

# **Eurovent Recommendation 6/18: Quality criteria of Air Handling Units**

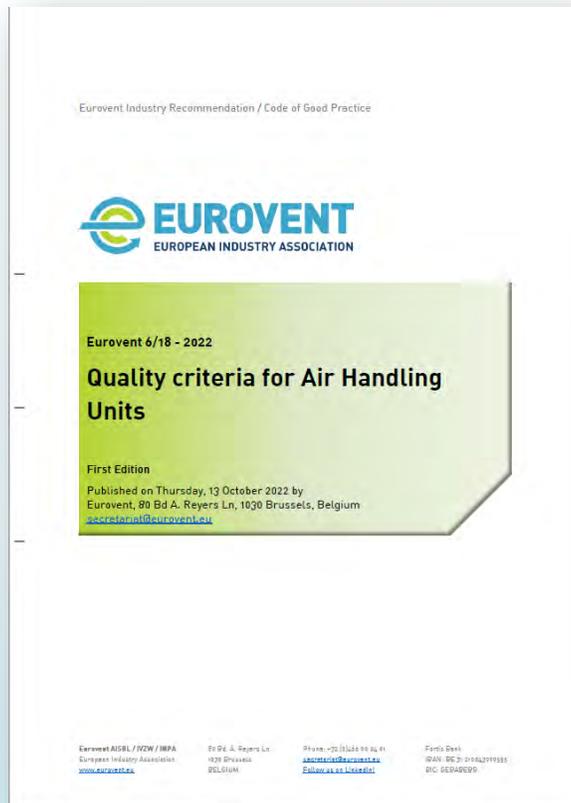


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# Preface

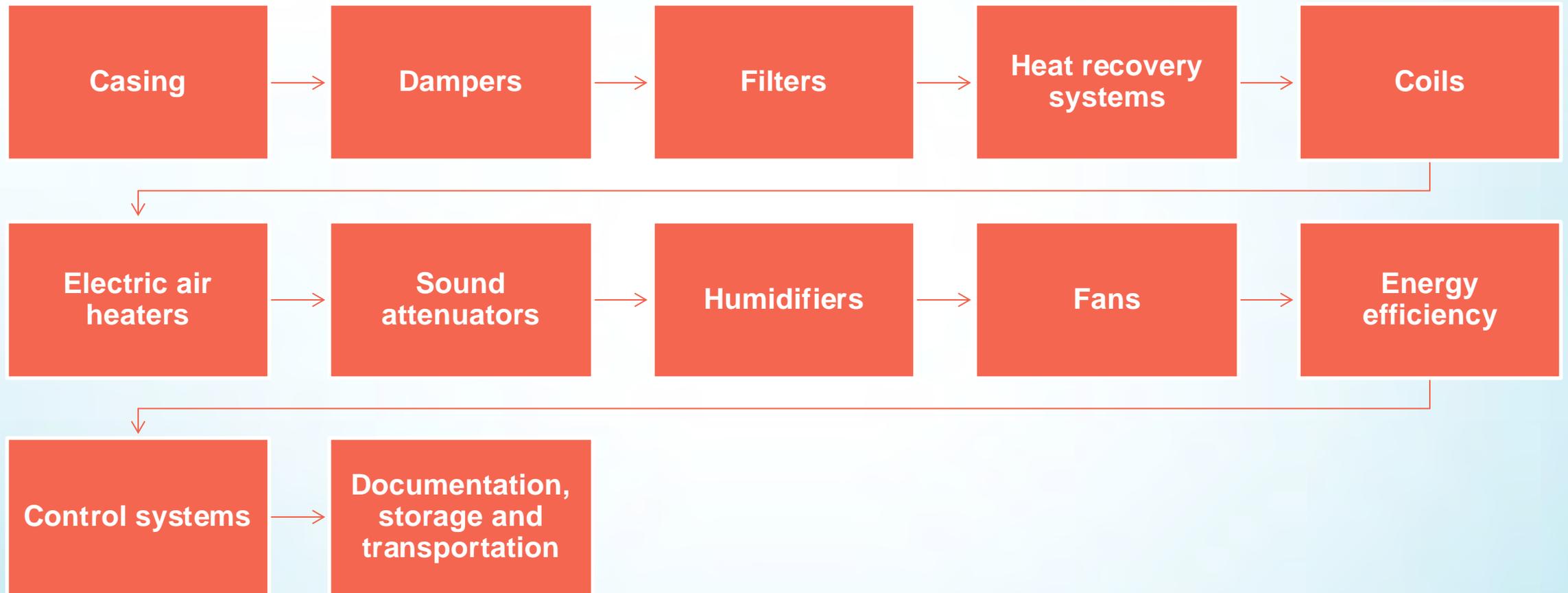
- ECC certifies the Air Handling units and validates the performance.
- ECC does not tell you how to manufacture.
- In order to uplift the standard of the certified units, Eurovent Association took up the task of identifying the Quality criteria for Air Handling Units.

