Instruction Sheet
"Use of fog machines"[1] 2026

Fog machines and hazers may only be used after prior consultation with NürnbergMesse (Event Technology) in due time before the event and must be approved. The request must be submitted in writing.
NürnbergMesse must be notified of the type and model of fog machine used and the data sheet, the fog machine operating instructions and the safety data sheet for the fog fluid are to be submitted. Proof of regular inspections of the machine must also be provided if applicable.
NürnbergMesse will charge the organizer for the cost of substitute measures if firefighting appliances must be deactivated before operating a fog machine. The organizer and/or person responsible will be charged for the cost of calling out the fire brigade and the subsequent costs resulting from the interruption or cancellation of the event if the fire alarm system is set off without prior consultation with NürnbergMesse.
The use of fog machines in exhibition areas may not impair the operation of the trade fair or other stands and any health risk to visitors and employees must be ruled out.
Only fog machines and hazers conforming to the basic requirements of the current Product Safety Act (ProdSG) may be provided and used.
The type of use and the specific operating conditions must be taken into account when selecting fog machines. The user of the fog machines must be in possession of the relevant operating instructions.

The following regulations must be observed in the selection and operation of fog machines:

- **DGUV Information 215-312 "Safety at Events and Productions – Pyrotechnics, Fog and Other Stage Effects"**
- **DGUV Information 215-315 "Safety at Events and Productions– Special Stage Presentations"**

General hazards associated with the use of fog machines

The conditions for the use of fog effects are based on the performance requirements and an assessment of the risk.

The fog is to be limited to the necessary amount and agreed with all concerned. Suitable measures are to be implemented to reduce the fog as much as possible in areas in which it is not required for performance effects. When used in an exhibition stand, it must be ensured that adjacent exhibition stands and hall gangways are not impaired by the use of fog machines or hazers.

The following hazards are to be included in the risk assessment of all types of fog production:

- **Visibility obstructions**
  Obstacles, places with a risk of falling or injury like stairs, lowered areas, exits, sharp edges, etc. are to be marked especially clearly if fog is used, likewise escape routes and emergency exits.
  If thick fog is used and obstacles, hazardous areas or their marking are not visible, special care is necessary to avoid these hazards.
  Fog must not cause warning and safety equipment and particularly escape route signs to become unrecognizable.
- **Risk of slipping**
  Fog directed onto a cold and smooth surface from a short distance away can cause condensation. Even thin layers of moisture can cause a risk of slipping and constitute a hazard, particularly for dancers, artistes and all other actors within the range of the fog machines.
  Measures must be taken to prevent condensation and the accompanying risk of slipping occurring within a radius of one to two meters.
  Condensation on the performance area and spilt fluids must be removed as quickly as possible.
- **Reaction of respiratory passages**
  As a high concentration of fog can cause a reaction in susceptible persons (e.g. dryness of the respiratory passages due to the hygroscopic property of fog), the use of fog must be notified in good time before the event.
  Higher concentrations may especially occur in the performance area.
- **Creation of hazardous substances through inappropriate use**
  Fog fluids and additives (e.g. fragrances and processing aids) are only to be used in fog machines if they are declared as suitable for the machine by the manufacturer. The instructions for use apply.
  The arbitrary mixing of fog fluids with fragrances and other additives is not allowed and users are not to mix different fog fluids or prepare their own fog fluids.
- **Risk of fire and explosion**
  Fog fluids that are inflammable, easily flammableor highly flammable within the meaning of Art. 4 of the current Hazardous Substances Act (German GefStoffV) must not be used.
  The fog produced must not create any flame in the outlet area and must not be combustible. No ignition sources are to be located near the fog outlet. A safety clearance of at least one meter is to be maintained. Fog fluids may only be stored in the manufacturer's original containers.
  If fog is used in rooms, buildings or halls monitored by automatic fire detectors, the fire alarm system must be deactivated within the range of the fog machines.
  In this case, equivalent substitute measures are to be implemented, for example, a fire safety guard at the expense of the perpetrator.
  Because of the open building structure in parts of the site (e.g. entrance areas, congress centres, etc.) or the layout of automatic fire alarms in inaccessible areas, the use of fog machines may also be prohibited in general.
  Fog machines not in use are to be disconnected from the mains to prevent the risk of fire through overheating after a fault.
- **Risk of malfunctioning of fog machines**
  Only properly maintained fog machines are to be used and these must pass a visual and functional inspection without faults. Unpleasant smells, machines that do not work correctly or the discharge of unvaporized fluid indicate defective operation. Such machines are to be serviced or repaired.
  Technical maintenance is to be performed at regular intervals by the manufacturer or in accordance with the manufacturer's instructions.

