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Nano Particle Technology

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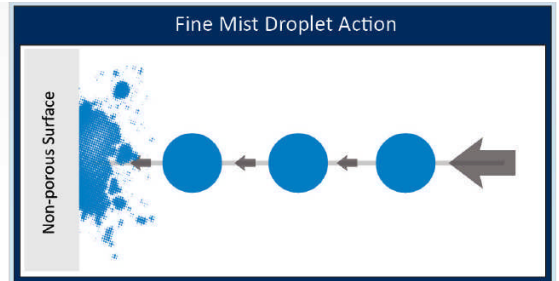
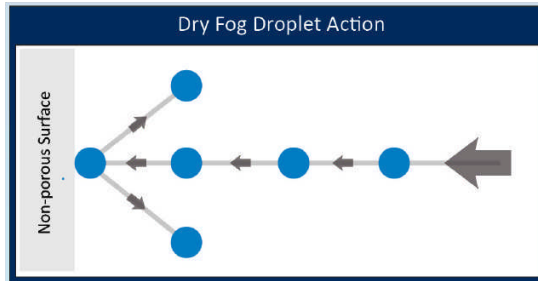
DF2S, Microbial, Bacterial, Fungal Disinfection

PORTABLE, Aerosol Disinfecting Dry Fogger, Closed Areas up to 35K Cu Ft. (1-6 Nozzles)

The Dry Fog DF2S machine is an easy to use, highly affective solution to disinfect unwanted microbial, bacterial and fungal contamination in Pharmaceutical ISO Suites, Pharmacy Rooms, Medical Operating Rooms, Emergency Rooms. The vapor contacting all surfaces, plants and leaves will rapidly kill off 99.9% of microbial, bacterial and fungal contamination in your operations. DF2S requires only the sanitizing agent and air pressure to completely saturate a room for disinfection. No plumbing required.

The combination of cold sterilant disinfecting liquid and DF2S enables users to rapidly and safely deliver a vapor to every accessible point in process labs, medical rooms and safely decontaminates any plant. The DF2S Dry Fogger is sanitary and autoclavable with a SS fogger design to maintain high sterility. The location and action of the dry fogging head is at the highest point of the equipment allowing for rapid vapor dispersion into a room, coming into contact thus. The lack of toxic Alde Hyde vapors provide extremely short process times, typically less than 3 hours depending on room size – over 95% faster than conventional systems meaning less production downtime and lower overhead costs.

The DF2S atomizer produces an ultrafine droplet size that averages 7.5 µm diameter ensuring a uniform density dispersion of the cold sterilant solution throughout the room, which evaporates to a vapor to penetrate every point in a room and contact all plant surfaces. The small droplets bounce off hard surfaces and nonporous surfaces (*below left*) due to high surface tension, reducing condensation, corrosion and surface wetting, which is associated with systems using large (*below right*) droplets.



The small droplets evaporate quickly into a vapor to **penetrate all accessible areas in the room**, providing a very effective disinfection process. The disinfecting liquid is a Peracetic Acid and Hydrogen Peroxide solution, based on proprietary chemistry for optimized biocidal efficacy. It is registered by the EPA for use as a liquid to enhance existing cleaning and disinfection process, and is fully biodegradable and will leave no measurable residuals once the room has been fully ventilated. DF2S Dry Fogger, cold sterilant includes pharmaceutical quality, raw materials. The operator can also use a standard hydrogen peroxide solution with the DF2S, which is powered through your compressed air supply, 2.5 SCFM per nozzle @ 75 PSI.

Mini-Dry Fog System

The Mini-Dry Fog machine provides an easy to use, high tech solution for fogging in confined spaces. The flexibility of the Mini-Dry Fog nozzle allows for rapid vapor dispersion to ensure the entire space is exposed to disinfecting vapor.

- ▶ Single Mini-DryFog suitable for room volumes of 20M³ or 700 ft³ to disperse 500ml of Minncare liquid disinfectant solution
- ▶ Eliminates Formaldehyde disinfection procedures
- ▶ Use in biological safety cabinets, cRABS, glove boxes, pass-through tunnels, ambulances, etc. The Mini-Dry Fog can be built into small cabinets and H₂O₂ vaporization systems.



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DF2S: Features & Benefits

Configurable Spray Head

Newly designed spray apparatus allows for eight different nozzle(s) positions increasing the coverage possibilities for higher flexibility. Additionally, the new head allows for spray diffusion that is horizontal or vertical.

Short Process Time

Typically, the entire process can be completed in less than 3 hours, depending upon room size and ventilation system efficiency, compared to up to 3-5 days with some conventional systems.

- Substantially lower clean room downtime
- Regular use may contribute to maintaining low particulate levels due to the suppression of airborne particles
- Lack of noise and ultrasonic vibration during use

Optimal Efficacy with Minncare®

Minncare is a peracetic acid and hydrogen peroxide based on proprietary chemistry for optimized biocidal efficacy.

- EPA registered for fogging as part of normal cleaning and disinfection procedures
- Faster and safer to use than existing aldehyde liquids

Highly Flexible System

The system is easily adaptable to differing room dimensions and configurations and can be adjusted to suit any room height.

