Eurovent Position Paper PP – 2019-12-20

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Eurovent comments to the Phase 1.1 and 1.2 Draft Reports of Tasks 1, 2 and 3 for the review study on Ventilation Units

Scope: Non-Residential Ventilation Units and Residential Ventilation Units

In a nutshell

This Position Paper presents comments to the Phase 1.1 and 1.2 Draft Reports of Tasks 1, 2 and 3 for the review study on Ventilation Units published on 25 November 2019. The comments were developed in a joint effort by members of the Eurovent Product Groups 'Air Handling Units', 'Residential Air Handling Units', 'Air Filters' and 'Energy Recovery Components'.

Comments are made on the issues listed below. With regard to other proposals of the reports, Eurovent does not take a position or holds positions already presented in the previous papers.

1 Proposed extensions to the product scope

1.1 VUs with < 30 W per airstream

Eurovent considers these products should be regulated. This would level the playing field, even though the energy impact might be not significant. The current exclusion makes possible to place on the market low energy-efficient products and circumvent ecodesign requirements.

1.2 Non-Residential Ventilation Units fitted with a Heat Pump and HRS or Heat Pump for heat recovery

The draft Report Task 1 states that the preliminary assessment in the Task 1 context, the EU-saving potential in the short term might be not sufficient to extend the scope of the revised Regulation and include multi-functional ventilation units (fitted with a heat pump). However, the report recommends anticipating on future extensions by providing a proposal for a method for rating these units.

Eurovent appreciates this recommendation and provides a proposal for consideration of Non-Residential Ventilation Units fitted with a Heat Pump and HRS or Heat Pump only.
The comprehensive proposal in presented in Annex I.

2 Proposed adjustments in Regulation text

2.1 Definition of Ventilation Units

Eurovent proposes to use the following definition:

'ventilation unit (VU)' means an electricity driven appliance equipped with at least one impeller, one motor and a casing and intended to replace utilised air by outdoor air in a building or a part of a building. The utilised air means the polluted air due to the presence of human beings and their use of the building including emissions from materials, equipment, internal and external heat gains; or air contaminated by any other source, replaced to enable prolonged stay of human beings.

Moreover, to avoid difficulties in interpreting the definition, Eurovent proposes to further extend the list of exclusions in Article 1 and to specify units that are obviously not used for ventilation related to human presence. The list of suggested applications to exclude was presented in Eurovent Position Paper PP-2019-11-27 submitted to VHK on 27 November 2019.

3 Proposed exclusions of the product scope

3.1 AHUs primarily used for air heating/cooling with 0-10% ventilation

The report expresses concern that a related technical feature should be defined for verification of this exclusion. In the view of Eurovent members, a clear declaration of the maximum flow rate of outdoor air under winter condition in the technical specification (information requirements) is sufficient to avoid a loophole.

3.2 VUs used for replacing old units in historic buildings

Eurovent appreciate the proposal for exclusion of ventilation units for historic and listed buildings presented in the report. A comprehensive position on this issue, including examples of relevant legislation in different EU Member States were set out in Eurovent Position Paper PP-2019-11-27.

3.3 VUs exclusively for dehumidification and de-chlorination of spaces

Eurovent holds that this exclusion should apply only to Ventilation Units for spaces not meant for human occupation.

4 Proposed revisions concerning the Energy Performance in regard to NRVU

4.1 Modifications regarding energy recovery

4.1.1 Include latent heat & humidity recovery feature

Eurovent supports the proposal to include latent and humidity recovery in the revised Regulation by using the formula: $\eta_e = \eta_t + 0.08 \cdot \eta_{x\_c}$.

However, to avoid loopholes and to maintain consistency with the existing regulation, we claim that the efficiency of thermal heat recovery (η_t) should be measured at dry conditions and at balanced mass flows (defined as per prEN308, exhaust air 25°C DB (< 14°C WB), outdoor air 5°C DB).

Consideration of sensible and latent heat in η_t (as proposed in the report) could mean that the total efficiency is dependent on the condition of the extract air and the temperature of the outdoor air.

Defining of the humidity recovery efficiency for cooling conditions (acc. to prEN308, exhaust air 25°C DB/18°C WB, outdoor air 35°C DB) ensures that the bonus might be applied only to exchangers that provide moisture recovery in summer conditions. It is in line with the original Eurovent proposal, to consider moisture recovery in minimum ecodesign requirements but without introducing complex definition of climate zones.

A comprehensive explanation of the original Eurovent proposal was presented in the Eurovent Position Paper PP-2019-10-25 of 25 October 2019.

