

PLP
COMPOSITE TECHNOLOGIES INC.
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Computerized Composite FLAGPOLE Engineering and Design
with Load Calculations Based on Standards Established by
The National Association of Architectural Metal Manufacturers (NAAMM)
and

The American Association of State Highway and Transportation Officials (AASHTO)
6th Edition 2013, using Appendix C-Alternate Method for Wind Pressures.

TABLE 1

GIVEN INFORMATION

Flagpole name.....	V20
Height of pole.....	20 feet
Depth of bury in ground.....	1 feet
Base diameter.....	3.844 inches
Tip diameter.....	2.672 inches
Flag size, hoist x fly.....	0 feet x 0 feet (polyester fabric)
Wind speed.....	125 MPH, gust factor 1.3
Material.....	PLP16, 50 inches wide
Breaking Stress.....	24000 psi
Modulus of Elasticity.....	2000000 psi
wall Th./Inside Dia. ratio....	.018

TABLE 2

V20
FLAGPOLE

BENDING MOMENT, STRESS, & DEFLECTION

POLE HEIGHT feet	OUTSIDE DIAMETER inches	INERTIA MOMENT inch ⁴	SECTION MODULUS inch ³	BENDING MOMENT ft-lbs	STRESS psi	DEFLECTION feet
20.000	2.672	1.005	0.752	0.000	0.000	3.078
19.000	2.742	1.091	0.796	8.387	126.444	2.841
18.000	2.756	0.975	0.708	33.679	571.129	2.605
17.000	2.926	1.177	0.805	76.290	1137.663	2.371
16.000	2.602	0.924	0.710	136.268	2303.438	2.139
15.000	3.140	1.252	0.797	213.704	3216.120	1.912
14.000	3.370	1.559	0.925	307.553	3987.928	1.691
13.000	3.390	1.588	0.937	416.350	5331.891	1.477
12.000	3.480	1.723	0.990	539.974	6544.595	1.273
11.000	3.550	1.832	1.032	678.341	7885.003	1.080
10.000	3.620	1.947	1.076	831.353	9275.886	0.901
9.000	3.680	2.048	1.113	998.931	10768.258	0.737
8.000	3.700	2.083	1.126	1181.010	12587.329	0.590
7.000	3.904	4.120	2.111	1377.501	7830.944	0.461
6.000	3.924	4.187	2.134	1588.280	8930.042	0.347
5.000	3.954	4.289	2.170	1813.268	10028.690	0.247
4.000	3.974	4.358	2.193	2052.440	11228.510	0.161
3.000	4.014	4.498	2.241	2305.766	12344.737	0.093
2.000	4.024	4.534	2.253	2573.216	13702.905	0.043
1.000	4.228	7.163	3.388	2854.723	10110.301	0.011
0.000	4.248	7.272	3.424	3150.175	11040.639	0.000
-1.000	3.844	1.909	0.993	0.000	0.000	0.000

Maximum stress is 13702.9 PSI, located at 2 FT above ground.