IMP KLIMA
AN ORANGE CLIMATE COMPANY

Hygienic air handling units

Applicable standards overview

Contents

This brochure is a short overview of key requirements of the following applicable standards for air handling units in hygienic version, listed in chapters for each functional unit.

- **DIN 1946-4 (09/2018)**
- **VDI 6022, Sheet 1 (01/2018), VDI 3803, Sheet 1 (05/2020)**
- **ÖNORM H 6020 (06/2019), ÖNORM H 6021 (08/2016)**
- **SWKI VA105-01 (08/2015)**

The source of this summary are the full versions of the above-mentioned standards. For each requirement, the chapter number from the original German document is stated.

Materials & Surfaces

DIN 1946-4

6.1.2	Supply and recirculation systems must be made of materials in the air-conducting area that neither emit substances that are hazardous to health nor form a breeding ground for microorganisms. It must be ensured that only devices and system components are used that do not emit harmful substances, fibers, and odors into the air flow or the rooms. Porous linings (e.g., Telephony silencers) in the air stream must be protected with suitable abrasion-resistant material (e.g., glass silk fabric or sheet metal).
6.1.2	Air-conducting surfaces and components/built-in parts must be designed and manufactured to be smooth (in particular burr-free due to the risk of injury) and abrasion-resistant to prevent dirt deposits and to ensure that they can be cleaned.
6.5.1	The casing materials and the components that are in contact with the air flow must be resistant to disinfectants.
6.5.1	The design of the components of central air handling units must comply with the requirements of EN 1886 and EN 13053.
6.5.1	All surfaces exposed to airflow, including components, must be at least Sendzimir galvanized and coated (coil coating of at least 25 µm, powder coating, or 2-layer wet painting with primer and top coat of at least 60 µm).
6.5.1	Sealing profiles must be closed-pored and must not absorb moisture. Seals must be inserted, clamped, foamed, but never glued to doors and filter mounting frames. Glued seals are only permitted on the filter insert and only for one-time use; they are disposed of when the filter is changed.

VDI 6022-1

6.1.1	The materials, surface design, and geometric shapes of the system components are intended to prevent adhesion, deposition, and release of contaminants.
6.1.1	Air-conducting components must be made of materials that neither emit substances that are hazardous to health nor give off odors, nor can they form a breeding ground for microorganisms – proof can be provided, for example, following EN ISO 846. Metallic surfaces meet these requirements if they are swept clean.
6.1.1	Bracing must be carried out using round profiles, to avoid sharp-edged bends, and transition pieces as well as unnecessarily long sections extending into the air flow. Avoid self-tapping screws or rivets.
6.1.1	The surfaces must be abrasion-resistant.

VDI 3803-1

5.6	The materials, surface design, and geometric shapes of the system components are intended to prevent adhesion, deposition, and release of contaminants.
5.6	No breeding ground for microorganisms must be formed.
5.6	No substances hazardous to health may be emitted.
5.6	The surfaces must be abrasion-resistant, smooth, and permanently corrosion-resistant.
5.6	Open-pored linings, open-pored insulation materials, or open-pored seals in contact with the air flow are not permitted.
5.6	The materials must withstand mechanical stress in all operating phases of the air conditioning system.
5.6	The materials must be cleanable.
5.6	If disinfection is necessary, the ability to disinfect and resistance to disinfectants must be demonstrated.

ÖNORM H6020

6.1	Components such as air heaters, air coolers, and humidifiers should be easy removable and readily accessible from the operator's side. They must be corrosion-resistant, easy to clean, and disinfectable if necessary. They must not emit any substances or odors that are hazardous to health.
6.1	The materials of the components must be harmless to health and must not provide a breeding ground for microorganisms.
6.1	All connecting pipes for hot water, cold water, steam, or drinking water to the components of the air conditioning system must be laid in such a way that the components can be easily removed by opening detachable connections.
6.1	The casing materials, the design of the components as well as the corrosion, sound and fire protection measures must meet the requirements of EN 1886 and EN 13053.
6.1	Regardless of the room class, all components of a central air handling unit (AHU) that come into contact with air of high humidity and where there is a risk of condensation must be made of stainless steel (e.g. B. stainless steel of steel grade 1.4301 according to EN 10088-1) or equivalent.)
6.1	Sealing profiles, e.g. in the area of doors and filters, must not be open-pored and must not absorb moisture or emit odors.
6.2	The cabling must be carried out using the shortest route and using airtight screw connections.

ÖNORM H6021

4.2	When using non-metallic materials that are in direct contact with the airflow, it must be ensured that they do not promote microbial growth. This requirement can be verified following EN ISO 846.
4.2	By using suitable connecting and sealing materials, as well as supporting frames, it must be ensured that the required level of cleanliness and functionality is permanently maintained and that internal cleaning is not made more difficult or hindered.

SWKI VA105-01

B1	If only certain disinfectants are suitable, this must be explicitly stated in the manufacturer's maintenance instructions.
B1	Surfaces exposed to the air flow must be at least sendzimir galvanized and/or coated, whereby the bottom part of the casing, including the slide-in rails of components and all other surfaces in the bottom area that come into contact with moisture, must be made corrosion-resistant (at least stainless steel 1.4301, AlMg, or equivalent).
B1	The use of sprayable joint sealants should be avoided if possible and is only permitted in joint areas and to a small extent.

Casing

DIN 1946-4

6.5.1	The floor area, including the slide-in rails of components and all other surfaces that come into contact with condensation/water, is made of corrosion-resistant stainless steel or an aluminum alloy.
6.5.1	Interior wall surfaces must be technically smooth and without exposed absorption surfaces, while the floor area must be designed without grooves and depressions.
6.5.1	Smooth, elastic connecting pieces made of closed-pore material without grooves or depressions (no flexible connection with folds).
6.3.1	Connections and fastenings, such as threads, screw shafts and internal flanges, must be designed in the air-conducting area in such a way that the risk of injury, e.g. during inspections, is excluded and that the ability to clean is ensured.
6.1.4	Permanent and obvious labeling of the enclosures and individual components with airflow direction.
6.5.1	Requirements of EN 1886 and EN 13053 (current version).
6.5.1	For inspection of components, the installation of sight glasses (at least 150 mm in diameter, or equivalent cross-section) in conjunction with internal lighting with a smooth surface is required. Luminaires with grille covers are not permitted.
6.5.1	For unit housings with a clear height =< 0.8m, at least easily removable covers must be provided, and for larger unit housings and chamber control units, a sufficient number of service doors must be provided.
6.5.1	The individual components of the air handling units must be accessible for cleaning from the inlet and outlet sides, or they must be easily and safely removable if the unit height is < 1.6 m.
	The following requirements according to EN 1886 must be met.
6.5.3	Mechanical stability corresponds to at least class D2.
6.5.3	Tightness class corresponds to at least class L2.
6.5.3	Filter bypass leakage maximum 0.5 % of the nominal volume flow (class PM1/ ≥ 80)
6.5.3	Thermal insulation of the device housing at least class T2.
6.5.3	To avoid condensation caused by temperatures falling below the dew point, the thermal bridge factor must be at least TB3 (M). For internal temperatures in the outside air chamber below -7 °C or for weatherproof designs, the thermal bridge factor TB2 (M) must be observed.

