

**EN-CAPE 18.131 C – V1-EN**

**Effect of wind on an outdoor modular cabinet**

**10149-337 (1300L-1630H-600D)**

***Bruno GAUDUCHEAU – Christian BARRE***

***Climatology – Aerodynamics – Pollution – Purification***

## Effect of wind on an outdoor modular cabinet 10149-337 (1300L-1630H-600D)

*Bruno GAUDUCHEAU – Christian BARRE*

**CLIMATOLOGY-AERODYNAMICS  
POLLUTION-PURIFICATION DEPARTMENT**

*This study has been performed  
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according to CSTB quotation  
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**Bruno GAUDUCHEAU**  
Technicien  
Division Equipements Industriels  
et Transports  
Direction Opérationnelle CAPE  
Climatologie-Aérodynamique-Pollution-Epuration

**Christian BARRE**  
Chef de Pôle Recherche & Expertise  
Division Vent, Aéraulique et Confort  
Direction Opérationnelle CAPE  
Climatologie-Aérodynamique-Pollution-Epuration

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## 1 INTRODUCTION

To the request of the company nVent, the effect of wind on a modular outdoor cabinet have been tested in the high-speed section of the climatic wind tunnel "Jules Verne".

The study is to qualify the aerodynamic behavior of the cabinet under several levels of velocities and wind directions.

These tests are to confirm the performances required by IEC 61969-3 and EN 50125-3 and recalled in §2.

## 2 COMPOSITION OF THE CABINET

The cabinet is presented below:



**Figure 1: outdoor modular cabinet (nVent document)**



**Figure 2: outdoor modular cabinet (nVent document)**

Drawings of the cabinet are given in appendix.

### 3 EXPERIMENTAL CONDITIONS

The cabinet is tested in the high-speed section of the Jules Verne Climatic wind tunnel which is 6 m wide and 5m high.

