



PROWANG PVC Corrugated Foam Sheet Wind Resistance Test Report

(LOW SPEED WIND TUNNEL TESTING REPORT)

Applicant : PROWANG ENTERPRISE INC.
Application number : 107FF001H-003
Engineer : Liao, Yi Ting, Fluid Science Department, ASRD, NCSIST
Name of article : PROWANG PVC Corrugated Foam Sheet, Thickness 5MM
Wind Resistance Test Report
Date tested : 2018/04/26
Job description : Wind Resistance Test
Date issued : 2018/05/10
Test instruments : Low-speed Wind Tunnel, Pressure Transducer
Contents : This report is comprised of 11 pages, invalid when excerpted.

1. Introduction.

The PROWANG PVC Corrugated Foam Sheet is entrusted by PROWANG ENTERPRISE INC. PROWANG ENTERPRISE INC. to ASRD with their wind resistance capability test. Test is conducted in a low speed wind tunnel with uniform velocity profile.

The test aims to qualify that the PROWANG PVC Corrugated Foam Sheet is capable of withstanding the designed test conditions or not. The detailed test matrix, test data, photographs, and Beaufort scale are shown in the following pages.

2. Result and Conclusions.

The PROWANG PVC Corrugated Foam Sheet is capable of withstanding wind velocity at 59.8 m/s and 60.1 m/s for 20 minutes for windward and crosswind respectively. There is no visible structure failure observed during or after the test.

Remarks.

1. This report will be invalid if obliterated, modified, duplicated or photocopied in part or in any other way.
2. This report applies to the tested specimen(s) only.
3. This report will be taking effect after the authentication of Aerodynamics Section.

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A. Test Results

1. PROWANG PVC Corrugated Foam Sheet was tested under the following test conditions.

Run No.	Test Model	Azimuth	Wind Speed	Comments
Run# 3	PROWANG PVC Corrugated Foam Sheet, Thickness 5MM	0°	29.9 m/s	● No visible deformation or fracture. (Fig.3)
		0°	59.8 m/s	● Keeping V=61.2 m/sec for 20 minutes. ● No visible deformation or fracture. (Fig. 5, 6)
Run# 4		90°	31.0 m/s	● No visible deformation or fracture. (Fig. 9)
		90°	60.1 m/s	● Keeping V=60.1 m/sec for 20 minutes. ● No visible deformation or fracture. (Fig. 11, 12)



2. Test Data.

<<<<<<< ASRD Low Speed Wind Tunnel >>>>>>>

Customer : PROWANG ENTERPRISE INC.

Project : PROWANG PVC Corrugated Foam Sheet (Thickness 5MM) Wind Resistance Test

Test No: 1803

Run No.: 003

PATM(Psi): 14.5188

ModelArea (in2): 882

Date&Time: 26/Apr/2018 13:40:20

Configuration: PROWANG PVC Corrugated Foam Sheet, Thickness 5MM

IPNT	PS	P0	Q (psf)	MACH	V (m/s)	Re	T0	Test Time
1	14.520	14.594	13.38	0.085	33.532	706147	551.400	13:12:02
2	14.520	14.630	19.82	0.104	40.766	860601	550.722	13:13:05
3	14.521	14.692	30.77	0.129	50.721	1074209	549.989	13:14:17
4	14.521	14.761	43.44	0.153	60.188	1278150	549.539	13:15:33
5	14.522	14.770	44.78	0.156	60.919	1303741	546.312	13:35:36

Nomenclature

P_0	= Total pressure, Psia	P_s	= Static pressure, Psia
Q	= Dynamic pressure, psf	MACH	= Mach number
V	= Wind velocity, m/sec	Re	= Reynolds number/ft
T_0	= Temperature, °R		



<<<<<<< ASRD Low Speed Wind Tunnel >>>>>>>

Customer : PROWANG ENTERPRISE INC.

