



WIND LOAD CALCULATIONS - METAL LETTERS

F9-TECH-Q16

Rev. 3/19/15

Metal Letters - Stud Mounted

The following data was calculated in May 2004 and reaffirmed in 2012.

Below is a table of Wind Load and Screw Strength calculations, based on theoretical calculations. Figures are based on a 240 pound holding force of an aluminum screw.

This is the theoretical load. Assuming a safety factor of 3, 80 pounds would be a good figure to use.

Wind Load Calculations on Cast or Flat Cut Metal, Gemini Letters.

Letter Height Inches	Wind Face Load lbs. Force	Wind Side Load lbs. Force	Screw Shear Strength lbs. Force
6"	12	5	720
12"	50	11	960
18"	112	22	960
24"	198	36	1440
36"	447	65	1920

Gemini Letter Data

Letter Height Inches	Face Area Sq. Inches	Side Area Sq. Inches	Screws per Letter	Screw Area Each Sq.In.	Total Screw Area Sq.In.
6"	21.6	9	3	0.015	0.045
12"	86.4	18	4	0.015	0.06
18"	194.4	36	4	0.015	0.06
24"	345.6	60	6	0.015	0.09
36"	777.6	108	8	0.015	0.12

Assumptions and Facts

The point of failure will be the Aluminum screws in shear, at the minor thread diameter.

144 mph wind speed is equal to 82.7 lb./sq.ft. (0.574 lbs./sq.in.)

Tensile strength at break for 3003 Aluminum is 16,000 psi.

Minor thread area in shear of a 10-24 Aluminum Screw is .015 sq.in. at 2 threads depth.

Therefore, each screw has a holding force in shear of 240 pounds.

Average face area of a sign letter is .6 x height squared.

Maximum depth of letters is 1.0" at 6" high, 1.5" at 12" high, 2.0" at 18" high, 2.5" at 24" high, and 3.0" at 36" high.

Testing and Calculations done and confirmed by David Schmitt, VP Operations, BSME, MMSE.