Cybenetics Chassis Test Protocol

Revision 2.3

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Revision History

Version	Release Date	Notes
1.0	September 2020	First draft
1.1	May 2021	Significant changes in testing methodology
1.2	June 2022	Changes in Soundproof levels
1.3	September 2023	Major methodology changes
1.4	June 2024	Various minor changes
1.5	August 2026	Measurement uncertainties updated to the current controlled budgets (P19).
1.6	August 2026	Removed the description and photographs of the superseded custom-made loader; added photographs of the test system inside the climate chamber; software screenshots recaptured from the current build (v6.94) - the previous ones were cropped.
2.0	October 2026	New noise-damping method: pink noise measured in 1/3-octave bands (LAeq) from 100 Hz to 10 kHz, insertion loss per band, DELTA calculated on a pink reference spectrum, resonance flag, with the speaker placed next to the CPU cooler. Test tones, chirp and white noise are no longer used. No DELTA level is awarded under 2 dB. One test system now serves the noise and the thermal tests. Fan noise: normalized noise levels from 20 to 40 dBA; the 75% step and the graphics card fan sweep were removed. New photographs of the climate chamber and screenshots of the current test application. The published results of earlier evaluations were re-assessed with the new calculation (see Data Analysis).
2.1	October 2026	Chassis evaluated before Revision 2.0 keep their measured pink-noise results, with levels assigned by the Revision 2.0 limits. This replaces the re-assessment from test tones described in Revision 2.0.
2.2	October 2026	References re-checked on 3 October 2026 and updated (links and access dates; links added for ISO 11546-1 and IEC 61672-1). Screenshots of the test software replaced with version 7.27. No measured value, test or published rating changes.
2.3	October 2026	Pictures 1 and 2 replaced: the microphone and DUT positions redrawn, and the set-up photograph re-annotated. No change to the method.

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Prologue

Taking accurate noise and thermal measurements in chassis (PC enclosures) is a challenge, and besides experience, it also requires specialized equipment and proper facilities, especially for noise measurements. After extensive research on this subject, we devised the methodologies we analyze in the following paragraphs. It is a work in progress, meaning that we will constantly update the corresponding procedures until we develop the perfect methodologies. Since nothing is perfect in this world, we will never settle down. On the contrary, we will always try to find the optimal testing procedures to reveal every aspect of the Device Under Test (DUT).

Revision 2.0 introduces a new method for the noise-damping measurements, which is described in the corresponding section. The chassis fan noise measurements and the thermal performance tests continue as in the earlier revisions, with the updates listed in the Revision History.

Noise Measurement Equipment and DUT Setup

Before conducting our noise measurements, we must install a complete system into the chassis. We do this for two reasons: to check the installation process thoroughly and, secondly, the parts minimize echoes inside the chassis. An empty chassis will have echoes similar to an empty room, notably affecting the noise measurements.

You will find the test system that we use for our chassis evaluations in the following table. The same system serves the noise and the thermal measurements. For smaller chassis, we use a mini-ITX mainboard.

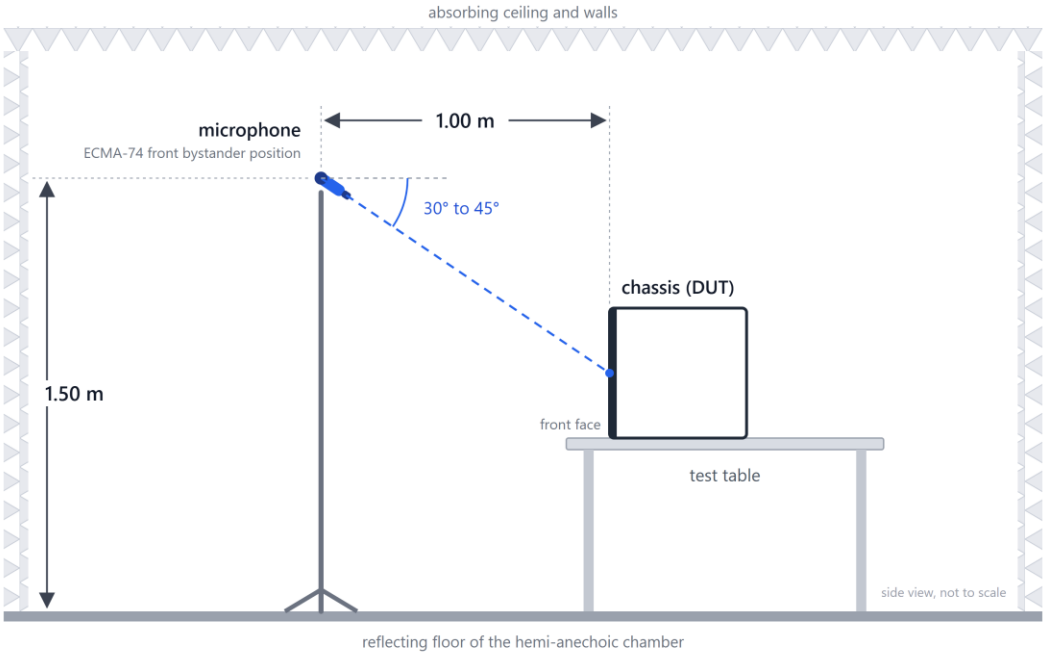
Test System Specifications	
Mainboard	Gigabyte X670E AORUS Master
CPU	AMD Ryzen 9 7950X3D
GPU	Galax GeForce RTX 4060 EX
NVMe	XPG GAMMIX S50 Lite 1TB
RAM	XPG Lancer DDR5 (2 x 16GB) @ 6000MHz
Power Supply	EVGA SuperNOVA 1000 G7
CPU Cooler	Noctua NH-D15S chromax.black
Chassis	Device Under Test

We install the system as a typical build, following the manual of the chassis: the power supply is mounted horizontally and the graphics card horizontally or vertically, as the chassis allows. The same parts are installed in every chassis, so the interior stays comparable.

We use a hemi-anechoic chamber with an extremely low noise floor at around 6 dBA for all noise measurements. The DUT is installed in the chamber. Picture 1 provides a detailed overview of the microphone's and DUT's positions inside the chamber.

