

# INFINITE POSSIBILITIES

We craft **CNT** into  
Breakthrough Innovations

\*Extreme Ultraviolet  
EUV Pellicle

CNT  
Membrane

CNT  
\*Carbon Nanotube



The axrial membrane is a very thin CNT film—just a few dozen nanometers thick. Made with aweXome Ray's own continuous process, it delivers precisely tuned EUV transmittance (70–98%), heat resistance (up to 1,000°C), and scalable width (up to 150 mm) built for next-gen EUV pellicles.

EUV Transmittance

up to **98%** ↑

Heat Resistance

**600-1000°C** ↑

**Infinite Possibilities**

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**aweXome Ray**

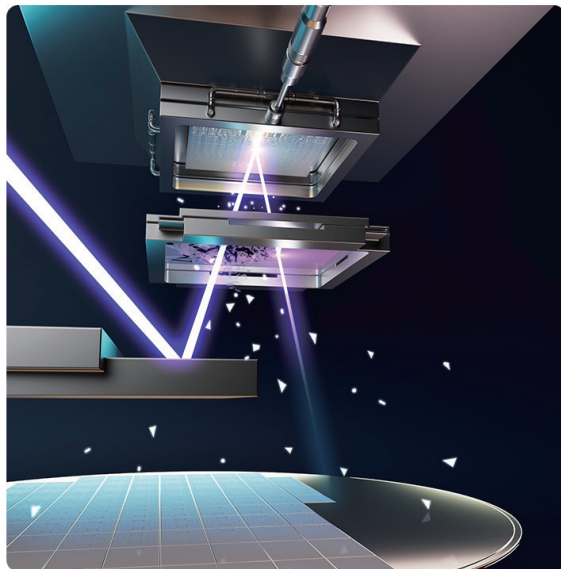
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## Pain point

In EUV (Extreme Ultraviolet) lithography for semiconductor patterning, pellicles are used to keep the photomask free from particles and improve yield. However, traditional materials cannot keep up, either due to an inability to handle heat or because of inadequate EUV transmission. Consequently, next-gen EUV processes (with higher power and NA) necessitate the development of a new kind of pellicle.

### Conventional pellicles used in 400W



Standard specifications for EUV pellicle membranes

EUV Transmittance

**94% ↑**

Uniformity of Transmittance

**0.4% ↓**

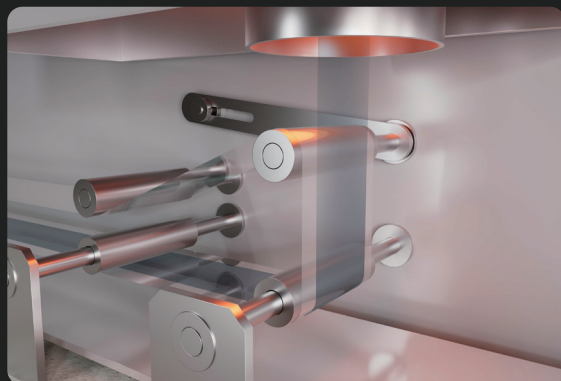
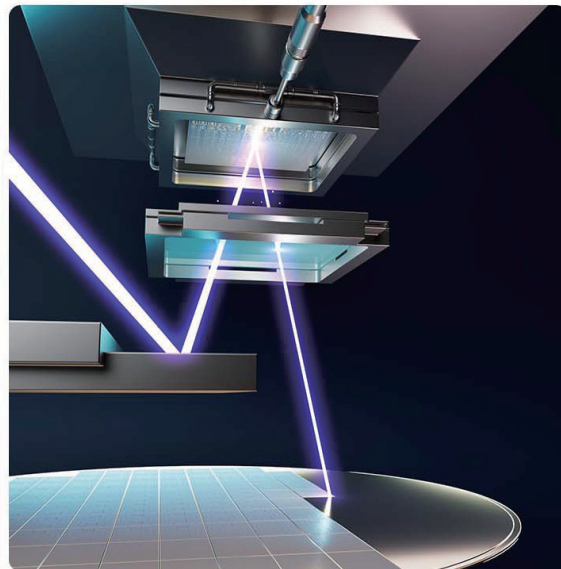
EUV Reflectance

**0.04% ↓**

Heat resistance

**1,000°C**

### CNT-based materials



## Core strengths of axrial membrane

The axrial membrane is continuously produced through a combination of FC-CVD-based CNT synthesis and a roll-to-roll system. By fine-tuning key variables during both synthesis and post-processing, we can precisely control the membrane's size (up to 150 mm wide) and microstructure, including its density.



