

SALTUS™ AGRI

COMPOSITE POLES

FOR THE
AGRICULTURAL
INDUSTRY

The SALTUS™ Composite Poles for the Agricultural Industry

has been developed in co-operation with the industry since 2012. The internationally patented design guarantees the **BEST VALUE composite pole in the world.**

“ **CARBON FIBRE DESIGN,** manufacturer of **WORLD CLASS QUALITY** carbon fibre and glass fibre poles, introduces the **REVOLUTIONARY** and worldwide patented **COMPOSITE SUPPORT POLE** ”



Developing and testing a **durable** and **robust** product took time and currently SALTUS™ poles are **well proven** for various applications in the Agricultural Industry, such as Vineyards, Shade netting & Fencing with or without electrification

ENVIRONMENTAL SUSTAINABILITY



Light composite mine roof support (6 kg/m)



Heavy timber mine roof support (20 kg/m)

SALTUS™ Poles was the **FIRST SUCCESSFULLY** underground tested composite mine roof support pole. The mine roof support pole carries loads up to **40 TONS** and **ONLY WEIGHS 6KG** per meter (compared to Timber at 20kg per meter). The composite mine roof support poles are **REVOLUTIONISING** the mine roof support industry by enabling more **EFFICIENT** installation of the poles.

The SALTUS™ Composite Vineyard Pole

Impact Resistance

YES, the SALTUS™ Composite Vineyard Support Pole has been tested for impact strength and will survive a mechanical harvest machine.

“Will SALTUS™ Composite Vineyard Support Poles survive mechanical harvesting?”



BEFORE
dynamite blast
(1.5m from
blast face)

**HIGH
BENDING
STRENGTH**



AFTER
dynamite blast
(survived rocks
of 3kg travelling
at 13 m/s)

The fibreglass layer itself can survive impacts and has been tested underground in mining to survive a dynamite blast impact with 11mm wall thickness.

Why consider SALTUS™ Composite Poles?

The internationally patented design aims at low cost to compete with the price of wood and addresses the following problems of wood and concrete poles:

WOODEN POLES

Durability & quality becoming an ever increasing problem

Deforestation

Termite & rodent infestation

Leaching of creosote or CCA into soil

Uniformity of product

Rotting of wood

Heavy weight

High percentage of breakages during installation due to brittleness

CONCRETE POLES

Supply problems

Heavy handling & installation

Degradation & Corrosion

BENEFITS of the SALTUS™ Composite Pole:

LOWEST LOGISTICS COST

SALTUS™ Poles nest for transport and is **LIGHT WEIGHT**, therefore the transport is usually volume limited and not weight limited as with concrete or timber

FLAME RESISTANT

SALTUS™ Poles has **SUPERIOR FLAME RESISTANCE** due to its unique advanced flame resistant composite properties. The special flame resistant resin is well known for its flame resistant properties and is often used for this reason in the aerospace composite industry

HARDWARE COMPATIBILITY

Smooth surfaced hardware without sharp edges should be used with SALTUS™ Poles. Hardware for round cross-sectioned steel and concrete poles is commonly available and can be used with SALTUS™ Poles

SUPERIOR TEMPERATURE PERFORMANCE

SALTUS™ Poles performs well in hot and cold environments. The established temperature range is -60°C to +75°C

MAINTENANCE FREE



NON-CORROSIVE

All products are manufactured **PROUDLY SOUTH AFRICAN** with focus on quality & sustainability

LONGEST LIFE

With a 60 years **ENGINEERED** service life and integrated UV protection. No scheduled maintenance is required resulting in lowest lifecycle cost and immunity to rot, corrosion, woodpeckers and termites

FAST INSTALLATION

SALTUS™ Poles are **LIGHT WEIGHT** and therefore installation requires **LESS LABOUR** and will typically be installed at twice the speed compared to concrete or timber poles. This contributes to its competitive initial installation cost compared with alternatives

LOWEST LIABILITY

With a limited 30 year warranty, high dielectric strength providing **IMPROVED SAFETY** for workers and the public, better storm and higher wind reliability and minimum environmental impact

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SALTUS™ Composite Pole Flame Resistance

*“Will SALTUS™
Composite Support
Poles survive
a fire?”*

The flame resistant composite layer on the outside can survive a gas flame burning for 1 minute without any smoke. The composite layer on the outside also protects the inner plastic layer and conducts heat away from the plastic layer.

