



High Performance  
**COMMUNICATION  
Monopoles**



**ENGINEERED  
RELIABILITY**

Resilient solutions for the growing needs  
of today's communications infrastructure

**High performance RS modular composite monopoles provide the most cost effective and reliable solution where 100% up time is required. RS poles have an 80 year service life and are covered by a 41 year limited warranty.**

### **Engineered Pole Technology**

RS Technologies Inc. answers the growing demand for reliable communication infrastructure products by providing a composite monopole solution. RS Composite Monopoles offer unique benefits when compared to traditional steel monopoles, lattice towers or wood and concrete poles for landline, 5G cellular, Wi-Fi/ WiMAX applications and other communication related applications.

### **The RS Monopole Solution**

RS Composite Monopoles are constructed from combinations of standard-sized, tubular modules to create poles with heights ranging from 20 ft. [6.1m] to 155 ft. [47.2 m] that use standard industry hardware. RS poles will cost less than traditional pole materials when used:

#### **⦿ *Where Traditional Poles Do Not Last as Long as They Should***

For example, steel poles installed near the coast or wood poles installed in hurricane or fire prone regions, not to mention woodpecker areas.

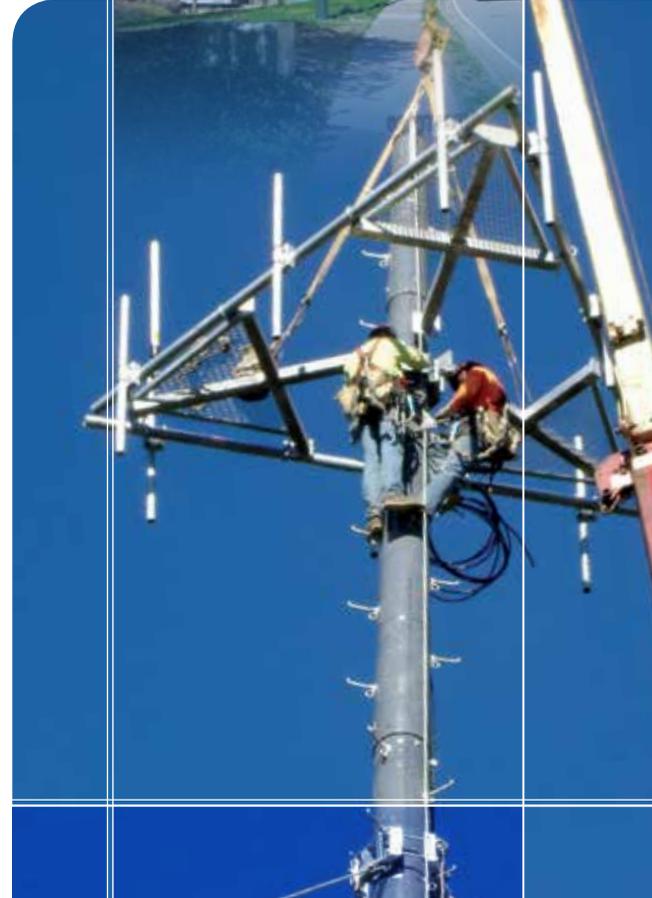
#### **⦿ *Where Structure Installation Cost is Higher Than Average***

For remote installation locations, direct embed RS poles will have the lowest installed cost. This includes mountainous regions, wetlands, backyards and tight urban locations. Hand installation is an option.

#### **⦿ *Other High Performance Applications***

Whether you need a non-conductive pole, a safer pole for motor vehicle impacts, no scheduled maintenance or simply resilient infrastructure, RS poles are the solution.

**“The highest performing  
Monopole  
on the  
Market”**



RS poles have been used by over 400 companies worldwide in 27 countries, including installations in North America, Australia, Europe, South America, Asia and the Caribbean.



### COMPOSITE MATERIALS

RS monopoles are made from an advanced composite material with integrated UV protection that combines an ultra strong polyurethane resin and E-glass fiber rovings. RS poles can be field drilled or pre-drilled and pre-assembled.

