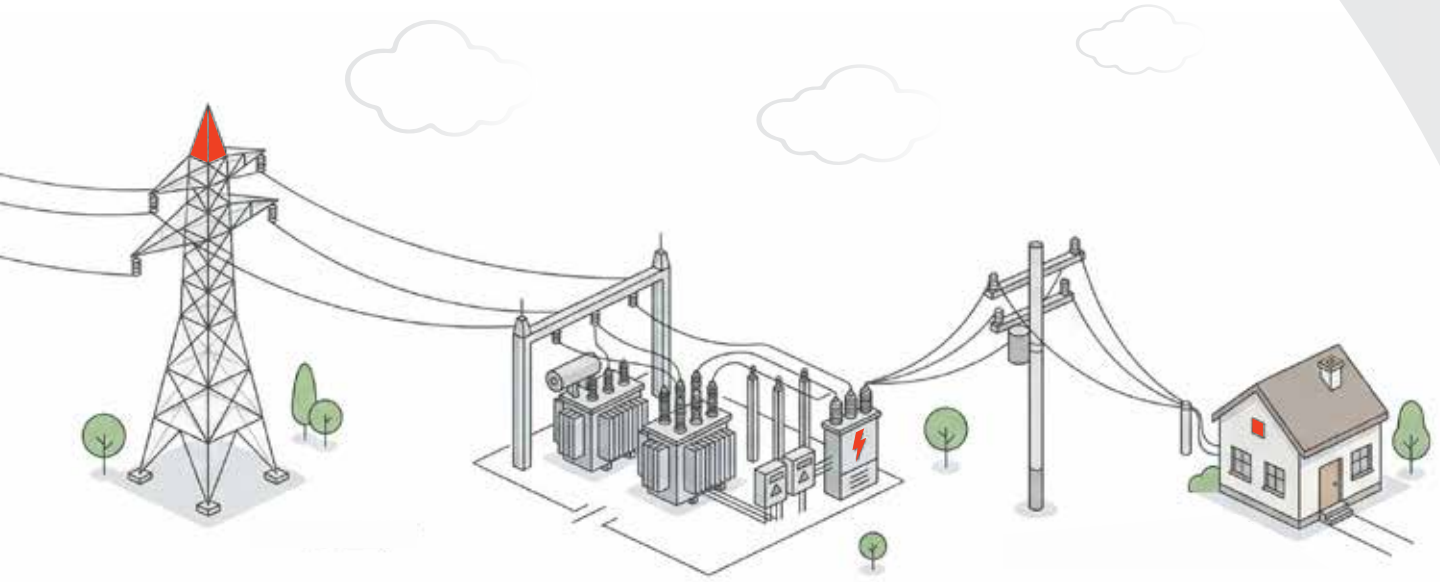
SUNGRID

**Sungrid Wires and Cables** offers reliable & sustainable solutions designed for the power industry. serving transformers, T&D systems, switchgears, & automation applications.

sungridcables.com

# About Us

Sungrid Wires and Cables specialises in products that are engineered to meet customers' technical requirements by offering high-quality, consistent, and sustainable solutions. They are designed for applications in the power industry, including Transformers, Transmission and Distribution Systems, Switchgears, Reactors, Furnaces, Capacitor Banks, Automation, and more.



Transmission Tower
(High Voltage)

Electrical Substation
Step-Down Transformer

Utility Pole
(Distribution Lines)

Service Drop
Residential Connection

# Our Mission

To design and deliver advanced electrical solutions that meet the evolving needs of the power industry—through precision engineering, customer-focused service, and a commitment to quality, safety, and sustainability.

# Our Vission

To be a globally trusted leader in powering the future—through innovative, sustainable, and high-performance solutions for the energy industry.

AT THE
CORE OF
GLOBAL
POWER

# Why chose us?

- Our advanced, 100% in-house, state-of-the-art manufacturing unit enables us to produce copper conductors ranging from 0.5 $mm^2$ to 1000 $mm^2$.
- We offer copper conductors in Class 2 to Class 6.
- Capable of manufacturing single wire sizes from 0.1 mm to 4.0 mm.
- We manufacture customized cables tailored precisely to our customers' specifications
- We manufacture conductors as per Metric, Imperial International Systems of Units
- Our conductors conform to major international standards including **NEMA, ASTM, DIN, IEC, KIS, JIS, and BS EN.**
- We can supply conductor quantities ranging from 50 kg/drum to 200 kg/drum.
- The minimum order quantity (MOQ) is 500 kg per product type.
- Our manufacturing facility has a monthly production capacity of 250 tons each, enabling us to meet both small and bulk order requirements efficiently.