## Target applications

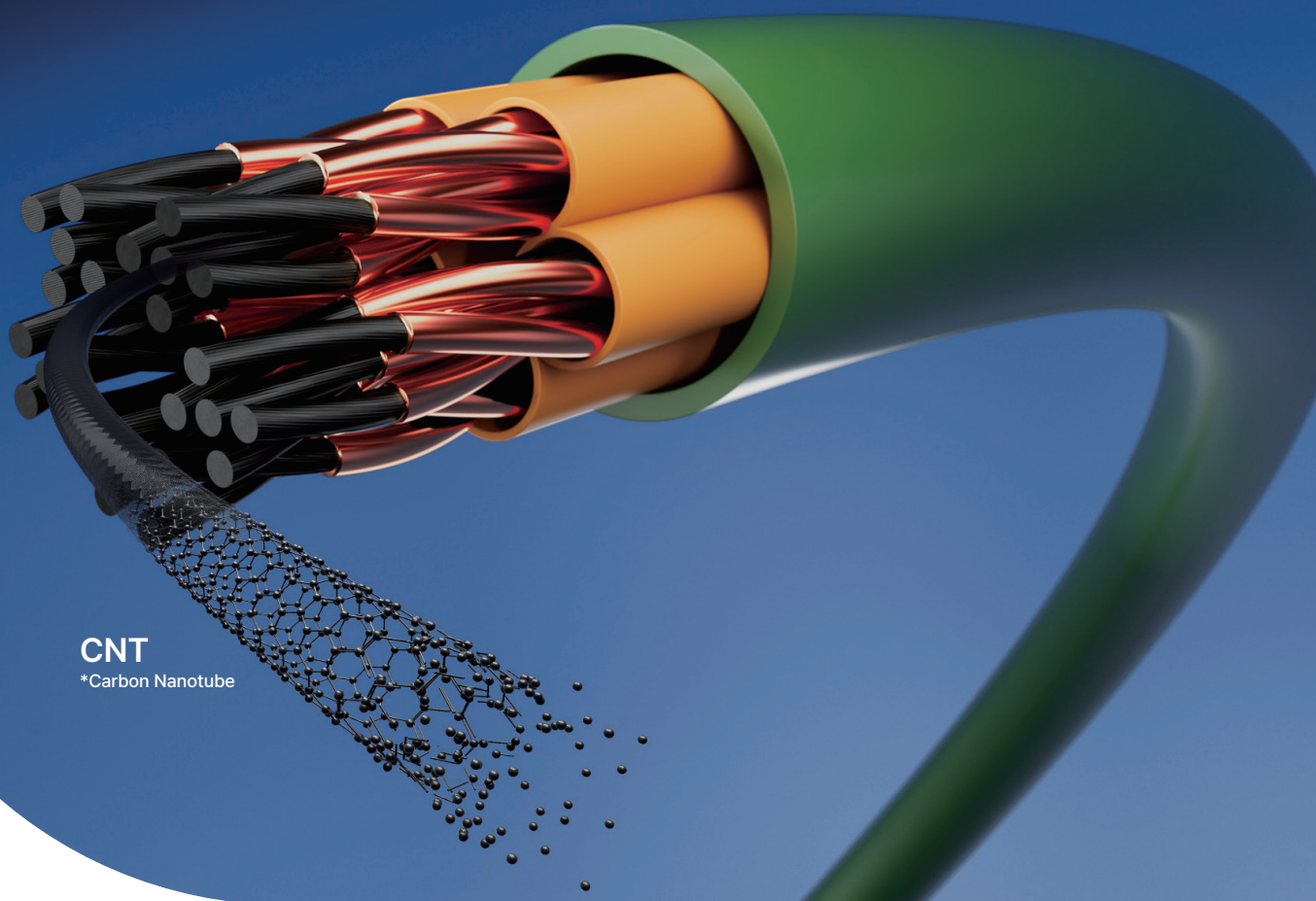
The axrial membrane is built for industries that demand extreme heat resistance and high optical transmittance from EUV pellicles and debris filters to transparent heaters, battery components, shielding films, and optical sensors.