*After flame test
of one minute at
1500°C – no
mechanical
degradation to
fiberglass layer or
inner plastic pipe*

Flame test

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SALTUS™ Composite Pole Easy Installation

LIGHT WEIGHT

**LOWER OVERALL
INSTALLATION
COST**



*For those
difficult to reach places*

*No crane needed
– three people
installing a 9m
pole easily*

**LOWER
TRANSPORT
COSTS**

**LABOUR
SAVING**

**FASTER
INSTALLATION**



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TYPICAL MYTHS RELATED TO FIBREGLASS SUPPORT POLES:

“Fibreglass poles whip around in the wind”

Each vineyard support pole is **engineered to withstand** a wind load of 365 Pascal which is an internationally accepted design standard for fibreglass luminaires and road signs. This allows for deflection of the tip of the pole up to 5% of its length in strong winds.

“Fibreglass poles leach chemicals into the ground over time”

Each **SALTUS™** pole is **engineered for a service life** of 60 years (with a limited warranty of 30 years) and the resin which holds the fibres together will not degrade or leach into the ground.

“Fibreglass poles cannot support big headloads”

Each **SALTUS™** pole is **individually engineered** by factoring in wind load and exposed area and support load. Also refer to 40 ton support for mining industry.

“Fibreglass poles are deteriorated by sunlight”

The UV rays of sunlight will only damage unprotected fibreglass. The **SALTUS™** support pole is **protected** by an imbedded layer of UV protection which cannot be scratched or flaked off. **No maintenance** is required.

“Fibreglass poles are made out of plastic”

Only the inner shell is made of plastic and is used for its elastic properties to extend the lifetime of the pole. The support is mainly provided by the fibreglass outer shell which consists of 70% fibreglass and 30% resin.

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The SALTUS™

Composite Poles

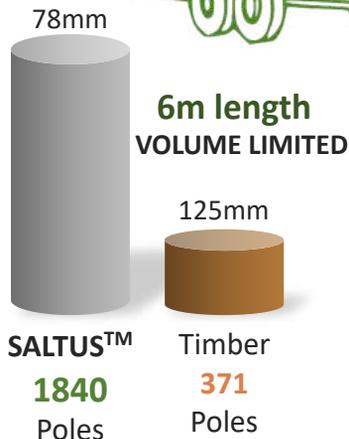
Lengths	Timber equivalent Diameter (mm)	Saltus™ Pole Outside Diameter (mm)	Height above ground for cable pull test (m)	Max force applied (kg) at height of 4.8m above ground (to compare with timber data)
2.5m to 3.9m	75-100	66	NA	NA
4m to 4.9m	100-125	78	NA	NA
5m to 5.9m	125-150	113	4.8	800
6m to 8m	150-175	128 LD 130 MD	4.8	1200 1500
8.1m to 10m	175-200	168	4.8	2000
10.1m to 11m	175-200	183	NA	NA
11.1m to 13m	175-200	208	NA	NA

Relevant pole data is based on a shape factor of 0.7 and a calculated wind pressure of 365-500 Pa depending on application