**SAFETY**
**DURABILITY**
**PERFORMANCE**

# Solid Conductor (S)

Well-suited for compact cable designs, this type is commonly used where space constraints and precise equipment configurations demand finer conductor sizes.

| | |
|---|---|
| American Standards | ASTM B33-04 |
| German Standards | DIN 48200 |
| British Standards | BS EN 13061 |
| European Standards | IEC 60228 |

The solutions meet stringent international benchmarks. This multi-standard alignment reflects a commitment to excellence, making the products suitable for diverse industrial and power sector requirements worldwide.

| Code No. | Nominal Cross Sectional Area (MM SQ) | Diameter D (MM) (±3%) |
|---|---|---|
| SWC/S/1.5 | 1.76 | 1.50 |
| SWC/S/2.5 | 5 | 2.5 |
| SWC/S/3.25 | 8 | 3.25 |
| SWC/S/4 | 12 | 4.00 |
| SWC/S/5 | 20 | 5.00 |
| SWC/S/6 | 30 | 6.00 |
| SWC/S/7 | 40 | 7.00 |
| SWC/S/8 | 50 | 8.00 |
| SWC/S/9 | 60 | 9.00 |
| SWC/S/10 | 80 | 10.00 |
| SWC/S/11 | 95 | 11.00 |
| SWC/S/12 | 110 | 12.00 |
| SWC/S/15 | 175 | 15.00 |
| SWC/S/18 | 250 | 18.00 |
| SWC/S/20 | 315 | 20.00 |
| SWC/S/25 | 500 | 25.00 |
| SWC/S/30 | 700 | 30.00 |

# Stranded Conductor (SC)

Ideal for customers who require compact connections with high Electro Mechanical efficiencies.

| | |
|---|---|
| American Standards | **ASTM B3-01, ASTM B246-06** |
| German Standards | **DIN 48203** |
| British Standards | **BS 6360 BS 7884** |
| European Standards | **IEC 60228** |

| Code No. | Nominal Cross Sectional Area (MM SQ) | Number of Wires/ Strands | Single Wires Size D1 (MM) (±2%) | Diameter D (MM) (Nom) |
|---|---|---|---|---|
| SWC/SD/4 | 4 | 7 | 0.85 | 2.55 |
| SWC/SD/6 | 6 | 7 | 1.05 | 3.15 |
| SWC/SD/8 | 8 | 7 | 1.20 | 3.60 |
| SWC/SD/10 | 10 | 7 | 1.35 | 4.05 |
| SWC/SD/12 | 12 | 7 | 1.50 | 4.50 |
| SWC/SD/16 | 16 | 7 | 1.70 | 5.10 |
| SWC/SD/25 | 25 | 7 | 2.14 | 6.40 |
| SWC/SD/35 | 35 | 7 | 2.52 | 7.60 |
| SWC/SD/50 | 50 | 19 | 1.83 | 9.20 |
| SWC/SD/70 | 70 | 19 | 2.18 | 11.00 |
| SWC/SD/95 | 95 | 19 | 2.52 | 12.70 |
| SWC/SD/120 | 120 | 37 | 2.03 | 14.30 |
| SWC/SD/150 | 150 | 37 | 2.27 | 16.00 |
| SWC/SD/185 | 185 | 37 | 2.52 | 17.70 |
| SWC/SD/240 | 240 | 61 | 2.25 | 20.30 |
| SWC/SD/300 | 300 | 61 | 2.52 | 23.00 |
| SWC/SD/400 | 400 | 61 | 2.90 | 26.50 |
| SWC/SD/500 | 500 | 61 | 3.25 | 30.00 |

# Stranded Flexible Conductors (SFC)

Designed for applications requiring high flexibility, these conductors are ideal for cables with large cross-sectional areas and are well-suited for use in EHV power transformers, supporting voltage classes up to 800 Kv.