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4.1.2 Proposal to increase limit values for minimum thermal efficiency to 77%

Eurovent holds that the limit for minimum thermal efficiency η_t of a non-residential HRS (denoted in the current Regulation as η_{t_nrvu}) should not be increased. Changing the limit from 73% to 77% would lead to the rise of pressure drop and electric energy consumption what is not economically legitimised in most of EU regions. Thus, in the opinion of Eurovent members introduction of any higher limits for thermal efficiency should be related to climate zones.

Eurovent fully supports the pursuit of further increasing energy efficiency. However, in opinion of our members, the focus should be on reducing the SPF_{int_limit} rather than raising the current η_t limit, which seems to be a good compromise for different climate zones.

4.1.3 Proposal to allow a reduction on limit values for η_t or $SFP_{int\text{-}limit}$ for non-residential BVUs that have smart controls (≥ IDA-C5, following table 12 of EN 16798-3)

Eurovent members acknowledge that an appropriate control system contributes to the reduction of electric energy consumption and support the proposal to reduce the limit value for SPF_{int_limit} for non-residential BVUs with smart controls (≥ IDA-C5, following table 12 of EN 16798-3).

However, we argue that the limit value for η_t should not depend on the type of controls.

4.2 Modifications regarding filters

4.2.1 Introduction of separate values for SFP_{int_limit} depending on the class of applied filters

Eurovent endorses the proposal to make the SFP_{int_limit} value dependent on the class of filters used. In our opinion all filters installed in a unit (all stages) should be considered in determination of SFP_{int}. Moreover, this approach should apply equally to UVUs and BVUs.

4.2.2 Set limit values for filter (media) velocity for RVU

In the first Position Paper (PP- 2019-03-28) of March 2019, Eurovent has proposed to limit filter media velocity as a feasible and easy to implement measure for reducing energy consumption related to air filters. This approach was questioned by some stakeholders as potentially limiting innovation and product development.

Being mindful of these concerns, Eurovent tables a new alternative proposal on the method for setting minimum energy requirement for air filters in the revised VU Regulation.

The method was developed by experts of the Eurovent Product Group 'Air Filters' in November 2019 and consists in limiting the maximum annual energy consumption of a filter expressed in kWh. Energy consumption is determined by the average pressure drop obtained from the dust loading test. The accuracy of this calculation model has been verified by several dust loading tests of air filters at different air velocities.

The details and justification of the proposed method are explained in Annex II.

Nevertheless, if the proposal for limiting media velocity is further considered, we propose to modify the limit values as follow:

- 0.2 m/s for ISO ePM1 and ISO ePM2.5 filters
- 0.5 m/s for ISO ePM10 and ISO course filters

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4.3 Modifications concerning leakages

Eurovent fully supports the proposal for introducing minimum requirements for external leakages and internal leakages (OACF and EATR) and for correcting mass flows accordingly. In our view it is the effective way for eliminating from the market NRVUs of a design that features high internal leakages rate. This would lead to a significant reduction of the energy consumed to transport redundant air that does not serve ventilation purposes. Moreover, we believe that setting a limit for EATR will help to counteract the problem of potential carry-over of contaminants and micro biological contamination addressed in the report. In our view, this issue concerns both enthalpy and non-enthalpy exchangers. For instance, a rotor with no sorption coating can also return big amounts of contaminants and many membrane users can show 0 viral penetration by ASTM F-1671. Thus, a low limit for EATR will reduce the major part of returning contaminants.

A comprehensive proposal for the calculation procedure of corrected mass flows will be presented in the upcoming **Eurovent Recommendation 6-15** in early 2020.

4.4 Modifications concerning defrosting

Eurovent maintains its original position regarding requirements for information on defrosting. However, being aware that it may be difficult to develop an appropriate assessment methodology, as a first step, we propose to include a demand for information about:

- the need for defrosting and its method.
- the outdoor temperature range in which the supply air temperature and airflow remain in
- design values

5 Proposed revisions concerning the Energy Performance in regard to RVUs

5.1 Ventilation Performance Indicator and new list of CTRL-factors

In general, Eurovent is in favour of the approach to consider the Ventilation Performance Indicator and the type of controls in the evaluation of the RVU energy efficiency. However, the method for doing this must be reliable and validated to make sure that the results are credible. The impact of the applied control system on energy consumption and IEQ should be explicitly clarified. The background studies that legitimise the method must be transparent. The assessment must be easy to understand for the end user and the manufacturer.
Moreover, being aware of the diversity of existing ventilation solutions and local regulations, Eurovent members are concerned if all available systems and design options could be covered in the assessment.

