

## KUVAG Group

### Products and capabilities

Leading in Insulator Technology made in Austria



## Overview on our available production technologies



Automatic pressure gelation



Silicon injection



Vacuum casting



Injection moulding



Filament Winding



Vacuum impregnation



High tension - bonding



SMC / BMC

# KUVAG is equipped with a broad range of inspection and testing facilities



## X-ray testing

- IT-based testing equipment
- Products up to 400 kg
- Electronic documentation of test reports for each part



## Climate chamber

- Temperature simulation
- -40 to +200 ° C range of machine



## Electrical testing

- Partial Distribution testing up to 100 kV
- IT based with semi-automatic programs for testing



## Gas leakage testing

- Helium based testing device to identify leakage (e.g. for isolators used in SF6-Switchgears etc.)



## Chemical laboratory

- Broad range of tests e.g. TG, moisture, viscosity, acidity, ash content, roughness, etc.
- Raw material testing



## Bursting pressure testing

- Own facility for pressure testing up to 100 bar
- Broad range of testing molds (customer specific)



## Mechanical testing

- Tensile
- Bending
- Elongation



## Dimensional testing

- 3-D machine
- Table of 5 sqm

# KUVAG covers a broad range of product lines and applications across a variety of industries



## Product lines and application of KUVAG products

### T & D – High voltage



Broad variety of insulated bodies, post insulators, bushings, switching rods for

- Gas insulated switchgear (GIS)
- Generator circuit breaker
- Circuit breakers of all types
- Disconnectors
- HV transformers
- Surge Arresters
- Cable joints and cable end plugs

### T & D – Medium voltage



All types of insulators, housings, post insulators, bushings, resistors indicating systems & LV current transformers applied in

- Gas insulated switchgear
- Air insulated switchgear
- MV circuit breakers of all types
- Recloser
- MV transformer products
- Outdoor applications

### Traffic engineering



All kind of pantographs, loop insulators, post insulators and roof bushings for

- Rolling stock
- Traffic Infrastructure

Broad knowledge and experience in hydrophobic material solutions for outdoor applications

### Medical technology



- Inner tubes for MRI (up to Ø 800 mm and length of 1.500 mm)
- Outer tubes for MRI (up to Ø 850 and length of 1.500 mm)
- Insulating loops

