PLANNING AND ORDERING MEASUREMENTS IN "PASSIVE HOUSE" BUILDINGS: LESSONS LEARNED FROM PRACTICAL EXPERIENCE AND APPROACH TO QUALITY CONCERNS

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1 INTRODUCTION

Bostoen is a building company that specialises in certified passive houses according to the innovative passive concept, nearly zero-energy and energy-efficient homes, as well as apartments. This within its own project builds as well as build to order, based on the client's own construction ground. In addition Bostoen also retails construction grounds in itself.

With years of expertise and market knowledge, Bostoen founded in 2013 a division of renovations for existing home owners. Under the brand name Bostoen, the company positions itself clearly as an all-round provider of housing solutions and dynamic market innovator. Bostoen evolved from a turn-key-project family business into a complete provider in the housing market with an integrated sustainable vision. It is a reference in the field of passive construction. In 2013 Bostoen also celebrated her 40th birthday with a total of 10.000 homes to this day.

2 WHAT ARE THE COMPLIANCE CONTROLS CARRIED OUT FOR PASSIVE HOUSE CERTIFICATION IN BELGIUM

2.1 Airtightness better than 0.6 h^{-1} at 50 Pa

The air leaks off the house should not cause more than 0.6 air changes per hour at 50 Pa in the house ($n50 \leq 0{,}6\ h^{-1}$). The test for this value should be performed in accordance with the NBN EN 13829 / measurement method A and this with overpressure and underpressure to get an average n50-value of both measurements.

This value is a direct certification criteria.

10. Synthesis of the additional specifications (requirements and recommendations)

The table below includes only the additional specifications addressed in the present document; the basic requirements for measuring the air leakage rate, $\dot{V}_{50}$, can be found in the NBN EN 13829:2001 standard.

	Requirements	**Recommendations**
Measured zone (§2.1)	EPR or EPN ≤ measured zone ≤ PV	Either measured zone = total PV or measured zone = individual EPR or EPN
Time of measurement (§2.2)	Envelope finished	All works completed
Choice of method (§3.1)	Method A	
Equipment (§3.2)	Measurement of pressure with an accuracy of 2 Pa	Regular calibration
Heating, ventilation and other apparatuses (§ 4.1)	Stop all apparatuses that take in air from or evacuate air to outside	
Intentional openings	If closing device available: close and keep closed Mechanical ventilation openings : seal Adjacent spaces: close the openings	
Installation of equipment (§5.1)	In the best sealed opening (safely accessible)	Seal the joint between the equipment and the building envelope
Measurement of leakage rate (§5.2)	2 series : pressurisation and depressurisation Highest pressure difference of at least 50 Pa (in absolute value)	Highest pressure difference of 100 Pa (in absolute value)
Calculation of result (§6.1)	$\dot{V}_{50}$ is the average of the leakage rate for pressurisation and depressurisation	

Figure 1: Excerpt from
http://www.epbd.be/media/pdf/etancheite_air/Airtightness_measurement_EPB_specifications_v3_130528.pdf

To come to this n50-value, we need to determine the net volume of the house. The net volume is calculated from the inner measurement between the finished surfaces of the building, inner walls and upper floors are included in this volume. This calculation is according to 'WTCB-Dossiers - Nr. 1/2007 - Katern nr. 6' hernomen in annex 4.

2.2 Ventilation

Our ventilation report will check two parameters, the ventilation airflow rates of every room/ventilation ducts and the energy consumption of the ventilation system at every airflow rate (1/2/3).
The ventilation unit has 3 fan speeds, each according to a specific use. The lowest speed and least airflow volume (1) is set for normal day use, the medium speed (2) is set to EPB standard and is recommended while cooking and/or taking a shower. The third fan speed is for extensive house use or high occupancy, for example when throwing a party.

The airflow rate is the maximum output of the system in which the legal demand for ventilation is required. In the case of supply of fresh air as well as the removal of polluted indoor air.

Depending on the region in which the ventilation system is installed there are rules to comply to (EPB, NBN D 50-001, ARAB, NBN EN13779, RGPT).

3 WHAT ARE THE ADVANTAGES/DISADVANTAGES TO WORK WITH AN INDEPENDENT COMPANY FOR THE AIRTIGHTNESS AND VENTILATION MEASUREMENTS ?

Pro's

+ Third party confirmation – independent quality control for us and the costumer
+ Official compliance test /Blowerdoor is mandatory / ventilation will become mandatory in the future
+ Final check before completion and creates awareness for costumer

Con's

- Time management (Bostoen – independent company – costumer)
- Communication (what – why - where – when)
- Cost (this service is included in the tag price, but is seen as a blind increase.)

4 IS THERE A NEED FOR CERTIFICATION OF SUCH MEASUREMENT COMPANY IN THE CONTEXT OF COMPLIANCE (EPBD, PASSIVE HOUSE, ETC.) WHAT IS THE VIEWPOINT FROM THE CONSTRUCTION COMPANY ?

The blower door/airtightness certificate is in compliance with regulations, the company that produces these documents is not certified as a company. The ventilation certificate is done by the same company, the installation is up to code according to recommendations but there are no regulations to comply to.

In EPBD it is not mandatory to do either ventilation or a building pressurization test. There is a default value that can be used. Doing these tests overrules the default value, this 'wins' E points which results in a better scoring house and more government compensation. Certification is thereby a choice but has a certain advantage, especially from a consumer point of view.

In Passive house certification only a building airtightness test is mandatory; testing the ventilation system is nevertheless strongly recommended.

The ventilation certificate is another check we as a company choose to have. The Passive House Platform (PHP) looks at these reports but has no regulations about the matter. We have them done to make sure everything is up to code.

The airtightness test certificate is mandatory to prove the 0.6 h^{-1} airtightness. If this report is not according to certain rules, PHP requires a new test. We could be denied the passive house certificate as a result, which is promised to every passive house customer.

Doing both tests is in most case a choice by our company to keep our work up to code, this also gives us an advantage in credibility and marketing.