Eurovent would support this proposal if all the above conditions were met. Otherwise, Eurovent opts for limiting requirements to the product only as it is today.

5.2 Modifications regarding energy recovery

5.2.1 Include latent heat & humidity recovery feature

In the first Position Paper of March 2019, Eurovent has proposed consideration of humidity recovery for NRVUs. It was motivated energy-wise, since in applications involving control of indoor air humidity, the use of enthalpy heat exchangers leads to significant energy savings (for humidification and dehumidification). In residential applications, the indoor humidity control is not a typical case. The proposed in the report approach to compensate for temperature efficiency by humidity efficiency might result (particularly in cold climate where very high temperature efficiency is required) in insufficient (too low) temperature of supply air leaving the exchanger. However, given that the moisture recovery lowers the HRS freezing temperature limit and improves IEQ, Eurovent would support this proposal, provided the bonus factor in η_e formula is adjusted to the climate conditions.

In Eurovent opinion, the thermal heat recovery η_t (in the η_e formula) should refer to dry conditions (sensible heat only).

5.2.2 Display the differences in SEC for the various climate zones on the Energy Label

Eurovent supports this proposal

5.2.3 Correct temperature efficiency for leakages ($\eta_t = \eta_5$ instead of η_0)

Eurovent supports this proposal. But we also assert that a discussion to find correct values for η_5 is needed. In our view, the current proposal of η_5 in the harmonised FprEN 13142 does not correctly take account of the leakage test method. (pressure test, in-duct tracer gas test or chamber tracer gas test). There is a common understanding among experts that the results of these methods cannot be directly compared. This situation could lead to inconsistency in the evaluation and rating of RVUs.

5.3 Modifications regarding filters

5.3.1 Include reference filters and increase initial pressure by a factor 1.5

Eurovent is in favour of including reference filters. This would facilitate fair comparison of the performance of different units.

Eurovent does not support the proposal to multiply the initial pressure drop by a factor 1.5 for determination of SPI and the reference flowrate. Using a fixed value of the multiplier does not reflect the actual 'pressure drop over time' characteristic of the filter or in other words its energy efficiency. In the opinion of Eurovent members, if this factor is to be used, it should be adjusted to the performance of a specific filter (result of the dust holding test).

5.3.2 Set limit values for filter (media) velocity for RVU

The same comments apply as in paragraph 4.2.2 and Annex II.

5.4 Information requirements for RVUs

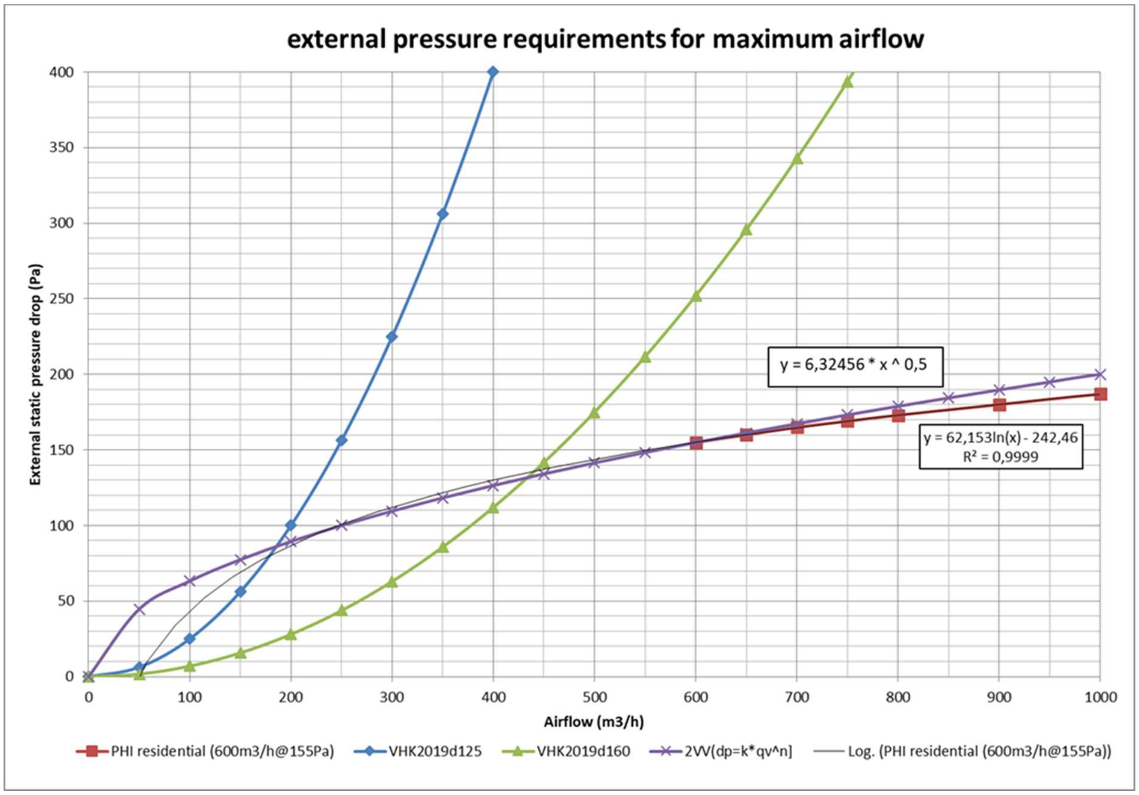
Eurovent supports inclusion of additional filter information in the information requirements for RVUs. **In addition to the scope of information presented in the report, we propose to inform end user about delivered filtration class on VU ecodesign label (in a way similar like vacuum cleaner ecodesign label)**.