### MODULAR DESIGN

The RS pole's unique tapered design enables the modules to be nested in compact bundles allowing for maximized efficiencies in storage and transportation. The eight module system can be configured to build virtually any pole required up to 155 ft. [47.2 m], which lowers the lead time for deliveries, reduces inventory requirements and simplifies transportation, handling and installation.

## RS ADVANTAGES

### Hardware Compatibility

Smooth surfaced hardware, commonly used with round cross-sectioned steel and concrete poles, should be used with RS monopoles. Solutions like steel bearing plates can be supplied by RS to enable the use of existing hardware.

### Superior Temperature Performance

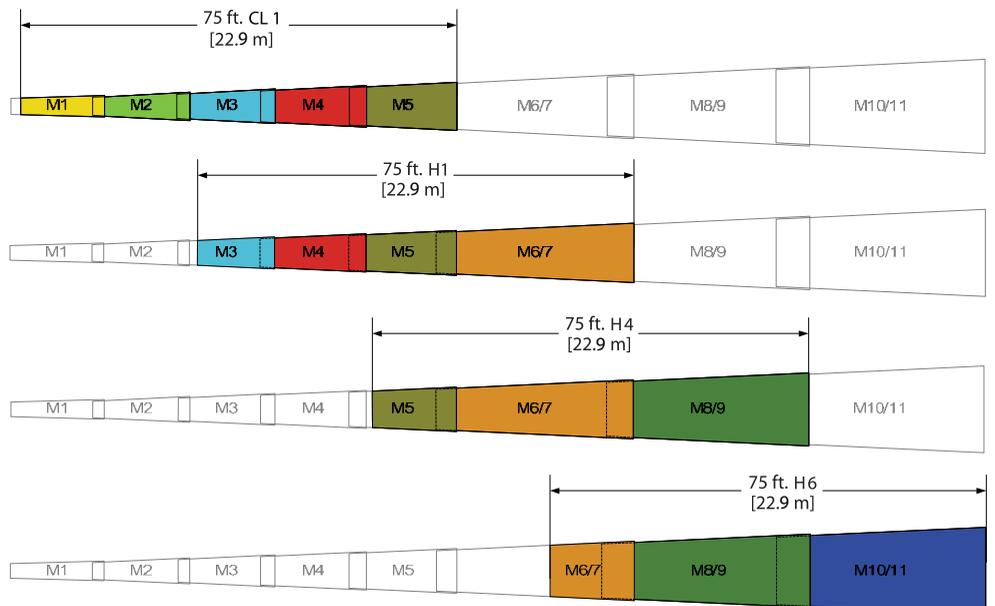
RS's composite material performs well in both hot and cold environments. The established temperature range is -76°F to +167°F [-60°C to +75°C]. RS poles are self-extinguishing and perform well in wild fires.

### Fast Assembly & Installation

RS pole slip joints assemble in approximately 10 minutes each. With the assistance of RS's assembly racks, entire poles can be completed in 15 minutes. Poles can be pre-drilled for specific framing patterns and/or pre-assembled prior to shipping to reduce installation time. Direct bury foundations means sites can go live the same day the monopole is installed.

### Modularity

Custom length and strength poles are created from standard sized modules for ultimate flexibility. Below are different strength module combinations to build a 75 ft. [22.9 m] pole:



### Case Study: Storm Resilience

RS poles can sustain a high load deflection from extreme winds and other loads and return to their original position.

### Case Study: Safety

Electrical & Utilities Safety Association (EUSA) lineman training yard has installed RS poles to utilize their lightweight, non-conductive properties.



# LOWEST LOGISTICS COST

The RS monopole's modular design offers the fastest delivery and lowest logistics cost of any monopole, from the time the order is placed to the time the pole is installed.