| | |
|---|---|
| American Standards | **ASTM B173, ASTM B174** |
| German Standards | **DIN 46438** |
| British Standards | **BS 6360** |
| European Standards | **IEC 60228** |
| Japanese Standards | **JIS C3102** |

| Code No. | Nominal Cross Sectional Area (MM SQ) | Number of Wires | Number of Strands | Single Wires Size D1 (MM) (±2%) | Diameter D (MM) (Nom) |
|---|---|---|---|---|---|
| SWC/FSD/2.5 | 2.5 | 20 | 1 | 0.400 | 2.40 |
| SWC/FSD/4 | 4 | 32 | 1 | 0.400 | 3.10 |
| SWC/FSD/6 | 6 | 49 | 7 | 0.400 | 3.80 |
| SWC/FSD/10 | 10 | 84 | 7 | 0.400 | 5.00 |
| SWC/FSD/16 | 16 | 126 | 7 | 0.400 | 6.30 |
| SWC/FSD/19 | 19 | 154 | 7 | 0.400 | 6.50 |
| SWC/FSD/25 | 25 | 154 | 7 | 0.457 | 8.00 |
| SWC/FSD/35 | 35 | 217 | 7 | 0.457 | 9.20 |
| SWC/FSD/50 | 50 | 259 | 7 | 0.500 | 11.00 |
| SWC/FSD/70 | 70 | 360 | 12 | 0.500 | 13.00 |
| SWC/FSD/95 | 95 | 475 | 19 | 0.500 | 15.20 |
| SWC/FSD/120 | 120 | 608 | 19 | 0.500 | 17.00 |
| SWC/FSD/150 | 150 | 756 | 27 | 0.500 | 19.00 |
| SWC/FSD/185 | 185 | 925 | 37 | 0.500 | 21.00 |
| SWC/FSD/200 | 200 | 1036 | 37 | 0.500 | 21.50 |
| SWC/FSD/240 | 240 | 1221 | 37 | 0.500 | 24.00 |
| SWC/FSD/300 | 300 | 1525 | 61 | 0.500 | 26.50 |
| SWC/FSD/400 | 400 | 2013 | 61 | 0.500 | 31.00 |
| SWC/FSD/500 | 500 | 1769 | 61 | 0.600 | 34.00 |
| SWC/FSD/600 | 600 | 2135 | 61 | 0.600 | 37.00 |
| SWC/FSD/700 | 700 | 2501 | 61 | 0.600 | 41.00 |

# Stranded Extra Flexible Conductors (SEFC)

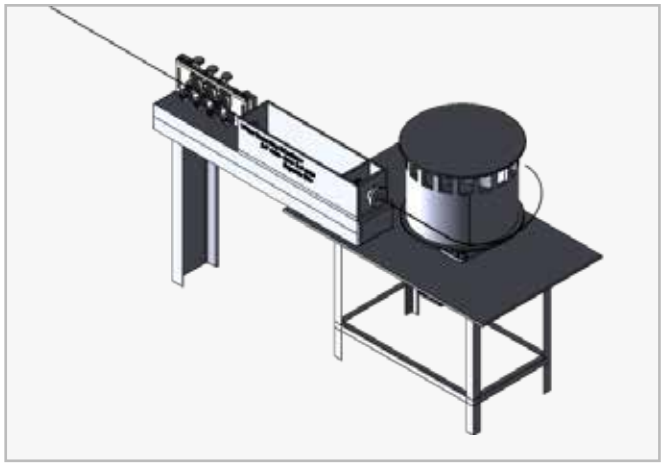
Specifically engineered for maximum flexibility, these conductors are ideal for dynamic installations where continuous movement or tight bending radius are crucial.

| | |
|---|---|
| American Standards | ASTM B172, ASTM B173 |
| German Standards | DIN 46438 |
| British Standards | BS 6360 |
| European Standards | IEC 60228 |

