

# EXEL RODS FOR COMPOSITE INSULATORS

## Insulating rods for low-, medium- and high-voltage applications

Composite insulators consist of a rod from GRP as core, a housing made of silicone and 2 pressed-on fittings made of metal. We manufacture these rods exclusively of boron-free ECR-glass with Epoxy Resin -system. At present, diameter with the following nominal sizes (mm) are available:

10	13	15	16	17	18	22
24	25	30	32	34	36	43
45	60	63	70	76	90	100

Tolerances of diameter  $\pm 0,05$  up to  $0,1$  mm. Straightness  $0,5$  mm / 1000 mm.

## Applications

- Composite – long rod insulators for overhead transmission lines
- Line posts for distribution and traction line





Epoxy-rods apply to all voltage ranges.

Resin epoxy

Fibers ecr glass 9600 tex

Property	Standard	Unit	Values
Diameter tolerance +/- from rated dimension		mm	0,1
Rounding		mm	< 0,1
Straightness to 1000 mm		mm	< 0,5
Content of glassfiber	DIN EN 60	% of vol	> 70
Content of glassfiber	DIN EN 60	% of weight	> 82
Density	DIN 53479	g/cm <sup>3</sup>	2,1
Thermal conductivity		W / mK	0,77
Linear thermal elongation coefficient (ll to fiber)	DIN 52328	10 <sup>-6</sup> / K	6
Linear thermal elongation coefficient (normal to fiber)	DIN 52328	10 <sup>-6</sup> / K	22
Water absorption	DIN 53495	%	< 0,03
Glass transition temperature	DMA / 1 Hz, 2 K/min	°C	> 130
Bending strength	DIN 53457	N/mm <sup>2</sup>	> 1200
Tensile strength	DIN 53455	N/mm <sup>2</sup>	> 1400
Pressure strength	DIN 53454	N/mm <sup>2</sup>	700
Torsion strength		N/mm <sup>2</sup>	70
Interlaminar shear strength	DIN 53422	N/mm <sup>2</sup>	51
Elasticity modulus	DIN 53457	N/mm <sup>2</sup>	> 50 000
Puncture voltage (ll to fiber)	IEC 243	kV/mm	5
Puncture voltage (normal to fiber)	IEC 243	kV/mm	9
Dielectric dissipation	DIN 53483	10 <sup>-3</sup>	< 13
Surface resistance	DIN 53482	10 <sup>13</sup> Ohm	> 1,1
Dye penetration test	IEC 1109	min	[> 15]
Water diffusion test	IEC 1109	mA	< 1
Tracking resistance	IEC 112		> CTI 600

These approximate values are not binding.

#### Advantages

- High mechanical strength
- Very good electrical isolation
- Low weight
- Easy installation
- High safety against brittle fracture
- High safety against vandalism



Our wide range of dimensions available in stock enable short delivery times.