

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.....	40 ADM
Nautical yardarm.....	13.5 feet long, 24 feet above ground
Gaff.....	10 feet long, 24 feet above ground
Height of pole.....	40 feet
Depth of bury in ground.....	5 feet
Base diameter.....	8.84977 inches
Tip diameter.....	5.276 inches
Flag size, hoist x fly.....	0 feet x 0 feet (polyester fabric)
Flags, nautical yardarm (2)...	0 feet x 0 feet (polyester fabric)
Flag, gaff.....	0 feet x 0 feet (polyester fabric)
Wind speed.....	150 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
40 ADM
FLAGPOLE
with 13.5 foot nautical yardarm and 10 foot gaff

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
40.000	5.276	7.356	2.788	0.000	0.000	6.602
39.000	5.415	7.970	2.943	10.732	43.754	6.360
38.000	5.554	8.617	3.103	43.209	167.113	6.117
37.000	5.694	9.298	3.266	97.990	360.011	5.875
36.000	5.833	10.015	3.434	175.632	613.761	5.634
35.000	5.972	10.767	3.606	276.696	920.850	5.393
34.000	6.065	9.517	3.138	401.694	1535.934	5.153
33.000	6.204	10.201	3.288	551.093	2011.103	4.914
32.000	6.344	10.917	3.442	725.406	2529.209	4.678
31.000	6.483	11.665	3.599	925.190	3085.111	4.443
30.000	6.714	17.802	5.303	1151.099	2604.773	4.212
29.000	6.853	18.961	5.533	1402.637	3041.855	3.983
28.000	6.944	19.746	5.687	1679.148	3543.251	3.757
27.000	7.036	20.552	5.842	1981.009	4068.920	3.533
26.000	7.127	21.380	6.000	2308.553	4617.087	3.313
25.000	7.218	22.230	6.160	2662.112	5186.114	3.098
24.000	7.309	23.102	6.322	3042.019	5774.481	2.886
23.000	7.400	23.997	6.486	3929.449	7270.466	2.679
22.000	7.491	24.915	6.652	4843.894	8738.664	2.478
21.000	7.582	25.855	6.820	5785.684	10180.334	2.285
20.000	7.766	35.130	9.048	6755.237	8959.634	2.098
19.000	7.857	36.415	9.270	7753.053	10036.466	1.919
18.000	8.040	46.960	11.682	8779.635	9018.828	1.748
17.000	8.085	43.813	10.838	9835.437	10889.938	1.583
16.000	8.145	44.818	11.005	10920.769	11907.631	1.427
15.000	8.296	55.983	13.496	12035.912	10701.801	1.279
14.000	8.356	57.241	13.701	13178.218	11542.468	1.139
13.000	8.508	69.462	16.329	14344.996	10541.812	1.007
12.000	8.567	70.990	16.572	15536.549	11250.002	0.883
11.000	8.627	72.541	16.817	16753.121	11954.293	0.766
10.000	8.779	86.143	19.626	17994.955	11002.858	0.658
9.000	8.838	87.987	19.911	19262.359	11609.357	0.557
8.000	8.990	102.782	22.866	20555.641	10787.541	0.464
7.000	9.096	111.683	24.558	21875.141	10689.180	0.379
6.000	9.155	114.004	24.905	23221.168	11188.855	0.300
5.000	9.173	114.719	25.011	24593.906	11799.840	0.229
4.000	9.284	129.678	27.937	25993.498	11165.307	0.165
3.000	9.302	130.484	28.055	27420.133	11728.349	0.109
2.000	9.412	146.136	31.053	28874.002	11158.108	0.060
1.000	9.430	147.035	31.183	30355.289	11681.368	0.019
0.000	9.541	163.400	34.254	31864.182	11162.922	0.000
-1.000	9.283	119.075	25.655	25491.346	11923.547	0.000
-2.000	9.117	91.592	20.092	19118.510	11418.315	0.000
-3.000	8.951	65.442	14.622	12745.673	10460.380	0.000
-4.000	8.832	46.747	10.586	6372.836	7223.825	0.000
-5.000	8.850	47.043	10.631	0.000	0.000	0.000

Maximum stress is 11954.29 PSI, located at 11 FT above ground.