The measuring microphone stands at the front bystander position of ECMA-74 [12]. It is centered on the front of the chassis, at a horizontal distance of one meter from the front face

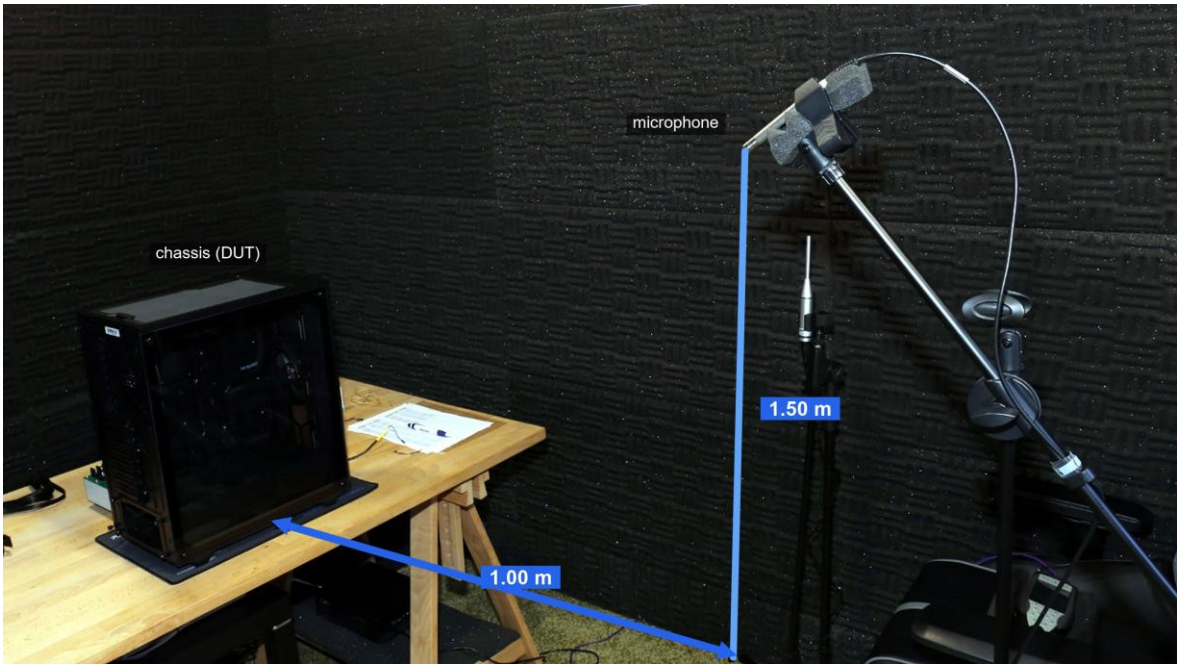
of the chassis outline (the smallest box that encloses the chassis, feet and handles included) and 1.50 m above the floor. It points at the center of the chassis front, forming an angle of 30° to 45° to the horizontal axis.



Picture 1

We turn on the sound meter Bruel & Kjaer G-4 Type 2270 [1] 15 to 30 minutes before starting the measurements to allow it to reach operational temperature. Before we start the measurements, we calibrate the sound meter using the Bruel & Kjaer Sound Calibrator Type 4231 [2].

We check the calibration again at the end of every session. Picture 2 shows a chassis on the test table of the chamber, with the microphone at the measuring position.



Picture 2

For the noise-damping measurements we also need a sound source and the means to position it. This equipment stays the same from chassis to chassis. Any change to the source chain (speaker, amplifier, gain or signal file) requires a new reference measurement of the source and a new linearity check; both are described in the next section.

Noise Damping Test Equipment		
Group	**Item**	**Requirement**
Room	Hemi-anechoic chamber and test table	Background noise of about 6 dBA. The table, the floor marks and the microphone stand stay in place for the whole test series
Source	Miniature dodecahedron speaker	Fits the free space next to the CPU cooler without touching anything. One face is marked “1” and always points to the microphone
Source	Amplifier and pink-noise source	Locked gain and one stored pink-noise signal at a fixed level. Battery power is preferred, because mains hum can appear as a line at 100 Hz
Source	Soft support (foam block)	The only contact of the speaker inside the chassis, so that it cannot shake the chassis
Source	Small speaker stand	Holds the speaker in open air at the same distance from the microphone, and at the check point
Source	Spare expansion-slot cover, drilled, with a grommet and removable putty	Exit of the speaker cable, sealed on both sides. Used only during the test
Measurement	Bruel & Kjaer Type 2270 [1] with its microphone on a boom stand	1/3-octave LAeq, 30 seconds per reading; the bands from 12.5 Hz to 20 kHz are stored
Measurement	Bruel & Kjaer Type 4231 calibrator [2]	Checked before and after every session
Positioning	Laser distance meter and cross-line laser	±2 mm. Measures the distance from the microphone to the speaker in both runs
Records	Thermometer, hygrometer and camera	The conditions are logged, and the speaker is photographed inside every chassis

Noise Damping Measurements Procedure

This test measures how much a chassis reduces, or amplifies, the noise of the parts installed inside it. A miniature dodecahedron speaker inside the chassis plays pink noise [4], and the microphone in front of the chassis compares the sound level with and without the chassis. The result is an insertion loss (IL) for every 1/3-octave band from 100 Hz to 10 kHz, 21 bands in total, and a single number, DELTA, which decides the DELTA level of the chassis.

The frequency range of interest and the microphone position follow ECMA-74 [12]. The insertion loss is defined as in ISO 11546-1 [14]: the level without the enclosure minus the level with it. We use this definition with one source position and one microphone position, so the method is a Cybenetics in-house method and not a declaration according to ISO 11546-1.

Up to Revision 1.6, we measured single test tones, a chirp signal [3], pink noise and white noise [5], with the speaker on the chassis floor, and DELTA was the difference of the two broadband pink-noise readings. A single broadband number follows the spectrum of the speaker, and it hides the resonances of the chassis at low frequencies, where a chassis often amplifies the noise. Fans and the graphics card excite these resonances in the same way the speaker does, so they are part of what a user hears. Revision 2.0 keeps them in the result: they appear in the chart of the insertion loss per band and in the resonance flag, and they no longer distort the single number. The following table summarizes the changes.

