

FRP UTILITY POLES TOP 10 MYTHS DEBUNKED

WAGNERS



Myth 01

Composite poles deflect too much.

Fact

First-generation composite poles were selected based on strength alone. In some cases, this resulted in more deflection under load than wood poles would exhibit. Wagners FRP composite poles, representing the third generation of composite pole technology, are characterized using both strength and serviceability equivalency, resulting in comparable deflection performance to wood with a higher ultimate strength.



Composite poles were first installed in the 1950's, over 70 years ago. When it comes to pole classification, FRP composite poles are characterized using the same pole classification system that wood poles use, ANSI O5.1. They are also full-scale bend tested the same way as wood poles, per ASTM D1036. This alignment with wood poles benefits the electric utility industry because it is easy to change out a wood pole for a composite pole.

There were challenges in the early days with this approach because the original characterization methods were only strength based. FRP poles have the highest specific strength, or strength per unit of weight, of all pole materials including wood, steel and concrete (this is why composite poles are so light compared to other pole materials), but lower comparative stiffness for strength equivalent poles. The challenge specifically was that because composite poles were only tested for strength and not stiffness, a Class 1 pole would have the tip load capacity required for the application but deflect more than its wooden counterpart at class load.

One the biggest advancements in the FRP composite pole industry in the last two decades is how the poles are characterized. The same ANSI O5.1 pole classes are still used for strength characterization however, in addition to strength, the composite poles of today are also evaluated on stiffness to ensure serviceability equivalency with wood poles for consistent overhead line performance when it comes to deflection.

With many composite poles, the governing selection criteria for ANSI O5.1 pole class is deflection which means that for composite poles to meet stiffness requirements for a given pole class, the comparative strength to a wood pole means that the equivalent composite pole can be up to 50% stronger. This is also the reason why composite poles are so resilient in high load weather events like hurricanes and ice storms and why FRP poles are now the choice of many utilities across the globe when it comes to grid hardening capital projects.



Watch this video of the installation of 38 Wagners CFT Utility Poles on Kawai Island off New Zealand which was delivered in line with the core Maori value of Kaitiakitanga – to care and protect the land, water and natural resources for future generations.

youtu.be/5ZdncSdFH6M



Myth 02

FRP pole technology is not standardized or regulated.

Fact

FRP poles are an engineered material manufactured and deployed within robust and growing framework standards and technical specifications, giving electric utility stakeholders confidence in their reliability, safety and long-term value.



When composite poles were first introduced in the 1950's they were a new material solution for electric utilities. In the decades following that first installation, there were generational improvements in both the manufacturing side with materials science and fiber angles and, more important, on the standards and regulatory side.

In some ways, FRP composite poles are like wood poles. They are characterized using the same full scale bend tests as wood poles, per ASTM D1036, and they follow the same strength classification system, per ANSI O5.1. With this level of standardization, it's easy to evaluate pole equivalency and compare and contrast the performance differences with wood poles which, of course, includes deflection performance equivalency.

Wagners FRP composite poles are manufactured to a 5% lower exclusion limit (LEL) and, in that way, they are viewed as an engineered material from a safety code perspective. From a strength perspective, the NESC and the CSA categorize FRP poles the same as steel and pre-stressed concrete poles, with no strength reduction factors. This is a big change from wood which carries a 0.85 strength reduction factor for Grade C construction and a 0.65 strength reduction factor for Grade B construction. GO95 views FRP and pre-stressed concrete poles the same and virtually identical to steel poles.

FRP pole standards also utilize long standing composite related tests like ASTM D570 – Standard Test Method for Water Absorption.

In this sense, some FRP pole standards are unique to composite materials.

All of the necessary specifications for composite poles have been fulsomely included in the [ANSI/ACMA/UCSC UP01-18-2019 Standard Specification for FRP Composite Utility Poles](#), published in 2019.

The most comprehensive assembly of FRP composite pole information is the [ASCE MoP 104 – Recommended Practice for Fiber-Reinforced Polymer Products for Overhead Utility Line Structures](#). In addition to specifications, this document includes use cases, framing, hardware, installation, foundation, and serviceability equivalency guidance.

