

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.....	30 ADM
Nautical yardarm.....	9.5 feet long, 17.5 feet above ground
Gaff.....	7.5 feet long, 17.5 feet above ground
Height of pole.....	30 feet
Depth of bury in ground.....	4 feet
Base diameter.....	6.55 inches
Tip diameter.....	3.156 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

30 ADM
FLAGPOLE
with 9.5 foot nautical yardarm and 7.5 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
30.000	3.156	1.493	0.946	0.000	0.000	5.107
29.000	3.126	1.449	0.927	10.789	139.678	4.832
28.000	3.150	1.264	0.803	43.160	645.193	4.557
27.000	3.380	1.574	0.931	96.989	1249.805	4.284
26.000	3.580	1.881	1.051	171.944	1963.701	4.013
25.000	3.734	1.746	0.935	267.671	3433.845	3.746
24.000	3.934	2.050	1.042	383.868	4419.750	3.484
23.000	4.124	2.369	1.149	520.241	5432.981	3.228
22.000	4.304	2.701	1.255	676.506	6468.061	2.981
21.000	4.464	3.021	1.353	852.412	7558.634	2.742
20.000	4.634	3.387	1.462	1047.735	8601.821	2.514
19.000	4.942	6.917	2.799	1262.220	5410.705	2.295
18.000	5.102	7.635	2.993	1495.585	5996.677	2.085
17.000	5.176	6.935	2.680	1925.262	8621.744	1.882
16.000	5.326	7.573	2.844	2551.462	10766.993	1.688
15.000	5.584	12.656	4.533	3197.202	8463.934	1.506
14.000	5.734	13.744	4.794	3861.162	9665.371	1.333
13.000	5.834	14.503	4.972	4541.831	10962.238	1.171
12.000	6.072	21.151	6.967	5239.638	9024.964	1.019
11.000	6.126	20.164	6.583	5955.042	10855.415	0.878
10.000	6.206	20.998	6.767	6688.355	11860.679	0.746
9.000	6.394	28.388	8.880	7439.871	10054.433	0.625
8.000	6.464	29.379	9.090	8209.972	10838.171	0.515
7.000	6.524	30.247	9.273	8998.943	11645.966	0.414
6.000	6.686	36.569	10.939	9807.042	10758.140	0.324
5.000	6.736	37.443	11.117	10634.585	11479.104	0.244
4.000	6.898	44.500	12.902	11481.878	10678.989	0.173
3.000	6.948	45.534	13.107	12349.235	11306.090	0.113
2.000	7.106	55.396	15.591	13236.962	10187.997	0.061
1.000	7.146	56.402	15.786	14145.354	10753.119	0.019
0.000	7.140	54.101	15.154	15074.580	11936.913	0.000
-1.000	7.078	48.299	13.648	11305.936	9940.979	0.000
-2.000	6.878	33.505	9.743	7537.290	9283.693	0.000
-3.000	6.668	19.713	5.913	3768.645	7648.472	0.000
-4.000	6.550	12.038	3.676	0.000	0.000	0.000

Maximum stress is 11936.91 PSI, located at 0 FT above ground.