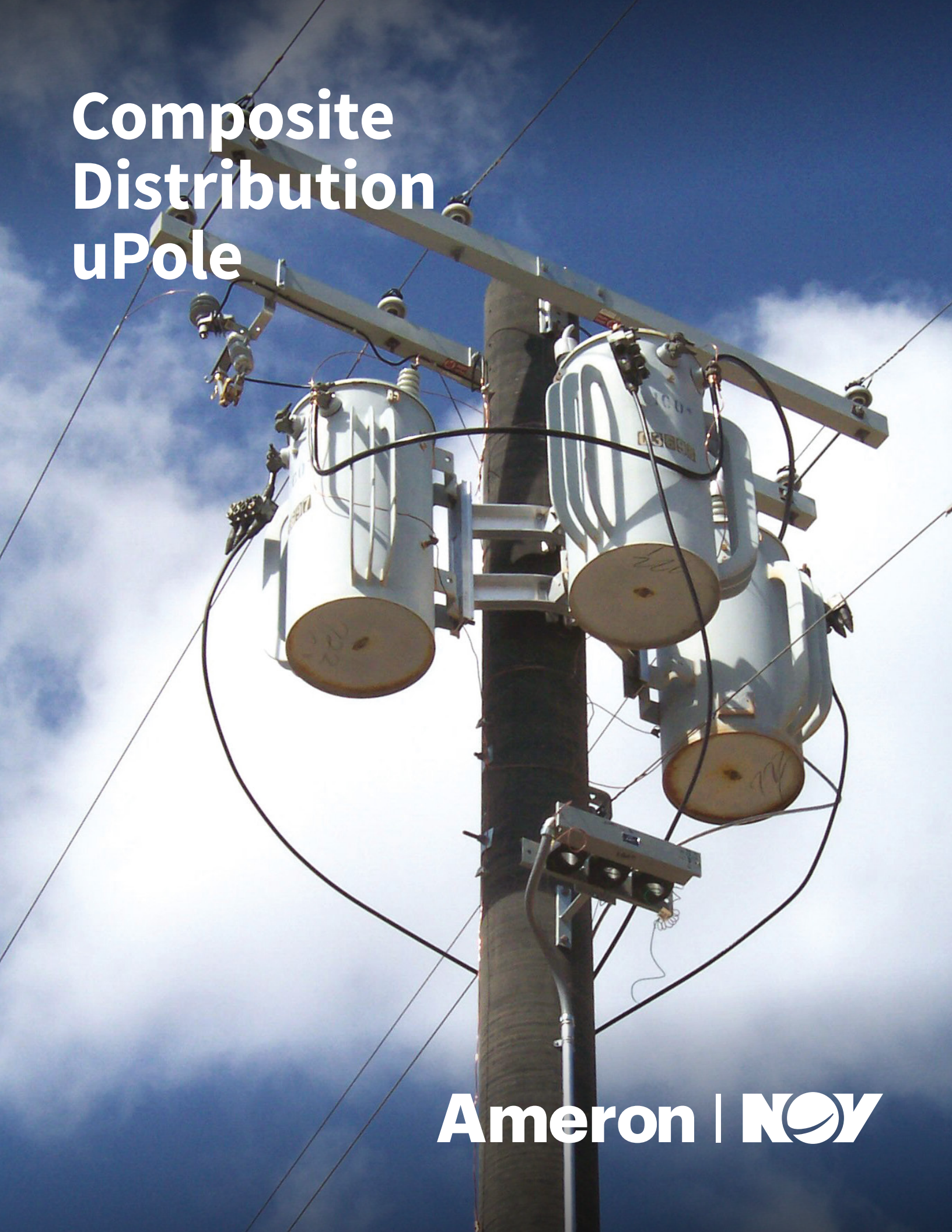
Composite Distribution uPole



Ameron | NOV

Weather and environmental threats can affect a utility's ability to deliver power to customers. The safety and operational hardships outages have caused a direct impact on an energy provider's performance, reputation, and, ultimately, the bottom line. As grid hardening initiatives to improve infrastructure grow, **we offer a trusted and reliable solution** that supports the goals of a utility's operations.

The Ameron™ uPole™ design was introduced to the utility market in 2008. Since then, it has been adopted by investor-owned utilities (IOUs), municipalities, and electric cooperatives in the US, Canada, Latin America, and Asia-Pacific regions.

