

# HOME CINEMA WORLD



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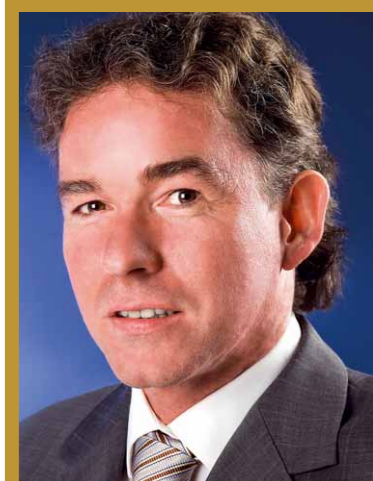
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# Laser TVs

Anyone who wants to enjoy large-format films in the living room usually relies on a flat-screen TV in the appropriate format. But at the latest when the screen diagonal should go up to two meters (almost 80 inches), their prices are correspondingly high. The usual alternative to this would be a classic projector, which, however, requires a certain amount of installation effort. But there is another type of device that is not yet very well known, but all the more interesting: the so-called laser TVs. This refers to ultra-short distance projectors with laser light sources that are placed directly in front of the projection surface, e.g. on a sideboard, and can therefore be set up just as easily as a television. Thanks to the laser optics, despite the short distance, they manage to project large images onto the screen without distortion. In this issue we took a closer look at two representatives of this young species.

Have fun in your home theater!

Dipl.-Phys. Guido Randerath



Dipl.-Phys. Guido Randerath  
Editor-in-Chief



Image: Epson







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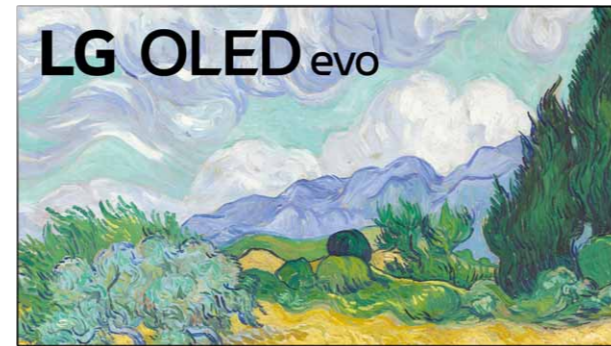
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### Sony 4K home theater projectors

Sony has announced two new native 4K home theater projectors with 4,096 x 2,160 pixels. Its heart, the image processor „X1 for projector“, is based on the technology of Bravia televisions from Sony and was specially designed for projectors. The processor combines technologies for high-precision image analysis, uses and optimizes functions such as the Dynamic HDR Enhancer and Reality Creation for top-class home cinema sharpness, promises Sony.

[www.sony.com](http://www.sony.com)



### Loewe picture i

Loewe announces the availability of the newly developed bild i product line. The OLED models Loewe bild i.65 dr +, Loewe bild i.55 dr + and Loewe bild i.48 dr + as well as the Loewe sound bar i address a target group that makes no compromises in terms of design and quality. Loewe relies on the latest display technology and excellent hardware for all bild i models. Loewe bild i should stand for breathtaking picture quality, fast and intuitive operation, the latest OLED technology and intelligent additional functions.

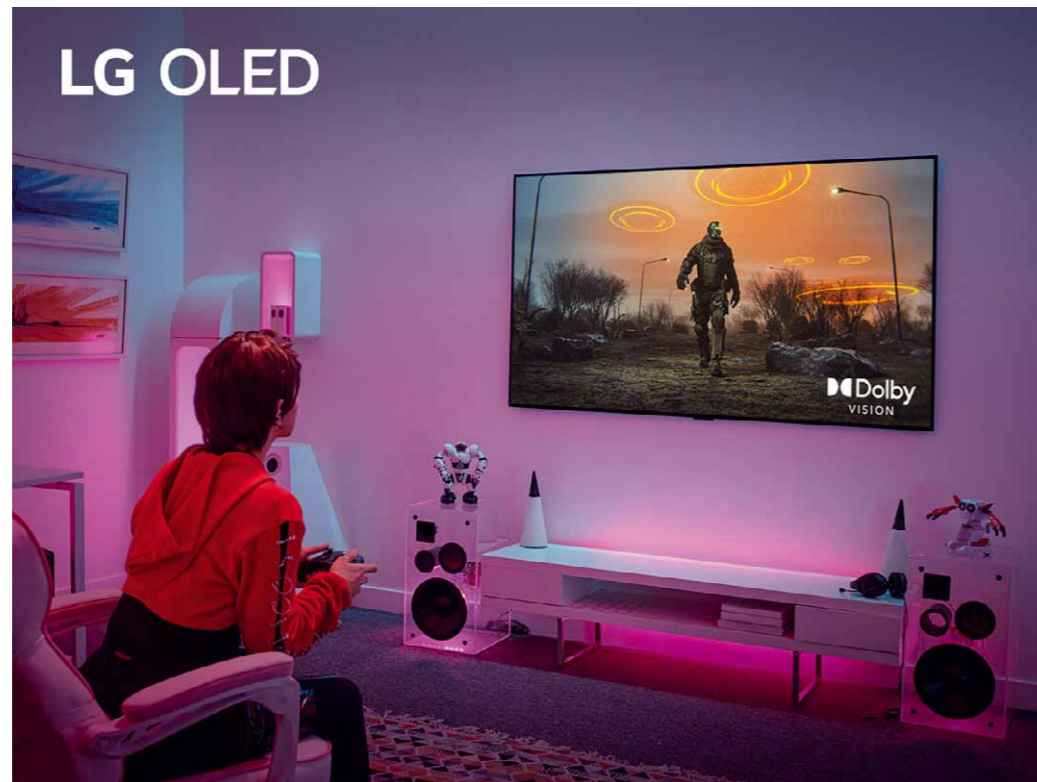
[www.loewe.tv](http://www.loewe.tv)

### HDR gaming

LG now supports Dolby Vision HDR for 4K / 120Hz gaming on compatible platforms. With optimized gaming features and convenient, easy-to-use controls, LG's premium televisions are ready for a superior next-generation gaming experience.

The roll-out of firmware version 03.15.27 starts immediately for the OLED TV models of the C1 and G1 series; further premium models of the 2021 line-up such as the OLED Z1 series, the QNED Mini LED QNED99 series and the NanoCell NANO99 series will follow. In addition, further 2021 and 2020 TV models for Dolby Vision Gaming in 60Hz or 120Hz will be tested.

[www.lg.com](http://www.lg.com)



### TCL Dolby Atmos soundbar

With the TS8132, TCL is launching a new soundbar this year. It is a 3.1.2 Dolby Atmos model with a wireless subwoofer that delivers immersive sound to all of your favorite streaming services, TV content and games. Features include Google Chromecast, Apple AirPlay, Google Assistant and Amazon Alexa. The soundbar also supports HDMI with eARC for connection to the TV and Dolby Vision-compatible 4K pass-thru.

[www.tcl.com](http://www.tcl.com)





Acoustically optimized 7.1.5 cinema with double center and double bass array

# **CINEMA INCOGNITO**

An elaborately designed high-end home theater for movies, stereo, and multichannel music. As many as six speakers have been designed exclusively for the room. A 4K projector from JVC and a 3.85-meter-wide CinemaScope screen promise the best image quality. Read this report to find out what else makes the „Reader's Cinema of the Month“ unique.

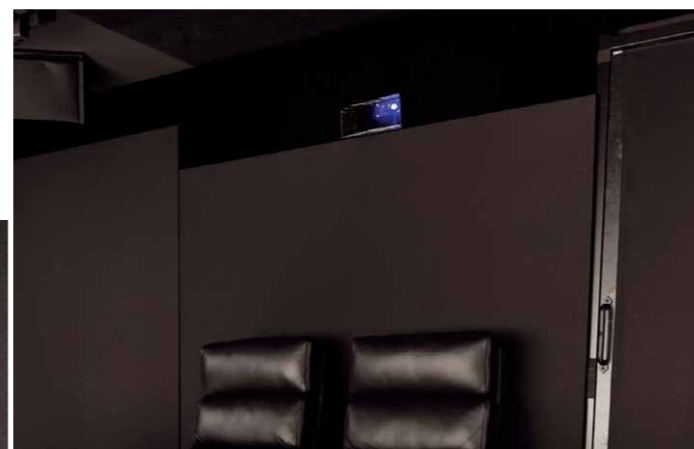


I visit my host near Hanover, who welcomes me in good spirits at summer temperatures. To refresh me, I have a cold drink. In the generously sized and well-air-conditioned living room, which is quite comfortably furnished in Italian style, I learn what to expect in the next few hours.

„The cinema room should be equally suitable for watching movies and listening to music,“ my host explains. „For feature films, however, my priority tends to be the picture. Exceptions are concerts and music films. For stereo music listening, of course, only the sound counts.“ I look around. To my surprise, nothing in the house reminds me of the hobby. No movie posters, replicas, vintage products provide a clue to a cinema. It seems to be clandestine. „Would you like to see Cinema Incognito?“ my host asks me. „Of course,“ I answer with anticipation and am led to an inconspicuous

white door. It is the entrance that leads directly from the living room. Behind it, completely incognito, is the all-black home theater – what a contrast to the white interior of the living room.

Behind the white-painted entrance door, a little distance away is a second door. As in many commercial cinemas, this airlock, including a double door, serves mainly for sound insulation so that the sound does not boom through the whole house. The second door also has another purpose: it contains a loudspeaker.



The projector is located outside the cinema. Through a projection window, it projects inaudibly onto the screen inside the cinema. The round holes in the pedestal serve as a bass trap



Comfortable cinema chairs invite you to stay for hours. The cup holders are illuminated

### The musical door

As I enter the spacious movie theater, I immediately notice the new characteristic of the room's sound. Behind me, the proud cinema owner closes the door. Since all the technical components, such as the power amplifiers, preamplifier, player, and projector, are housed outside the cinema, the room is entirely silent.

From initial planning to completion, the project took about four years. „Craftwork is not my thing, and I also lack the talent for it,“ laughs the owner of the house. „Planning, on the other hand, gave me a lot of pleasure.“

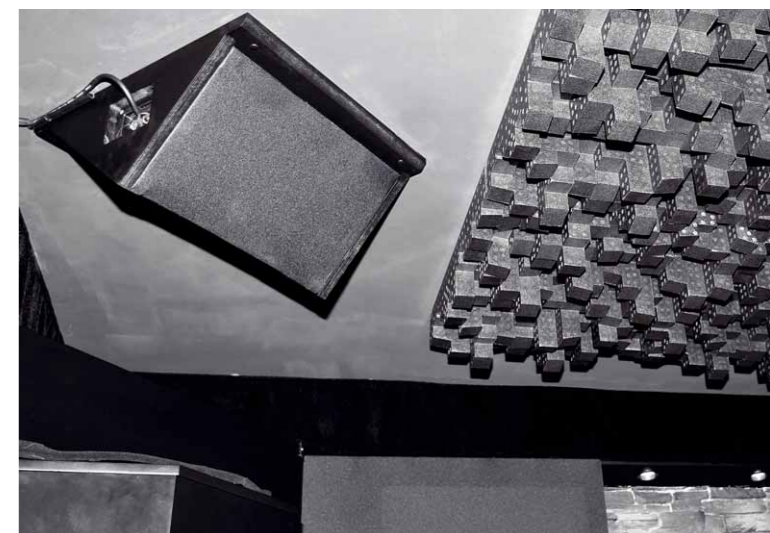
The installation of the left surround speaker turned out to be a real challenge at the time. The entrance door is located where it belongs. Placing it next to it was out of the question at the time. Also, the speaker should not be moved to its optimal place for every movie night. Therefore, the large surround speaker was installed in the door (see photos). Due to the weight, a special construction and reinforced hinges became necessary. A panel made of acoustic fabric covers the speaker, resulting in a coherent look. In general, I like the fact that almost no technology is visible in the room. I only discovered the four top speakers for Dolby Atmos under the acoustically treated ceiling when I looked very closely.

### Customized loudspeakers

The owner has rigorously implemented the aspiration for excellent sound. Loudspeakers have been developed exclusively for the cinema, which satisfy his high audiophile demands. This is an individual four-way system with optimized sound radiation characteristics. This is made



Conveniently control lighting scenes and even entire playback scenarios via Creston



Conveniently control lighting scenes and even entire playback scenarios via Creston



Two doors form the entrance sluice



When the acoustic fabric panel is removed, the impressive size of the rear speaker embedded in the door becomes apparent







The ceiling is acoustically optimized with meter-long absorbers and so-called „Skyliners,“ which act as diffusers

possible by the chassis arranged according to d'Appolitto. The goal: Horizontally, the speakers radiate evenly wide, vertically evenly narrow. This sound routing reduces unwanted reflections.

Six of these identical speakers are distributed invisibly around the room. Four of them are recessed as rears at the side and rear. Two front speakers are located to the left and right of the 3.85-meter wide screen. The custom-made speakers are not controlled by the preamplifier but

by additional mini DSPs. The four paths are thus separated individually with phase and delay time correction. This is not possible with a preamplifier.

Four KEF Q350 are used as top speakers. Their enclosures were also processed so that they radiate directly to the reference position.

Two more speakers are located centrally above and below the screen. They are a double center speaker that repro-

duces the dialogues in the movie precisely in between, i.e., at the height of the center of the screen. The speakers are all flush with the walls with acoustic fabric panels.