Truckload Quantity Comparison



of poles by 12m truck



SALTUS™

The SALTUS™

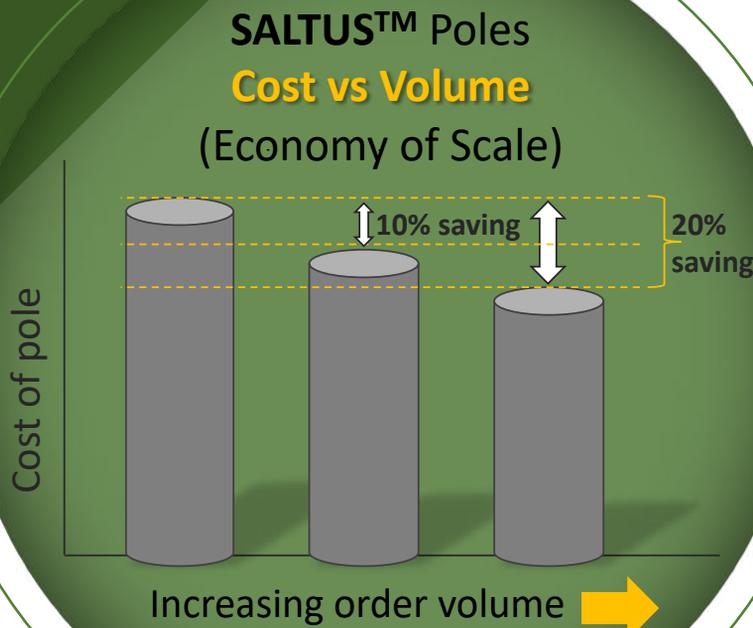
Range of Poles

COLOUR	WIND LOAD	APPLICATION
Yellow	365 Pa	Light duty agri - typically pine pole strength comparison
Orange		Medium duty agri - typically pine pole strength comparison
Red	500 Pa	Heavy duty agri/Street light pole/Extra light duty utility - typically pine pole strength comparison
Grey		Light duty utility
Dark Grey	700 Pa	Medium duty utility - typically concrete pole comparison
Black		Heavy duty utility

POLE OD (mm)	LENGTH (m)																																			
	2.5	3.1	3.6	4.1	4.2	4.6	4.8	5.0	5.2	5.4	5.7	6.0	6.3	6.9	7.0	7.4	8.0	8.6	9.0	9.2	9.8	10.0	10.4	11.0	11.6	12.0	12.2	12.8	13.4	14.0	14.6	15.2				
66	Yellow	Yellow	Yellow	Yellow	Yellow																															
78	Orange	Orange	Orange	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow																									
113	Red	Red	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange																									
128	Grey	Grey	Grey	Grey	Grey	Red	Red	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow																					
130	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Orange	Orange	Orange																					
133	Black	Black	Black	Black	Black	Grey	Grey	Grey	Grey	Grey	Grey	Red	Red	Red	Red	Yellow																				
165						Black	Black	Black	Black	Black	Black	Grey	Grey	Grey	Grey	Orange	Yellow	Yellow	Yellow	Yellow	Yellow															
168												Grey	Grey	Grey	Grey	Red	Orange	Orange	Orange	Orange	Orange															
183												Black	Black	Black	Black	Grey	Red	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow											
208																	Grey	Orange	Orange	Orange	Orange															
233																																			Red	Red
236																																				

SALTUS™ Poles Applications

The poles can be recycled and used in other applications after its service life of 60 years



“Inner plastic tube recycle”

The plastic inner layer can be recycled via the standard plastic recycle route. This is a closed loop cycle and no plastic is wasted.

“Chopped fibre filler for green plastic wood products”

Each SALTUS™ pole has a fibreglass outer layer. This layer can be chopped into short fibres and the fibres can be mixed into green plastic wood products. It has been shown that extruded plastic profiles can be strengthened using up to 50% (by volume) chopped fibre.

“Chopped fibre filler for geopolymers or concrete”

Each SALTUS™ pole has a fibreglass outer layer. This layer can be chopped into short fibres and the fibres can be mixed into geopolymer or concrete. It has been shown that geopolymer and concrete can be strengthened using up to 40% (by volume) chopped fibre.

DURABLE

SALTUS™ Composite Support Pole for Vineyards

DESIGN STORY



The pole is oversized in vertical load, but design limited for **AFFORDABILITY** to be just **STRONG** enough for hurricane winds from the side when fully loaded



Standard vineyard trellis design:

60	ton/hectare (maximum possible yield)
500	poles per hectare
120	kg per pole (for grape yield)
240	kg total for vine plant and grape yield
3000	kg design yield load
13	safety factor for wind and cable weight forces

“Stok by Paal” design:

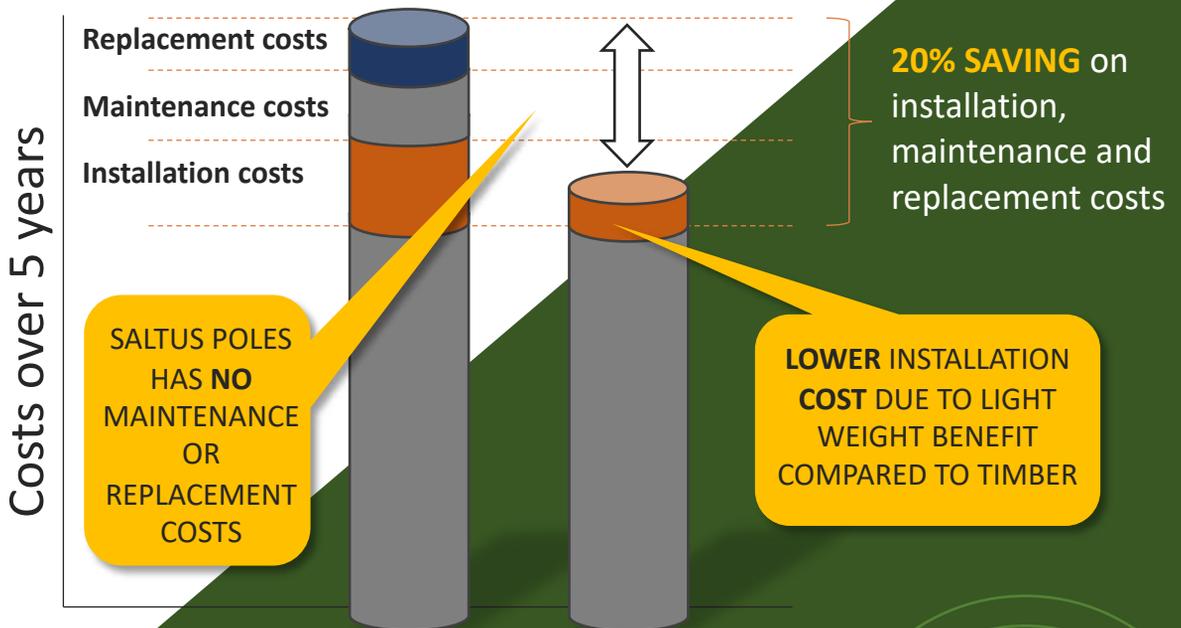
60	ton/hectare (maximum possible yield)
3600	poles per hectare
17	kg per pole (for grape yield)
33	kg total for vine plant and grape yield
2500	kg design yield load
75	safety factor for wind and cable weight forces

Note:

A wooden pole with OD=50mm will load test up to 5 tons depending on moisture content and sun degradation. In engineering practice wood will be downrated with 50% due to variability to 2.5 tons

Installed Vineyard Pole Price Comparison*

Treated PINE TIMBER Poles vs SALTUS™ Poles (Comparing high volume order pricing)



Treated PINE
TIMBER
Poles

SALTUS™
Poles

* As demonstrated
at L'Ormarins,
Franschoek, Western
Cape, South Africa

Consequential losses due to failure of timber poles over the expected life cycle of the SALTUS pole are not shown, but makes the cost of the pole insignificant

**"UNPARALLELED
total
OWNERSHIP
COST"**



SALTUS™ Composite Support Pole for Vineyards

WIND DESIGN

Deflection at top of pole as calculated for a wind load force of 112 km/h (365 Pa). As can be seen from the table, all designs are within the specification of 15% deflection of total length above ground when carrying full grape load.

Outside Diameter (mm)	Height above ground (m)	Vineyard effective area (m ²)	Deflection at tip (mm). Wind effect on pole alone	Deflection at tip (mm). Wind effect on pole and vineyard	Max allowed deflection (15% of length)
32	2	4×1×0.025	43	101	300
43	2	4×1×0.025	20	48	300
78	2	4×1×0.025	7	11	300

After yield load test

INNER LAYER: PLASTIC TUBING

Plastic tubing is used for increasing wall thickness and also adds elasticity to protect fibreglass shell. Plastic tubing is typically used as water irrigation pipe and has very little load bearing compressive strength.

MIDDLE LAYER: FIBREGLASS WITH RESIN

Fibreglass acts as main load bearing material with its excellent compressive and tensile strength properties. Fibreglass to resin ratio is 70:30.

Application	Wood equivalent Diameter (mm)	Saltus™ Outside Diameter (mm)	Total weight (kg/m)	Max vertical load per pole (ton)
"Stok by paal"	25-50	32	0.4	2.5
Standard vineyard trellice	50-75	43	0.6	3.5
Table grape support pole	75-100	66	1.1	6
Shade net canopy inner pole	100-125	78	1.3	7.5
Shade net canopy anchor pole	125-150	113	2.2	12

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Attachments to SALTUS™ Composite Vineyard Support Poles

ALL types of
hooks can
screw into the
SALTUS™ Poles

Standard hook
recommended for
vineyard support
cables – cable can clip
in from top or below



COMPATIBILITY

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SALTUS™ Composite Vineyard Support Poles

Stok-by-
Paaltjie or
Posted Vine

32mm diameter design of 2.1m total length
(1.5m above ground)



INSTALLATION

In well prepared and/or sandy soils Saltus posts can be planted by hand without the need for hammering the pole into the ground. Planting easily by hand has a 20% saving on labour costs compared to wood and other alternatives.