VDI 6022-1

6.3.5	Housing construction according to DIN EN 13053 or for devices for domestic ventilation according to EN 13141-7.
6.3.5	The housing design must comply with the requirements of DIN EN 1886 and VDI 3803 Sheet 1.
6.3.5	Grooves and joints in the bottom area of the unit must be avoided or closed.
6.1.2	Compliance with the required tightness class according to EN 12237, EN 1507, and EN 16798-3.
6.3.5	Interior wall surfaces must be smooth and free of exposed adsorption surfaces and insulation materials.
6.6	Labeling of the individual components.
6.3.5	Good accessibility of the components for necessary inspection and cleaning work (covers for unit housings < 1.6 m clear height, doors from 1.6 m clear height).
6.3.5	Sufficient space must be provided for maintenance. All components and fittings must be arranged so that they are easy to maintain.
6.3.5	Inspection glass (diameter at least 150 mm) in conjunction with an interior light in the humidifier door.
6.3.5	Inspection glass (diameter at least 150 mm) in conjunction with interior lighting in the door of the filter chamber (from a clear housing height of 1.60 m).
6.3.5	Inspection glass (diameter at least 150 mm) in conjunction with interior lighting in the device door of the fan chamber (from a clear housing height of 1.60 m).
6.3.5	Electrical cables must be routed through the housing using suitable cable glands and pipes using suitable rosettes, and cables must be laid using the shortest route possible without empty conduits.
6.3.5	Cooling pipes must be routed through the housing in such a way that condensation due to temperatures falling below the dew point is safely avoided.
6.6	Compliance with minimum distances for the operation and maintenance of the installed components.

VDI 3803-1

6.1	The wall structure shall be double-walled with insulation in between.
6.1	The surface finish of the housing should correspond at least to the quality level of Sendzimir galvanized sheet steel.
6.1	For reasons of corrosion protection, units intended for outdoor installation should also have a coating or paint applied to the outer shell.
6.1	For reasons of corrosion protection, hygiene equipment must be coated at least on the inside (powder coating, coil coating, or two-layer wet painting with primer and top coat), and the floor must be made of stainless steel (at least 1.4301) or aluminum (corrosion-resistant, at least AlMg3).
6.1	The mechanical stability must not be less than class D2 according to EN 1886.
6.1	The housing leakage must not exceed class L3 according to EN 1886. In case of increased requirements, class L2 must be applied.
6.1	The thermal insulation must correspond at least to the housing class of the thermal transmittance T4 according to EN 1886.
6.1	If there is a risk of the temperature falling below the dew point with condensate precipitation (e.g. coolers < 13 °C), at least the thermal bridge factor TB4 according to EN 1886 must be observed.
6.1	Protection against injuries caused by sharp edges or pointed objects must be ensured.
6.1	All parts of the device must be easily accessible for inspection and cleaning. For this purpose, doors or inspection covers with suitable locks must be provided in sufficient numbers.
6.1	Doors must be used for walk-in devices (device housing with a clear height of > 1.6 m). These must also be able to be opened from the inside. Doors on vulnerable components must be secured against unauthorized opening (e.g., with a special tool or key). Pressure-side doors must be protected against slamming open. These devices must not be able to be deactivated.
6.1	Weatherproof devices must be equipped with door locking devices and an overhang roof with a drip edge.
6.1	In the case of weatherproof units, the intake and exhaust openings must be equipped with suitable weather protection devices that provide weather protection even when the device is not in use.
6.1	Intake chambers must also be equipped with a corrosion-protected bottom pan, e.g., stainless steel (at least 1.4301) or aluminum alloy (corrosion-resistant, at least AlMg3) with proof of suitability as described in section 6.2.5, for efficient drainage of incoming water.
6.2	All air-conducting components must be able to be inspected, cleaned, and, if necessary, disinfected with reasonable technical effort.
6.2	All components must be accessible and cleanable from the operator's side; appropriate space and access must be provided.

ÖNORM H6020

6.4	For cleaning, the interior wall surfaces must be smooth and without exposed linings (sound and thermal insulation).
6.4	The floor area shall be designed without grooves and depressions so that effective manual wiping or mechanical cleaning can be carried out over the entire surface without leaving any residue.
6.4	Mechanical stability at least class D2 according to EN 1886
6.4	Casing leakage at least class L2 according to EN 1886
6.4	Filter bypass leakage maximum 0.5% of the nominal volume flow according to EN 1886
6.4	Thermal insulation of the device housing at least class T3 according to EN 1886
6.4	Thermal bridge factor TB3 according to EN 1886
6.22	Labeling of system components (in German, permanent)
6.2	The cabling must be carried out using the shortest route and using airtight screw connections are made
6.4	For the connection of the air ducts to central air handling units and fans, smooth, elastic connecting pieces made of non-porous material without grooves or recesses must be provided (no flexible connection with folds).
6.4	In the case of a non-walk-in unit housing (clear height less than 1.6 m), removable panels or doors must be provided, and in the case of a walk-in unit housing, doors must be provided for maintenance and repair work.
6.4	The individual components of the central air handling units must be accessible for cleaning from the upstream and downstream sides or, alternatively, easily extendable if the unit has a clear height of less than 1.6 m.
6.4	All components must be arranged so that inspections, maintenance, and checks (including filter changes) can be carried out with the least possible effort.

