

CLAIMS

1. A method of oxidizing, sanitizing, disinfecting, and/or sterilizing a target comprising:

ejecting a gas stream of a gaseous mixture comprising 50 to 30,000 ppm_v chlorine dioxide from a gas source at a velocity of 25 to 900 ft/sec; and

contacting the gas stream with the target.
2. The method according to claim 1, wherein the gaseous mixture comprises 2,000 to 10,000 ppm_v chlorine dioxide.
3. The method according to claim 1, wherein the gas stream is ejected from the gas source at a velocity of 600 to 800 ft/sec.
4. The method according to claim 1, wherein the target is selected from:
 - (i) at least a portion of a ceiling or wall;
 - (ii) at least a portion of a medical instrument;
 - (iii) an area of skin;
 - (iv) at least a portion of a mammalian wound; and
 - (v) at least a portion of an medical procedural area.
5. The method according to claim 1, wherein the gas stream contacts the target at a velocity of 15 to 500 ft/sec.

6. The method according to claim 5, wherein the gas stream contacts the target at a velocity of 50 to 250 ft/sec.
7. The method according to claim 1, wherein the gas source is a nozzle.
8. The method according to claim 1, wherein the gas source is positioned 0.5 to 25 cm from the target during ejection of the gas stream.
9. The method according to claim 1, wherein the contacting is performed in an application zone, wherein circulation of air per minute in the application zone is at least 5 ft/sec, and wherein the velocity of the gas stream at the target increases due to the circulation of air in the application zone.
10. The method according to any one of claims 1-9, wherein the contacting is performed in a contained application zone.
11. The method according to claim 10, wherein the application zone is maintained under a negative pressure.
12. The method according to claim 11, wherein the application zone is sealed and comprises the gas source, the target, and a source of a vacuum.
13. The method according to claim 12, wherein the vacuum retrieves spent gaseous mixture, and wherein the spent gaseous mixture is recycled for one or more subsequent ejection cycles from the gas source.

14. A device for oxidizing, sanitizing, disinfecting, and/or sterilizing a target comprising:
a chlorine dioxide inlet configured for intake of a gaseous mixture comprising 50 to 30,000 ppm_v chlorine dioxide; and
a gas source configured to eject a gas stream of the gaseous mixture at a velocity of 25 to 900 ft/sec.
15. The device according to claim 14, additionally comprising a containment mechanism, said containment mechanism housing the gas source, and configured to define an application zone.
16. The device according to claim 15, wherein the containment mechanism is configured to seal the application zone in relation to a target to be sterilized.
17. The device according to claim 16, wherein the target is selected from:
- (i) at least a portion of a ceiling or wall;
 - (ii) at least a portion of a medical instrument;
 - (iii) an area of skin;
 - (iv) at least a portion of a mammalian wound; and
 - (v) at least a portion of an medical procedural area.
18. The device according to any one of claims 14-17, said device additionally comprising a source of a vacuum configured to retrieve spent gaseous mixture.

19. The device according to claim 18, wherein the device is configured to recycle the spent gaseous mixture for one or more subsequent ejection cycles from the gas source.
20. The device according to claim 19, wherein the chlorine dioxide inlet is configured to intake chlorine dioxide from a chlorine dioxide source, and wherein the device comprises a gas return component that returns the spent gaseous mixture to the chlorine dioxide source for recycling.
21. The device according to claim 20, wherein the gas return component comprises or is connected to a filter and a chlorine dioxide scrubber.

CLAIMS

1. A method of oxidizing, sanitizing, disinfecting, and/or sterilizing a target comprising:

ejecting a gas stream of a gaseous mixture comprising 50 to 30,000 ppm_v chlorine dioxide from a gas source at a velocity of 25 to 900 ft/sec; and

contacting the gas stream with the target,

wherein the gas stream contacts the target at a velocity of 15 to 500 ft/sec.
2. The method according to claim 1, wherein the gaseous mixture comprises 2,000 to 10,000 ppm_v chlorine dioxide.
3. The method according to claim 1, wherein the gas stream is ejected from the gas source at a velocity of 600 to 800 ft/sec.
4. The method according to claim 1, wherein the target is selected from:
 - (i) at least a portion of a ceiling or wall;
 - (ii) at least a portion of a medical instrument;
 - (iii) an area of skin;
 - (iv) at least a portion of a mammalian wound; and
 - (v) at least a portion of an medical procedural area.

5. The method according to claim 1, wherein the gas stream contacts the target at a velocity of 50 to 250 ft/sec.
6. The method according to claim 1, wherein the gas source is a nozzle.
7. The method according to claim 1, wherein the gas source is positioned 0.5 to 25 cm from the target during ejection of the gas stream.
8. The method according to claim 1, wherein the contacting is performed in an application zone, wherein circulation of air per minute in the application zone is at least 5 ft/sec, and wherein the velocity of the gas stream at the target increases due to the circulation of air in the application zone.
9. The method according to any one of claims 1-8, wherein the contacting is performed in a contained application zone.
10. The method according to claim 9, wherein the application zone is maintained under a negative pressure.
11. The method according to claim 10, wherein the application zone is sealed and comprises the gas source, the target, and a source of a vacuum.

12. The method according to claim 11, wherein the vacuum retrieves spent gaseous mixture, and wherein the spent gaseous mixture is recycled for one or more subsequent ejection cycles from the gas source.
13. A device for oxidizing, sanitizing, disinfecting, and/or sterilizing a target comprising:

a chlorine dioxide inlet configured for intake of a gaseous mixture comprising 50 to 30,000 ppm_v chlorine dioxide; and

a gas source configured to eject a gas stream of the gaseous mixture at a velocity of 25 to 900 ft/sec, such that the gas stream contacts the target at a velocity of 15 to 500 ft/sec .
14. The device according to claim 13, additionally comprising a containment mechanism, said containment mechanism housing the gas source, and configured to define an application zone.
15. The device according to claim 14, wherein the containment mechanism is configured to seal the application zone in relation to a target to be sterilized.
16. The device according to claim 15, wherein the target is selected from:
- (i) at least a portion of a ceiling or wall;
 - (ii) at least a portion of a medical instrument;
 - (iii) an area of skin;
 - (iv) at least a portion of a mammalian wound; and
 - (v) at least a portion of an medical procedural area.

17. The device according to any one of claims 13-16, said device additionally comprising a source of a vacuum configured to retrieve spent gaseous mixture.

18. The device according to claim 17, wherein the device is configured to recycle the spent gaseous mixture for one or more subsequent ejection cycles from the gas source.

19. The device according to claim 18, wherein the chlorine dioxide inlet is configured to intake chlorine dioxide from a chlorine dioxide source, and wherein the device comprises a gas return component that returns the spent gaseous mixture to the chlorine dioxide source for recycling.

20. The device according to claim 19, wherein the gas return component comprises or is connected to a filter and a chlorine dioxide scrubber.