*Power amplifiers, preamplifier, and player have their place right next to the cinema entrance. When the door is closed, nothing of the technology is visible*

## Equipment:

· Size:	5.80 x 5.04 x 2.58 meters
· Projector:	JVC DLA-X7000
· Screen:	Elite Screens 3.85 x 1.85 meters
· Preamplifier:	Trinnov Altitude 32
· Power amplifiers:	10 x IMG STA2000D, 4 x Yamaha P7000S
· 4K feed:	HTPC, Apple TV 4K
· Speakers:	6 x custom-made, 2 x custom-made center, 4 x KEF Q350
· Subwoofer:	16 x Peerless XXLS 12 inch chassis
· Other:	Creston
· Specials:	custom 4-way speakers, Creston control, acoustic measures, and double bass array







No sunbathing lawn: Directly in front of the screen, these absorbers are designed to eliminate the initial reflection from the lower center speaker to the listening position

### Screen with double center

Usually, there is only one center speaker in a home theater that sits centrally under a screen or at 5/8 height behind a sound-permeable screen. Not in this case. The theater owner decided to use a dual center with one speaker above and one below the screen. That makes sense: The screen is not acoustically transparent, yet the sound should come from the center of the image. By using two speakers, it is now possible for dialogues to take place precisely in the center: Similar to classic stereo speakers, where newscasters, for example, can be heard from the center, your double center also creates a phantom sound source. The centered localization remains even when one of the side seats is used since the relative distance to the floor or ceiling center does not change.

The upper center speaker is also part of the Dolby Atmos installation: It acts as a fifth speaker in addition to the four ceiling speakers for the Atmos setup.

„The center is indeed designed as a double center,“ the music lover explains to me. „But I additionally count the top speaker as the fifth speaker of the height plane.“ Background: as a preamplifier, the Trinnov Altitude 32 can precisely place object-based sound events from movies in the room. If an acoustic event takes place centered above the screen, that is additionally reproduced by the center speaker above. Clever.

### Double bass array and room acoustics

„The room entrance at the back presented some problems for the realization of the DBA,“ reports the proud cinema owner. „To give the DBA back wall a closed surface, I had a second door installed.“

As many as 16 Peerless XXLS 12-inch drivers reside in 70-liter enclosures. Since it is a dedicated DBA arrangement, eight subwoofers are used in the front and eight in the back, which have been placed according to specifications.

A few acoustic measures are easy to spot. These include absorbers and diffusers on the ceiling.

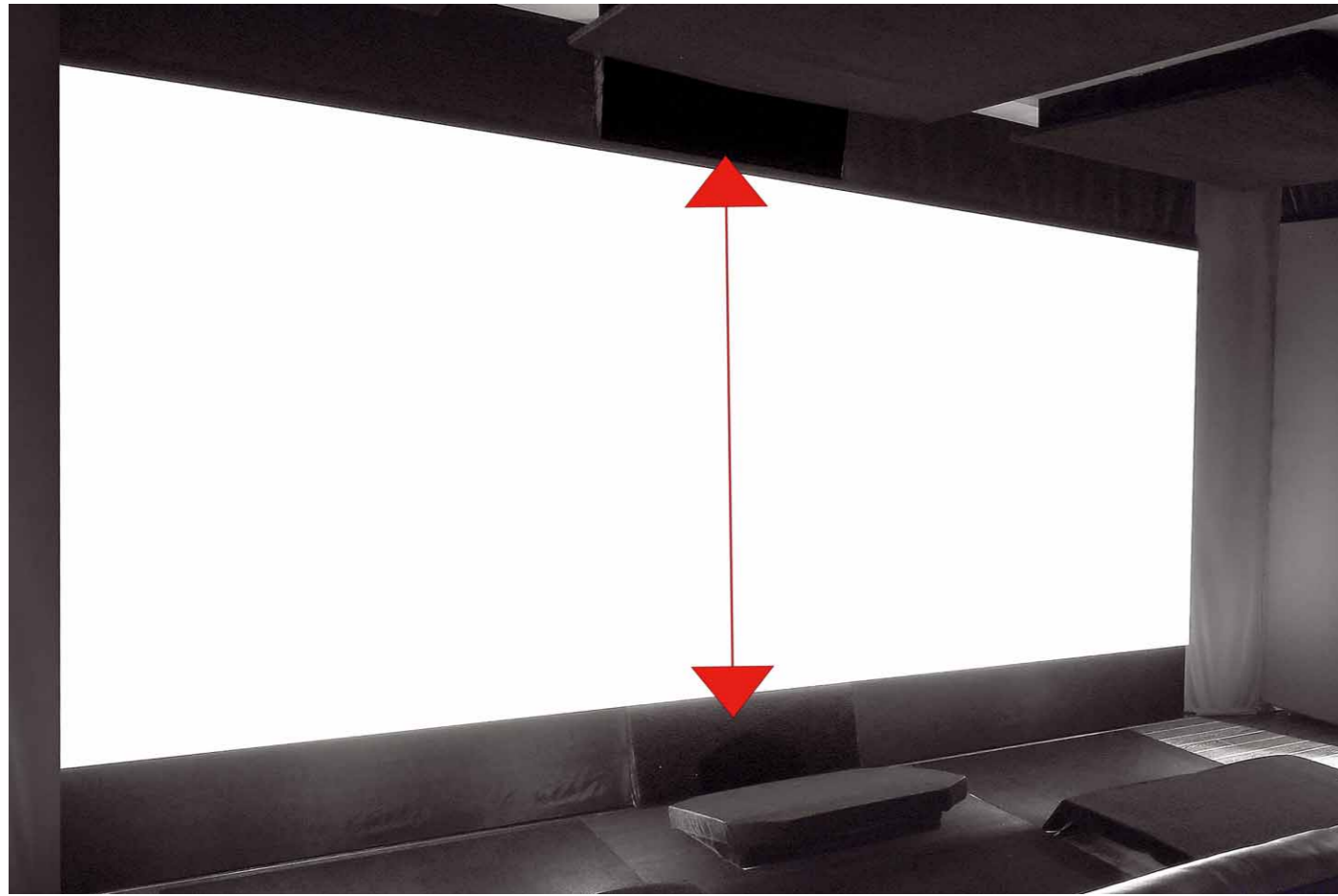
„I designed the central ceiling absorber to attenuate the initial reflection from the upper center on the ceiling,“ my host explained to me. Since reflections to the listening posi-

tion are undesirable, this effect should be avoided as much as possible. There are also absorbers in front of the lower center. With the angled Basotect panel, the reflected sound is not directed towards the reference position but absorbed there. „The reflection problem is thus solved.“



Six of the speakers designed for the Cinema Incognito have an impressive height of almost 1.80 meters. Here: the left surround speaker





The double center is recessed flush above and below the screen. Voices thus sound from the center of the screen. The concept even works well from the second row of seats

Additional absorbers and diffusers are located on the side and rear walls. These are all covered with black acoustic fabric so that they do not distract from the film action. There is also absorber material under the podiums, which ensures that the seats do not vibrate unnecessarily.

### And action!

Now the best part of the visit begins: the image and sound check. First, my host starts with stereo music. What an experience! I don't miss a thing. Treble, midrange, fundamental, bass, everything sounds perfectly coherent. The performers are in the middle of the stage. If the level increases, the speakers still flatter my ears.

There is no coloration bass drums and the snare sound authentic. Female voices sound realistic as if the performers were standing in front of me on stage and singing live for me alone. Great!

Next up is some rougher fare. The JVC DLA-X7000 projects the 4K version of „Mad Max: Fury Road“ onto the screen. Even the Warner logo shines in magnificent colors. The high contrast range vividly peels out the rust on the „W.“ When Max stands next to his car in the desert, his voice sounds so-

norous and voluminous from the front speakers. The voices that now wander around the room are reproduced precisely on and between the speakers. I have rarely heard such a good sound in home theaters. When the pursuers race into the picture with their futuristic cars, the subwoofers of the DBA are in top form. The most delicate low bass gradations are precisely pressed into the room. Perfectly localized effects of the Dolby Atmos soundtrack are perceptible from the ceiling. During the dialogue scenes, the voices are precisely placed in the center of the screen. The double center does an outstanding job here. Even on the seats to the left and right of the reference position, the precise representation is maintained. This is great cinema!

### Conclusion

The CINEMA INCOGNITO is an actual high-end home theater that delights with stunning acoustics and an XXL picture. The speakers, specially designed for the room, combine cinema, studio, and high-end sound characteristics. Room design and craftsmanship are flawless. In sum, a cozy movie theater has been created in which blockbusters, concerts, and stereo can be experienced at the highest level.

## Interview:

### Why do you use a double center?

Because I decided to use an acoustically non-transparent film screen due to the advantages for the image quality, I cannot position a center speaker behind the screen. Therefore it has become a double center for me. This design has the advantage of working correctly for all three front row seats in terms of amplitude, delay time, and phase. So, in sum, the visual benefits of the acoustically non-transparent screen outweigh the minor disadvantages of a double center.

### Why did you put the left rear surround speaker in the door?

Since there was no more room for the left rear surround speaker in the back wall area, it is integrated into the „door,“ which thus weighs over 100 kg in total. It's not the easiest solution, but it works.

### You had speakers designed exclusively for you. What are the reasons?

For my speakers, I wanted the level stability of a cinema speaker, the precision of a studio monitor, and most importantly, the musicality of a high-end speaker. Fortunately, I can say that the above goals are achieved for my demands.

### What are your ten favorite movies?

#### „Lord of the Rings“ trilogy.

An epic story, awe-inspiringly filmed. I read the books many years ago.

#### Game of Thrones (series)

A fascinating world with interesting characters that develop throughout the story.

#### Terminator 1

It fascinated me incredibly as a teenager, even on a VHS cassette and a small TV.

#### Terminator 2

was the ultimate in effects for me at the time.

#### Batman - The Dark Knight

This dark world fascinates me. Beyond that, I like to take it to screen because of the excellent sound.

#### The Godfather - Trilogy

Seems very authentic, less as a movie, more like you're following the characters.

#### Forrest Gump

Stupid is as stupid does – the best line I've ever heard in a movie.

#### King Kong

Excellent remake of a classic, visually stunning. Here the film benefits from the cinema and the cinema from the film.

#### The Life of Brian

Jehovah. He said Jehovah.

#### Lucy

The drive through Paris is the most remarkable car scene I've seen.

#### The Last Samurai

I'm a big fan of Japan, especially Japanese culture.





*Your cinema in the magazine!*

Do you also want to present your cinema project in HOME CINEMA WORLD? Then please send us an e-mail with a short description and ideally already some photos to [randerrath@brieden.de](mailto:randerrath@brieden.de)



WMF KÜCHENminis Popcorn Maker

# Fresh Popcorn

Whether for a cozy home cinema evening or simply as a delicious snack - fresh popcorn is popular with young and old.

Popcorn tastes best when it is still warm. That's why ready-bought popcorn can never match the taste of freshly made popcorn. Popcorn can be made in a pan, but it is easier and more successful with a special popcorn maker.

### Small and sophisticated

The popcorn maker belongs to the WMF KÜCHENminis and is accordingly compact. With a diameter of only about 17 cm (plus handles), you can always find a place for it. The



The lid doubles as a serving bowl



finish and appearance are typical WMF high quality. The bottom part of the popcorn maker houses a coated heating plate, above which the popcorn turner rotates at a distance of a few millimeters. The transparent plastic cover prevents the corn from popping out and gives a clear view of the action.

### In operation

Operation is as simple as can be. Plug it in, put the corn on the hot plate, put the hood on without the top lid, press the button and wait. The top lid must be off during operation so that the air holes in the hood are unobstructed. Immediately after switching on, the popcorn turner rotates and ensures that the corn kernels are mixed and evenly heated. After just a few minutes, the spectacle begins: the first corn kernels start popping, then they quickly increase in number, and after a short time the hood is completely filled with

popcorn. Now the machine can be switched off. To serve, simply put on the top lid so that the hood is tight. Now turn the entire device upside down and the hood serves as a practical serving bowl.

When filling with corn, be careful not to put too many kernels in, or the finished popcorn won't fit in the hood and will lift it. The increase in volume is enormous. After cooling, the unit is easy to clean. The popcorn turner is quickly unscrewed and the heating plate can be easily wiped clean.

### Conclusion

The WMF KÜCHENminis popcorn maker is compact, stylish and practical. In just a few minutes, it makes tasty, fresh popcorn as the perfect snack for movie night. Plus, there's a certain fascination in watching the corn pop.

## WMF KÜCHENminis Popcorn Maker

Price	around 70 Euro
Distribution	WMF
Internet	www.wmf.com

### • Technical specifications

Performance	600 Watt
Dimensions	19 x 20 cm
Capacity	ca. 2,2 l
non-stick coating / hood with lid	

- **Function** 40 % ★★★★★
- **Handling/Cleaning** 40 % ★★★★★
- **Workmanship/Design** 20 % ★★★★★

Upper class



Germany 2/21

Price/performance: very good

- + compact dimensions
- + hood at the same time serving bowl
- + easy cleaning



# Ultra-short distance projectors instead of TVs?

They are called ultra-short distance projectors, or more recently laser TVs. They can project a huge image even if they are only a few centimeters away from the screen. And because it makes sense, most manufacturers equip their projectors for the extremely short distance with a decent sound system and corresponding loudspeakers. This not only looks homely compact, but in most cases, it also sounds considerably better than most flat screens.





Unlike TVs, a projector, whether ultra-short distance or not, virtually disappears among the other furniture in the setup, at least when it's turned off and the screen is rolled up. With a TV screen, there is always a dark rectangle on the wall. Whereas the size of the image on a conventional television is rigidly limited by the size of the screen, on a projector, there is always the possibility of varying it by zooming in or out or by adjusting the distance to the screen.