SWKI VA105-01

B8	The choice of materials and/or corrosion protection treatment for the equipment must be determined according to the intended use of the system, but must at least comply with quality level 2 (SWKI 92-2 B). For special systems (e.g., corrosive exhaust air), quality level 4 (SWKI 92-2 B) must be selected.
B8	Mechanical stability at least class D2.
B8	Casing leakage at least class L2.
B8	Filter bypass leakage maximum 0.5% of the nominal volume flow.
B8	Thermal insulation of the device housing at least class T3.
B8	Only double-walled enclosures with thermal insulation in between may be used.
B8	In the area of the installed components (fan and humidifier sectors), sight glasses of approximately 30 cm in diameter must be installed.
B8	The fan and humidifier sectors shall be equipped with interior lighting.
B8	The inside of the units must be as smooth as possible and have few joints so that they can be easily cleaned.
B8	To facilitate cleaning, an inspection section with a tray must be installed between the intake opening and the first air treatment component in the air handling unit.
B8	Accessibility must be ensured by removable covers or doors.

Damper

DIN 1946-4

6.4.1	The damper must meet at least a leakage loss class 2 according to EN 1751.
6.4.1	If the drive for the individual damper blades is via gears, these must not be in direct contact with the transported air flow.
6.4.1	The current damper position (open/closed) must be visible on the outside of the damper.
6.4.2	Fresh air and exhaust air dampers must be designed and constructed to be corrosion-resistant, made of stainless steel (e.g., material no. 1.4301) or an aluminum alloy (e.g., AlMg).
6.4.2	Dampers for increased tightness requirements (airtight dampers) must correspond to at least a leakage rate class 4 according to EN 1751.
6.5.6	For outdoor units, dampers must be installed inside. For indoor units, outside air dampers must be installed either inside or outside with double-layer insulation.

VDI 3803-1

6.2.9	Shut-off dampers must be provided on the outside air and exhaust air sides to prevent air flow through the system when it is at a standstill.
6.2.9	Air control and shut-off valves must correspond to at least a tightness class 2 according to EN 1751.
6.2.9	The incoming flow velocity shall be limited to 5 m/s.
6.2.9	Outside air dampers must be installed internally or insulated (double-shelled with insulation in between).
6.2.9	In weatherproof units, all dampers must be arranged on the inside.
6.2.9	The surface of the outside air damper should consist of at least hot-dip galvanized and coated sheet steel.
6.2.9	The position of the dampers must be visible from outside.

ÖNORM H6020

6.5.1	When the system is shut down, no air can be transported through the air duct systems due to wind pressure, buoyancy, or similar factors. Such air flows must be prevented by closed air dampers with a tightness requirement (tightness class 2).
6.5.2	A shut-off damper must be provided at the outside air inlet of the central supply air unit and at the exhaust air outlet of the central extract air unit.
6.5.2	The dampers must be corrosion-protected, at least made of galvanized sheet steel.
6.5.2	These dampers must close automatically in the event of a power failure.
6.5.2	The damper position (open/closed) must be visible on the outside of the damper.
6.5.2	The shut-off dampers must comply with tightness class 2 according to EN 1751 (classification of leakage when the valve is closed).
6.5.3	A shut-off damper is considered to be highly tight if it complies with EN 1751 tightness class 4 (classification of leakage when the damper is closed) and has been tested at a differential pressure of 500 Pa. The tightness class is confirmed by a test certificate (factory test certificates according to EN 10204) for this type of construction.

SWKI VA105-01

B9.1	Air conditioning systems must be designed in such a way that no air can be transported through their air duct networks, even due to wind or buoyancy pressures, which could reduce the quality of the air purity in the building.
B9.1	Air handling units must be equipped with dampers for exhaust, supply, extract, and fresh air openings, as well as air duct connections. These must meet at least tightness class 2 according to EN 1751.
B9.1	The current damper position (OPEN/CLOSED) must be visible on the outside of the damper.
B9.2	Outside air shut-off dampers shall be installed before the first air treatment stage.
B9.2	Airtight dampers must comply with at least class 4 according to EN 1751.

Humidifier

DIN 1946-4

6.5.11	For hygienic reasons, only humidification systems with steam that is harmless to health are permitted.
6.5.11	The humidifiers must be designed in such a way that, in case of operation or failure of the air handling unit, and lack of or insufficient supply air volume flow, no droplet formation occurs in the supply air volume flow downstream of the humidifiers.
6.5.11	Humidification systems must be fully accessible, inspectable, and cleanable.

VDI 6022-1

6.3.7	Only materials that do not promote microbial proliferation and are permanently corrosion-resistant may be used.
6.3.7	The components for air humidification must be easily accessible. They must be designed so that the water-carrying areas can be inspected, checked, and cleaned at any time.
6.3.7	Humidifiers may only be used in front of air filters or silencers if the necessary humidification distance is observed; water ingress into air filters and silencers must be avoided in any case.
6.3.7	Microbial proliferation in humidification systems, even during downtimes, must be avoided.
6.3.7	The operating status of the lighting must be visible from the outside.
6.3.7	A possibility of darkening the viewing opening (except for steam humidification) must be provided. No light from outside may penetrate through the humidification housing.
6.3.7	Condensate trays must be provided with an inclination on all sides towards the water drain, even when installed, and a siphon to prevent leaks on the air side. A direct connection of the water drains to the sewage network is not permitted.
6.3.7	If the air conditioning system is shut down or fails, the humidifier must be switched off automatically. The necessary pre-run shutdown must ensure that the humidifier chamber can be dried out beforehand during a scheduled shutdown.
6.3.7	It must be ensured that the tank and pipes can be completely emptied during system downtimes or periods of no humidification requirement lasting longer than 48 hours. The aim is to empty the system sufficiently so that the water residues left over due to surface tension can be completely dried by "running dry" the system.
6.3.7	Droplet separators and rectifiers must be designed to be easily dismantled for replacement or cleaning.

