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wr A4010-I
140321 Test Certificate-1
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08.08.2022

TEST CERTIFICATE

• Determination of the sound insulation R'_w in accordance with DIN EN ISO 140-3 / 717-1 •

Test subject:	Impact on sound insulation of appliance junction boxes fitted in solid walls
Client:	Kaiser GmbH & Co. KG Ramsloh 4 58579 Schalksmühle
Test certificate no.:	A4010-I
Creation date:	21.03.2014

[stamp of VMPA approved sound insulation centre]

VMPA SCHALLSCHUTZPRÜFSTELLE NACH DIN 4109

(GRANER+PARTNER) (Director of Test Centre) (Measuring Engineer)

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The test report comprises 8 pages of text

Appendices

Evaluation diagrams of building sound insulation measurements
Documentation

1. General provisions

The sound insulation measurement of the test material is determined in accordance with

DIN EN ISO 140 / 717.

Graner + Partner (G + P) are entitled to publish the test result. This also applies to any translation thereof into another language. Reproduction by the client is permissible. Transmission to a third party is restricted to either the covering page alone or the entire test certificate. It is not permitted to pass on individual parts thereof. G + P shall receive a specimen copy if the test certificate is to be used for advertising purposes and publications.

The test certificate shall remain valid provided that the manufacturer guarantees the preservation of the tested materials as well as their properties and structures.

Revocation of the test certificate:

G + P are entitled to revoke the test certificate if the conditions for its issue are no longer fulfilled. This applies in particular if materials and structural designs have been altered, resulting in the product no longer corresponding with the version tested.

2. System description of the test material/test setup

The tests were undertaken to determine to what extent appliance junction boxes installed in solid walls impact the sound insulation of the walls.

Appropriate solid partition walls to simulate corresponding structures were mounted on the building acoustics test stand for this purpose.

Setup:

- Surrounding wall area of the test stand: reinforced concrete, d = 280 m
- Mounted solid wall I:
  limestone blocks, type KS4DF E 115R Plan 20-1.8, gross density class 1.8, d = 115 mm
  double-sided 10 mm lime-cement rendering, CSIII, PII
  proportional area 2.4 m²
- Mounted solid wall II:
  limestone blocks, type KS6DF E 175R Plan 20-2.0, gross density class 2.0, d = 175 mm
  double-sided 10 mm lime-cement rendering, CSIII, PII
  proportional area 2.4 m²
- Total test area 9.4 m^2

The first step was to metrologically determine the sound insulation of these wall structures.

The next step was to incorporate the appliance junction boxes into the partition walls. They were fitted by means of continuous and partially continuous bores, whereby the appliance junction boxes were plastered in on both sides opposite each another.

The following box types were tested:

Appliance junction box type 1555-04

Flush-mounted sound insulation appliance junction box type 1569-01

3. Sound insulation test

The total surface of the test setup covered 9.4 m^2. The sound insulation was determined on evaluation of the building sound insulation measurement based on this test area.

The following individual measurements were taken:

- Measurement of the sound insulation in each case without installation fixtures, solid walls type 1 and type II

- Measurement of the sound insulation in each case after mounting appliance junction boxes type 1555-04 (5-fold, double-sided opposite each another) in continuous (wall type I) and partially continuous (wall type II) bore

- Measurement of the sound insulation in each case after flush-mounting sound insulation appliance junction boxes type 1569-01 (5-fold, double-sided opposite each other) in continuous (wall type I) and partially continuous (wall type II) bore

4. Measurement technology

Cortex Instruments	Spectrum analyser, type NC10 Free-field microphone 221 Preamplifier MV203
Norsonic	Amplifier, type 235
Behr & Obermeyer	Loudspeaker

5. Measurement and evaluation specifications

DIN EN ISO 140-3:

Measurement of sound insulation in buildings and of building elements on a test stand
Part 3: measurement of airborne sound insulation of building elements on test stands

DIN EN ISO 717-1:

Rating of sound insulation in buildings and of building elements
Part 1: airborne sound insulation

The test sound consisted of noise filtered on the transmitting and receiving sides in accordance with DIN 45652 with one-third-octave filters.

The measurements were taken in 2 loudspeaker positions and in each case in 2 positions of the boom microphone system (in each case 4 series of measurements on the transmitting and receiving sides).

The sound insulation measurement R is calculated from the measurement readings as follows:

$R` = L_1 - L_2 + 10 \log S/A, \quad A = 0{,}16 * V/T$

where:

R` =	sound insulation measurement in accordance with DIN EN ISO 140
L_1 =	Sound level in transmitting room
L_2 =	Sound level in receiving room
S =	Surface area of test wall
A =	Equivalent sound absorption surface area of the receiving room calculated from measurements of the reverberation time.
V =	Volume of the receiving room
T =	Reverberation time in the receiving room

6. Test results

The measurements taken resulted in the following single-number quantities of the sound insulation (see also Appendices 1 - 8):

Installation 1	Sound insulation of the partition wall element type I without fixtures	R_w = 52 dB
Installation 2	Sound insulation measurement, wall type I, with appliance junction boxes type 1555-04 5-fold, double-sided opposite each another in continuous bore	R_w = 31 dB
Installation 3	Sound insulation measurement, wall type I, with Flush-mounted sound insulation appliance junction box type 1569-01 5-fold, double-sided opposite each another in continuous bore	R_w = 52 dB

The single-number quantities show that there is no reduction of the building sound insulation measurement calculated of the wall structure in the case of the flush-mounted sound insulation appliance junction boxes type 1569-01.

In contrast, the building sound insulation measurement when using appliance junction boxes type 1555-04 is reduced from R'_w = 52 to R'_w = 31 dB.

Installation 5	Sound insulation of the partition wall element type II without fixtures	R_w = 56 dB
Installation 6	Sound insulation measurement, wall type II, with appliance junction boxes type 1555-04 5-fold, double-sided opposite each another in continuous bore	R_w = 33 dB
Installation 7	Sound insulation measurement, wall type II, with Flush-mounted sound insulation appliance junction box type 1569-01 5-fold, double-sided opposite each another in continuous bore	R_w = 56 dB

The single-number quantities show that there is no reduction of the building sound insulation measurement calculated of the wall structure in the case of the flush-mounted sound insulation appliance junction boxes type 1569-01.

In contrast, the building sound insulation measurement when using appliance junction boxes type 1555-04 is reduced from R'_w = 56 to R'_w = 33 dB.

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Graner-Sommer i. A. Gräf

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duplication of parts oft the test certificationist are disallowed.
This test certificate consist of 8 pages and 1 – 11 appendices.