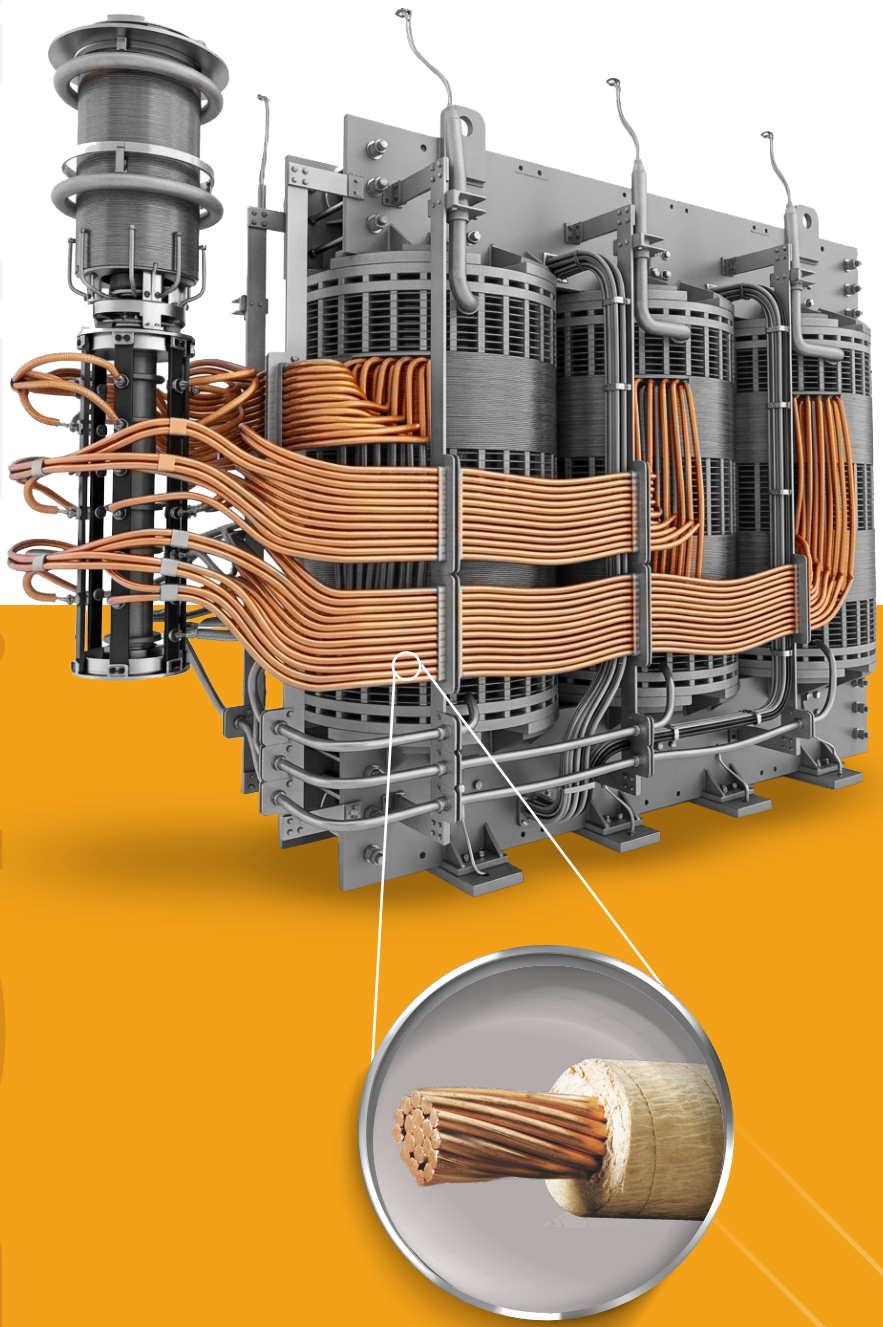
SUNGRID



sungridcables.com

MADE IN THE **USA**
TO SERVE **"IN THE USA"**

Who We Are

A U.S.-based manufacturer of high-performance paper-wrapped flexible copper conductors, engineered for the evolving needs of power and distribution transformer manufacturers across North America.

Our operations combine American precision and service standards with globally optimized manufacturing, ensuring superior quality, shorter lead times, and competitive pricing. We operate on a Made in America, delivered just-in-time model — enabling our customers to reduce inventory, achieve faster project turnaround, and maintain strict quality.

With a focus on customization, reliability, and technical excellence, we aim to be the preferred partner for OEMs seeking a transparent, agile and responsive supply chain.

Our Vision

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

Our Strengths

- Just-in-Time — Minimize your inventory.
- Custom Solutions — Tailored sizes, flexibility, and quick response.
- Reliable Partnership — Transparent service and on-time delivery, every time.
- Local Finishing & Quality Control — U.S. based assurance for consistency and compliance.

Reduction in scrap at customer end.
We can supply exact length/drum.