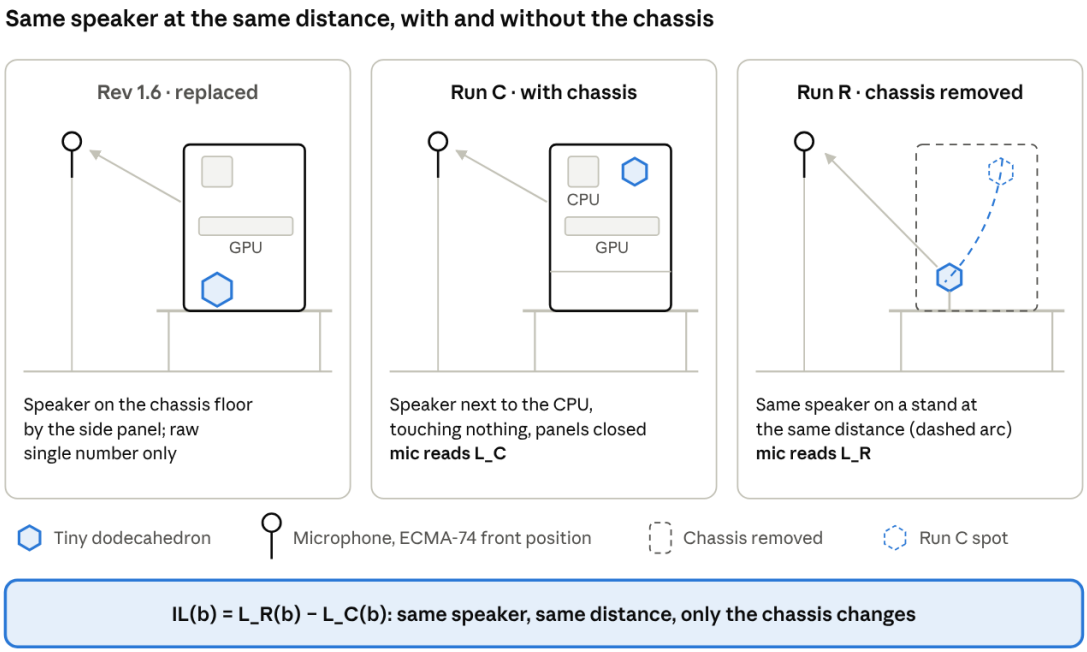
Changes from Revision 1.6		
Item	**Revision 1.6**	**Revision 2.0**
Speaker inside the chassis	On the chassis floor, close to the side panel	Next to the CPU cooler, touching no panel, part or cable
Reference	Speaker in open air at the measuring position	The same speaker in open air at the same distance from the microphone, with the chassis lifted away
Microphone	1.00 m in front of the chassis, 1.50 m above the floor	Unchanged
Signal	Test tones, chirp, pink and white noise	Pink noise only
Evaluation	Test tones from 100 Hz to 20 kHz	1/3-octave bands from 100 Hz to 10 kHz; the bands from 12.5 kHz to 20 kHz are informative
DELTA	Difference of the two broadband pink-noise readings	Insertion loss per band, applied to a fixed pink reference spectrum and A-weighted
Resonances	Hidden inside the single number	Reported as a resonance flag

For every chassis, we report:

- the insertion loss per 1/3-octave band from 100 Hz to 10 kHz; negative values, which mean amplification, are shown;
- DELTA, calculated from the insertion loss of the bands;
- the DELTA level;
- a resonance flag, which lists every band in which the chassis amplifies by 3 dB or more;
- for information, the insertion loss from 12.5 kHz to 20 kHz, where the signal is at least 10 dB above the background noise.

Measurement Principle

The same speaker plays the same pink noise twice, at the same distance from the microphone: once inside the closed chassis (Run C) and once in open air, with the chassis lifted away (Run R). The microphone does not move between the two runs, so the difference in every band is caused by the chassis alone (Picture 3).