There are also international resources like the [CIGRE – Transmission Line Structures with Fiber Reinforced Polymer \(FRP\) Composite](#).

All of these publications are authored to educate the industry on the safe, efficient, and optimal use of FRP poles in the overhead transmission and distribution grid.

Of course, in addition to the independent resources available, Wagners is committed to the successful and long-lasting use of FRP poles and is dedicated to training all utility personally from engineering to operations and asset management to supply chain. We are here to ensure proper training and confidence to work and design safely with FRP poles.



Watch the video to learn how Wagners CFT produces the most durable, safe and environmentally conscious poles for networks around the globe.
youtu.be/AJPIn7kCckY

TOTAL COST OF OWNERSHIP (TCO)

Wagners Fibre Reinforced Polymer (FRP) utility poles are 30% cheaper than timber poles over the Total Cost of Ownership of 80 years. Please note, figures are cost of pole only and excludes all other installation costs.



\$3,000

FRP

0

20

40

60

80

YEARS

\$1,000

\$1,000

\$1,000

WOOD



Myth 03

FRP poles are too expensive.

Fact

FRP poles have a higher purchase price than wood; however, they deliver a competitive installed cost and substantial long-term savings especially where resilience, reliability and sustainability are priorities.



FRP composite poles typically have a higher purchase price than wood poles, but this is only part of the story. FRP poles have a lower lifecycle cost and can even have a lower installed cost, in some cases.

One of the primary use cases for composite poles is in difficult-to-access areas, such as backyard to a wetland to a remote radial line. In these applications, where a bucket truck cannot simply drive up to the pole location, the cost of installation is far greater than the pole cost, and that's where composite poles shine. Due to their light weight, about one-third the weight of a wood pole, logistics and installation are simplified, which means lower costs.

Even with truck-accessible areas, the cost of the pole relative to the total installed cost means that even if a composite pole is 2-3x the purchase price of wood, once all installation costs are considered including engineering, switching, logistics, equipment, etc., the typical total installed cost difference is within about 10-20% of the cost of wood.

When moving into the total cost of ownership of the utility pole, FRP poles deliver significant value.

Unlike wood poles, which may require treatment, regular inspections and replacement every 25 to 40 years, or sooner in harsh environments, FRP composite poles are designed to last 80 years or more. Their strength, inertness and durability mean faster inspections, no scheduled maintenance requirements, and a reduced risk of premature failure. Over time, this translates into a lower total ownership cost, especially for utilities operating in corrosive, remote or severe weather-prone environments while improving SAIDI and SAIFI metrics.

For example, in coastal regions or areas with acid sulfate soils, traditional materials degrade quickly, wood rots, steel rusts and concrete spalls. This deterioration drives up operations and maintenance expenses and increases the risk of unplanned outages. FRP poles, on the other hand, are resistant to corrosion, rot, UV and chemical exposure. These advantages result in less downtime, lower O&M costs and fewer site visits, all of which reduce operational expenses.

Additionally, FRP poles have lower risk exposure. They are non-conductive, reducing the likelihood of electrical incidents and they are impervious to pests and woodpeckers, eliminating the hidden costs of biological damage and retreatment. These safety and durability benefits contribute to better long-term budget predictability.

When viewed through a lifecycle lens, FRP composite poles are a cost-effective, threat-mitigating, environment friendly solution.

The myth that FRP poles are more expensive doesn't stack up. The cost of the product may be higher, but installation and lifecycle costs are lower, and they are proven to deliver substantial long-term savings, especially where resilience, reliability and sustainability are priorities.

When considering the total cost of owning and maintaining utility poles over an 80-year timespan, it is 50% less expensive to install FRP utility poles compared to traditional timber poles.

Myth 04

FRP poles degrade quickly in UV or coastal conditions.

Fact

FRP composite utility poles are purpose built for resilience in precisely the places where traditional materials fall short.