5.5 Modifications regarding reference external pressure difference

5.5.1 Reference external pressure

Eurovent supports the principle for adjusting the applicable reference external pressure to the declared maximum flowrate instead of using the fixed value of 50 Pa and to determine the reference flowrate accordingly. We hold it should be a clear distinction between the maximum working point and the reference working point.

Eurovent is not in favour of relating the external pressure to the cross-section of unit spigots. In our opinion, the spigot cross-section is not insufficient to determine the external pressure drop that depends on many other factors. Instead, we suggest using a single function relating the external pressure to the maximum flowrate. A sample of the function that might be used is presented on the graph below (see purple curve – 2VV, $\Delta p = 6.32 \cdot q^{0.5}$).



5.5.2 Reference pressure parameters

Eurovent is in favour of using p_{us} and p_u parameters.

5.6 Modifications regarding limit values for BVU-leakages

Eurovent supports introduction of limit values for BVU leakages. Taking into consideration the current status of standardisation, we agree with the proposed limit classes for ducted BVUs. Given that the method C is not considered reliable enough if the external leakage is high, in addition we propose to set a limit for class B3 if the chamber tracer gas is used.

Since the proposed limits for the leakage are low, we do not support the proposal to correct the declared outdoor supply and indoor exhaust mass-flows for these leakages. In the opinion of Eurovent members, the energy impact is reflected in heat recovery, thus introducing a correction of η_t due to leakages (η_5) is enough.

Moreover, we firmly express our opinion, that a unified method for leakages test (most preferably pressure based) of ducted BVUs should be developed to ensure comparable evaluation of any unit (as a 'black box') regardless of the HRS type.

5.7 Modifications regarding energy consumption for defrosting

Eurovent is in favour of indicating the impact of defrosting strategy on the energy consumption provided it would be simple and easy to implement. According to prof. Huber, the author of approach proposed in FprEN 13142:2019, the current method for correcting SEC might be simplified by selecting the variant of a blacklist or a whitelist. The idea behind this method is to indicate which frost protection strategies have a relevant impact on energy and therefore can lead to a reduction of an energy class.

Furthermore, the criteria for functionality of acceptable defrosting strategy should include the outdoor temperature range at which a unit can properly operate (continuous and balanced air flows and the acceptable limit for minimum supply air temperature).

As the alternative approach Eurovent proposes including a simple information requirement for BVUs and adding a symbol on the energy label, to inform the end-user whether the unit has passed the cold climate test, has failed the test, or has not been tested. For outside temperatures down to -15°C the cold climate test according to EN 13141-7 might be used. For units operating in a very cold climate (e.g. northern Scandinavia) a lower testing temperature would be necessary.

Annex I - Eurovent proposal for consideration of Non-Residential Ventilation Units fitted with a Heat Pump and HRS or Heat Pump only into the scope of the revised VU Regulation

Scope: Non-Residential Ventilation Units

Background

Currently, Article 1(2)(g) of Regulation 1253/2014 excludes from the scope ventilation units which include a heat exchanger and a heat pump for heat recovery or allowing heat transfer or extraction being additional to that of the heat recovery system.

Eurovent maintains that this exclusion should be lifted and NRVUs including a heat exchanger (HRS) and a heat pump (HP) or only Heat Pump for heat recovery should be covered in the scope of the revised VU Regulation.

This document includes a proposal of the method to evaluate minimum requirement for this type of Ventilation Units. Requirements for units including HRS and HP and for units including only HP are defined separately.