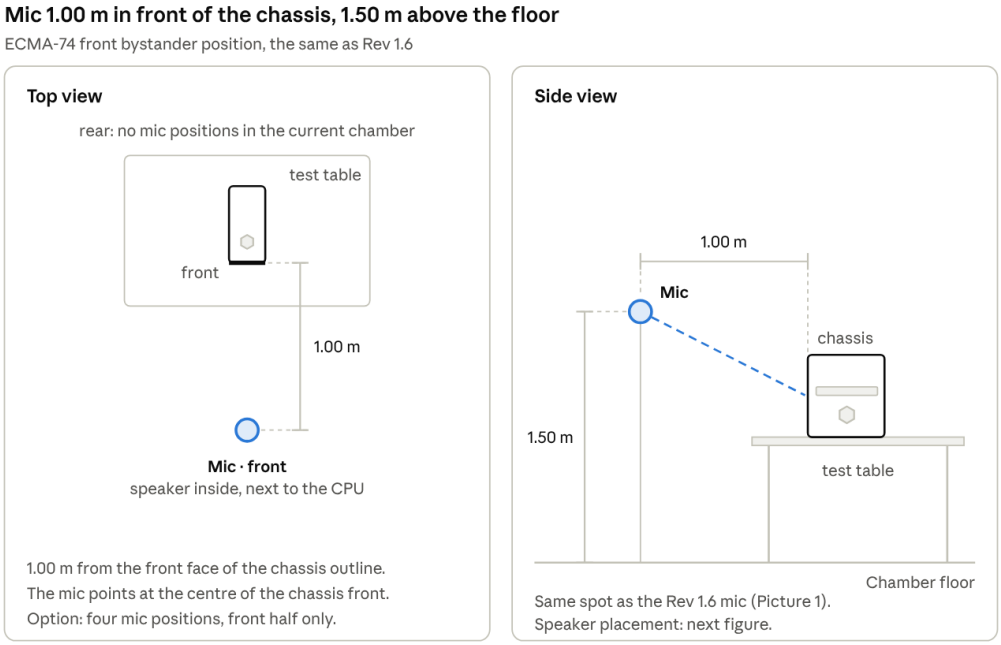


Picture 3

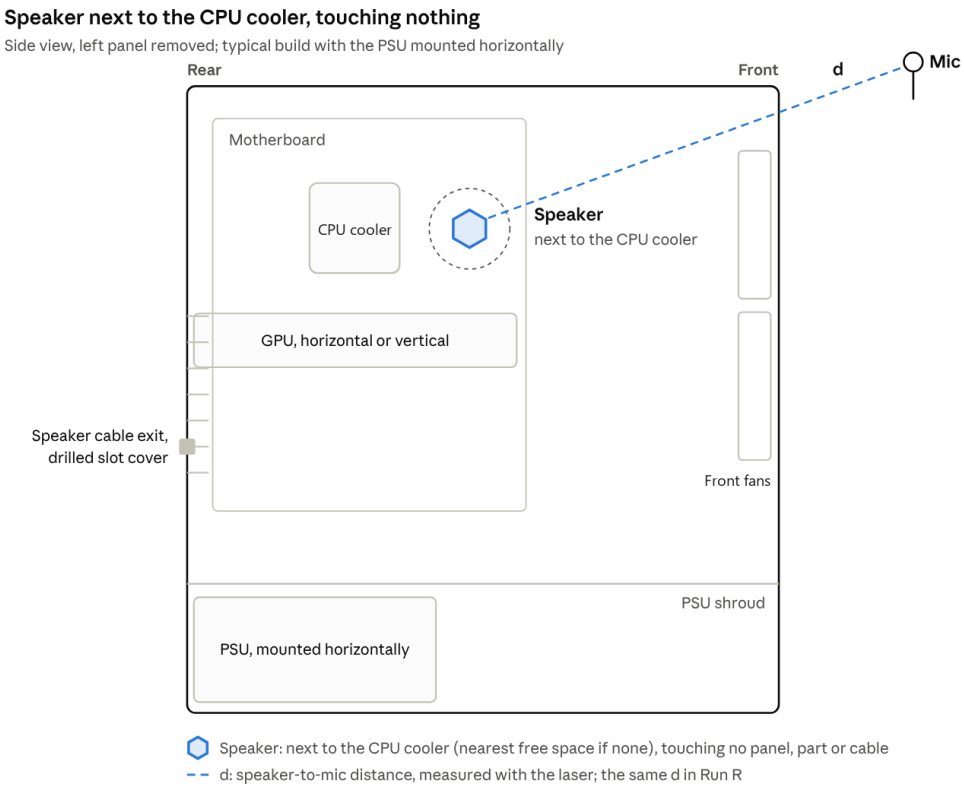
The speaker sits in the free space next to the CPU cooler and touches nothing, like one more noise source among the real parts. Everything except the chassis stays fixed between the two runs: the distance from the speaker to the microphone, the orientation of the speaker, the signal, the gain and the microphone position. The speaker usually sits a little higher inside the chassis than in open air; only the distance has to match. The spectrum of the speaker cancels out in every band, and the fixed pink reference spectrum that we use for DELTA keeps it out of the single number as well.

Test Geometry

The chassis stands on the test table with its front facing the microphone. The microphone stays at the position described in the previous section (Pictures 1 and 4), and the speaker sits in the free space next to the CPU cooler (Picture 5).



Picture 4



Picture 5

Using the same spot in every chassis keeps the results comparable, because the place of the speaker changes how strongly it excites the resonances of the chassis. The rules for the placement are the following:

- Where: next to the CPU cooler, where there is usually free space. If there is none, the nearest free space in the main compartment.
- Contact: the speaker touches no panel, component or cable; it rests only on its soft support.
- Orientation: face 1 points to the microphone.
- Distance: from the acoustic center of the speaker to the microphone capsule, measured with the laser to ±2 mm.
- Record: the distance, and a photograph of the speaker inside the chassis.

We keep the following tolerances:

- the chassis stands on its marked footprint within ±5 mm, with its front square to the microphone;
- the microphone is within ±10 mm of its position, horizontally and in height;
- the distance from the speaker to the microphone is measured to ±2 mm in both runs, and the distance in Run R matches the distance in Run C within 10 mm. The height of the speaker may differ between the two runs.

Preparation and Checks

Every session starts with the calibration of the sound meter, a hum and background check, and a source check. If any check fails, we do not measure until the cause is found and fixed.

The check point is the center of the chassis footprint on the test table, with no chassis present. The speaker sits there on its stand, 0.25 m above the table top, with face 1 toward the microphone. The spectrum of the speaker at the check point is the fingerprint of the source.

Once per test series:

1. We mark the chassis footprint on the test table and the microphone position on the floor. The table, the marks and the microphone stand do not move during the series.
2. We set the level: with the speaker at the check point and the pink noise on, we adjust the amplifier until the microphone reads 60.0 ± 0.5 dBA, and then we lock the gain.
3. We store the source reference: three readings of 30 seconds at the check point, energy-averaged per band.
4. We check the linearity on one chassis in Run C: we measure at the locked gain and 10 dB lower. Every band from 100 Hz to 10 kHz must drop by 10.0 ± 0.5 dB. A larger error means that something rattles, and we fix it before testing.

In every session:

1. We log the temperature and the humidity.
2. We switch on the sound meter 15 to 30 minutes before the measurements, calibrate it with the Type 4231 calibrator and note the reading.
3. We set the sound meter to 1/3-octave bands, LAeq, 30 seconds. If audio is recorded, we use a fixed recording gain.
4. We warm up the speaker with pink noise for 15 minutes at the locked gain.

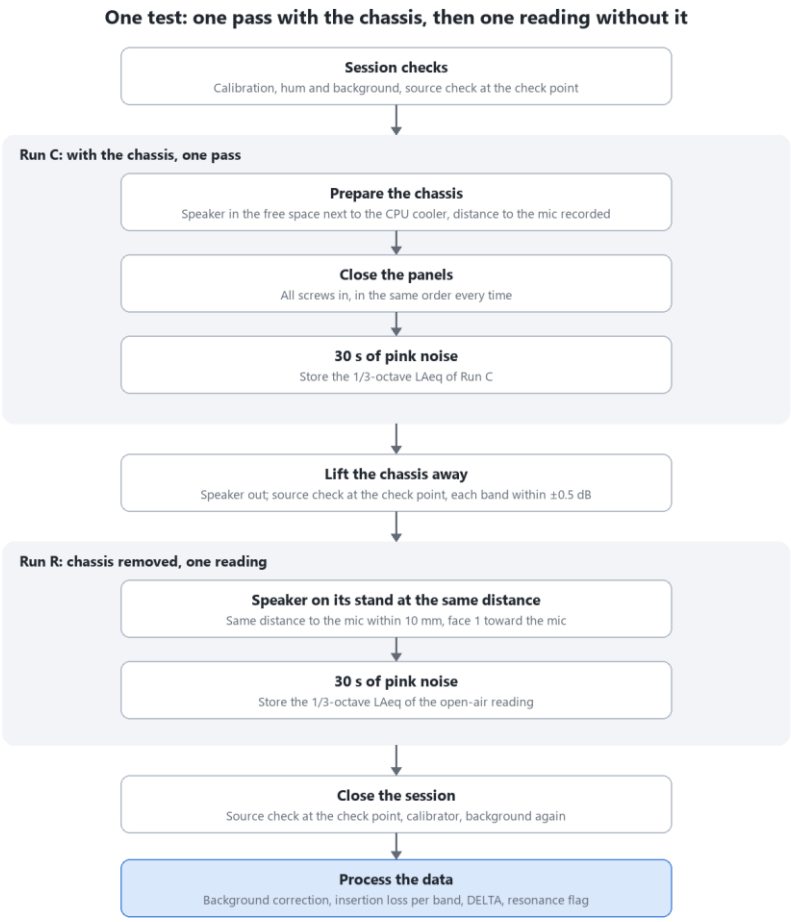
5. Hum and background check: with the speaker at the check point, the amplifier on and the signal muted, we take a reading of 30 seconds. This is the background spectrum. No line at 50 Hz or 100 Hz may stand more than 3 dB above its neighboring bands; for this comparison, the A-weighting of each band is removed.
6. Source check: with the signal on and the speaker at the check point, we take a reading of 30 seconds. Every band from 100 Hz to 10 kHz must be within ±0.5 dB of the source reference.

