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Eurovent comments on 2025 draft revised VU Regulation – ecodesign requirements for NRVUs

In a nutshell

With this position paper Eurovent provides comments on the draft revised Ecodesign Regulation for Ventilation Units discussed at the Stakeholder meeting on 24 April 2025 with regard to Non-Residential Ventilation Units.

Introduction and background

The stakeholder consultation meeting was held on 24 April 2025 as part of the follow-up study on the review of the Ecodesign Regulation (EU) 1253/2014 for VUs and the Energy Labelling Regulation (EU) 1254/2014 for RVUs. It was preceded by publication of consultation documents at CIRCABC, including the draft revised Ecodesign and Energy Labelling Regulations. Prior to this (in June 2024), the study consultant published Phase 1.1: Technical Analysis (Draft).

Eurovent members thank the Commission and the consultant for their work and welcome the proposals set out in the draft revised regulations. We appreciate that many of Eurovent' s proposals have been considered in these documents.

In this document, members of the Eurovent Product Group 'Air Handling Units', which brings together 110 manufacturers representing the majority of European AHU industry, provide their comments and questions on the draft revised Ecodesign Regulation with regard to requirements for non-residential ventilation units.

Comments are listed in order of importance.

1. Significantly increased requirements for RAC systems

Reference	Annex III (1), page 20

The current draft revised Ecodesign Regulation surprisingly increases the minimum energy recovery efficiency (temperature ratio) for RAC heat recovery systems by 5%, while reducing the corresponding SFP_{int_limit} by 50%[1] compared to the current Regulation of 2014.

Eurovent members do not understand the reason and rationale for this change and point out the following issues with the new proposed requirements:

- Reaching a temperature efficiency of 73% by RAC systems is challenging and, according to some Eurovent members, not feasible. The efficiency that can be achieved depends on the type and proportion of antifreeze in the fluid, which is not defined in the draft Regulation.
- A higher minimum temperature efficiency for RAC systems entails:

[1] At t_{ODA} = -14 °C and with control bonus C = 1, supply air filter ISO ePM1 >50% (F7), exhaust air filter ISO ePM10 >50% (M5) and q_{nom} > 2 m/s.
With the current Regulation SFP_{int_limt} = 1300+(0.73-0.68) ·3000 = 1450 W/(m³/s)
With the draft revised Regulation SFP_{int_limt} = 0.83·1· (215+388+150+120) = 725 W/(m³/s)

  - increase in price of the unit due to more materials needed (more coil rows, larger unit casing, larger brine pump),
  - increased environmental impact of the production phase due to more materials used,
  - higher electricity consumption of fans and pumps due to higher air and liquid pressure drop.
- The proposed and changed SFP_{int_limit} formula leaves only about 300[2] Pa for air pressured drop associated with HRS (150 Pa per air side), while according to the expertise of Eurovent members, with currently available technology, 18 to 20 row coils are typically needed to achieve an efficiency of 73%. Their pressure drop at a typical face velocity of 2 m/s is approximately at least 200 - 220 Pa (per air side).

Eurovent already expressed its position on the requirements for RAC in comments from 2021 (PP – 2021-04-30, section 1.2), which is reiterated below:

> Eurovent fully supports the proposal to maintain different requirements for the minimum temperature ratio (η_{t_nrvu}) for the run-around ERS and other ERS.
>
> Current requirements (ErP2018) are at the limit of what is reasonable and economically justifiable for this kind of exchangers. Further increase in requirements would lead to the abandonment of this technology, which is not acceptable from the market perspective since in many applications there is no alternative for RAC.
>
> To meet even higher requirements, the design face air velocity across run-around coils has to be very low. But it must be noted that with much reduced air velocity (compared to the design velocity), which occurs most of the time with Ventilation Demand Control, the efficiency of the RAC drops dramatically. In this context, enforcement of VDC (by means of C factor) in connection with higher requirements for RAC, would be opposing.

Given the above, Eurovent members reckon that the proposed new requirements would result in widespread attempts to circumvent the regulation by using two UVUs instead of one BVU. This would be contrary to the Commission's intention to reduce the number of UVUs installed in the market, which is intended to be achieved by introducing the 'known location' approach.