A cost-effective alternative to wood, steel, and pre-stressed concrete distribution poles, the uPole is manufactured using fiberglass reinforced polymer (FRP) and is finished with a sand-hardened coating for ultimate strength and durability.

Features and benefits

Resistant to degradation thus eliminating maintenance costs related to:

Rust and corrosion


Rot


Woodpeckers


Termites


Water absorption


Snow and ice


Hot arid exposures

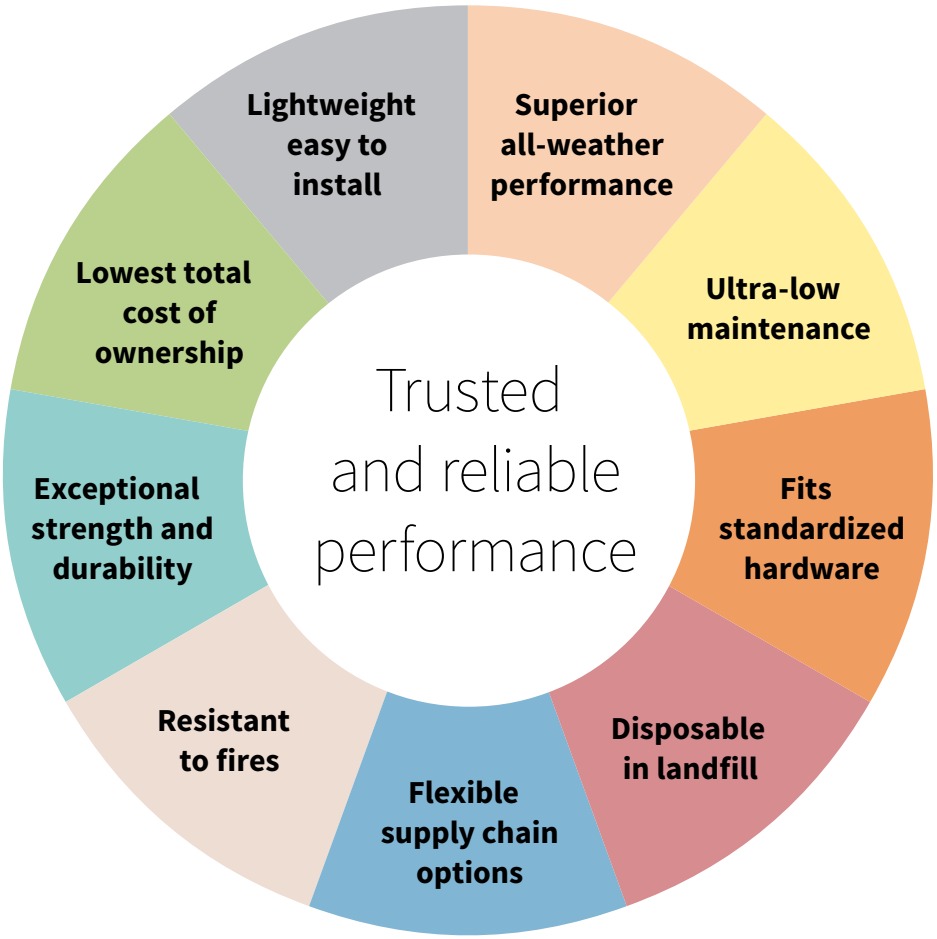
Q How long will a uPole last?

The uPole has a UV-resistant coating with a fine sand finish that acts as a shield against normal environmental conditions. Based on UV testing of the coating, we estimate the useful lifespan of our poles at 100+ years.

While the strength of wood poles decreases over time due to rot and other forms of degradation, the composite uPole is more resilient and retains its strength and capacity through its lifespan.

- Non-tapered pole allows for consistent fit of electrical equipment, predictable sizing, and simplified field fitting
- Sand finish creates a rough, non-slip surface for lineman to safely perform work
- High Basic Impulse Level (BIL) compared to wood per NEETRAC testing
  - 600 kV dry
  - 455 kV wet
  - 75 impulses no damage

