

SPISE Advice of the Periodical inspection of misting equipment

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Summary

All types of machines used to the application of pesticides must be inspected because of the EU SUD directive. This includes fogging and misting equipment used in Europe for treatments in greenhouses and other specialist indoor and outdoor applications. This machines are not covered by EN-ISO 16122:2 (2015), therefore SPISE has produced a SPISE Advice about the inspection of this kind of machines. This SPISE Advice covers all relevant inspection point for this type of machines.

Introduction.

Foggers are mainly used to control pests in closed environments, such as greenhouses or storage rooms. In some cases, they are used for specific outdoor treatments. They are available in portable and stationary versions or even bigger versions carried by a tractor/vehicle. Foggers produce very fine droplets varying from 1-50 µm with a Volume Median Diameter (VMD) that varies from 5 to 25 µm. Because of these very small droplet sizes there are additional inhalation risks for the operator, particularly for indoor uses (although some units are remotely controlled), and great care must be taken in outdoor uses due to the high risk of drift.

There are foggers working with different principles. The most common are thermal fogs, based on the principle that the droplets are created and transported by means of hot air made by the burning of gasoline. But also electrical fogs are on the market, where the heat for the creation of droplets is made by an electrical heat element and the transport of the droplets is done by a fan. In greenhouses often cold foggers are used, there the droplets are created by means of pressured air created by an (external) compressor and the transport of the droplets is done by means of a fan.

The main advantage claimed by this principle is the dual action when used in closed environments. Due to the “flushing” effect obtained with a fogger, insects (thrips, whitefly, etc.) leave their hiding place and fly up and then receive a lethal dose from airborne droplets. This effect is called the ‘space fumigation’ obtained by the smaller droplets < 10 µm. The bigger droplets (30 to 50 µm) will deposit on the crop which is interesting when using systemic agents, foliage fertilizers, etc. This effect is called the “deposit treatment”. Another advantage claimed by the system is that it is not time consuming. The operator only needs to start up the fogger and the machine does the rest.

The disadvantage of the system is the uneven distribution, unintended contamination from other objects (walls, ceilings, etc.) and high losses. The room needs to be well ventilated before re-entering after pesticide application.

Some machines generate slightly larger droplets (VMDs of between 50 and 100 micron), referred to as mists, that will directly sediment and deposit on a crop or other surfaces. Again most use in Europe is for specialist indoor applications (greenhouses, fly control in stables, post-harvest treatments, etc) and extra care needs to be taken in any outdoor use due to the risk of drift. Some specialist atomisers eg rotary atomisers, twin fluid atomisers, are commonly used for misting and the manufacturer’s instructions/recommendations for use should be strictly followed.



Pre-inspection of the machine

For the safety of the test-operator and to protect the environment and the testing-equipment to get contaminated, the inspection of the machine shall only start when it is made clear that the machine is safe and clean. Here for the item listed in 5.3 of EN-ISO 16122:1 (2015) can be used, but with thermal foggers special attention shall be given to the safety of the fuel system, with electrical foggers to the electrical safety and with cold foggers to the condition of the compressor and also to the electrical safety.

Requirements of the inspected machine

Leakage

- With the engine of the machine not running, with the tank(s) filled with clean water, there is no leakage at any part of the machine.
- With an operating machine, with the liquid flow to the nozzle blocked, there is no leakage at any part of the machine.
- With an operating machine, working with normal flow rate, there is no leakage at any part of the machine.

Spray Mix Agitation

- If an agitation system in the spray liquid tank is present, this system is functioning properly.
- There is a clearly visible agitation in the spray liquid tank.

Spray liquid tank(s)

- The spray liquid tank(s) is/are provided with a lid that shall be well adapted, in good condition.
- The volume of liquid in the tank(s) is clearly visible from the place the machine is filled.
- It shall be possible to empty the tank(s) without the use of special tools and without contamination of the operator and the environment.
- If present, all on the machine present provisions for cleaning the machine and the inner side of the spray tank, shall function and be in good condition.
- With a working machine there should be enough pressure accumulation in the spray liquid tank(s). This pressure is in line with the specifications of the manufacturer (normally 0,3- 0,4 bar).

Measuring-, controls- and regulation systems

- All present instruments for controlling the flow rate are functioning properly.
- All controls for the adjustment of the flow rate are functioning properly.
- All controls for switching on and off the machine and the atomization function properly.

(if present) Pressure Indicator(s)

- All analogue pressure indicators for the reading of the spray liquid pressure have a minimal diameter of 50 mm (measured according EN837-1)
- The scale division of analogue manometers is minimal 0.1 bar in the range of 0-5 bar.
- The pressure can be read from the operator's position. The scale should be appropriate to the working pressure range of the machine.
- The accuracy of the pressure indicators is maximal +/- 10% relative to the value read on the reference manometer.

Lines (pipes and hoses)

- Hoses and Lines are in good condition. These do not show extreme bending and/or wear and are not kinked. They are free from exceptional wear, cuts and cracks. Couplings are in good condition.

Filtering

- In the suction line of the pressure line is at minimum one filter present.
- The filter elements are in good condition, have no holes or cracks and are clean.
- The mesh size of the filter elements are corresponding to the demands of the manufacturer.
- Filters can be checked without emptying the spray liquid tank.
- Filter elements are changeable.

Flowrate / function machine

- The ignition (thermal fog) is function properly
- Functioning burner
- The burning system (thermal fog) is functioning properly
- The compressor (LVM) is functioning properly
- A trial run of the machine should be undertaken at the intended operational settings to ensure, by visual check, that the droplets are sufficiently fine and uniform (no dripping, etc).
- The flow rate of the machine does not differ by more than +/- 15% from the nominal flow rate according to the manufacturer's specifications when the machine has the intended nozzles fitted and with the engine running as in use.