# Quality Criteria for Air Handling Units



- First edition, published on 13 October 2022
- Product Group 'Air Handling Units' (PG-AHU)
- Provide a comprehensive overview of features that determine highly efficient operation and correct service of air handling units.
  - Casing & individual components
  - Energy efficiency
  - Controls requirement
  - Maintainability
  - Content of technical documentation

# The recommendations cover practically all the components/aspects of Air Handling Unit



# Casing

- **Surfaces and Materials**



- Flammability (EN 13501-1) for insulation
  - A1 or A2 (Reaction to fire - A to F : A is best)
  - S1 (Smoke production – S1 to S3 : S1 is best)
  - d0 (Flaming droplets – d0 to d3 : d0 is best).
- Hygiene aspect (Access, corrosion, ISO 846, smooth surfaces).
- Corrosion – C3 for normal application & C4 for corrosive atmosphere.
- Maintainability – Cleaning & Maintenance schedules.

# Casing

- Surfaces and Materials
- **Casing indicator values/Mechanical performance.**



- Casing strength - D2 (R)
- Air tightness - L2 (R)
- Thermal transmittance - T3 (M)
- Thermal Bridging - TB3 (M)

- Filter bypass

- ISO ePM10 50% - 60% and ISO Coarse 30% - 95% 5,0 %
- ISO ePM2,5 50% - 60% and ISO ePM10 65% - 95% 3,0 %
- ISO ePM1 50% - 65% and ISO ePM2,5 65% - 95% 2,0 %
- ISO ePM1 70% - 75% 1,0 %
- ISO ePM1 80% - 95% 0,5 %
- Gas phase (carbon) filter 0,5%

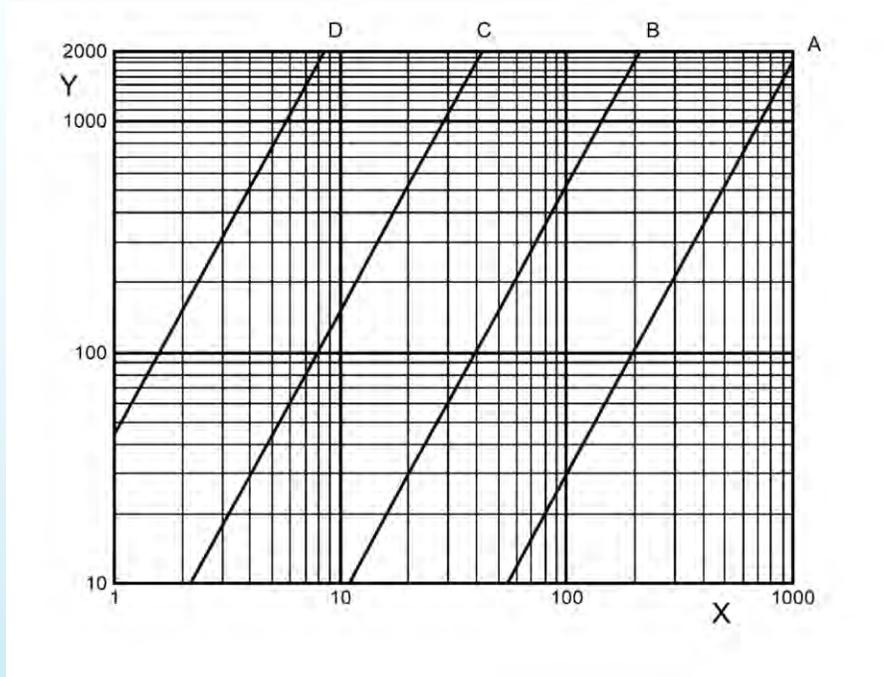
# Casing

- Surfaces and Materials.
  - Casing indicator values/Mechanical performance.
  - **Access door/Panel.**
- Doors for components posing danger openable with tools and having warning sign and adequate guard.
  - Openable from inside if height >1.6 mt.
  - Protected against abrupt uncontrolled opening on positive pressure side.
  - All components to be accessible for cleaning & maintenance.