Proposal for a method to evaluate the cumulative heat recovery efficiency of NRVUs including a heat exchanger and an air-to-air heat pump for the primary purpose of heat recovery from exhaust to supply air

Introduction

Today, the EU regulation 1253/2014 does not cover NRVU's with heat exchangers (HRS) and air to air heat pumps (HP), primarily designed for the purpose of heat recovery from exhaust to supply air, supporting the passive heat recovery system. This situation creates a loophole for manufacturers, to design units with low energy efficient heat recovery systems, combined with simple designed heat pumps, which are out of scope of any ecodesign regulation. Therefore, we come to the conclusion, to include those units into the regulation 1253/2014 for NRVUs, together with a new (third) way of evaluating these heat recovery systems. The efficiency of such systems shall match the efficiency of heat recovery systems other than run around systems.

Goal

- Closing the loophole of unregulated NRVUs with heat recovery and air to air heat pump, by including those units into EU regulation 1253/2014.
- Establishing a new way of evaluating those units within 1253/2014.

Proposal

- If a unit with heat pump and heat recovery can fulfil the limits of 1253/2014, like units with normal/passive heat recovery systems, it does not have to fulfil the proposed new evaluation process for units with air to air heat pump. Instead, it can be treated as a normal NRVU by the rules of 1253/2014 as is. If such unit cannot fulfil those requirements, it shall be evaluated in a new way for units with HP and HRS (see proposals b ff.).
- The new evaluation shall be based on unit calculations for a fixed temperature difference between extract and outdoor air, a humidity ratio of 0 $kg/kg_{dry\ air}$ (no possible condensation) and expected maximum air volume flow through HRS and HP during heating period without thermal bypass in use. The proposed dry temperature difference between extract and outdoor air shall be 15K.
- Introduction of a specific heat recovery capacity of the entire system (HRS + HP) in $kJ/kg_{dry\ air}$, instead of the heat recovery efficiency in percent as a criterion for a minimum heat recovery capacity from the exhaust air of the ventilation unit.

- Introduction of a specific electrical power consumption of the entire system (fans with air-side pressure loss of heat recovery, heat pump and filter plus HP compressor) in $kJ/kg_{dry\ air}$, instead of the specific fan power as the criterion for maximum ventilation power consumption. The new value shall be called SSP_{int} (Specific System Power).
- Introducing a heat recovery limit of 10.95 $kJ/kg_{dry\ air}$
- Maintaining the efficiency bonus E, that is, the more $kJ/kg_{dry\ air}$ of thermal energy is recovered from the exhaust air, above the minimum requirement 10.95 kJ/kg, the higher the SSP can be. E = ((recovered heat capacity - 10.95 kJ/kg) / 0.15 kJ/kg) / 100 * 3000
- The maximum internal specific system power of ventilation components and compressor power (SSP_{int_limit}) in $kJ/kg_{dry\ air}$ shall be:
- (1 100 + E - 300 * q_{nom} /2 – F) / (1.204 * 1 000) if $q_{nom} < 2\ m^3/s$ and
- (800 + E - F) / (1.204 * 1 000) if $q_{nom} \geq 2\ m^3/s$

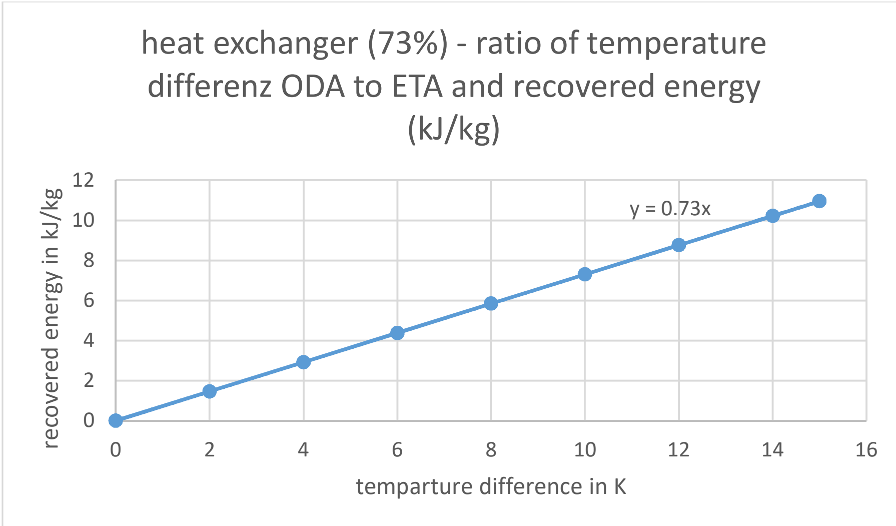
Air density at standard air conditions 20 °C, 0 kg/ $kg_{dry\ air}$ and 101 325 Pa: 1.204 kg/m³

