



2. Discussion document

Considerations about the scope of Regulation 327/2011 and Regulation 1253/2014 for ventilation products producing an airflow in one direction only and intended to replace air in a building or part of a building

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Background

- **Ventilation products without filter and air treatment are basically fans moving air from one place to another.** The fans fall under Regulation 327/2011. However, **Regulation 1253/2014 ('Ventilation units')** also includes ventilation products with similar purposes.
- For some products, it is more **advantageous to fall under Regulation 1253/2014** than Regulation 327/2011 (and vice versa).
- It appears that there is **no common or standardised terminology** for these products. Furthermore, the commercial terminology/trade names (used in product catalogues, on webpages, etc.) are not always in line with the terminology used in the regulations.

Background

- **The purpose of the discussion document is to present a systematic approach.**
- The aim of the approach is that it must be:
 - clear (no disagreements about regulation to use);
 - easy to use; and
 - be in line with the intentions of the regulations.
- The systematic approach will use **the term 'housing'** as defined in Regulation 327/2011 ('Fans') and **the term 'casing'** as defined in Regulation 1253/2014 ('ventilation units') to define the product boundaries. **The explanation that a housing is close to the fan is not precise and consistent.**
- We are open to other suggestions/proposals, but please bear in mind the above-mentioned aim and the time schedule.

Uni-directional Ventilation Unit (UVU)



What do the regulations say?

Regulation 327/2011

1. **'Fan'** means a rotary bladed machine that is used to maintain a continuous flow of gas, typically air, passing through it and whose work per unit mass does not exceed 25 kJ/kg, and which:
 - is designed for use with or equipped with an electrical motor with an electric input power between 125 W and 500 kW (≥ 125 W and ≤ 500 kW) to drive the impeller at its optimum energy efficiency point;
 - is an axial fan, centrifugal fan, cross flow fan or mixed flow fan; and
 - may or may not be equipped with a motor when placed on the market or put into service.
 12. **'Housing' means a casing** around the impeller that guides the gas stream towards, through and from the impeller.
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Fan review Draft regulation (**working document**)

1. **'Fan'** means a configuration of impeller, stator and drive system, intended for the continuous displacement of gas with at its bep an electric input power ≥ 125 W and ≤ 500 kW, a pressure-increase ratio lower than 1.1 and an output air velocity lower than 65 m/s, and which is an axial fan, centrifugal fan, cross flow fan, mixed flow fan or jet fan.
4. **'Stator'** is the stationary part of the fan that interacts with the air stream passing through the impeller and, within the geometrical air-stream envelope between defined fan inlet and outlet sections, includes any part that may increase, and excludes any non-fan component that may decrease, the fan efficiency, following the manufacturer's instruction.

What do the regulations say?

Excerpts from Regulation 1253/2014

Article 2, Definitions

1. '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;

Article 1, Subject matter and scope

This Regulation **shall not apply to ventilation units** which:

- c. are axial or centrifugal fans only **equipped with a housing in terms of Regulation (EU) No 327/2011**

What do the regulations say?

Annex I, Definitions,

2. Definitions for NRVU, in addition to the definitions in Annex I Part 1:

3. **'reference configuration of a BVU'** means a product configured **with a casing**, at least two fans with variable speed or multi-speed drives, a HRS, a clean fine filter on the inlet-side and a clean medium filter on the exhaust-side;

4. **'reference configuration of an UVU'** means a product configured **with a casing** and at least one fan with variable speed or multi-speed drive, and —in case the product is **intended to be equipped with a filter** on the inlet-side —this filter shall be a clean fine filter;

Systematic approach for ventilation products

The systematic approach is based on the following considerations:

- **a 'fan' can be with or without a 'housing';**
- **the housing can be considered the first layer enveloping the air stream;**
- **a 'ventilation unit' is always configured with a casing; and**
- **the 'casing' can be considered the second layer enveloping the air stream.**