### Case Study:

#### Inventory Advantage

"Having the ability to build a variety of pole lengths and classes from just eight modules gives utilities faster deployment time for emergency outages."

Utility Products,  
November 2006

### Industry Best Lead Times

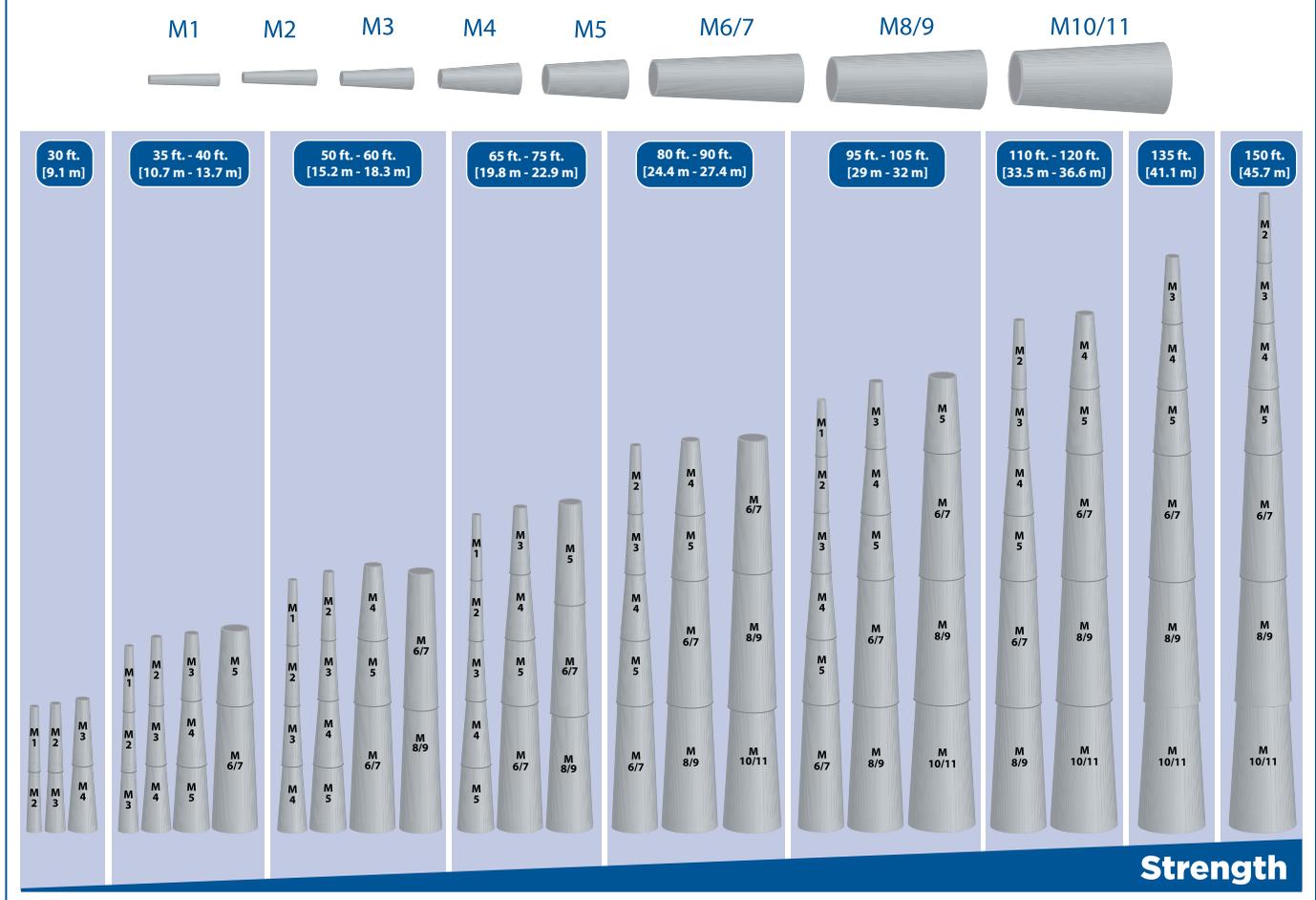
RS maintains a large inventory of modules and hardware which enables even large custom pole orders to be shipped within weeks. On demand production capability ensures RS has the pole inventory communication companies require.