BENEFITS

Low weight & labour saving installation as well as long term cost savings.



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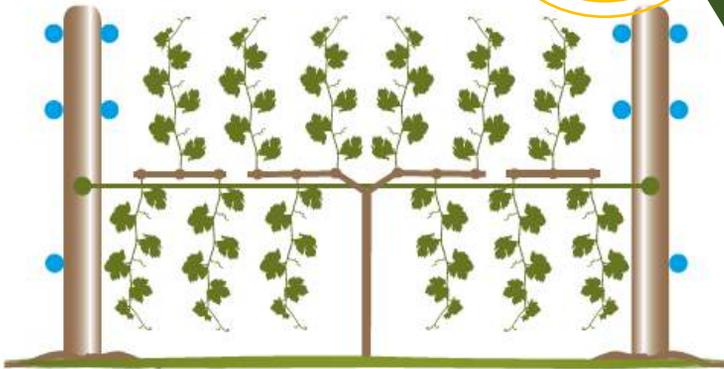
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SALTUS™ Composite Vineyard Support Poles

**Ballerina or
Smart-Dyson**

43mm diameter design on 1.8m, 2.1m and 2.4m total length (1.2m, 1.5m or 1.8m above ground)

Designed for high yields per hectare



INSTALLATION

In well prepared damp soils, planting posts is quick & easy. This results in much faster installation compared to other alternatives. In tougher soils holes can be drilled or stamped for planting. Save 10%-20% on installation costs compared to heavier wood & other alternatives



BENEFITS

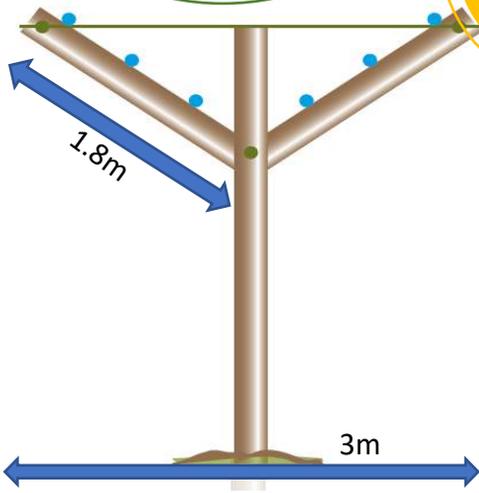
Low weight & labour installation savings. A competitive alternative with long term benefits.

SALTUS™ Composite Vineyard Support Poles

Geneva
Double
Curtain

Designed
for high
yields per
hectare

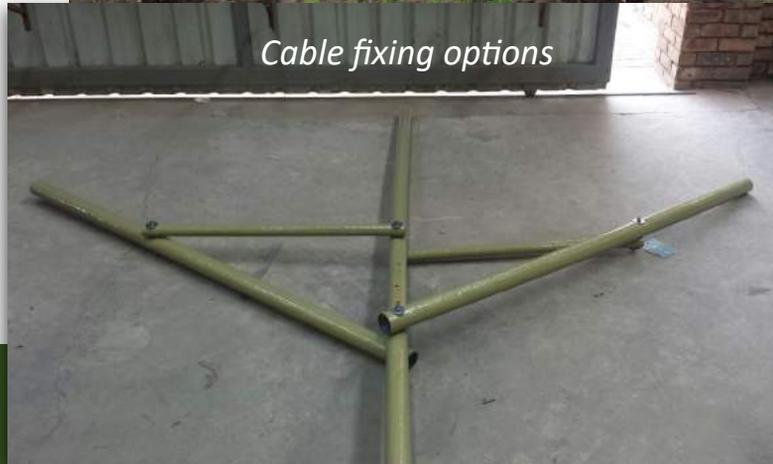
66mm diameter vertical support posts with either 66mm diameter Y-arms or 43mm diameter Y-arms depending on row lengths, planting width and yield. If the ends of two neighboring rows are connected, 43mm diameter will provide ample strength and support.



Extendable Vertical posts can be ordered in 2.4m and 3.6m lengths (for supporting net or plastic film). Alternatively 2.4m lengths can be planted and later extended to 3.6m with a spigot joint.



Cable fixing options



MODULAR BENEFITS

Low weight, quick installation and labour saving. Posts are pre-assembled in our factory with collapsible Y-arms giving transport and quick re-assemble benefits.