RAC is a system used is specific applications, like operating theatres in hospitals, where contamination of supply air with exhaust air is absolutely not acceptable or units with remotely located supply and exhaust parts. It is already typically the most expensive design compared to other HRS. According to Eurovent Market Intelligence, RAC systems account only for around 5% of HRS placed on the market, which translates to approximately 15 000 units per year. This makes the circumvention scenario envisaged by Eurovent members likely.

[2] With t_{ODA} = -14 °C, control bonus C = 1 and q_{nom} > 2 m/s. Assumed efficiency of fans = 60%. Accordingly, the maximum pressured drop attributable to HRS is 0.83·1· (215+388) · 0.6 = 300 Pa.

Eurovent position

- Eurovent opposes the new proposal and requests to maintain the current distinction between RACs and other HRS (as per PP – 2025-04-08),
- If an adequate study is available to prove benefits of the proposed changes (outweighing the thermal energy savings over the additional financial costs and environmental impact by more materials and electricity consumed), Eurovent may agree to increase the minimum η_t for RACs but while maintaining the current difference in the SFP_{int_limit}.

2. Modified efficiency bonus E

Reference	Annex III (1), page 21

In December 2024, prof Huber noted an issue with the efficiency bonus E recommended for incorporation by ICF in section 2.1.3 of Phase 1.1: Technical Analysis (Draft). He also put forward a tentative proposal for a modified E-bonus for further discussion and evaluation, which was sent to Eurovent and EVIA. This preliminary proposal has now been included in the draft revised Regulation.

Eurovent and Prof Huber continued to investigate the issue and concluded that the tentatively proposed new E-bonus does not provide a sufficient increase in the $SFP_{int\ limit}$ to compensate for a higher pressure drop of more efficient energy recovery components (see yellow curve in charts below).

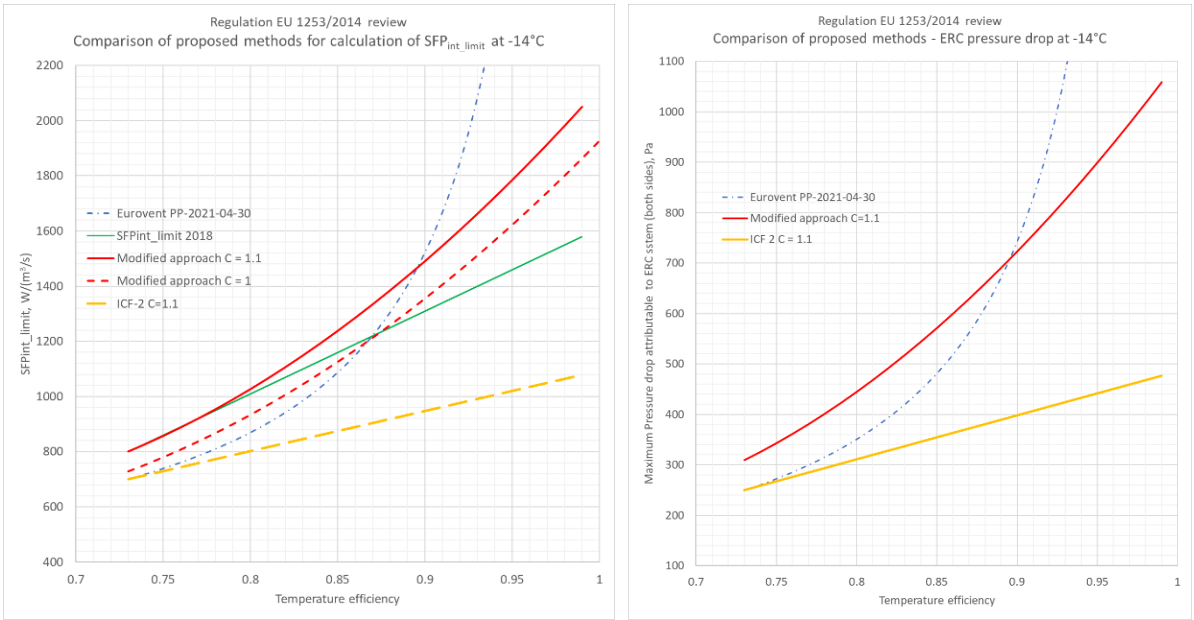

Table 1. Comparison of SFP_{int_limit} (left) and maximum pressured drop attributable to the energy recovery system (right) for different approaches. Data refers to for outdoor temperature of -14°C, other ERC type (without moisture recovery), q_{nom} > 2 m3/s, F_{sup} = 150 (ISO ePM1 >50% ≈ F7), F_{exh} =135 (ISO ePM2.5 >50%), total efficieny of the fans = 60%, C = 1.1

Furthermore, it does not eliminate the problem of the climate-dependant gap in the $SPF_{int\ limit}$ bonus.

