



THE RETURN OF ALUMINIUM & GLASS AS PREFERRED MATERIALS FOR STREET LIGHT LUMINAIRES

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Electrical Street lighting in South Africa has been with us for more than a century. The first electrical street lights in this country were installed around 1887 in the, then very progressive mining town of Kimberly. The first street light in Cape Town was installed in the Rondebosch Fountain around 1891. These first luminaires were manufactured of cast iron and glass.

In the late 1930's aluminium was introduced as the norm for manufacturing streetlight housings. At that time all streetlights were imported into this country from either England (GEC, AEI, Metropolitan Vickers) or America (General Electric) and were a combination of aluminium housings with glass diffusers. This combination proved to be extremely reliable and most street lights until the mid 1960's were manufactured this way.

In the mid 1960's Lexan, polycarbonate and mackrolon were introduced as alternative materials for the manufacture of diffusers bowls. These products were made viable due to the advancement in the manufacturing process as well as the developments made in plastic technology. Although these plastic products offered a cheaper solution they weren't as durable as glass. As there was no local facility to viably produce the glass diffusers these new material were soon accepted as the norm.

In the mid 1970's most street light manufacturers, internationally and later locally started experimenting with alternative materials for the housings of their street lights. This gave rise to products like fibreglass, dough moulding compounds (DMC) and later polymers. These products offered a cheaper alternative to the traditional aluminium and thus took the market by storm however they too have various limitations.

Thanks to developments in the casting processes, aluminium can now be successfully reintroduced to the local street lighting market as a viable option.

Aluminum is a very versatile metal with a range of properties that make it:

Lightweight - Aluminium is about one-third the weight of an equal volume of copper, steel or brass.

Strength - Aluminium can withstand heavy loads and pressure; when alloyed appropriately, its strength approaches that of steel.

High strength-to-weight ratio - The ratio of the tensile strength of aluminium, divided by density, is higher than any other metal.

Corrosion resistance - The formation of a microscopic film of aluminium oxide on the surface of the metal protects it against the corrosive influences of water, salt and other influences.

Resilience/Flexibility - Some applications require some flexibility in addition to strength; an aluminium sailboat mast can spring back where necessary and bend slightly. Aluminium streetlights also provide necessary resilience with safety benefits of flexibility.

Thermal conductivity - Aluminium spreads heat or cooling energy evenly and quickly.

Reflectivity - Aluminium reflects light and other forms of radiant energy.

Ductility - Aluminium is easy to cold work and fabricate.

Malleable - The vulnerability of aluminium to heat and pressure make it ideal for extruding into formed, intricate shapes with ledges, grooves, hinges, screw holes and interlocking parts. This allows the creation of single components, whereas other metals must be manufactured into pieces that must then be assembled to create a final product.

Mixable - Aluminium can be easily modified by the addition of alloys to make a final metal that is even more resilient, conductive or malleable than aluminium alone.

Finishing - Aluminium can be finished with a variety of coatings and finishes such as paint, lacquer, porcelain or organic coatings, which can be anodized to bond to the metal.

Availability - Alumina is the most abundant metallic element in the earth's crust and thus aluminium will always be available.

The above properties of aluminium, in comparison to other metals, make it the most popular choice for large-scale manufacturing of consumer goods like street light luminaries.

Streetlights have to be lightweight, strong and durable, of a manageable size and be able to dissipate heat effectively to ensure that the electrical components operate under ideal conditions and therefore cast aluminium will almost always be the preferred manufacturing material of streetlight luminaire housings.