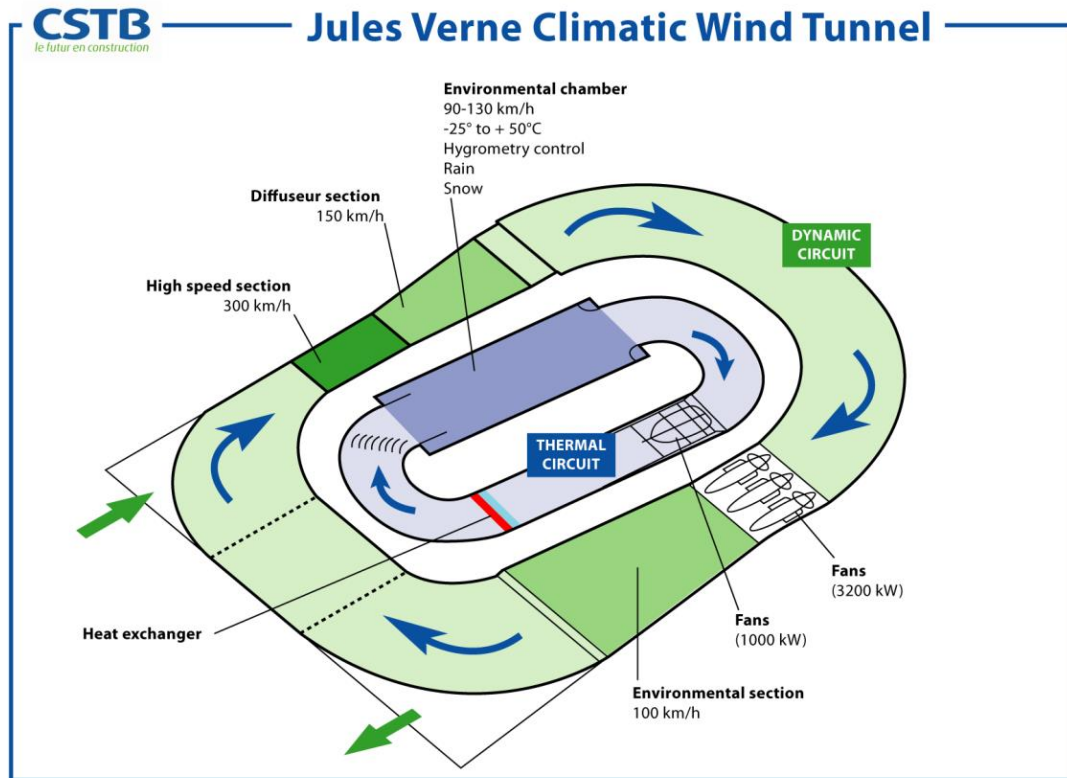


Figure 3: Jules Verne Climatic Wind Tunnel

The cabinet is set on a supporting rig connected to the turntable in the "high speed" section of the wind tunnel (see figure 4).



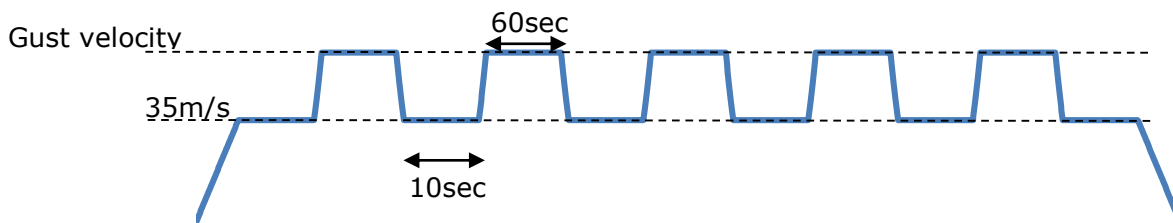
Figure 4: The cabinet in the high speed section of the climatic Wind Tunnel

Four levels of velocities are tested:

- 35m/s or 126 km/h required by EN-50125-3,
- 50m/s or 180 km/h required by IEC – 61969-3, class 1,
- 60m/s or 216 km/h required by IEC – 61969-3, class 2,
- 69,44m/s or 250 km/h representative of a cyclone of category 5

These velocities are to be considered as gust speeds. These variations are of short durations, which is why the sequences of tests reproduced in the wind tunnel consist of stabilized speed periods followed by a sudden increase of the velocity, assimilated to gusts of the natural wind.

A velocity of 35 m / s is maintained for about ten seconds, followed by a period of one minute at gust velocity, this being reproduced 5 times, as illustrated in the following figure 5.



**Figure 5: sequence of five gusts**

Five wind directions are tested:

- wind perpendicular to the doors of the cabinet, called 0 °,
- 45 °,
- wind perpendicular to the small front of the cabinet, called 90 °,
- 135 °
- downwind, called 180 °.

The videos are made from the inside of the wind tunnel using a camera mounted on a wall.

## **4 TESTS AND RESULTS**

### **4.1 Tests at 35m/s or 126km/h**

The cabinet was continuously loaded at 35 m/s for 2 minutes at 0, 45, 90, 135 and 180 ° directions.

At the end of the test, the cabinet is inspected. It shows no degradation or residual deformation. The doors open and close normally.

### **4.2 Tests at 50m/s or 180km/h**

The burst sequences are started according to Figure 5, in the directions 0, 45, 90, 135 and 180 °.

At the end of the test, the cabinet is inspected. It shows no degradation or residual deformation. The doors open and close normally.

### **4.3 Tests at 60m/s or 216km/h**

The burst sequences are started according to Figure 5, in the directions 0, 45, 90, 135 and 180 °.

At the end of the test, the cabinet is inspected. It shows no degradation or residual deformation. The doors open and close normally.

### **4.4 Tests at 69,44m/s or 250 km/h**

For this last test, the duration of the gust velocity is reduced to 30 seconds. The burst sequences are started in the directions 0, 45, 90, 135 and 180 °.

At the end of the test, the cabinet is inspected. It shows no degradation or residual deformation. The doors open and close normally.

## 5 CONCLUSION

At the request of the company nVent, the wind behavior of a modular outdoor cabinet 10149-337 (1300L-1630H-600D) was studied in the Jules Verne wind tunnel at CSTB.