For every chassis:

1. We install the test system as a typical build and fit all panels, front covers, dust filters and drive cages as shipped.
2. We leave the system switched off and unplug every fan.
3. We place the chassis on its footprint, with the front facing the microphone.
4. We put the speaker on its soft support in the free space next to the CPU cooler, with face 1 toward the microphone.
5. We route the speaker cable through the drilled slot cover and seal the gap with putty on both sides.
6. We measure the distance from the acoustic center of the speaker to the microphone capsule with the laser, and we photograph the speaker.
7. We close the panels with all their screws, in the same order every time.

Measurement Sequence

A complete test consists of one pass with the chassis (Run C) and one reading without it (Run R). Everything happens in one session, and the source chain is not touched from start to finish (Picture 6).



Picture 6

After Run C, we lift the chassis away, repeat the source check at the check point, and place the speaker on its stand in open air, at the distance from the microphone that we recorded in Run C. Run R is a single reading of 30 seconds. We close the session with one more source check, the calibrator and a second background reading.

During the readings, the following rules apply:

- the operator stays outside the chamber during each reading of 30 seconds, or at least 2 m behind the microphone, and the chamber door stays closed;
- the panels are closed in the same way for every chassis, with all screws in, in the same order;
- Run R follows Run C in the same session;
- if a source check fails, we stop, fix the cause and start the session again.

Chassis Fans Noise Measurements

We use Corsair's Commander Pro [6] to control the chassis fans, using custom software developed by our team. In addition, the Commander Pro is driven by another passively cooled system that doesn't affect the chamber's noise floor.

Our software allows for precise fan speed adjustments in both RPM and percentage. Hence, we can set a portion of the speed individually for each fan, e.g., setting the fan speed at 50% for a fan with a maximum speed of 1000 RPM will result in a fan speed of 500 RPM (±1%).

We measure the noise the fans produce at 40%, 50%, 60%, 70%, 80%, 90%, and 100% of their maximum speed. Next, we change the fan speed by reversing the measurements' logic to achieve normalized noise outputs of 20, 25, 30, 35, and 40 dBA, where the fans can reach them, and we record the corresponding speed of every fan for later use.

The 75% step and the noise measurement of the graphics card's fans, which were part of the earlier revisions, are no longer performed.

Thermal Performance Testing Setup and Procedure

Thermal performance is evaluated on a real system installed inside a Giant Force climate chamber, which holds the ambient temperature steady for the whole of every test. The photographs below show the chamber and a test system installed inside it.

Pictures 7 and 8 show the chamber with a chassis under test. The same chamber hosts our cooler evaluations, where the test system is installed on an open bench (Picture 9).

Picture 7

Picture 8

Picture 9

The table below shows the test system configuration for thermal performance evaluation. We have installed thermal probes (K-type) on the mainboard's chipset, VRMs, and the NVMe drive to acquire accurate temperature readings. We get the rest of the temperature readings from the mainboard's sensors. We don't use any additional fans, only the ones that come with the chassis.

Thermal Test System Specifications	
Mainboard	Gigabyte X670E AORUS Master
CPU	AMD Ryzen 9 7950X3D
GPU	Galax GeForce RTX 4060 EX
NVMe	XPG GAMMIX S50 Lite 1TB
RAM	XPG Lancer DDR5 (2 x 16GB) @ 6000MHz
Power Supply	EVGA SuperNOVA 1000 G7
CPU Cooler	Noctua NH-D15S chromax.black
Chassis	Device Under Test
Ambient Temperature	25°C ± 0.1°C

First, we install the chassis in a controlled environment, a Giant Force [7] climate chamber, where the temperature is set at 25° C (77° F). Next, we connect the Pico TC-08 thermocouple data logger [8] to get data from all thermal probes installed in designated places inside and outside of the chassis. Specifically, we have probes at the mainboard's VRM, chipset, NVMe drive, chassis exhaust, and PSU's exhaust. Lastly, we have an additional probe measuring the ambient temperature for redundancy.

