

07 May 2018

TO WHOM IT MAY CONCERN

RE: Wind-Tunnel Tests of Cape Umbrella Products

Dear Sir,

Cape Umbrella units were tested in the CSIR's 7-metre Wind Tunnel on 10 April 2018. Two types of tests were conducted:

- 1 Umbrella survival tests, fixed mount
- 2 Umbrella topple tests, standard mount

The orientation applicable to these results is such that the edge is 90° to the wind direction as shown in Figure 1. In cases where the edges are not equal, the major edge is the reference edge.

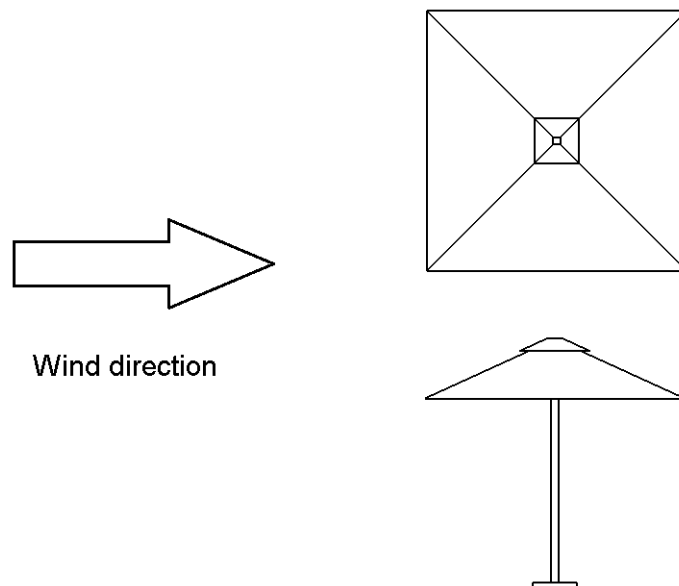


Figure 1: Umbrella orientation

1. Survival tests

Each specimen was inserted into a secured base housing and oriented such that the major edge was at 90° to the wind direction. The wind speed was increased in stages and flow conditions were sampled if the units did not close significantly, or fail structurally. The highest recorded wind speed for each unit is here referred to as the maximum survival speed tested.

Restrictions:

1. Standard wind tunnel flow profile
2. Not a fatigue test

2. Topple tests

Each specimen was installed on the floor of the wind tunnel in its standard mounting base. The wind speed was increased in stages and flow conditions were sampled until the umbrella toppled over, or was deemed to be on the verge of toppling over. The highest recorded wind speed for each unit in this case is the maximum toppling resistance speed tested.

Restrictions:

1. Standard wind tunnel flow profile
2. Wind tunnel floor conditions (smooth concrete)

The survival and resistance speeds are listed in Table 1 for the model numbers for the umbrella units that were tested.

Table 1: Cape Umbrella survival speed and topple speed wind tunnel test results

Test type	Model	Static Pressure	Dynamic Pressure	Static Temperature	Equivalent Airspeed	Equivalent Airspeed
		Pa	Pa	K	m/s	km/h
Survival	S300AP	86670	71	296.4	10.8	39.0
Topple	S300AP	86547	68	296.5	10.6	38.2

Yours faithfully,



Dr Kavendra Naidoo
Competency Area Manager
Aeronautic Systems Competency