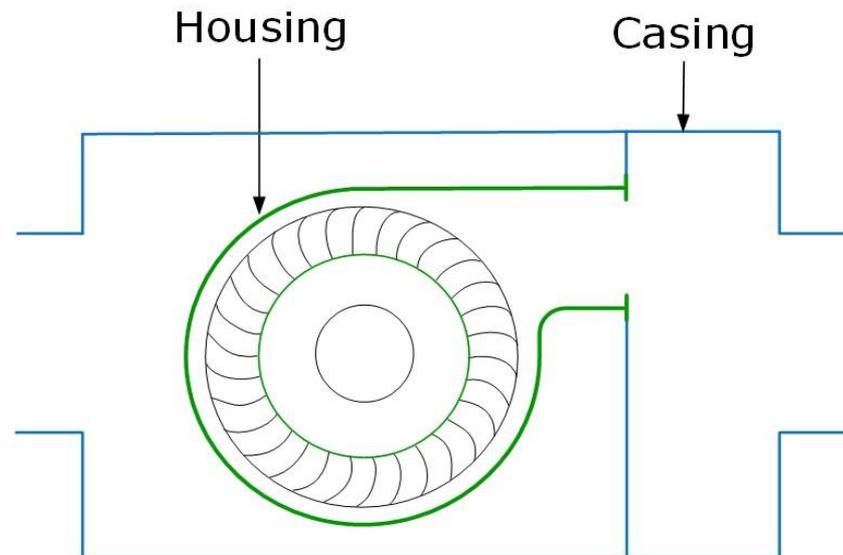
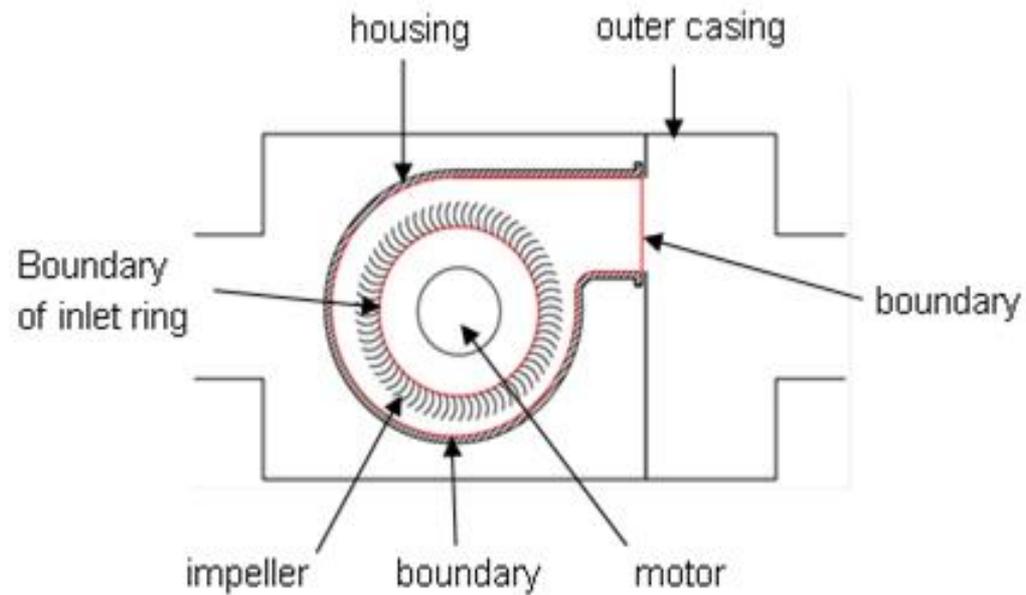
This implies that any first layer enveloping the fan air stream will be a 'housing' and that a ventilation unit will always have both a first layer ('housing') and a second layer ('casing').

- Grilles/protection guards or rain covers/guards are to be considered as the second layer enveloping the air stream ('casing').
- The approach is inspired by drawings presented in the final report of the review study of Regulation 327/2011 (see www.fanreview.eu).