**Precision work**

However, there are a few things to consider when setting up an ultra-short distance projector. For example, the projector should be absolutely level on the sideboard or other furniture. For this purpose, the feet of most devices are height adjustable. Just like a standard projector, an ultra-short distance projector should be positioned as parallel as possible to the screen, i.e., the light from the optical unit should strike the screen at a right angle. With a laser TV or ultra-short distance projector, even a few millimeters of

misalignment lead to strong distortions in the image. As mentioned, an ultra-short distance projector always comes with the tools to facilitate the most accurate set-up possible. If the image still tilts slightly on the screen even after painstaking work, you can always correct it with the so-called keystone correction. This is already fully automatic with many projectors, but the image can also be easily aligned manually with all projectors known to us.

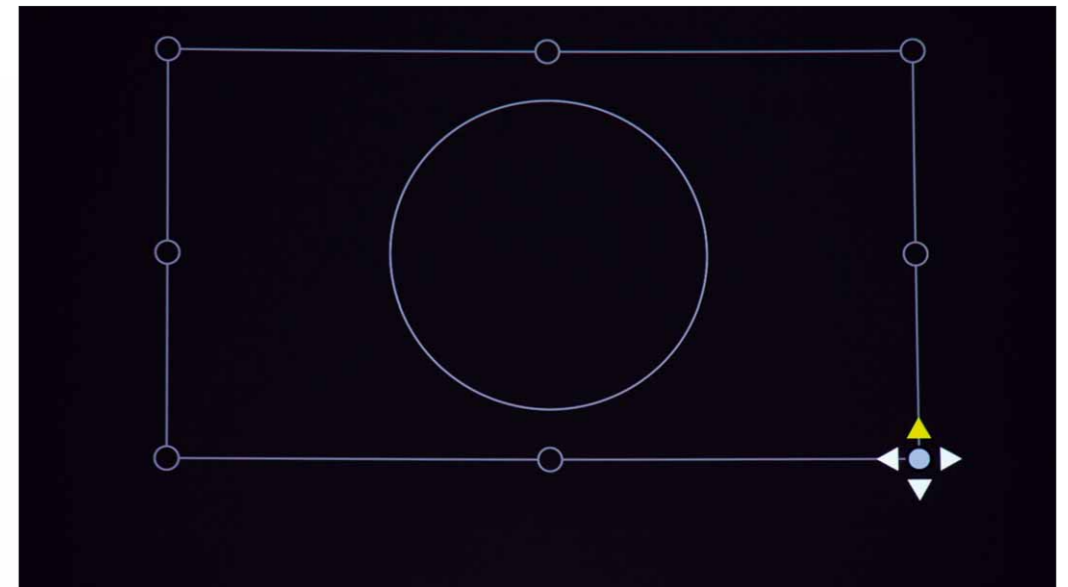
**Transport and setup**

Even if this fine-tuning of the image seems a bit tricky and time-consuming, there is another advantage that speaks for using an ultra-short distance projector to the detriment of a TV. The TV also has to be dragged into the living room to be mounted on the wall. The larger the picture, the more difficult this becomes. A TV with a 100-inch screen is easily over two meters wide and almost 130 centimeters high - not counting the controls and, if necessary, the speakers at the bottom. Apart from the fact that the weight is considerable,



*To bring them optimally into balance, many projectors have height-adjustable feet, ...*

*... and the rest is done by automatic or manual keystone correction, as shown here using multi-point adjustment*



such a bulky colossus can only be handled by at least two people. A single person is usually enough to put the projector in place. Image sizes of 100 inches are not a significant problem even for an ultra-short distance projector; if necessary, the sideboard can be moved a few centimeters away from the screen.



*The fabric cover of the speakers usually characterizes the front of an ultra-short distance projector; the connectors are well hidden on the side facing the screen*



The position to the projection screen is ideally parallel; some devices have built-in rulers for perfect adjustment



### Smart? Indeed!

Especially in terms of support for streaming services and other online activities, projectors led a somewhat muted existence for a long time, unlike smart TVs, which have become very fashionable and have user interfaces reminiscent of tablets or smartphones. This is changing visibly; especially the two ultra-short distance projectors in this issue have great user interfaces. The Epson even dives into the world of streaming via an Android interface. The BenQ also has a corresponding interface and is also open for connecting and managing external drives.

So, there are many good reasons to replace the TV with an ultra-short distance projector, the proven greater potential in the sound department being just one of them.

*Many projector manufacturers get external support for the audio part of ultra-short distance projectors – at Epson, for example, it's Yamaha*

# The Equipment Classes

In HOME CINEMA WORLD, all products are classified into one of five performance classes:

- **Reference Class** – Uncompromising products with outstanding image and sound quality
- **Top Class** – Products for higher demands with excellent image, sound, and processing quality
- **Upper Class** – Products for quality-conscious connoisseurs who value good value for money
- **Middle Class** – Solid products that meet average requirements in all respects
- **Entry Level** – Qualitatively convincing products with an excellent price-performance ratio

## The Rating

Devices are tested and rated according to strict criteria and can reach up to five “stars”. Ratings are only comparable within a class and device type. To score four stars in the top class, the device must meet more demanding requirements than for a 4-star rating in the upper class. The model names, prices (RRP), and equipment specifications for the devices always refer to the German market at testing. For some devices, such as TVs, prices and features may differ in the individual countries.

The star rating provides comprehensive and concise orientation when searching for devices for your home theater. However, depending on your situation and application, the device with the best star rating is not automatically the best fit for you. For example, a projector may score very well overall but still produce quite a lot of fan noise. Depending on where the unit is placed, this either doesn't matter at all or can be seriously annoying in the worst case. Therefore, you should additionally consult the detailed information provided in the text of the test reports.

## The Test Equipment of the HOME CINEMA WORLD Editorial Team

For our tests, HOME CINEMA WORLD uses – among others – the following special measuring instruments and reference devices for the comparison of image and sound quality:

- Audio Precision
- Clio Win ATB
- Konica Minolta CS-2000
- Color analysis software CALMAN
- Kenwood CS-6030
- ELV EM800
- Load resistors Reohm 55/2000/4



Ultra-short distance projector: BenQ V6050 in Review

# ***BenQ V6050 – Ultra Short Distance at its Best***



Projectors for ultra-short distance setups are enjoying enormous popularity these days. Like hardly any other type of projector, they claim the place of the TV in the living room. The BenQ V6050 also stands inconspicuously like a soundbar on the sideboard directly in front of the screen and effortlessly projects a gigantic image that measures two meters diagonally and more. A long-lasting laser serves as the light source, which has also earned this equipment category the marketing name „Laser TV“.



## Image

UHD HDR 3D DLP Ultra Short Distance Projector

The BenQ V6050 comes in an elegant black casing, while the possibly more living room-friendly white version is called the V6000. There is no difference in technology. In the front, under the fabric cover, two speakers provide good sound, which is miles superior to the internal audio systems of most TVs.

There are two HDMI inputs on the back (facing the screen), a digital audio output, and the obligatory RS232 jack for controlling screens, curtains, or other peripherals. The two USB sockets on the side are intended for external media.

The BenQ V6050 makes a statement regarding ease of use and quality as soon as it is switched on: a metal cover quietly whirs open to reveal the mirror optics. It protects the

optics from dust and other mischiefs when the projector is off. As soon as humans or animals get a bit too close to the opening, the laser also switches off automatically, so it doesn't hurt the eye. The remote control also has a high-quality build and a generous button layout.

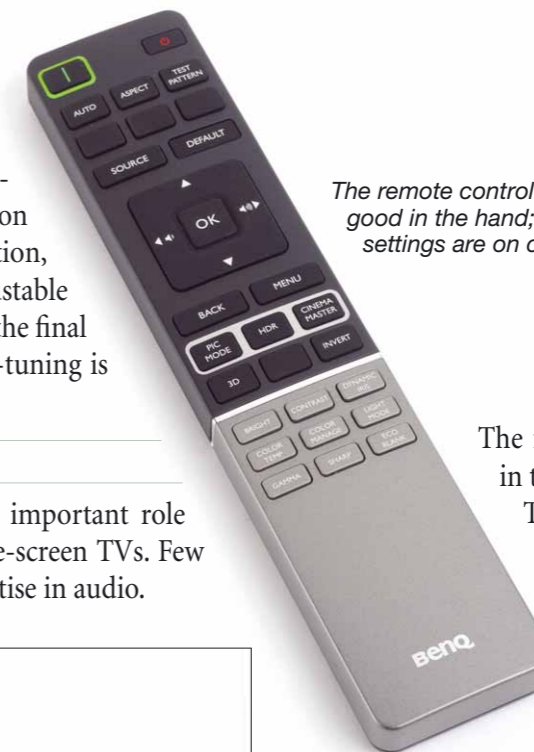
### Close up

To achieve an image diagonal of about two and a half meters, which corresponds to a 100-inch TV screen, the distance between the V6050 (or rather its optics) and the screen is only about 63 centimeters. Like all ultra-short-throw projectors, the BenQ should be perfectly aligned in front of the screen – if it's out of place by just a few millime-

ters, it will directly affect the image geometry severely. To prevent the problem, there are two extendable rails on the side facing the screen. In addition, the V6050 can be leveled using adjustable screw feet, which makes the work of the final keystone correction easier; only fine-tuning is required here.

### The sound to the picture

As mentioned, sound plays a more important role with the V6050 than with most large-screen TVs. Few know that BenQ also has some expertise in audio.



*The remote control is heavy and feels good in the hand; the most important settings are on direct selection buttons*

The fact that this expertise comes to bear in the V6050 is not only evident from the Trevalo logo on the casing, but especially from the sound. You can also adjust the sound individually in the menu.

This can either be done using the five presets Standard, Cinema, Music, Gaming, and Sport, or with the help of the 5-band equalizer, which is available in the user preset.

Either way, the speakers' potential in the V6050 is enough to fill a medium-sized living room with sound.

If you want more, you can use the digital output to control an external sound system, which can be anything from a proper soundbar to a full-blown receiver.



*Two HDMI inputs on the back are available for conventional sources; the two USB sockets on the side are responsible for external media or the optional WiFi dongle.*





Six presets take care of the good sound, but the menu is not yet completely translated; „Muzika“ is self-evident, and the sound for gaming is set under „Joc.“



In the user menu, the sound can be individually adjusted with the help of a 5-band equalizer

### Setup and image quality

Once the V6050 is correctly aligned, only the picture needs to be adjusted in contrast and color fidelity. In our test device, the picture mode was set to „living room,“ and the laser was in bright standard mode. The picture looks correspondingly bright and cool, but the measurement still shows a good overlap of the HDTV standard color space. Even though a color temperature of around 7,000 Kelvin is okay in a typical living room, we are more in the mood for a cinema-like movie experience. For this, we set the picture

mode to „Cinema REC.709“, the HDTV standard color space REC.709 is already defined here. Now we just put the laser to Eco mode and the color temperature towards „Warm.“ A measured 6,000 Kelvin and a 100% coverage of the standard color space prove us correct. With a rich 1,600 lumens in Eco mode, the projector conjures a brilliant picture on the screen, even in a bright living room.

When fed with HDR signals, the V6050 automatically sets the corresponding picture mode „HDR10“. The gamma value is fixed here, and we can now turn on the „Large Color



For orientation, the distances are printed on both holders. Two spacers can be pulled out of the back, allowing the projector to be set up exactly parallel to the screen



Space“ setting in the menu. Our measurement shows that the extended D65 P3 color space is completely covered. The gamma values follow the prescribed PQ curve as closely as possible. In the end, this ensures an increased contrast range, just as required for an HDR production.

### Conclusion

With the V6050, BenQ has brought a very special ultra-short distance projector to the market. The laser light source's high luminous efficiency and color fidelity make it a genuine alternative to the big TV. Unlike these, it can also score with authentic soundbar sound.



The lid slides back when switched on to reveal the laser. When switched off, or if curious pet or child's eyes get too close to the laser, the lid closes again



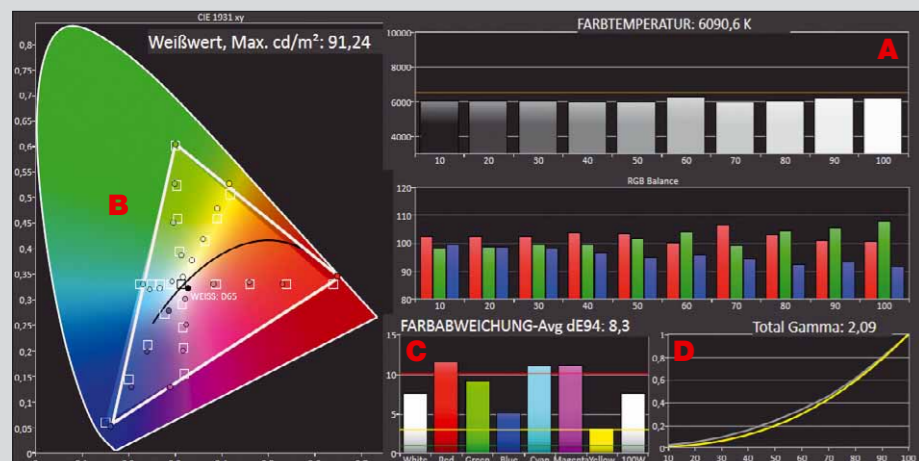
The four feet are designed as knurled screws so that the projector can be optimally adjusted to a horizontal position



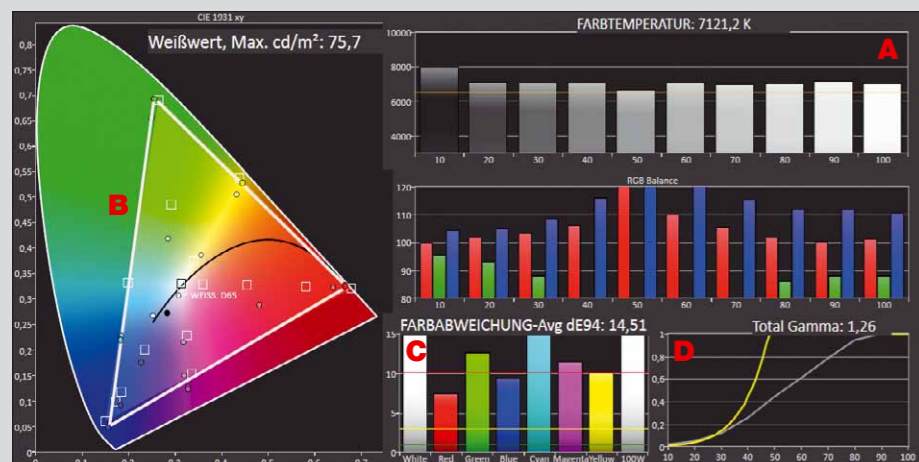
## HOME CINEMA WORLD Laboratory



The BenQ is delivered in „living room“ picture mode, the color temperature is set to „cool,“ and the laser is set to the bright, normal position. As expected, the color temperature is slightly above the desired 6,500 Kelvin, which is quite common in the living room **A**. The HDTV standard color space is mainly covered; the white value tends towards blue **B**. The color deviations are relatively high overall **C**. The gamma curve corresponds to a straight line, which speaks for a low definition in very bright and very dark parts of the picture **D**.