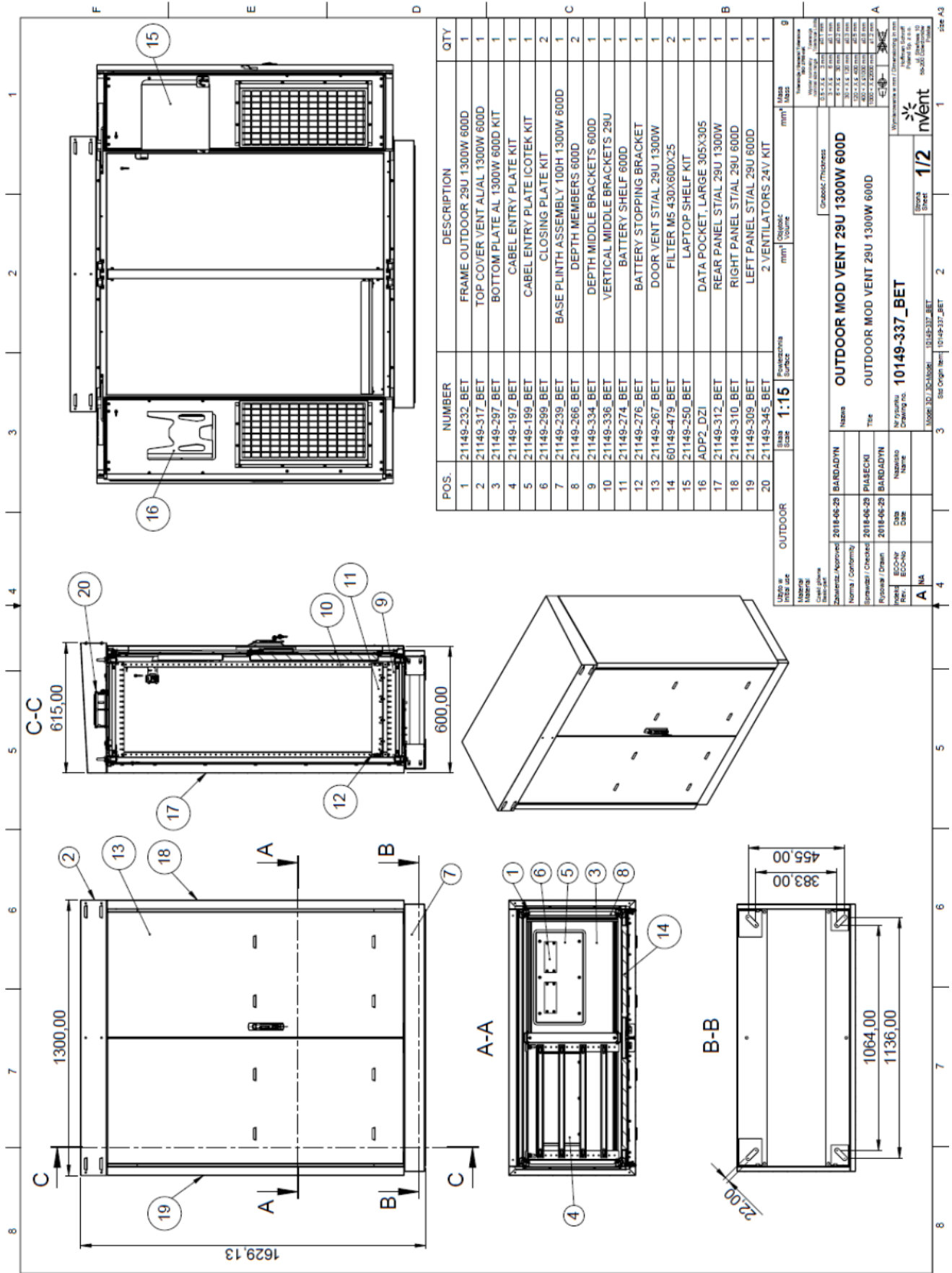
At the end of the tests, the cabinet has no degradation. The doors open and close normally.

These results confirm the wind resistance performance of the outdoor cabinet according to EN 50125-3, IEC 61969-3 Class 2 and up to a level of 250km/h corresponding to a category 5 cyclone.

