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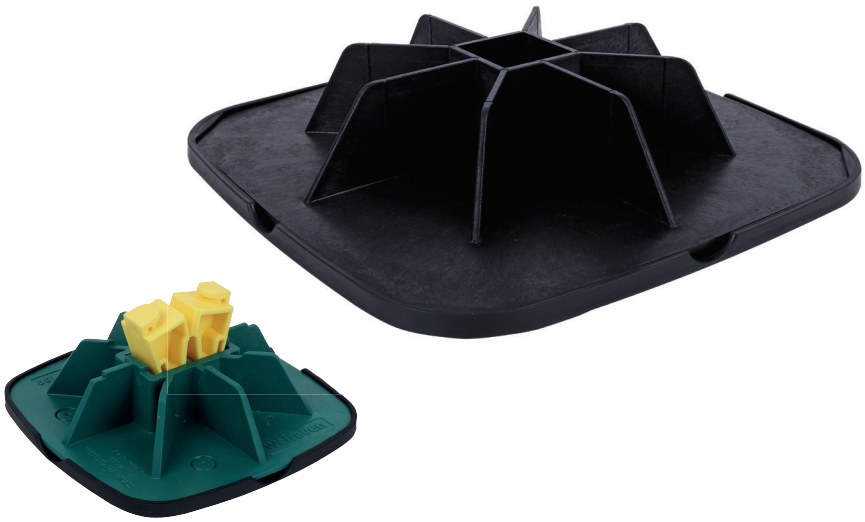
Technical Information
Walraven Yeti® 280 Mountingsystem
Walraven Yeti® 130 Mountingsystem



Test Report
2072-001-25

- Impact Sound Reduction by Support Systems in the laboratory -

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SG-Bauakustik

Institut für schalltechnische Produktoptimierung

Test Report

No. 2072-001-25 dated 19th August 2025

Impact Sound Reduction by Mounting Systems in the laboratory

Client:	J. van Walraven Holding B.V. Industrieweg 5 3641 RK Mijdrecht The Netherlands
Test Object:	BIS Yeti® Mounting Systems, type 130 and type 280 with or without EPS-insulation
Contract:	Determination of the impact sound reduction according to DIN EN ISO 10140-1 and DIN EN ISO 10140-3 in the laboratory
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CONTENTS

1. Definition of project and general details

1.1 Definition of project

J. van Walraven Holding B.V., Mijdrecht, Netherland, offers, among other things, BIS Yeti® mounting systems of the type 130 and type 280, which are intended to elevate ventilation and air conditioning installations on flat and slightly inclined roofs. The mounting systems are to be examined with regard to their acoustic properties in different load conditions and configurations.

To determine the impact sound reduction, sample structures were produced in which a steel plate was screwed onto the BIS Yeti® mounting bases (type 130 or 280) to be tested via profile rail bases and profile rails. Depending on the test configuration, the profile rails were subjected to additional loads (load levels: 25 kg, 50 kg, 75 kg, 100 kg, 200 kg and 300 kg per foot) or the test setup with EPS insulation underlay (d = 200 mm, type DAA dm) was tested. An identical structure was used as a reference structure, in which concrete slabs were used instead of the BIS Yeti® mounting feet. The sound level was measured in the receiving room below the test ceiling when the steel plate of the respective structure was struck with the standard hammer mechanism. The reference structure was analysed as part of the series of measurements described in test report no. 1762-001-19.

The measurements are carried out in accordance with DIN EN ISO 10140-3. Three measurements were carried out for each test and their results were averaged.

1.2 Manufacturer of the Support System

J. van Walraven Holding B.V.
Industrieweg 5
3641 RK Mijdrecht
The Netherlands

1.3 Client requesting tests

J. van Walraven Holding B.V.
Industrieweg 5
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1.4 Measurement standards

The tests were carried out in the ceiling test stand by our company's skilled employees in accordance to the following standards and guidelines:

- DIN EN ISO 10140-1 "Acoustics – Laboratory measurement of sound insulation of building elements – Part 1: Application rules for specific products"
  (ISO 10140-1:2021); German Version EN ISO 10140-1:2021

- DIN EN ISO 10140-3 "Acoustics – Laboratory measurement of sound insulation of building elements – Part 3: Measurement of impact sound insulation"
  (ISO 10140-3:2021); German Version EN ISO 10140-3:2021