Principles



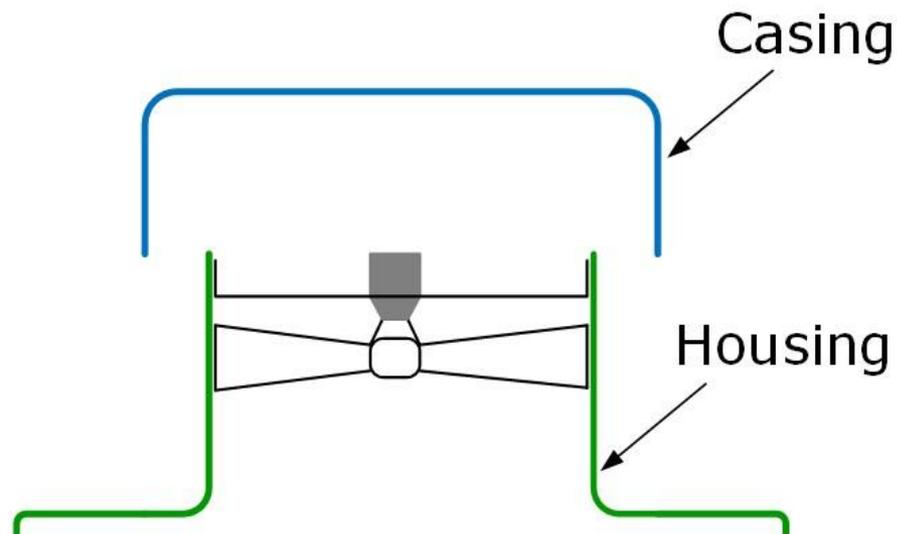
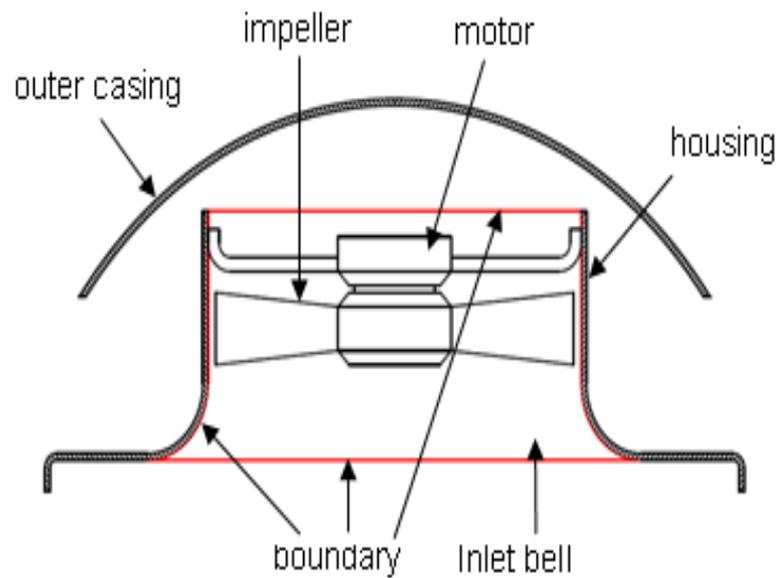
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Housing = first envelope/first layer (green): 

Casing = second envelope/second layer (blue): 

