

Epoxy Glass Fiber Filament Wound Insulation Tubes

Structural insulation components engineered for high-voltage electrical equipment.

Electrical insulation · Mechanical support · Dimensional control

GIS/HGIS · CT/PT/CVT · SURGE ARRESTER
TRANSFORMER SYSTEMS · BREAKERS & FUSES ·
HVDC



Reliable composite insulation materials for industrial applications.

A focused supply platform for engineered epoxy composites, supported by application review, manufacturing coordination and export-oriented service.



WORKSHOP & EQUIPMENT

About WEENOOR

WEENOOR supplies engineered composite insulation components and related epoxy material systems for electrical and industrial applications. Our work connects material selection, filament-wound construction, machining and application-specific review.

For each inquiry, we review the customer drawing, insulation level, mechanical load, operating environment and interface requirements before confirming the construction and validation scope.

Application-led · Made to drawing · Export-oriented

Product platform

The insulation tube remains the core focus; supporting material systems can be coordinated for compatible assembly and processing.

01 Epoxy insulation tubes

Filament-wound structural insulation tubes for high-voltage equipment.

02 Epoxy adhesive systems

Bonding systems for flanges, inserts, interfaces and assembly operations.

03 Epoxy resin systems

Formulations for casting, impregnation and composite processing requirements.

04 Composite process additives

Selected auxiliaries for process stability, wetting and surface performance.

CUSTOMER INPUT

Drawing & operating conditions

CONSTRUCTION REVIEW

Material, winding & interfaces

VALIDATION

Sample / drawing / test approval

SERIES SUPPLY

Inspection & protected packing

A structural insulation component — not a general-purpose FRP pipe.

High-performance epoxy resin and continuous glass fiber are filament wound and thermally cured into a tube that carries electrical and mechanical functions together.



How the structure works

Continuous reinforcement and a compatible epoxy matrix are combined through controlled winding, wet-out and curing. The construction can be adjusted for axial, hoop and combined loading.



CONTINUOUS GLASS FIBER + EPOXY MATRIX

Smooth bore · controlled wall · machinable ends

Six technical advantages

The final balance of properties is set by the resin system, fiber content, winding architecture and cure cycle.

01

Electrical insulation

Stable dielectric behavior from controlled resin/fiber interfaces and low void content.

02

Mechanical strength

Winding angles can be selected for bending, compression, hoop and combined loads.

03

Temperature stability

Resin and Tg options are selected around the intended operating requirement.

04

Low porosity

Controlled wet-out and cure help reduce internal defects and support consistent insulation.

05

Smooth inner surface

Mandrel finish and process control support sealing, assembly and field uniformity.

06

Accurate dimensions

ID, OD, wall thickness, concentricity and end features are made to drawing.

Construction and claims are confirmed against the approved drawing and technical data sheet for each specification.

TYPICAL APPLICATIONS

Designed into the insulation and load path of high-voltage equipment.

Representative application environments are shown below. Final product suitability depends on voltage class, mechanical load, pressure/sealing form and the equipment maker's validation plan.



GIS/HGIS & SF₆ switchgear

Insulating cylinders for bushings, interrupter and switching assemblies.



Instrument transformers & arresters

Primary insulation cylinders, supports and protected structural cores.



Transformers, reactors & tap changers

Machined insulating cylinders and structural components for internal assemblies.



HVDC converter valves

Insulating members for valve towers and demanding high-field structures.

ADDITIONAL APPLICATION FIT

Composite hollow insulators · Breakers and current-limiting fuses · Electrical pressure vessels · Bushings and equipment-specific insulating cylinders

CUSTOMIZATION INPUT

Voltage level · mechanical load · pressure · sealing method · dimensions · wall thickness · machining tolerance

Typical performance data and manufacturing focus.

The ranges below preserve the complete reference set from the original catalog. Final values depend on the approved material system, tube size, wall thickness and agreed test method.