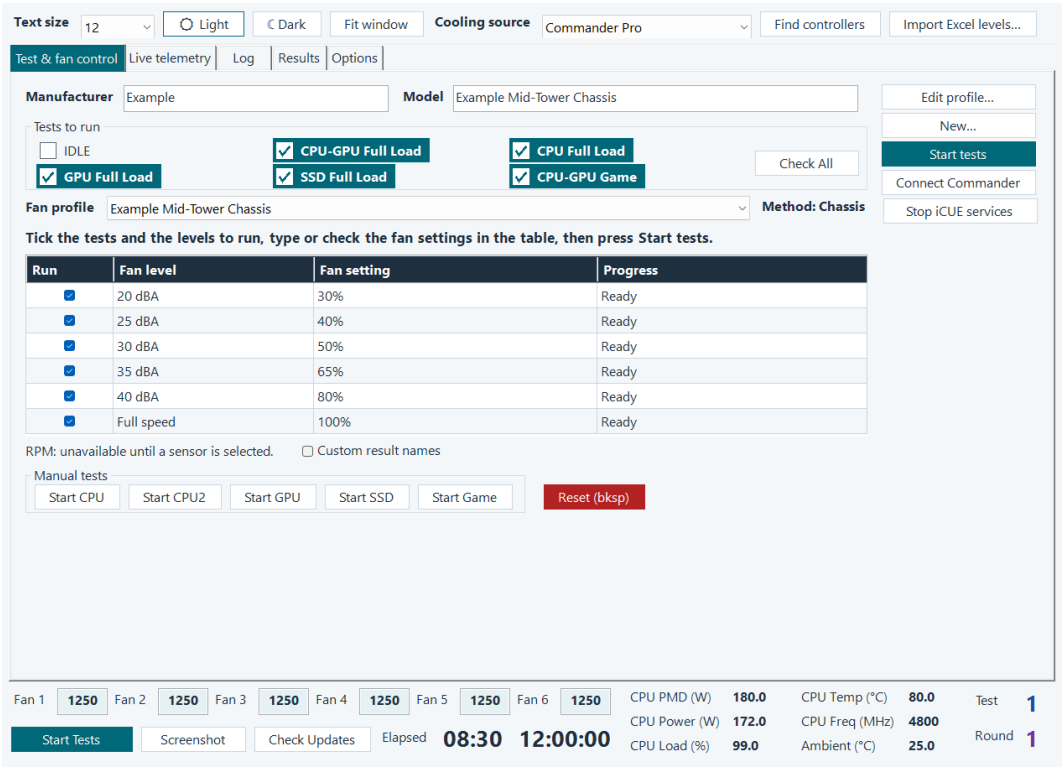
Picture 10 shows the thermocouples and the data logger next to a chassis under test.

Picture 10

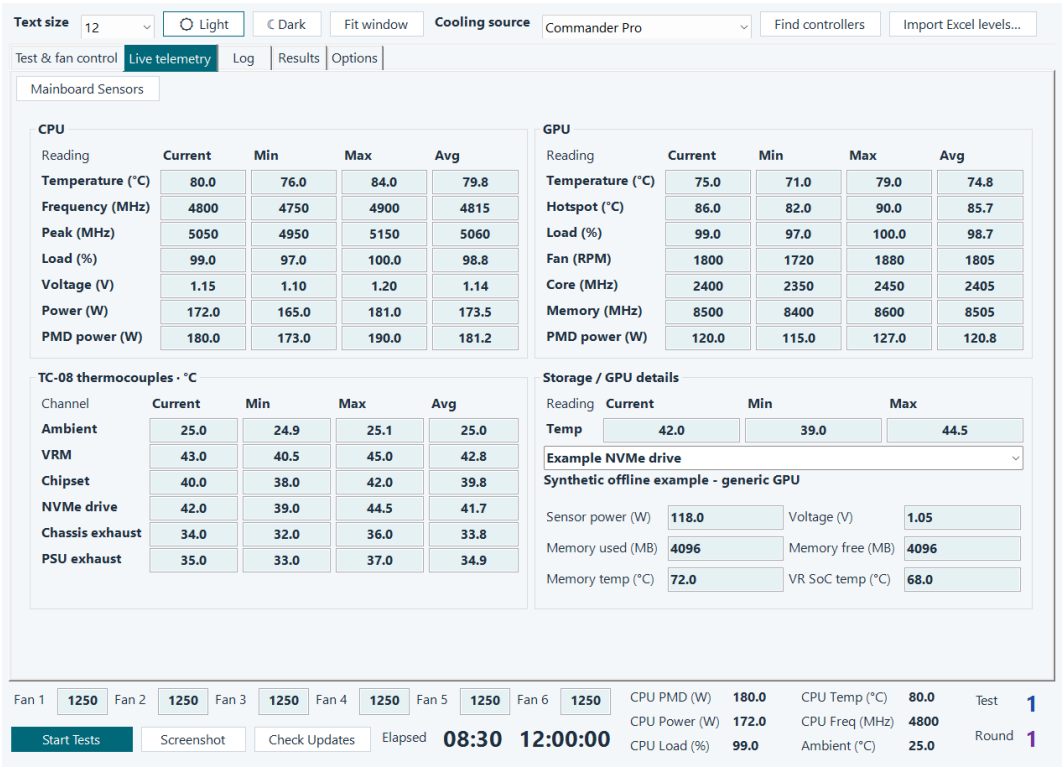
Our software allows us to run several benchmarks for prolonged periods, fully automatically, to check the chassis thermal performance under different load levels. The toughest test is the one running Prime95 and FurMark simultaneously.

Below are screenshots of our in-house software, the Chassis/Coolers Thermal Performance application (Pictures 11 to 13); the fan settings they show are example values. The chassis fans spin at the speeds recorded in the previous section to output the normalized noise levels

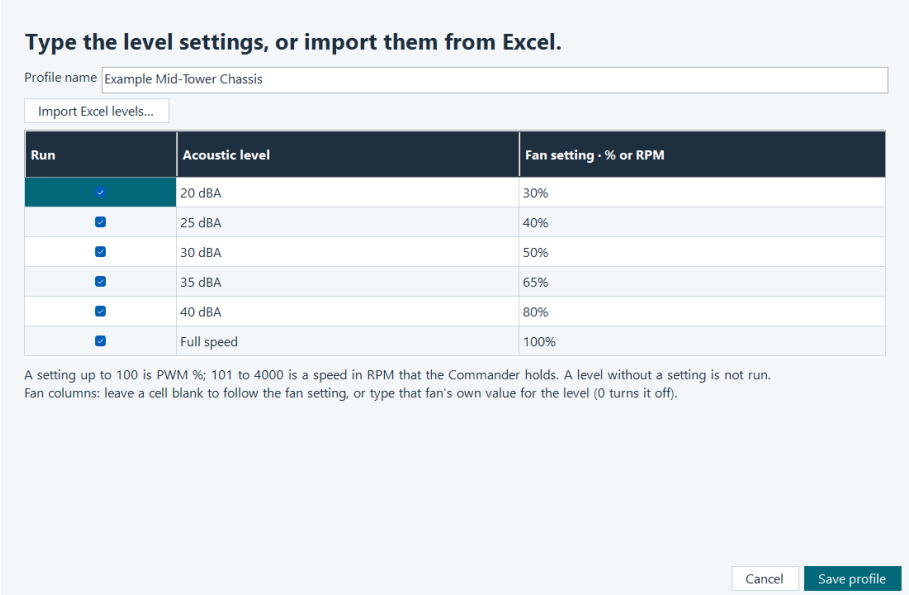
of 20, 25, 30, 35, and 40 dBA, and at their maximum rotation speed. Hence, it is necessary to conduct noise testing first. The CPU's and GPU's fans operate at their default fan speed profiles, which is the same for every chassis we evaluate.