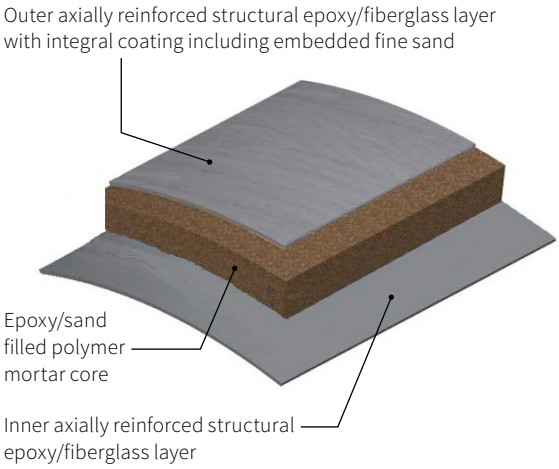
The uPole advantage



Sand-hardened FRP pole wall

Using a patented continuous process, we are able to uniquely construct the structural pole wall and outer layer of the uPole shafts. Our approach is to build hoop and axial strength by alternating directions of fiberglass strands coated with strong and durable epoxy resin. By employing a proprietary, sand-filled polymer mortar core to thicken the wall, our design adds strength and stiffness at a lower cost compared to other composite poles.

The final step is to apply the thick outer layer epoxy-based coating resin with strong UV absorbers and with fine sand embedded in the surface to provide an outer barrier that is nearly impervious to the elements. This results in a sand-hardened FRP pole wall that feels solid like concrete, but has the performance and toughness of fiberglass.



We comply with the following codes and guidelines:

- ANSI O5.1 (USA)
- NESC C2 (USA)
- CSA C22.3 (Canada)
- ENA DOC 011-2006 (Australia)
- AS/NZS 7000 (Australia and New Zealand)

Holes and attachments

- Factory-drilled holes available on request
- Removable or permanent step attachments available upon request
- Clips and riv-nuts can be used to attach ground wire or small equipment
- Bolt torque ratings
  - 100 ft-lb (136 N-m) for standard wall thickness
  - 250 ft-lb (339 N-m) for heavy wall thickness
- Bolt bearing ratings

Wall Thickness in. (mm)	Vertical Bolt Bearing lb (kN)			
	⅝ in. (16 mm) Bolt		¾ in. (19 mm) Bolt	
	Single Wall Bolt	Through Bolt	Single Wall Bolt	Through Bolt
0.44 (11)	5,500 (24)	11,000 (49)	6,400 (28)	12,800 (57)
0.55 (14)	10,800 (48)	21,600 (96)	12,600 (56)	25,200 (112)

Top caps and bottom plates

- Conical-shaped top cap designed to resist bird nesting
- Bottom plate is designed to resist vertical loads with the embedment resistance area similar to a wood pole of the same class

Field support services

Our team has been providing field support services for more than 40 years. We can accommodate your project schedule and budget with these four delivery options tailored to fit your needs:

- Delivery
- Delivery and unload
- Delivery, unload, and manpower
- Delivery and erection for new lines

Q Can the same hardware used for wood poles be used on a uPole?

Yes, except for lag bolts. Being round, virtually all hardware used for wood poles can be used on uPoles, except for lag bolts. In place of lag bolts, common length through-bolts with washers and nuts and all-thread rod with washers and nuts are used. Self-tapping screws or riv-nuts can be used to attach grounding wires and lightweight equipment.

The sand surface of the pole works well for attaching clamps, brackets, and mounts. However, to ensure stability after installation, use all through-bolts required by the hardware attachment.

A uPole has very high resistance to through-bolt torque compared to other composite poles. Unlike wood poles, uPoles do not creep over time leading to loosening of hardware attachment. Therefore, once bolts are torqued, no further re-torquing is normally necessary.

Q How do you climb a uPole?

Although most distribution poles are serviced by bucket trucks, some pole installations require climbing. Like steel poles, a uPole needs to have step attachments installed to facilitate climbing. Step attachments are available on the market for this purpose. We can supply poles with step attachment holes factory drilled for customer step attachment installation, or if requested, NOV can install step attachments at the factory prior to delivery.