PROPERTY	UNIT	TYPICAL VALUE
Glass transition temperature (Tg)	°C	126–220
Glass fiber content	wt%	70–85
Dye penetration time (reference)	min	>15
Bending / flexural strength	MPa	140–200
Compressive strength	MPa	>130
Axial breakdown strength	kV/mm	>3
Circumferential breakdown strength	kV/mm	>15
Dielectric constant	—	4.5–5.5
Volume resistivity	Ω·m	>10 ¹²

Manufacturing & quality focus

- 01 **Material compatibility**

Resin and glass fiber system selected together.
- 02 **Stable winding**

Controlled tension, angle and fiber placement.
- 03 **Controlled cure**

Thermal cycle matched to the resin system.
- 04 **Low porosity**

Wet-out and process controls reduce internal voids.
- 05 **Smooth bore**

Mandrel and release-process surface control.
- 06 **Accurate geometry**

OD, wall, concentricity and machining to drawing.

Inspection and release

The agreed inspection plan is aligned with the drawing, specification and customer documentation requirements.

- 01 **Visual & dimensional**

Surface, ID/OD, wall, length and specified tolerances.
- 02 **Drawing conformity**

End faces, holes, grooves, flanges and interface features.
- 03 **Agreed performance tests**

Electrical, mechanical or sealing tests as specified.
- 04 **Packing release**

Protection, labeling and shipment condition check.

Typical reference values only. Final specification and test methods are subject to the approved technical data sheet and customer requirements.

Real production visibility from winding to protected packing.

The production image below is an on-site manufacturing record. Size capability, controlled workshop conditions and production flow are presented to support technical review.



Manufacturing capability

STANDARD WINDING RANGE

OD < Ø650 mm · Length < 5,300 mm

EXTENDED WINDING RANGE

OD < Ø1,100 mm · Length < 11,000 mm

Controlled manufacturing environment

- Workshop temperature and relative humidity are controlled.
- Supports stable resin viscosity and glass-fiber wet-out.
- Winding and cure parameters follow the approved process.

Typical production flow

01 Material preparation

Resin, glass fiber and tooling.

02 Filament winding

Tension, angle and wet-out control.

03 Thermal cure

Approved cure temperature and time.

04 Demold & machining

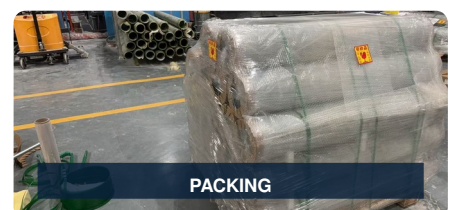
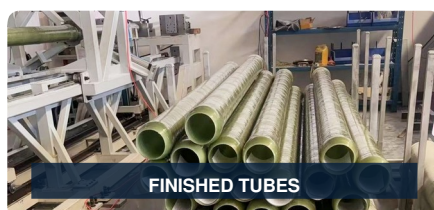
Ends, bores and interface features.

05 Inspection

Dimensions and agreed test checks.

06 Protected packing

Surface protection and labeling.



Size feasibility is subject to wall thickness, winding construction, tolerance and drawing review. Process sequence and inspection scope are adjusted to the approved specification.

Define the tube around the equipment — not the other way around.

Send the drawing or target specification. We review the application, construction, interfaces and validation scope before quotation.

CUSTOMIZATION ITEM	REVIEW / CONFIGURATION SCOPE
Tube size	OD / ID / wall thickness / overall length
Electrical	Voltage level / insulation / breakdown requirement
Mechanical	Bending / compression / pressure / mounting load
Material system	Resin / glass structure / fiber content / Tg
Surface & machining	Inner smoothness / end face / holes / grooves
Assembly	Flange bonding / sealing / inserts / interfaces
Working conditions	Temperature / pressure / gas / oil / humidity
Documentation	Drawing review / discussion / inspection data

Enquiry checklist

Please include, where available:

- Drawing or target dimensions
- Voltage class and insulation duty
- Mechanical and pressure loads
- Operating temperature / medium
- Machining and interface details
- Test and documentation needs
- Estimated quantity and schedule

A complete input package shortens technical review and quotation time.

Related material support

Supporting material systems can be discussed together with the tube and assembly design.

01

Epoxy adhesive systems

Flanges, inserts, interfaces and bonding operations.

02

Epoxy resin systems

Casting, impregnation and composite processing.

03

Composite process additives

Selected auxiliaries for stable manufacturing.

Send your drawing or target specification.

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