Picture 11



Picture 12



Picture 13

All case fans are connected to the Corsair Commander Pro so we have complete control over them. Additionally, both the Corsair Commander Pro and the Pico TC-08 are controlled and monitored by our software.

All tests are carried out automatically through our custom software without the intervention of a test engineer, except for the initial settings that are made at the very beginning of the procedure. The thermal tests consist of six individual tests that run for fifteen minutes each. There is an intermediate 10-minute cool-off period between each test while we allow the system to remain idle for ten minutes before we gather all temperature information.

To explain the procedure we follow thoroughly, first, we input the case-fan speeds corresponding to the normalized noise levels (20, 25, 30, 35, and 40 dBA), as obtained during the noise measurements. We consider an additional scenario where the fans operate at full speed (100%).

Using standardized noise output levels for all chassis, we can put all relevant products under the same strict operating conditions. It would be unfair to compare cases with pre-installed fans of different characteristics and, subsequently, different noise outputs. There is always the full fan speed test for those who don't care about noise output but only want to know the thermal performance in the best-case scenario.

The thermal performance tests run for several hours. Once everything is finished, we gather the results and enter them into our database for further analysis. All results are collected automatically and can be exported in various formats.

Data Analysis

The data is being analyzed based on the scientific literature on sound [12] [13] and the experience we gained after conducting dozens of tests in PC cases.

For the noise-damping test, every reading is a spectrum of 1/3-octave band levels (LAeq). In the following, b is a band from 100 Hz to 10 kHz, $L_C(b)$ is the level of Run C, $L_R(b)$ is the level of Run R, and $L_{bg}(b)$ is the level of the background noise.

Background Correction

The reading of Run R lies far above the background noise in almost every band, so only Run C needs a correction. With $\Delta L(b) = L_C(b) - L_{bg}(b)$ for each band:

- if ΔL is 15 dB or more, no correction is applied;
- if ΔL is from 10 dB to less than 15 dB, the reading is corrected with the formula below;
- if ΔL is less than 10 dB, the reading is kept without correction. The insertion loss of this band is then a lower bound, and the band is marked "≥" in the report.

$$L_{C,\mathrm{corr}}(b) = 10\lg\left(10^{0.1\,L_C(b)} - 10^{0.1\,L_{bg}(b)}\right)$$

Where the reading of Run R itself is less than 10 dB above the background noise, the speaker is too weak to measure in this band. We report no insertion loss for the band, and it counts as 0 dB in DELTA.

The source checks at the start of the session, between Run C and Run R, and at the end must each stay within ±0.5 dB of the source reference in every band. If one of them fails, the session is not valid. We do not correct the readings for a drift of the source.

Insertion Loss per Band

The insertion loss of a band is the level without the chassis minus the level with it, where $L_C(b)$ is the corrected level $L_{C,\mathrm{corr}}(b)$ in a band in which a correction was applied:

$$IL(b) = L_R(b) - L_C(b)$$

A positive insertion loss means that the chassis damps the band, and a negative one that it amplifies it.

DELTA

DELTA applies the insertion loss of every band to a fixed pink reference spectrum, which has the same energy in every 1/3-octave band, and weights the result with the A-weighting curve. In this way, the spectrum of the speaker does not affect the single number.

$$\Delta = 10\lg\sum_b 10^{0.1\,[L_{ref}(b)+A(b)]} \;-\; 10\lg\sum_b 10^{0.1\,[L_{ref}(b)+A(b)-IL(b)]}$$

Δ is DELTA. $L_{ref}(b)$ is the pink reference spectrum, which is 0 dB in every band, and the sums run over the 21 bands. A(b) is the A-weighting of the band according to IEC 61672-1 [15],

taken from the table of the standard (from −19.1 dB at 100 Hz to −2.5 dB at 10 kHz). The insertion loss enters the calculation at full precision, and DELTA is rounded once, to 0.1 dB. DELTA is positive when the chassis damps, as in the earlier revisions. It shows by how many dBA a pink-noise source inside the chassis becomes quieter because of the chassis.

Resonance Flag

The resonance flag lists every band with an insertion loss of −3 dB or lower, together with the worst band and its value.

Validity Criteria

A test is valid only when every check of the following table passes. The only exception is the check of the signal of Run C over the background noise: a band that fails it is marked “≥” and the test remains valid.

Validity Criteria		
Check	**Limit**	**If it fails**
Calibrator reading, before and after the session	Within 0.2 dB	The session is repeated
Source checks against the source reference (each band, 100 Hz to 10 kHz)	Within ±0.5 dB	The cause is found, the source reference is stored again and the session is repeated
Hum at 50 Hz and 100 Hz	Not more than 3 dB above the neighboring bands	The grounding or the cabling is fixed, or the source runs on battery
Signal of Run C over the background noise (each band)	10 dB or more	The band is marked “≥”
Linearity (each band)	10.0 ± 0.5 dB per 10 dB step	Rattles are found and fixed
Distance from the speaker to the microphone, Run R against Run C	Within 10 mm	The speaker is re-positioned and Run R is repeated

