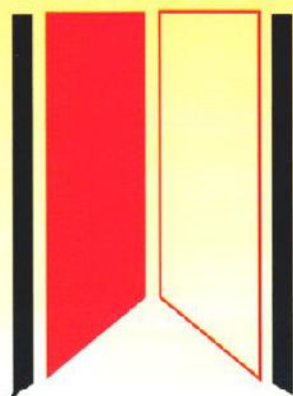




shakti[®]
ORIGINAL



SUPER ENAMELLED COPPER WIRE

QUALITY ★ PURITY ★ ACCURACY ★ QUALITY ★ PURITY ★ ACCURACY

THE COMPANY

shakti[®] ORIGINAL group of Industries, established in 1980 is a leading manufacturer of enamelled copper winding wires in India for the electrical industry, with a reputation for quality, purity, accuracy and reliability.

Shakti Tamba Tar Pvt. Ltd. is professionally managed by person's with a great deal of experience in their relative fields. The company's motto is providing good quality at competitive prices. The company strictly believes in adhering to the universal policy. Quality never sleeps, it is the guiding light underlying all its operations.

As part of our policy of providing service as well as quality, the data in this brochure has been collected and published to provide a basic reference. More detailed information may be obtained from us, as we are always available to give advice on the properties and application of our products **shakti**[®] ORIGINAL enamelled copper wire.



RANGE OF PRODUCTS

| DESCRIPTION | SPECIFICATION | APPLICATION |
|------------------------------------------------|--------------------|-------------------------------------------------------------|
| POLYESTER ENAMELLED COPPER WIRE | IS-13730 (Part 34) | General purpose motors, Transformers, Fan etc. |
| MODIFIED POLYESTER ENAMELLED COPPER WIRE | IS-13730 (Part 3) | Special motors, Handtools, Generators etc. |
| POLYESTER ENAMELLED COPPER WIRE | IS-13730 (Part 8) | Hermetic application and all thermal 'H' class equipment. |
| POILYVINYLE ACETAL (PVA) ENAMELLED COPPER WIRE | IS-13730 (Part 1) | All general equipment requiring high mechanical properties. |

shakti[®] ORIGINAL enamelled copper wires confirm to IS:13730. Our Product enjoy a quality-product image and wide & regular customer base in North India. This customer base comprises of companies manufacturing electrical & electronic goods, and all other industrial applications wherein copper wire winding is essential.

**RANGE AND TYPES OF ENAMELLED WIRE AVAILABLE AND
THEIR TEST VALUES AS PER
IS : 13730 SPECIFICATION FOR 1.0 MM WIRE OF GRADE 2
(MEDIUM COVERING)**

| TYPES OF TEST | POLYESTER Part 34 | POLYESTER Part 3 | PVA Part 1 | POLYESTERIMIDE Part 8 |
|---------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Thermal Class | 130 | 155 | 105 | 180 |
| Mandrel Winding | 1 x d | 1 x d | 1 x d | 1 x d |
| Elongation | 30% (Min) | 30% (Min) | 30% (Min) | 30% (Min) |
| Springiness | 41 (Max) | 41 (Max) | 41 (Max) | 41 (Max) |
| Jerk | No loss of adhesion | No loss of adhesion | No loss of adhesion | No loss of adhesion |
| Break down Voltage | 5 KV (Min) | 5 KV (Min) | 5 KV (Min) | 5 KV (Min) |
| Cut Through | 240°C, 18N for 2 mins | 240°C, 18N for 2 mins | 170°C, 18N for 2 mins | 300°C, 18N for 2 mins |
| Heat Shock | 155°C, 6xd 30 mins | 175°C, 2.24 mm 30 mins | 155°C, 1xd, 30 mins | 200°C, 2.24 mm 30 mins |
| Resistance at 20°C per metre | 0.02116Ω (Min.) 0.02240Ω (Max.) | 0.02116Ω (Min.) 0.02240Ω (Max.) | 0.02116Ω (Min.) 0.02240Ω (Max.) | 0.02116Ω (Min.) 0.02240Ω (Max.) |
| Resistance to Abrasion | Min.: 8.8 N Av: 10.4 N | Min.: 8.8 N Av: 10.4 N | Min.: 9.6 N Av: 11.3 N | Min.: 9.2 N Av: 10.9 N |
| Continuity of Covering | 5 Faults/30m (Max.) at 1500 volts | 5 Faults/30m (Max.) at 1500 volts | 5 Faults/30m (Max.) at 1500 volts | 5 Faults/30m (Max.) at 1500 volts |
| SWG Range | 12 - 38 | 12 - 38 | 12 - 38 | 12 - 38 |