| Code No. | Nominal Cross Sectional Area (MM SQ) | Number of Wires | Number of Strands | Single Wires Size D1 (MM) (±2%) | Diameter D (MM) (Nom) |
|---|---|---|---|---|---|
| SWC/EFSD/0.25 | 0.25 | 120 | 3 | 0.0508 | 0.70 |
| SWC/EFSD/0.50 | 0.50 | 266 | 7 | 0.0508 | 1.00 |
| SWC/EFSD/1.00 | 1.00 | 525 | 7 | 0.0508 | 1.50 |
| SWC/EFSD/2.50 | 2.50 | 651 | 7 | 0.0710 | 2.40 |
| SWC/EFSD/4 | 4 | 1036 | 7 | 0.0710 | 3.10 |
| SWC/EFSD/6 | 6 | 1575 | 7X3 | 0.0710 | 4.00 |
| SWC/EFSD/10 | 10 | 2562 | 7X3 | 0.0710 | 5.00 |
| SWC/EFSD/16 | 16 | 4116 | 7X7 | 0.0710 | 6.50 |
| SWC/EFSD/25 | 25 | 3234 | 7X7 | 0.100 | 8.40 |
| SWC/EFSD/35 | 35 | 4508 | 7X7 | 0.100 | 1.00 |
| SWC/EFSD/50 | 50 | 6468 | 7X7 | 0.100 | 12.00 |
| SWC/EFSD/70 | 70 | 8967 | 7X7 | 0.100 | 14.20 |
| SWC/EFSD/95 | 95 | 12201 | 7X7 | 0.100 | 17.00 |
| SWC/EFSD/120 | 120 | 7840 | 7X7 | 0.140 | 18.40 |
| SWC/EFSD/150 | 150 | 9800 | 7X7 | 0.140 | 21.50 |
| SWC/EFSD/185 | 185 | 12348 | 7X7 | 0.140 | 22.50 |
| SWC/EFSD/240 | 240 | 15778 | 7X7 | 0.140 | 24.50 |
| SWC/EFSD/300 | 300 | 19684 | 19X7 | 0.140 | 28.00 |
| SWC/EFSD/375 | 375 | 7448 | 19X7 | 0.254 | 31.00 |
| SWC/EFSD/400 | 400 | 7980 | 19X7 | 0.254 | 33.00 |
| SWC/EFSD/500 | 500 | 9842 | 37X7 | 0.254 | 34.50 |
| SWC/EFSD/600 | 600 | 11914 | 37X7 | 0.254 | 35.50 |
| SWC/EFSD/700 | 700 | 10101 | 37X7 | 0.300 | 42.00 |
| SWC/EFSD/800 | 800 | 11396 | 37X7 | 0.300 | 45.00 |

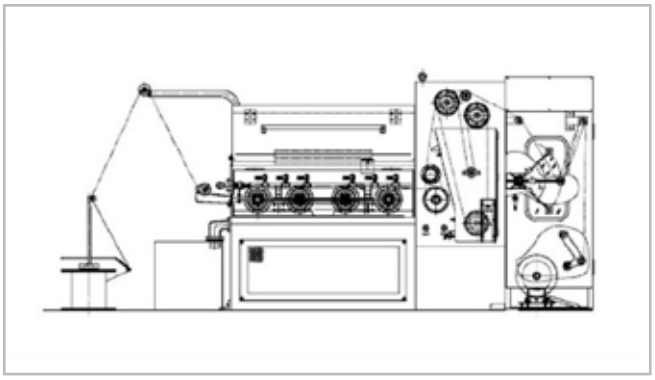
# METHOD OF MANUFACTURING

## 100% INHOUSE
## MANUFACTURING FACILITY



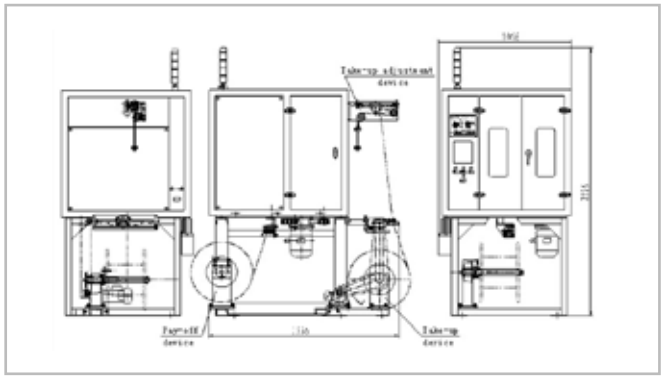
### Wire Drawing Machine

Reduces copper rod diameter (Rod-Break Down)



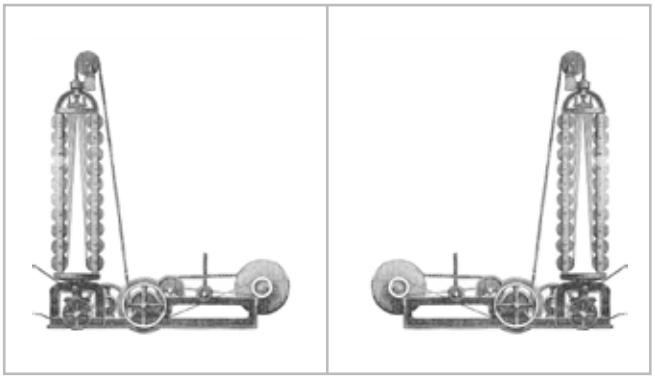
### Fine Wire Drawing Machine with online Annealing

Refines wire diameter, relieves internal stress and maintains constant elongation by reducing hardness.