Worked Example

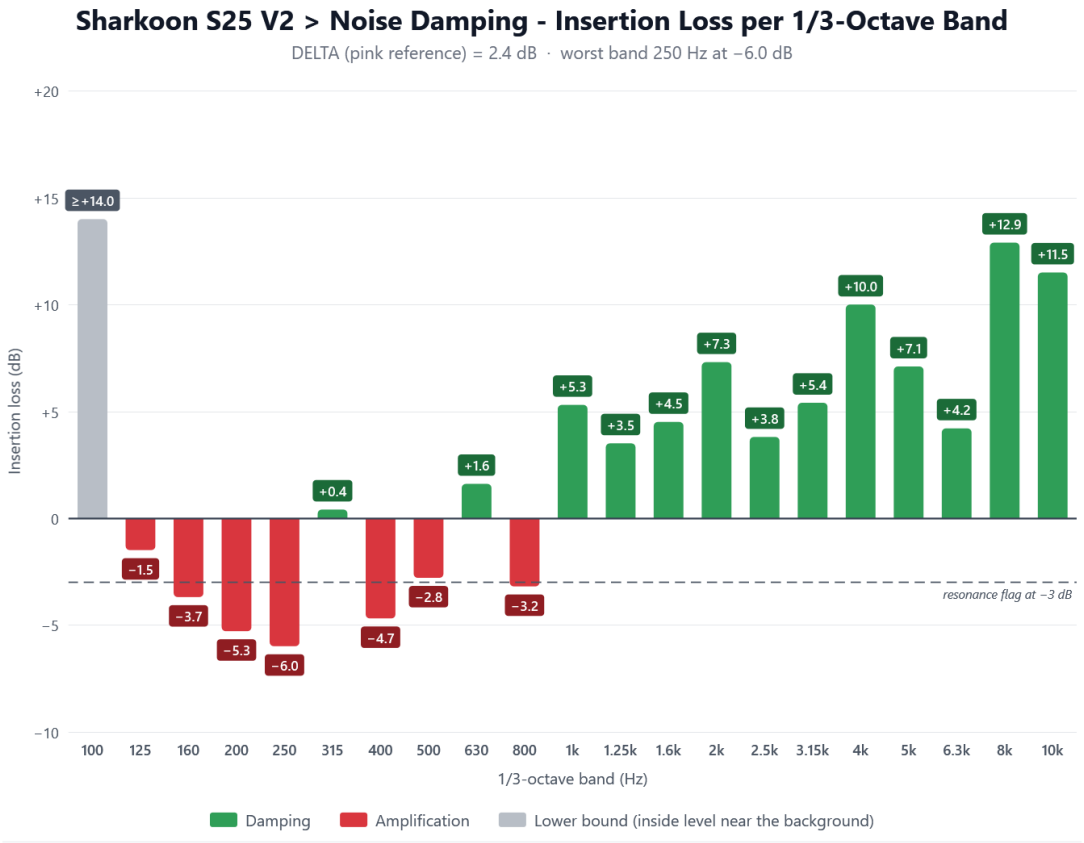
The measurement of the Sharkoon S25 V2 of 28 September 2026 shows how the calculation works. It was taken with the speaker on the chassis floor and with one pass, before the placement of Revision 2.0 was introduced.

Sharkoon S25 V2, 28 September 2026	
Quantity	**Value**
Speaker in open air (reference), LAeq	59.9 dBA
Speaker inside the chassis, LAeq	61.6 dBA
Difference of the two broadband readings (Revision 1.6)	1.7 dB louder inside
DELTA, pink reference, 100 Hz to 10 kHz (Revision 2.0)	2.4 dB (Standard)
Resonance flag	160, 200, 250, 400 and 800 Hz; worst band 250 Hz at −6.0 dB
Damping above 1 kHz	3.5 dB to 12.9 dB per band

Above 1 kHz the chassis damps every band by 3.5 dB to 12.9 dB. Below 1 kHz it amplifies seven bands, five of them by 3 dB or more, with the worst band at 250 Hz (6.0 dB). DELTA is calculated in three steps:

1. The pink reference, A-weighted and summed over the 21 bands, gives 11.731 dB.
2. The same sum, after the insertion loss of each band is subtracted, gives 9.283 dB.
3. DELTA = 11.731 − 9.283 = 2.448 dB, which is reported as 2.4 dB.

If only the bands from 1 kHz to 10 kHz were used, the result would be 5.7 dB, one level higher, and every flagged band would be hidden. Picture 14 shows the insertion loss per band of this measurement.



Pink noise, 30 s per reading, B&K 2270. Open air: the speaker alone, at the same distance from the microphone. Inside: the speaker in the chassis, system installed and powered off. Both runs are at least 10 dB above the 6.2 dBA room ambient in every band shown, except inside at 100 Hz (a lower bound, marked ≥).
Insertion loss = open air minus inside. DELTA applies it to a pink reference spectrum, A-weighted.

Picture 14

Reporting

Every report presents the insertion loss per band first, as signed bars (Picture 14), followed by DELTA, the DELTA level and the resonance flag.

Content of the Report	
Item	**Content**
Insertion loss chart	1/3-octave bands from 100 Hz to 10 kHz, signed bars; a band that is a lower bound is marked "≥" on its bar
DELTA	DELTA, pink reference
DELTA level	A+, A or Standard; no level under 2 dB
Resonance flag	Every band at −3 dB or lower, with the worst band and its value
Informative bands	12.5 kHz to 20 kHz, where the signal is 10 dB or more above the background noise
Test record	Date, temperature, humidity, calibrator readings, source checks, distance from the speaker to the microphone, photograph of the speaker inside the chassis

DELTA Levels

We use DELTA to compare the results of different chassis. Cybenetics has created special badges for this purpose, the Delta Badges, with which we can easily categorize the chassis in terms of the noise attenuation they manage to achieve.

The level is decided on DELTA as it is published, rounded to one decimal place. A chassis with a DELTA lower than 2 dB receives no level.

Levels	Soundproofing Requirements
A+	≥8 dB
A	≥5 dB to <8 dB
Standard	≥2 dB to <5 dB

We will review the limits of the levels once a sufficient number of chassis has been tested with this revision.

Chassis Evaluated Before Revision 2.0

The chassis that we evaluated before October 2026 were measured with the procedure of the earlier revisions: single test tones, a chirp signal, pink noise and white noise, with the speaker

on the chassis floor. Their published result was the difference of the two broadband pink-noise readings.

Their published results are kept as they were measured. Their levels were assigned again with the limits of Revision 2.0: A+ from 8 dB, A from 5 dB and Standard from 2 dB, with no level below 2 dB.

These chassis were not measured again, and the earlier procedure is not identical to the procedure of Revision 2.0. Their results are therefore indicative when compared with chassis tested under Revision 2.0. The report of every such chassis carries a note, which also names the originally published level where it changed.

Epilogue

In this article, we tried to explain the methodology we follow in our chassis evaluations as straightforward as possible. A few things are required in every sound test procedure: reliability, accuracy, calibrated equipment, knowledge of how to operate it properly, and the experience to recognize problems and measurement errors as soon as possible. Unfortunately, experience only comes after a significant number of test sessions. Thankfully, the members of the Cybenetics team have dealt with chassis for more than a decade now, and their combined knowledge on this subject led to the complete testing protocol that we follow. Since we are after perfection, although we know that there is nothing perfect in this world (cats excluded, of course), we will continue searching for new methodologies and ways that will allow us to explore more aspects of this subject.

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