Principles



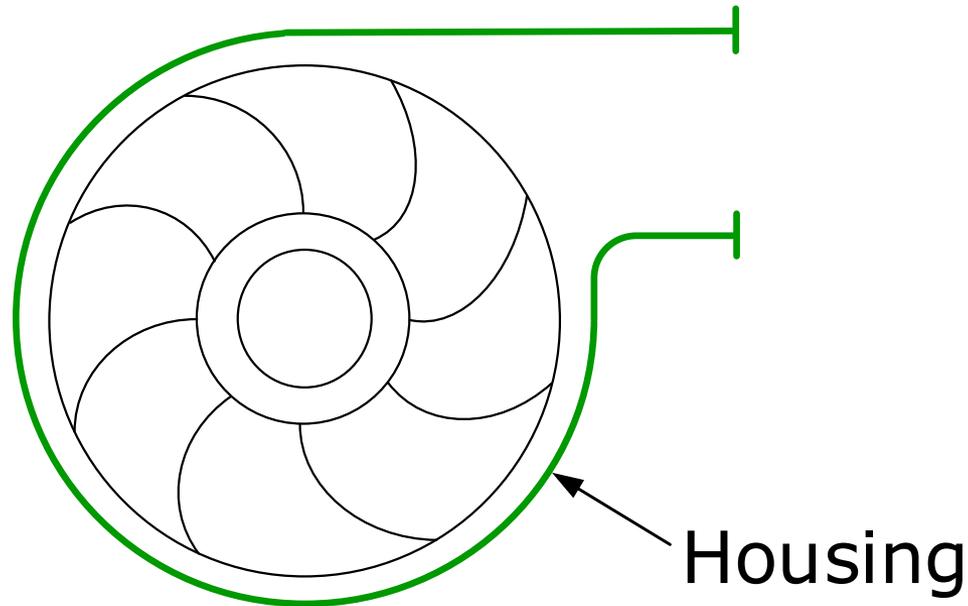
Housing = first envelope/first layer (green):



Casing = second envelope/second layer (blue):

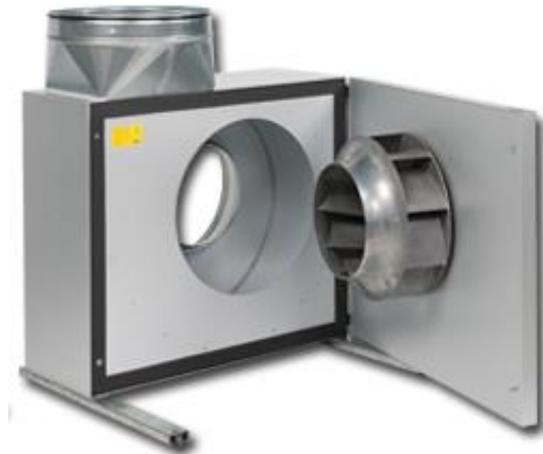
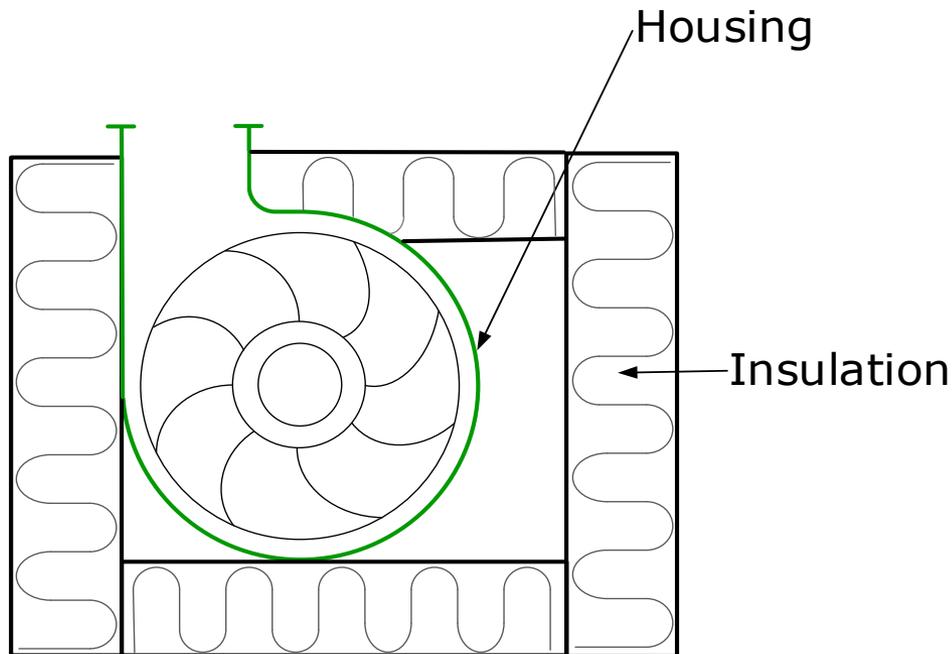