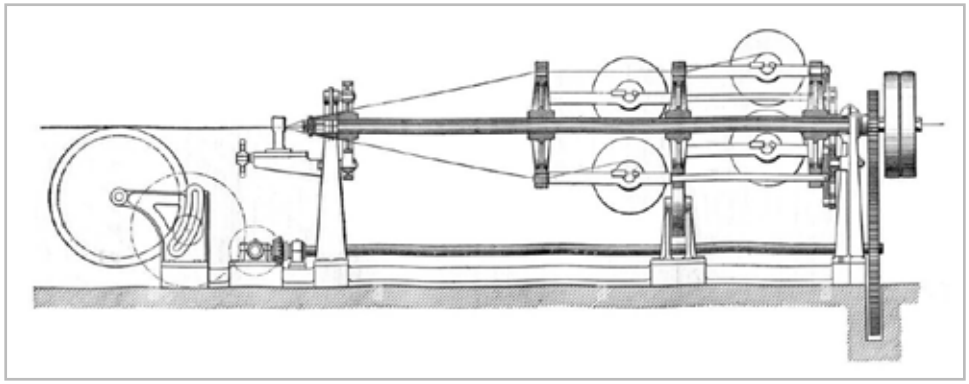
### High Speed Bunching Machine

Twists multiple wires into multi-stranded conductors



### Vertical Stranding Machine

Strands sector-shaped wires for heavy duty applications

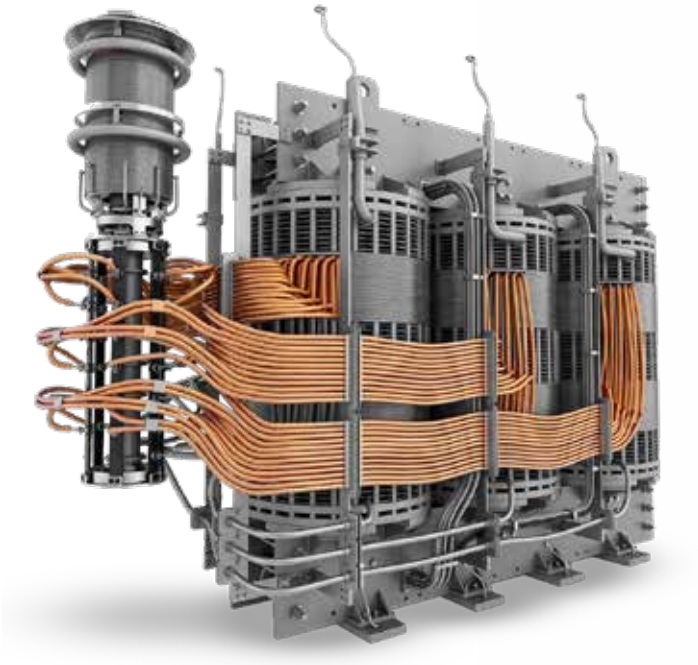


### Horizontal Stranding Machine

Twists wires horizontally into a cable structure

# CREPED WRAPPED CABLES

Crafted with high-quality crepe paper wrapping, these cables ensure optimal thermal resistance and electrical reliability in demanding transformer environments.



## Plain Kraft Paper Insulated Copper Conductors

Bending Radius 8 times the outer diameter of the cable.

**Special Features :** We can lapp a maximum of 200 layers of kraft paper on a bare conductor. The maximum over all diameter manufactured by us is 50 mm.

## Natural Crepe Paper Insulated

**Special Features :** We can lapp a maximum of 207 layers of Crepe Paper on a conductor. The maximum over all diameter manufactured by us is 90 mm.

### Advantage

- Better Electrical Values.
- Dense Insulation.
- Excellent Degree of Filling.
- Better Electrical Values.
- Higher Bending Values.
- Helps in reducing clearance between cables
- Bending Radius: 5 times the outer diameter of the cable.

# Thermally Upgraded Kraft and Crepe Paper Insulated

The definition on Thermally upgraded paper in according to IEEE [1] to have minimum of 50% retention in tensile strength after 65000 hours in a sealed tube at 110° C.

**Thermo stabilised paper having a nitrogen content exceeding 2.5%**

## Advantage

- Better Electrical Values.
- Higher Thermal Values.
- Improves life of cable, thus provides supports to enhance the life of the transformer.

# Two Way Stretched Thermally Upgraded Crepe Paper Insulated

Basically crepe paper have higher bursting strength for machine direction but in case of two way stretched thermally upgraded crepe paper has higher bursting strength values for machine direction as well as cross direction.