The BenQ has a picture mode with the descriptive name „Cinema REC.709“, which is also supposed to cover the standard color space REC.709. After an initial visual inspection, we set the laser to Eco mode and the color temperature to „warm.“ It is now 6,000 Kelvin across all brightness levels **A**. The HDTV standard color space is now almost perfectly covered; only magenta tends towards blue at 100% saturation; below that, everything is fine **B**. The color deviations are now much smaller **C**. The gamma value now reaches a satisfying 2.1 and follows the prescribed curvature **D** as far as possible.



If you feed the V6050 with an HDR signal, the corresponding picture mode „HDR10“ is automatically set. The gamma value is also selected automatically. We left the color temperature at „normal,“ and we can now turn on the „Large Color Space“ setting in the menu. By this, BenQ means the D65 P3 color space. The color temperature of just over 7,100 Kelvin is similar to the „living room“ setting **A**. The extended D65-P3 color space is completely covered, but cyan and magenta move towards blue with increasing saturation **B**. The color deviations have increased strongly again **C**. The gamma values follow the prescribed PQ curve **D** quite well.

Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral



## BenQ V6050

<b>Price</b>	<b>4.000 Euro</b>
Distribution	BenQ
Internet	www.benq.com

### • Measured values

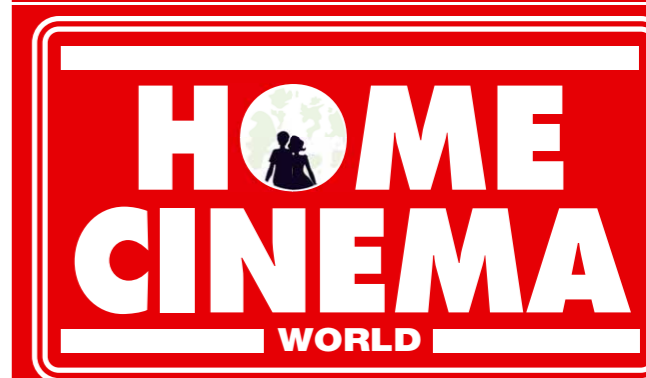
Lumen (according to manufacturer)	3000
Lumen (measured in Eco mode)	1600
Image brightness (at 6500 Kelvin) ...black/white	1.4 / 1600
ANSI contrast	748:1
Full-on / Full-off contrast	1143:1
Illumination (in %)	86
Operating noise (0.5 m/dB(A), in dB)	> 30
min. / max. distance (at 2 m image width, in m)	0.5 / 0.5
Projection ratio / zoom factor	0.25:1 / 1
Gamma (D65)	2.09
Dimensions W x H x D (in cm)	50 x 15.7 x 38.8
Weight (in kg)	10
Power consumption	
Off / Standby / Operation	< 0.3 W / 330 W (hrs.) / 220 W (Eco)
Lamp type / Lamp wattage (in watts)	Laser diode
Price Replacement lamp	does not apply
Lamp life (in hrs.) Standard / Eco	20,000
Cost per hr (in cents)	-

<b>• Image</b>	<b>60 %</b>	
Contrast	10 %	★★★★☆
Color reproduction	10 %	★★★★☆
Sharpness	10 %	★★★★☆
Geometry	10 %	★★★★☆
Noise	10 %	★★★★☆
Image steadiness	10 %	★★★★☆
<b>• Practice</b>	<b>15 %</b>	
Zoom factor	5 %	★★★★☆
Fan noise	5 %	★★★★☆
Operating costs	5 %	★★★★☆
<b>• Operation</b>	<b>15 %</b>	
Device	5 %	★★★★☆
Remote control	5 %	★★★★☆
Menus	5 %	★★★★☆
<b>• Equipment</b>	<b>5 %</b>	★★★★☆
<b>• Hardware quality</b>	<b>5 %</b>	★★★★☆

### • Features

Projection principle	DLP 0.47"
Native resolution	1920 x 1080 (3840 x 2160 with XPR2 technology)
3D method	Frame Packing (Full HD 3D), Top-and-Bottom Frame Sequential (3D Ready)
Connections:	
...Video / S-Video	- / -
...components / SCART	- / -
...VGA / RGB / DVI / HDMI	- / - / - / •
...audio / 12 volt trigger / RS-232C	• / - / •
...Full HD	•
Motorized zoom / focus	- / -
Rear pro / Ceiling pro	- / •
Keystone compensation	Vert.: +/-30°
Lens shift (manual/motorized)	- / -
Format switching	16:9 (native), switchable to 4:3
Remote control / illuminated	• / •
Signal compatibility	480i, 480p, 576i, 576p, 720p, 1080i, 1080p UHD
Specials	Integrated soundbar, HDMI with ARC 2.0

## Reference class



Germany 2/21

Price/performance: very good

- + excellent HDR performance
- + effortless installation



Ultra-short distance projector: Epson EH-LS300 in test

# Projector with Android TV

There are at least two reasons to consider the Epson EH-LS300 as a replacement for a TV. The Epson is designed as an ultra-short distance device and can therefore be placed close to the screen on the sideboard, and it is fully streaming capable thanks to the Android interface and integrated Wi-Fi. Conveniently, the built-in speakers can also be used as a soundbar.





## Image

Full HD HDR LCD ultra-short throw projector

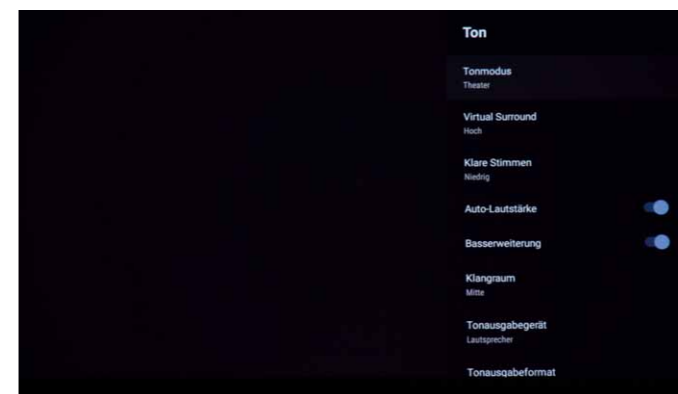
Like all ultra-short-throw projectors, the Epson can stand directly in front of the screen and still manage to project a huge image. With just over 50 centimeters between the mirror optics to the screen, you get a 90-inch image. With every inch of distance, you can further enlarge the image. However, unlike other projectors, including other ultra-short distance projectors, the Epson cannot be mounted under the ceiling. This reduces the installation flexibility but makes sense for the integrated soundbar; after all, you don't want to be exposed to sound predominantly from above.

## Expertise

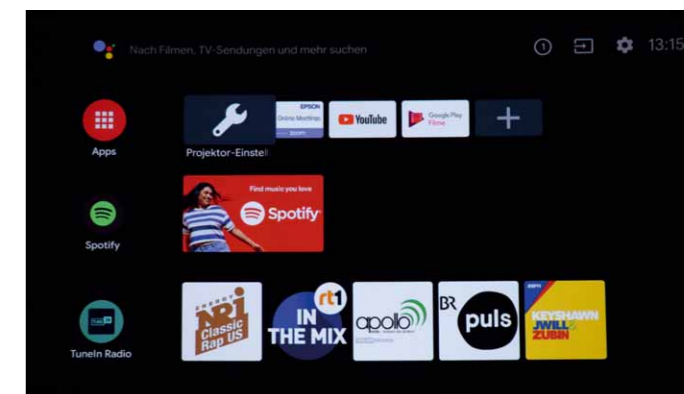
By the way, Epson relies on the expertise of Yamaha's sound specialists for the EH-LS300's sound department. A total of

three speakers work behind the front cover. One provides a decent bass range, and two full-range speakers radiate slightly to the sides and provide a fairly broad spatial sound experience. As if that wasn't enough, Yamaha is also responsible for the electronic processing – after all, they also have soundbars in their lineup. The sound image can be individually adjusted in the projector's audio menu, and even virtual surround sound can be realized in three gradations. Just in case, i.e., for connecting a separate soundbar or other equipment, the Epson also has a digital audio output.

Conversely, the projector can receive music from a smartphone via Bluetooth, for example. If they simply turn off the picture, you have a large, powerful Bluetooth speaker.



The EH-LS300 has extensive audio setting options



Together with the integrated Wi-Fi, the Android interface makes the projector smart



## Smart all-around thanks to Android TV

The Epson is a veritable streaming expert. In addition to the two HDMI jacks, a USB input on the back accepts an external storage device. The EH-LS300 has integrated Wi-Fi, which allows streaming from the network and the Internet. Epson has given the EH-LS300 an Android TV user interface for straightforward and convenient control. The connection to the PlayStore and thus to new apps is only a click away. The remote control is optimally adapted to the interface, and even Google Assistant can be activated with one button. The microphone for the voice control is also located in the remote. The menu for the projector-specific settings is only a click away and allows quite extensive settings of the picture quality.



Also visible; two proximity sensors, which switch the laser off as soon as sensitive eyes approach

In addition to the two HDMI interfaces, a USB input and an optical audio output are also available in the connection panel, and the Epson also has integrated Wi-Fi





## Image

Full HD HDR LCD ultra-short throw projector



*Behind the front cover, potent speakers provide the perfect sound to the image. Yamaha has optimized the audio*

the extended D65 P3 color space very well but also has a gamma that follows the required PQ curve.

In short, except for the limitation to FullHD resolution, the EH-LS300 manages quite excellent HDR performance. To conclude the test, we treat ourselves to a round of Aquaman to immerse ourselves in the turquoise splendor of underwater shots. Together with the great sound, this gives us a comprehensive cinema experience.

### Conclusion

With the EH-LS300, Epson has an ultra-short-throw projector in its lineup that, apart from the resolution, delivers a tremendous HDR performance. The extensive streaming capabilities and the good integrated sound perfectly round off the cinema experience.



*The remote control grants quick access to all functions*

### Image Quality

The Epson EH-LS300 uses LCD panels with FullHD resolution. Unlike some other Epson projectors, they are not interpolated to 4K by the in-house 4K enhancement technology. Together with the quite expensive optics necessary for that, it would exceed the price range. Therefore, only native FullHD resolution is available in this model.

The EH-LS300 is shipped in „Vivid“ color mode. Since the laser is set to 80 percent brightness by default, the picture is very bright, but there is still room for improvement. In this setting, the user must tolerate a color temperature of over 8000 Kelvin, which gives the picture a visible blue cast. Interestingly, the measured color space extends far beyond the HDTV standard color space, but more on that later.

Most Epson projectors achieve the best color reproduction in „Natural“ color mode, which is also the case with the LS300. After we turned down the laser brightness to 50 percent and set the color temperature to position eight, the image already looks properly cinema-like. With the Calman measuring system, we can now attest the projector has a color temperature of 6500 Kelvin. The HDTV standard color space is covered almost perfectly.



