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Object : Comments for the project team to be considered as part of the Questions and Answers document related to the Commission Regulation (EU) No 1253/2014 and Commission Delegated Regulation (EU) No 1254/2014

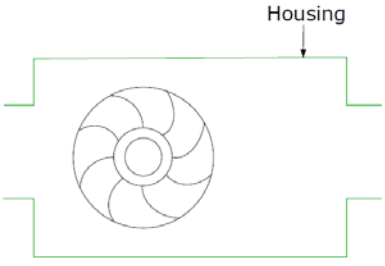
Dear All

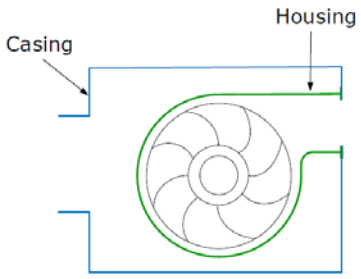
Soler & Palau is a Spanish global manufacturer within the ventilation industry, having a broad portfolio of products. It covers from small to heavy duty fans falling under regulation 327, a whole range of residential and non-residential ventilation units, and also a whole range of box and roof fans falling under the regulation 1253 for several applications.

Soler & Palau is member of AENOR, the Spanish association which represents the interests of Heating, Ventilation, Air conditioning and Refrigeration industries, and it is also member of EVIA, the association representing the interests of the ventilation industry throughout Europe.

We would like to react due to the first stakeholder meeting about the following points:

a) Scope of Regulation 327/2011 and Regulation 1253/2014 for ventilation products

	Configuration	Regulation	Comment
1		327/2011	Agreed
2	 *Figure 10 Fan with large housing*	327/2011	Not Agreed

3	 *Figure 12 Ventilation unit including fan with scroll housing and casing*	1253/2014	Agreed

The fan incorporated in those products is ErP compliant. Then what it has to be regulated only is the impact of the box, cowl, etc. (casing, housing whatever) surrounding the fan.

We cannot make a difference and the market would not understand the different treatment between example 2 and example 3 because both of them are box fans. It will create confusion on the market and a difference between both designs (with or without main housing) for a same application.

Imagine that the fan in example 1 fulfils the requirements of reg.327. To comply with the Machine Directive and to attach that fan to the duct system of an installation a manufacturer builds up a housing around it converting it into a Box Fan (Ventilation Unit) as shown in example 2. The requirements cannot be the same as the housing will create a system effect for the fan and therefore, it will be very difficult to match the efficiency requirement of regulation N°327/2011.

b) <u>Are all Box & Roof fans Ventilation Units?</u>

'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.

Question:
What means the replace of utilized air by outdoor air in a building or a part of a building?

Answer:
Utilized air is polluted from human or building emission caused by a typical use for human presence.
Even though this do not include non-ventilation applications, where minimum one of the air streams is defined by an industrial or a product process, etc., the design of the box & roof fan is similar, if not the same, of those for ventilation applications. Therefore the scope for box&roof fans should be for all types of box & roof fans independent from its application.

Justification: From the beginning of the ErP implementation there had been many discussions regarding the inclusion of Box&Roof fans in regulation 327/2011 or in regulation 1253/2011. Finally, Ventilation Unit regulation focuses on 3 different product groups: residential ventilation units (RVU), non-residential ventilation units (NRVU) and also Box&Roof fans **only** for ventilation purposes. Therefore Box&Roof fans not used for ventilation purposes would **not fall under the scope** of the regulation opening a door for loopholes.

Similar as a Fan, Box & roof fans are products that are used to maintain a continuous air flow. Sometimes they are used in a ventilation system to replace utilized air, and sometimes they are used in an industrial process application, for cooling an application, keep a stairway overpressurized in a tertiary, office or collective building for safety reasons (in case of fire it is free from smoke), and many others, exactly like fans are.

The reason to build a box or a cowl surrounding the fan is to protect the fan's drive transmission from dust and/or for safety and security reasons, and/or for soundproofing reasons, and/or for rain water protection, and/or to guide the air from the ductwork, etc.