### Minimal Inventory

Dynamic RS module sets take up a fraction of the yard space required for static, single application one piece poles and even enable faster transportation to the installation site. A major contributor to an effective sparing strategy, RS's modular system keeps minimal inventory on hand, quickens turnover cycles and reduces safety stock inventory costs while effectively meeting day-to-day and emergency requirements. Downtime from structure/pole damage is significantly reduced because RS modules can be quickly configured to build almost any pole class up to 155 ft. [47.2 m].

**“One Set of  
Modules can build  
262 Different poles”**

## RS Modular Pole Combinations





### Monopole Capabilities From One Set of RS Modules

Pole Length	20 ft.	30 ft.	40 ft.	50 ft.	60 ft.	70 ft.	80 ft.	90 ft.	100 ft.	110 ft.	120 ft.	130 ft.	140 ft.	150 ft.
	[6.1 m]	[9.1 m]	[12.2 m]	[15.2 m]	[18.3 m]	[21.3 m]	[24.4 m]	[27.4 m]	[30.5 m]	[33.5 m]	[36.6 m]	[39.6 m]	[42.7 m]	[45.7 m]
Light Duty	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Medium Duty	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy Duty	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
# of Pole Capabilities	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Pole Capabilities = 42														

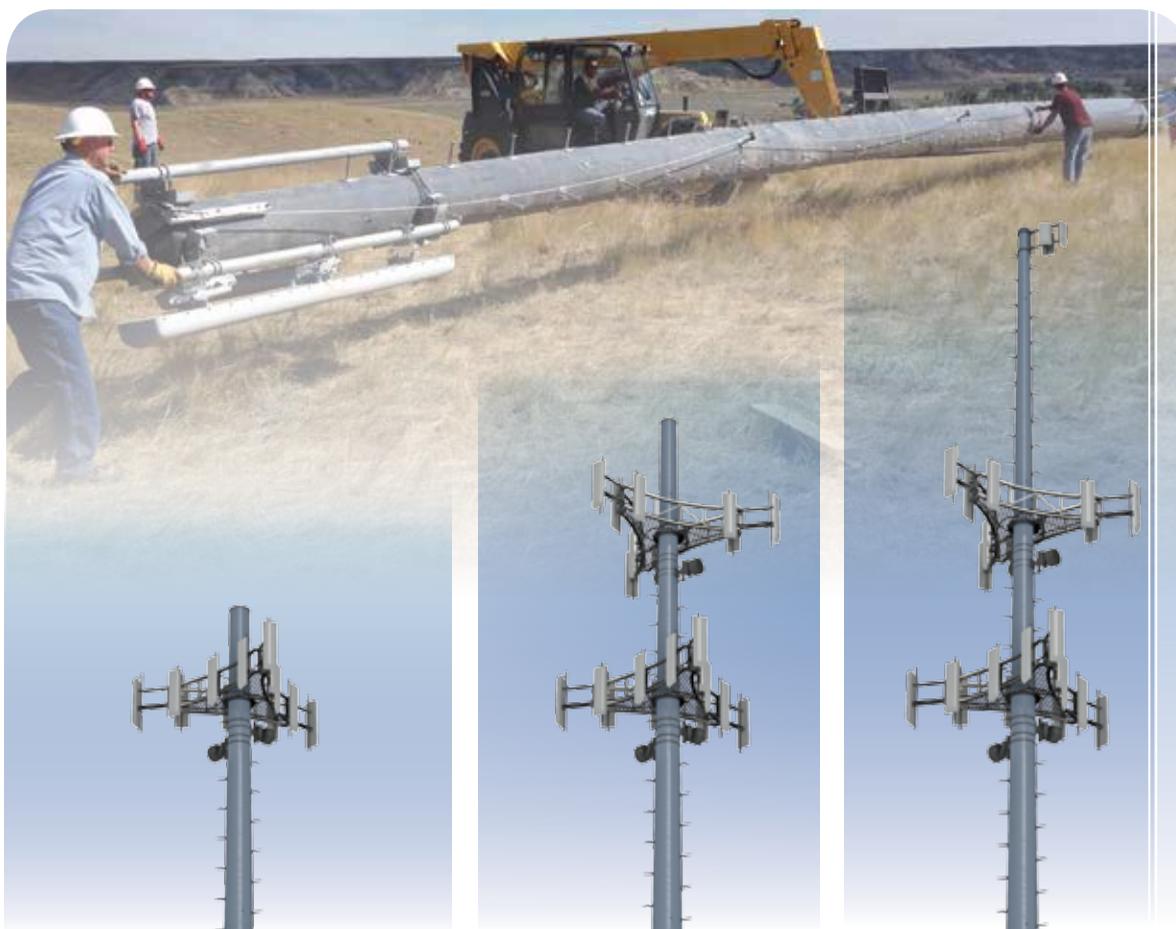
## Efficient Transportation

The RS pole's nesting modules mean even the longest RS poles only require standard length trailers and they eliminate the need for slow and expensive long load permits. See the Truckload Quantity Comparison below to review the significant shipping efficiencies that can be realized with RS poles. Depending on pole size, RS modules can also be shipped and stored in 20 ft. [6.1 m] or 40 ft. [12.2 m] intermodal containers for international deliveries and quick deployment after natural disaster damage. Lightweight RS poles have been air freighted in bulk quantities in emergencies and enable the use of helicopters for transportation to site.