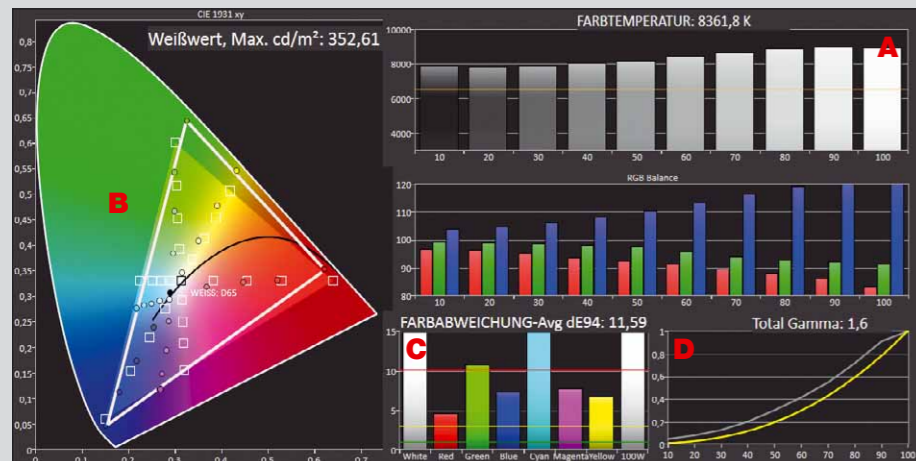
*The focus control is located on the side of the device and is usually hidden behind a flap. Above it is the control panel with the Bluetooth pairing button*

The first measurement made us curious; we fed the Epson with UHD HDR material, rendered without delay. Although it downscales the resolution to FullHD, it impresses with a very crisp, dynamic picture in the color mode „Vivid.“ A few fine-tuning adjustments later, including setting the gamma correction to the new value „Scene Gamma 10“ in the menu, we can certify that the projector not only covers

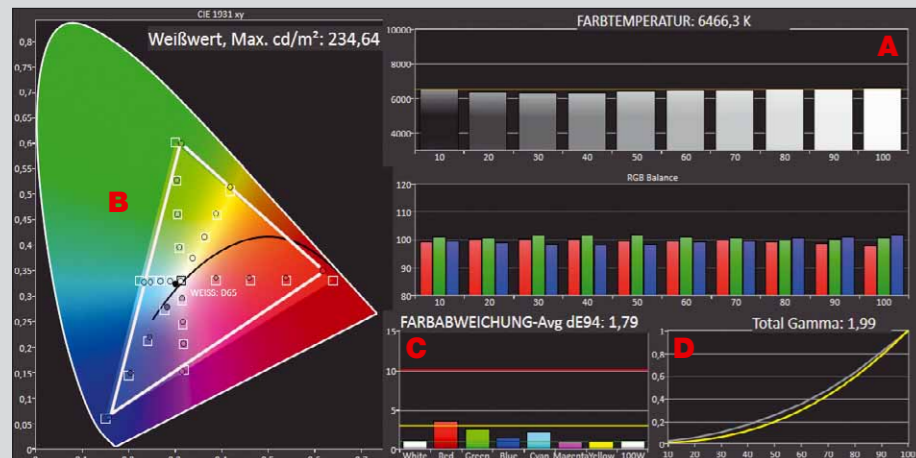




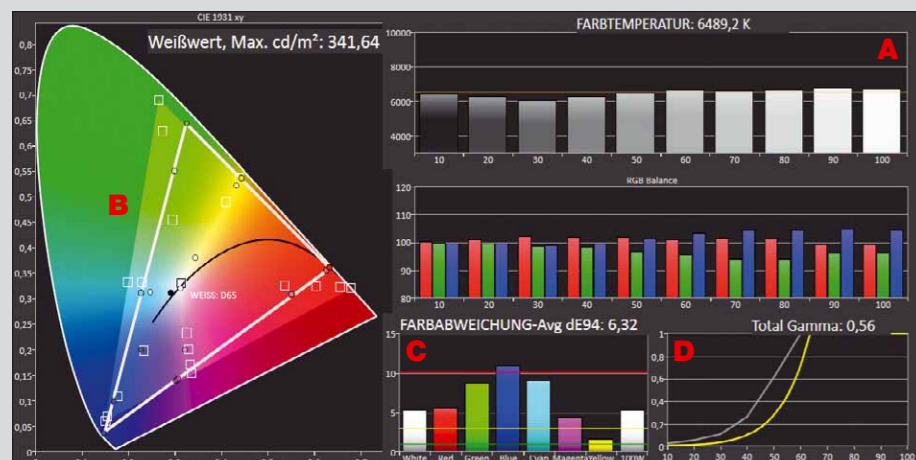
## HOME CINEMA WORLD Laboratory



The EH-LS300 is in „Vivid“ color mode on delivery, the laser brightness is set to 80 percent, and the color temperature is set to level 12. The color temperature is very cool at 8300 Kelvin, so the picture is already quite bluish **A**. The HDTV standard color space is already overcovered, though **B**. As expected, the color deviations are relatively high **C**. The gamma curve is optimized for a bright environment but does not meet the standard **D**.



In just a few steps, the Epson is set to the „Natural“ color mode, and the laser brightness is lowered to 50%. We set the color temperature by eye to 8, which now measures the desired 6500 Kelvin **A** almost precisely. The color space is now limited to the HDTV standard color space BT.709 **B**. The color deviations turn out to be record-breakingly low **C**. The gamma value of just under two is not within the target. Still, it follows the specified curve shape **D**. The color temperature is now almost exactly the desired 6500 Kelvin.



We now feed the Epson with a 4K HDR signal, set it back to the color mode „Vivid,“ the laser brightness to 80%, and the gamma correction to the value „Scene Gamma 10,“ which has just appeared in the menu. We leave the color temperature at 8. This still measures the desired 6500 Kelvin **A**. The color space now covers a large part of the extended D65 P3 **B**. The color deviations are in the mid-single digits, perfectly fine for the extended color space **C**. The gamma value now follows the required PQ curve very closely **D**.

Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral



## Epson EH-LS300

<b>Price</b>	<b>2.900 Euro</b>
Distribution	Epson
Internet	www.epson.com

### • Measured values

Lumen (according to manufacturer)	3.600 (1.800 Eco)
Lumen (measured in Eco mode)	2288
Image brightness (at 6500 Kelvin) ...black/white	6.35 / 2288
ANSI contrast	360:1
Full-on / Full-off contrast	7667:1
Illumination (in %)	88
Operating noise (0.5 m/dB(A), in dB)	> 30
min. / max. distance (at 2 m image width, in m)	0.52 / 0.7
Projection ratio / zoom factor	0.26 - 0.35:1 / 1.35 (digital)
Gamma (D65)	2
Dimensions W x H x D (in cm)	46.7 x 15 x 40
Weight (in kg)	7.2
Power consumption	
Off / Standby / Operation	< 0.3 W / 180 W (hrs.) / 100 W (Eco)
Lamp type / Lamp wattage (in watts)	Laser diode
Price Replacement lamp	does not apply
Lamp life (in hrs.) Standard / Eco	20,000
Cost per hr (in cents)	-

<b>• Image</b>	<b>60 %</b>	
Contrast	10 %	★★★★☆
Color reproduction	10 %	★★★★☆
Sharpness	10 %	★★★★☆
Geometry	10 %	★★★★☆
Noise	10 %	★★★★☆
Image steadiness	10 %	★★★★☆
<b>• Practice</b>	<b>15 %</b>	
Zoom factor	5 %	★★★★☆
Fan noise	5 %	★★★★☆
Operating costs	5 %	★★★★☆
<b>• Operation</b>	<b>15 %</b>	
Device	5 %	★★★★☆
Remote control	5 %	★★★★☆
Menus	5 %	★★★★☆
<b>• Equipment</b>	<b>5 %</b>	★★★★☆
<b>• Hardware quality</b>	<b>5 %</b>	★★★★☆

### • Features

Projection principle	3 x 0.61" LCD with C2 Fine
Native resolution	1920 x 1080
Connections:	
...Video / S-Video	- / -
...components / SCART	- / -
...VGA / RGB / DVI / HDMI	- / - / - / •
...audio / 12 volt trigger / RS-232C	• / - / -
...Full HD	•
Motorized zoom / focus	- / -
Rear pro / Ceiling pro	- / -
Keystone compensation	Point & Arc correction
Lens shift (manual/motorized)	- / -
Format switching	16:9 (native), switchable to 4:3
Remote control / illuminated	• / -
Signal compatibility	Pal, SECAM, NTSC, HDTV 720p, 1080i, 1080p, EDTV 480p, 576p
Specials	integrated 2.1 speaker system

# Top class

★★★★☆

# HOME CINEMA

WORLD

Germany 2/21

Price/performance: good – very good

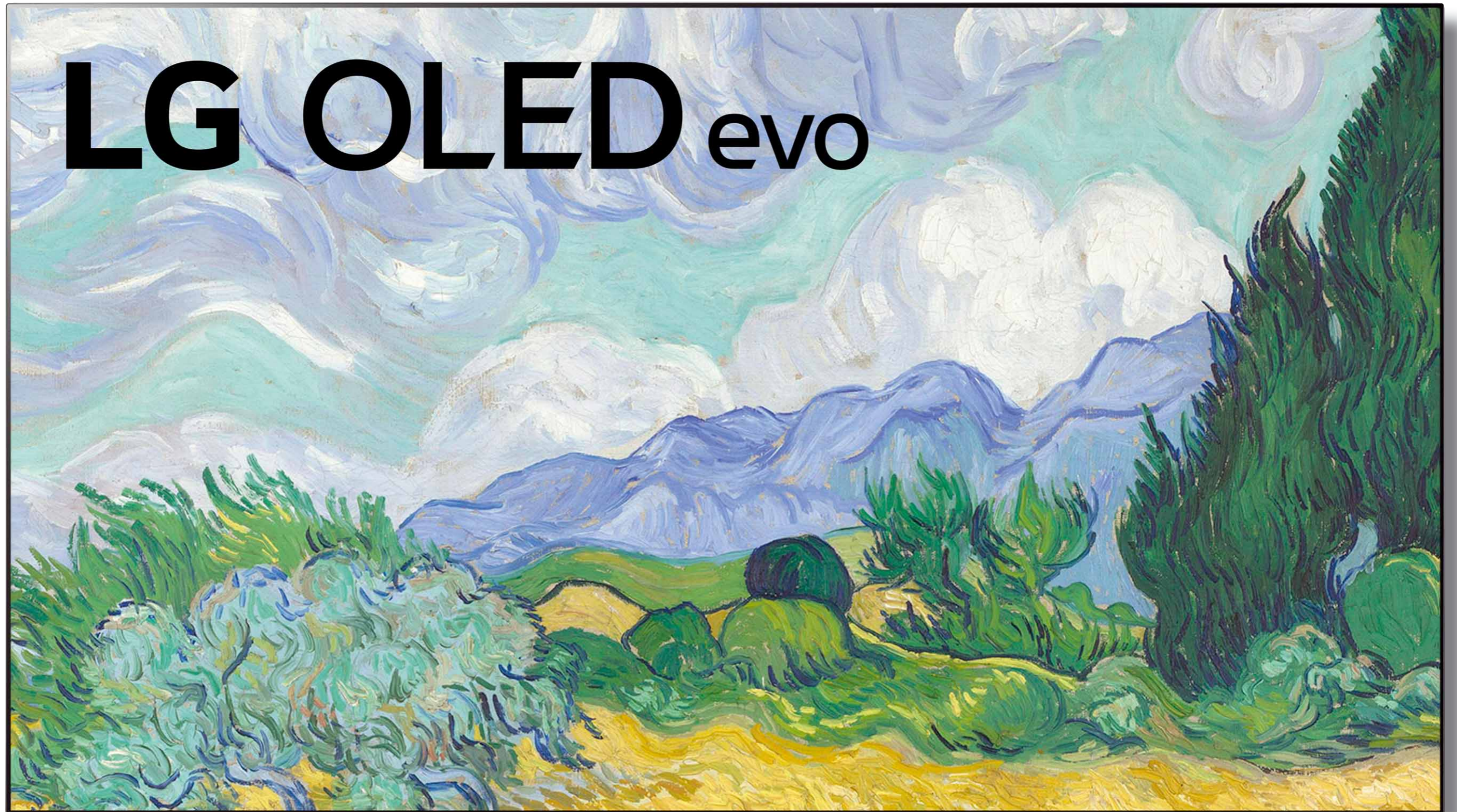
- + very good color reproduction
- + good HDR conversion
- + excellent sound



The new LG Flagship: OLED 65G1

# **OLED Evolution**

LG has further developed its in-house OLED displays for its 2021 top models. The latest generation is called „OLED evo.“ Together with the 4th generation a9 AI processor, it promises even better image quality.





LG uses new illumination elements in the OLED evo panels. They each offer a more precise, narrower color spectrum and thus add up more precisely to the respective color to be displayed. They are also slightly more efficient than their predecessors and allow for a slightly increased maximum brightness. In combination with the α9 Gen4 AI image processor, this once again improves the image quality compared to the predecessor – even if one would hardly have thought it possible. The AI image processing has been further optimized and extended by the recognition of individual scenes. And for an even better sound, LG has improved the 5.1.2 up-mixing and introduced an automatic volume adjustment, especially for voices.

### webOS 6.0

LG has also revised the smart TV operating system webOS. The various streaming contents are now displayed more clearly and are easier to access. LG has added hotkeys for Netflix, Prime Video, Disney+, and LG Channels to the Magic Remote. A „Sports Alert“ now provides games, results, and other information about the favorite team. In addition, LG’s developers have revised and partly reorganized the individual menus, which makes operation and settings easier.

### Image quality

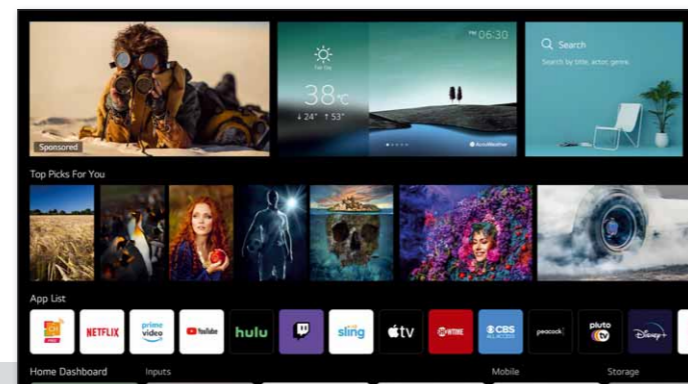
Since the predecessor OLED65GX is still one of the TVs with the best image quality on the market, our expectations for the G1 were extremely high. And we were not disappointed. LG does not promise too much in terms of color fidelity: The measurements with Calman certify that the G1 already has perfectly calibrated colors „out of the box.“

There is nothing to complain about in the measurements of the OLED evo panel, and the LG does not show any weaknesses in the practical test with human eyes either. The video performance is simply flawless. Its pictures are not only objectively good but also subjectively captivating.