Project : PROWANG PVC Corrugated Foam Sheet (Thickness 5MM) Wind Resistance Test

Test No: 1803 Run No.: 004 PATM(PSI): 14.5188 ModelArea (in2): 546

Date&Time: 26/Apr/2018 14:28:19

Configuration: PROWANG PVC Corrugated Foam Sheet, Thickness 5MM

IPNT	PS	P0	Q (psf)	MACH	V (m/s)	Re	T0	Test Time
1	14.518	14.587	10.88	0.082	30.063	642606	544.832	13:58:30
2	14.517	14.642	19.74	0.111	40.466	866130	544.810	14:00:40
3	14.516	14.712	30.95	0.139	50.653	1084325	545.455	14:02:13
4	14.514	14.795	44.38	0.166	60.648	1297927	546.410	14:04:04
5	14.515	14.796	44.37	0.166	60.724	1295120	547.906	14:24:07

Nomenclature

P_0	= Total pressure, Psia	P_s	= Static pressure, Psia
Q	= Dynamic pressure, psf	MACH	= Mach number
V	= Wind velocity, m/sec	Re	= Reynolds number/ft
T_0	= Temperature, °R		



B. Photographs

● PROWANG Corrugated Foam Sheet_ Azimuth=0° _ Run#3

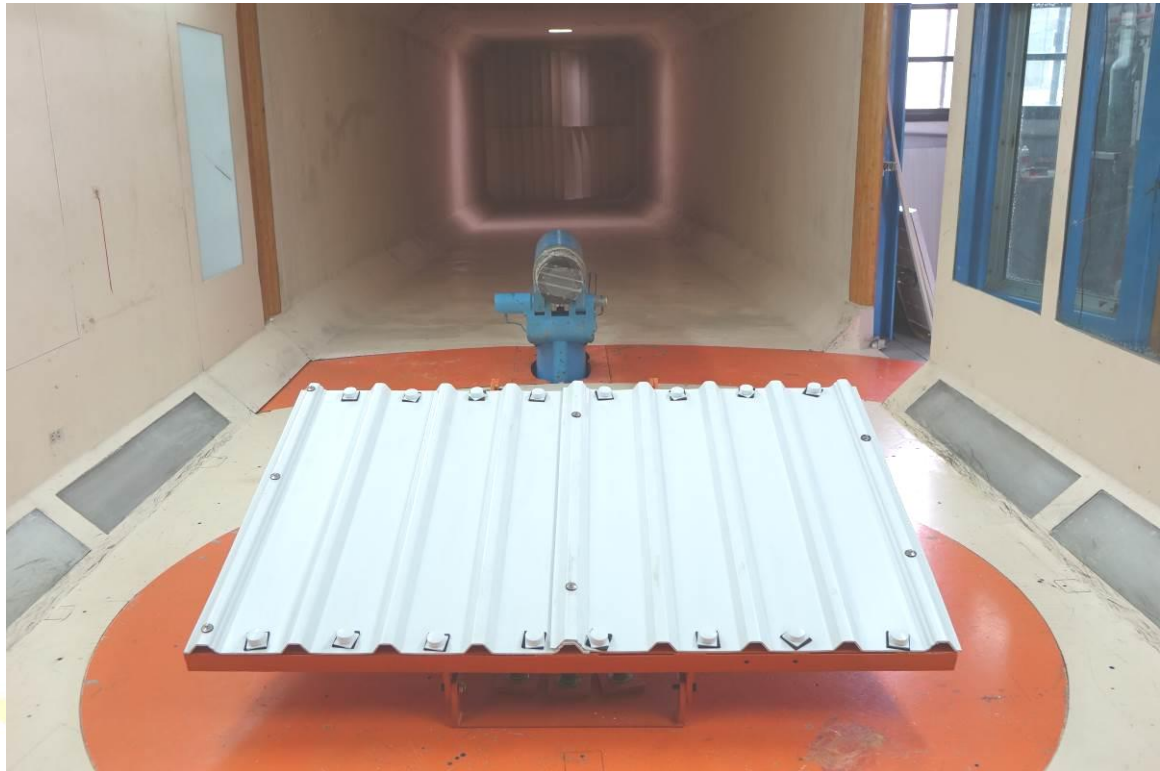


Figure. 1 Front view before the test

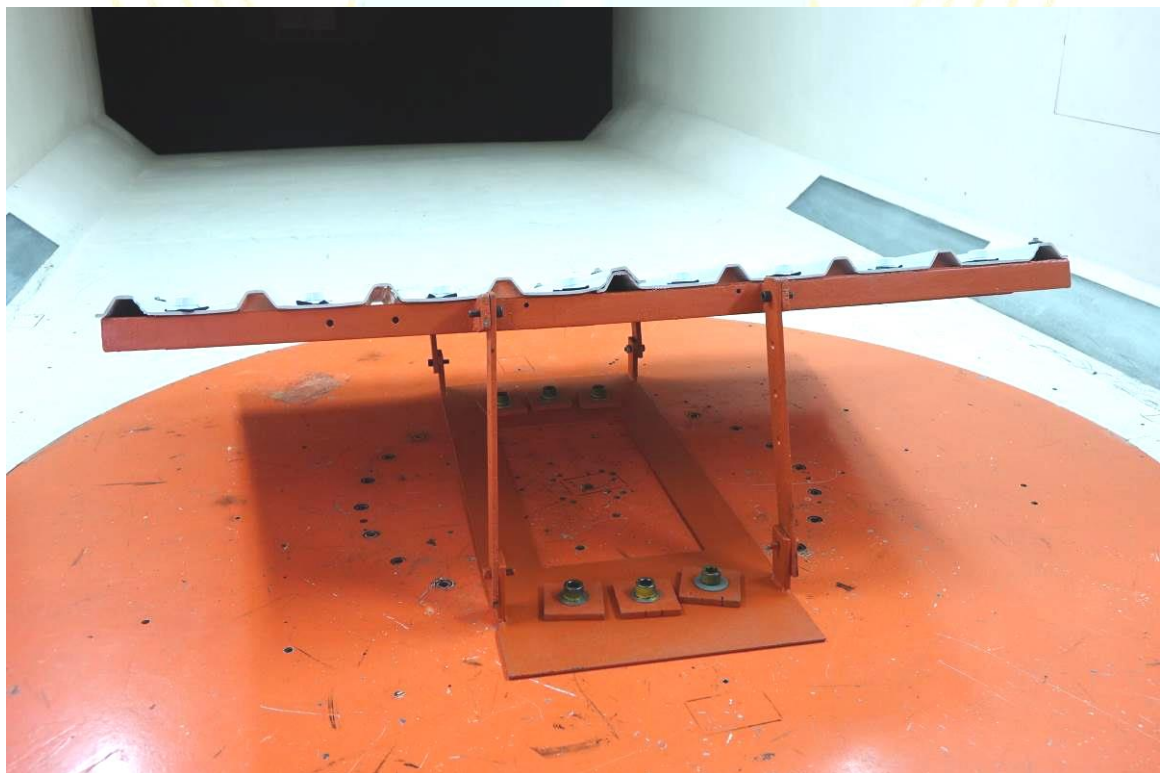


Figure. 2 Rear view before the test



Figure. 3 The Corrugated Foam Sheet is under the test, $V = 29.9 \text{ m/s}$



Figure. 4 The Corrugated Foam Sheet is under the test, $V = 59.8 \text{ m/s}$



Figure. 5 Front view after the test

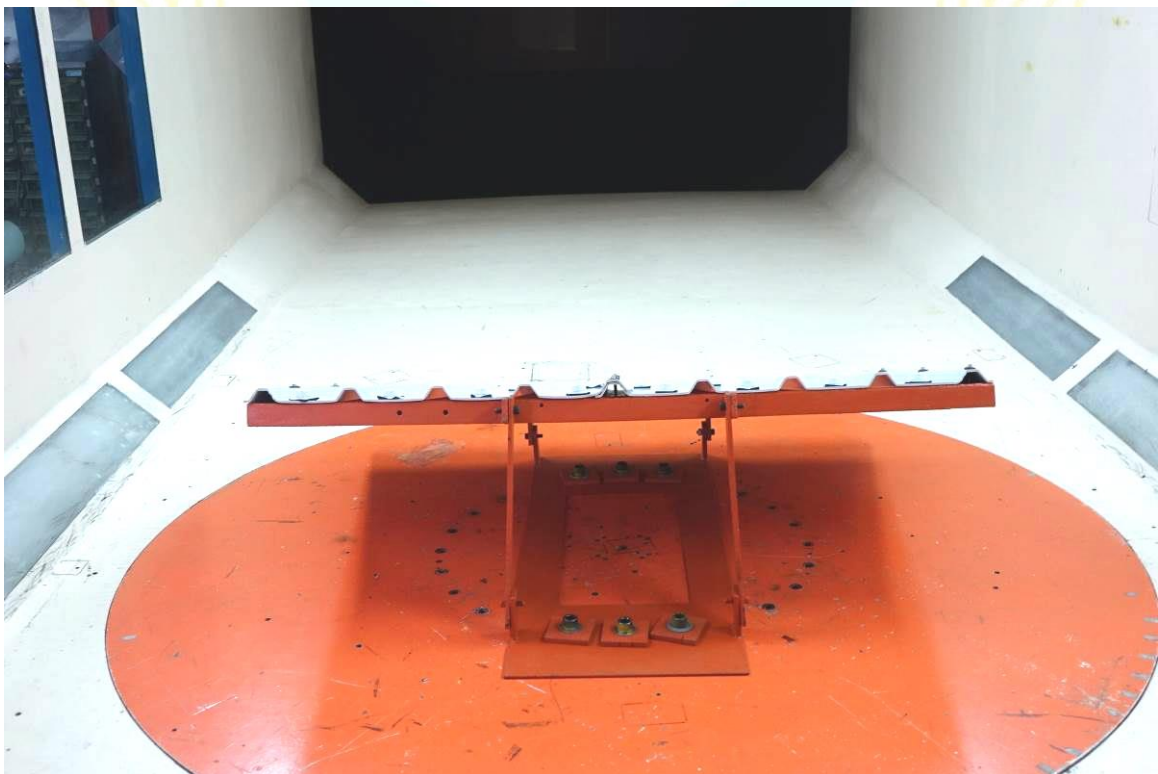


Figure. 6 Rear view after the test, no deflection or damage observed



● **PROWANG Corrugated Foam Sheet_ Azimuth=90°_ Run#4**



Figure. 7 Front view before the test



Figure. 8 Rear view before the test



Figure. 9 The Corrugated Foam Sheet is under the test, $V = 31.0 \text{ m/s}$



Figure. 10 The Corrugated Foam Sheet is under the test, $V = 60.1 \text{ m/s}$

