

CONFIDENTIEL



**MEASUREMENT OF THE EMISSION OF OZONE
FROM AN AIR PURIFIER**

TEQOYA TEQAIR 200

OZONE EMISSION ANALYSIS

Project reference : G15

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Confidentiality : **Yes**

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N° SIRET. 421 436 569 00014 – Code APE. 731 Z

1 CONTEXT AND EXPERIMENT SET UP

The CERTAM was solicited by the company TEQOYA to evaluate the emission of ozone from an air purifier. The purifier in question consists of a ramp of ionizers whose expected effect is the reduction of particulate concentrations by electrostatic precipitation. It is known as TeqAir200.

Ionizers are known to present a risk of ozone emission. International standards allowing the placing on the market of such equipment impose an ozone emission cap in the immediate vicinity of the device (5 cm from the *air outlet*). TEQOYA's technology claims a virtually undetectable ozone emission level, which these tests have been committed to checking.



TEQOYA TEQAIR 200

Measurement equipment:

The measurements were carried out using an Environment SA / O342M ozone analyzer, whose detection threshold and measurement accuracy are 1 ppb.

This analyzer has a fast response time to follow unsteady phenomena.

Experimental set up :

The measurements were made in a quasi-hermetic plexiglass box with a volume of 1 m³ (1 meter side for each side).

This type of caisson is usually used for standard VOC abatement tests by photocatalytic equipment.



The protocol set up aims to:

1. Measure the ozone concentration at 5 cm from the device, in accordance with the standards in force, and compare this measurement device on / device off
2. Detect any traces of ozone emitted by the device by the effect of accumulation in the quasi-hermetic box during a period of 12h

The measurement of ozone requires a levy of 0.8 liters/hour, hence the box is not perfectly hermetic. As ozone measurements were very low, an influence of the ozone concentration of the environment was observed. On Figure 1 one can observe that daily ambient ozone variations (up to 80 $\mu\text{g}/\text{m}^3$ during day time) influence the ozone level in the test chamber.

The tests were therefore conducted at night, when ambient ozone was lower and more stable, especially from midnight until 9am, as can be seen on Figure 1. The vertical blue line marks the end of the 12-hours measurement period for TeqAir 200).

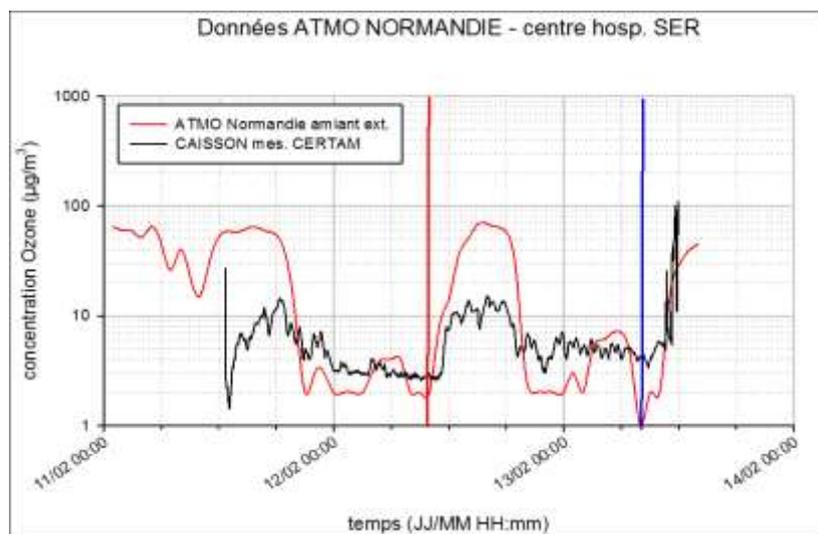


FIG 1. INFLUENCE OF AMBIENT OZONE ON OZONE CONCENTRATION VARIATION IN THE TEST CHAMBER

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Over a period of more than 12 consecutive hours, the following test protocol is applied:

- Measurement of ozone to 5 cm of the unit ionization nozzles, continuously throughout the test period
- Activation of the device under test in the quasi-hermetic chamber
- Comparison of the ozone measurement before / after putting the device into operation
- During a night (approximately 12 hours), keeping the device in operation to detect a possible accumulation of ozone in the chamber
- Monitoring of the environmental ozone provided by the nearest environmental measurement station, to compare with any fluctuations in the chamber
- After the accumulation test, comparison of the ozone measurement before / after switching off the device under test

2 MEASURING THE OZONE CONCENTRATION

The results of ozone continuous measurements during the nighttime trial period (night of February 12 to 13, 2019) are shown on the graph below.

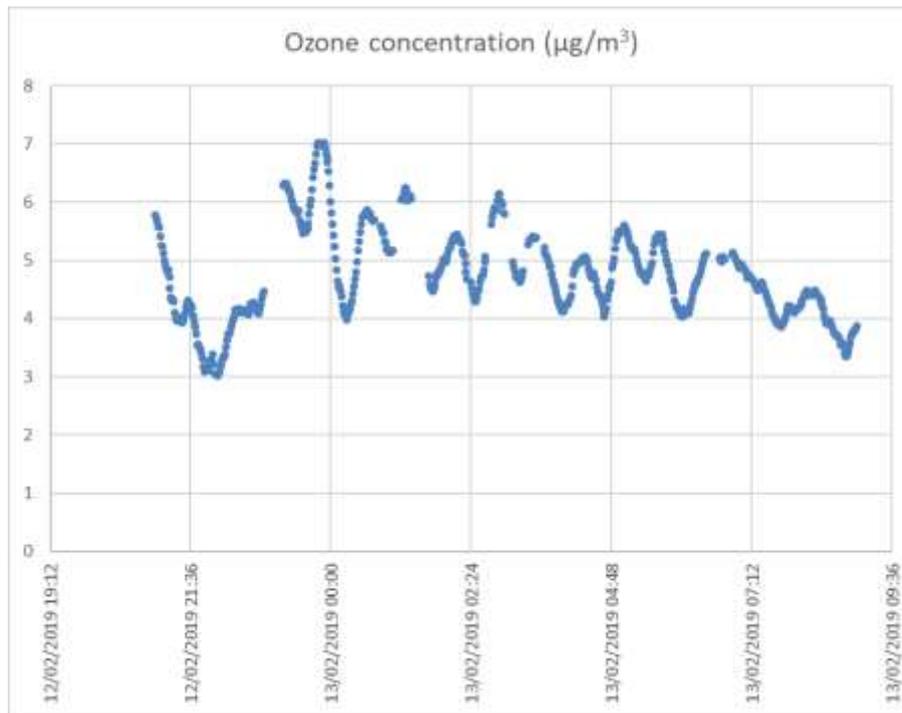


FIG 2. OZONE CONCENTRATION DURING OVERNIGHT ACCUMULATION TEST

Measurements revealed no elevation of concentration during TEQOYA TeqAir200 operation, either:

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- by difference between in-use / out-of-service device measurement,
- progressively by accumulation in the box.

The background levels recorded during operation (or not) of the device are less than $6 \mu\text{g}/\text{m}^3$ (3 ppb). Over the same period, the ozone measurement in the environment, as provided by the closest *ATMO* station, varied from 1 to $7 \mu\text{g}/\text{m}^3$.

For information:

- the objective of air quality in France for the protection of human health is $120 \mu\text{g} / \text{m}^3$ (60 ppb) maximum;
- the information threshold for susceptible populations in France is $180 \mu\text{g} / \text{m}^3$ (90 ppb);
- the maximum value of ozone emission by an air purifier according to the CE standard, at 5 cm of the air outlet, is $100 \mu\text{g} / \text{m}^3$ (50 ppb).

3 CONCLUSION

No ozone emission attributable to the TEQOYA TeqAir200 has been detected.