VDI 3803-1

6.2.10	Components for air humidification must be easily accessible. They must be designed so that areas exposed to water can be inspected, checked, and cleaned at any time. Components such as droplet separators or rectifiers must be easily removable for cleaning purposes.
6.2.10	All water-exposed components of humidifiers and the downstream air treatment components must be corrosion-resistant.
6.2.10	The inner sides of the humidification section, as well as the inner surfaces of the section immediately following humidification, must consist at least of galvanised and additionally coated sheet steel (powder coating, coil coating, or two-layer wet painting with primer and top coat).
6.2.10	Humidification systems must be equipped with condensate trays with an inclination on all sides towards the drain.
6.2.10	Humidifiers must switch off automatically as soon as the air conditioning system is switched off or fails. In the case of a planned shutdown, a pre-run circuit (fan run-on) must ensure that the humidifier chamber is dried beforehand by the air flow.
6.2.10	For inspection purposes, viewing openings (at least 150 mm in diameter) with the option of darkening (except for steam humidifiers) must be provided. In addition, a lighting device must be integrated in such a way that its operating status can be seen from the outside and, if installed outside, no light can penetrate the humidifier chamber when the lighting is switched off.

ÖNORM H6020

5.3.2	The operation of humidifiers in the outside air/supply air using circulating water is not permitted.
6.13.1	Humidification must not impair the microbiological and chemical quality of the air.
6.13.1	The humidification equipment must be corrosion-resistant, easily accessible, and easy to clean and disinfect.
6.13.1	The inner surfaces of the housing of the central unit must be made of stainless steel (at least steel grade 1.4301 according to EN 10088-1).
6.13.1	All installations must meet the quality requirements of drinking water installations.
6.13.1	In the case of humidification systems, it must be ensured that droplet formation or condensation does not occur under any circumstances, even in the event of a failure of the ventilation system or if the supply air volume flow is missing or too low.
6.13.1	The length of steam humidification systems must be dimensioned in such a way that no condensation occurs in the supply air system and no wetting of the downstream components (e.g., air filters) occurs.

6.13.1	In addition to easy accessibility, the humidification system must also provide the possibility of observing its function (e.g., sight glass).
6.13.1	The installation of a drip tray with a drain shall be provided.
6.13.1	Humidification with steam poses the lowest risk of microbiological and hygienic impairment. Therefore, this type of humidification should be used preferentially.
6.13.1	To avoid condensation in the air duct system, the supply air fan must be allowed to run for a sufficiently long time before and after switching on and off the humidifier (recommendation: 10 minutes each).
6.13.2	If other air humidification systems are used, their microbiological and hygienically safe equivalence with steam air humidification must be demonstrated and confirmed by an expert opinion; the addition of biocides or other additives is not permitted.

ÖNORM H6021

4.3.4	Humidification must not impair the microbiological and chemical quality of the air.
4.3.4	The humidification section must be corrosion-proof, abrasion-resistant, easily accessible, and easy to clean and disinfect.
4.3.4.1	The condensate drains must be designed in such a way that, in supply air systems, no solid, liquid, or gaseous contaminants of any kind enter the supply air flow from the condensate drains when the system is at a standstill or in any operating condition.
4.3.4.2	Requirements when using water for air humidification are no recirculation of excess spray water (no water circulation), use of atomizing nozzles, devices for aerosol-free evaporation, e.g., ceramic bodies.
A.2	The drip trays must be sized to collect all the condensate that occurs.
A.2	The unhindered drainage of the condensate from the tray must be ensured.
A.2	Observation options must be provided to monitor the functionality of humidification systems. This can be achieved, for example, by installing sight glasses in the central units.

SWKI VA105-01

B4	Supply air humidifiers may only be used if their safety has been proven.
B4	Only materials that are permanently corrosion-resistant, such as stainless steel of at least 1.4301 or suitable plastics, may be used for humidifiers and humidification chambers.

Filter

DIN 1946-4

6.5.7.1	Filter sections are designed so that the filters are always accessible and visible.
6.5.7.1	Easy, safe, and damage-free installation and a tight fit of the filters are possible.
6.5.7.1	Filter change on dirty side, no lateral change.
6.5.7.1	For maintenance purposes, the space required for changing the filter (at least the length of the filter) must be provided in front of the filter unit with access via a door or inspection opening. Extendable filter frames (for removal perpendicular to the air flow direction) are not permitted for room class I and are not recommended for room class II.
6.5.7.6	Signage (necessary information on filters: nominal air volume flow, number of filter stages, air filters used, filter type, filter class, dimensions, final pressure drop) is available.
6.5.7.2	The air filters used must be free of residues.
6.5.7.6	Filter systems of the 1st and 2nd filter stages must each be equipped with their own differential pressure gauges.

VDI 6022-1

6.3.9.3	Filter classes according to VDI 6022 6.3.9.3 (based on EN 16798-3).
6.3.9.1	Filters used must be tested by EN ISO 16890-1 or EN 1822 and individually visibly marked.
6.3.9.1	Air filters must be designed to be installed, inspected, and replaced in a manner that minimizes, but under no circumstances increases, the entry of airborne microorganisms and solid and liquid aerosols into downstream components and into the rooms to be ventilated.
6.3.9.2	Closed-pore sealing profiles
6.3.9.2	Permanent fixing of the seal.
6.3.9.2	There must be no manufacturing residues on the air filter that could be released during operation of the system.
6.3.9.3	Minimum hygiene requirements for dust separation.
6.3.9.3	Filtering of the air before the air treatment device (also fan) at least ISO ePM10 50%, or according to the recommended filter classes based on EN 16798-3.
6.3.9.3	Filtration of supply air at least ISO ePM1 50% for the last filter stage.

6.3.9.3	Filtering of secondary air as required, but at least ISO ePM10 50% to ensure hygiene in the device.
6.3.9.2	Surface contact of filters with the chamber floor or the chamber walls is not permitted in any operating condition (pocket filters may only be installed in such a way that the pockets are vertical in the floor area).
6.3.9.2	Easy, safe, and damage-free installation, as well as a tight fit of the filters, is possible (even when exposed to moisture).
6.3.9.2	Air filter materials must withstand the mechanical stresses in all operating phases of the system.
6.3.9.2	Filter change side on the fresh air side or side pull-out.
6.3.9.2	The filter chamber must be designed in such a way that it can be cleaned with reasonable effort, and the air filters are always easily accessible and visible.
6.3.9.2	Necessary information about filters must be permanently and visibly attached to the outside of the air filter chamber.
6.3.9.2	For systems > 1,000 m³/h, a differential pressure measuring device is required for monitoring the pressure of the filters.