Technical Capabilities

We provide comprehensive, **100% in-house manufacturing** solutions tailored to your specific requirements. Our engineering team is equipped to design and construct high-performance cables in accordance with custom client specifications or **SG USA Standards.**

Copper Cable Specifications:

Our production facility supports a wide range of dimensional requirements and stranding configurations to ensure optimal conductivity and durability.

- **Capacity Range:** #10 to 1200 MCM
- **Wire Diameter:** 0.00393" (min) to 0.197" (max)
- **Maximum Radial Build:** 1.00"

Precision Stranding Options:

We offer versatile stranding patterns and directions to meet the mechanical flexibility and electrical demands of your application.

Standard Stranding (Total Wires):

- 7, 19, 37, 61, 91

Multi-Stranding Configurations:

Construction	Total Strands
7x7	49
19x7	133
37x7	259
37x19	703
61x7	427
61x19	1159
61x37	2257

Lay Directions:

We offer both **'S' type** and **'Z' type** stranding directions. Additionally, we can provide complex constructions utilizing **multiple stranding directions** within a single cable to enhance torque balance and structural integrity.

AT THE CORE OF

GLOBAL POWER

OUR PRODUCTS

Solid Conductor (S)

This type is preferred when the cross sectional area of the conductor is less and where the design criteria of the equipment is important

Stranded Conductor (SC)

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

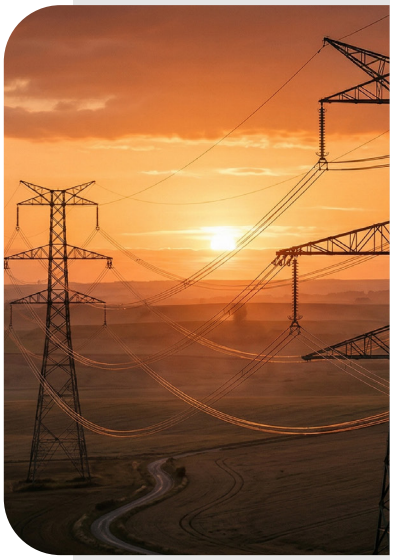
Flexible Conductors

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.

Super Flexible Conductors

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

Thermally Upgraded Crepe Paper wrapped



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.

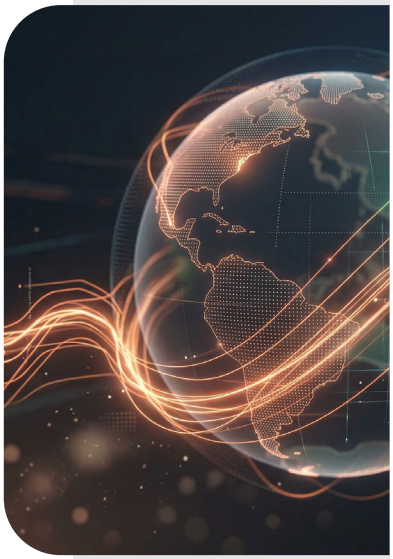
Thermo stabilised paper having a nitrogen content exceeding 2.5% We can lapp a maximum of 200 layers of kraft paper on a bare conductor. The maximum over all diameter manufactured by us is 50 mm.

Advantage

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

Multi Direcrional stretched crepe paper wrapped

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.



Special Features

We can lapp a maximum of 200 layers of kraft paper on a bare conductor. The maximum over all diameter manufactured by usis 50 mm.

Advantage

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

Thermoflex 'X' Crepe

2-35 H (High Density Crepe)

22-HCC (High Density Crepe Calendared)

HYBRID INSULATION

Sungrid Group US has the expertise to produce the following

NOMEX® Tape Insulated/paper Insulated Copper Flexible Cables (Hybrid Cables)