## Installation Flexibility

When setting the pole, in addition to using lighter duty machinery, modularity allows for installation sequencing options. The entire pole can be assembled on the ground and then installed. Alternatively, the base can be installed first and the remaining top modules added at a later time either one at a time or as a pre-assembled unit. RS can pre-assemble poles and pre-drill to reduce on site installation time. On-the-fly design changes to pole height are easily accomplished by simply adding or removing the desired module. Pole modularity also provides for future height increases and colocation potential. Compared to traditional pole materials, smaller helicopters can be used to lift fully constructed monopoles for challenging location drops. RS poles are easily cut and drilled in the field. RS poles can be installed by hand with the RS gin pole tool.



### Case Study: Installation Advantage

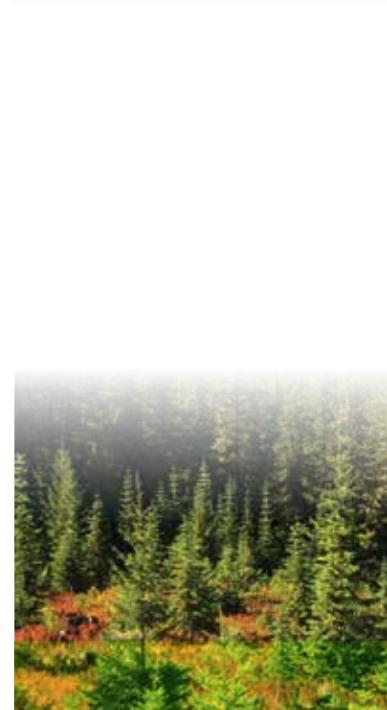
“The standard sized, nesting modules allowed for quick lead time and cost effective transportation. Pole assembly and setting are very efficient with this system, which allowed us to expedite our build schedule. We also have the flexibility to deploy larger base modules today and add new top modules in the future to increase the pole height to accommodate future network upgrades or site sharing revenue opportunities. The RS monopole is the only monopole system that offers this many solutions and is also maintenance free.”

Jeff St. Aubin  
Project Manager  
Morrison  
Hersfield Ltd.



