

BSK Zephyr Outdoor Sound Insulation Test Report

1. Introduction

The BSK Zephyr is a decentralized heat recovery ventilation unit designed for installation in single rooms. Its purpose is to provide efficient ventilation while recovering heat from the outgoing air to improve energy efficiency. This report presents the results of tests conducted to evaluate the unit's ability to reduce sound transmission from the outside environment to the interior space, ensuring that it maintains a quiet and comfortable atmosphere for occupants.

2. Test Method

The test method used follows the guidelines outlined in EN 13141-8, section 9.3, and is further detailed in EN ISO 10140-1, EN ISO 10140-2, and EN ISO 10140-5. Testing was conducted in the Turkish Standards Institute's Acoustics Laboratory, located at the Tuzla Campus.

The lab consists of two reverberation rooms separated by a window panel, where the BSK Zephyr unit is installed. The room at the back serves as the "outdoor" environment, where a sound generator is placed to simulate external noise. The front room serves as the "indoor" environment, where a microphone is positioned to measure the sound transmitted through the unit. Various measurements are taken to evaluate the amount of sound passing from the outdoor environment into the indoor space.



Image 1-4; Various pictures from the reverberation rooms

3. Test Results

The following measurements were taken during the testing process to demonstrate the noise levels before and after the installation of the BSK Zephyr, as well as the effect of different configurations of the separator plate.

	Details	Sound Power
Measurement 1	Baseline measurement without noise	22.4 dB
Measurement 2	Baseline measurement with noise generator	79.8 dB
Measurement 3	Full separator plate	57.5 dB
Measurement 4	Separator plate with 160mm hole	63.9 dB
Measurement 5	Separator Plate with BSK Zephyr installed	56.4 dB

Table 1; Measurement Results

Since decibels are a logarithmic scale, simple subtraction of decibel values does not yield the correct result. The sound power difference between two decibel values can be accurately calculated using the following formula:

$$L_{result} = 10 * \text{Log}_{10}(10^{L1/10} - 10^{L2/10})$$

When comparing the sound levels of the full separator plate (57.5 dB) and the separator plate with the BSK Zephyr installed (56.4 dB), the difference is calculated as follows:

$$L_{result} = 10 * \text{Log}_{10}(10^{57.5/10} - 10^{56.4/10})$$

$$L_{result} = 51dB$$

4. Conclusion

The installation of the separator plate with the Zephyr reduced the sound power to 56.4 dB, a reduction of approximately 51 dB compared to the full separator plate configuration 57.5 dB. The test results clearly demonstrate the significant impact of the BSK Zephyr on noise reduction. The measurements taken before and after the installation of the Zephyr, as well as the variations in separator plate configurations, reveal that the BSK Zephyr effectively reduced sound power levels.

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