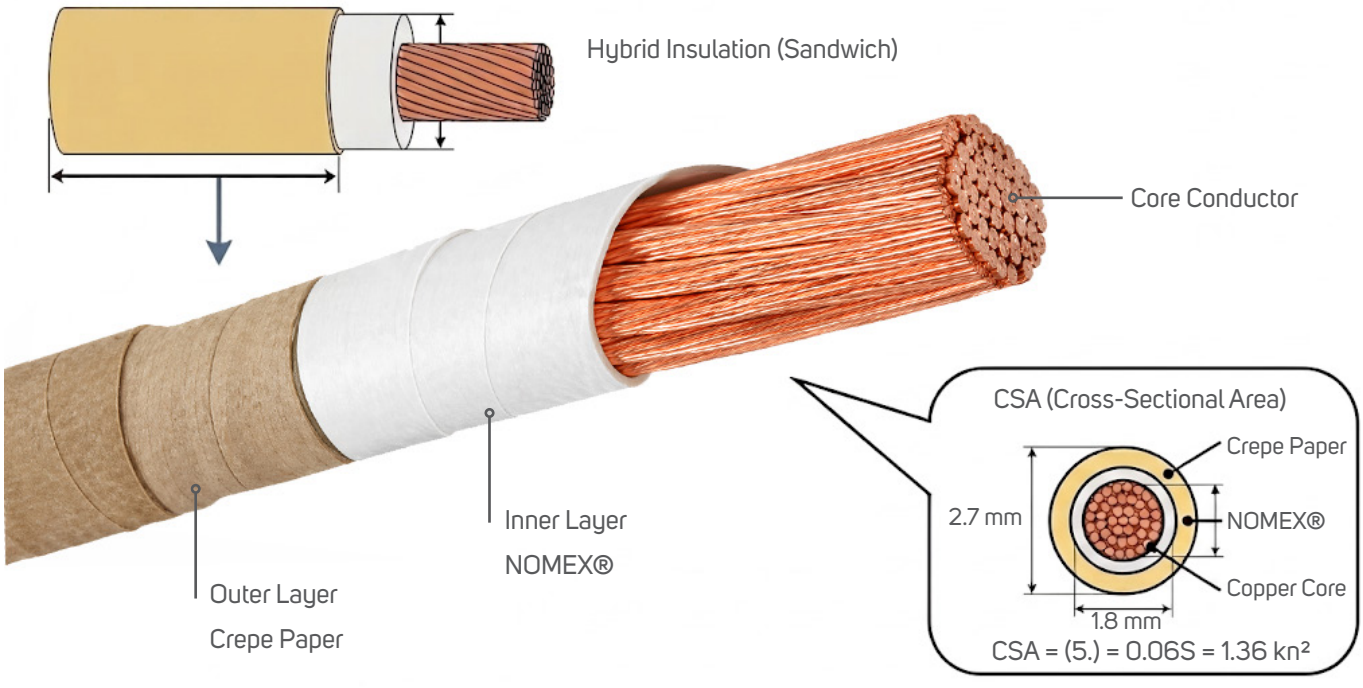
Solutions

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 area of prime importance.

By Applying multiple layres



Hybrid Insulation Systems:

Sandwich Design Advantages

The implementation of a hybrid "sandwich" insulation system—combining NOMEX® and high-grade Insulating Paper—offers significant thermal and structural enhancements for high-current cable applications.

Key Benefits of Hybrid Insulation

- Superior Thermal Resilience

NOMEX® is a high-performance aramid capable of withstanding continuous operating temperatures between 200°C and 220°C. This material provides the critical thermal barrier necessary to contain the intense heat generated by bare conductors during high-current loads, ensuring long-term structural integrity where standard papers might fail.

- Enhanced Dielectric and Cooling Properties

While NOMEX® provides the thermal backbone, the Paper component is utilized for its highly hygroscopic nature. When submerged in transformer oil, the paper facilitates efficient heat dissipation away from the conductor, providing a synergistic cooling effect that protects both the bare cable and the NOMEX® layers.

Impact on Cable Application

The adoption of hybrid cable technology yields two primary engineering advantages:

1. Reduction of Radial Build

Advantage: The high dielectric strength of the hybrid system allows for a thinner insulation profile, effectively reducing the Radial Build without compromising safety.

Result: A reduced diameter increases the clearance between adjacent cables. This expanded spacing promotes superior oil circulation, which is vital for maintaining stable operating temperatures within the transformer.

2. Optimization of Cross-Sectional Area (CSA/MCM)

Advantage: Because NOMEX® can sustain significantly higher temperatures, the conductor's CSA/MCM (Cross-Sectional Area) can be downsized. The insulation is robust enough to contain the higher heat density produced by a smaller, more efficient conductor.

Result: Reducing the CSA allows for a more compact cable group. This is particularly beneficial when routing through tight internal transformer components, such as the OLTC (On-Load Tap Changer) or DETC (De-Energized Tap Changer). Improved oil flow in these areas significantly mitigates the risks of gassing and Partial Discharge (PD).

Economic Impact

Beyond the technical performance, the use of hybrid insulation drives **substantial cost efficiencies.** By optimizing the CSA/MCM, the total volume of conductive material is reduced, leading to lower overall material expenditures without sacrificing power capacity or reliability.

Square & Rectangular Cable

Single wires are bunched, twisted and stranded together to form a Circular Cable which is then further processed into Square & Rectangular Shar / Profile by using precision engineering.

The objective of using these Profiled Conductors' is compactness in Winding which would result into saving of space thus reducing the overall diameter of the windings.