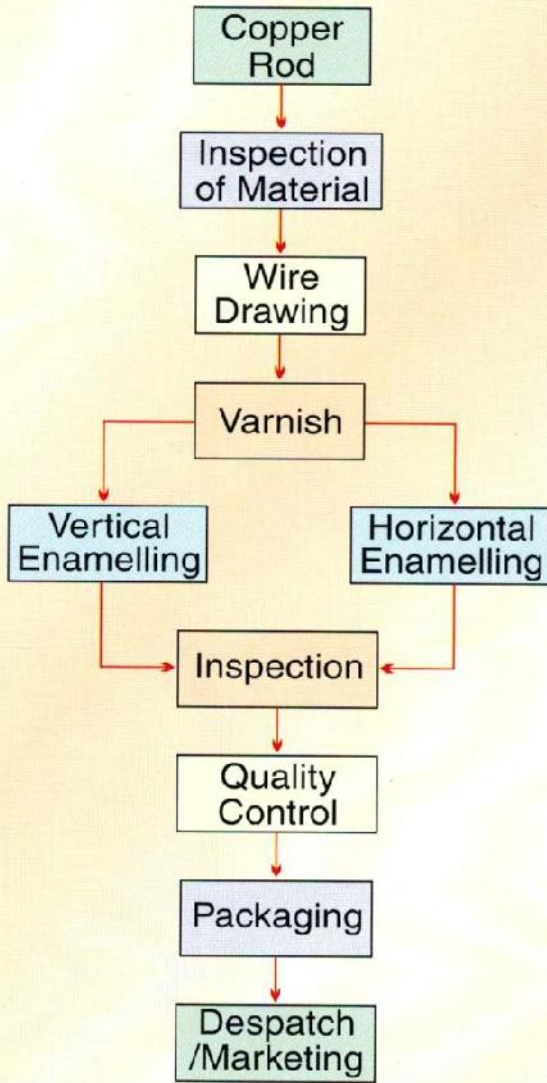


THE RAW MATERIALS

COPPER : Copper is procured in the form of continuous cast copper rod from renowned and advanced production plants across the India. The copper rod used in the process are of the highest international standards. These rods, of 3-4 tons coils, give weld-free length of quality drawn wire with enhanced electrical properties. The other type, the thinner-sized wires, are drawn from annealed wire to obtain maximum softness for specific uses.

ENAMEL : The wire insulation enemels are procured from the leading manufacturers of insulating enamels and varnishes. The enamels (varnish) are selected on the basis of their mechanical, electrical, thermal and chemical properties, according to their purpose. Using the right enamel ensures superior quality finished wires. These wires are capable of withstanding the tensions caused by the high speed of modern coil winding machines, and have properties beyond the requirement of relevant specifications.

THE PRODUCTION PROCESS



APPROXIMATE EQUIVALENT COMBINATIONS OF GAUGES FOR EMERGENCY USE.

| | | | |
|-----|-------------------------------------------|-----|------------------------------------|
| 10 | 14+15+15½ 14+14+16½ 16+16+16+16 | 17½ | 19+21 19½+20 21½+21½+21½ |
| 11 | 15+15+17 14+16+17½ 16½+16½+17+17 | 18 | 20+21 20½+20½ 23+23+23+23 |
| 12 | 15+15 16½+16½+16½ 17½+17½+17½+17½ | 18½ | 21+21½ 22+23+23 22½+22½+23 |
| 13 | 16+16 17½+17½+17½ 17+17+18½ | 19 | 21½+22½+21+23 23+23+24 22+22 |
| 13½ | 16½+16½ 16+17 17½+18+18 | 19½ | 22+22½ 23+24+25 24+24+24 |
| 14 | 17+17 16+18 19+19+19+19 | 20 | 22+24 22½+23 25+25+25 |
| 14½ | 18½+18½+18½ 19½+19½+19½+19½ 17+17½ | 20½ | 23+23 22½+24 24+26+26 |
| 15 | 17½+17½ 17+18 20+20+20+20 | 21 | 24+24 22½+25 26+26+26 |
| 15½ | 18+18 19+19+20 19+19½+19½ | 21½ | 24+25 23+26 28+28+28+28 |
| 16 | 18+19+18½+18½ 19½+20+20 21+21+21+21 | 22 | 25+26 26+27+27 24+27 |
| 16½ | 18½+19 19½+20½+21½ 21½+21½+21½+21½ | 22½ | 25+27 27+28+29 28+28+28 |
| 17 | 19+19½ 21+21+21 20+21+22 | 23 | 26+28 27+27 29+29+29 |
| | | 24 | 27+28 29+30+31 |

Each application of a winding wire presents a different set of requirements. The product should be unaffected by environmental conditions in use, and in addition have good mechanical and electrical properties such as flexibility, adhesion, abrasion, resistance and high di-electric strength. The quality of conductors and insulation, as well as the finished product, is monitored throughout production by its quality control department. The Quality Control Department is equipped with state-of-the-art equipment for testing enamelled copper wires as per the IS:13730 guidelines. Various tests such as visual, physical, mechanical, electrical, thermal and chemical are repeatedly carried out during the process and before despatch of the final products.