- The following results shall be documented by the manufacturer:
- Air volume flow rate
- Heat recovery thermal efficiency of the passive heat recovery
- Heat recovery thermal efficiency of the heat recovery system, including HP
- Internal pressure drop of ventilation components for SUP and ETA
- Internal specific system power SSP_{int}

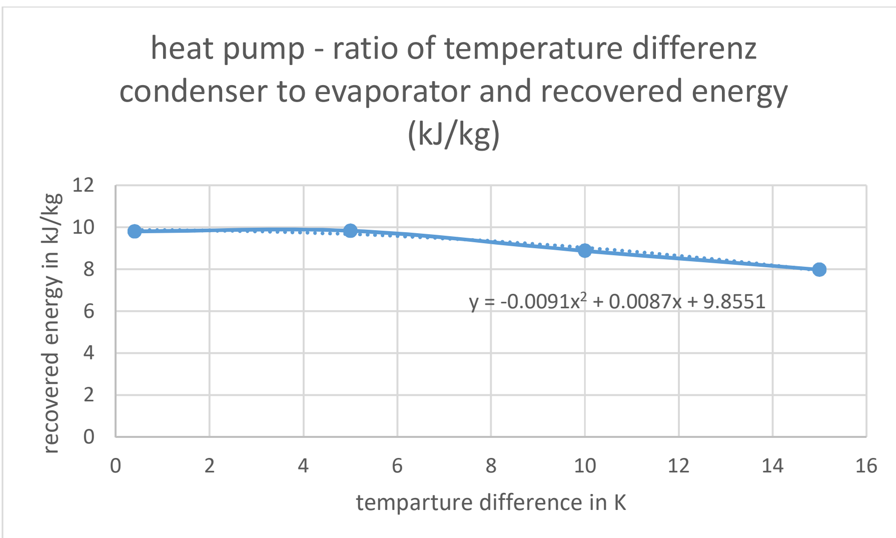
Explanation

Right now, regulation 1253/2014 only knows two heat recovery systems, run around and other heat recovery systems. These systems can be called passive heat recovery systems, as there is no additional power, apart from the fan motors, needed, to operate the heat exchanging process. The efficiency of such recovery systems is expressed as a percentage value of the dry temperature efficiency and can be seen as a constant value.

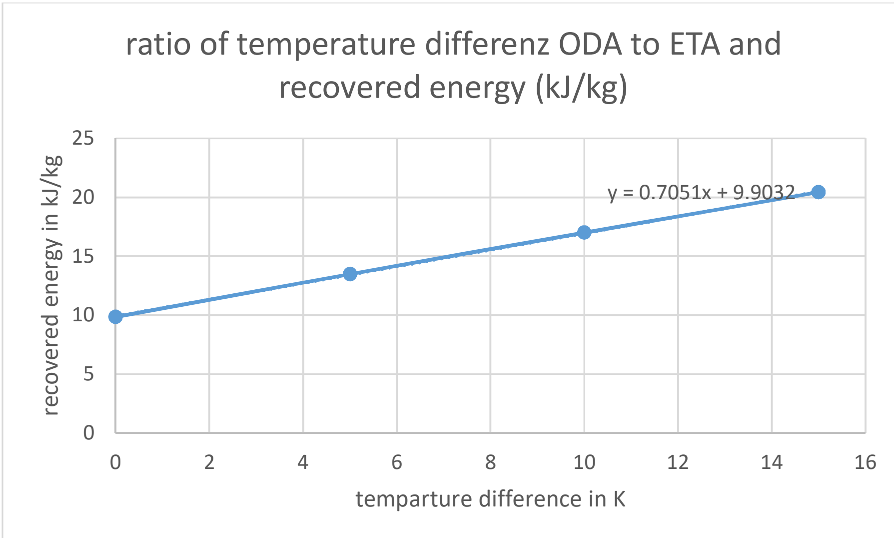
Heat recovery systems, designed with a heat exchanger and an air-to-air heat pump, cannot be valued this way, because they can still recover heat, even when there is no temperature difference between outdoor and extract air. In passive heat exchanger with 73% temperature efficiency is shown in the first graph, displaying the recovered energy in kJ/kg over the dry temperature difference.



The next graph shows the results of a heat pump. The heat pump loses efficiency, as the temperature difference between air in of condenser and evaporator increases.



The two systems combined as one heat recovery system then show the following behaviour.



