



Tested Products

(Selected sizes only. For complete tested products, visit www.fortresspilings.com)

General Properties

Nominal Diameter	Inches	8	8	9	10	10	12	12
Wall Thickness	Inches	1/4	3/8	5/16	1/4	3/8	1/4	3/8
Part Number		FP080-025	FP080-038	FP090-031	FP100-025	FP100-038	FP120-025	FP120-038
Inside Diameter	Inches	7.69	7.69	8.38	9.69	9.69	11.67	11.67
Outside Diameter	Inches	8.2	8.44	9.0	10.19	10.44	12.17	12.42
Weight	Lbs / ft	4.9	7.5	7.2	6.1	9.3	7.4	11.2
Specific Gravity		1.98	1.98	1.98	1.98	1.98	1.98	1.98
Chemical Resistance		Outstanding	Outstanding	Outstanding	Outstanding	Outstanding	Outstanding	Outstanding
Deflection Temperature	°F	>205	>205	>205	>205	>205	>205	>205
Burning Rate		Self extinguishing within 15 seconds						

Compression

All Fortress Pilings have been full-scale compression tested in accordance with ASTM D5449, Standard Test Method for Transverse Compressive Properties of Hoop Wound Polymer Matrix Composite Cylinders

Product		FP080-025	FP080-038	FP090-031	FP100-025	FP100-038	FP120-025	FP120-038
Area	In ²	6.0126	9.2315	9.0762	7.6925	12.0279	9.1117	13.9499
Peak Load	Lbf	134,382	212,387	203,280	130,457	235,109	154,061	256,410
Peak Stress	Psi	22,350	23,083	17,555	16,960	19,547	16,905	18,383
Modulus of Elasticity	Psi	2,033,100	2,114,800	1,721,200	1,555,800	2,160,700	1,846,200	2,069,400
Poisson's Ratio		0.19	0.315	0.229	0.142	0.269	0.154	0.308
Moment of Inertia	In ⁴	49	77	80	96	150	166	258

Tension

Fortress Pilings have been tested in accordance with ASTM D3039, Standard Test Method for Tensile Properties of Polymer Matrix

Product		FP080-025	FP080-038		FP100-025	FP100-038	FP120-025	FP120-038
Strain at Initial Break	In./In.	0.0057	0.0054		0.0045	0.0053	0.0037	0.0065
Load at Initial Break	Psi	1,784	2,560		1,396	2,479	1,129	2,161
Peak Load	Lbf	2,139	3,198		1,666	2,881	1,515	2,724
Stress at Initial Break	Psi	9,980	8,510		7,580	7,550	6,560	7,670
Tensile Strength	Psi	11,910	10,680		9,040	8,780	8,830	9,690
Tensile Modulus	Psi	2,267,000	1,840,300		1,660,000	1,665,700	1,393,100	1,398,600
Tensile Elongation	%	1.4	1.1		0.7	0.8	1.5	1.7

Bolted Connections

Fortress Pilings have been tested in accordance with ASTM D5961, Standard Test Method for Bearing Response of Polymer Matrix Composite

Product		FP080-025	FP080-038		FP100-025	FP100-038	FP120-025	FP120-038
Peak Load	Lbf	31,416	50,265		31,416	50,265	31,416	50,265
Peak Stress	Psi	20,000	32,000		20,000	32,000	20,000	32,000

Piling Material Comparison

Product		Fortress	Southern Pine	Steel	Concrete
Yield Strength	Psi	7,975	464	36,000	6,000
Elastic Modulus	Psi	1,928,743	1,987,017	29,007,548	6,580,000