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**CNT**

\*Carbon Nanotube



axrial electric is a conductive composite wire made by coating CNT yarn with metal— typically copper. It delivers copper-level conductivity at just 20 percent of the weight. It is lightweight, flexible, and built to endure, making it a strong fit for wiring in EVs, drones, and urban air mobility systems.

**Electrical  
conductivity**

**50MS/m**

**Tensile strength**

**1.0-5.0N/tex**

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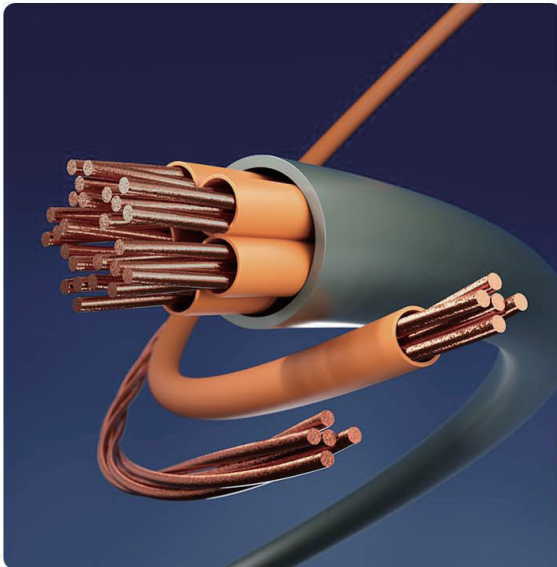
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## Pain point

Traditional copper wires are heavy, stiff, and prone to performance loss or breakage due to fatigue over time. That is why there is growing demand for lightweight conductors with strong electrical performance, especially in next generation mobility systems like electric vehicles, drones, and urban air mobility.

## Conventional copper cables



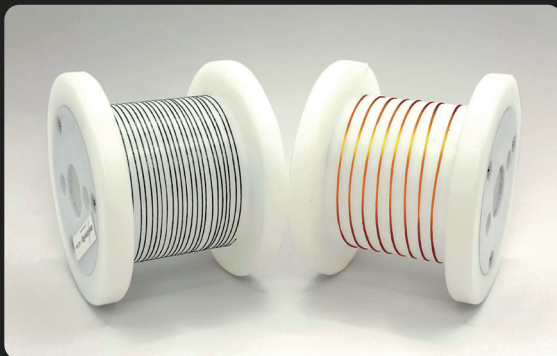
Core  
strengths of  
axrial electric

Electrical  
conductivity  
**50MS/m**

Tensile strength  
**1.0-5.0N/tex**

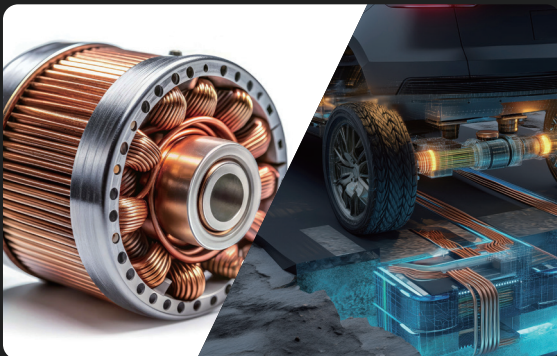
Weight  
**20%**  
(lighter than copper)

## CNT-CU composite cables



## Core strengths of axrial electric

axrial electric is a hybrid material made by continuously coating CNT yarn with copper. It delivers copper-level conductivity but is lighter, more flexible, and stays stable even under repeated bending or vibration.