First-generation composite poles did not have the required UV protection to last in areas with high UV exposure. This is the primary reason some believe that FRP utility poles are vulnerable to degradation under intense ultraviolet (UV) exposure, particularly in coastal and marine regions.

Wagners FRP poles represent the third generation of FRP poles and are specifically engineered with effective UV protection for long-term durability in extreme exposure conditions. The poles have UV-resistant protective coatings that guard against solar radiation, preventing surface chalking and degradation. These UV protection solutions ensure the pole maintains its strength, appearance and structural integrity for its full 80-year service life.

In coastal areas, where salt spray and high humidity accelerate corrosion, FRP poles offer a major advantage. They are inert and resist water ingress, meaning they will not rust, swell, rot or degrade when exposed to saline air or seawater. This makes them an ideal solution for beachfront networks, offshore islands and marine infrastructure.

Their resilience extends beyond the coast. In acid sulfate soils, common in low-lying tropical and estuarine areas, Wagners FRP poles resist the chemical attack that can break down wood products preservatives or corrode steel

poles. They also perform exceptionally well in snowbelt and alpine regions, where cycles of freezing and thawing, road salt and high moisture levels cause accelerated deterioration in traditional pole materials, including the degradation of rebar in pre-stressed concrete poles.

Importantly, FRP poles do not absorb moisture, eliminating the risk of rot, fungal growth or internal weakening. Their surface is hydrophobic and smooth, resisting grime build-up and reducing maintenance requirements in environments where upkeep is challenging.

With proven performance in environments ranging from the humid tropics of Southeast Asia to the cold, wet conditions of Northern Europe, and the salt-laden winds of the Middle East, FRP poles are the most environmentally resilient pole type. They are a reliable, long-life solution designed to withstand the very conditions that shorten the lifespan of traditional pole materials.

With third-generation technology, the belief that FRP poles degrade in UV or coastal environments is false. Wagners Fiber Reinforced Polymer (FRP) composite products are purpose-built for resilience in precisely the places where traditional materials fall short, and they've been proving their value for over 20 years.

Myth 05

FRP poles can't handle heat or fire.

Fact

Thermoset FRP materials do not support combustion. FRP composite poles have been rigorously fire tested and proven in wildfire events to be the primary strategy for utilities looking to mitigate overhead line fire threats.



A common misconception about FRP utility poles is that they are cannot withstand fire or high heat due to their composite makeup. This myth often stems from the assumption that polymer-based materials are inherently susceptible to thermal stress. The reality is that FRP composite poles are made using thermoset resins, not thermoplastics. The difference is that, once the resin components are mixed during pole manufacturing, a reaction is created and, once cured, the resin is set and the composite laminate itself does not support combustion.

The Wagners CFT pole is classified as self-extinguishing as it will not fuel the fire once the source is removed. An internal test simulating wildfire was undertaken, in which a full-scale pole was subjected to fire from a hay bale at the ground line. The flame lasted for 25 minutes with a maximum recorded surface temperature on the pole of 1652°F (900°C). Post-fire flexural tests were undertaken, and the results showed that the pole maintained its stiffness and capability to carry dead and indicative service loads.

For example, in the western United States and in Australia, regions frequently impacted by intense wildfires, FRP poles have been deployed as part of resilience strategies. FRP poles are self-extinguishing, meaning they will not continue to burn once the heat source is removed.

In addition, because FRP poles have greater fire resilience, they retain certain load-bearing capacity even after fire exposure, allowing critical infrastructure to remain operational. Therefore, replacements can be scheduled rather than emergency driven. As a result, service restoration to customers can be much faster because the poles remain standing which reduces outage duration and directly impacts SAIDI metrics.

By contrast, wood poles are a fire liability because, once ignited, they can continue to smolder for hours after the fire front has passed, ultimately resulting in pole collapse. This results in extended outage durations, and restoration planning becomes more complicated and expensive, especially in remote areas. Even steel poles can succumb to fire heat, potentially losing strength at high temperatures and bending or collapsing.

Note, after a fire event, it is always recommended to inspect the affected portion of the line to assess structure condition.

With extensive fire testing and field proven fire performance, Wagners FRP poles are the best defense in regions with wildfire exposure.

