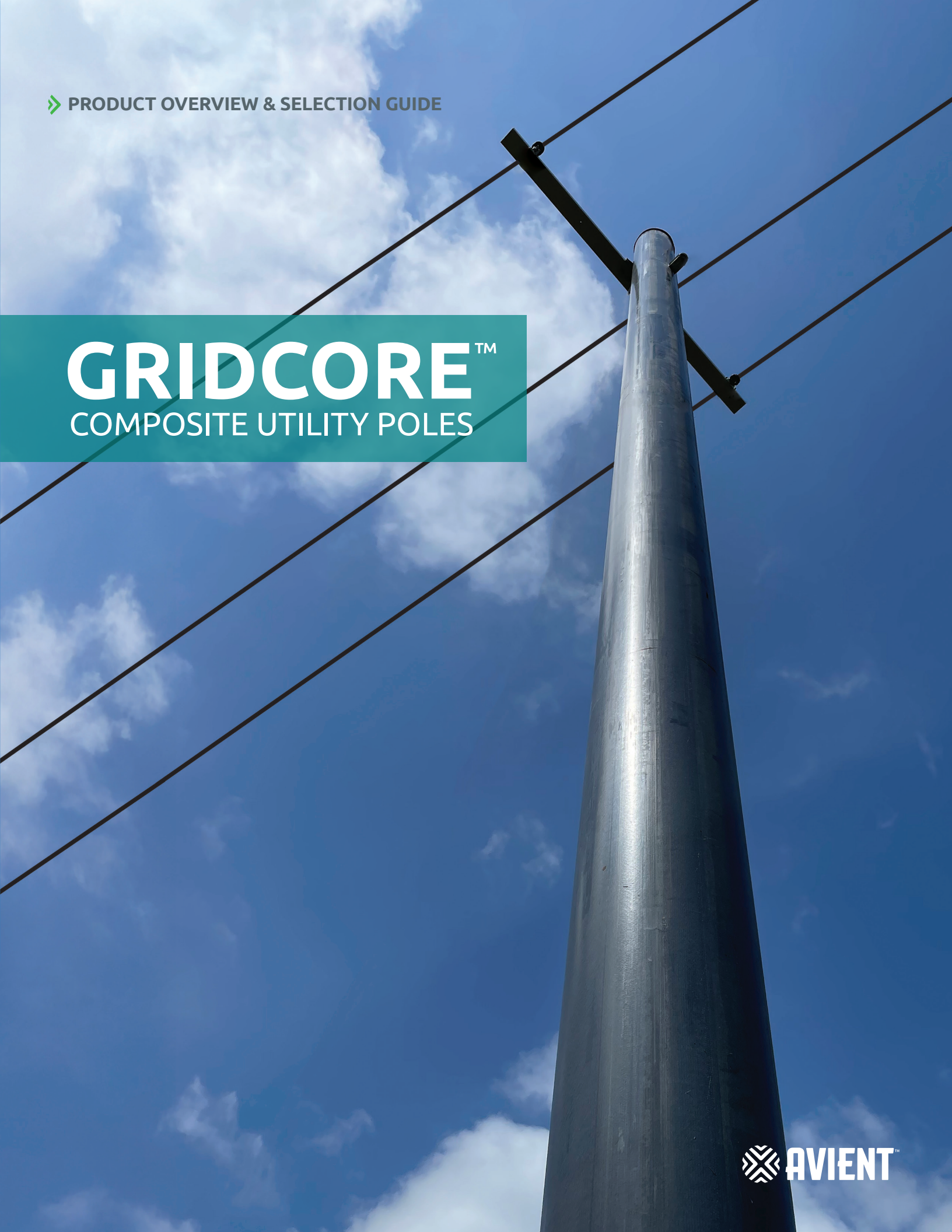
PRODUCT OVERVIEW & SELECTION GUIDE

GRIDCORE™
COMPOSITE UTILITY POLES



AVIENT™

INTRODUCING GRIDCORE™ COMPOSITE UTILITY POLES FOR ELECTRIC POWER DISTRIBUTION

GridCore™ Composite Utility poles from Avient are engineered to enhance grid resilience as a superior alternative to wood, steel, or concrete poles. Compared to traditional materials, fiber reinforced polymer (FRP) composites are more durable, require less maintenance, and provide a longer service life. They are also significantly lighter in weight, allowing for safer and simplified installation.

KEY PERFORMANCE ADVANTAGES

Lower Total System and Lifecycle Cost
GridCore Composite Poles have an expected service life of up to 80 years, compared to 30-40 years for wood poles. Considering the cost of replacing aged, damaged, and failed poles, the longer lifespan of an FRP pole results in total cost savings over the life of the pole.

