

2005 SUPER LIGHT WEIGHT BRIDGE AND WING BUILDING CONTESTS

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The eighth annual Super Light Weight Bridge competition was held at SAMPE 2005 on May 3rd. This year we had 45 teams registered. 31 showed up for testing. In addition, we had a Light Weight Wing competition with 20 entries, of which 15 showed up for testing. There were approximately 140 students involved with all the teams. We limited the Bridge competition to students only but allowed professionals into the Wing contest. There were only a few, one of whom was a professor "forced" to compete with his students.

All the student entries had to submit posters for display. The posters had to address some aspect of the construction or design of their bridge/wing. As an added incentive, failure to submit a poster disqualified the team from any cash awards. If you attended the show, we're sure you saw an impressive display of more than 40 posters.

As always, we changed the rules from last year. This year, an assortment of eight 24" pultrusions were supplied in each kit, and each bridge entry was required to use at least two of them.

This year we had categories of best bridge using carbon or glass reinforcement. "Best" was defined as the highest ratio of ultimate load to bridge weight. Results are given in the table.

The Wing contest was new this year. Sponsored by NASA Langley, the objective was to design and build a dihedral wing (that's like a "V" with a flattened center) with an airfoil cross section that could support a 100 pound load applied at two points 34 inches apart. The wing itself was 36 inches long tip to tip with the leading edge to trailing edge distance being 6 inches. The best wing was the lightest one that supported the load without failing. Results are given in the tables.

All of the awards were given out at the Student Awards Breakfast on Wednesday. In the Bridge contest, four sponsored awards of \$250 each were given to first place winners in the different categories and the poster session. These were:

- Carbon/kit: University of Washington (Sponsor: High Performance Composites magazine)
- Glass/kit: University of Washington (Sponsor: Owens Corning Fiberglas)
- Carbon/non-kit: University of California Santa Barbara (Sponsor: A&P Technology)
- Bridge Poster: University of California Santa Barbara (Sponsor: Boeing Corp.)

NASA Langley provided the cash awards for the Wing Contests. Both wing structure and wing poster first place awards of \$250 each went to the University of Washington.

You'll notice that University of Washington and UC Santa Barbara did quite well. In fact we believe that the two student SAMPE chapters consider the contests as their primary fund raising activity for the year. With all due respect, we'd like to see some other schools displace them next year.

In all, we gave away more than \$4000 in prize money as well as the usual assortment of composite tennis racquets and fishing rods and a composites training course from Abaris, all donated by the sponsors.

Once again, we thank our 41 sponsors for their support. They provided the materials for the kits and the cash and product hardware for the prizes. Without their support, we can't run this contest. We thank United Testing Systems for providing the tensile machine used to load the bridges at the Exhibition. We also acknowledge the very strong financial support from NASA Langley for all of the Wing contest prizes.

A note in closing – one of the contest coordinators (S.S.) couldn't resist the challenge and built both a bridge and a wing. You'll notice in the standings that his structures did quite well. He was not eligible for any of the prizes.

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BRIDGE BUILDING CONTEST 2005 FINAL STANDINGS

School	Maximum Load (lbs)	Bridge Weight (grams)	P/wt
CARBON KIT			
Univ. Washington	15449	1537	10.05
US Naval Academy	8934	1454	6.14
Cerritos College	11386	2355	4.83
S Dakota Sch M&T	9930	2129	4.66
San Diego State Univ.	9713	2476	3.92
Winona State Univ.	3355	977	3.43
San Diego State Univ.	5642	2276	2.48
Cal State LA	3471	1530	2.27
Winona State Univ.	3975	1840	2.16
Univ. Brit Columbia	2286	1172	1.95
S Dakota Sch M&T	3119	1656	1.88
Univ. Auckland	1865	1070	1.74
Cerritos College	2501	1437	1.74
Univ. Cal San Diego	2129	1267	1.68
San Diego State Univ.	1294	959	1.35
Virginia Tech	3337.9	3314	1.01

GLASS KIT			
Univ. Washington	12349	2087	5.92
Cal State LA	4759	1553	3.06
Mt Miguel H.S.	2870	1468	1.96
Winona State Univ.	2177	1173	1.86
Univ. Brit Columbia	1756	1179	1.49
Mt Miguel H.S.	1084	2808	0.39

CARBON NON-KIT			
Univ. Cal Santa Barbara	8905	1198	7.43
Stanford Univ.	14583	2042	7.14
Univ. Washington	11440	1879	6.09
Univ. Cal Santa Barbara	6588	1168	5.64
Univ. Cal Santa Barbara	7032	1252	5.62
Univ. Cal Santa Barbara	4686	1022	4.59
Univ. Cal Santa Barbara	4125	1229	3.36
S. Stawski	9479	839	11.30

GLASS NON-KIT			
Univ. Washington	10714	1912	5.60

WING BUILDING CONTEST 2005 FINAL STANDINGS

School	Wing Weight (grams)	Deflection @ 100 lbs (inch)	Peak Load (lbs)
Univ. Washington	194	0.58	144
Univ. Cal Santa Barbara	217	0.61	190
Univ. Maryland	286	0.26	187
Univ. Cal Santa Barbara	395	0.37	158
San Diego State Univ.	525	0.25	407
Cerritos College	643	3.30	109
S Dakota Sch M&T	773	0.12	294
Univ. Auckland	1015	0.92	184
S Dakota Sch M&T	1194	0.12	361

Univ. Cal Santa Barbara	238	fail < 100 lbs	81
Univ. Maryland	245	fail < 100 lbs	94
Professional Class			
B. Flinn, U.Wash	191	1.04	116
B. Flinn, U.Wash	290	0.53	267
S. Wu, ATK	291	0.45	114
S. Stawski	172	0.30	100

POSTER AWARDS

Bridge	Wing
1 UC Santa Barbara	1 Univ. Washington
2 Stanford Univ.	2 S. Dakota School M&T
3 Univ. Washington	3 S. Dakota School M&T