The joint work of Eurovent and Prof Huber has resulted in an updated proposal to solve the observed problems with the E-bonus. It was submitted to the Commission and ICF as PP – 2025-04-08 and provides the following suggestions:

Proposed modifications

To eliminate the pointed issues, while maintaining unchanged the overall concept of the new approach based on Dr Kaup's original study, we propose the following:

- Adjust (decrease gradient) the function of the correction factor E for high efficiency values.
- Calculate SFP_{int_limit} as a function of the actual η_{e_nrvu} and not the design outdoor temperature to exclude the influence of climate.
- Adjust the SFP_{int_limit} function so that for a unit without any controls (C = 1), it gives limits approx. 10% lower than the current 2018 values, and for a unit with controls corresponding to C = 1.1, it gives the same limits as the current 2018 values.

In addition, to facilitate the implementation of the new approach, we propose to simplify the set of formulas by embedding both the SFP_{HRS_base} and E into the following single equation for SP_{int_limit} with coefficients depending on the range of nominal air flowrate (q_{nom}) and the type of energy recovery system:

Eurovent position

- Eurovent requests adoption of the proposal as per PP – 2025-04-08.

3. Requirements as regards internal leakages in non-residential BVUs

Reference	Annex III (4), page 22

After the first stakeholder meeting in June 2024, where the ICF report Phase 1.1: Technical Analysis (Draft) was presented, Eurovent signalled in its PP – 2024-06-25 the need to modify the proposed OACF limit requirements (The OACF at nominal flow and nominal pressure must be within 0.90 and 1.10) , because:

- OACF and EATR significantly depend on the external static pressure (ESP) in the connected ductwork. This value is defined by the customer / designer and is out of control of the AHU supplier. With high ESP values, meeting the proposed requirement would not be technically feasible. As the Regulation is intended to be a product regulation, this external system impact needs to be eliminated.
- Small NRVUs with rotary heat exchangers of small diameter may not technically be able to meet the proposed requirements.

This was followed by a comprehensive updated Eurovent proposal for requirements to limit internal leakage in NRVUs, which resolves the above-mentioned problems as follows:

- Reduce the leakage of extract air to supply air by setting a limit for EATR and implicitly at the same time for OACF<1, since EATR and OACF<1 are concurrent
- limit the OACF leakage indirectly via the SFP_{int_limit} by including the effect of OACF leakage on SPF_{int} test and calculation.

It must be stressed that the updated Eurovent proposal aims not only to reduce internal leakage by increasing the tightness of ERC components, but also to eliminate incorrect fan configurations that significantly affect the leakage. This subject was comprehensively explained in Eurovent 6/15 and the related potential energy savings were estimated in PP – 2020-12-18.

The updated proposal was submitted to the Commission in December 2024 as PP – 2024-12-10. It was not considered in the current draft Regulation which still requires a fixed OACF limit (0.9 < OAFC < 1.1).

The Consultant recommended not considering it since proposal's testing methods and specifications still need further clarification and definition. It should be emphasised that testing of SFP_{int} including the impact of OACF is already a standard element of the Eurovent Certification for AHU and this test is based on the current standards (EN 13053:2019 and EN 308:2022). Given that 161 air handling unit manufacturers participate in this certification program, and according to Eurovent Market Intelligence the total number of European manufacturers amounts to 300-320, it can be estimated that about half of the market already applies the Eurovent approach to consider the impact of OACF on SFP_{int}.

Eurovent position

- Eurovent request adoption of the proposal as per PP – 2024-12-10
- Alternatively, if the above proposal cannot be accepted by the Commission, Eurovent requests the following modification of the EATR and OACF requirements:
  - Set the OACF and EATR limits at a reference $\Delta P_{22\text{-}11}$ pressure difference of 0-20 Pa (positive value) as per EN 308 test standard.
  - Relate the OACF limit to the rotor diameter or air flow rate. Preliminary ideas on this requirement for further elaboration are presented in the Annex I.

4. Definition of control bonus C

Reference	Annex VII Table 6, page 38

Definitions of control bonuses C1 and C2 are vague and open-ended while definitions of terms 'NRVU-package', 'co-purchased' and 'co-delivered' are missing.