Example 1: Fan with scroll housing



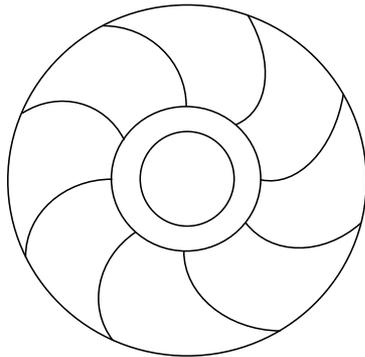
Approach for discussion: The first layer enveloping the air stream is the scroll housing (marked with green). As there is no second layer enveloping the air stream, the product falls under Regulation 327/2011.

Example 2: Fan with scroll housing and insulation



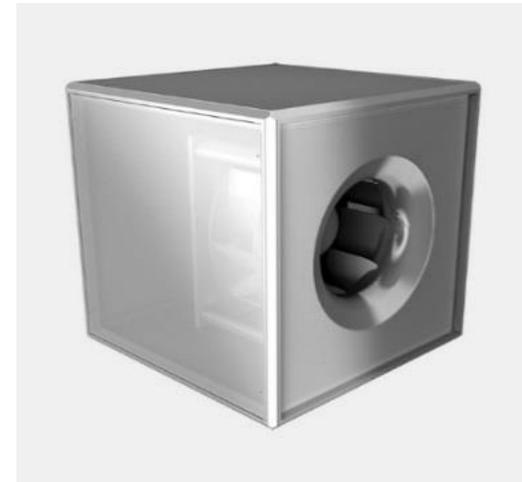
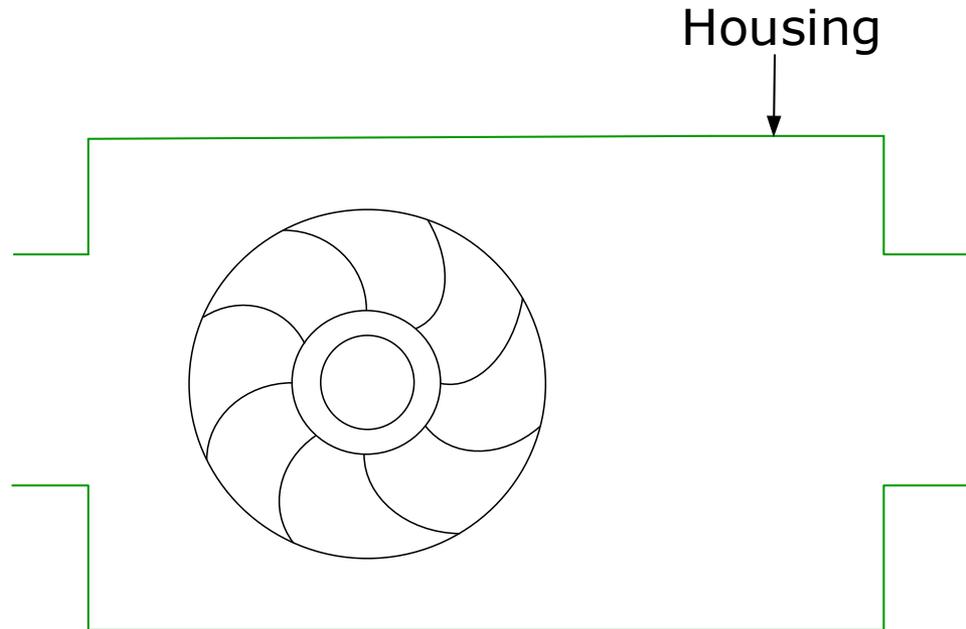
Approach for discussion: The product has an outer casing that protects the insulation material that is part of this product. However, the casing is not in contact with the airstream. So, in this case, there is no second layer enveloping the air stream, and the product falls under Regulation 327/2011.