For instance to inflate and keep the pressure of a bouncy castle a box fan is usually used. That box fan can also be used for ventilation purposes. The same happens with a box fan for heat control of an industrial process, etc. In those applications some requirements that are valid for VU are non-sense for Box & Roof fans.

The scope should be for all Box & Roof fans independently from its application and consequently the requirements for all Box & Roof fans must take into account for that.

c) Adjustment for SFP_{int}

During the first stakeholder meeting great consensus was detected to use both 'SFP_{int} 2' and/or 'SFP_{int} 3' to assess the requirement of SFP_{int}. Using them a manufacturer of NRVU can use the data from the manufacturer of the fan outside the unit (in red below) to assess the requirement when it is integrated in the VU, focusing only in the design and assessment of the VU:

$$SFP_{int\ UVU} = \frac{\Delta p_{fan} - \Delta p_{s,ext}}{\eta_{Fan}} \cdot \frac{P_{Fan}}{P_{Fan,ext}} = \frac{\Delta p_{fan} - \Delta p_{s,ext}}{\frac{q_{nom} \cdot \Delta p_{fan}}{P_{Fan,ext}}} \cdot \frac{P_{Fan}}{P_{Fan,ext}}$$

$$SFP_{int\ UVU} = SFP_{all} \cdot \frac{\Delta p_{int}}{\Delta p_{fan}} = SFP_{all} \cdot \frac{\Delta p_{fan} - \Delta p_{s,ext}}{\Delta p_{fan}} = SFP_{all} \cdot (1 - \frac{\Delta p_{s,ext}}{\Delta p_{fan}})$$

These formulas incorporate a correction factor for the power consumption due to the system effect.

Δp_{fan} is the static pressure difference measured outside the unit at nominal flow rate and **same rotation speed** as in the unit. There is a problem if the rotation speed of the fan outside the unit is different from the rotation speed of the unit at same nominal air flow. Then another correction factor is needed for the static pressure of the fan outside the unit.

The first assessment done with a VU using a 3 speeds fan, it is not possible to get Δp_{fan} from the fan measured outside the unit at the same nominal flow rate and rpm at the VU because it performs at different conditions due to the system effect: rpm aren't the same when the fan is inside or outside the unit.

Example:

- UVU with filter using a 3 speed fan. At maximum speed and at nominal flow rate (1000 m^3/h declared air flow), performances of the fan alone given by the fan manufacturer are Δp_{fan}=200 Pa, 150 W and 1000 rpm (according to ISO5801)
- Due to the "system effect", the results of the ventilation unit at 1000 m^3/h: $\Delta p_{s,ext}$=130 Pa, 160 W and 900 rpm
- The fan manufacturer should be able to give performances (W, Pstat, Ptot) of the fan alone for working point at maximum speed: 1000 m^3/h - 900 rpm, but the fan

manufacturer can't get these performances without reproducing the system effect.

This problem can be solved by using a correction factor in the formulas can be done to avoid this misalignment between the data from the fan manufacturer and the VU:

$$SFP_{int\ UVU} = SFP_{all} \cdot \left(1 - \frac{\Delta p_{s,ext}}{\Delta p_{fan}} \cdot \left(\frac{rpm_{fan\_out}}{rpm_{vu}}\right)^2\right)$$

d) <u>Heat Recovery should not be mandatory for BVU in some parts of EUROPE</u>

There are some parts of Europe where the use of heat recovery in BVU is against energy savings. The increase in the electrical energy to account for the pressure loss of the heat recovery is lower than the thermal energy recovered. For instance, in the Canary Islands where the mean temperature in coldest winter month is 15ºC and in summer 26ºC: www.spain-grancanaria.com/s/weather-averages.html

e) <u>Separate Delivery</u>

(4)'variable speed drive (VSD)' means an electronic controller, integrated or functioning as one system or as a **separate delivery** with the motor and the fan, which continuously adapts the electrical power supplied to the motor in order to control the flow rate

Question: What does it mean 'separate delivery' for RVU?