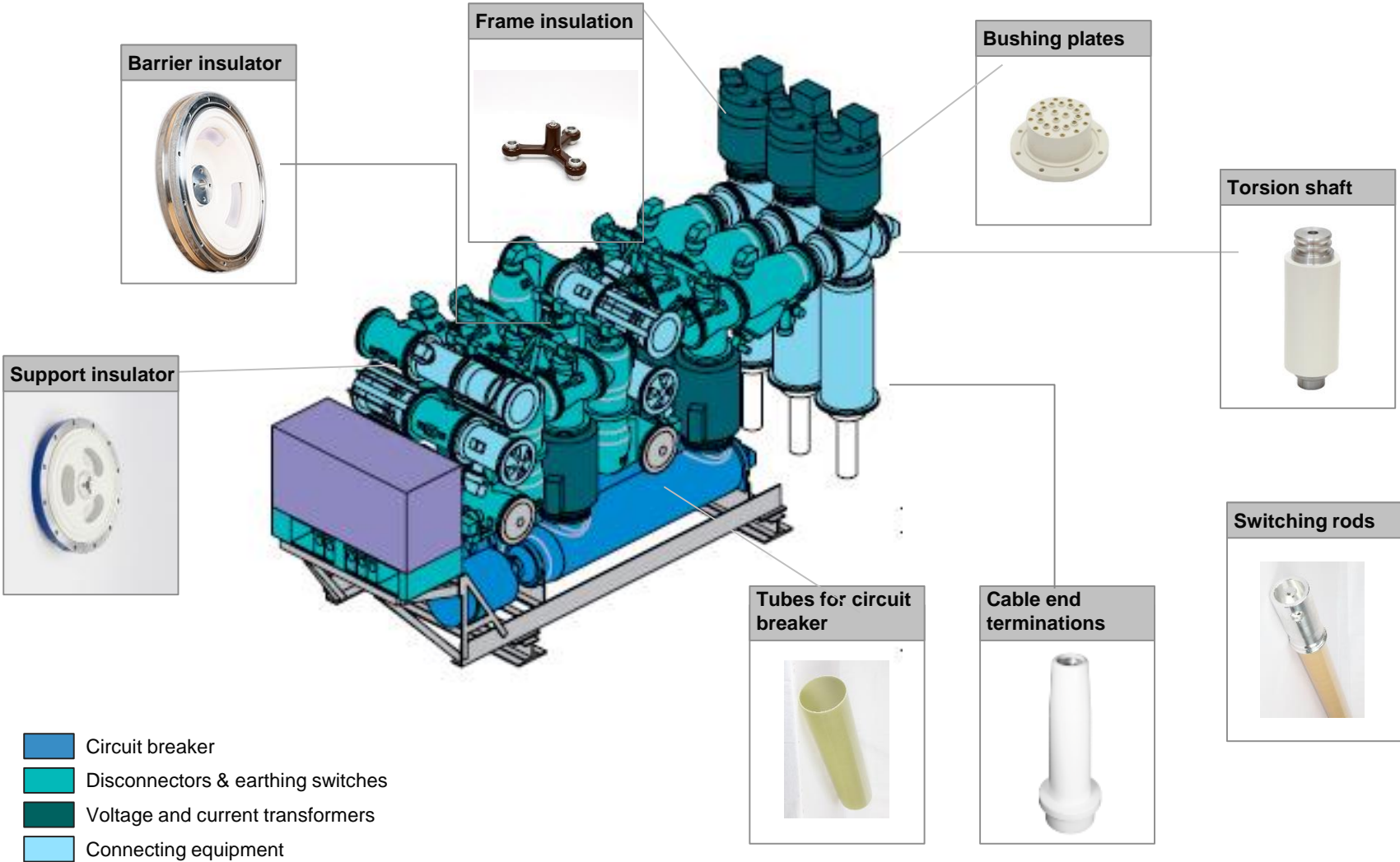
### Industrial Solutions



All kind of tubes made of glass-, carbon- and aramid-fibre; up to Ø of 2.300 mm and length of 6.500 mm; current products include:

- Coupling for wind turbine (ultra-high torsion); Up to Ø of 1.500 mm
- Rolls (Paper industry)
- Rolls and cores for foil production
- Corona roll (Foil industry)
- HV test equipment (tube)

# KUVAG products in HV-GIS (Gas insulated switchgear)



# Cable terminations - dry type / Selected examples

All cable terminations according to IEC and DIN standards

Rated voltage

---

Dimension

---

Length

---

Material

---

72,5 kV

---

Ø 300mm

---

~ 500 mm

---

Epoxy resin with aluminumoxyd filler

---



145 kV

---

Ø 300mm


---

~ 700 mm

---

Epoxy resin with aluminumoxyd filler

---



300 kV

---

Ø 345 mm


---

~ 900 mm

---

Epoxy resin with aluminumoxyd filler

---



# Cable terminations – wet type / Selected examples

All cable terminations according to IEC and DIN standards

Rated voltage

---

Dimension

---

Length

---

Material

---

72,5 kV

---

Ø 255 mm

---

~ 660 mm

---

Epoxy resin with aluminumoxyd filler

---



170 kV

---

Ø 300mm

---

~ 850 mm

---

Epoxy resin with aluminumoxyd filler

---



420 kV

---

Ø 620 mm

---

~ 1600 mm

---

Epoxy resin with aluminumoxyd filler

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# KUVAG products in MV-GIS (Gas insulated switchgear)



