

TITLE: SURFACE AND AIR DISINFECTION BY OZONE GAS

AUTHORS: CAETANO, M.H.¹; BRIZZOTTI, N.S.²; MARQUES, M.D.R.²; SILVA, C.A.²; BIANCO, L.M.¹; ALMEIDA, B.G.¹; SIQUEIRA, J.P.Z.²; CASTILHO, E.M.²; FERREIRA, A.M.³; ALMEIDA, M.T.G.².

INSTITUTION:¹UNIVERSIDADE ESTADUAL PAULISTA (UNESP), INSTITUTO DE BIOCÊNCIAS, LETRAS E CIÊNCIAS EXATAS (IBILCE), CÂMPUS SÃO JOSÉ DO RIO PRETO (RUA CRISTÓVÃO COLOMBO, 2265, JARDIM NAZARETH, CEP 15054-000, SÃO JOSÉ DO RIO PRETO – SP, BRASIL)

²FACULDADE DE MEDICINA DE SÃO JOSÉ DO RIO PRETO (AVENIDA BRIGADEIRO FARIA LIMA, 5416, VILA SÃO PEDRO, CEP 15090-000, SÃO JOSÉ DO RIO PRETO – SP, BRASIL)

³UNIVERSIDADE FEDERAL DE MATO GROSSO DO SUL, UNIDADE II, TRÊS LAGOAS, MATO GROSSO DO SUL (AVENIDA RANULPHO MARQUES LEAL, 3220, DISTRITO INDUSTRIAL II, CEP 79.620-080, TRÊS LAGOAS – MS, BRASIL)

ABSTRACT:

In health and food services, quality assurance is a priority. In this scenario, primary permanence or occurrence of microorganisms are considered the main source of contamination or infection in humans. Following the trend that abusive use of chemicals often induces the selection of resistant microorganisms, these control strategies are not always effective. The use of ozone gas (O₃) can improve the air and surfaces quality standards by reducing the microbial load, given the oxidation of compounds, leading to cell death, without leaving toxic residues. The objective of the present study was to evaluate the antimicrobial action of O₃ gas on the disinfection of 30 surfaces (including floors, walls, and table), and air of ten rooms of 9m² of physical area. The microbiological analysis was conducted at two distinct times, before and after the O₃ exposure for one hour. The equipment used was OZON® O₃ generator GEO 20000/AR-TD with flow rate (200m³/h) and ozone concentration in parts per million (2 ppm). For both collections, a swab pre-moistened in sterile distilled water was scrubbed over predetermined areas of the floor, table, and wall, and inoculated in Petri dishes containing Brain Heart Infusion Agar DIFCO® (BHI). Plates were incubated at 35 °C for 24 hours. For microbiological analysis of the air, Petri dishes containing BHI were kept open for one hour before (control) and after the ozone gas, followed by incubation at 35 °C for 24 hours. Air conditioning was kept turned on during all investigations. The results showed that on the floor, O₃ gas exhibited high antimicrobial activity, with an expressive reduction or total removal of Colony Forming Units (CFUs). Considering the table, potent activity of O₃ was also observed among nine, with reduction of UFC of microorganisms. On the surface of the walls, the reduction of the microbial count occurred in 50% of the samples, and the air, 70%. The excellent antimicrobial activity of O₃, generated by the OZON® GEO 20000/AR-TD, is a practical procedure for environmental decontamination, feasible for domestic or hospital routine, fast and easy to perform. Considering that surfaces such as floors, counters, and walls, are the main targets for microbial adherence, the adoption of O₃ gas as a practice of sterilization or hospital disinfection is a measure for quality and improvement for health.

Keywords: ozone, disinfection, rooms, air

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), OZON®