# LOWEST LIABILITY

High performance, resilient RS poles reduce the risks and costs associated with managing communication companies infrastructure and increase grid reliability.



### Case Study: Non-Conductivity

RS poles were proven by test lab Kinectrics in Ontario, Canada to pass the test for a hot stick making them one of the safest poles on the market.

### Case Study: Environmental Advantage

“RS poles do not need to be coated with Penta, arsenic or creosote. As a result, these poles are the most environmentally friendly ones available in the market place.”

NWPPA Bulletin, January 2006

## Reliable Infrastructure Hardening

The ultra strong RS composite pole can absorb significant elastic strain energy in high-load situations like hurricanes, tornados, ice storms and seismic events. This capability delivers infrastructure resiliency far beyond the expected performance of conventional pole materials. The exceptional load carrying capacity combined with the RS pole’s light weight reduces the potential for cascade failures. Excellent fracture toughness protects against crack initiation and propagation. Additionally, RS poles are self-extinguishing and maintain their initial published pole strength values from full scale bend tests conducted after exposure to fire tests simulating severe wildfires.

## Increased Safety

Manufactured with a non-conductive and hydrophobic material, RS poles reduce the risk of second point of contact injuries, eliminate electrical tracking and help prevent arcing due to lightning or switching. RS poles pass the 100  $\mu$ A test for a hotstick. Lightweight RS modules decrease the probability of worker injury and equipment fatigue. Hollow RS poles allow cable runs to be placed internally to reduce theft potential.

## Environmentally Responsible

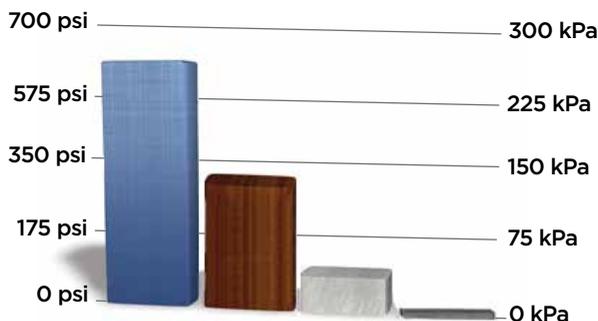
RS poles are free of toxic preservatives common to wood poles and as a result they do not leach chemicals into the ground or water table. Soil remediation is never required. To confirm they are inert, RS poles have been tested to ASTM C1308-08 Leach Test and the water used in the test subsequently passed both Canadian and US drinking water safety standards. The reliable RS manufacturing process releases no volatile organic compounds (VOC) or hazardous airborne pollutants (HAP).

## Public Satisfaction

RS’s controlled manufacturing process ensures a consistent lifetime aesthetic. RS poles are available in either grey or brown to match existing wood and steel poles or to blend in with the scenery. Custom colors are available. The surface of the RS pole is easily cleaned of graffiti and poster glue and is resistant to staples.

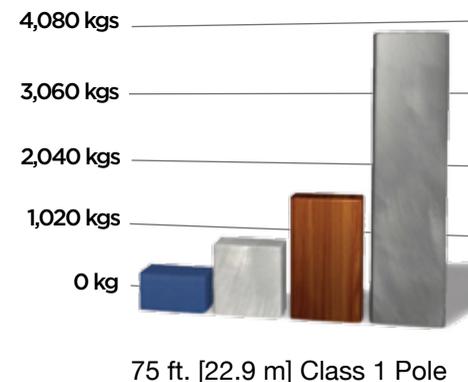
### Specific Strength Comparison

RS Monopoles: 630 psi.ft<sup>3</sup>/lb [271 kPa.m<sup>3</sup>/kg]  
 Wood (Douglas Fir): 272 psi.ft<sup>3</sup>/lb [117 kPa.m<sup>3</sup>/kg]  
 Steel: 119 psi.ft<sup>3</sup>/lb [51 kPa.m<sup>3</sup>/kg]  
 Concrete: 7 psi.ft<sup>3</sup>/lb [3 kPa.m<sup>3</sup>/kg]



### Weight Comparison

RS Monopoles: 1,181 lbs [536 kg]  
 Steel: 2,190 lbs [993 kg]  
 Wood: 3,695 lbs [1,676 kg]  
 Concrete: 8,500 lbs [3,856 kg]





## LONGEST LIFE

Manufactured with integrated UV protection and a durable composite material, RS poles have a longer service life than any other pole alternative.

