Hygiene inspection / cleaning / disinfection Space Air Technical – Investments

The aim of a hygiene inspection, cleaning and disinfection measure in air conditioning systems is the hygienic safety for persons who depend on the fresh air supply of such systems.

Hygiene inspection

A hygiene inspection is the prerequisite before and after a disinfection measure. A hygiene inspection must be carried out under the following technical conditions.

a) Before commissioning a new air conditioning system, a hygiene inspection including microbiological examination (in accordance with VDI 6022) must be carried out by a qualified specialist (expert) following a test in accordance with EN12599 and cleaning / fine cleaning. This includes

Contact samples

- Airborne measurement
- Determination of Legionella in circulating water systems

b) Regular hygiene checks including visual inspections should be carried out at least once every 1 to 2 years for humidified air conditioning systems and every 2 to 3 years without humidification. This includes Visual inspection and microbiological tests by means of

- Gossip samples

- Airborne germ measurement (fresh air / supply air / exhaust air / if necessary also room air)
- Determination of Legionella in circulating water systems

c) For each technical maintenance, a regular visual inspection, which can give indications of hygiene problems, should be carried out. A visual inspection is included

- impurities
- lime deposits

Corrosion Position surface damage

- Liquid leakage (for example in the case of air washers, cooling coils, drives, etc.)

d) A corresponding documentation is required for all controls listed above (a / b / c) and the client resp. to hand over to the responsible person for the maintenance. It is recommended that maintenance personnel receive a ready-made log for maintenance and visual inspection.

1) Cleaning

A technically qualified cleaning of the air conditioning systems (supply and exhaust air) is as Preparation for a subsequent "successful disinfection measure"
unavoidable. This applies to current and new, not yet commissioned, facilities. On the basis of empirical values one should divide the cleaning before disinfection in 2 areas,

0 Coarse cleaning 0 Fine cleaning

a) Rough cleaning (brush clean according to VDI 6022)

By this is meant that "all air-contacting surfaces" are cleaned by brushing, brushing, sweeping, vacuuming, blowing off, evaporating, wet / wet and dry wiping. For visual inspection, the surfaces must be considered clean. Evidence can be obtained by measuring dust surface density. Cleaning should only be done by trained personnel. At least one on-site employee must be familiar / trained with the design and function of HVAC systems. Lt., ÖNORM H 6021, the cleaning staff should have a hygiene training according to VDI 6022.

b) fine cleaning
By this is meant that after a rough cleaning all air-contacting and accessible surfaces as well as plant parts, in the sense of the preparation of a disinfection measure, on lime deposits, corrosion spots, surface damage, residual contamination, etc..., are scrutinized. These include, in particular, hard to clean areas (joints, corners, (filter) holders, sealing areas, heat / cold registers, etc.). If defects are found, they must be remedied before the disinfection begins. For example, Cleaning of cracks, joints, corners, holders by means of small brushes, tools, removal of lime scale deposits by means of lime scale removers, etc.
Before the actual disinfection, all essential surfaces are wiped damp / dry with a surfactant-based disinfectant approved for medical applications to remove residual dust, grease deposits, etc…… completely remove.

2) Disinfection

With the term "disinfection" is the surface disinfection of the
Designated system components. Here are "also inaccessible
Positions "such as internal fins of the heat and cold registers, fan blades and the like included.
Not included is a water disinfection (e.g. in the air scrubber) as well as the disinfection of sealed containers (e.g. control cabinets installed inside the air conditioning) which are not reached with the dry mist.

It is essential that in the context of disinfection all microorganisms are also reached in difficult or inaccessible places, otherwise strong, z.T. resistant surviving germs have the chance to spread faster and more efficiently due to an unrivaled situation. A resistant monoculture of microorganisms can cause massive problems.

The preferred disinfectant is approved for medical applications (VAH - Association of Applied Hygiene), specially stabilized chlorine dioxide, (ClO_2) which is the most effective
Oxidizer completely eliminates all germs including spores at low concentration and very short contact time without leaving dangerous residues and causing damage to materials. Germs can not build up resistance to ClO_2.

As application technology, a specially developed dry misting nozzle is used, which brings about 50% of the ClO_2 into the gas phase immediately after application and leaves about 50% in the droplet phase (<10 µm).

Disinfection is considered successful if inactivation of the microorganisms by 4 logs level = 99.99% = by a factor of 10,000 is achieved.

3) Execution of a cleaning and disinfection measure

The assessment of the plant is carried out by an expert by means of air-trapping and contact test and shows the need or scope of a disinfection measure.

The combined coarse and fine cleaning is done in one operation carried out as follows.

a) dry brushing of visible deposits
b) Checking the mufflers for damages such as Fiber discharge, etc.
c) removal of corrosion spots with suitable tools and subsequent post-galvanizing / recoating
d) Removal of lime scale (manual and / or chemical)
e) replace filter if necessary (depending on condition) before cleaning,

f) Blow off the register and silencer
g) sucking out all horizontal surfaces
h) Pre-spray registers with acidic (lime) and / or basic (grease) cleaning agent and allow to act. Then rinse with water and dry. Lime and fat deposits must be eliminated by means of 2 passes, first fat then lime.

i) Wipe all accessible surfaces with a "soft, basic cleaner" dissolved in "fully distilled water". The wiping begins after the outside air, section by section in the direction of supply air duct. Then the exhaust air system is wiped. For each section a fresh mixture of detergent and distilled water is used! After each wipe, the surfaces are wiped wet with pure distilled water and dried with a cloth.

j) Fine cleaning of joints, edges, rotor blades, resp. all posts which were not reached with the coarse mop cleaning.

k) Depending on system / part condition, wipe off all critical areas (e.g., filter edges, register surfaces, etc.) with a disinfectant surfactant which may be used in medical settings.

The disinfection becomes after successful pre-cleaning as follows carried out.

a) All parts of the system, in particular the registers, silencers, filters, supply pipes, etc. are manually atomized with chlorine dioxide 2x. After each manual atomization, an exposure time of approx. 10 minutes is provided.
b) After manual pre-fogging, all sections of the system are individually atomized by means of an automatic device, that is to say that the closed space is completely filled up with ClO2. The exposure time is about 30 to 45 minutes.
c) In some cases the automatic full fogging will be 2x carried out.
d) The system may take approx. 60 minutes after completion of the Disinfection measure to be put back into operation.

The conditions required for cleaning and disinfecting

conditions, means, technology, personnel and results.
a) For degreasing, a material-friendly, environmentally friendly, solvent-free alkaline cleaner, based on a composition with natural glycosides, alcohols, phosphates, silicates is required.
b) For system disinfection with superficial atomization, based on experience, effectiveness and safety reasons, only stabilized chlorine dioxide (ClO2) with a VAH approval recognized in Austria and Germany, for non-mechanical use in medical applications (hospitals, etc.).
c) For mechanical wipe disinfection, based on experience and for safety reasons, there is only one product based on quaternary ammonium compounds (QA's) with VAH approval, for mechanical applications in the area medical applications (hospitals, etc.).

d) For fine atomization a special nozzle technology is used which is capable of producing the stabilized chlorine dioxide immediately after extraction into approx. 50% gas and approx. 50% bound in water droplets to bring phase.
e) Demands a disinfection result with an inactivation of Microorganisms by 4 log levels = 99.99% = by the factor 10,000 within the RLT facility.

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IN ACCORDANCE WITH THE REACH-ENACTMENT (EG) -Nr. 1907/2006, art.31 appendix II

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