PROFILE FLEXIBLE CABLES = COMPACTNESS IN DIMENSIONS = REDUCTION IN OVERALL WINDING DIMENSIONS

SG USA Produce these Profiled Cables with Follwing wraps

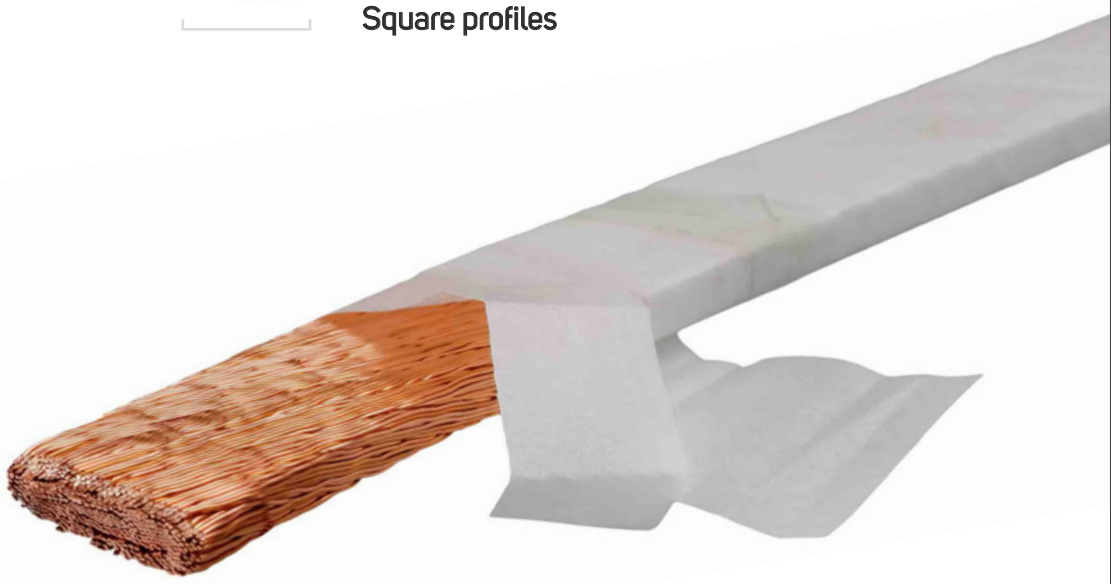
- ARAMID
- CREPE
- CREPED ARAMID

Dimensional Specifications

Minimum Width	5mm
Maximum Width	30mm

Minimum Thickness	5mm
Maximum Thickness	30mm

Square profiles

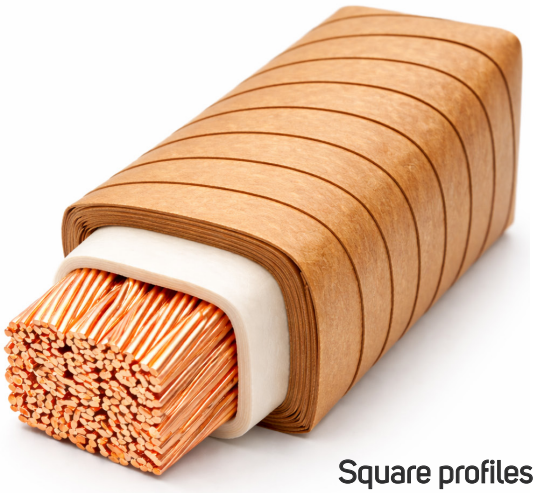


Rectangular profiles

Note: We can offer square and rectangular cable for 1/0, 2/0, 3/0, 4/0, 250MCM, 300MCM, 400MCM, 450MCM, 500MCM, 600MCM, 650MCM, 750MCM, 800MCM, 900MCM, 1000MCM and up to 1200MCM

Multi-Layer Conductor Build

The stranded conductor consists of multiple wires enclosed in an Inner NOMEX® layer, with additional crepe or NOMEX® wrapping for insulation. Available in both square and rectangular profiles, this structure ensures strong protection, flexibility, and reliable electrical performance.



Square profiles

Engineered Cross-Section Design

The cable structure features multiple conductive wires/strands enclosed within high-performance insulating paper. Depending on the design, it uses crepe brown paper for flexible rectangular profiles or NOMEX® plain white paper for durable square profiles. This construction ensures strong insulation, efficient conductivity, and adaptability across different cable dimensions and applications.

Rectangular profiles

Mobile Substation Transformer

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.

Application – As leads

(Save an Extra Soft Lead)

Advantages = Highly Flexible
Accurate length = Saves Scrap Generation
Reduction in Production time = Increased through put time
Inventory Control = Least storage Area

Extra Soft Lead Cables

Precision-Engineered for Distribution and Power Transformers

Designed specifically for Oil and Liquid-Filled Transformers, our Extra Soft Lead Cables utilize a specialized dual-stage annealing process. By treating both individual strands and the final stranded cable, we achieve a level of pliability and structural integrity that exceeds standard industry benchmarks.

TECHNICAL SPECIFICATIONS & PERFORMANCE

Superior Maneuverability: Engineered for high-flexibility applications, allowing for acute bending without compromising the conductor's physical or electrical properties.

Optimized Geometry: Delivers a Lower Overall Diameter (OD) per MCM, providing a compact profile that facilitates easier routing within high-density transformer housings.

Advanced Construction: The extra-soft metallurgical state allows for higher single-wire construction, resulting in a more robust conductor that remains effortless to manipulate.