Example 3: Fan without housing



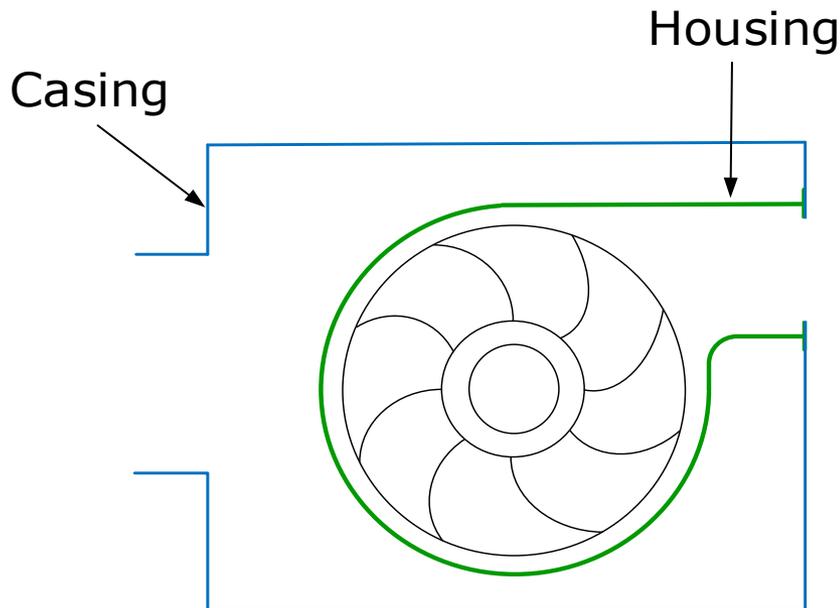
Approach for discussion: There is no housing and therefore no first layer enveloping the air stream. The product falls under Regulation 327/2011.

Example 4: Fan with large housing



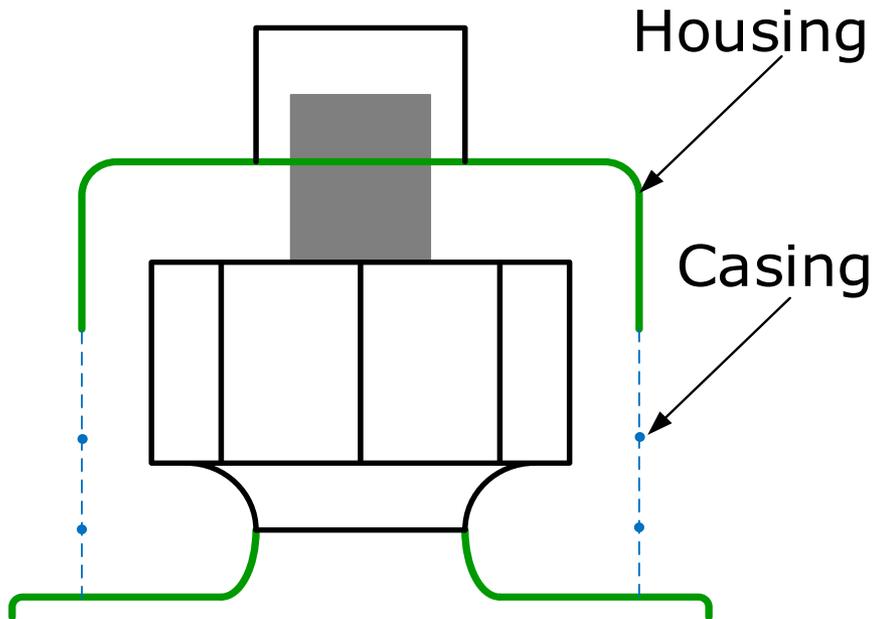
Approach for discussion: The first layer enveloping the air stream is the large housing (marked with green). As there is no second layer enveloping the air stream, the product falls under Regulation 327/2014.

