

Experimental Drone Solutions to Aid in COVID-19

*Type of Disinfectant

The main active ingredient of the disinfectant is chlorine or alcohol, taking 84 disinfectant as an example, its active ingredient is sodium hypochlorite, which produces hypochlorous acid in contact with water, and also has bleaching and disinfecting effects.

Before Spraying

Pilot Qualification and Equipment Inspection

1) Obtain Flight Permission

For spraying operations in cities, villages and other areas, permission from local government agencies must be obtained in advance, **never operate without permission.**

2) Licensed Flight

Pilots who conduct disinfection and spraying operations must have certification. The epidemic prevention operation situation is complicated with many obstacles, it is recommended that the mission should be operated by the experienced pilots.

3) Equipment inspection

- ① Choose an agricultural drone in good condition for operation, never use a bulging or damaged battery for operation.
- ② Check if the arm sleeve is tightened, if the blades are damaged, and if the battery lock is fastened, etc.
- ③ If it is an MG series model, it is necessary to calibrate the magnetic compass if there is no flight for a long time.
- ④ Because the disinfection operation requires the assistance of the FPV image transmission system, please ensure that the FPV system is in good working condition.
- ⑤ **Watch for obstacles:** Due to the complexity of the obstacles in the epidemic prevention operation area, it is recommended to calibrate the radar before take-off, and please keep the obstacle avoidance radar in working state during flight.
- ⑥ **Ensure good signal of remote control:** In order to avoid the signal loss of the drone and remote control caused by the blockage of the building, it is recommended that the pilot hold the remote control at a high place to ensure that there is no blockage between the drone and the remote control.

4) Protective Measures for Operation Workers

To ensure the safety of pilots, the following should be done:

- ① The pilot should reasonably **add clothing** according to the local climate to avoid cold during long-term outdoor operations.
- ② Smoking and eating are not allowed during the operation.

- ③ Operators should wear a **full set of protective equipment**, including protective clothing, protective screens or goggles, disposable work caps, disposable latex gloves, medical protective mask, long rubber boots.
- ④ During the operation, make sure that your eyes, mouth, and nose must not be in contact with exposed parts such as hands. After the operation, wash your hands with alcohol-based hand sanitizer.



Protective equipment such as protective clothing should be worn

5) Early Announcement in Community

It is necessary to communicate with the local community in advance to avoid the potential harm that caused by drift to personnel and food. Committee should inform the residents in the operation area to close the doors and windows before spraying, and avoid going out during the operation.

Using DJI Agricultural Drone to Spraying Disinfectant

Disinfectant Spray Requirements

Major spraying areas for disinfectant spraying including streets, farmers' markets, hospitals, schools, parks, etc.

For epidemic Zone (area with confirmed cases):

When there are visible pollutants, the pollutants should be completely removed before disinfection. If the pollutants cannot be eliminated, spray the floor with 5000 mg-10,000 mg/L of chlorine-containing disinfectant, the disinfection operation time should be 10-15 minutes.

When there are no visible pollutants, it's recommended to use 1000 mg/L of chlorine-containing disinfectant. Ground disinfection should be taken from the outside to the inside once, with the spraying amount of 3-5 liters / 667 square meters. After the indoor disinfection is completed, repeat spraying from the inside to the outside once again. The disinfection operation time should be 10-15 minutes.

For non-Epidemic Zone (area without confirmed cases):

Can be sprayed back and forth with 500 mg/L of chlorine-containing disinfectant and 3 liters of disinfectant on an area of 667 square meters.

Recommended Parameters:

No more than 3-5 meters away from the operation surface. Note that the active ingredients in the medicinal solution are easy to volatilize if the drone is flying too high. (Refer to the local terrain for specific flight altitude, pay attention to ensuring flight safety).

Area	Chlorine content and dilution ratio	Liquid Amount Sprayed per mu	Speed	Height
Epidemic Zone	1000 mg/L, 100	3 – 5 L	2-3 m/s	3 – 5
Non-Epidemic Zone	500 mg/L, 50	3 L	3-5 m/s	meters



Safety First

Personnel Safety

Operator safety

During the operation, please avoid direct contact of disinfectant with skin and eyes. The take-off and landing area may be relatively narrow, pay attention to maintaining a safe distance from the drone.

Other personnel safety

Before operation, inform the residents about the operation task, and start operation **only when there are no people on the site.**

Within half an hour after the end of the operation, residents are advised not to be exposed to the area where the operation has been taken, to avoid adverse effects of disinfectants on the human respiratory tract.

There may be onlookers during the operation, please ensure that onlookers are outside the safety line during take-off and landing.

Flying over crowds is strictly prohibited.

Operation and Equipment

- Ensure GNSS Satellite Signal

High-rise buildings may block the drone's GNSS satellite signals greatly, and the drone may appear a situation of attitude-cutting (the drone cannot position and hover autonomously). Try to avoid flying at ultra-low altitude between high-rise buildings.

- Watch for Obstacles

There may be many obstacles in operation area, so it is necessary to ensure that the drone is in the visible range, and it is recommended to turn on the drone radar obstacle avoidance function.

- Monitoring Drone Power

It is necessary to pay attention to the battery power at all times and return in advance, and it is recommended to warm up the battery before take-off.

- Reduce Drug Loading

It is recommended to charge 80% of the rated capacity to ensure sufficient power redundancy to ensure flight safety.

- Control Flight altitude

The height of the agricultural drone cannot be higher than 30 meters, after reaching the height of 30 meters, the drone will hover in place, extra attention must be paid to the disinfection of high-rise buildings.

After Spraying

Cleaning and Equipment Maintenance

1. After the disinfection operation is completed, the residual chemical must be diluted and sprayed on the spot, the residual chemical must not be brought back, and the drone body and spray system must be thoroughly cleaned with water.
2. Workers should clean up all the protective equipment they wear in accordance with the sanitation and disinfection safety guidelines, clean up all the protective equipment that has worn and store them together with the drone in a special storage area away from people, animals, and living areas.
3. After the completion of each shift, workers should wash their hands, face, bathe and change their clothes in a timely manner, and pay attention to personal safety and hygiene protection at any time.