Installation

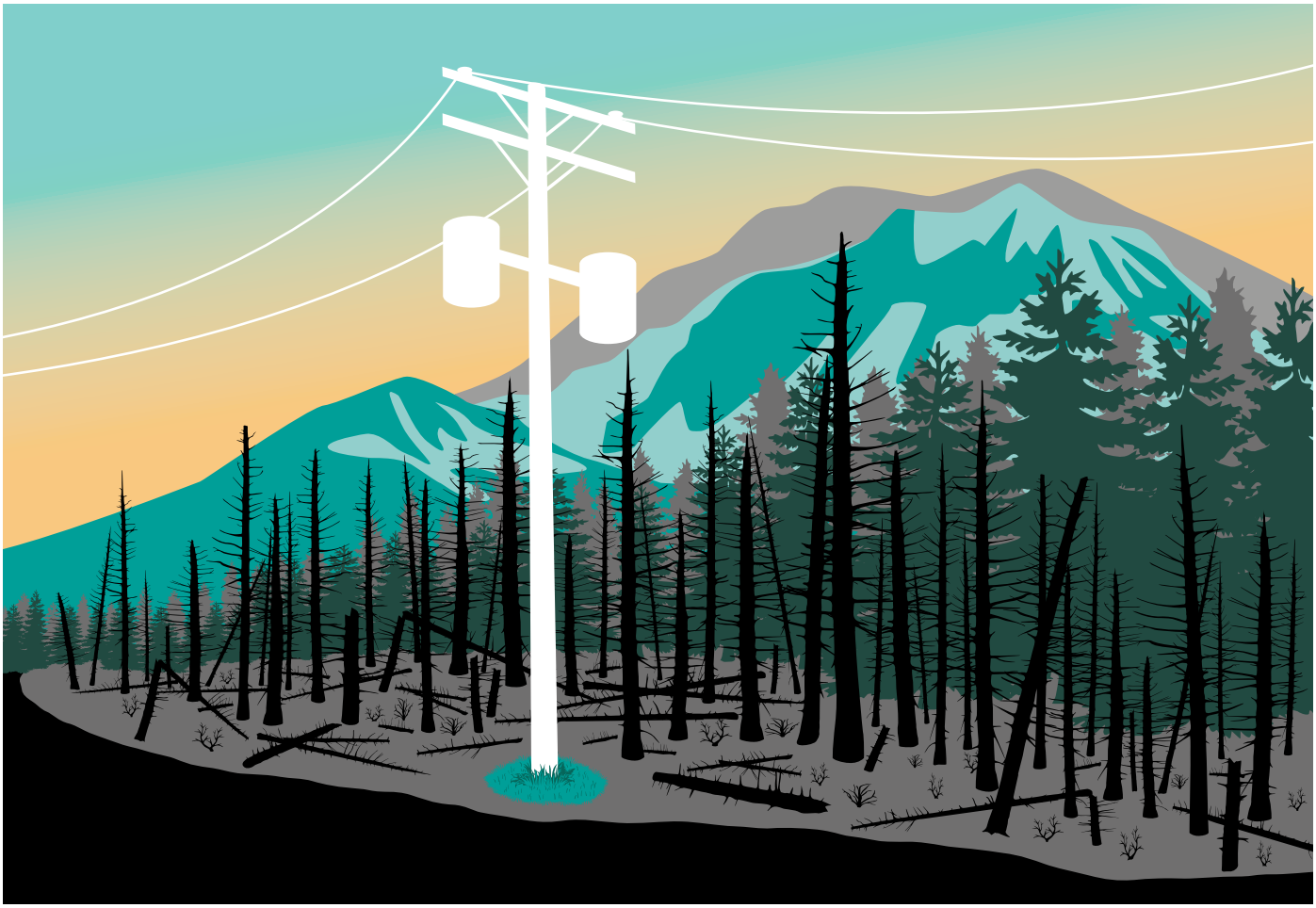
- Installation is identical to wood poles using the same equipment
- Standard tools can be used for installing utility equipment and devices
- 40% lighter than wood poles making it easier to handle
- Field drilling of holes with off-the-shelf, diamond-tip drill bits
- Supports the following:
  - Wood, steel, and composite crossarms
  - Transformers and other hardware
  - Guy attachments
  - Most portable platforms and overhead wire saddles

Q Is a uPole installed the same as a wood pole?

Yes, a uPole is installed just like a wood pole. Typically, 18-in. augers are used to bore a hole at the installation site, and the poles are set in place and aligned using load straps or cloth belts. Because uPoles weigh significantly less than a wood pole, handling and installation is much easier. uPoles can be embedded in native soil using standard tamping equipment, rock, or readily available structural foam. No special procedures are needed to protect the coating during installation.

Q Can a ground wire be run inside a uPole to counter copper theft?

Yes. We can run the ground wire through the center of the pole and out the bottom below grade to the ground rod.



uPole’s exceptional fire resistance

Standard uPole

uPole’s superior coating resists the effects of fast-passing wildfires. The sand-hardened FRP surface provides protection against heat and direct flame. For even greater protection in fire-prone areas, we offer an enhanced fire-resistant uPole.