VDI 3803-1

6.2.2	The seals of the filter holders must be designed with closed pores.
6.2.2	The permanent sealing fit (e.g., by operation on the dirty air side) must be ensured.
6.2.2	Filter differential pressure monitoring shall be provided.
6.2.2	From a clear device height of 1.6 m, the filter control chambers must be equipped with a sight glass and interior lighting.
6.2.2	Sufficient access must be provided to facilitate filter replacement.
6.2.2	The necessary dirty-air-side service unit must have at least a length corresponding to the length of the bag filter to be changed.
6.2.2	For weatherproof air handling units, the frame of the first filter stage must be additionally protected against corrosion (e.g. coated).
6.2.2	In the last filter stage, at least one filter ISO ePM 1 ≥ 60 % must be used.
6.2.2	To protect the components in exhaust air systems, filtration in the exhaust air area with at least a filter class ISO ePM 10 50% must be provided.

ÖNORM H6020

6.6	Air filters must comply with EN ISO 16890-1 and EN 1822-1.
6.6	Filter systems (inserts, seals, frames) must not show any swelling, shrinkage, or decomposition, nor any emission of odors, nor any increased air-side pressure loss up to a relative humidity of 95%
6.6.1	At a minimum, the following data must be visible on each filter system: number of filters, filter type(s) and dimensions, filter class, operating flow rate, initial pressure drop, and recommended final pressure drop at operating flow rate.
6.6.1	The air filter change for all filter stages in the central air handling unit must be carried out from the dirty air side.
6.6.1	Each filter cell must be installed in its own filter mounting frame.
6.6.1	Lateral insertion of filter cells is not permitted.
6.6.1	All fine dust filters must be equipped with a locally readable differential pressure indicator, even if remote data transmission is used. Liquid-filled pressure gauges (e.g., inclined tube or U-tube gauges) are not permitted.
6.6.1	The second filter stage is generally to be arranged as the last component, after the last air treatment component, before the supply air duct system, on the pressure side.
6.6.3	The filter material must be classified as non-carcinogenic.
6.6.4	Filters shall be designed by EN ISO 16890-1 and EN 1822-1.

ÖNORM H6021

4.3.1.1	The filter quality must not be achieved through temporary effects (e.g., electrostatic charges).
4.3.1.1	The filter quality, as specified in EN 779, must be demonstrated.
A.1	In order to ensure and maintain the filter quality, a secure seal must be created between the filter insert and the air filter frame on the one hand and the air filter frame and the inner wall of the ventilation unit on the other.
A.1	The filters must have sufficient clearance from the floor and walls, as well as sufficient distance from the outside air intake.
A.1	The replacement of the filters must always be carried out on the dirty air side
A.1	Moisture penetration of the air filter elements must be prevented

SWKI VA105-01

B2	Air conditioning systems are equipped with at least a two-stage filtration of the outside air.
B2	Air filters of at least class M6 are required as pre-filters for the outside air. Class F9 is required for the second filter stage.
B2	The first and second air filter stages must be equipped with differential pressure gauges (without sealing fluid).

Silencer

DIN 1946-4

6.5.12	Silencers should preferably be placed immediately before and after the sound source, and thus between the 1st and 2nd filter stages.
6.5.12	They are not permitted directly after a cooler with dehumidification or a humidification device (exception: steam humidifier with sufficiently dimensioned post-evaporation distance).
6.5.12	Silencer splitters must be designed in such a way that their surfaces facing the air flow are smooth, abrasion-resistant (e.g., protection of the absorption material by ageing-resistant glass silk fabric), water-repellent, and rot-proof.

VDI 6022-1

6.3.12	Silencers/silencer splitters must be designed to be easily accessible or removable for cleaning without having to dismantle other components.
6.3.12	Soundproofing elements must be covered with a permanently abrasion-resistant, dimensionally stable, and cleaning-resistant material that is harmless to health, e.g., glass silk fabric or foil, or must themselves be made of permanently abrasion-resistant and cleaning-resistant material. The material used must not emit any odors.

VDI 3803-1

6.2.8	For hygienic reasons, silencers must not be installed directly after coolers with dehumidification or humidification devices.
6.2.8	In the air handling unit, silencers should be placed directly in front of and behind the fan and between the first and second filter stages.
6.2.8	To ensure unhindered inflow and outflow, a minimum distance to other components of one (inflow) or 1.5 times (outflow) maximum splitter width must be provided.
6.2.8	The individual splitters must be removable for cleaning and must be made of permanently abrasion-resistant material that is harmless to health.

ÖNORM H6020

6.10	The surfaces of a silencer's splitter must be smooth, abrasion-resistant, dimensionally stable, water-repellent, and rot-proof. They must also be resistant to mechanical cleaning (e.g., the cover made of glass fiber fabric or foil) and must not emit any odors.

ÖNORM H6021

4.3.5	Splitter surfaces must be cleanable (wipeable) and have a high mechanical stability.
4.3.5	Binding agents that cause odor shall not be used.

Fan

DIN 1946-4

6.5.1	For inspection of components, the installation of sight glasses (at least 150 mm diameter, or equivalent cross-section) in conjunction with internal lighting with a smooth surface is required. Luminaires with grille covers are not permitted.
6.5.10	Plug fans without spiral casings should be used to ensure easier cleaning.
6.5.10	Fan unit including base frame made of sheet steel and profile steel, protected against corrosion (min. Sendzimir galvanized and coated, the impeller powder-coated).
6.5.10	Labelling with minimum information (type, year of manufacture, design, nominal volume flow, total pressure increase, nominal speed, max. speed, nominal motor power, direction of rotation of the fan impeller on the impeller or on the housing).
6.5.10	Fans are fully accessible.
6.5.10	Fans are not belt-driven.
6.5.14	The actual value of the volume flow is displayed on the fan section or on the control cabinet.

VDI 6022-1

6.3.13	Arrangement after the first filter stage.
6.3.13	An additional filter stage must be installed behind supply air fans with belt abrasion in the air stream.
6.3.13	Good accessibility for maintenance must be ensured.
6.3.13	For radial fans with housing: provide a water drain with a closure or easy removal overall; for nominal sizes > 400 mm impeller diameter, provide an easily removable inspection cover on the fan housing.
6.3.13	Engine cable routing over a short distance without an empty conduit.