- DIN EN ISO 10140-4 "Acoustics – Laboratory measurement of sound insulation of building elements – Part 4: Measuring procedures and requirements"
  (ISO 10140-4:2021); German Version EN ISO 10140-4:2021

- DIN EN ISO 10140-5 "Acoustics – Laboratory measurement of sound insulation of building elements – Part 5: Requirements for test facilities and equipment"
  (ISO 10140-5:2021); German Version EN ISO 10140-5:2021

- DIN EN ISO 717-2 "Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation"
  (ISO 717-2:2020); German Version EN ISO 717-2:2020

2. Installation and design layout of the test objects

2.1 Laboratory

The laboratory ceiling is a homogeneously built-up, massive reinforced concrete ceiling which has a thickness of d = 120 mm. The surface of the ceiling measures approx. 20.4 m² as seen from the receiving room below. The reinforced concrete ceiling is treated with an even smooth coating. The reinforced concrete ceiling corresponds with DIN EN ISO 10140-5, Appendix C, Section C.2.

The standard impact sound level of the reinforced concrete ceiling with stimulus on the ceiling areas amounts to:

Table 1: Standard Impact Sound Level Raw Ceiling (measured on 26.09.2018):

f [Hz]	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**
$L_{n,0}$	60,0	56,2	64,1	64,0	70,1	67,6	73,4	71,5	71,0	70,6	72,1

f [Hz]	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**
$L_{n,0}$	72,6	73,0	73,8	75,4	77,2	76,6	76,1	74,2	72,6	69,8

The evaluated standard impact sound level of the raw ceiling amounts to $L_{n,0,w}$ = 81,6 dB.

2.2 Set-up of test objects

The test set-ups are sample set-ups in which a steel plate (800 mm x 300 mm x 6 mm) was screwed onto the BIS Yeti® mounting feet (type 130 and type 280) to be tested via profile rail feet and profile rails. Depending on the test configuration, the profile rails were subjected to additional loads (load levels: 25 kg, 50 kg, 75 kg, 100 kg, 200 kg and 300 kg per foot) or the test setup with EPS insulation underlay (d = 200 mm, type DAA dm) was tested. An identical structure was used as a reference structure, in which concrete slabs were used instead of the BIS Yeti® mounting feet. The reference structure was analyzed as part of the series of measurements presented in test report no. 1762-001-19.

Concrete slabs (500 mm x 500 mm x 60 mm or 400 mm x 400 mm x 50 mm) were placed on the profile rails to produce the different load levels. The test material was delivered to our test stand on 08/12/2025 and then prepared for testing by specialists from the manufacturer and our company.

In detail, the following tests were carried out:

	reference arrangement (set-up with concrete slabs, see test report no. 1762-001-19) with rail base (2 pieces), placed on laboratory ceiling, appx. 100 kg additional load per foot
Measurement 1:	**BIS Yeti® mounting system, type 130** (4 pieces, 2 per side), placed on laboratory ceiling, **appx. 25 kg additional load per foot**
Measurement 2:	**BIS Yeti® mounting system, type 130** (4 pieces, 2 per side), placed on EPS-insulation (t = 200 mm), **appx. 25 kg additional load per foot**
Measurement 3:	**BIS Yeti® mounting system, type 130** (4 pieces, 2 per side), placed on EPS-insulation (t = 200 mm), **appx. 50 kg additional load per foot**
Measurement 4:	**BIS Yeti® mounting system, type 130** (4 pieces, 2 per side), placed on EPS-insulation (t = 200 mm), **appx. 75 kg additional load per foot**

Measurement 5: **BIS Yeti® mounting system, type 280** (2 pieces), placed on laboratory ceiling, **appx. 100 kg additional load per foot**

Measurement 6: **BIS Yeti® mounting system, type 280** (2 pieces), placed on EPS-insulation (t = 200 mm), **appx. 100 kg additional load per foot**

Measurement 7: **BIS Yeti® mounting system, type 280** (2 pieces), placed on EPS-insulation (t = 200 mm), **appx. 200 kg additional load per foot**

Measurement 8: **BIS Yeti® mounting system, type 280** (2 pieces), placed on EPS-insulation (t = 200 mm), **appx. 300 kg additional load per foot**

The detailed build-up of the constructions can be seen in the manufacturer's construction drawings, appendices 1 to 5. Appendices 6 to 10 contain a photo documentation of the set-up in the laboratory.