- Robust construction, with easy maintenance
- Does not require electrical connection
- Sanitary construction using 316L Stainless Steel and Titanium for key components
- 100% Autoclavable design
- Single units are suitable for use in rooms up to 35,000 ft³ (1000 m³) and will disperse up to 14 liters per hour of liquid Minncare Cold Sterilant solution
- Bio-Decontamination of multiple linked rooms simultaneously is possible

Ultrafine Droplets

The DF2S equipment is designed to produce ultrafine atomized droplets that evaporate to a vapor for dispersion of sterilant chemical vapors throughout the room.

- Controlled and consistently accurate droplet size
- Minimized risk of condensation
- Ensures penetration into normally inaccessible areas

| Minncare Dry Fog Tested according to AFNOR N F T 72-281 | |
|--|---------------------|
| Species | Log Reduction |
| <i>Pseudomonas aeruginosa</i> (CIP A22) | > 7.5 log reduction |
| <i>Enterococcus hirae</i> (CIP 58 55) | 7.0 log reduction |
| <i>Penicillium verrucosum</i> var. <i>cycloplum</i> (IP 1186-79) | 6.4 log reduction |
| <i>Staphylococcus aureus</i> (CIP 53 154) | 6.8 log reduction |
| <i>Candida albicans</i> (IP 1180-79) | 6.8 log reduction |
| <i>Bacillus stearothermophilus</i> spores (CIP 52 81) | 6.8 log reduction |
| <i>Bacillus atrophaeus</i> spores (CIP 52 62) | 6.9 log reduction |

| In Vitro Aqueous Test at 20°C | | |
|--------------------------------|-----------------------|--------------------------|
| Minncare Concentration .5% | | |
| Species | Count per ml | Time for 100% kill (min) |
| <i>Bac. subtilis</i> | 6 x 10 ⁶ | 2.5 |
| <i>Bac: stearothermophilus</i> | 6 x 10 ⁶ | 2.5 |
| <i>Bac. subtilis</i> NCTC 3610 | 2.4 x 10 ⁹ | 5.0 |
| <i>Bac. mesentericus</i> | 1.6 x 10 ⁹ | 5.0 |
| <i>Clostr. perfringens</i> | 1 x 10 ⁷ | 10.0 |
| <i>Clostr. tyrobutyricum</i> | 1 x 10 ⁷ | 5.0 |
| <i>Sacchar. cereisiae</i> | 6 x 10 ⁷ | 0.5 |
| <i>Cand. mycoderma</i> | 1.4 x 10 ⁸ | 0.5 |
| <i>Hansenula anomala</i> | 6.4 x 10 ⁸ | 0.5 |
| <i>Pichia membronaefaciens</i> | 4.8 x 10 ⁸ | 0.5 |
| <i>Pen. camcrunense</i> | 1.7 x 10 ⁸ | 2.5 |
| <i>Mucor plumbeus</i> | 3 x 10 ⁶ | 2.5 |
| <i>Geotrichum candidum</i> | 2 x 10 ⁷ | 0.5 |
| <i>Byssochlamys nivea</i> | 6 x 10 ⁷ | 0.5 |
| <i>Staph. aureus</i> | 2.6 x 10 ⁹ | 0.5 |
| <i>Strept. faecalis</i> | 4.6 x 10 ⁹ | 0.5 |
| <i>Kleb. aerogenes</i> | 2.3 x 10 ⁹ | 0.5 |
| <i>Ps. fluorescens</i> | 4.6 x 10 ⁹ | 0.5 |
| <i>Ps. aeruginosa</i> | 2 x 10 ⁹ | 0.5 |
| <i>Salm. thyphimurium</i> | 2.8 x 10 ⁹ | 0.5 |
| <i>Coryneb. rubrum</i> | 1 x 10 ⁷ | 1.0 |
| <i>Leuconostoc spec.</i> | 5.3 x 10 ⁸ | 0.5 |
| <i>Lactob. brevis</i> | 1.8 x 10 ⁹ | 0.5 |

DF2S Accessories

1. DF2S on wheels with 1 Nozzle in support of 5833.33 Cubic Foot volume room
 2. DF2S SS machine nozzle** 1 nozzle provided as standard with 5 additional nozzles available per DF2S providing (# of nozzles X 5833.33 = Cubic Volume) up to 35000 Cubic Feet room coverage
 3. Remote Control Unit with On/Off Switch, 165 feet cable length
 4. Cable Free Thermo-Hygrometer (1 needed)
 5. Thermo-Hygrometer sensors (minimum 3 recommended)
 6. Vapor Detection Kit
 7. Hydrogen Peroxide Detector tubes, 10 per case
 8. Acetic Acid Detector tubes, 10 per case
 9. Cold Sterilant 4 X 1 Quart case (smallest qty. avail.)
- * DF2S system comes complete with wheeled carrying case, IQ-OQ manual, software package, operating instruction manual. Manuals are provided only with ordered system.
 **Each nozzle will saturate 5833.33 Ft³. Systems and parts are 5 to 6 weeks ARO (After Receipt of Order).