Types of fog production:

Fog through cold	typical:	for ground fog, e.g. using dry ice, liquid nitrogen
Fog through heating	possible:	clouds, room fog, mist, also ground fog, e.g. vaporizer
Fog through mech. methods	typical:	mist, e.g. atomizer method (crackers)

Fog through cold: e.g. "DRY ICE"

Ground fog is usually produced by vaporizing dry ice, which is frozen carbon dioxide (CO_2). The fog is distributed passively or with the help of a low-power fan.
Dry ice fog machines are equipped with a water tank and electric heating elements in the tank heat up the water to temperatures near the boiling point depending on the system. Measures to protect against scalding may be necessary depending on the temperature of the water bath.
Carbon dioxide gas is heavier than air. It can accumulate in low areas and force out the air. This constitutes a risk to life in performances at floor level – for example, persons lying on a floor covered with dry ice fog.
A risk of poisoning or suffocation exists if the concentration of carbon dioxide is not sufficiently diluted. To protect against these hazards, measures must be taken to prevent the accumulation of carbon dioxide in hollows and low areas. This may require extracting the (invisible, odorless) carbon dioxide from hollows and discharging it into the outside air.

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Dry ice is very cold (minus 80 °C) and can cause frostbite on direct contact. Dry ice and any residues are to be stored to prevent access by unauthorized persons.
Personal protective equipment is required for handling dry ice: protective gloves, gloves insulated against the cold and, if necessary, safety goggles.

The hazards and protective measures necessary for using nitrogen for fog production differ only slightly from those for handling dry ice.

Fog through heating: e.g. "VAPORIZER"

Most fog for stage effects is created with vaporizer fog machines.

In these machines the fog fluid is sucked out of a tank or container, heated and pressed through a jet. The fluid is a mixture of alcohols and water. The alcohols used are hygroscopic. The bonded water forms the fog after passing though the jet and the cooling and expansion processes. The properties of the fog produced can be influenced by the choice of fog fluids and the machine settings.

Ground fog can also be produced with the aid of attachments. Here the fog from a vaporizer fog machine is cooled until it is distinctly heavier than air and sinks correspondingly quickly.

To provide information about the ingredients of the fog fluids or fragrance additives, the manufacturer's information and a safety data sheet must be requested and be available for inspection at the event. Only fog fluids with vaporization temperatures that match the temperature of the vaporizer are to be purchased.

Risks can occur if inferior quality fluids are used with component properties that are irritating or damaging to health.

The addition of fragrance additives to the fluid and exceeding the stated optimum fog temperature of the fluid must be carefully avoided to exclude possible hazards through unknown reactions.

There is a risk of burning on the hot surface of the fog outlet. It may also be necessary to wait until the machine cools down before removing protective covers.

Fog through mechanical methods: e.g. "atomizer method" (crackers)

Oil crackers atomize oil by mechanical means without heating it. The oil mist produced is very stable and does not mix with the surrounding air.

Water/glycol crackers atomize the fog fluids in the same mechanical way as oil crackers. The fog fluid consists of water and polyvalent alcohols.
The condensation deposited by the fog on general traffic areas or on equipment – such as performance areas, decorations, trusses and machines – is a problem, as it creates a risk of slipping.
Oil fog and water/glycol fog are preferably used only in areas that visitors or the cast do not need to enter.
The condensation must be removed as quickly as possible.
Attention must also be paid to the special features of operating compressors and accessories. The system is to be depressurized before changing fittings, hose connections or additional elements.

For further information, please contact:

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[1] **Instruction sheet contains excerpts from: OHS information DGUV Information 215-312.**