To compare a standard HRS with this combined HRS, we can now use the specific recovered heat energy of both systems. To do so, it is essential to agree on an average temperature difference throughout a whole year in Europe. We believe, that a difference between 10 to 15K represents the average climate situation. Therefore, the ongoing explanation continues with 15K as the extreme of this temperature range. With 15K, a standard HRS with an efficiency of 73% can recover 10.95 kJ heat energy per kilogram dry air. This recovery value shall be the new limit for the minimum heat recovery capacity of an HR + heat pump system.

To compare the electric power consumption of the two systems, the heat pump system must include the power consumption of the fans to overcome the pressure loss of the heat exchanger, the condenser and the evaporator. The power consumption of the compressor has to be added, too. This will be then a new value, as proposed in point 2.d. At the minimum heat recovery capacity, the new specific electrical power consumption SSP shall not exceed the SFP_{limit} of a standard HRS.

A new efficiency bonus formula is needed, following the same principle of the old efficiency bonus, but now based on the amount of extra heat recovery capacity, exceeding the limit of the heat recovery capacity of 10.95 kJ/kg. To compare it to the old bonus, we can say that 1% of increase in efficiency of a passive HRS at a temperature difference of 15K equals an increase of recovered energy by 0.15 kJ/kg. To keep the bonus in line with the bonus for passive HRS, the new formula shall look like this:

Efficiency bonus = ((recovered heat capacity - 10.95 kJ/kg) / 0.15 kJ/kg) / 100 * 3000

The efficiencies, documented by the manufacturer, shall be expressed in percentage instead in kJ/kg. It will be easier for the customer to read and understand.

Proposal of a method to evaluate efficiency of NRVUs including only an air-to-air heat pump for heat recovery from exhaust to supply air (thermodynamic energy efficiency)

Eurovent proposes the following approach:

- Use the physical principle of EN 13141-7 for non-residential application
- Determine a minimum supply air temperature to evaluate recovery system (e.g. 20°C)
- Apply test procedure and measurement according to EN 14511-2018
- Declare heating supply capacity [kW], airflow rate [m^3/h], supply air temperature [°C] and COP
- Set minimum requirements for COP value

In opinion of Eurovent members, the minimum requirement should be COP ≥ 4.0 at indoor temperature 20°C (DB) / 12°C (WB) and outdoor temperature 7°C (DB).

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Annex II - Eurovent proposal of the alternative method for consideration of the air filter energy efficiency in the revised VU Regulation

Scope: Non-Residential Ventilation Units and Residential Ventilation Units

Introduction

Pressure drop over air filters fitted in a Ventilation Unit represents a significant part of the total fan pressure. This pressure drop is not constant, and it increases over time. Thus, considering only the clean filter pressure drop in the assessment of energy efficiency does not reflect the actual performance of the filter and in turn of the ventilation unit. Pace of the pressure increase depends on various features of the filter. On the main important of these is the filter area. For this reason, in the original Position Paper, Eurovent proposed to limit the filter 'media velocity' defined as a ratio of the air flow to the filter surface. Since other features influence the average pressure drop too, this proposal has raised several Stakeholder's comments on possible hindering of innovations and product development.

Being mindful of these concerns, members of the Eurovent Product Group 'Air filters' propose an alternative and more reliable method for the assessment of the filter average pressure drop over its service period, or in other words, filter energy efficiency.

Reasoning of the new proposal

The alternative approach draws on the Eurovent Recommendation 4/21 – 2019 'Energy Efficiency Evaluation of Air Filters for General Ventilation Purposes'.

The recommendation provides a comprehensive methodology for determining the reference energy consumption of a filter based on the dust holding capacity test defined in EN ISO 16890 part 3. This approach allows to estimate the real-life performance of a filter. The amount of the testing dust corresponds to a period of one year of operation.

The reference energy consumption is tested for the nominal air flow rate (3400 m^3/h @592x592) and next can be recalculated for different air flows using a new simple method presented in the latest edition of the Recommendation 4/21 (November 2019).

In other words, the Eurovent methodology estimates energy consumption of the filters on the assumption that filters are replaced in regular periods of time (typically one year). This assumption is essentially correct for Non-residential ventilation systems operated by Facility Management companies who apply so called 'planned maintenance' scheme. These systems are normally large, and presumably represent the major part of the ventilation related energy consumption on the EU market.

Also, for Residential ventilation systems this assumption is legitimate, since RVUs placed on the market are fitted with the timer informing the user on the need for changing filters.