### Excellent Weathering and UV Protection

High performance RS poles are engineered for an 80 year service life that requires no scheduled maintenance. This extended life expectancy, tested to ASTM G154 for 25,000 hours, is achieved from a single step manufacturing process which creates a monolithic laminate with an imbedded layer of aliphatic UV protection that cannot be scratched or flaked off. RS poles retain their hydrophobic qualities over their entire service life ensuring that the poles continue to be self-washing and maintain their high dielectric strength. RS poles are covered by a 41 year limited warranty - see the RS Limited Warranty for complete details.

### Corrosion, Rot and Woodpecker Resistant

RS poles will not rot or corrode and are resistant to salt, soil pH levels and chemicals. This allows for excellent wet area and coastal performance. RS poles are impervious to woodpeckers, termites, carpenter ants and other pests. These performance advantages dramatically increase the pole service life and reliability of the grid.

### Maintenance Free Poles

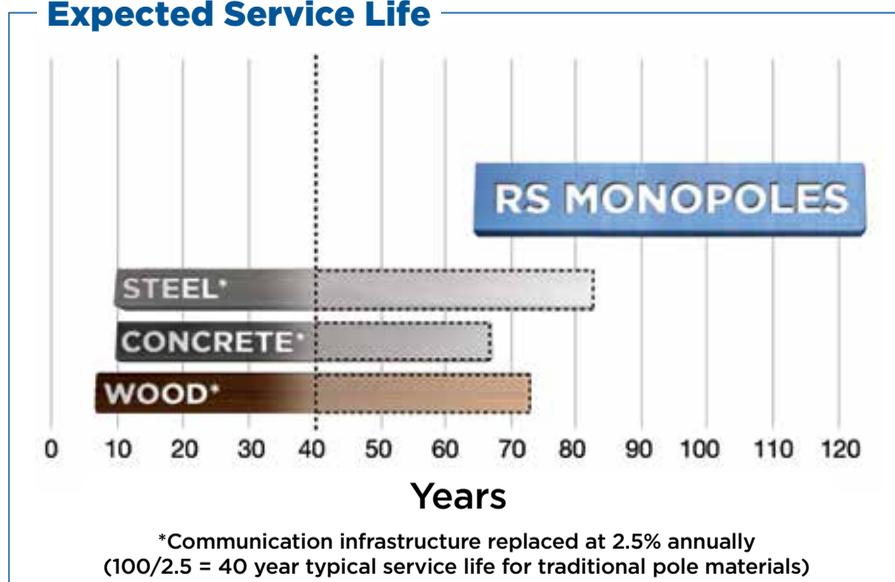
RS poles are not painted and therefore require no scheduled maintenance, like preservative treatments or repainting, resulting in significant operation and maintenance savings. Inspections are fast and non-invasive. Typical pole replacement frequencies are cut in half.

### Installed Cost and NPV Advantage

The RS pole delivers the lowest total ownership cost based on Net Present Value (NPV) calculations. For installations with challenging terrain, long length poles, remote locations or helicopter lifts, RS poles can provide the lowest installed cost. Move beyond the material cost comparison and find out how much wood poles truly cost. A tailored analysis for your grid can be completed by RS Technologies.

**LOWEST TOTAL OWNERSHIP COST**

### Expected Service Life



**Case Study: Longevity Advantage**  
An island based company plagued by termite damage on wood poles has increased the life of their sites 8-fold by using RS monopoles.