Videos and digital photos of each test were produced and transmitted to nVent.



## 6 APPENDIX : DRAWINGS OF THE CABINET



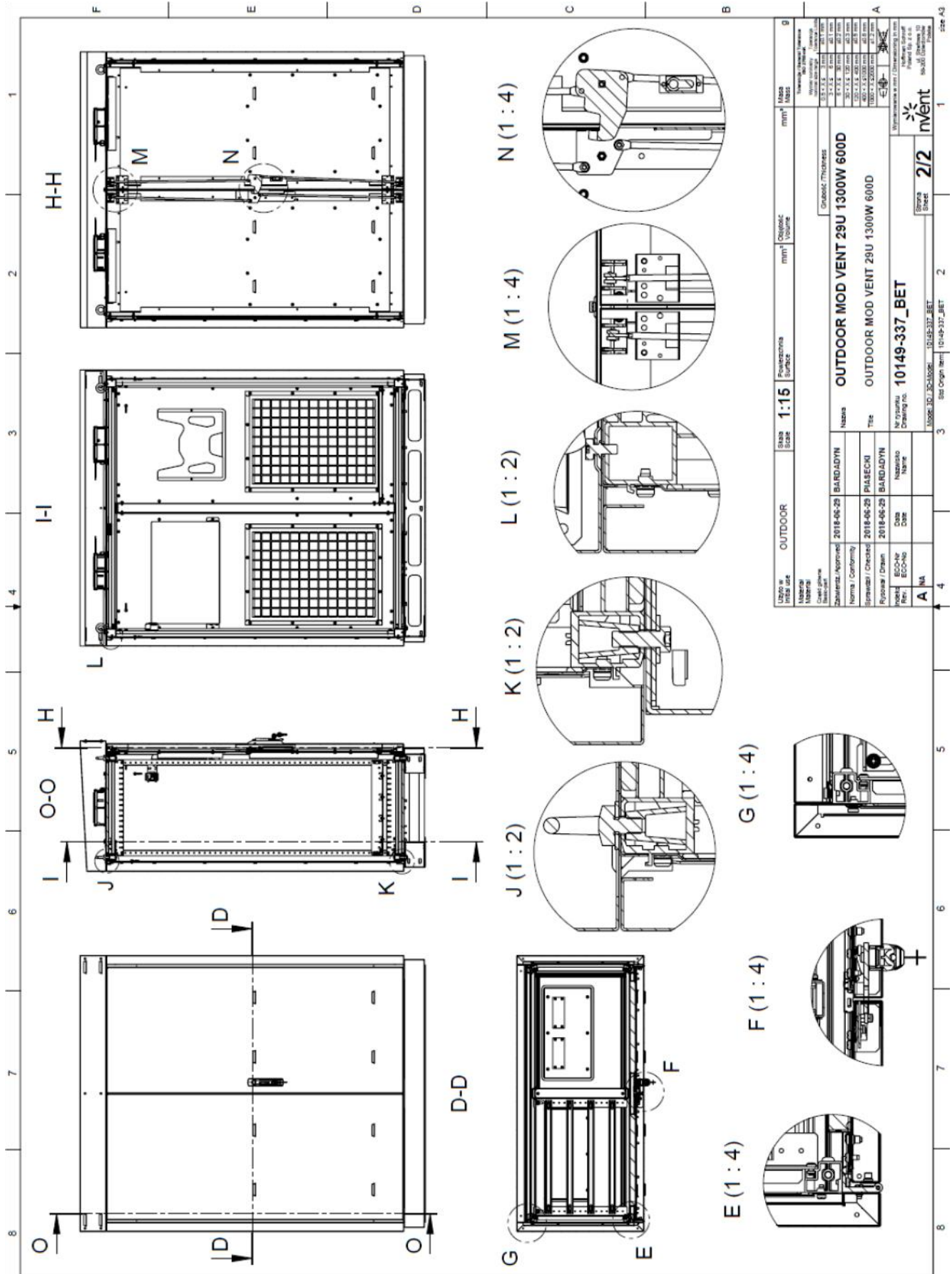
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