# Damper

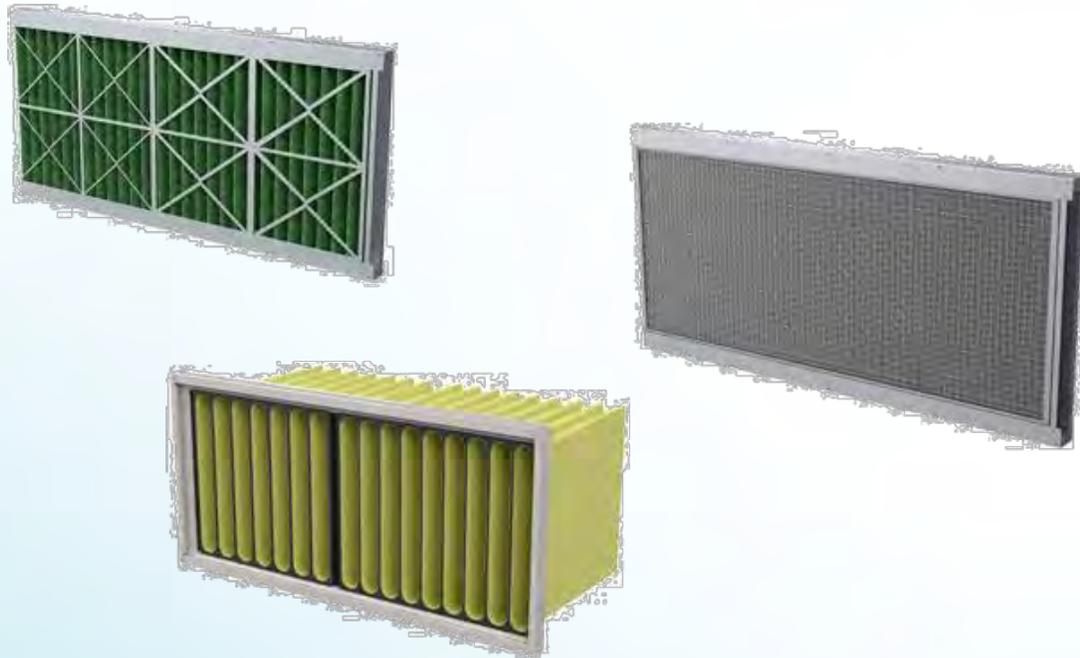
- Air leakage class as per EN 1751



- Class 3 for Supply & Exhaust air dampers (30 LPS/Sq. Mt.)
- Class 2 for Mixing & Bypass dampers (150 LPS/Sq. Mt.).
- Velocity < 8 MPS.

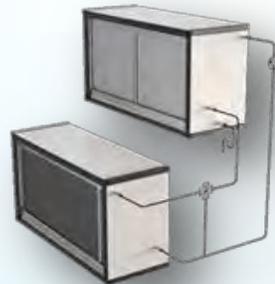


# Filters



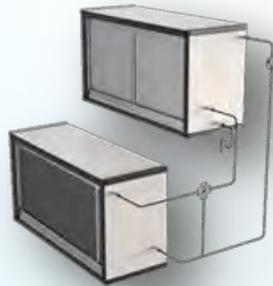
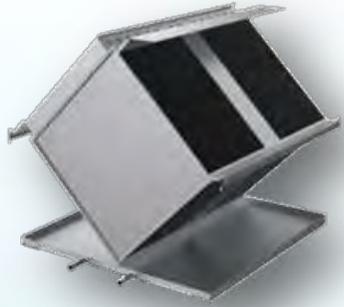
- ISO ePM1 50% filter on the outdoor air inlet (first filtration stage)
- ISO ePM1 80% filter in the supply air (second filtration stage, if applicable)
- ISO ePM10 50% filter on the extract air inlet
- Minimum Eurovent filter energy efficiency class: C

# Heat recovery system



- The HRS must meet the minimum requirements of Regulation (EU) 1253/2014
- OACF (Outdoor Air Correction Factor) within the range of 0.90 to 1.1 (OACF class 4 of EN 16798-3:2017).
  - Ratio of the entering outdoor mass airflow rate and the leaving supply mass airflow rate, which provides information about the leakages between the air flows.