### Features

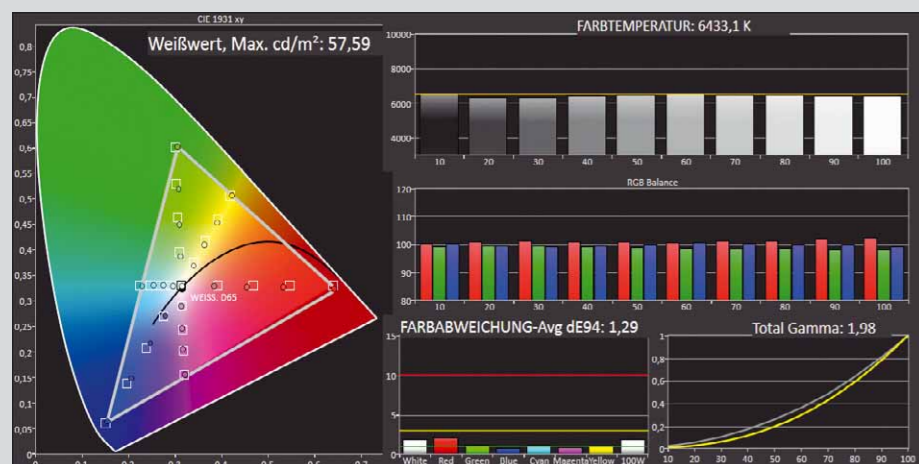
The G1 comes in a gallery design, i.e., it is ultra-flat (just under 2 cm) and can be mounted flush to the wall with the included bracket. By the way, feet are not included in the scope of delivery. If you want to place the OLED65G1 on a low board or similar, they are available separately. Otherwise, the hardware and software features are complete, as befits a top model. HDR, including Dolby Vision IQ, is supported, as is Filmmaker Mode. Double tuners, 4x HDMI 2.1, and 3x USB 2.0 ports offer the complete entertainment program.

LG also thinks about gamers and gives the G1 the „Game Optimizer,“ which offers Auto Low Latency Mode (ALLM), Variable Refresh Rate (VRR), HGIG, Nvidia G-Sync, and AMD FreeSync Premium for smooth gaming experiences.



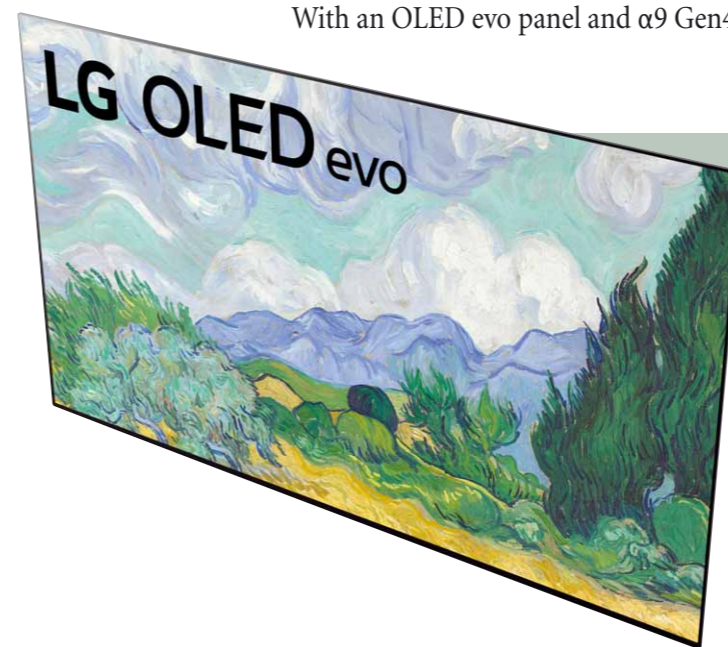
With the redesigned home screen, webOS 6.0 offers faster access to apps and a more straightforward content search function with even more personalized recommendations

## HOME CINEMA WORLD Laboratory



Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral

Measurements with CalMAN software from Portrait Displays: The OLED65G1’s color fidelity is exemplary. Hardly any deviations from the ideal are measurable in the entire spectrum, even with sensitive measuring devices – and thus not visible to the naked eye. Perfect!



With an OLED evo panel and α9 Gen4 AI processor, LG OLED 65 G1 offers superior image quality that no other TV on the market currently surpasses.

### Conclusion

## LG OLED65G19LA

### • Features

Screen diagonal in inch / cm / Resolution	65 / 164 / 3.840 x 2.160
Tuner: DVB-T2 / -C / -S/S2	2 / 2 / 2
CI+ interface	•
HDR: HDR10 / HDR10+ / HLG / Dolby	• / - / • / •
HDMI / Scart / Cinch-AV	4 / - / -
HDMI: CEC / ARC	• / •
Audio-out: analog / opt. / coax / ARC	- / • / - / •
Headphone jack	•
Bluetooth	•
Cardreader / LAN / WLAN	- / • / •
USB / player / recorder	3 / • / •
Smart TV system	Web-OS 6.0
White balance/color calibration	• / •
Room light sensor	•
Voice / motion control	• / •
Other	Filmmaker Mode

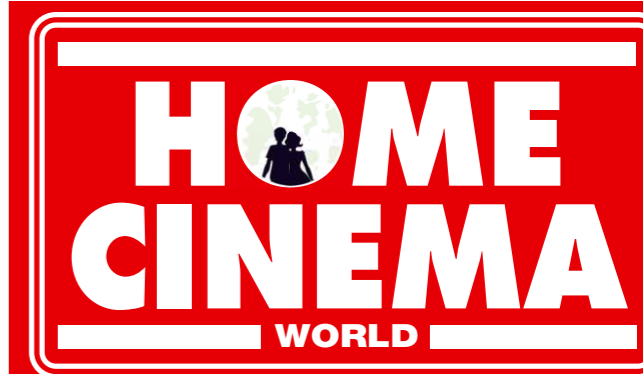
<b>Price</b>	<b>3.500 Euro</b>
Distribution	LG
Internet	www.lg.com

### • Measured values

Dimensions (W x H x D, in mm)	1446 x 830 x 20
Weight in kg	30
Black level (cd/m <sup>2</sup> )	< 0,0001
Contrast	> 500.000:1
Color temperature in Kelvin (movie mode)	6433
Power consumption operation/standby in W	125 / 0,3
EU-Energielabel	G

<b>• Image</b>	<b>40 %</b>	
Picture illumination	4 %	★★★★★
Color fidelity (HDMI)	8 %	★★★★★
Contrast range (HDMI)	8 %	★★★★★
Moving picture (HDMI)	7 %	★★★★★
Overall impression	8 %	★★★★★
Picture DVB tuner	5 %	★★★★★
<b>• Sound</b>	<b>5 %</b>	★★★★☆
<b>• Features</b>	<b>30 %</b>	
Hardware	15 %	★★★★★
Software	15 %	★★★★★
<b>• Hardware quality</b>	<b>5 %</b>	★★★★★
<b>• Usability</b>	<b>20 %</b>	
Remote control	5 %	★★★★☆
Recording	5 %	★★★★☆
Smart TV menu	5 %	★★★★☆
Television menu	5 %	★★★★☆

## Reference class



Germany 2/21

Price/performance: very good

- + outstanding image quality
- + flush wall mounting
- + color fidelity



Reference OLEDTV Sony XR-65A90J

# Sony's Best OLED TV

With the OLEDTV Bravia XR A90J, Sony introduces its new top model. Cognitive intelligence and innovative streaming services are making a stir.





All major TV manufacturers have been using artificial intelligence AI for image optimization in their top models for some time now. High-performance image processors are trained with colossal data banks to recognize individual image elements such as faces, backgrounds, etc., and display them optimally. Sony is now going one step further with the „Cognitive Processor XR“ and mimicking human perception.

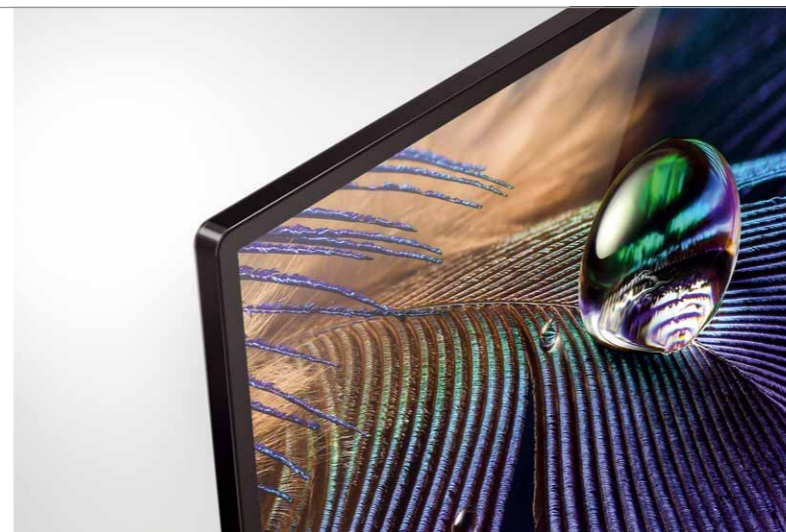
### Cognitive intelligence

When we see and hear, we perceive a multitude of impressions in parallel. Our brain can filter in real-time and distinguish between what is essential and what is not. In this way, we can follow movements in a targeted manner or concentrate fully on our conversation partner. Similarly, the Bravia XR analyzes many individual image elements in parallel and recognizes what the focus is in the respective scene. All components are combined in context so that the overall image is as natural and harmonious as possible. In addition, the XR processor recognizes the sound or noise

source in the picture and adjusts the sound reproduction accordingly thanks to „Acoustic Surface Audio+.“ 3D Surround Upscaling also ensures that a three-dimensional soundscape is created even with content not equipped with Dolby Atmos sound.

### Bravia Core

In addition to the new type of picture processing, Sony is also launching its brand-new streaming service „Bravia Core“ with the XR series. This is exclusively available on the new XR TVs. It offers a collection of free video-on-demand content that can be streamed for 24 months on the A90J. In addition, ten credits for current movies are included with the purchase of the TV. What makes Bravia Core special is the quality it offers. „Pure Stream“ content can be streamed in 4K HDR with up to 80 Mbps, which equals the quality of an Ultra HD Blu-ray. This puts Sony's Bravia Core Pure Stream at the top of all available TV streaming services in terms of quality. The technical prerequisite for this is, of course, fast Internet access with at least 115 Mbps.



Extremely sharp pictures with high contrast



The stands can be mounted in two ways

In addition, the Core movie database offers numerous contents in the IMAX Enhanced standard. This means that the Bravia Core streaming service, which was developed with Sony Pictures, is currently the benchmark in terms of image quality.

Ultra thin design







*If the feet are mounted horizontally, the Sony stands flush on the floor*

## Google TV

As in the past, Sony continues to rely on Android TV for the operating system of the 2021 models. What is new is the option to activate Google TV.

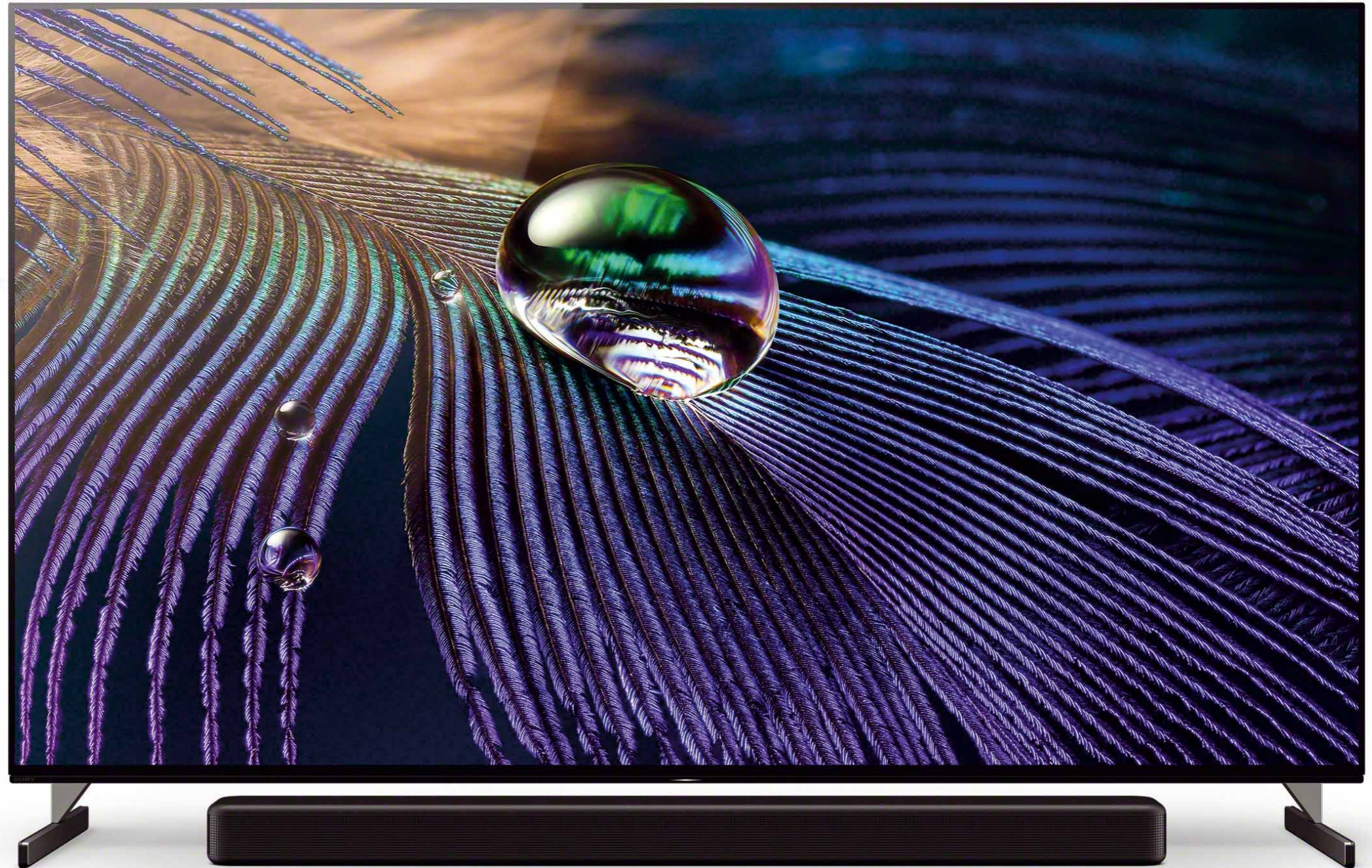
Google TV combines all leading streaming services such as Amazon Prime, Disney+, and Netflix, as well as live TV, in a single app, so users don't have to switch back and forth between the individual offerings but can find their favorites at a glance and search the entire offering for specific movies or series. Thanks to personalized suggestions, users can quickly discover new things, bookmark shows and films in a single watchlist, and keep track of everything. Moreover, the watchlist can be supplemented with Google search via smartphone or laptop. Bringing together the various streaming providers and live TV in one app thus makes it easier to use and select the program of your choice.

