BEKAPOLE Success Story

In the late Seventies, BEKA Schréder was approached by the authorities in Namibia to find a solution to the corrosion which was damaging the then conventional materials used for lighting poles, like steel, wood and concrete.

Namibia is not only one of the world's most atmospherically corrosive environments, but it also has large tracts of land with highly corrosive soils.
The resulting research into non-corrosive materials has culminated in the choice of the glassfibre reinforced polyester (GRP) pole. This material exceeded the expectations of the authorities, as it not only offered the answer to the excessive corrosion, but also offered convincing strength properties combined with an appealing finish and design.

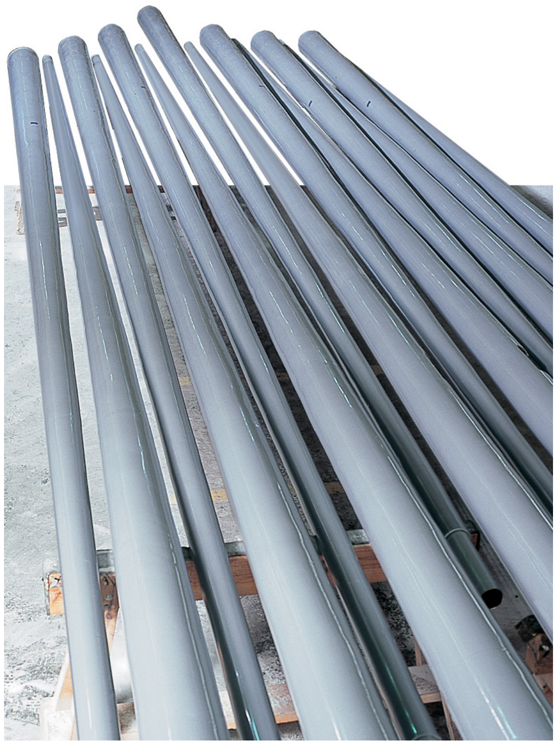
BEKA Schréder subsequently bought the expertise and machinery for the manufacture of filament wound GRP poles from a leading German manufacturer and, since commencement of production in July 1978, has manufactured several hundreds of thousands of GRP poles for the African subcontinent and beyond.

BEKA Schréder has perfected the process by adopting the latest technology.

In 1989 BEKA Schréder became the first manufacturer to be awarded the ISO 9002 accreditation for its quality management of its pole and luminaire manufacturing plant. BEKA Schréder's production is constantly subjected to the stringent quality demands which this accreditation implies.

Through its commitment to consistent quality, BEKA Schréder has become one of the world's leading manufacturers of GRP poles. BEKA Schréder's GRP poles are used for highways, main roads, residential streets, sportsfields, decorative lighting, area lighting, post-top lighting, perimeter security, parks and gardens, as well as for flag poles.

The BEKAPOLE, as it became known, is used not only for its resistance to corrosion, but is preferred by architects, developers and local authorities for its aesthetic appearance, strength, ease of installation and inherent safety for road users.



Key Advantages

Non-Corrosive
No above- or below-ground corrosion in salt climates or acid soil.

Maintenance-Free
No corrosion or decay ensures that the surface coat of the pole will not require maintenance.

Light Weight
The low mass saves handling, transport and erection costs during installation.

Longevity
Over time, BEKA Schréder fibreglass poles will outlast wood, concrete, steel and aluminium under similar climatic conditions.

Non-Conductive
Perfect electrical insulation prevents accidental electrocution by faulty wiring.

Low Inertia
A reduction in personal injury and damage to vehicles in road accidents.

High Bending Strength
Engineered to withstand a wind pressure of 500 Pa inclusive of $0.20m^2$ luminaire area with less than a 5% deflection of the mounting height. This relates to a wind speed of 103.9km/h. Any other wind speeds must be calculated separately.

Versatility
A wide range of spigots, floodlight mountings, baseplates and decorative arrangements ensure
a product for almost every application.

Vandal Resistant
High impact strength of polyester gel coat and glass filament wound structure.

Sustainable
The manufacturing process for glass fibre poles is much kinder to the environment than metal or timber products.

Light weight

Bending strength

Corrosion of steel pole

Myths

"Glass fibre poles whip around in the wind..."
Due to the unique process of glass filament winding, standard BEKA Schréder GRP poles are designed to withstand a wind pressure of 500 Pa on a projected luminaire area of 0.20m^2. Some of our most satisfied customers are situated in coastal environments subjected to high winds. All BEKA Schréder GRP poles are designed and manufactured with a safety factor of 2,5.

"Glass fibre poles are deteriorated by sunlight..."
The ultraviolet rays in sunlight will deteriorate only unprotected glass fibre. This has been eliminated by pigmenting the resin and the application of a polyester gel coat with UV inhibitors to the surface of the pole structure.

"Glass fibre poles cannot support big headloads..."
Each BEKA Schréder glass fibre pole is individually engineered by factoring in the weight, projected area and windloading requirements of the installation site. The most demanding installation is easily achieved by a pre-engineered BEKA Schréder glass fibre pole.