VDI 3803-1

6.2.1	For reasons of hygiene and to reduce maintenance effort, it is recommended to arrange supply air fans in such a way that leakage air flows on the suction side are minimized.
6.2.1	The arrangement of the fan in the device housing must ensure an even inflow and outflow of air.
6.2.1	The fan section must be equipped with a sight glass and interior lighting for a clear unit height of 1.6 m or more.

ÖNORM H6020

6.9	Supply air fans shall be arranged between the first and second air filter stages.
6.9	Direct-drive fans shall be used.
6.9	The use of belt-driven fans is not permitted.

ÖNORM H6021

4.3.10	For fans and drives that require regular cleaning, splash-proof components must be used.
4.3.10	Inspection covers and closable water drain nozzles for accumulating liquids must be installed.
4.3.10	To reduce or avoid belt wear, the use of flat belts or direct drives is recommended.

Heat recovery

DIN 1946-4

6.5.8.1	Heat exchangers must be designed so that they are easy to clean and disinfect. Continuous cleaning from the inflow to the outflow side must be ensured for hygiene reasons. For heat exchangers with a construction depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible construction depth can be selected proportionally and linearly larger.
6.5.8.1	Corrosion-resistant materials must be used for finned heat exchangers (fins: aluminum, pipes: copper, collectors: copper, galvanized steel).
6.5.8.1	The spacing between fins must be at least 2 mm.
6.5.8.2	Only heat recovery systems in which no mass transfer is possible are permitted; in rooms of room class I, closed-loop systems are required.

VDI 6022-1

6.3.14	The transfer of pollutants and/or odorous substances from the exhaust air is to be avoided.
6.3.14	If the transmission of harmful and/or odorous substances cannot be ruled out, these heat recovery systems may only be used if the use of recirculated air in the system also complies with hygiene requirements.
6.6	Specification of the necessity and design of droplet separators by the manufacturer.
6.3.15.1	Heat exchanger accessible from both sides / extendable.
6.3.15.1	Continuous cleaning or a divisible design of the heat exchanger is to be ensured.
6.3.15.1	For finned heat exchangers, a fin spacing of at least 2 mm has proven to be effective due to the ease of cleaning; it may be necessary to set a larger spacing depending on the purity of the air flowing through.
6.3.15.1	To reduce contamination and extend cleaning intervals, upstream air filtration must be provided, with at least a filter level of class ISO ePM10 50% for central air handling units.
6.3.15.2	Droplet separators must be designed to be easily dismantled for replacement or cleaning.
6.3.15.2	For coolers, a fin spacing of at least 2.5 mm has proven to be effective.
6.3.15.2	Condensate tray is made of corrosion-resistant material, e.g. steel 1.4301 with sufficient inclination on all sides to the drain.

6.3.15.2	Good accessibility of the condensate tray for cleaning work.
6.3.15.2	Measures must be taken to ensure that the tank is completely emptied when the system is not in operation, so that the water residues remaining due to surface tension can be completely dried by “running dry” the system.

VDI 3803-1

6.2.3	Heat exchangers are smooth and burr-free and made of corrosion-resistant material depending on the application. If special corrosion protection measures are necessary for humidification or dehumidification or disinfection requirements, the heat exchangers must be additionally protected (e.g. epoxy coating).
6.2.3	For energy and hygiene reasons, the fin spacing in heat exchangers must be at least 2.0 mm and in coolers 2.5 mm.
6.2.3	Heat exchangers shall not be used to dry the first filter stage.
6.2.3	Continuous cleaning must be ensured.
6.2.3	For fin heat exchangers with a depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible installation depth can be selected linearly larger.
6.2.3	Heat exchangers must be accessible from both sides for cleaning or must removable for cleaning with reasonable effort.
6.2.3	If cleaning is necessary after installation, the design must ensure controlled water drainage (e.g. tub).
6.2.3	The heat exchanger must be designed in such a way that a cleaning jet (high-pressure cleaning) is maintained continuously with a residual kinetic energy up to the end of the installation depth.
6.2.3	In order to check for possible contamination, the heat exchanger must be designed in such a way that a cleaning fleece (e.g. as a wick) with a thickness corresponding to the fin spacing can be pulled through the heat exchanger.
6.2.6	Heat recovery systems must have a device for thermal bypass/shutdown; possible bypasses are mechanical bypasses (e.g. in plate heat exchangers) or thermal power control (e.g. rotor speed control, pump speed control in closed-loop systems (KVS)).
6.2.6	Plate heat exchangers with a depth of 1200 mm or more, based on a fin spacing of 3 mm, must be specially designed to make them easier to clean, e.g. split design. For other fin spacings, the permissible installation depth can be selected proportionally and adjusted linearly. The minimum fin spacing for plate heat exchangers must be 2 mm.

ÖNORM H6020

6.7.2	Exhaust air containing radioactive substances or originating from infectious disease wards, postmortem examination rooms, or animal experimentation departments may not be routed through plate heat exchangers (cross-flow and diagonal-flow heat exchangers). The condensate tray on the exhaust/exhaust air side of the heat exchanger must be equipped with a condensate drain.
6.7.4	For plate heat exchangers and rotary heat exchangers, a pressure gradient from the outside air to the extract air must always exist during operation of the system (see EN 16798-3).
6.7.4	The possibility of complete cleaning must be provided and cleaning instructions must be given to the operator.
6.12	Air coolers must be cleanable.
6.12	Pipe routing through the device housing must be designed in such a way that the tightness requirements according to EN 1886 are met.
6.12	According to EN 13053, without a corresponding expert report, heat exchangers may not exceed an installation depth of 300 mm, or 450 mm for aligned pipes. The fin spacing must be at least 2.5 mm. With a corresponding expert report, installation depths greater than those specified above are permitted.
6.12	If droplet separators have to be installed, the correct installation position of the separator blades must be permanently marked on the insert.
6.12	Each air cooler must be provided with a condensate tray and a condensate drain across the entire installation depth.
6.12	The unhindered drainage of the condensate from the tray must be ensured.

ÖNORM H6021

B3	Heat recovery units where the transfer of pollutants and/or odorous substances from the exhaust air cannot be excluded by other measures may only be used if the use of recirculated air is also possible for hygiene reasons.