This poses a considerable risk of misinterpretation, circumvention and lack of verifiability by Market Surveillance Authorities. Therefore, Eurovent members request that these shortcomings are eliminated, and offer putting forward an industry proposal for an unequivocal interpretation of these terms in the next few weeks.

Furthermore, following the position submitted in 2021 (section and 1.4.4 and 1.3.1 in PP – 2021-04-30) Eurovent requests the ventilation demand control (VDC) function to be mandatory in all cases in order to avoid compensating low energy efficiency by a bonus for controls that may not be used in practice.

5. Ecodesign requirements - the minimum fan efficiency

Reference	Annex III (1), page 20

To avoid duplicate requirements, Eurovent requests the following change it the requirement.

- *For UVUs without a filter, the minimum fan efficiency (η_{vu}) shall be*
  - *6,2 % * ln(P) + 42,0 % if P ≤ 30 kW and*
  - *63,1 % if P > 30 kW.*

6. Ecodesign requirements for non-residential UVUs

Reference	Annex III (2), page 21

In order to avoid a loophole, Eurovent requests the following change it the requirement.

From [2 years after entry into force of this Regulation] the $SFP_{int-limit}$ for UVUs intended to be used with a supply filter shall be F_{sup} and for UVUs intended to be used with an exhaust filter shall be F_{exh}.

7. Information requirements for NRVUs with ERS and HP

Reference	Annex V, page 30

Definition of '*internal specific system power SSP_{int}*' is missing. Eurovent already raised this issue in the comments from 2021 (section 1.1 in PP – 2021-04-30) and referred to Eurovent proposal for information requirements for NRVU with HP and HRS - Eurovent.

Accordingly, Eurovent requests the following modifications to the Regulation text:

I. Change clause 2.g in Article 1

use ~~both a passive energy recovery system and~~ a heat pump for the recovery of energy between the supply and exhaust ventilation airflows, except for information requirements;

Rational: This clause is a loophole. By simply adding a heat pump to a passive ERS the manufacturer can ignore the requirements of the regulation and produce a unit with a temperature efficiency below minimum limits and a SFP_{int} above the maximum limit.

This means that units with both a passive heat exchanger and a heat pump will be in scope and that they must meet the relevant requirements for temperature efficiency of the passive heat exchanger and SFP_{int}.

II. Change information requirements in Annex V as follows:

Additional Information requirements for NRVUs with ERS and integrated HP.

(NRVUs using both passive ERS and integrated HP for the recovery of energy between the supply- and exhaust ventilation airflows)

NRVUs with ERS and integrated HP are defined as units with a passive heat exchanger combined with a heatpump exclusively for heat recovery where the heat exchange of the heat pump is exclusively with the supply and the extract airstreams within the unit.

From [2 years after entry into force of this Regulation], instruction manuals for installers and end-users, and free access website of manufacturers, importers or authorised representatives shall include the following additional information:

(a) temperature ratio of the total heat recovery system (ERS including HP) in [%] defined here as the ratio of the supply temperature rise due to passive ERS and condenser coil and ~~the~~ a fixed ~~difference between the~~ temperature difference between ~~of~~ exhaust air inlet and ~~the temperature of~~ supply air inlet ~~(equals 15K) (Reference test standard: EN 308)~~ of 15K.

(b) internal pressure drop of ventilation components; ~~for SUP and ETA in [Pa]~~ which is the same as that for the reference NRVU but including the pressure drop of the heat exchangers of the heat pump.

(c) internal specific system power SSP_{int} expressed in both kJ/kg_{dryair} and $W/m^3/s$, where SSP_{int} $[W/m^3/s]$ = $SSPint\ [kJ/kg_{dryair}] \cdot 1.204 \cdot 1000$

Definition:

SSP_{int} is the specific power consumption of the ventilation unit including the compressor power at the nominal operating point

OR

SSP_{int} is the ratio of the sum of the power consumption of the fans due to the ventilation components including the heat exchangers of the heat pump and the compressor input power at the nominal operating point to the nominal airflow.

8. Information requirements for NRVUs – external leakage rate

Reference	Annex V (p), page 29

The current draft states:

(p) declared maximum external leakage rate (%) of the casing of ventilation units

Eurovent position:

Eurovent requests to express the declared maximum external leakage rate as a leakage rate in l/s per square meter to ensure the consistency with the relevant EN 1886 test standard.