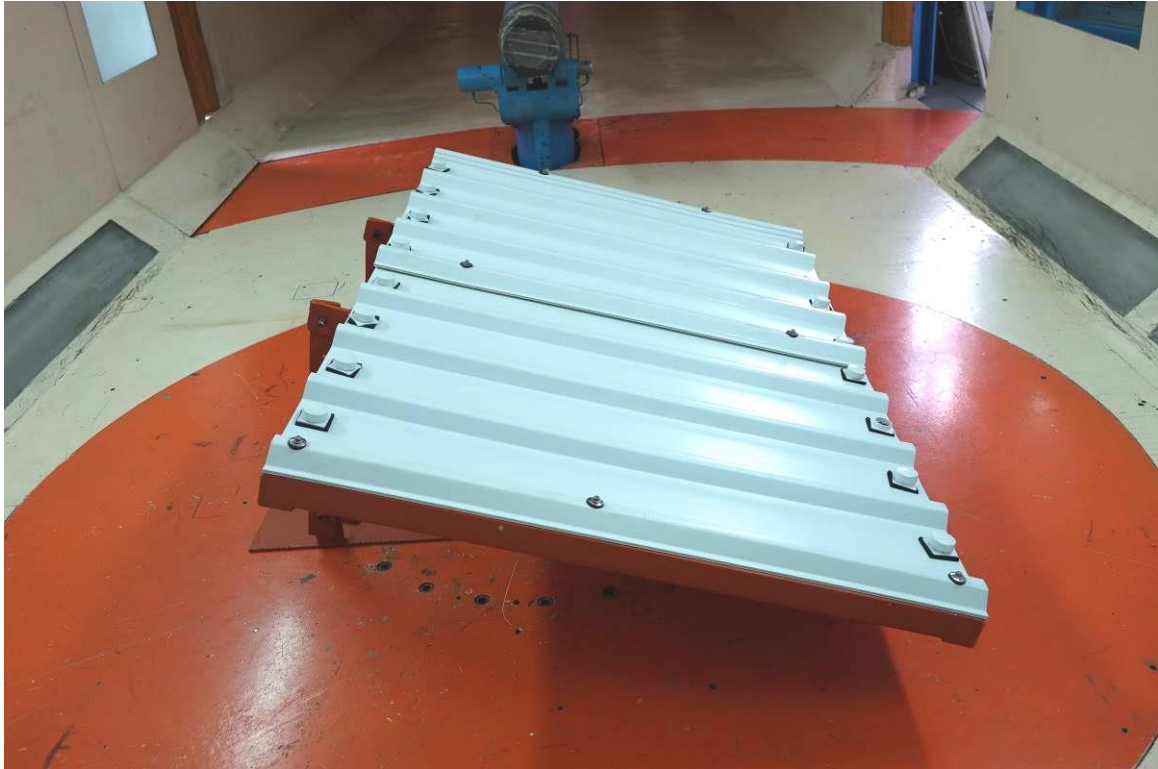


Figure. 11 Front view after the test



Figure. 12 Rear view after the test



C. Beaufort scale

Beaufort scale is named after Sir Francis Beaufort (1774-1857), British naval officer who devised the original scale of wind force and speed.

The relationship between actual wind speed and Beaufort scale is

$$V = 0.836 * (B^{3/2})$$

where B is Beaufort number and V is wind speed (m/s), respectively.

Beaufort scale is tabulated as follows :

Beaufort number	International description	General description	Wind speed	
			m/s	kts
0	Calm	Smoke goes straight up.	0-0.3	0-1
1	Light air	Smoke shows wind direction; wind vane stands still.	0.3-1.5	1-3
2	Light breeze	Wind can be felt; leaves of trees shiver, wind vane turns.	1.6-3.3	4-7
3	Gentle breeze	Leaves and twigs of trees shake incessantly; flags wave.	3.4-5.4	8-12
4	Moderate breeze	Clouds of dust raise; branches of trees shake.	5.5-7.9	13-16
5	Fresh breeze	Trees with leaves begin to tremble.	8.0-10.7	17-21
6	Strong breeze	Hard to keep an umbrella open.	10.8-13.8	22-27
7	Moderate gale	Trunks of trees shake; hard to walk.	13.9-17.1	28-33
8	Fresh gale	Twigs of trees break; can not walk.	17.2-20.7	34-40
9	Strong gale	Buildings damaged; chimneys collapse.	20.8-24.4	41-47
10	Whole gale	Trees uprooted; buildings damaged considerably.	24.5-28.4	48-55
11	Storm	Rarely seen; catastrophes ensue when it does happen.	28.5-32.6	56-63
12	Hurricane		32.7-36.9	64-71
13			37.0-41.4	72-80
14			41.5-46.1	81-89
15			46.2-50.9	90-99
16			51.0-56.0	100-108
17			56.1-61.2	109-118