Lower Maintenance and Resistant to Pests
Also contributing to lower lifecycle cost, composite poles require only visual inspection and are not susceptible to damage from woodpeckers and insects, reducing maintenance and repair costs. Superficial damage can often be repaired on-site, using recommended products and procedures available from Avient.

Customized and Consistent Material
Manufactured in a continuous pultrusion process, GridCore poles are engineered for consistent strength and uniform appearance and are not subject to warping, shrinkage, or splintering. Unlike wood they can withstand strong storms without breaking.

Lightweight and Safer Installation
GridCore poles are significantly lighter than equivalent wood and concrete poles and can be installed using light-duty equipment and without expensive cranes. The lower weight can reduce the opportunity for worker injuries and strain on equipment. The poles have excellent dielectric strength that allows for safer installation near energized lines.

No Assembly Required
GridCore pultruded composite poles are fully fabricated as one-piece, uniform diameter, requiring only one size through-bolt length, saving assembly labor in the field, and reducing outage time.

Simple to Drill
GridCore poles can be purchased pre-drilled, and they can easily be field drilled using a handheld cordless drill and recommended bits.

POLE SELECTION GUIDE

		Southern Yellow Pine[1] Equivalent Wood Pole			GridCore FRP Pole[2]			
					14.0 x 0.5 in		14.0 x 0.75 in	
Length (ft)	Load Class[3]	Allowable Class Load[4] (kip)	Weight (lb)	Deflection[5] (in)	Weight (lb)	Deflection[5] (in)	Weight (lb)	Deflection[5] (in)
40	4	1.56	1160	38	707	13	1041	8
	3	1.95	1360	35		17		10
	2	2.41	1580	32		21		13
	1	2.93	1810	30		25		16
	H1	3.51	2050	28		30		19
	H2	4.16	2310	26		36		22
	H3	4.88	2580	24		42		26
	H4	5.66	2870	23		*		30
45	4	1.56	1390	49	795	20	1171	12
	3	1.95	1630	45		24		15
	2	2.41	1880	41		30		19
	1	2.93	2160	38		37		23
	H1	3.51	2450	36		44		27
	H2	4.16	2760	33		52		33
	H3	4.88	3090	31		61		38
50	4	1.56	1630	61	884	27	1301	17
	3	1.95	1910	56		34		21
	2	2.41	2210	52		42		26
	1	2.93	2530	48		52		32
	H1	3.51	2880	45		62		39
	H2	4.16	3240	42		73		46
	H3	4.88	3620	39		*		54
55	4	1.56	1890	75	972	37	1431	23
	3	1.95	2210	68		47		29
	2	2.41	2550	63		58		36
	1	2.93	2930	58		70		44
	H1	3.51	3320	54		84		52
	H2	4.16	3740	51		99		62
	H3	4.88	4180	48		*		73
60	4	1.56	2150	90	1060	49	1561	31
	3	1.95	2520	82		62		38
	2	2.41	2910	76		76		47
	1	2.93	3340	70		92		58
	H1	3.51	3790	65		111		69
	H2	4.16	4270	61		*		82
	H3	4.88	4770	58		*		96

		Southern Yellow Pine[1] Equivalent Wood Pole			GridCore FRP Pole[2]			
					14.0 x 0.5 in		14.0 x .75 in	
Length (ft)	Load Class[3]	Allowable Class Load[4] (kip)	Weight (lb)	Deflection[5] (in)	Weight (lb)	Deflection[5] (in)	Weight (lb)	Deflection[5] (in)
65	4	1.56	2430	107	1149	63	1691	40
	3	1.95	2840	97		79		50
	2	2.41	3290	90		98		61
	1	2.93	3770	83		119		74
	H1	3.51	4280	77		143		89
	H2	4.16	4820	72		*		106
70	3	1.95	3180	114	1237	100	1821	63
	2	2.41	3690	105		124		77
	1	2.93	4220	97		150		94
	H1	3.51	4790	90		180		113
	H2	4.16	5390	85		*		134
75	3	1.95	3540	131	1325	125	1951	78
	2	2.41	4090	121		154		96
	1	2.93	4690	112		187		117
	H1	3.51	5320	104		*		140
80	3	1.95	3900	150	1414	152	2081	95
	2	2.41	4520	138		188		118
	1	2.93	5170	128		229		143
	H1	3.51	5870	119		*		172

[1] Wood properties data are per ANSI O5.1-2022 Table 1. For other wood species not shown in the table above, visit gridcore.avient.com or contact an Avient representative for suggestions.