## Advantages:

- Good bending values for machine direction lay as well as for cross direction lay.
- High thermal stability.
- Excellent bending capabilities.

**Decision make dicy green paper -** 2-35 H (High Density Crepe) | 22-HCC (High Density Crepe Calendared)

# Nomex® Tape Insulated/paper Insulated Copper Flexible Cables (Hybrid Cables)

## Solutions

By applying 2/3 layers of Nomex® Tape on the Bare Conductors / Sandwich / in intermediate layers / On the Cables along with the Kraft / Crepe paper. The Nomex® tape would absorb such voltage Spikes. Also it helps in maintaining the temperature of the cable while the cable is immersed in oil due to its excellent thermal Capabilities.

## Type

- Nomex® type 410 is high density calendared grade that offers high inherent dielectric strength.
- Nomex® type 411 is low density uncalendared grade is used where high bulk and conform ability

# Micro Creped Wrapped Cables

Our Micro Creped Paper Insulated Cable is an advanced alternative to traditional crepe paper insulation, designed to meet high voltage breakdown requirements while ensuring superior flexibility. The unique 15% stretch property allows for heavy insulation without cracking, enabling an excellent bending radius ideal for transformer applications with limited clearance.

This innovative insulation delivers enhanced electrical performance, superior thermal stability, dense and uniform insulation, and a high degree of filling efficiency, all while remaining extremely cost-effective due to optimized transformer design advantages.

## Solutions

By applying 15% stretch kraft paper, if provided heavy insulation to match the voltage requirements and also provides excellent bending radius since it has an in built stretch of 15%. So finally using this type of insulation one can achieve better electrical values as well as better bending radius in a cable without using a typical crepe paper.

## Advantage

- Excellent electrical values.
- Good thermal stability.
- Dense Insulation.
- Excellent degree of filling.
- Extremely cost effective due to design advantages in the transformer.

# Nomex® Tape Insulated/paper Insulated Copper Flexible Cables (Hybrid Cables)

LOW MODERATE HIGH

| CABLE TYPES | ELECTRICAL VALUES | | | | | | | | | MECHANICAL VALUES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOLTS | | | FLEXIBILITY | | | COMPACT-NESS IN BARE | | | COMPACT-NESS IN INSULATED CABLE | | | BENDING | | | WALL/ BUILD | | |
| **NORMAL CABLES** | | | | | | | | | | | | | | | | | | |
| Thermally Upgraded Kraft & Crepe Paper Insulated | | ● | | ● | | | ● | | | ● | | | ● | | | ● | | |
| Two Way Stretch Thermally Upgraded Crepe Paper Insulated | | | ● | | | ● | | ● | | | ● | | | | ● | | ● | |
| Thermally Upgraded Paper Having Nitrogen Content | | ● | | | ● | | ● | | | ● | | | ● | | | | ● | |
| **SPECIAL CABLES** | | | | | | | | | | | | | | | | | | |
| 'X' Creped Wrapped Cables | | | ● | | | ● | | | ● | | | ● | | | ● | | | ● |
| Hybrid Cables | | | ● | | | ● | | | ● | | | ● | | | ● | | | ● |
| Extra Soft Cables | | ● | | | | ● | | | ● | | | ● | | | ● | | | ● |
| Nomex® Wrapped Cables | | | ● | | ● | | | ● | | | ● | | | ● | | | | ● |
| Micro Creped Wrapped Cables | | | ● | | ● | | ● | | | | ● | | ● | | | | ● | |

# Micro Creped Wrapped Cables

Micro Creped Wrapped Cables are engineered for enhanced flexibility, durability, and superior electrical performance. Designed with precision wrapping techniques, these cables ensure better insulation integrity and resistance to mechanical stress, making them ideal for demanding industrial and power applications.