## Features

In addition to the new highlights mentioned, the A90J comes with a complete set of features, just as you would expect in the reference class. And Sony has also thought of gamers: The HDMI inputs support 4K120, HDCP 2.3, eARC, VRR, and ALLM. Thus, the TV also gets along with gaming consoles of the latest generation and enables responsive gaming with impressive, smooth graphics with variable refresh rate (VRR) and auto-low latency mode (ALLM).

## Picture and sound quality

The XR A90J is currently available in 55- and 65-inch formats. An 83-inch model will be added in the year. At



*When the feet are mounted vertically, there is enough space for a soundbar*

the market launch, we had the 164 cm variant, the Sony XR-65A90J, in our TV test room. The technical analysis with a signal generator, optical sensor, and Calman software certifies the flawless performance of the Sony OLED panel. Contrast values that exceed the sensor's sensitivity limits even in a completely darkened room, high color fidelity, and the complete color space characterize the A90J. This is outstanding, but it can be expected from OLED panels in this price range.

The subjective picture and sound impression in real movie scenes is decisive. And the Sony does not allow itself any weaknesses here either. The cognitive algorithm with the various XR image enhancements simply does an excellent job. Admittedly, I was a bit worried before the test that the whole intelligent calculation might be a bit too much and that the movies and scenes would no longer look adequate. However, the A90J quickly dispelled these concerns. The presentation is fantastic across the board - no mistakes and no excessive detail or other exaggerations. The glorious

visual impression is supported by the excellent sound quality directly from the display. It's easy to completely lose yourself in the movie and forget about all the technology that makes this immersive experience possible.

## Conclusion

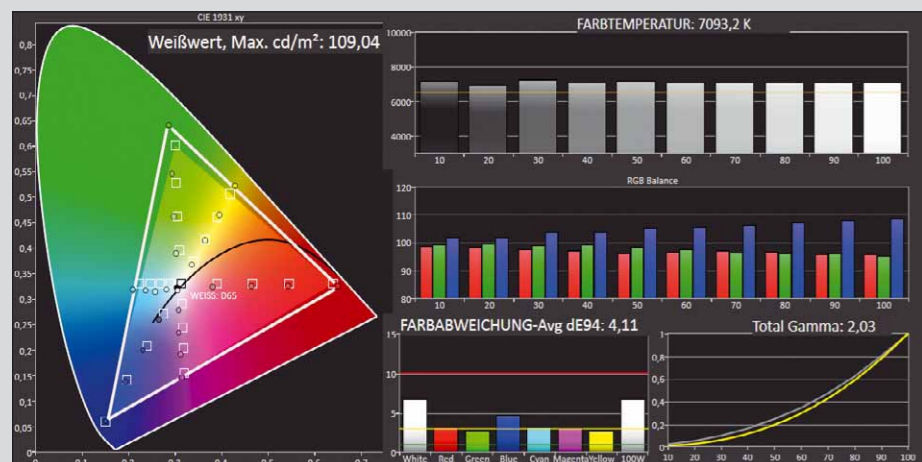
The new Bravia XR A90J from Sony offers outstanding image quality, good sound, and the best streaming options. A major success that is unquestionably one of the very best TVs around.



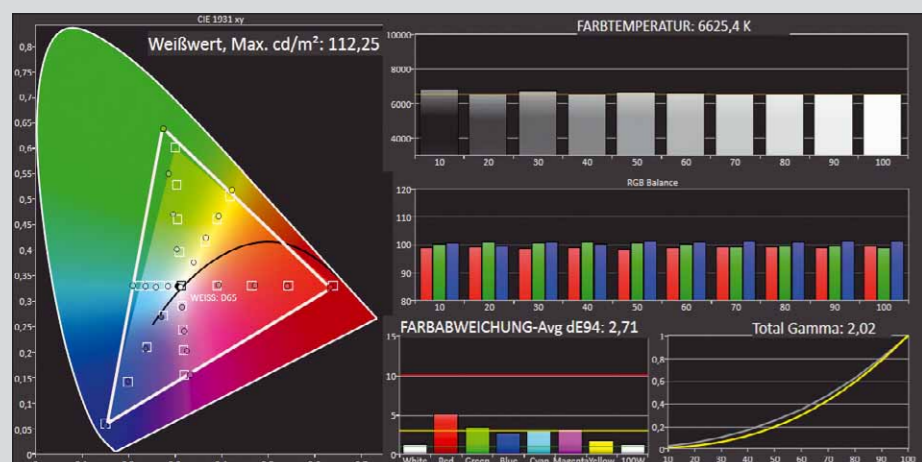
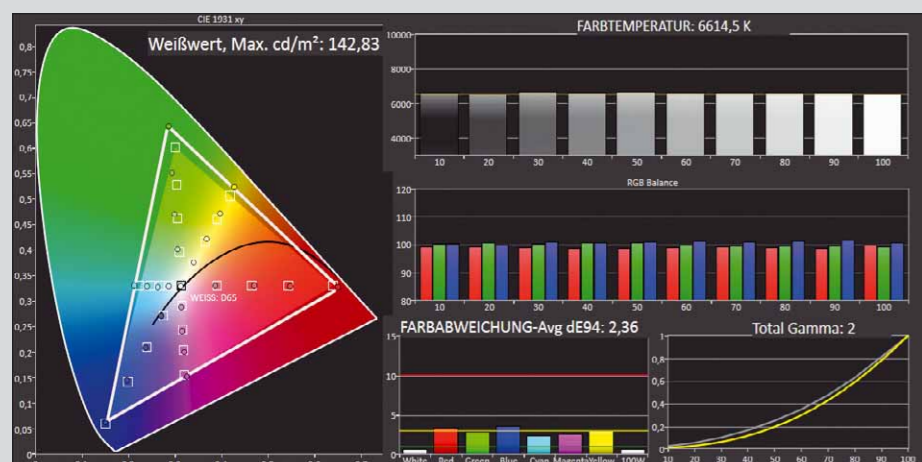


# Sony XR-65A90J

## HOME CINEMA WORLD Laboratory



Measurements with CalMAN software from Portrait Displays: In film mode, the color temperature ex-works is just under 7100 K. This is above the ideal of 6500 K but is acceptable in rooms that are not entirely dark. Even a slight blue correction (-5, second diagram) brings the color temperature down to 6600 K. The color fidelity and gamma curve do not give a reason for criticism. This also applies to the IMAX Enhanced mode (third diagram).



Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral

<b>Price</b>	<b>3.500 Euro</b>
Distribution	Sony
Internet	www.sony.com

• **Measured values**

Dimensions with base (W x H x D, in mm)	1.502 x 834 x 317
Weight in kg	23
Black level (cd/m²)	0,0001
Contrast	> 500.000:1
Color temperature in Kelvin (movie mode)	6625
Power consumption operation/standby in W	140 / 0
EU-Energielabel	G

• **Image 40 %**

Picture illumination	4 %	★★★★★
Color fidelity (HDMI)	8 %	★★★★☆
Contrast range (HDMI)	8 %	★★★★★
Moving picture (HDMI)	7 %	★★★★★
Overall impression	8 %	★★★★★
Picture DVB tuner	5 %	★★★★☆

• **Sound 5 %**

Sound	5 %	★★★★★
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• **Features 30 %**

Hardware	15 %	★★★★★
Software	15 %	★★★★★

• **Hardware quality 5 %**

Hardware quality	5 %	★★★★☆
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• **Usability 20 %**

Remote control	5 %	★★★★☆
Recording	5 %	★★★★☆
Smart TV menu	5 %	★★★★☆
Television menu	5 %	★★★★☆

• **Features**

Screen diagonal in inch / cm / Resolution	65 / 164 / 3.840 x 2.160
Tuner: DVB-T2 / -C / -S/S2	2 / 2 / 2
CI+ interface	• / • / •
HDR: HDR10 / HDR10+ / HLG / Dolby	• / - / • / •
HDMI / Scart / Cinch-AV	4 / - / -
HDMI: CEC / ARC	• / •
Audio-out: analog / opt. / coax / ARC	- / • / - / •
Headphone jack	•
Bluetooth	•
Cardreader / LAN / WLAN	- / • / •
USB / player / recorder	3 / • / •
Smart TV system	Android / Google TV
White balance/color calibration	• / •
Room light sensor	•
Voice / motion control	• / -
Other	Miscellaneous

**Reference class**

★★★★★

HOME  
CINEMA

WORLD

Germany 2/21

Price/performance: very good

- + Bravia Core
- + Google TV
- + Excellent Image Quality



TCL 65C825 reviewed

# ***QLED TV with Mini LED Technology***

In its new LED flagship, TCL combines Quantum Dots with a backlight of mini LEDs.





In contrast to OLED panels, the imaging LCD layer of LED-LCD TVs is not self-luminous but requires LED backlighting. The backlight is either placed at the edge (Edge-LED) or all over the panel (Direct LED). The latter distribution enables local dimming, i.e., selective brightness control in separate areas. Mini-LED technology uses many tiny LEDs, which results in more even illumination, greater brightness, higher efficiency, and significantly more dimming zones than conventional Direct LED TVs. The TCL 65C825 offers a whopping 160 zones in which the power of the mini LEDs is controlled independently. Thus, it creates

enormous contrast values. In addition, TCL uses Quantum Dots: tiny crystals that improve color reproduction.

### All HDR formats

The new C82 series now supports all HDR formats, including HDR10+ and Dolby Vision IQ. Of course, TCL also relies on Deep Learning for its image processing algorithms, which means that the software is trained with neural networks based on vast amounts of data. In simple terms, this means that TCL relies on artificial intelligence for video and audio processing.

### Android TV

TCL relies on Android TV as the operating system. This provides access to all streaming services and other apps. From fall on, the TVs will also support Google TV via an update and thus enable even more convenient and intuitive access to the preferred content. The TV includes the Magic Camera, which is magnetically attached to the top of the TV. This can be used, for example, to make video calls and other calls directly via the TV using Google Duo. Gesture control is also possible.

### Sound

The C82 comes with an Onkyo soundbar, and a subwoofer in the back provides bass support. The soundbar supports

Dolby Atmos and can upconvert standard audio signals to 5.1.2.

### HDMI 2.1

As befits its status, the TCL offers four HDMI interfaces. The HDMI 2.1 standard enables faster frame rates, including 4K at 100/120 frames per second. HDMI 2.1 ensures compatibility with the latest gaming consoles and enables features like ALLM (Auto Low Latency Mode) and VRR (Variable Refresh Rate). Thus, the panel responds ultra-fast and allows for smooth gaming. For receiving live TV, the TCL offers single tuners for cable, satellite, and antenna.





## Image

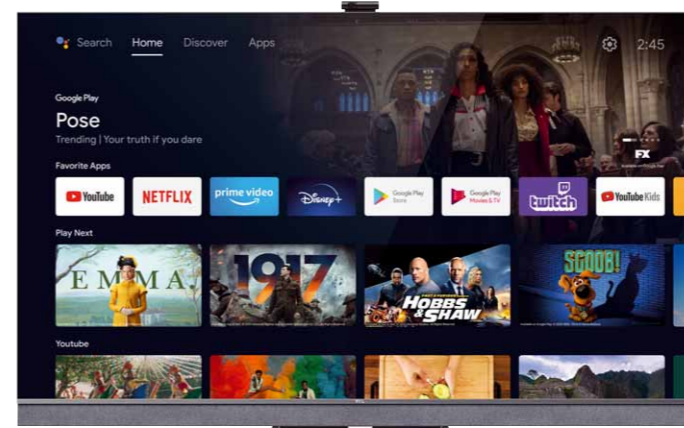
The TCL 65C825's image quality is awe-inspiring. The mini LED panel offers all the advantages of an LED TV. The colors shine brilliantly, and the maximum brightness is entirely sufficient to easily assert itself against the ambient light, even in bright rooms. In addition, the C82 also seriously competes with OLED TVs in their parade disciplines. It offers enormous contrast values that do not quite reach the perfect black of an OLED but are entirely sufficient in practice. Thus, it does not have any problems extracting all details even in challenging scenes, where parts of the picture tend to dull and others to over-brighten. Especially with HDR material, it offers top-level movie pleasure.



The subwoofer is located in the back of the TV

## Conclusion

TCL's recommended retail price in Germany is 3,000 Euros. The actual prices are considerably lower, mostly below 1,800 Euros. Considering this and also in absolute terms, the TCL 65C825 delivers an excellent performance. The Image Quality is exquisite and comes very close to the much more expensive reference-class TVs.