3. Measurement and execution of measuring

The measurement of the standardized impact sound level (L_n in dB) and the determination of the impact sound reduction (ΔL in dB) were carried out in accordance with the specifications of DIN EN ISO 10140-1 and DIN EN ISO 10140-3.

To determine the standardized impact sound level of the mounting system, the sound level was determined when the test arrangement was excited on the test stand ceiling with a standardized hammer mechanism at a total of 3 measurement positions in the receiving room below, which meets the requirements of DIN EN ISO 10140-5. The standardized impact sound level was calculated considering the reverberation time and the equivalent absorption area A.

The standardized impact sound level $L_{n,0}$ of the bare ceiling was determined in the same way with excitation of the smooth finish without test object. The difference between the impact sound levels with and without the test object represents the impact sound reduction. The single number ΔL_w is obtained by reference to the values of a reference ceiling according to the method specified in DIN EN ISO 717-2. The calculation of the spectrum adjustment values (supplementary assessment method) is also carried out in accordance with DIN EN ISO 717-2. A description of the measurements and the measuring instruments used can be found in Appendix 11.

4. Measurement results

Table 2 below shows the standardized impact sound level of the bare ceiling and the impact sound reductions of the individual superstructures.

Table 2: Impact Sound Reduction in dB, measurements on 08/13/2025

f_{Terz} in Hz	50	63	80	100	125	160	200	250	315	400	500
$L_{n,0}$	60,0	56,2	64,1	64,0	70,1	67,6	73,4	71,5	71,0	70,6	72,1
ΔL, Measurement 1	0,0	0,0	0,0	2,7	0,0	5,6	11,1	9,4	11,6	9,3	11,0
ΔL, Measurement 2	8,4	1,9	9,2	7,5	9,3	13,7	18,4	16,1	15,1	16,7	21,7
ΔL, Measurement 3	13,4	8,4	16,8	15,7	13,8	14,7	21,9	17,3	18,2	17,1	18,7
ΔL, Measurement 4	12,2	6,9	16,4	15,7	10,3	14,5	22,4	16,0	17,2	18,6	18,6
ΔL, Measurement 5	0,0	0,0	1,1	5,9	2,4	0,1	12,4	6,7	8,7	5,9	7,9
ΔL, Measurement 6	9,5	6,4	13,3	13,7	10,7	11,0	17,8	14,8	14,0	11,3	15,4
ΔL, Measurement 7	23,9	14,3	15,1	17,4	16,2	14,7	21,8	16,0	16,3	9,7	12,4
ΔL, Measurement 8	17,5	5,2	12,0	14,9	22,3	19,5	21,0	17,8	21,0	16,1	13,7

f_{Terz} in Hz	630	800	1.000	1.250	1.600	2.000	2.500	3.150	4.000	5.000
$L_{n,0}$	72,6	73,0	73,8	75,4	77,2	76,6	76,1	74,2	72,6	69,8
ΔL, Measurement 1	15,3	16,5	18,0	18,1	20,8	24,8	30,6	30,8	30,1	31,0
ΔL, Measurement 2	22,2	25,8	27,9	29,5	31,3	32,4	36,4	40,0	40,3	41,6
ΔL, Measurement 3	20,1	21,4	26,2	28,4	28,6	30,2	34,0	39,1	38,9	40,6
ΔL, Measurement 4	19,8	18,9	25,1	26,9	27,4	31,0	34,0	38,5	39,3	40,5
ΔL, Measurement 5	11,5	13,9	14,0	16,0	21,1	29,5	30,4	31,9	32,1	35,3
ΔL, Measurement 6	20,1	25,2	28,2	31,6	33,0	33,6	36,3	40,0	40,7	41,5
ΔL, Measurement 7	18,0	23,0	24,2	30,8	31,2	33,2	36,0	39,7	40,0	41,1
ΔL, Measurement 8	18,2	22,5	23,5	31,3	31,5	33,4	36,7	39,7	40,8	42,0