9. Spare parts – availability of technical characteristics

Reference	Annex III (5)(1)(b), page 22

Since some motors are integrated into a non-demountable fan assembly, Eurovent proposes the following amendment to this requirement:

(b) Manufacturers, importers or their authorised representatives of NRVUs shall make available to professional repairers the technical characteristics of at least the following components, when present:

- *Motors,*
- *Non-detachable fan-motor assemblies*

10. Access to repair and maintenance information

Reference	Annex III (5)(2), page 22

Since NRVUs are often customised products, Eurovent proposes the following modifications to requirements for access to repair and maintenance information:

(2) access to repair and maintenance information:

From [2 years after entry into force of this Regulation] or 6 months after the first unit of a model of a NRVU has been placed on the market and, whichever is the later date, and at least until 8 years after the last unit of the model has been placed on the market, the manufacturer, importer or authorised representative shall provide professional repairers with access to repair and maintenance information for the parts concerned by point 1(a). For that purpose, the list of spare parts under point (a), the list of technical characteristics of the components referred to point (b) and the procedure for ordering them, shall be available in the documentation of the delivered unit or on request from the manufacturer or importer. The contact address is part of the technical documentation of the unit. This information shall be available for any authorized person. Unit documentation including technical data sheets, drawings and information for the maintenance and integrated components should be available for 10 years after delivery.

11. Requirements for filters for NRVU and spare part filters for NRVU

Reference	Annex III (3), page 21

Eurovent welcomes the inclusion of spare part filters in the requirements, which is a logical consequence that spare filters, as consumables that are replaced several times over the AHU lifetime should be of the same energy efficiency as filters in new units placed on the market.

However, since the Regulation only applies to products placed on the market or put into service, a question arises how this requirement could be enforced afterwards, especially given that spare filters can be supplied by various entities, e.g. facility management companies, or purchased directly by a unit owner / operator.

Eurovent asks the Commission to clarify this issue.

12. Information requirements for air filters

Reference	Annex V (s)(t) page 29

In relation to the previous comment 11, and given that there is no standard or reliable method to estimate power consumption of used/full filters in case they are not exchanged, nor expected filter change intervals of the filters installed in the model, Eurovent proposes the following modifications:

(s) filter(s) class, clean pressure drop(s), final pressure drop(s) ~~and related expected filter change intervals of the filters installed in the model~~.

(t) ~~power consumption of used/full filters in case they are not exchanged or energy performance (declared~~ information about the annual energy consumption (AEC) of the filters installed in the model calculated according to Annex VIIa.

13. Spare part definition

Reference	Annex I (43) page 12

Eurovent proposes the following change in the definition:

(43) *'spare part' means a separate part that can replace a part with the same or similar function in a VU ~~server or data storage product. The functionality of the server or data storage product is restored or upgraded when the part is replaced by a spare part~~. A spare part does not have to be the exact identical product; it can be a technically updated product which complies with the latest regulations but delivers the at least the same technical performances. Spare parts may be used parts.*

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.

About Eurovent

Eurovent is the voice of the European HVACR industry, representing over 100 companies directly and more than 1.000 indirectly through our 16 national associations. The majority are small and medium-sized companies that manufacture indoor climate, process cooling, and cold chain technologies across more than 350 manufacturing sites in Europe. They generate a combined annual turnover of more than 30 billion EUR and employ over 150.000 Europeans in good quality tech jobs.

Mission

Eurovent's mission is to bring together HVACR technology providers to collaborate with policymakers and other stakeholders towards conditions that foster fair competition, innovation, and sustainable growth for the European HVACR industry.

Vision

Eurovent's vision is an innovative and competitive European HVACR industry that enables sustainable development in Europe and globally, which works for people, businesses, and the environment.