MANUFACTURING & OPERATIONAL EFFICIENCY

Precision-Cut Lengths: Supplied to your exact specifications to eliminate scrap generation and reduce material waste on the production floor.

Increased Throughput: Ready-to-install leads reduce preparation time, directly accelerating your assembly and production cycles.

100% In-House Testing: Every lead undergoes rigorous electrical and mechanical testing in our facility to guarantee uncompromising quality and consistency.

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.

Power performance mapped with precision and clarity

This performance matrix provides a clear comparison of various cable types based on key electrical and mechanical parameters. It highlights critical factors such as voltage capacity, flexibility, compactness, bending, and wall/build strength, enabling easy evaluation of each cable's capabilities.

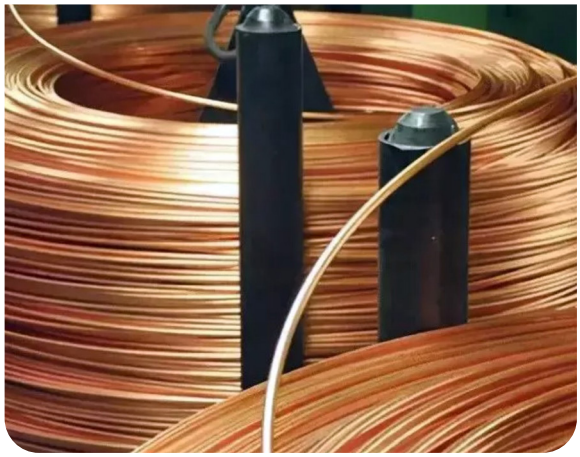
LOW MODERATE HIGH

CABLE TYPES	ELECTRICAL VALUES			MECHANICAL VALUES		
	VOLTS	FLEXIBILITY	COMPACTNESS IN BARE	COMPACTNESS IN INSULATED CABLE	BENDING	WALL / BUILD
NORMAL CABLES						
Thermally Upgraded Kraft & Crepe Paper Insulated	MODERATE	LOW	LOW	LOW	LOW	LOW
Two Way Stretch Thermally Upgraded Crepe Paper Insulated	HIGH	HIGH	MODERATE	MODERATE	HIGH	MODERATE
Thermally Upgraded Paper Having Nitrogen Content	MODERATE	MODERATE	LOW	LOW	LOW	MODERATE
SPECIAL CABLES						
'X' Creped Wrapped Cables	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Hybrid Cables	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Extra Soft Cables	MODERATE	HIGH	HIGH	HIGH	HIGH	HIGH
NOMEX® Wrapped Cables	HIGH	MODERATE	MODERATE	MODERATE	MODERATE	HIGH
Micro Creped Wrapped Cables	HIGH	MODERATE	LOW	MODERATE	LOW	MODERATE

RAW MATERIAL

Our Core Raw Materials

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



Special Features:

- Electrical-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

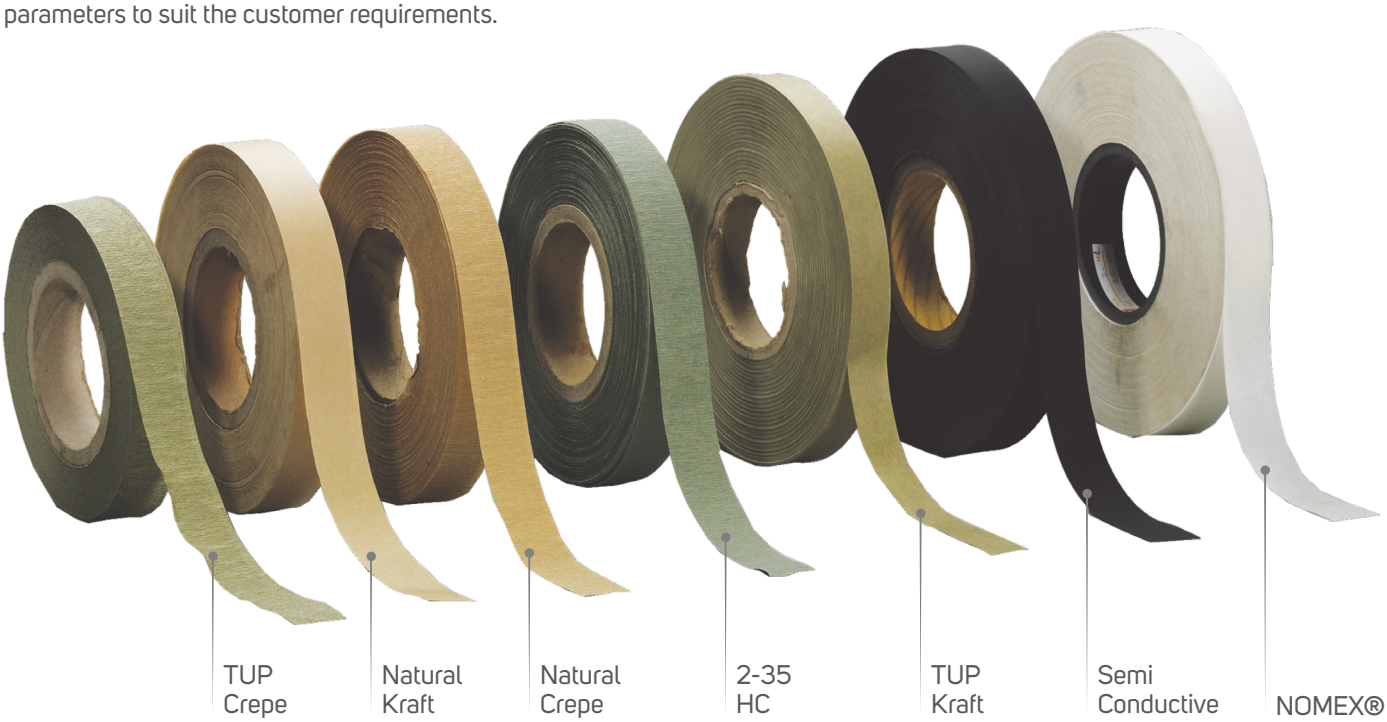
Resistivity: 0.0172410 Ω.mm²/mtr | **Conductivity:** ≥100% IACS