MV Indicating system



SF6 Bushing



Support Insulators – all types



Housings



LV current transformer



Fuse tubes





# Overview – Product line Medium voltage

## Examples

**Bushings (Air, Oil, SF6)**



**Recloser**



**Outdoor solutions (silicone)**



**Indicating systems**



**SF6 bushings**



**Polehouseings (APG)**



**Socket plugs**



**LV Current transformers**



**Support Insulators**



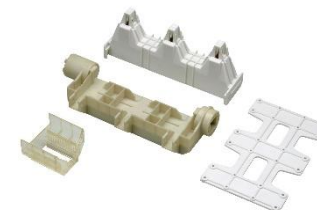
**Housings (SMC)**



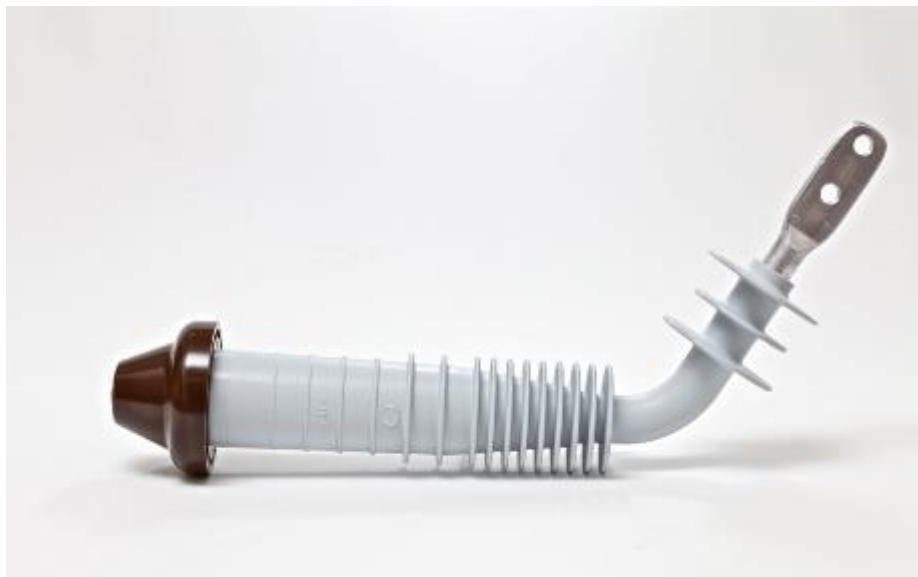
**Monoblocks**



**Thermoplastic parts**



## Example from our Outdoor portfolio - traverse silicone



Technical details	
Rated voltage	24 kV
Rated current	630 A
Description	Silicon coated insulator (produced with APG process)

## Example: Outdoor insulators with siliconised surfaces

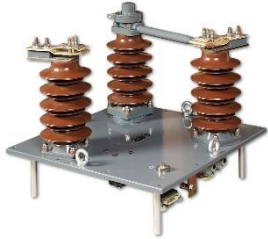


### Technical details

- Description
- Broad range of standard MV insulators and bushings with a silicon surface for heavy polluted areas
  - Engineering and design by KUVAG

# Product line Rolling stock

**Post Insulator for Disconnectors**



**Pantograph Insulators 25kV**



**Pantograph insulator 25kV (composite)**



**Pantograph Insulators up to 6kV**



**Circuit Breaker Housings**



**Circuit Breaker Housings**



**Post Insulator for the roof garden**



**Roof Bushings 25kV**



**DC Bushing 3kV**



# Product line Infrastructure

3<sup>rd</sup> Rail Metro Athens



3<sup>rd</sup> Rail SMC solution



3<sup>rd</sup> Rail SMC solution



Loop Insulators



Loop insulator with silicon



Section insulator



3<sup>rd</sup> Rail Epoxy Insulator



3<sup>rd</sup> Rail epoxy solution



3<sup>rd</sup> Rail epoxy solution

