

# Ozone disinfection cabinet :OR-series (OR-5V & OR-12)

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## 1. Introduction

'Disinfection by ozone' was newly added to the relevant Japanese law on April 1, 2007, while the method of disinfecting beddings used in the hospital and the clinic, with the danger or fear of infection, is legislated in "Consignment of business activities" for the hospitals and clinics (the 14th article; Ministry of Health and Welfare Health, Policy Bureau guidance section chief notification on February 15, 1993).

And, what is developed according to this law revision is 'OR-5V' (net capacity 6m<sup>3</sup>) & 'OR-12' (net capacity 10m<sup>3</sup> or more). These machines are large-scale linen disinfection cabinet with a large amount of ozone that subcontractors who undertake the disinfection of beddings can process.

## 2. Process of development

In a current disinfection method (Ethylene oxide and Formaldehyde), the large encumbrance was caused for the workers and the ambient environment as the regulatory control became severe from the carcinogenic problem by the residual toxicity, and an obligation of the environmental measurement and designated administrator were required.

The Japanese hospital bedding foundation, who looked for a way that the cloth do not get hurt or damaged by the low temperature disinfection as a result of requesting a safer and easier disinfection method, decided to use the ozone disinfection method because the least amount of residual toxicity and the antiseptic property were proven.

OR-5V and OR-12 were jointly developed by us who had ozone technology and the Japanese hospital bedding foundation with their know-how of the linen disinfection.



Figure 1 OR-5V External view

## 3. The main features of the OR series

(1) Equipped with high concentration ozonizer manufactured in house. Pure and high concentrated ozone can be injected in the disinfection cabinet by an oxygen generator and the ozonizer with voiceless electrical discharge type manufactured in house.

(2) Improved permeability inside linens

The linens are always piled in the disinfection cabinet when disinfecting those. Ozone CT value of inside of the accumulated

objects tends be lower than CT value on surface of those. The CT value is an indication here shown by multiplied value with concentration of the ozone gas and its exposed time, and the antiseptic property is considered by the CT value.

Vacuum inside is used to raise the accumulated internal ozone CT value in the cabinet, then ozone is injected afterwards. The injection has been done from the injection ports in two places of the upper side, center four places, and four places in the lower side with two stages.

As a result, ozone can infiltrate inside of the linen. The ozone that remained after set-time passes, returns to oxygen by the fragmentation mechanism, and exhausts outside the cabinet, and operation ends.

The permeability of bedding is obtained about 70% and the one of towels is about 90% as a result of measuring the ratio of the ozone levels in the processing objects to the one in the disinfection cabinet.

These processes are operated by automatic control, and inside and outside of ozone concentration for the disinfection cabinet are measured, and the confirmation of the antiseptic property and work pursuer's security shall be completed. Figure 2 shows the system configuration.

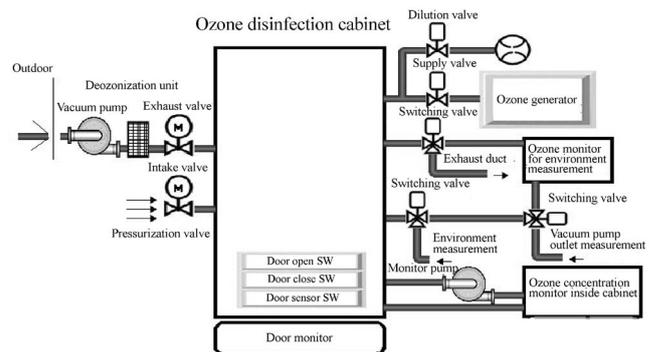


Figure 2 Ozone linen cabinet OR-5V system configuration

(3) About the disinfection effectiveness

To record the disinfection's effectiveness, the ozone level is output with the record meter. It is possible to keep the record as an evidence, using ozone CI (Chemical indicator) first and only in the ozone industry, so as to confirm permeability and the disinfection's effectiveness to the property.

## 4. Sales performance

The number of sales of these machines by the end of 2010 is 13 units, and the market share of the linen disinfection cabinet with ozone is 100%.

## 5. Conclusion

In the linen industry, the expectation for the ozone disinfection method as a new disinfection cabinet has been grown as its effectiveness, safety, and economy because of the height of environmental compatibility with ozone returning to oxygen & of strong oxidizing power.

Hope to expand for the application of ozone to more fields with a lot of features such as unnecessary of the regulatory control and unnecessary to stock any medicine in the future.