Heating coil

DIN 1946-4

6.5.8.1	Heat exchangers must be designed so that they are easy to clean and disinfect. Continuous cleaning from the inflow to the outflow side must be ensured for hygiene reasons. For heat exchangers with a construction depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible construction depth can be selected proportionally and linearly larger.
6.5.8.1	Corrosion-resistant materials must be used for fin heat exchangers (fins: aluminum, pipes: copper, collectors: copper, galvanized steel).
6.5.8.1	The spacing between fins must be at least 2 mm.

VDI 6022-1

6.3.15.1	Heat exchanger accessible from both sides / removable.
6.3.15.1	Continuous cleaning or a divisible design of the heat exchanger is possible.
6.3.15.1	For fin heat exchangers, a fin spacing of at least 2 mm has proven to be effective due to easy cleaning; it may be necessary to set a larger spacing depending on the purity of the air flowing through.
6.3.15.1	To reduce contamination and extend cleaning intervals, upstream air filtration must be provided, with at least a filter level of class ISO ePM10 50% for central air handling units.

VDI 3803-1

6.2.3	Heat exchangers are smooth and burr-free and made of corrosion-resistant material, depending on the application. If special corrosion protection measures are necessary for humidification or dehumidification, or disinfection requirements, the heat exchangers must be additionally protected (e.g., epoxy coating).
6.2.3	For energy and hygiene reasons, the fin spacing in heat exchangers must be at least 2.0 mm and in coolers 2.5 mm.
6.2.3	Heat exchangers shall not be used to dry the first filter stage.
6.2.3	Continuous cleaning must be ensured.

6.2.3	For fin heat exchangers with a depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible installation depth can be selected linearly larger.
6.2.3	Heat exchangers must be accessible from both sides for cleaning or must be removable for cleaning with reasonable effort.
6.2.3	If cleaning is necessary after installation, the design must ensure controlled water drainage (e.g., tub).
6.2.3	The heat exchanger must be designed in such a way that a cleaning jet (high-pressure cleaning) is maintained continuously with a residual kinetic energy up to the end of the installation depth.
6.2.3	To check for possible contamination, the heat exchanger must be designed in such a way that a cleaning fleece (e.g., as a wick) with a thickness at least corresponding to the fin spacing can be pulled through the heat exchanger.

ÖNORM H6020

6.11	Air heaters must be cleanable.
6.11	Pipe routing through the device housing must be designed in a manner that the tightness requirements according to EN 1886 are met.
6.11	The possibility of complete cleaning must be provided, and cleaning instructions must be available to the operator.
6.11	According to EN 13053, without a corresponding expert report, heat exchangers may not exceed an installation depth of 300 mm or 450 mm for aligned pipes. The fin spacing must be at least 2 mm. With a corresponding expert report, installation depths greater than those specified above are permitted.

ÖNORM H6021

6.11	Air heaters must be designed so that they can be cleaned.
6.11	Pipe routing through the device housing must be designed in a manner that the tightness requirements according to EN 1886 are met.
6.11	The possibility of complete cleaning must be provided and cleaning instructions must be given to the operator.
6.11	According to EN 13053, without a corresponding expert report, heat exchangers may not exceed an installation depth of 300 mm, or 450 mm for aligned pipes. The fin spacing must be at least 2 mm. With a corresponding expert report, installation depths greater than those specified above are permitted.

Cooling coil & Condensate tray

DIN 1946-4

6.5.5	Corrosion-resistant trays made of stainless steel (e.g., material no. 1.4301) or an aluminum alloy (e.g., AlMg) are required at least for the outside air intake chamber, cooler, humidifier/ dehumidifier, and heat recovery on the supply and exhaust air side.
6.5.5	Accessibility to these tank areas must be ensured by removable panels or doors.
6.5.5	The connection pipe for drainage must have a diameter of at least 40 mm and a sufficient gradient and must lead into the sewer system via a siphon with backflow protection and a free outlet.
6.5.5	Condensate drainage must be complete, condensate trays with gradient on all sides with sufficiently dimensioned drain nozzle at the lowest point, requirement is considered fulfilled if it is proven that after filling with 5 l of water per m^2 of tray surface, more than 95% of the filling has drained away within 10 minutes of system operation.
6.5.8.1	Heat exchangers must be designed so that they are easy to clean and disinfect. Continuous cleaning from the inflow to the outflow side must be ensured for hygiene reasons. For heat exchangers with a construction depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible construction depth can be selected proportionally and linearly larger.
6.5.8.1	Corrosion-resistant materials must be used for finned heat exchangers (fins: aluminum, pipes: copper, collectors: copper, galvanized steel).
6.5.8.2	Air coolers must be designed in such a way that droplet separators are not required due to the air velocity.
6.5.8.2	When installed, the air cooler must be visible from both sides.
6.5.8.2	The frame is made of corrosion-resistant stainless steel (material 1.4301) or an aluminum alloy (AlMg), and the collector is made of copper or equivalent material.
6.5.8.2	The spacing between fins must be ≥ 2.5 mm.

VDI 6022-1

6.6	Specification of the necessity and design of droplet separators by the manufacturer.
6.3.15.1	Heat exchanger accessible from both sides / removable.
6.3.15.1	Continuous cleaning or a divisible design of the heat exchanger is possible.

6.3.15.1	For fin heat exchangers, a fin spacing of at least 2 mm has proven to be effective due to the ease of cleaning; it may be necessary to set a larger spacing depending on the purity of the air flowing through.
6.3.15.1	To reduce contamination and extend cleaning intervals, upstream air filtration must be provided, with at least a filter level of class ISO ePM10 50% for central air handling units.
6.3.15.2	Droplet separators must be designed to be easily dismantled for replacement or cleaning.
6.3.15.2	For coolers, a fin spacing of at least 2.5 mm has proven to be effective.
6.3.15.2	The condensate tray is made of corrosion-resistant material, e.g., steel 1.4301 with a sufficient inclination on all sides to the drain.
6.3.15.2	Good accessibility of the condensate tray for cleaning work.
6.3.15.2	Measures must be taken to ensure that the tank is completely emptied when the system is not in use, so that the water residues left over due to surface tension can be completely dried by "running dry" the system.