"Glass fibre poles are made out of plastic..."
BEKA Schréder glass fibre poles are manufactured by the filament winding process where continuous glass rovings are fed through a polyester resin bath and wound at an even tension onto a rotating mandrel, resulting in a mass glass to resin ratio of 70:30, making full use of the tensile strength of the glass filament which is more than that of steel.

Applications

The BEKAPOLE has virtually unlimited applications. It can be manufactured to any requirement relating to the number and configuration of luminaires to be mounted, inclusive of any special colour.


Main roads


Residential streets


Area lighting

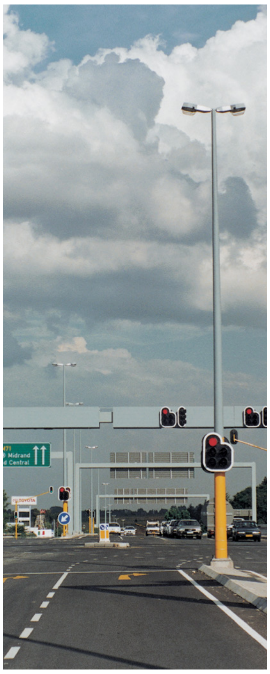

Post-top lighting


Sportsfields


Decorative lighting


Perimeter security


Parks and Gardens


Highways

Manufacturing

A mechanised system of manufacturing, utilising a track mounted winding machine onto which both the glass filament rovings and resin bath are mounted, is applied. The filament winding machine is operated at calculated speeds whilst moving alongside the rotating mandrels to achieve maximum winding angles.

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After the winding process has been completed, the glass filament structure is cured and then removed from the mandrel for surface preparation.

A base coat of polyester resin that complies with the requirements of SANS 1749 is applied, thereafter the cured structure is further machined to receive a final gel coat that is applied to a uniform thickness of between 250 and 500 microns.

In the mechanical assembly process, the pole is machined to provide holes for base plate hookbolts, cable entries, access door openings, as well as any other details required. Spigot arrangements and surface base plates, where required, are moulded into the pole and secured in position with locking screws.

Throughout the manufacturing process, the pole is subjected to stringent quality checks and tests.

Pole manufacturing plant

Finishing

Winding of glass filament

Precision quality inspection

Machining of cured pole

Access door detail

Design & Construction Details

Material
The pole is constructed by the filament winding process to achieve optimum results for strength and rigidity.
The filament winding process is continuously applied with uniform tension onto a rotating mandrel, resulting in a minimum mass glass to resin ratio of 70:30. The surface is seamless, smooth and tapered.

Finishing Coat
The material of the finishing coat is a gel coat that complies to SANS 1749 and is applied to a uniform thickness of between 250 and 500 microns, providing a weatherproof, UV-resistant, flame-resistant and impact-strong surface in the colour specified.

Mechanical Properties
A standard pole supporting a luminaire with a wind surface of 0.20m^2 may not have a pole top deflection of more than 5% of its height above ground when subjected to a basic wind pressure of 500 Pa. A safety factor of 2.5 times the total maximum windload is applicable.

Quality System
The pole is manufactured in accordance with SANS 1749 under the ISO 9002 quality system.

Access Opening
If an access opening is required, the cut-out is covered by an access door cover manufactured from glass filled nylon impregnated in the same colour as that of the surface coat. It is secured to the pole by two stainless steel Allen head captive screws into M4 brass inserts embedded in the pole.

Cable Entry
A cable entry with a minimum diameter of 34mm is provided at a minimum depth of 400mm below the ground surface.

Glandplate
A hot dipped galvanised glandplate, suitable for gland no. 0 or 1, complete with terminal block and DIN rail for a miniature circuitbreaker, is provided and is mounted to a bolt provided in the access opening.

Base Plate
Poles for direct embedment in the ground can be provided with a 300x300x1.6mm hot dipped galvanised base plate complete with 2 x hot dipped galvanised steel hookbolts and nuts. Base-mounted poles have a hot dipped galvanised flange plate that can be bolted to a foundation which is designed to withstand the forces the pole will experience in service.

Relevant pole data and other factors			Corresponding calculated key values	
Total length of pole (m)	Height of pole above ground (m)	Diameter of pole at ground level (mm)	Load to be applied inpole-top deflection test (N)	Maximum permitted deflection in pole-top deflection test (mm)
2.6	2.0	110	135.4	100
3.1	2.5	120	143.4	125
3.6	3.0	128	152.0	150
4.1	3.5	135	161.0	175
4.6	4.0	146	171.6	200
5.2	4.5	155	182.3	225
5.7	5.0	164	193.6	250
6.3	5.5	173	205.4	275
6.9	6.0	170	213.7	300
7.4	6.5	178	225.9	325
8.0	7.0	186	238.6	350
8.6	7.5	194	251.8	375
9.2	8.0	202	265.5	400
9.8	8.5	210	279.7	425
10.4	9.0	218	294.3	450
11.0	9.5	226	309.4	475
11.6	10.0	237	326.8	500
13.4	11.5	290	463.4	575
14.0	12.0	300	504.0	400

NOTES:
1. Relevant pole data is based on a shape factor of 0.7 and a calculated wind pressure of 500.14 Pa (relating to a wind speed of 103.9km/h).
2. Corresponding calculated key values are based on a luminaire surface area of 0.2m^2 with a shape factor of 1.