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

- **ASTM B 49-08**

Raw Material Paper

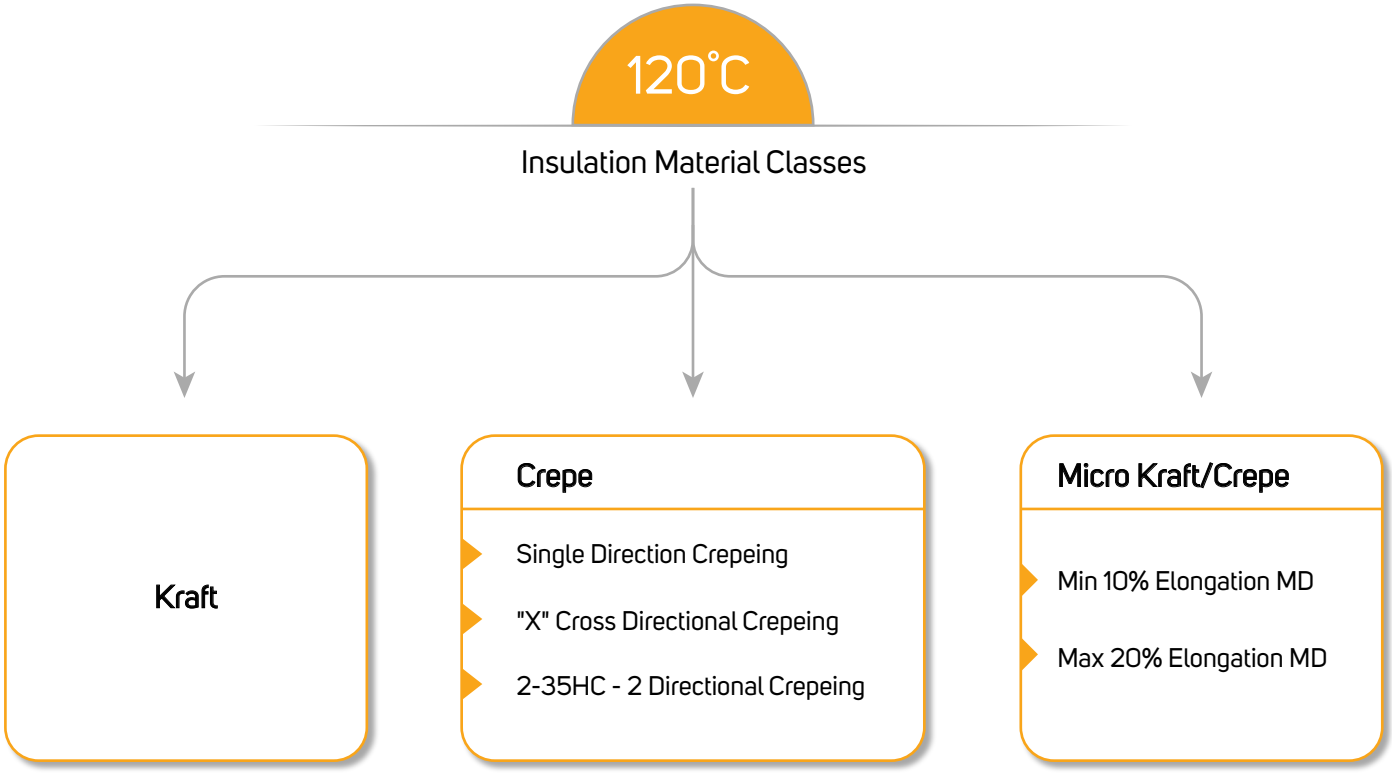
Paper slitting/storage and lapping done under temperature and atmosphere controlled dust free environment.
P.S. we can manufacture cables with paper having various GSM's and technical
parameters to suit the customer requirements.