VDI 3803-1

6.2.3	Heat exchangers are smooth and burr-free and made of corrosion-resistant material, depending on the application. If special corrosion protection measures are necessary for humidification or dehumidification, or disinfection requirements, the heat exchangers must be additionally protected (e.g., epoxy coating).
6.2.3	For energy and hygiene reasons, the fin spacing in heat exchangers must be at least 2.0 mm, and in coolers, 2.5 mm.
6.2.3	Heat exchangers shall not be used to dry the first filter stage.
6.2.3	Continuous cleaning must be ensured.
6.2.3	For fin heat exchangers with a depth of 300 mm or more (450 mm with aligned pipe arrangement), based on a fin spacing of 2 mm, special measures are therefore required; a split design with appropriate access is recommended. For larger fin spacings, the permissible installation depth can be selected linearly larger.
6.2.3	Heat exchangers must be accessible from both sides for cleaning or must be removable for cleaning with reasonable effort.
6.2.3	If cleaning is necessary after installation, the design must ensure controlled water drainage (e.g., tub).
6.2.3	The heat exchanger must be designed in such a way that a cleaning jet (high-pressure cleaning) is maintained continuously with a residual kinetic energy up to the end of the installation depth.

6.2.3	To check for possible contamination, the heat exchanger must be designed in such a way that a cleaning fleece (e.g., as a wick) with a thickness at least corresponding to the fin spacing can be pulled through the heat exchanger.
6.2.5	Coolers must be fitted with a corrosion-resistant condensate tray made of stainless steel (e.g., material no. 1.4301) or an aluminum alloy (e.g., AlMg3). The tray has an inclination towards the drain to ensure unhindered condensate drainage. The following proof of suitability must be used: When 5 l of water is added per 1 m 2 of tray surface area, at least 95% must drain away within ten minutes.
6.2.5	For reasons of corrosion resistance, the collector must be made of copper in the case of copper-copper or copper-aluminum. In the case of galvanized steel coolers, these must be completely galvanized in a full bath.

ÖNORM H6020

6.8	A connection of condensate drains arranged on the suction and pressure sides is not permitted.
6.8	Suitable devices, such as a siphon with a mechanical closure, must be used to prevent contaminants from entering the air system via the drainage system.
6.8	A direct, uninterrupted connection of the condensate drains to the sewage network is not permitted.
6.12	Air coolers must be cleanable.
6.12	Pipe routing through the unit housing must be designed in such a way that the tightness requirements according to EN 1886 are met.
6.12	The possibility of complete cleaning must be provided, and cleaning instructions must be available to the operator.
6.12	According to EN 13053, without a corresponding expert report, heat exchangers may not exceed an installation depth of 300 mm or 450 mm for aligned pipes. The fin spacing must be at least 2.5 mm. With a corresponding expert report, installation depths greater than those specified above are permitted.
6.12	If droplet separators have to be installed, the correct installation position of the separator blades must be permanently marked on the insert.
6.12	Each air cooler must be provided with a condensate tray and a condensate drain across the entire installation depth.
6.12	The unhindered drainage of the condensate from the tray must be ensured.

ÖNORM H6021

4.3.2	A direct connection to the sewage network is not permitted for hygiene reasons.
4.3.3	For ease of cleaning, the fins of air coolers should be smooth.
4.3.3	For vertically installed air coolers, the airflow velocity - relative to the finned front surface of the cooler – should not exceed 2.0 m/s. Up to this air velocity, a droplet eliminator is not required.
4.3.3	Condensate shall be drained away by the shortest route.
A.2	The drip trays must be sized to collect all the condensate that occurs.
A.2	The unhindered drainage of the condensate from the tray must be ensured.
A.2	Air coolers must be accessible and removable.

SWKI VA105-01

B6	In order to ensure dry cooling in rooms with increased air quality requirements, the outside air must be dehumidified in the outside air treatment unit or in a post-treatment unit.
B6	Good accessibility to the wetted system parts must be ensured for maintenance (cleaning and disinfection).

Droplet eliminator

DIN 1946-4

6.5.8.3	Droplet eliminators must be corrosion-resistant and cleanable.
6.5.8.3	Droplet eliminators must be removable from the device housing via panels or doors.
6.5.8.3	Droplet eliminators must be dismantled down to the individual fins.

VDI 3803-1

6.2.5	For hygienic and energy reasons, droplet eliminators should only be used if the flow velocity in the heat exchanger does not exclude the possibility of droplets being entrained. They are easy to pull out and dismantle, and the cooler should always be designed to be visible from both sides.

Controls

VDI 6022-1

6.6	Pre-flow shut-off, automatic emptying, dry running
6.2.2	Flow cut-off, automatic closing of the dampers

Further requirements

DIN 1946-4

6.10	For operation, it must be ensured that the air conditioning system can be inspected without special technical effort and cleaned and, if necessary, disinfected with reasonable technical effort. For this purpose, appropriate accessible openings must be provided by EN 12097.
6.1.3	For subsequent operation, it must be ensured that the entire system can be inspected without any special technical effort and cleaned and, if necessary, disinfected with reasonable technical effort. For this purpose, appropriate openings by EN 12097 must be provided in sufficient number and size so that the areas to be cleaned are accessible.

6.1.4	All system components must be clearly and permanently labelled or marked so that their function, supply area, and the direction of the air flow can be identified at all times.

VDI 6022-1

6.1.2	Components can be delivered packaged (air-conducting surfaces must comply with the required cleanliness classes).
6.6	Instructions for operation, control, and inspection
6.6	The manufacturer specifications in the operating instructions regarding suitable cleaning and disinfection agents, and which procedures can be used to clean and disinfect all components.

VDI 3803-1

6.4	Air handling units must have type plates that are permanently marked and attached.
6.4	Air handling units must be delivered by the manufacturer with a drawing of the unit with all main and air duct connection dimensions, a spare parts list, and installation, commissioning, and maintenance instructions.

ÖNORM H6020

6.22	System components must be labeled so that their function is clearly recognizable at all times. The labels must be written in German and be permanent.
6.23.3	Humidifiers must be able to be switched off in the event of a failure or shutdown of the supply air fans, as well as when a relative humidity of 85% is exceeded, regardless of the system control.
9.2.4	Instructions for operation, control and inspection

ÖNORM H6021

4.1.9	The cleaning agents and cleaning aids used must be safe and compatible with the materials from the point of view of occupational medicine and hygiene and must not be corrosive. The safety data sheets of the cleaning agents must be attached to the cleaning concept.

OC IMP Klima d.o.o.
Godovič 150
SI - 5275 Godovič

T: +386 5 3743 000
E: info@oc-impklima.com