SALTUS™ Composite Vineyard Support Poles

**Gable Trellis
(Double
Slanting
Trellis)**

**Designed
for high
yields per
hectare**

66mm diameter vertical support posts with either 66mm diameter Y-arms or 43mm diameter Y-arms depending on row lengths, planting width and yield.

If the ends of two neighboring rows are connected, 43mm diameter will provide ample strength and support.

Also, support poles for net or plastic file in existing infrastructure

Extendable Vertical posts can be ordered in 2.4m and 3.6m lengths (for supporting net or plastic film). Alternatively 2.4m lengths can be planted and later extended to 3.6m with a spigot joint.

BENEFIT

Single light weight support posts can easily be installed on existing infrastructures as net or plastic film supports.



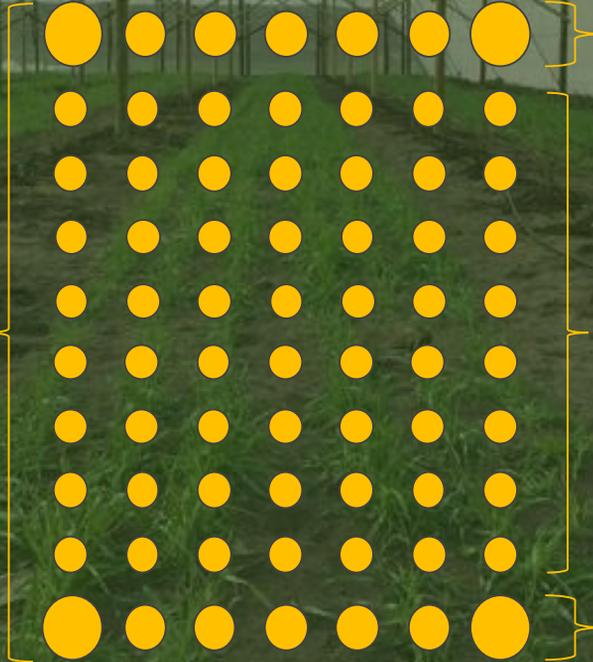
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SALTUS™ Composite Poles for Fruit Shade Net Structures

OVERALL COST PER INSTALLED BLOCK

Comparison between SALTUS™ poles and Pine Timber poles

1.03 * cost of Pine
for overall cost of
combined block



1.2 × cost of Pine: to
ensure strong and
rigid anchor structure

0.95 × cost
of Pine

1.2 × cost of Pine: to
ensure strong and
rigid anchor structure

Application	Timber equivalent Diameter (mm)	Saltus™ Pole Outside Diameter (mm)	Height above ground for cable pull test (m)	Max force applied (kg) at height of 4.8m above ground (to compare with timber data)
Shade net inner pole (lower than 4m above ground)	75-100	66	NA	NA
Shade net inner pole (lower than 6m above ground)	100-125	78	NA	NA
Shade net perimeter pole (lower than 4m above ground)	125-150	113	4.8	800
Shade net perimeter pole (lower than 6m above ground)	150-175	128 LD 130 MD	4.8	1200 1500
Shade net corner pole (lower than 6m above ground)	175-200	168	4.8	2000

Please note: The recommendation left is only valid for a shade net structure area of 300m by 300m (or 9 hectares) and maximum roof height of 6m

The SALTUS™ Composite Poles for Fencing

**TURNKEY DESIGNS
AVAILABLE FOR FENCING,
GAME FENCES OR ELECTRIC
FENCES**

**QUICK &
EASY**
Installation



UV RESISTANT
(60 years service life
with 30 years limited
warranty)



**NON-CONDUCTIVE &
FIREPROOF**

*66mm diameter poles every 100m
of 2.6m length (2m above ground);
a 32mm pole every 5th pole of
2.6m (2m above ground); four
10mm solid Fibreglass droppers
spaced every 2m and 2m in length
(not fixed in the ground)*

Satisfied SALTUS™ Composite Poles Agricultural Clients:

Supported by an international patent and a dedicated engineering team

L'Ormarins
Franschoek
South Africa

Vredehof
Rawsonville
South Africa

***"BEST VALUE
composite pole
in the world"***

Doornkraal
Wines
Ebenhaeser
South Africa

Phil Reed
Quiedan
New Zealand

SALTUS™ AGRI



INTERNATIONAL PATENT

WO2015/196219 A1