Answer: As specific energy consumption and SEC class are linked with x-value parameter, VSD must be delivered within the packaging of the RVU, even though it could be separate from the motor and the fan. It means the delivery of a completed system kit RVU with the labelling in the packaging.

Question: What does it mean 'separate delivery' for NRVU?

Answer: It means a delivery fiscally independent from the motor and the fan when the VU is placed in the market or put into service.

f) <u>Continuous Regulation</u>

2) The definition given in Annex I for 'Central Demand control' and 'Local demand control', states that it is "a demand control for a (ducted) ventilation unit that continuously regulates the fan speed(s) and flow rates …'".

Question: What does it really mean 'continuously regulates the fan speed(s) and flow rates'?

Answer: The word 'Continuously' refers to the continuous measurement of the control parameter. This way a RVU with MSD and DCV can be considered as a continuous regulation.
The fan speed and flow rate is adjusted based on a continuous measure of a control parameter 'to regulate automatically the flow rate' as stated in 'demand control' definition, whatever the drive is MSD or VSD.

g) <u>Definitions for NRVU "fan efficiency"</u>

For a stakeholder of both fans according regulation 327/2011 and ventilation units according regulation 1253/2014, the wording given in 1253/2014 for 'fan efficiency

(η_{fan})' could be misunderstood as the efficiency of the fan alone (327/2011) integrated in the ventilation unit.

(2) 'fan efficiency (η_{fan})' means the static efficiency including motor and drive efficiency of the individual fan(s) in the ventilation unit (reference configuration) determined at nominal air flow and nominal external pressure drop

Question: Does this fan efficiency η_{fan} refer to the individual fan(s) in the VU or to the complete VU (including housing)?

Answer: η_{fan} refers to the efficiency at BEP (best efficiency point) for the complete UVU

Justification: The efficiency requirement of the individual fans (P>125W) is determined in the fan regulation EU 327/2011. The efficiency of the incorporated fans cannot be subject of different requirements at the same time. Besides the efficiency requirement is based on a similar EU 327/2011 logarithmic target efficiency which are based at BEP.

h) Control Parameter

(17) 'control parameter' means a measurable parameter or set of measurable parameters that are assumed to be representative of the ventilation demand, e.g. the level of relative humidity (RH), carbon dioxide (CO2), volatile organic compounds (VOC) or other gases, presence, motion or occupancy detection from infrared body heat or from reflection of ultrasonic waves, electrical signals from human operation of lights or equipment

Question: Can the switch of a light controlled by human operation be the control parameter used in demand control ventilation?

Answer: No, as it cannot be operated automatically. They are operated manually and its control factor must be CTRL=1

i) Paradox of the Acoustic requirements for non-ducted residential ventilation units

The acoustic requirement for non-ducted units is for "the casing-radiated A-weighted sound power level". As defined in part 3.2.5 of ISO 13347-3, the casing sound power is measured using type D installation (ISO 5801) being the sound power radiated from the external surface of the fan casing (the Ventilation Unit in our case).

Paradox 1: What does it really mean the "casing-radiated" in a single room ventilation unit not intended to be equipped with duct connections? How should it be measured as a type D installation is impossible?

The requirement given in Annex II for 'Non-ducted units including ventilation units intended to be equipped with one duct connection on either supply or extract air side shall have a maximum LWA of 45 dB' is confusing. The definition of non-ducted unit states that 'it … is not intended to be equipped with duct connections'.

Paradox 2: Is it really a non-ducted unit intended to be equipped with one duct connection on either supply or extract air side a non-ducted unit?

Answer: This requirement is only relevant for ducted RVU.

j) Where the label must be fitted?

Each residential ventilation unit is accompanied by a printed label in the format and containing the information set out in Annex III, the label must be provided at least in

the packaging of the unit. In the Spanish translation it states that the label must be provided ”en el embalaje”.

Question: Where does the label be fitted? Inside the packaging or stamped, sticked, glued (whatever) on the packaging?

Answer: Inside the packaging.