Other Insulating Paper/Tapes

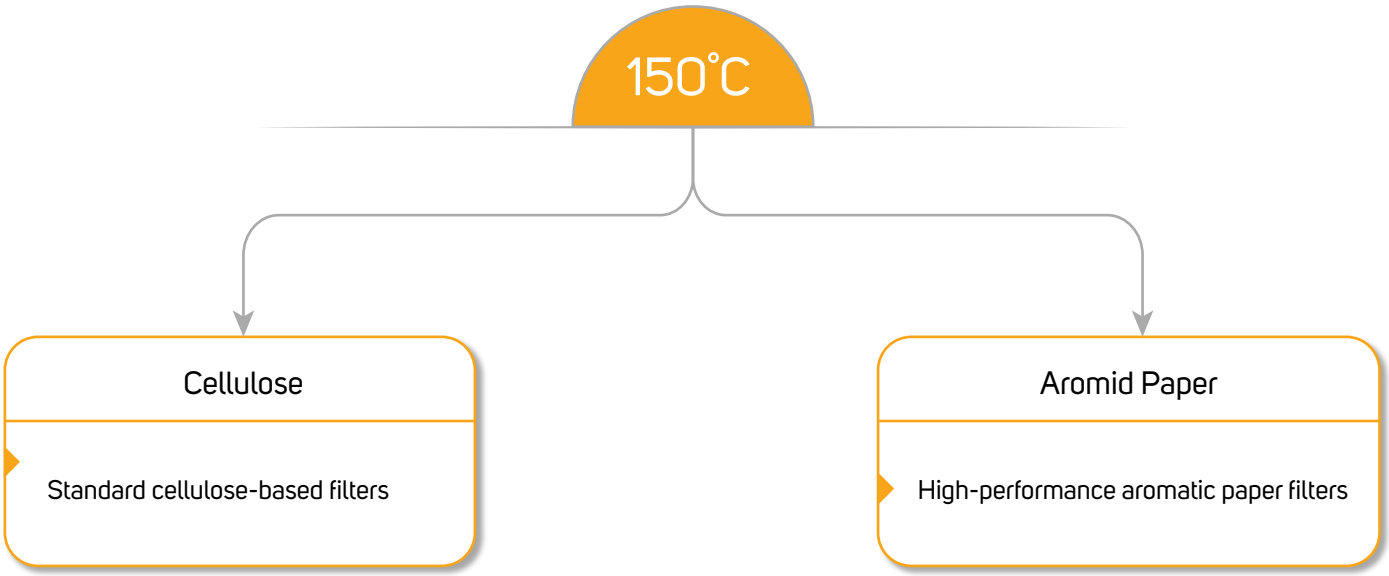
Polyester/Mylar Film | Cotton Tape/Yarn | Teonex | Kapton Film | Semi-conductive (Carbonized) Tape

