



Ozone Air Sampling Report
During b-pure ASM-500 Air
Purification System Operation

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1. Forward

On March 11, 2021 we conducted Ozone air sampling during b-pure ASM-500 purification system operation.

The sampling was held at one of Biopharmax group Ltd meeting rooms, located at 4 Hasadnaot street. In Herzliya, Israel.

The meeting room area is approximately 20 meters. Its height is approximately 2.7 meters.

Air conditioning system in the meeting room was adjusted to 22 C degrees and was operated during the entire air sampling period.

Ozone measurement was performed at a sitting person height, approximately 1.2 from the air purification system (photos are attached to this report).

In these tests we performed two air samples. The first, conducted before operating b-pure air purification system and was intended for establishing Ozone background concentration (if exists). The other, performed while the air purification system was operated at a 60 percent mode as recommended by Biopharmax.

The tested air purification system technology is based on UV-C lamps at 254 nanometers.

Additional air purification system technical specification appear in the information brochure further in this report.

2. Ozone

Ozone is a molecule consists of three atoms of oxygen (O₃). Ozone is formed from dioxygen by the action of ultraviolet (UV) light and electrical discharges within the Earth's atmosphere. It is present in very low concentrations throughout the latter, with its highest concentration high in the ozone layer of the stratosphere, which absorbs most of the Sun's ultraviolet (UV) radiation. Ozone is also created close to the ground as hydrocarbons and Nitrogen oxides produce chemical reaction in the presence of sun light. Whereas Ozone itself does not emitted to the air, but only after other pollutant emission, it is considered "secondary pollutant". Sources of hydrocarbons are piping and storage containers of fuels and organic compounds, as well as emissions from gas powered vehicles.

Israel Clean Air Law (2008 Onwards)

The Clean Air Law was prepared by a designated subcommittee of the parliamentary Internal Affairs and Environment committee, in collaboration with civil society (IUED), the private sector (the Manufacturers Association of Israel) and the Israel Electric Corporation. It was approved in Israel in 2008 and came into force on 1 January 2011.



2. Ozone/ continued

The law includes the following types of values:

- *Target values: set according to public health safety and based on international standards such as those recommended by the World Health Organization. However, these values are not necessarily feasible in Israel at present and are therefore not mandatory. Ozone target value is 100 microgram/m³ for an 8-hour period.*
- *Ambient air quality values (environmental standards): mandatory values considered achievable at present. Ozone environmental standard is 140 microgram/m³ for an 8-hour period.*
- *Alert thresholds for emergencies. Ozone alert threshold is 240 microgram/m³ for a 1-hour period in three consecutive hours.*

Israel Ministry of Labor, Social Affairs, and Social Services has adopted Ozone standards, as appear in the latest (2021) ACGIH (American Conference of Governmental Industrial Hygienists) TLVs and BEIs Book, which are as follow:

0.1 ppm (approximately 196 microgram/m³) for an 8-hour light work.

0.08 ppm (approximately 157 microgram/m³) for an 8-hour moderate work.

0.05 ppm (approximately 98 microgram/m³) for an 8-hour heavy work.

The threshold limit value for Heavy, moderate, or light workloads (< 2 hours) is 0.2 ppm (approximately 393 microgram/m³).

3. Description of the method we used to test Ozone in ambient air

The test was performed according to method number 820 appears in methods of air sampling and analysis book:

a measured volume of air was drawn using a "personal sampling pump" through a glass vessel (impinger), containing 15 ml of specific adsorption reagent consists of 40 gram/liter of sodium hydroxide and 10 gram/liter potassium iodide. The reaction between Ozone in the air and the reagent inside the impinger, produces color change which is visualized by a spectrophotometer at 352 nm.



4. Test results

Ozone air sampling test results:

Description	Sample number	Sampling period (minutes)	Air volume collected (m³)	Result (microgram/m³)
Approximately 1.2 meters from the b-pure ASM-500 air purification system. Background measurement without operating the system	1/110321	32	0.048544	77
Approximately 1.2 meters from the b-pure ASM-500 air purification system. During system operation	2/110321	32	0.046592	36



5. Findings and conclusions

- 5.1 Ozone concentration in the background measurement as well as the concentration measured during b-pure air purification system operation, were both below the values specified in great details in paragraph 2.
- 5.2 The fact that Ozone concentration found in the background measurement was higher than the concentration measured during b-pure air purification system operation, may suggest that this difference is a consequence of Ozone fluctuating in air, with no regard to the b-pure air purification system operation, and that operating the system has no additional effect on Ozone air concentration.
- 5.3 According to ACGIH 2021 TLVs and BEIs Book "Ozone is produced in air by sources emitting UV radiation at wavelengths below 220 nm". Biopharmax information brochure states that the b-pure air purification system operation is based on UV-C bulbs at 254 nm. Hence, the potential of the air purification system to emit Ozone to the air during operation (if any), is miniscule.