Enhanced fire-resistant uPole with high-performance coating

For areas susceptible to wildfires, uPoles can be enhanced with a fire-resistant coating to provide greater protection.

Full-scale testing was performed to demonstrate how poles would react to a wildfire event and to determine how much strength capacity was retained after burning. Poles were exposed to flames reaching 2,100°F for 2-minute or 3-minute burns. uPoles enhanced with a fire-resistant coating were proven to retain up to 98% of their original strength depending on fire exposure time and thickness of the coating. Enhanced fire-resistant poles can not only withstand wildfires, but also be remediated and remain in use after a fire event occurs.

Contact your sales representative for a copy of our technical bulletin.

Long-term weathering

UV and corrosion protection

The sand-hardened FRP construction of the uPole structural wall is protected with a break-through integral resin/sand polymer mortar outer coating layer filled with strong UV absorbers that has been lab tested to withstand the effects of harmful UV ray exposure.

The coating has been subjected to over 100,000 hours of accelerated weathering exposure in a QUV chamber under aggressive UV-B bulbs without any coating crazing, cracking, peeling, or other significant degradation.

The uPole's unique composite material provides a solution that is not susceptible to corrosion.

Designed with tough conditions in mind, the uPole resists the effects of harmful UV exposure.

Environmentally green

A sustainable alternative to wood

uPoles are non-toxic and can be reused or disposed of in a standard landfill. It contains no pesticides, preservatives, or other harmful chemicals that can leach into the ground. Once properly installed for the line design requirements, unlike wood or steel poles, no further maintenance outside of normal inspection practices should be required.

ISO 9001-2015

Quality tested

The uPole is manufactured in our Burkburnett, Texas plant which is certified to ISO 9001-2015. This plant has been in operation making world-class FRP pipe since 1966. Material and processes are rigorously tested to strict standards.

Q **Can a uPole be disposed of in an ordinary landfill?**

Yes. The pole is comprised of epoxy resin, sand, and fiberglass. The fully-cured epoxy resin is safe for landfills. The sand and fiberglass, which is essentially melted sand, are also non-toxic.

uPole selection guide

Pole type	Nominal diameter, in. (mm)	Ground line moment capacity k*ft (kN*m)	Pole length, ft (m)							
			30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)	55 (16.8)	60 (18.3)	65 (19.8)
			Nominal weight, lbs (kg)							
UPS-11 (MUPS-28)	11 (28)	75 (101)	335 (152)	390 (177)	440 (200)	495 (225)	550 (249)	-	-	-
UPS-13 (MUPS-33)	13 (33)	100 (135)	390 (177)	455 (206)	515 (234)	580 (263)	645 (293)	705 (320)	770 (349)	835 (379)
UPS-15 (MUPS-38)	15 (38)	120 (162)	445 (202)	515 (234)	590 (268)	660 (299)	735 (333)	805 (365)	875 (397)	950 (431)
UPH-13 (MUPH-33)	13 (33)	130 (176)	540 (245)	625 (283)	715 (324)	805 (365)	890 (404)	980 (445)	1065 (483)	1155 (524)
UPH-15 (MUPH-38)	15 (38)	190 (257)	615 (279)	715 (324)	815 (370)	915 (415)	1015 (460)	1115 (506)	1215 (551)	1315 (596)
UPX-15 (MUPX-38)	15 (38)	220 (298)	-	620 (281)	690 (313)	760 (345)	835 (379)	905 (411)	980 (445)	1050 (476)
UPXX-15 (MUPXX-38)	15 (38)	290 (393)	-	815 (370)	915 (415)	1015 (460)	1115 (506)	1215 (551)	1315 (596)	1415 (642)