Temperature/Class

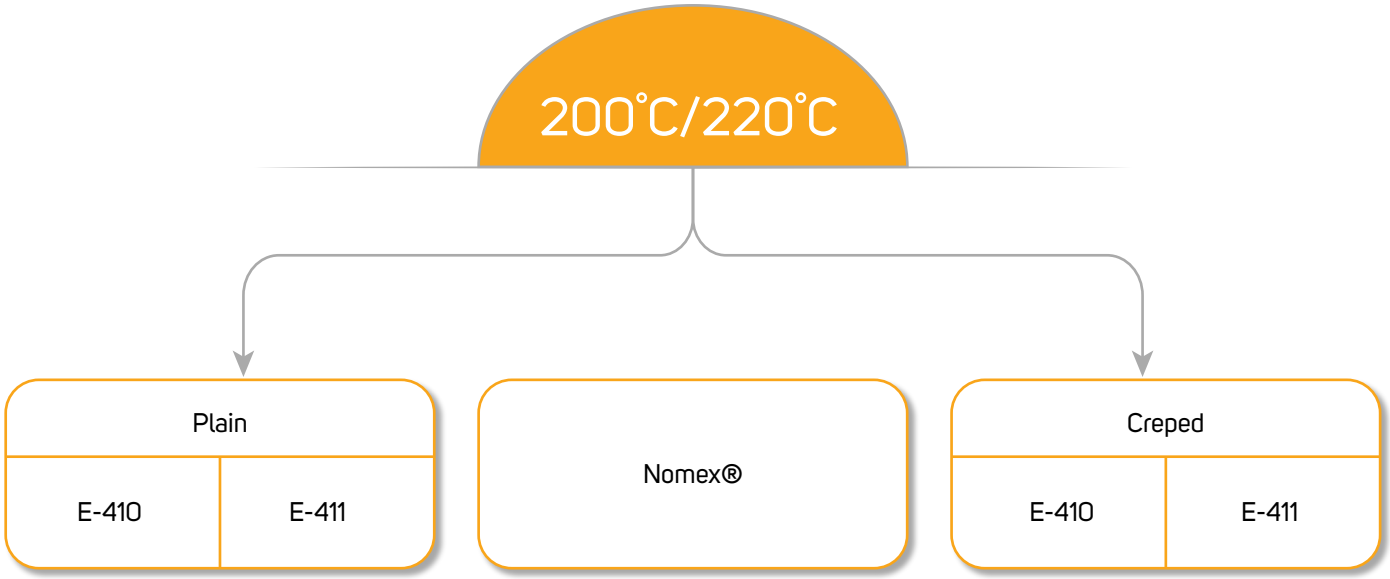


Our filtration solutions are categorized by temperature range, helping you choose the most suitable media for consistent performance and long-lasting reliability.

Low Temperature Filtration Options:



High Temperature Filtration Solutions:



Advanced Manufacturing Capabilities

Precision Radial Build

High-Volume Single Pass: Our advanced machinery achieves a 32-layer radial build in a single pass, ensuring structural integrity and production efficiency.

Dimensional Accuracy: This streamlined process guarantees a precise inch-radial build, meeting the most stringent tolerance requirements.

Stress-Free Material Handling

Caterpillar Traction System: To maintain the physical properties of the conductor, we utilize a caterpillar pulling mechanism that eliminates bending stress.

Zero Paper Shifting: By minimizing mechanical bending, we prevent the shifting of insulation layers, ensuring a uniform and stable wrap throughout the cable length.

Smart Monitoring & Quality Control

Integrated Sensor Array: Every taping head and pad is equipped with dedicated sensors.

Automated Continuity: The system triggers an instant automated stop if a paper break is detected, guaranteeing a 100% consistent layer count and radial thickness across every meter.

Uniform Tension Management

Active Tension Compensation: Each individual head features a tension compensating device to maintain exact wrapping pressure.

Perfect Concentricity: This ensures a tight, uniform paper wrap and superior concentricity of the radial build, which is critical for high-voltage performance.

Advanced Adhesion Technology

Precision Glue Application: We offer both Line and Dot bonding methods tailored to specific application needs.

Structural Integrity: Our specialized glue application prevents the "un-wrapping" of the final paper layers, facilitating easier handling and installation for the end-user.

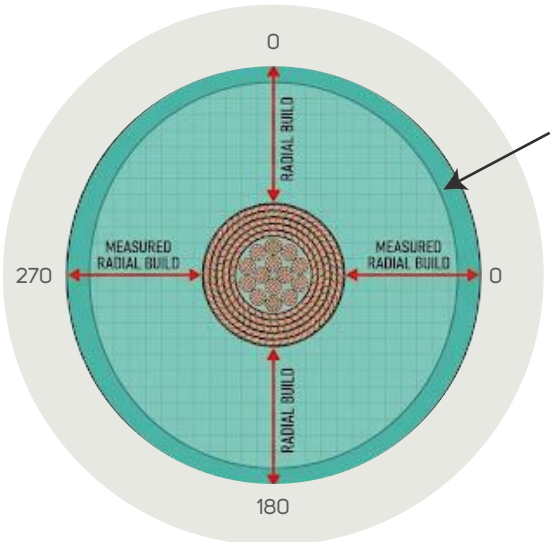
Customized Cable Identification

On-Demand Surface Printing: We provide high-legibility printing on the cable jacket or insulation surface at precise intervals.

Bespoke Coding: Whether it is technical specifications, batch numbers, or client branding, our "As per Customer Request" printing ensures effortless cable identification and onsite traceability.

ENGINEERING DIAGRAM:

RADIAL BUILD CHARACTERISTICS



DESIGN SPECIFICATIONS:
UNIFORM RADIAL BUILD TARGET (UNIFORMITY)

PACKAGING AND LOGISTICS

We prioritize the integrity of our products through rigorous packaging standards and tailored logistical solutions.

Drum Specifications and Handling

- Material Construction: Cables are supplied on high-durability plywood or pinewood drums, engineered to withstand the rigors of industrial transport.
- Interlayer Protection: To prevent surface abrasion during transit and decoiling, each layer of cable is separated by a protective interleaving of paper or polyethylene sheeting.

Environmental Preservation

- Atmospheric Shielding: Every drum is encapsulated in a comprehen sive layer of industrial-grade stretch film. This barrier ensures the cables remain shielded from humidity, dust, and other atmospheric contaminants during storage and handling.

Customization and Precision

- Tailored Lengths: SGU is fully equipped to provide precision-cut cables. We supply exact lengths tailored to specific customer requirements, minimizing on-site waste and streamlining the installation process.

USA GROUP

AT THE CORE OF GLOBAL POWER

SUNGRID USA CORP.
728 WERTZ RD NE, ROANOKE VA 24012

SUNGRID