## WORLD CLASS CUSTOMER SUPPORT

RS is the world leader in composite monopole. Our dedicated and qualified team of experienced engineers and technical service representatives work with you from preliminary planning to installation completion.

### Design Support

The RS technical department is involved throughout the entire process to ensure you chose the right RS pole for your application. Our design support includes structural analysis using PLS-POLE™ where your loading requirements are reviewed and a report is generated detailing the performance of the RS pole in your application. RS poles can also be analyzed independently using the FRP library files available from Power Line Systems (PLS).

### Technical Binder

All RS technical information, available upon request and on the RS website, is compiled into a single package containing:

- RS Pole Data from 30 ft. [9.1 m] to 155 ft. [47.2 m]
- Structural Design Guide
- Maintenance and Inspection Guide
- Technical Specification
- Module Testing and Quality Assurance Overview (MTQAO)
- Assembly and Installation Guide
- Frequently Asked Questions

### Application and Installation

RS engineers will assist with project planning and assessment and are available to answer questions and provide support. Prior to commencing a project, RS can complete a full hardware review and provide the necessary recommendations to ensure a long lasting, successful installation. On-site field support is provided during installation to ensure your field crews and contractors receive best practice RS pole training.

## LAB TESTED, FIELD PROVEN

The controlled RS manufacturing environment produces consistent pole modules each and every time for measured, reliable infrastructure performance. You can count on it.

### Quality Assurance

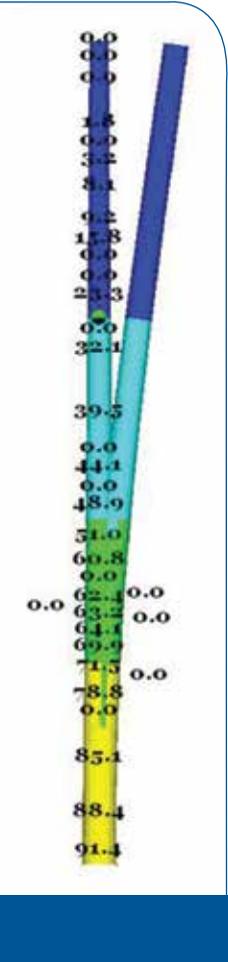
RS is ISO 9001:2015 certified and maintains a stringent quality focus throughout the entire manufacturing process. From material inputs to production to order preparation, each step is carefully monitored to ensure you receive the best pole on the market.

### Testing

RS poles have been thoroughly full scale tested and verified to all relevant ASTM, ANSI EIA/TIA and CSA S37-01.

### Communication Installations

Current installations are subject to extreme temperatures, corrosive environments, pest attacks, heavy loading and severe weather. All poles continue to deliver superior, predictable performance, without a single documented failure in over 16 years of RS pole installations.





### **Rural Broadband Application**

“We are involved with construction of one of the world’s largest wireless broadband networks to date. Our early construction efforts last year confirmed the many advantages of using the RS monopole. At the time this was a relatively new application of the product, but RS worked with us to quickly develop the specific telecom and safety hardware we required.

The logistics advantages of the RS allowed us to keep ahead of a very tight build schedule. The modular concept also allows us tremendous inventory flexibility with our installations ranging from 20 to 40 meters [65.6 to 131.3 ft.] in above ground height, all constructed from standard modules. We are continuing to find new applications for this versatile product and the RS engineering team has always been there to support us.

In the end, the RS modular concept allowed for quick lead times, fast, economical and permit-free transportation from our central yard to the sites and very efficient pole assembly and setting.”

**Mac Fuller**  
**Regional Manager**  
**Seaside Wireless Communications**



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### **RECOGNIZED INNOVATION**

The RS composite monopole won the 2005 Award for Composite Excellence from the American Composites Manufacturers Association for the most creative application and innovative use of composites materials.

RS Technologies' filament winding process won the 2005 Innovation in Manufacturing Process Award.



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"PLS-POLE" is a trademark of Power Line Systems Inc.

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