[2] FRP pole sizes are selected based on allowable Class loads specified in NESC Table 261-1. For Grade B construction, strength factor for FRP is 1.00. The values for 14 x 0.75 in pole have been verified by third-party full-scale testing. The values for 14 x 0.5 in pole, which is in development, are estimates and will be verified by third-party full-scale testing.

[3] Load classes and pole embed depths used in calculations are per ANSI O5.1-2022 tables. For load classes and pole lengths outside of those listed, please contact Avient.

[4] Horizontal load, 2ft from the pole tip. Allowable Class loads are based on NESC Table 261-1. For Grade B construction, strength factors for wood is 0.65.

[5] Pole tip horizontal deflection at the allowable Class load, based upon published mean moduli of elasticity of wood and FRP. Wood poles' diameters are per ANSI O5.1 tables, and their (tapered) flexural stiffness. The calculations are based on ASTM D1036-99 Eq. (5).

* Indicates excessive deflection while the strength is sufficient.

FRP POLE SECTIONAL PROPERTIES

	GridCore FRP Pole[a]	
	14.0 x 0.5 in	14.0 x 0.75 in
Nominal Fiber Stress, F[b] (psi)	45000	
NESC Construction[b]	Grade B	
Strength Factor, ϕ[b]	1.0	
Modulus of Elasticity E (10^6 psi)	5.00	5.63
Density (lb/ft^3)	120	
Outer Diameter (in)	14	14
Wall Thickness (in)	0.50	0.75
Inner Diameter (in)	13.00	12.50
Moment of Inertia, I (in^4)	484	687
Flex. stiff., EI (lb-in^2 10^6)	2419	3870
Section Modulus, S (in^3)	69.10	98.20
Allowable Moment., ϕFS (kip-ft)	259	368
Cross Section Area, A (in^2)	21	31
Weight (lb/ft)	17.70	26.00

[a] The values for 14 x 0.75 in pole have been verified by third-party full-scale testing. The values for 14 x 0.5 in pole, which is in development, are estimates and will be verified by third-party full-scale testing.

[b] FRP pole sizes are selected based on allowable class loads specified in NESC Table 261-1. For Grade B construction, strength factor for FRP is 1.00. Fiber stress is at 5% LEL, and modulus of elasticity is at mean.

WOOD POLE DESIGN PARAMETERS

	Southern Yellow Pine Equivalent Wood Pole
Nominal Fiber Stress, F[a] (psi)	8,000
NESC construction[b]	Grade B
Strength factor, ϕ[b]	0.65
Modulus of Elasticity, E[a] (10^6 psi)	2.13
Estimated Density (lb/ft^3)	65

[a] Average properties per ANSI O5.1-2022 Table 1.

[b] Per NESC Table 261-1

LOAD CLASS EQUIVALENCIES[1]

Wood Species[2]		Southern Yellow Pine			
Design Basis		Matching Deflection		Matching Strength	
GridCore Pole Size		14 x 0.50	14 x 0.75	14 x 0.50	14 x 0.75
Pole Length (ft)	40	1	H2	H6	H6
	45	1	H2	H6	H6
	50	2	H1	H4	H6
	55	2	H1	H4	H6
	60	3	1	H3	H5
	65	3	1	H2	H5
	70	3	1	H1	H4
	75	*	1	H1	H4
	80	*	3	H1	H4

[1] This table is to assist users to size GridCore™ composite poles to match performance of common wood poles based on mean moduli of elasticity of wood and FRP (NESC Grade B construction).

[2] Average modulus of elasticity and fiber stress per ANSI O5.1-2022 were used in the calculations.

* No data for wood poles from ANSI O5.1 for this length and load class.

ABOUT AVIENT

Avient Corporation (NYSE: AVNT) is a global provider of specialized and sustainable materials solutions, with 9,300 employees and a revenue of approx. $3.1 billion. Avient's Advanced Composites business segment specializes in lightweight, strong, cost-efficient, and customizable composite materials used in many different industries, from automotive to construction and from infrastructure to recreation.

Our diverse portfolio of purpose-engineered electrical components include Glasforms™ fiberglass reinforced insulator rods, guy insulators, crossarms, and pole profiles that meet the specific and rigorous demands of the electrical utility industry, and have been trusted by major utility product manufacturers for decades. Our advanced pultrusion processing capabilities combined with chemistry formulation and material science expertise have made us leaders in the industry. Our pultruded composite materials are proudly made in the USA in Birmingham, Alabama.

For the latest product information,
please visit gridcore.avient.com or call +1.844.4AVIENT.

AVIENT™