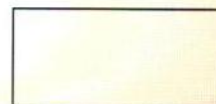
PRODUCT DISTINCTNESS

For the last two decades, we are the leading manufacturers of super enamelled copper wire in North India. So many local manufacturers has come up with names having resemblance to our brand name **shakti** ORIGINAL.

To avoid duplicacy, our product bears a hologram Sticker on each spool and cartoon. So always confirm the following original hologram Sticker before purchase of **shakti** ORIGINAL product.

BEWARE OF TOUTS

Our Hologram



Diameters and increase in diameters of enamelled round winding wires.

| Nominal conductor diameter SWG (mm) | | Conductor tolerance ± (mm) | Grade 1 | | Grade 2 | | Conductor Resistance at 20°C for 1 meter (Ohm) | | |
|----------------------------------------|-------|-------------------------------|-----------------------|---------------------------|-----------------------|---------------------------|------------------------------------------------|----------|----------|
| | | | minimum increase (mm) | maximum overall dia. (mm) | minimum increase (mm) | maximum overall dia. (mm) | | | |
| 3 | 6.401 | 0.064 | 0.055 | 6.500 | 0.100 | 6.554 | 0.000531 | 0.000520 | 0.000532 |
| 4 | 5.893 | 0.059 | 0.054 | 5.990 | 0.098 | 6.042 | 0.000626 | 0.000630 | 0.000639 |
| 5 | 5.385 | 0.054 | 0.053 | 5.482 | 0.096 | 5.530 | 0.000750 | 0.000723 | 0.000765 |
| 6 | 4.877 | 0.049 | 0.052 | 4.970 | 0.094 | 5.018 | 0.000913 | 0.000881 | 0.000933 |
| 7 | 4.470 | 0.045 | 0.050 | 4.561 | 0.092 | 4.607 | 0.001089 | 0.00105 | 0.00111 |
| 8 | 4.064 | 0.040 | 0.050 | 4.155 | 0.092 | 4.201 | 0.001317 | 0.00127 | 0.00134 |
| 9 | 3.658 | 0.037 | 0.049 | 3.746 | 0.089 | 3.791 | 0.001626 | 0.00157 | 0.00166 |
| 10 | 3.251 | 0.032 | 0.048 | 3.336 | 0.086 | 3.380 | 0.002057 | 0.00198 | 0.00209 |
| 11 | 2.946 | 0.030 | 0.045 | 3.029 | 0.084 | 3.072 | 0.002508 | 0.00242 | 0.00256 |
| 12 | 2.642 | 0.027 | 0.043 | 2.722 | 0.081 | 2.764 | 0.003118 | 0.00300 | 0.00318 |
| 13 | 2.337 | 0.024 | 0.042 | 2.415 | 0.079 | 2.455 | 0.003985 | 0.00384 | 0.00407 |
| 14 | 2.032 | 0.020 | 0.041 | 2.108 | 0.077 | 2.147 | 0.005271 | 0.00507 | 0.00532 |
| 15 | 1.829 | 0.019 | 0.040 | 1.903 | 0.075 | 1.941 | 0.006506 | 0.00626 | 0.00664 |
| 16 | 1.626 | 0.017 | 0.039 | 1.698 | 0.073 | 1.735 | 0.008232 | 0.00742 | 0.00842 |
| 17 | 1.422 | 0.015 | 0.038 | 1.492 | 0.071 | 1.528 | 0.01076 | 0.0104 | 0.0109 |
| 18 | 1.219 | 0.013 | 0.035 | 1.285 | 0.067 | 1.318 | 0.01465 | 0.0141 | 0.0149 |
| 19 | 1.016 | 0.011 | 0.034 | 1.080 | 0.065 | 1.113 | 0.02108 | 0.0206 | 0.0212 |