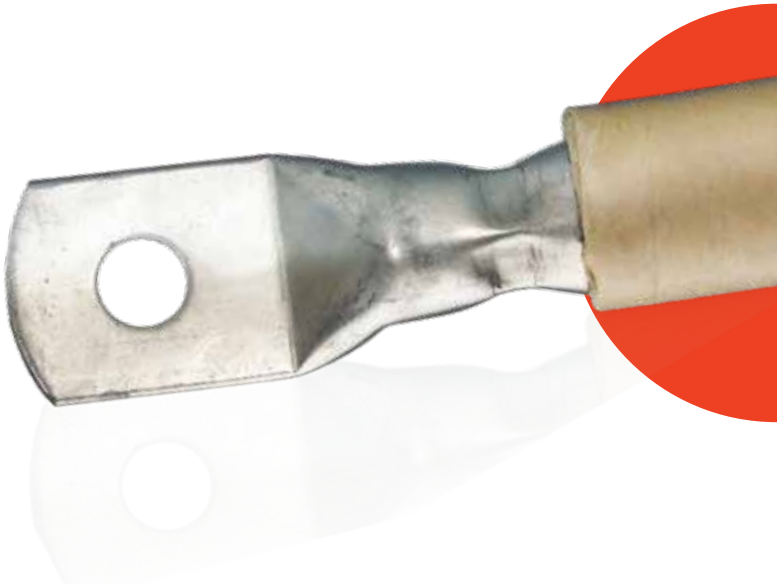
# Cut-lengths and Lugged Copper Flexible Leads and Connections (Bare and Insulated)

## Bend Cable

Instead of using Crepe Paper Tube on solid or stranded conductors, we can provide crepe paper insulated solid or stranded conductors directly.

We can provide the cable in cut-lengths with paper duly stripped at one/both ends as per customer requirement. We can also provide cables with end lugs crimped at one or both the ends as per customer requirement.

Copper stranded and flexible stranded lead (Bare as well as Insulated) are cut into lengths as per customer specifications. The crepe paper tubes are then inserted and duly crimped with lugs at both ends.



# Extra Soft Cables

### Applications:

- As Lead Connections in an Oil/Liquid Filled Distribution Transformer.

### Advantages:

- Accurate Length
- Saves scrap Generation
- Reduction in production time
- Inventor control (Transformer producer does not need to buy drums of Cables)
- Consistent quality of leads since we carry out 100% in-house testing of the leads.

# Our Core Raw Materials

Engineered for high-performance industrial applications, our copper offers unmatched conductivity, durability, and corrosion resistance.

## Special Features:

- Electricall-Grade Purity - Engineered with high-purity copper for reliable and efficient performance in demanding applications.
- Superior Conductivity - Delivers outstanding electrical and thermal conductivity—ideal for power cables, electronics, and precision components.

## Chemical Composition

Material Grade:UNS No. C11040 (ETP)

Composition: Copper 99.90% Min.

## Electrical Properties

Resistivity: 0.0172410 Ω.mm²/mtr

Conductivity: ≥100% IACS

## Surface Finish

Bright, smooth and free from scratch and other mechanical imperfections reference international standards which covers the product.

- ASTM B 49-08
- BS EN 13601

# Raw Materials

Paper slitting/storage and lapping done under temperature and atmosphere controlled dust free environment.

P.S. we can manufacture cables with paper having various GSM's and technical parameters to suit the customer requirements.


- Thermally upgraded crepe paper designed for enhanced flexibility and insulation performance.
- High-strength kraft paper suitable for general insulation applications.
- Crepe paper offering improved elasticity and adaptability in winding applications.
- High-compression insulation paper designed for superior mechanical strength.
- Thermally upgraded kraft paper for improved thermal endurance and durability.
- Insulation material with controlled conductivity for electric field management.
- High-performance insulation paper known for excellent thermal and electrical resistance.

# Packing

Material is supplied on chemically treated wooden drums. Each drum is covered with a polythene tube to ensure the cable remains protected from moisture and water ingress. The cable is wound in layers with polythene sheets placed between each layer to prevent abrasion during handling and installation.

- The final layer of the cable is positioned 50 mm below the drum flange to ensure adequate protection.
- Once sealed, the drum is wrapped with a polythene sheet, corrugated liner, or anti-humidity paper (hezin cloth) for additional moisture resistance.
- Silica gel bags are placed inside the drum flanges to absorb residual moisture.
- Drums are mounted on IPPC-compliant wooden or plastic pallets and secured with nylon or steel straps to ensure stability during handling and transit.
- The entire drum is shrink-wrapped from top to bottom to provide an added layer of protection.
- The packed material is then dispatched to the customer.