→ For in-depth information and a list of all our members, visit www.eurovent.eu

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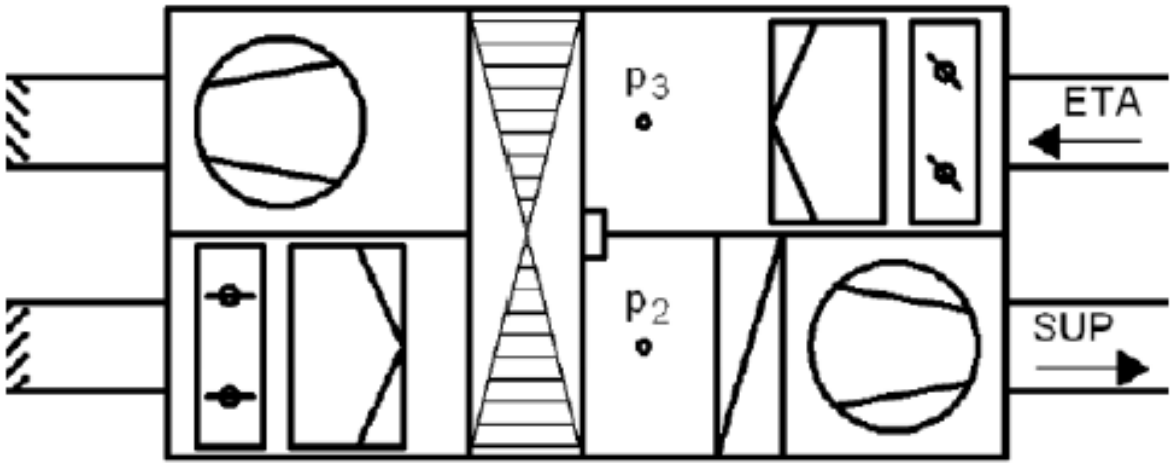
Annex I



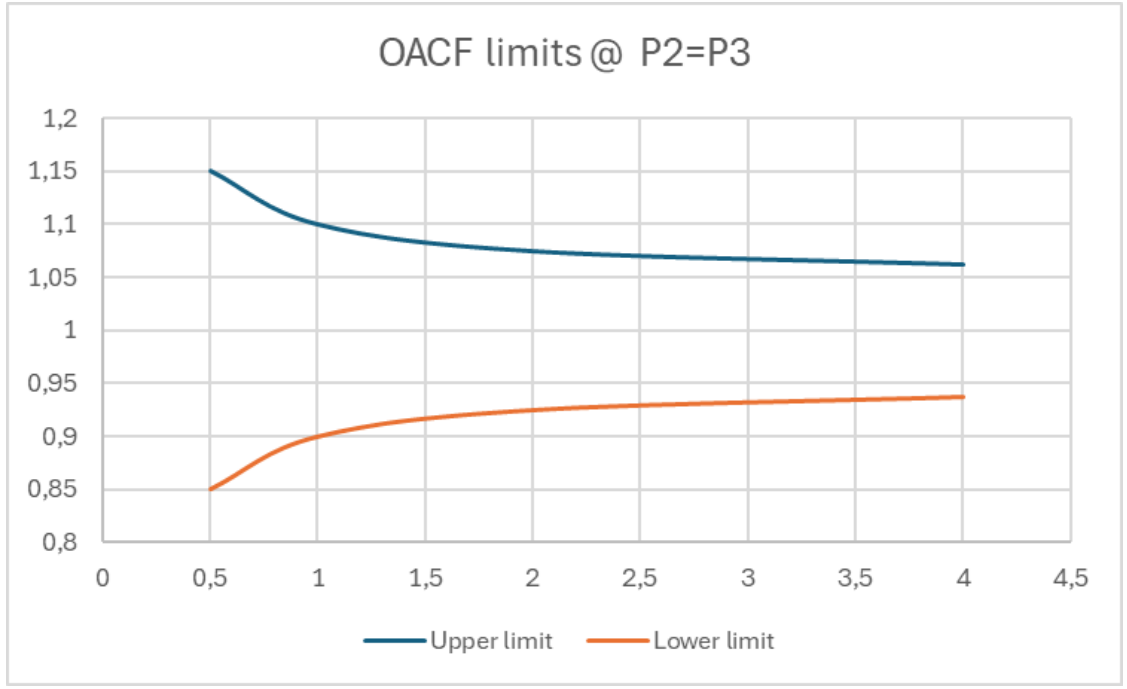
Proposal:

For the purpose of establishing compliance with the Regulation an OACF is calculated with P3=P2

This means that the pressure difference on the atmospheric side of the rotor will be 2x Rotor pressure drop.

Manufacturers shall also provide the real OACF for their customers.

Proposed upper and lower limits of OACF as a function of diameter
Alternative 2 (gives a higher OACF at small rotor diameter.)



Upper limit
OACF limit = 1,05 + 0,05/Diam

Lower limit
OACF limit = 0,95 - 0,05/Diam