Grade	Class	Pole length ft (m)							
		30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)	55 (16.8)	60 (18.3)	65 (19.8)
B	5	UPS-11	UPS-11	UPS-11	UPS-11	UPS-11	UPS-13	UPS-13	UPS-13
		(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-33)
	4	UPS-11	UPS-11	UPS-11	UPS-11	UPS-11	UPS-13	UPS-13	UPS-13
		(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-33)
	3	UPS-11	UPS-11	UPS-11	UPS-11	UPS-13	UPS-13	UPS-13	UPS-15
		(MUPS-28	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-33)	(MUPS-38)
	2	UPS-11	UPS-11	UPS-13	UPS-13	UPS-13	UPS-15	UPH-13	UPH-15
		(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-33)	(MUPS-38)	(MUPH-33)	(MUPH-38)
	1	UPS-11	UPS-13	UPS-13	UPS-15	UPS-15	UPH-15	UPH-15	UPH-15
		(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-38)	(MUPS-38)	(MUPH-38)	(MUPH-38)	(MUPH-38)
	H1	UPS-13	UPS-13	UPS-15	UPH-13	UPH-15	UPH-15	UPH-15	UPX-15
		(MUPS-33)	(MUPS-33)	(MUPS-38)	(MUPH-33)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)
	H2	UPS-13	UPS-15	UPH-15	UPH-15	UPH-15	UPH-15	UPX-15	UPXX-15
		(MUPS-33)	(MUPS-38)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)
	H3	UPS-15	UPH-15	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15	UPXX-15
		(MUPS-38)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	(MUPXX-38)
	H4	UPH-15	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15	UPXX-15	-
		(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	(MUPXX-38)	-
	H5	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15	-	-	-
		(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	-	-	-

Assumed all holes are located 15 ft (4.6 m) or greater above ground line. Contact us if holes are required below 15 ft (4.6 m) above ground line.
Assumed embedment equal to 10% of pole length + 2 ft (0.6 m).

uPole selection guide (continued)

Grade	Class	Pole length ft (m)							
		30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)	55 (16.8)	60 (18.3)	65 (19.8)
C	5	UPS-11	UPS-11	UPS-11	UPS-11	UPS-11	UPS-13	UPS-13	UPS-13
		(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-33)
	4	UPS-11	UPS-11	UPS-11	UPS-11	UPS-13	UPS-13	UPS-15	UPS-15
		(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-38)	(MUPS-38)
	3	UPS-11	UPS-11	UPS-13	UPS-13	UPS-15	UPS-15	UPH-13	UPH-15
		(MUPS-28)	(MUPS-28)	(MUPS-33)	(MUPS-33)	(MUPS-38)	(MUPS-38)	(MUPH-33)	(MUPH-38)
	2	UPS-11	UPS-13	UPS-15	UPS-15	UPH-13	UPH-15	UPH-15	UPH-15
		(MUPS-28)	(MUPS-33)	(MUPS-38)	(MUPS-38)	(MUPH-33)	(MUPH-38)	(MUPH-38)	(MUPH-38)
	1	UPS-13	UPS-15	UPH-13	UPH-15	UPH-15	UPH-15	UPX-15	UPX-15
		(MUPS-33)	(MUPS-38)	(MUPH-33)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPX-38)
	H1	UPS-15	UPH-13	UPH-15	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15
		(MUPS-38)	(MUPH-33)	(MUPH-38)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)
	H2	UPH-13	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15	UPXX-15	-
		(MUPH-33)	(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	(MUPXX-38)	-
	H3	UPH-15	UPH-15	UPX-15	UPXX-15	UPXX-15	-	-	-
		(MUPH-38)	(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	-	-	-
	H4	UPH-15	UPX-15	UPXX-15	UPXX-15	-	-	-	-
		(MUPH-38)	(MUPX-38)	(MUPXX-38)	(MUPXX-38)	-	-	-	-
	H5	UPX-15	UPXX-15	UPXX-15	-	-	-	-	-
		(MUPX-38)	(MUPXX-38)	(MUPXX-38)	-	-	-	-	-

Assumed all holes are located 15 ft (4.6 m) or greater above ground line. Contact us if holes are required below 15 ft (4.6 m) above ground line.
Assumed embedment equal to 10% of pole length + 2 ft (0.6 m).

Part designation legends:

Standard uPole

UPS - 11 - 30 - F

- UPS: uPole; S = Standard wall, H = Heavy wall, X = X-Strong, XX = XX-Strong
- 11: Nominal OD (in.)
- 30: Pole length (ft)
- F: Fire resistant coating (omit if not required)

Metric uPole

MUPS - 28 - 9 - F

- MUPS: uPole; S = Standard wall, H = Heavy wall, X = X-Strong, XX = XX-Strong
- 28: Nominal OD (mm)
- 9: Pole length (m)
- F: Fire resistant coating (omit if not required)

Additional pole configurations may be available. Contact us to learn more.

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