## Target applications

It is used in lightweight wiring, coil windings, and wire harnesses where high conductivity, low weight, and flexibility are essential, especially in next generation mobility systems.



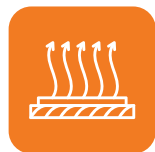


# INFINITE POSSIBILITIES

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**CNT**

\*Carbon Nanotube



axrial heat is a CNT-based material available in fabric, film, and wire formats. It provides both heating and cooling functions. The size and shape can be adjusted during processing, and it is lightweight, flexible, and highly durable against fatigue. That makes it ideal for next generation heating and cooling applications like wearables, massage chairs, and more.

**Thermal conductivity**  
(vs. nichrome)

**300%** ↑

**Heat resistance**  
(in air)

**500°C**

**Still works after repeated use**

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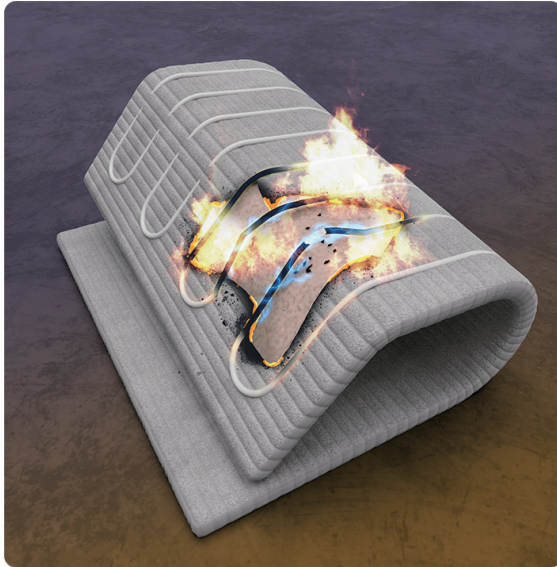




## Pain point

Conventional heating materials lack fatigue durability and are easily damaged by repeated bending or movement. Their poor stability and heating efficiency often require extra reinforcement, which adds thickness. These limitations make it difficult to apply these materials to products with complex shapes or curved surfaces.

## Traditional metal / carbon-based heating materials



Core  
strengths of  
axrial heat

Thermal conductivity  
(vs. nichrome)

**300% ↑**

Heat resistance  
(in air)

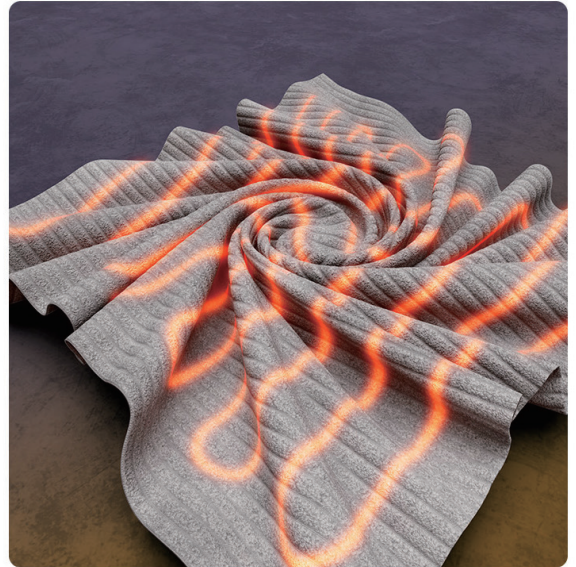
**500°C**

Weight  
(vs. copper)

**20%**

Tensile strength  
**1.0-5.0N/tex**

## CNT based heating materials



## Core strengths of axrial heat

axrial heat is a CNT fiber-based heating material available in yarn, fabric, and film formats. It offers precise temperature control and high fatigue durability, making it reliable for a wide range of applications. It can also be blended and woven with conventional textiles, making it ideal for wearables, devices, and smart clothing.



## Target applications

This is ideal for products that demand flexibility and fatigue durability, including wearables, smart clothing, massage chairs, and medical heating devices.