Myth 06

FRP poles are a new and unproven technology.

Fact

FRP composite utility poles have been in service since the 1950s when they were first installed in Hawaii. That's a 70-year proven track record of reliability. With Wagners FRP poles representing the third generation of composite poles, this is now a mature technology. Utilities across North America and around the world are increasingly using FRP composite utility poles as they build reliable, resilient and sustainable infrastructure.



Some believe that FRP poles are a relatively new technology, lacking a long-term track record. This myth can lead to hesitation from decision-makers who are more familiar with traditional pole materials like wood, steel, or concrete. This perception, however, doesn't reflect reality.

Fiber Reinforced Polymer (FRP) or composite poles have been in active service since the 1950s and have consistently demonstrated reliability, durability, and performance in some of the harshest environments on Earth.

In continental North America, electric utilities in the United States and Canada began installing composite poles in larger numbers in the 1990s. In remote areas where logistics and maintenance are costly, FRP poles have a lower installed cost than wood products, and for critical overhead line infrastructure such as crossings, equipment poles and radial lines, they are increasingly the trusted solution for utilities investing in resilience and long-lasting performance.

Europe has also embraced composite pole technology for decades, with utilities across Sweden, Norway, and Ireland adopting FRP poles as part of long-term network modernization, meeting environmental, and safety regulations while lowering life-cycle costs.

In Australia and New Zealand, utilities have been progressively replacing aging timber infrastructure with FRP poles, with results showing excellent mechanical performance, reduced maintenance demands, and easier handling thanks to the poles' lightweight nature.

In the Middle East, utilities have adopted FRP poles to combat the extreme corrosion caused by salt, sand and heat, conditions where traditional steel or concrete quickly deteriorate.

These real-world deployments, across varied geographies and climates, offer compelling proof that FRP poles are standing up to demanding conditions of virtually every type. They are field-proven and their performance is supported by rigorous engineering, international standards compliance, and extensive in-service data.

Fiber Reinforced Polymer (FRP) or composite utility poles are not 'new.' They are a mature technology with a global track record. Their growing adoption reflects increasing confidence among utilities seeking reliable, resilient, and sustainable infrastructure for the next century.



Watch this webinar to understand how the engineering behind UV resistance works in Wagners FRP utility poles.

youtu.be/tsQ5e190BGQ

Myth 07

FRP poles are not environmentally friendly.

Fact

FRP composite poles are inert, require no scheduled maintenance, and offer a durable alternative to traditional materials, making them a sustainable choice for building greener, more resilient infrastructure.



Some think that FRP composite utility poles are not environmentally sustainable and therefore must have a higher environmental cost than traditional options, especially compared to natural products like wood products. FRP poles are an engineered material and, like steel and concrete poles, they have a higher embodied energy than wood products. Interestingly, when the full cradle-to-grave lifecycle is considered, including manufacture, installation, use and end-of-life, FRP poles offer the lowest carbon footprint.

Here's how this works: wood poles can typically last up to 40 years in service; however, some utilities are experiencing a much shorter service life for wood poles, sometimes as low as 20 years. With a service life of 80 years, a single FRP composite pole is equal to two to four wood poles.

FRP poles do not require preservatives or in-field chemical treatments that leach into the ground where wood products are installed. Unlike wood poles, which are saturated with CCA (copper chromium arsenate), DOCl (4, 5-Dichloro-2-n-octyl-4-isothiazolin-3-one) or other toxic preservatives to resist decay, FRP poles are inert and naturally resistant to moisture, pests, fungi and UV degradation. This means they do not leach harmful substances into the soil or surrounding groundwater, making them a safer choice in environmentally sensitive areas such as wetlands, coastal zones, water catchments and near drinking water sources.

Their durability also plays a major role in reducing environmental impact. With a design life exceeding 80 years, FRP poles

far outlast wood products, which typically require more frequent replacement due to rot, insect damage, or mechanical failure. Fewer replacements mean fewer trees cut down, less transport emissions, and reduced resource consumption over the infrastructure's life cycle.