# Container

Compliance with Global Quarantine Standards
To meet international quarantine regulations,
we ensure the following:

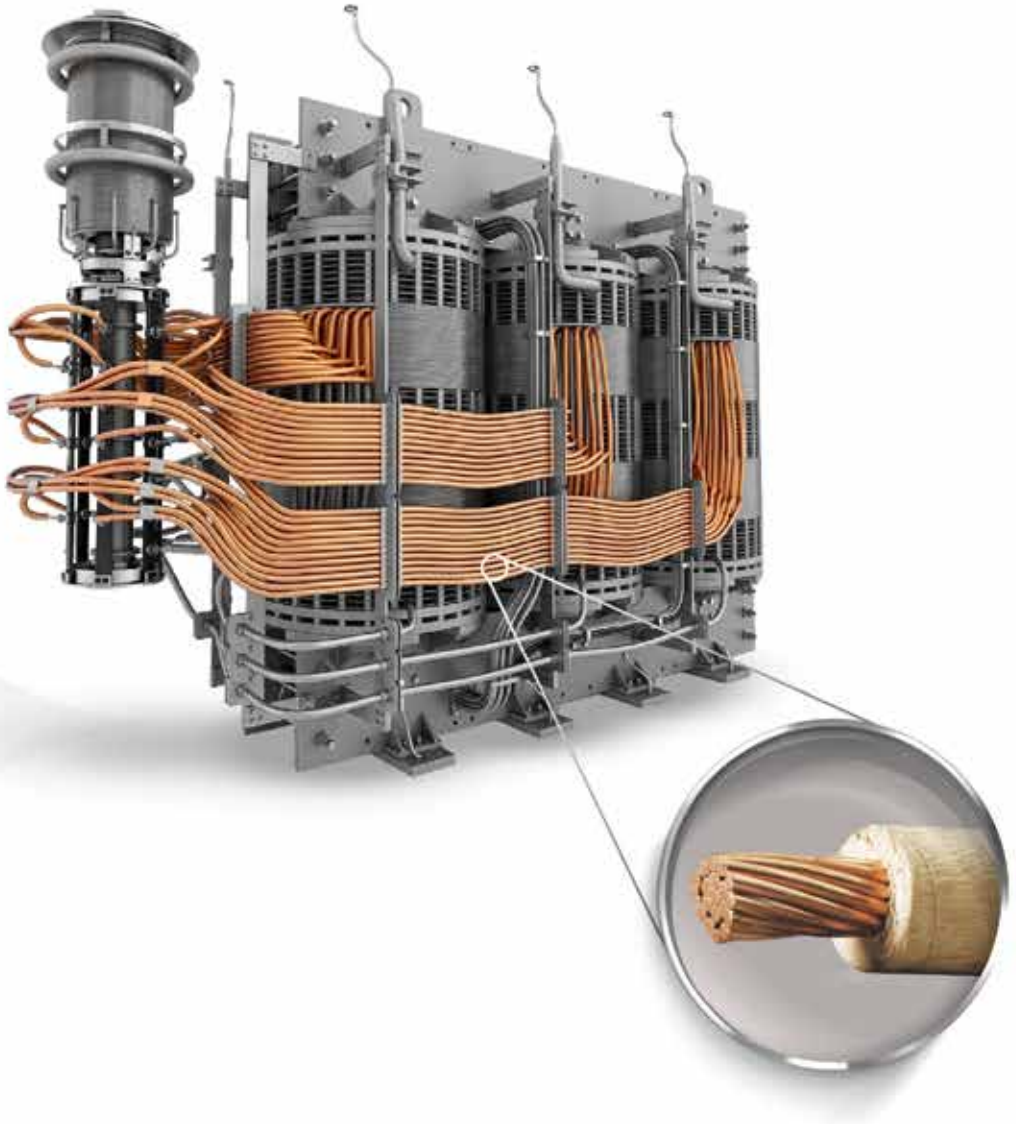
- Drums: Available in Pine/Plywood, Plastic, or Steel.
- Pallets: Available in Pinewood, Plastic, or Jute.
- Material Treatment: All wooden drums and pallets are made from chemically treated timber and certified as per IPPC standards.
- LCL Shipments: Drums and pallets are externally fumigated using Methyl Bromide (MB).
- FCL Shipments: Entire containers are fumigated by a government-approved fumigation agency in the destination country.


# Special Features

Logistics & Delivery Highlights

With tie-ups with globally renowned shipping forwarders, SW ensures:

- Factory-to-Door Delivery: Direct delivery to the customer's factory premises
- Fastest Lead Times: Optimised routes for the shortest delivery duration
- Flexible Shipment Modes: Truck, LCL (Less than Container Load), and FCL (Full Container Load) options
- Simplified Documentation: Minimal paperwork for quicker processing
- Efficient Logistics: Reduced transit and handling time for improved reliability




**SUNGRID WIRES AND CABLES PVT. LTD.**

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