# Heat recovery system



- EATR (Exhaust Air Transfer Ratio)  $\leq 5\%$ .
  - Percentage of exhaust air transfer into the supply air side, mainly due to carryover.

# Coils

- **Surfaces & materials.**



- **Cooling coil**
  - Aluminium/coated fins
  - Copper tube
  - MS/GI/Cu Header
  - GI housing
- **Heating coil**
  - Aluminium fins
  - Copper tube
  - MS/GI/Cu Header
  - GI housing

# Coils

- Surfaces & materials.
- **Arrangement & position.**



- Ensure no bypass.
- Accessible from at least one side.
- Corrosion resistant drain pan with slope & insulation.
- Drain trap not connected to wastewater.
- Mist eliminator if velocity  $> 2.5$  MPS.
- Header insulation through the casing.

# Coils

- Surfaces & materials.
  - Arrangement & position.
  - **Hygienic & energy consideration.**
- Distance between fins – 2.5 mm.
  - Fluid pressure drop.
    - Cooling coil – 40 kPa
    - Heating coil – 18 kPa



# Coils

- Surfaces & materials.
  - Arrangement & position.
  - Hygienic & energy consideration.
  - **Additional consideration.**
- Drain & vent caps.
  - Free access to capillaries.
  - DX circuits to be interlaced.



# Electric Air Heaters



- Air flow control interlock.
- Step/Modulating control for energy efficiency.
- Sufficient space upstream / downstream.

# Sound Attenuator

- **Surface & materials.**



- Permanently abrasion resistant.
- Resistant to cleaning processes.
- Non-Moisture absorbant.

# Sound Attenuator

- Surface & materials.
  - **Arrangement & position.**
- To be mounted inside the AHU.
  - Should be near the fan.
  - Between 1<sup>st</sup> & 2<sup>nd</sup> stage of filters.
  - Splitters (Baffles) should be demountable for cleaning.



# Humidifiers



- Corrosion/disinfectant materials.
- Low bacteria in humidifier water.
- Assessable for cleaning & inspection.
- Not placed directly upstream of filter or attenuator.
- All components to be demountable.

# Fans

- **General**



- Direct driven BC or AF type.
- IE4 AC, EC & PM variable speed motor.
- Speed control according to demand.
- Corrosion resistant materials.

# Fans

- General
- **Arrangement & position**
- Ensure even inflow & outflow.
- Good access for service & maintenance.
- System effect to be considered in calculation.



# Fans

- General
  - Arrangement & position
  - **Installation & accessories**
- Balancing as per G 6.3 (ISO 21940-11)
  - Isolators.
  - Lockable maintenance switch.
  - Safety device during transportation.



# Energy efficiency



Figure 26: The "Eurovent Certified Performance" >>

- SFPv within the range of 1300 and 1800 W/(m<sup>3</sup>/s)
- Temperature efficiency  $\eta_t$  according to Regulation (EU) 1253/2014
- Efficiency class of the HRS: H2 (acc. EN 13053)

# Energy efficiency



Figure 26: The "Eurovent Certified Performance" >>

- EATR < 5% (where applicable)
- OACF with the range of 0.95 and 1.05 (where applicable)
- OACF with the range of 0.90 and 1.00 (where applicable)
- Energy efficiency of ePM1 / ePM2,5 / ePM10 filters: Class C
- Minimum Eurovent Energy Efficiency Class: B\*

# Control system



- Communication with Building Management System (BMS) via analogue and/or digital signals
- Management of ventilation air volume through DCV depending on IAQ determined by at least one sensor Variable fan speed control
- Air filter pressure drop monitoring

# Control system



- Continuous control of heat recovery efficiency depending on the currently demanded supply air temperature
- Monitoring of core performance parameter and statuses, including:
  - Malfunction of fans and heat recovery systems
  - Current temperatures, airflows and power consumption

# Documentation, storage & transportation



- What should the manufacturer do before the unit delivery?
- What should the manufacturer deliver with the unit?
- What are the Directives the manufacturer must comply with at the time of delivery?
- What should the customer do before assembly?
- Required content of installation, operation and maintenance instructions

# Conclusion

- Covered an overview of the Recommendation.
- For detailed understanding, please refer Eurovent 6/18-2022.
- Please ask questions or write to us for any clarification.

# Thank You!

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