In addition, FRP poles are lightweight, which has a direct environmental benefit during transport and installation. Lighter materials require less fuel to transport and can be installed using smaller, more efficient machinery, especially important in remote or rugged terrain where traditional poles may require helicopters or heavy equipment.

At end-of-life, many FRP poles can be repurposed, ground down or recycled into other composite products using a process called pyrolysis to extract the glass fiber. Moreover, because they contain no hazardous materials, FRP poles are considered safe for handling and disposal compared to chemically treated wood, which is considered a toxic substance. While thermoset composite recycling infrastructure is still evolving globally, the long service life of FRP poles means this will become increasingly viable over time.

Fiber Reinforced Polymer (FRP) composite poles support sustainability by offering a non-toxic, no scheduled maintenance, and long-lasting alternative to traditional materials. As utilities and governments move toward more environmentally responsible infrastructure solutions, composite poles are increasingly recognized as a leading solution for building greener, more resilient networks.

Myth 08

FRP poles are difficult to install.

Fact

Their lightweight nature, standardized form, compatibility with existing hardware and installation equipment, and improved safety all contribute to the ease of installation of FRP poles.



Some line crews believe FRP composite utility poles are more complex to install than wood products. This belief typically originates when working with modular or sectional FRP poles. Modular FRP poles require field assembly which complicates the installation process. Additionally, modular FRP poles have large drilling restricted areas around the slip joints. This forces engineering involvement and complicates long standing standard framing spacings that operations crews are trained on.

Wagners FRP poles are single-piece and arrive ready to install. Framing locations can be pre-drilled at the factory or field-drilled with no restrictions because the poles are one piece. Modular composite poles have their place in remote locations; however, for the 90% of the grid that is truck-accessible, single-piece poles are the obvious, more efficient choice.

One of the most significant advantages of FRP poles is their light weight. Depending on the size and specification, FRP poles are about 1/3 the weight of a comparable wood product, 1/2 the weight of a steel pole and 1/8 the weight of a concrete pole. Lightweight FRP poles mean substantial logistical benefits and cost savings, particularly in regions where access is limited or terrain is challenging.

Lighter poles are also safer to handle and create less wear and tear on equipment, which is a major benefit for transport and installation. In many cases, FRP poles can be installed manually or with smaller vehicles and lifting gear, eliminating the need for heavy cranes and equipment, especially valuable in

remote, mountainous or environmentally sensitive areas. This can significantly reduce installation costs and time, as well as overall risk to crews and contractors.

Additionally, FRP poles are manufactured to industry standard dimensions, meaning they are compatible with standard pole-handling equipment and mounting hardware. They can be drilled and framed on site with conventional tools with carbide-tipped bits, using the same techniques crews are already familiar with for wood products. With basic training, most field crews find the transition to FRP poles seamless.

Due to their non-conductive properties, FRP poles present less electrical hazard during installation near live line works. This can enhance crew safety. When drilling a composite pole, the PPE required is the same as a wood product. The dust created when drilling is inert and considered a nuisance dust. Treated wood products are hazardous materials. Check the safety data sheet (SDS) information for FRP and wood products for more information.

Reports from the field consistently note their ease of handling, minimal installation complications, and time savings in deployment.

The belief that single-piece FRP composite poles are difficult to install just doesn't stack up against real-world experience. Their light weight, standardized form, compatibility with existing hardware and safety benefits make them extremely easy to install and more efficient to deploy than wood poles.



Watch this webinar of a linesman in Australia discussing the benefits of working with FRP composite utility poles.

youtu.be/m78nNLNoqVwa

Myth 09

FRP poles are electrically conductive.

Fact

As a non-conductive, insulating material, FRP poles enhance safety, lower risk, and add resilience to transmission and distribution grids.



Some have expressed the view that, because FRP composite utility poles are a manufactured material, they must conduct electricity like metal. This assumption is false. In fact, one of the key advantages of FRP composite poles is that they are inherently non-conductive, providing significant safety benefits for workers, the public, and wildlife.