Example 5: Ventilation unit including fan with scroll housing and casing



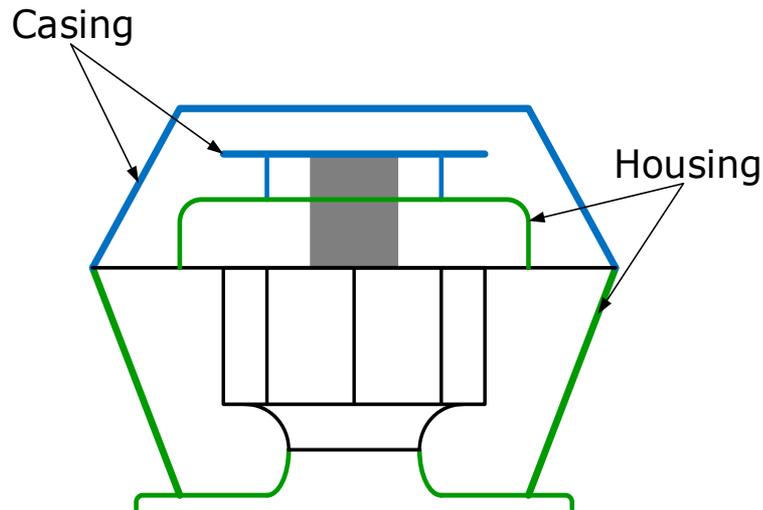
Approach for discussion: The first layer enveloping the air stream is the scroll housing (marked with green). The product has a casing that is also in contact with the airstream. So in this case, there is a second layer enveloping the air stream, and the product falls under Regulation 1253/2014.

Example 6: Ventilation unit with fan and grilles



Approach for discussion: The product has grilles, so in this case there is a second layer enveloping the air stream ('casing'), and the product falls under Regulation 1253/2014.

Example 7: Ventilation unit with fan and rain guard



Approach for discussion: The first layer enveloping the air stream consists of the inlet section to the radial fan and the housing including the motor (marked with green). The product also has a rain guard, so in this case a second layer envelopes the air stream ('casing'), and the product falls under Regulation 1253/2014.

Other issues - Accessories



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- The eco-design requirements of **Regulation 1253/2014** are set at a level so that they **generally take into account the additional pressure loss caused by the casing and the build-in of components.**
- For **non-ducted ventilation units** it is proposed that they be **tested with the duct lengths required to connect the ventilation unit with the outdoors through an external wall** (e.g. 1/2-1 metre – to be decided on) **and with the protection grilles** to be mounted in the façade after the manufacturer's recommendation/instructions.
- For **ducted unidirectional ventilation units to be placed outdoors (e.g. on a roof or external wall)** it is proposed **testing them with rain cover and protection grilles** (or one of these) according to the manufacturer's recommendation/instructions in case they are not an integrated part of the ventilation unit

Other issues - Accessories



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- **For other ventilation products** producing an airflow in one direction only and intending to replace air in a building or part of a building, they can either fall under Regulation 327/2011 or under Regulation 1253/2014. In this case, **the first layer/second layer systematic approach decides which of the regulations the ventilation product falls under.** It is proposed that for a case where **a fan (with first layer) is combined with a protection grille only (second layer) and is not one of the other ventilation unit types specified above** the manufacturer can chose to declare the ventilation product according to Regulation 327/2011 and the grille(s) can be removed during testing.

Other issues – Hybrid solutions

- To be investigated further