| 20 | 0.914 | 0.010 | 0.034 | 0.976 | 0.063 | 1.008 | 0.02605 | 0.02528 | 0.02686 |
| 21 | 0.813 | 0.009 | 0.032 | 0.872 | 0.060 | 0.902 | 0.03293 | 0.03194 | 0.03396 |
| 22 | 0.711 | 0.008 | 0.030 | 0.766 | 0.056 | 0.795 | 0.04305 | 0.04175 | 0.04442 |
| 23 | 0.610 | 0.006 | 0.027 | 0.659 | 0.050 | 0.684 | 0.05848 | 0.05687 | 0.06017 |
| 24 | 0.559 | 0.006 | 0.025 | 0.605 | 0.047 | 0.629 | 0.06965 | 0.06760 | 0.07178 |
| 25 | 0.508 | 0.006 | 0.025 | 0.554 | 0.047 | 0.578 | 0.08434 | 0.08168 | 0.08711 |
| 26 | 0.457 | 0.005 | 0.024 | 0.501 | 0.045 | 0.523 | 0.1042 | 0.1011 | 0.1075 |
| 27 | 0.417 | 0.005 | 0.022 | 0.458 | 0.042 | 0.480 | 0.1252 | 0.1212 | 0.1293 |
| 28 | 0.376 | 0.005 | 0.021 | 0.417 | 0.040 | 0.435 | 0.1539 | 0.1487 | 0.1595 |
| 29 | 0.345 | 0.005 | 0.020 | 0.382 | 0.038 | 0.401 | 0.1829 | 0.1772 | 0.1888 |
| 30 | 0.315 | 0.004 | 0.019 | 0.349 | 0.035 | 0.367 | 0.2193 | 0.2121 | 0.2269 |
| 31 | 0.295 | 0.004 | 0.019 | 0.329 | 0.035 | 0.347 | 0.2501 | 0.2414 | 0.2592 |
| 32 | 0.274 | 0.004 | 0.018 | 0.306 | 0.033 | 0.323 | 0.2889 | 0.2792 | 0.3011 |
| 33 | 0.254 | 0.004 | 0.018 | 0.286 | 0.033 | 0.303 | 0.3374 | 0.3242 | 0.3512 |
| 34 | 0.234 | 0.004 | 0.017 | 0.265 | 0.032 | 0.281 | 0.3974 | 0.3809 | 0.4149 |
| 35 | 0.213 | 0.003 | 0.015 | 0.241 | 0.029 | 0.255 | 0.4798 | 0.4625 | 0.4978 |
| 36 | 0.193 | 0.003 | 0.014 | 0.219 | 0.027 | 0.232 | 0.5842 | 0.5618 | 0.6081 |
| 37 | 0.173 | 0.003 | 0.013 | 0.197 | 0.025 | 0.210 | 0.7271 | 0.6967 | 0.7596 |
| 38 | 0.152 | 0.003 | 0.012 | 0.174 | 0.023 | 0.186 | 0.9418 | 0.8982 | 0.9888 |
| 39 | 0.132 | 0.003 | 0.011 | 0.152 | 0.021 | 0.162 | 1.2496 | 1.1841 | 1.3192 |
| 40 | 0.122 | 0.003 | 0.010 | 0.141 | 0.019 | 0.151 | 1.4623 | 1.3811 | 1.5502 |
| 41 | 0.112 | 0.003 | 0.009 | 0.130 | 0.017 | 0.139 | 1.7354 | 1.6318 | 1.8477 |
| 42 | 0.102 | 0.003 | 0.009 | 0.119 | 0.017 | 0.128 | 2.0923 | 1.9574 | 2.2398 |
| 43 | 0.091 | 0.003 | 0.008 | 0.107 | 0.016 | 0.115 | 2.6298 | 2.4423 | 2.8348 |
| 44 | 0.081 | 0.003 | 0.008 | 0.096 | 0.015 | 0.103 | 3.3192 | 3.058 | 3.6082 |
| 45 | 0.071 | 0.003 | 0.007 | 0.084 | 0.012 | 0.091 | 4.3167 | 3.9408 | 4.7475 |
| 46 | 0.061 | 0.002 | 0.007 | 0.074 | 0.011 | 0.081 | 5.8541 | 5.3272 | 6.3809 |
| 47 | 0.051 | 0.002 | 0.007 | 0.062 | 0.010 | 0.068 | 8.3794 | 7.6253 | 9.1335 |
| 48 | 0.041 | 0.002 | 0.005 | 0.050 | 0.010 | 0.056 | 12.9500 | 11.6939 | 14.2062 |



shakti[®]

ORIGINAL

SUPER ENAMELLED COPPER WIRE



Gross Wt.

Tare Wt.

Nett Wt.

SIZE

M

TYPE

Batch No.

Manufactured By :

SHAKTI TAMBA TAR PVT. LTD.

QUALITY ★ PURITY ★ ACCURACY ★ QUALITY ★ PURITY ★ ACCURACY