Fiber Reinforced Polymer (FRP) is a dielectric material, meaning it does not conduct electricity. Unlike steel, or even moisture-laden wood, which can carry current under certain conditions, FRP remains non-conductive even when wet, offering reliable electrical insulation in all weather. This property makes FRP composite poles particularly well-suited for live-line work, as they help to reduce the risk of shock and electrocution to line workers operating near energized conductors.

Another major safety benefit is the reduction in touch potential hazards. In the event of a ground fault or lightning strike, traditional conductive poles can channel electrical energy into the ground, creating dangerous voltage gradients that put workers or bystanders at risk. FRP poles help interrupt this path to ground, improving safety during fault conditions and storm events.

Their non-conductive nature also makes FRP composite poles ideal in lightning prone regions, where electrical surges from strikes can cause dangerous flashovers or damage to poles and attached equipment. FRP composite poles can act as an insulator rather than a conductor, helping to limit the spread of high voltage through the network and protecting sensitive components.

Furthermore, the FRP material's electrical insulation properties are permanent and built into the material structure; they don't rely on coatings, sleeves or treatment that can wear off or degrade over time. This ensures that their electrical performance remains consistent over the entire lifespan of the pole.

Globally, electric utilities have already embraced FRP poles in high-risk environments, from subtropical thunderstorm regions to remote areas where ground and earthing infrastructure is difficult to install. These real-world applications demonstrate the clear electrical safety advantage FRP composite utility poles offer.

While not certified as insulators, meaning that not every pole has had its insulation properties tested, Wagners FRP poles are non-conductive. Their insulating properties enhance safety, lower risk and add resilience to modern power transmission and distribution networks.



Watch this webinar on the raw ingredients that go into manufacturing a Wagners CFT Utility Pole and why "It's what's inside that counts!"
youtu.be/r_zJAddUOac

Myth 10

FRP poles are vulnerable to pests and biological attack.

Fact

FRP poles are unaffected by any known pest, fungus or marine organism, making them an ideal choice for utilities operating in challenging environments where wood poles simply cannot survive.



Wagners FRP composite utility poles are immune to biological threats such as woodpeckers, carpenter ants, termites, fungi, marine borers, and many more threats.

Unlike wood, FRP composite poles contain no cellulose or organic compounds that can attract or sustain biological organisms. Carpenter ants, termites, beetles, and wood-boring insects cannot feed on or damage FRP materials, making it a permanent solution in pest-prone regions. This eliminates the need for toxic chemical pesticide-containing preservatives that are typically used to protect timber poles from insect infestation.

Even woodpeckers and other birds, which routinely damage wooden poles by pecking holes for nesting or feeding, are unsuccessful when up against a Wagners FRP composite utility pole. The dense, smooth and non-organic surface of an FRP pole deters them entirely, helping preserve pole integrity and avoid expensive preventative measures and pole replacement.

Climbing animals like squirrels, raccoons and other climbing pests, as well as vegetation, cannot gain purchase on the surface of an FRP pole, meaning that animal- and vegetation-related outages are eliminated.

FRP poles are also highly resistant to fungal decay and mold, even in humid and wet environments. Wood poles often degrade when exposed to high levels of moisture and organic material, particularly on islands and in rainforests, wetlands, or water crossings. However, FRP composite utility poles are inert and non-biodegradable, meaning they do not rot, swell, or break down, even when submerged or exposed continuously to water.

In marine and estuarine environments, borers such as shipworms (Teredo) and gribbles can quickly destroy untreated or poorly protected wood. The composite matrix of FRP utility poles is such that no nutrition or entry point is made available to these organisms. That makes FRP composite poles a natural choice for coastal infrastructure, tidal zones and remote island networks, where wood products degradation from marine life is a significant risk.

Because they are engineered to be biologically inert, FRP composite poles deliver a long service life in even the most biologically aggressive conditions without the need for pesticides or preservatives.

In summary, Wagners FRP poles are unaffected by any known pest, fungus or marine organism, making them an ideal choice for utilities operating in challenging environments where wood products are prone to attack and will not provide the required lifecycle.



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