CLAIMS

[Claim 1] A device for decontaminating a device used to culture cells, manipulate microorganisms, or perform a sterility test, the decontamination device comprising:

an ultrasonic atomizer for atomizing a peracetic acid disinfectant by using ultrasonic oscillation to discharge droplets;

a diffusion fan;

a temperature-humidity sensor; and

a controller.

[Claim 2] The decontamination device according to claim 1,

wherein the peracetic acid disinfectant is a mixture of peracetic acid, hydrogen peroxide, acetic acid, and water.

[Claim 3] The decontamination device according to claim 1 or 2,

wherein the controller has an automatic decontamination-period-calculating function.

[Claim 4] The decontamination device according to any one of claims 1 to 3,

wherein the controller has an automatic decontamination-period-calculating function for calculating the decontamination period based only on the temperature and humidity in the device to be decontaminated.

[Claim 5] The decontamination device according to any one of claims 1 to 4,

wherein the droplets discharged from the ultrasonic atomizer have a diameter measurable in microns.

[Claim 6] The decontamination device according to any one of claims 1 to 5,

further comprising a catalyst fan.

[Claim 7] The decontamination device according to any one of claims 1 to 6,

wherein the device used to culture cells, manipulate microorganisms, or perform a sterility test is a CO_2 incubator, a safety cabinet, a pass box, a clean bench, a temperature controlling device, or a centrifugal separator.

[Claim 8] The decontamination device according to any one of claims 1 to 7,

wherein the ultrasonic atomizer is provided with at least one component selected from the temperature-humidity sensor, the diffusion fan, and the catalyst fan.

[Claim 9] A method for decontaminating a device used to culture cells, manipulate microorganisms, or perform a sterility test, the method comprising:

placing an ultrasonic atomizer in the device used to culture cells, manipulate microorganisms, or perform a sterility test;

activating the ultrasonic atomizer to atomize a peracetic acid disinfectant by using the resultant ultrasonic wave to discharge droplets; and

causing contact between the droplets and the device.

[Claim 10] The method according to claim 9,

wherein the peracetic acid disinfectant is atomized and discharged in the form of the droplets until the humidity in the device reaches a predetermined value, whereupon the ultrasonic atomizer is repeatedly activated and deactivated to maintain the predetermined humidity.

[Claim 11] The method according to claim 9 or 10,

wherein the ultrasonic atomizer is repeatedly activated and deactivated to maintain the humidity in the device at the set humidity after the humidity is set before decontamination is initiated, and the peracetic acid disinfectant is atomized and discharged in the form of the droplets until the humidity in the device reaches the set value.

[Claim 12] The method according to claim 11,

wherein before decontamination is initiated, a temperature-humidity sensor is used to measure the temperature and humidity in the device to calculate a decontamination period at the set humidity.

[Claim 13] The method according to any one of claims 9 to 12,

wherein a diffusion fan is used to diffuse the droplets in the device.

CLAIMS

1. A decontaminator for decontaminating a device having an interior space that is used to culture cells, manipulate microorganisms, or perform a sterility test, the decontaminator comprising:

an ultrasonic atomizer for atomizing a peracetic acid disinfectant by using ultrasonic oscillation to discharge droplets;

a diffusion fan;

a temperature-humidity sensor; and

a controller,

wherein the ultrasonic atomizer and temperature-humidity sensor are configured to be placed within the interior space of the device that is to be decontaminated,

wherein the controller has an automatic decontamination-period-calculating function that calculates a decontamination period time based only on the temperature and humidity in the device to be decontaminated,

wherein the ultrasonic atomizer is configured to display a low chemical level, suspend the atomizing operation, and immediately stop counting down the decontamination period time if the device is performing decontamination when an amount of a chemical decreases to a value below a necessary amount,

wherein the ultrasonic atomizer is configured to pause a restart of the atomizing after the chemical is replenished above the necessary amount, and

wherein after a set humidity is reached, the ultrasonic atomizer is configured to start counting down rest of the decontamination period time.

2. The decontaminator according to claim 1,

wherein the peracetic acid disinfectant is a mixture of peracetic acid, hydrogen peroxide, acetic acid, and water.

3. The decontaminator according to claim 1,

wherein the droplets discharged from the ultrasonic atomizer have a diameter measurable in microns.

4. The decontaminator according to claim 1,

further comprising a catalyst fan.

5. The decontaminator according to claim 1,

wherein the device to be contaminated is a CO_2 incubator, a safety cabinet, a pass box, a clean bench, a temperature controlling device, or a centrifugal separator.

6. The decontaminator according to claim 1,

wherein the ultrasonic atomizer is provided with at least one component selected from the temperature-humidity sensor, the diffusion fan, and the catalyst fan.

7. A method for decontaminating a device having an interior space that is used to culture cells, manipulate microorganisms, or perform a sterility test, the method comprising:

placing an ultrasonic atomizer within the interior space of the device that is to be

decontaminated;

measuring temperature and humidity in the device to be decontaminated;

calculating a decontamination period time based only on the temperature and humidity in the device to be decontaminated;

activating the ultrasonic atomizer to atomize a peracetic acid disinfectant by using the resultant ultrasonic wave to discharge droplets;

causing contact between the droplets and the device;

displaying a low chemical level, suspending the atomizing operation, and immediately stopping counting down the decontamination period time if the device is performing decontamination when an amount of a chemical decreases to a value below a necessary amount;

pausing a restart of the atomizing after the chemical is replenished above the necessary amount; and

after a set humidity is reached, starting counting down rest of the decontamination period time.

8. The method according to claim 7,

wherein a diffusion fan is used to diffuse the droplets in the device.

9. The decontaminator according to claim 1, wherein the ultrasonic atomizer comprises:

a plate-shaped piezoelectric element and includes a piezoelectric ceramic plate having a first principal surface, a second principal surface, and a side surface that connects

the first and second principal surfaces to each other;

a first electrode layer that spreads over the first principal surface and extends via the side surface to the second principal surface; and

a second electrode layer that is separated from the first electrode layer, spreads over the second principal surface, and faces the first electrode layer on the first principal surface via the piezoelectric ceramic plate.

10. The method according to claim 7, the ultrasonic atomizer comprises:

a plate-shaped piezoelectric element and includes a piezoelectric ceramic plate having a first principal surface, a second principal surface, and a side surface that connects the first and second principal surfaces to each other;

a first electrode layer that spreads over the first principal surface and extends via the side surface to the second principal surface; and

a second electrode layer that is separated from the first electrode layer, spreads over the second principal surface, and faces the first electrode layer on the first principal surface via the piezoelectric ceramic plate.