	0.039	1.698	0.073	1.735	0.110	1.770	0.008232	-	-
17	1.422	0.015	0.038	1.492	0.071	1.528	0.107	1.562	0.01076	-	-
18	1.219	0.013	0.035	1.285	0.067	1.318	0.100	1.350	0.01465	-	-
19	1.016	0.011	0.034	1.080	0.065	1.113	0.098	1.144	0.02108	-	-
20	0.914	0.010	0.034	0.976	0.063	1.008	0.095	1.038	0.02605	0.02686	0.02528
21	0.813	0.009	0.032	0.872	0.060	0.902	0.090	0.931	0.03293	0.03396	0.03194
22	0.711	0.008	0.030	0.766	0.056	0.795	0.085	0.822	0.04305	0.04442	0.04175
23	0.610	0.006	0.027	0.659	0.050	0.684	0.075	0.708	0.05848	0.06017	0.05687
24	0.559	0.006	0.025	0.605	0.047	0.629	0.071	0.652	0.06965	0.07178	0.06760
25	0.508	0.006	0.025	0.554	0.047	0.578	0.071	0.601	0.08434	0.08711	0.08168
26	0.457	0.005	0.024	0.501	0.045	0.523	0.067	0.544	0.1042	0.1075	0.1011
27	0.417	0.005	0.022	0.458	0.042	0.480	0.064	0.500	0.1252	0.1293	0.1212
28	0.376	0.005	0.021	0.417	0.040	0.435	0.060	0.454	0.1539	0.1595	0.1487
29	0.345	0.005	0.020	0.382	0.038	0.401	0.057	0.418	0.1829	0.1888	0.1772
30	0.315	0.004	0.019	0.349	0.035	0.367	0.053	0.384	0.2193	0.2269	0.2121
31	0.295	0.004	0.019	0.329	0.035	0.347	0.053	0.364	0.2501	0.2592	0.2414
32	0.274	0.004	0.018	0.306	0.033	0.323	0.050	0.339	0.2899	0.3011	0.2792
33	0.254	0.004	0.018	0.286	0.033	0.303	0.050	0.319	0.3374	0.3512	0.3242
34	0.234	0.004	0.017	0.265	0.032	0.281	0.048	0.296	0.3974	0.4149	0.3809
35	0.213	0.003	0.015	0.241	0.029	0.255	0.043	0.269	0.4798	0.4978	0.4625
36	0.193	0.003	0.014	0.219	0.027	0.232	0.039	0.245	0.5842	0.6081	0.5618
37	0.173	0.003	0.013	0.197	0.025	0.210	0.036	0.222	0.7271	0.7596	0.6967
38	0.152	0.003	0.012	0.174	0.023	0.186	0.033	0.197	0.9418	0.9888	0.8982
39	0.132	0.003	0.011	0.152	0.021	0.162	0.030	0.171	1.2496	1.3192	1.1841
40	0.122	0.003	0.010	0.141	0.019	0.151	0.028	0.160	1.4623	1.5502	1.3811
41	0.112	0.003	0.009	0.130	0.017	0.139	0.026	0.147	1.7354	1.8477	1.6318
42	0.102	0.003	0.009	0.119	0.017	0.128	0.026	0.136	2.0923	2.2398	1.9574
43	0.091	0.003	0.008	0.107	0.016	0.115	0.023	0.122	2.6298	2.8348	2.4423

ENAMELLED RECTANGULAR COPPER WINDING WIRES

Properties	Type Class	PVA 105	Mod. PE 155	PEI 180	DC (PEI + PAI) 200
Standard	IS:13730	Part 17	Part 16	Part 28	Part 29
	IES-317	Part 17	Part 16	Part 28	Part 29
	NEMA 1000	MW 18C	-	-	MW 36C
Thickness	mm	2.5 mm	2.5 mm	2.5 mm	2.5 mm
Covering	Grade	G2	G2	G2	G2
Elongation (%) (min.)	IS/IEC-Min.	30	30	30	30
	Nema-Min.	32	-	-	32
	KWW Value	40	40	40	40
Springiness (Deg.) (max.)	IS/IEC-Max.	5.0	5.0	5.0	5.0
	NEMA-Max.	5.0	-	-	5.0
	KWW Value	4.0	4.0	4.0	4.0
Flexibility (No Crack)	IS/IEC	4×W/T	4×W/T	4×W/T	4×W/T
	NEMA	30% Prest.	-	-	30% Prest.
	KWW Value	3×W/T	3×W/T	3×W/T	3×W/T
Heat Shock (½hr) Deg-C	IS/IEC	155-6×T	175-5×T	200-6×T	220-6×T
	NEMA	150-30% Pt	-	-	220-30% Pt
	KWW Value	175-6×T	200-5×T	200-6×T	240-6×T
BDV (V)	IS/IEC-Min.	2000	2000	2000	2000
	NEMA-Min.	2500	-	-	2500
	KWW Value	3200	3200	3200	3200
Range (mm)	Width	3.0-15.0	3.0-15.0	3.0-15.0	3.0-15.0
	Thickness	1.5-4.5	1.5-4.5	1.5-4.5	1.5-4.5
Application		For E Class Oil, Synthetic liquid filled transformers, AC/DC alternator motors, Turbo generators and Traction motors.	For F Class Dry type transformers, AC/DC alternator motors, Turbo generators and Traction Motors.	For H Class Dry type transformers, AC/DC alternator motors, Turbo generators and Traction Motors.	For H^+ Class Dry type transformers, AC/DC alternator motors, Turbo generators and Traction Motors.

MAJOR APPLICATIONS


Relay Coils


Transformers


Alternators


Motors


Domestic Appliances

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