

PLP
COMPOSITE TECHNOLOGIES INC.
57 Creamery Road
P.O. Box 429
Fitzwilliam, New Hampshire 03447

DATE: 09-25-2015

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.....	SW40
Height of pole.....	40 feet
Depth of bury in ground.....	4 feet
Base diameter.....	7.17 inches
Tip diameter.....	3.106 inches
Flag size, hoist x fly.....	0 feet x 0 feet (polyester fabric)
wind speed.....	200 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

SW40
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
40.000	3.106	1.420	0.914	0.000	0.000	7.435
39.000	3.126	1.449	0.927	14.551	188.373	7.124
38.000	3.426	3.194	1.865	57.986	373.180	6.813
37.000	3.610	3.504	1.941	129.786	802.307	6.503
36.000	3.810	4.161	2.184	229.425	1260.346	6.194
35.000	3.964	4.324	2.182	356.746	1962.335	5.887
34.000	4.118	4.409	2.141	512.365	2871.350	5.583
33.000	4.308	5.078	2.358	697.445	3550.081	5.283
32.000	4.488	5.771	2.572	913.259	4260.981	4.988
31.000	4.602	5.545	2.410	1160.994	5781.336	4.700
30.000	4.956	10.365	4.183	1442.009	4137.034	4.417
29.000	5.080	10.327	4.066	1756.363	5183.699	4.141
28.000	5.240	11.382	4.344	2103.744	5811.109	3.870
27.000	5.360	12.218	4.559	2485.065	6540.949	3.606
26.000	5.464	11.828	4.329	2901.143	8041.055	3.350
25.000	5.584	12.656	4.533	3352.708	8875.604	3.102
24.000	5.734	13.744	4.794	3840.559	9613.796	2.864
23.000	5.834	14.503	4.972	4365.540	10536.739	2.636
22.000	5.934	15.289	5.153	4928.381	11476.864	2.419
21.000	6.126	20.164	6.583	5529.881	10080.392	2.213
20.000	6.206	20.998	6.767	6170.954	10943.155	2.017
19.000	6.394	28.388	8.880	6852.478	9260.614	1.831
18.000	6.464	29.379	9.090	7575.304	10000.332	1.655
17.000	6.524	30.247	9.273	8340.062	10793.276	1.487
16.000	6.686	36.569	10.939	9147.325	10034.443	1.330
15.000	6.736	37.443	11.117	9997.795	10791.745	1.181
14.000	6.898	44.500	12.902	10887.737	10126.395	1.042
13.000	6.948	45.534	13.107	11813.345	10815.467	0.912
12.000	7.106	55.396	15.591	12775.166	9832.569	0.791
11.000	7.146	56.402	15.786	13773.727	10470.612	0.679
10.000	7.278	64.253	17.657	14809.505	10064.889	0.575
9.000	7.308	65.110	17.819	15882.938	10696.227	0.480
8.000	7.430	73.248	19.717	16994.430	10343.096	0.394
7.000	7.450	73.888	19.836	18144.363	10976.781	0.316
6.000	7.608	86.143	22.645	19333.154	10244.794	0.246
5.000	7.720	95.047	24.624	20561.383	10020.308	0.185
4.000	7.878	108.760	27.611	21829.746	9487.405	0.131
3.000	8.000	119.221	29.805	23138.973	9316.085	0.085
2.000	8.010	119.714	29.891	24489.578	9831.471	0.046
1.000	8.010	119.714	29.891	25881.764	10390.371	0.014
0.000	8.010	119.714	29.891	27315.529	10965.964	0.000
-1.000	8.030	120.706	30.064	20486.646	8177.287	0.000
-2.000	7.682	86.516	22.524	13657.765	7276.252	0.000
-3.000	7.380	60.125	16.294	6828.882	5029.274	0.000
-4.000	7.170	43.181	12.045	0.000	0.000	0.000

Maximum stress is 11476.86 PSI, located at 22 FT above ground.