In case of non-residential ventilation units where the filters are only changed after the max pressure drop has been reached (typically small systems including one unit installed), the proposed approach does not lead to significant savings in the energy consumption. However, filters featuring lower reference energy consumption (lower average pressure drop over one year) will be operating longer before replacement what brings tangible benefits from the Circular Economy point of view.

Alternative proposal

Considering the above, Members of the Eurovent propose the following alternative method for evaluation and limiting energy consumption of air filters installed in Ventilation Units.

1. Set minimum requirements for the reference energy consumption of a filter (expressed in kWh/a)

   As a basis for determining the Best Available Technology (BAT), Eurovent Market Intelligence statistics might be used.
   Eurovent members propose to consider as the limit for energy consumption the values corresponding to the Energy Class C of the Eurovent Certita Certification (ECC) programme 'Air Filters'. Eurovent Certita Certification Energy Classes A+ to C represent approximately 53% of all certified filters. In turn, according to Eurovent Market Intelligence estimations, over 80% of filters placed on the EU market are ECC Certified.
   This would lead to elimination from the market filters featuring low energy efficiency (equivalent to ECC energy class D and E) rated at the nominal air flow (3400 m^3/h @592x592)

2. The filter supplier declares the maximum air flow rate at which a filter can still offer the energy consumption limit. Energy consumption is rated at the nominal flow rate and next recalculated for the maximum declared flow according to the Eurovent Recommendation 4/21-2019.

   Filters installed in Ventilation Units often operate at air flow rate lower than the nominal one (3400 m^3/h). Filters with a higher energy consumption than class C, might be still used, yet up to the maximum flow declared by their supplier.

3. In case of filters of the worst energy class, for which the reference energy consumption cannot be determined and recalculated, the maximum face velocity criteria would be applied instead of the maximum energy.

   Eurovent members propose to set in this case as a limit velocity of 1.2 m/s (1500 m^3/h @592x592). At such low face velocity, resistance of a filter is very low and not relevant.

4. The supplier of Ventilation Unit is responsible for using and selecting only the compliant filters

Eurovent and transparency

When assessing position papers, are you aware whom you are dealing with?

Eurovent's structure rests upon democratic decision-making procedures between its members and their representatives. The more than 1.000 organisations within the Eurovent network count on us to represent their needs in a fair and transparent manner. Accordingly, we can answer policy makers' questions regarding our representativeness and decisions-making processes as follows:

1. Who receives which number of votes? At Eurovent, the number of votes is never determined by organisation sizes, country sizes, or membership fee levels. SMEs and large multinationals receive the same number of votes within our technical working groups: 2 votes if belonging to a national Member Association, 1 vote if not. In our General Assembly and Eurovent Commission ('steering committee'), our national Member Associations receive two votes per country.	**2. Who has the final decision-making power?** The Eurovent Commission acts as the association's 'steering committee'. It defines the overall association roadmap, makes decisions on horizontal topics, and mediates in case manufacturers cannot agree within technical working groups. The Commission consists of national Member Associations, receiving two votes per country independent from its size or economic weight.
3. How European is the association? More than 90 per cent of manufacturers within Eurovent manufacture in and come from Europe. They employ around 150.000 people in Europe largely within the secondary sector. Our structure as an umbrella enables us to consolidate manufacturers' positions across the industry, ensuring a broad and credible representation.	**4. How representative is the organisation?** Eurovent represents more than 1.000 companies of all sizes spread widely across 20+ European countries, which are treated equally. As each country receives the same number of votes, there is no 'leading' country. Our national Member Associations ensure a wide-ranging national outreach also to remote locations.

Check on us in the European Union Transparency Register under identification no. 89424237848-89.

We are Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies – thinking 'Beyond HVACR'

Eurovent is Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies. Its members from throughout Europe represent more than 1.000 companies, the majority small and medium-sized manufacturers. Based on objective and verifiable data, these account for a combined annual turnover of more than 30bn Euros, employing around 150.000 people within the association's geographic area. This makes Eurovent one of the largest cross-regional industry committees of its kind. The organisation's activities are based on highly valued democratic decision-making principles, ensuring a level playing field for the entire industry independent from organisation sizes or membership fees.

Eurovent's roots date back to 1958. Over the years, the Brussels-based organisation has become a well-respected and known stakeholder that builds bridges between the manufacturers it represents, associations, legislators and standardisation bodies on a national, regional and international level. While Eurovent strongly supports energy efficient and sustainable technologies, it advocates a holistic approach that also integrates health, life and work quality as well as safety aspects. Eurovent holds in-depth relations with partner associations around the globe. It is a founding member of the ICARHMA network, supporter of REHVA, and contributor to various EU and UN initiatives.

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