

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.....	25 CMDR
Nautical yardarm.....	6.6 feet long, 16 feet above ground
Gaff.....	4.6 feet long, 16 feet above ground
Height of pole.....	25 feet
Depth of bury in ground.....	3 feet
Base diameter.....	5.826 inches
Tip diameter.....	3.18 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

25 CMDR
FLAGPOLE
with 6.6 foot nautical yardarm and 4.6 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
25.000	3.180	1.302	0.819	0.000	0.000	3.899
24.000	3.380	1.574	0.931	10.650	137.238	3.662
23.000	3.630	1.963	1.082	42.390	470.247	3.425
22.000	3.814	1.864	0.977	94.825	1164.154	3.189
21.000	3.964	2.098	1.059	167.632	1899.953	2.955
20.000	4.134	2.387	1.155	260.557	2707.467	2.724
19.000	4.304	2.701	1.255	373.356	3569.650	2.497
18.000	4.404	2.898	1.316	505.812	4612.170	2.275
17.000	4.484	3.062	1.366	657.774	5779.190	2.059
16.000	4.604	3.320	1.442	829.115	6898.664	1.851
15.000	4.724	3.592	1.521	1269.547	10018.078	1.653
14.000	4.972	7.048	2.835	1727.140	7310.227	1.465
13.000	5.042	7.360	2.920	2199.814	9041.796	1.288
12.000	5.082	7.542	2.968	2687.474	10864.724	1.121
11.000	5.280	11.656	4.415	3190.179	8670.364	0.966
10.000	5.320	11.935	4.487	3708.188	9917.373	0.822
9.000	5.390	12.434	4.614	4241.754	11032.797	0.689
8.000	5.598	17.526	6.262	4791.162	9181.858	0.567
7.000	5.628	17.825	6.334	5356.788	10147.883	0.457
6.000	5.678	18.331	6.457	5938.864	11037.570	0.357
5.000	5.856	23.994	8.195	6537.616	9573.533	0.267
4.000	5.860	22.815	7.787	7153.341	11024.146	0.189
3.000	5.920	23.565	7.961	7786.219	11736.131	0.122
2.000	6.098	30.014	9.844	8436.475	10284.385	0.066
1.000	6.158	30.971	10.059	9104.449	10861.500	0.020
0.000	6.198	31.620	10.203	9790.395	11514.302	0.000
-1.000	5.972	20.077	6.724	6526.930	11648.810	0.000
-2.000	5.776	9.718	3.365	3263.465	11638.099	0.000
-3.000	5.826	9.979	3.426	0.000	0.000	0.000

Maximum stress is 11736.13 PSI, located at 3 FT above ground.