<b>Price</b>	<b>3.000 Euro</b>
Distribution	TCL
Internet	www.tcl.com

### Measured values

Dimensions with base (W x H x D, in mm)	1.446 x 905 x 290
Weight in kg	27,2
Black level (cd/m <sup>2</sup> )	0,004
Contrast	25.000:1
Color temperature in Kelvin (movie mode)	6522
Power consumption operation/standby in W	110 / 0
EU-Energielabel	G

### Image

<b>Image</b>	<b>40 %</b>	
Picture illumination	4 %	★★★★★
Color fidelity (HDMI)	8 %	★★★★☆
Contrast range (HDMI)	8 %	★★★★★
Moving picture (HDMI)	7 %	★★★★★
Overall impression	8 %	★★★★★
Picture DVB tuner	5 %	★★★★☆

### Sound

<b>Sound</b>	<b>5 %</b>	★★★★★
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### Features

<b>Features</b>	<b>30 %</b>	
Hardware	15 %	★★★★☆
Software	15 %	★★★★★

### Build quality

<b>Build quality</b>	<b>5 %</b>	★★★★☆
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### Operation

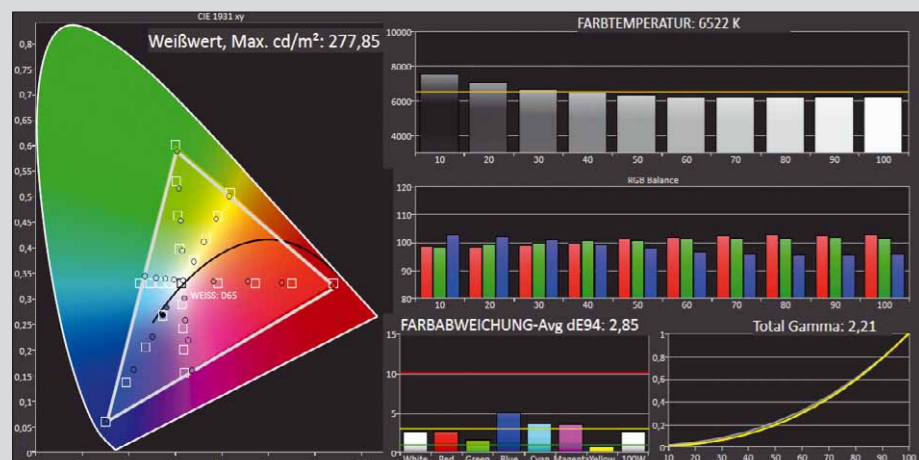
<b>Operation</b>	<b>20 %</b>	
Remote control	5 %	★★★★☆
Recording	5 %	★★★★☆
Smart TV menu	5 %	★★★★☆
Television menu	5 %	★★★★☆

# TCL 65C825

### Features

Screen diagonal in inch / cm / Resolution	65 / 164 / 3.840 x 2.160
Tuner: DVB-T2 / -C / -S/S2	• / • / •
CI+ interface	•
HDR: HDR10 / HDR10+ / HLG / Dolby	• / • / • / •
HDMI / Scart / Cinch-AV	4 / - / 1
HDMI: CEC / ARC	• / •
Audio-out: analog / opt. / coax / ARC	- / • / - / •
Headphone jack	•
Bluetooth	•
Cardreader / LAN / WLAN	- / • / •
USB / player / recorder	• / • / -
Smart TV system	Android
White balance/color calibration	• / •
Room light sensor	•
Voice / motion control	• / •
Other	Local dimming

## HOME CINEMA WORLD Laboratory



Measurement with CalMAN software from Portrait Displays: The color deviations are consistently below the critical value of 5 for deltaE, mostly even below 3. Thus, the C82 masters not only a brilliant but also a natural color reproduction.

Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral

# Top class

★★★★★

# HOME CINEMA

WORLD

Germany 2/21

Price/performance: very good

- + Mini LED
- + Dolby Visio IQ
- + Onkyo sound system



SB-1000 Pro, PB-1000 Pro, and 3000 Micro from SVS – from inexpensive to noble

# ***Three subwoofers of the 1000 Pro and 3000 series from subwoofer specialist SVS***





## Sound

Active subwoofer

The subwoofers of the American specialist SVS are known for bringing abysmally deep bass to the cinema at an acceptable price. After testing the sophisticated woofers of the 3000 and 2000 series, SVS now delivers supplies in the affordable range. In addition, the living room-friendly 3000 Micro is a new concept in the lineup.

SVS has an orderly approach to the individual product lines. The reference models of the Ultra series rank at the top, followed by the regular 4000, 3000, 2000, and 1000 series, which cover the price range from 2,500 to 600 Euros.

### 1000-Pro-Serie

Our new 1000 Pros represent the entry-level range at SVS. As usual with SVS, there is a choice of a closed model SB-1000 Pro and a bass reflex model PB-1000 Pro. The standard finish is foil ash, but the smaller closed SB-1000 Pro is also available in high-gloss lacquer for an additional 100 Euros. It has turned out really small for a 12-inch

subwoofer. The chassis takes up virtually the entire front, and the cabinet is built almost as small as possible around it so that the cube only measures about 33 centimeters side length. The PB-1000 Pro is more of a grown-up subwoofer. However, with a height of just under 47 centimeters, it's not excessively large either. Beneath the 12 inch driver, it proudly displays two generous reflex tubes, which, for super low tuning, go under the enclosure lid with a 90° bend. The cabinets are neatly built and far better than the „entry level“ found elsewhere. We see solid MDF panels and internal bracing in the cabinets.



*The 1000 Pro series comes in well-made MDF cabinets and foiling in black ash*



*The 1000-Pro series uses solidly made 12-inch drivers with polypropylene cones*

Whether SB or PB: Both have the driver and the electronics in common. The 12-inch woofer chassis is a sturdy model equipped with a filled plastic cone and a metal basket. Of course, you can't expect high-end or expensive high-tech materials for the price, but the SVS driver is not poorly made. The drive with a 1.5-inch coil and ferrite system can also be seen; with over 13 millimeters of linear travel, the woofer performs very well. The electronics are divided into signal processing and power amplification. According to the manufacturer, the latter produces 325 watts, which is in the upper range of its class, and a good 300 watts is enough to drive a lightweight 12-inch woofer. Fascinating is the signal processing, which is entirely digital. Quite outstanding: This unit is identical to the larger 2000 and 3000 sub-

woofers; nothing has been cut down here. The difference between the series lies primarily in the amplifier power. Accordingly, the equipment is more than respectable in this class. There are analog high-level and RCA inputs, and the outputs are also doubled. Pre-filtered LFE signals can be fed to RCA just as well as a „raw“ mono because the SVS can also adjust everything independently. This is the merit of the signal processor from Analog Devices, which naturally has an easy time processing the „only“ subwoofer signal. On the device itself, low-pass, level, and phase inversion can be controlled with a fancy LED chain and plus/minus buttons. More advanced settings can be made in the app, but more about that later.



### 3000 Micro

Before that, we come to our third test candidate, the 3000 Micro, which is by far the smartest and smallest of the trio. Unfortunately, it is also the most expensive, but there is a reason for that. According to its name, it is part of the 3000 series, and in terms of price, it is on par with the 2000 models. The 3000 Micro sets up its own new series because it differs entirely from the 2000 and 3000 series regarding technology and approach. While the regular SB and PB woofers embody the classic subwoofer concept, with plenty of diaphragm area thanks to 12-inch drivers and adequate volume, the 3000 Micro wants to be different. As the name suggests, it is all about the smallest possible size; the Micro wants to score with living room friendliness and design. The quality of workmanship is clearly on a very high level; the almost cubic housing is wrapped in glossy piano lacquer, and sturdy and shapely metal grilles protect the sides. And with an edge length of around 28 centimeters, the little cube is significantly smaller than the SB-1000 Pro.

But being small and pretty is not enough. All this should, of course, take place without sacrificing performance – after all, it carries the SVS badge. The performance is provided by a powerful 800-watt-power amplifier, which stems directly from the 3000 series. However, it also has to drive two woofers because the 3000 Micro does not work with a passive cone but is equipped with two powered eight-inch drivers. And they pack a punch: real heavy-duty drivers that may be small in diameter but are very generous in their equipment. Behind the grilles sit highly stable, one-piece aluminum diaphragms. Their bowl shape makes them highly torsion-resistant for an almost perfect „piston-like“ diaphragm movement. Blessed with ample drive, they also enjoy a whole 24 millimeters of voice coil overhang (and thus linear excursion). SVS has even given the 8-inchers short-circuit rings to linearize the magnetic field in the air gap. This is anything but standard, especially in the subwoofer sector, and is definitely a high-end feature. The

closed construction with two driven opposing woofers has the advantage of impulse compensation. Both membranes move simultaneously and uniformly outward and inward so that the impulses exactly cancel each other out. This symmetrical mode of operation keeps the cabinet quiet because of the balanced and linear compression of the air inside the cabinet.

The challenge is to conjure home theater-suitable low bass out of only roughly 15 liters of cabinet volume (i.e., only 7.5 per driver). The aforementioned long-throw design of the drivers for sufficient displacement helps here – plus the DSP once again. The digital assistant can shape the frequency response at will to counteract the natural level drop of the small woofer at low frequencies. This requires long-throw drivers and plenty of power amplifier performance – and the Micro has both.

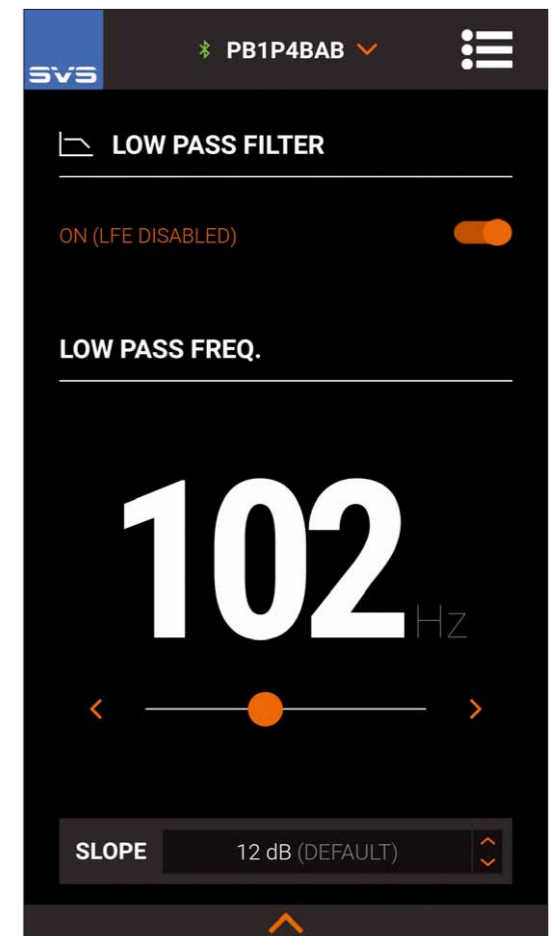
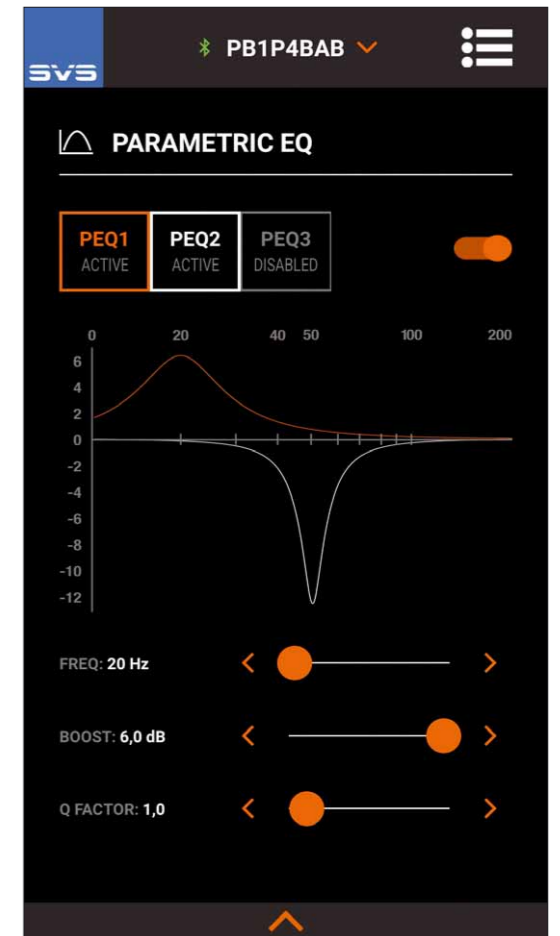
### The App

While the basics like level, polarity reversal, and low-pass frequency can be easily adjusted on the subwoofer, you need the app for finer details. The app is available for all standard operating systems. It is a pleasure to use it: All essential functions can be found in the user-friendly arranged main menu, and the corresponding parameters are then set in the respective submenus. Let's start with the parametric equalizer, of which there are three. That should probably be enough for the subwoofer range. The low-pass filter's slope can be adjusted in the app, and the phase control and polarity reversal also help perfect sound integration. Furthermore, a three-stage subsonic filter dampens booming low frequencies. Three presets for music, movie, and custom are switchable, so you don't have to adjust the EQ every time. A slight cosmetic for bass reflex subwoofers is a correction for when you plug reflex tubes. You don't necessarily need that, but it can be helpful. Good to have are the setting options for display and lighting – anyone who has ever been in a cinema where the electronics provide visual distraction with dozens of LEDs will know what I mean. The configuration options for automatic switching on and off are also convenient and help save power, just like the relatively small standby consumption of the SVS subwoofers of 0.5 watts.

*The app allows extensive configuration of amplitude and phase, plus practical setting options for lighting, automatic switch-on, and setups*



*The 3000 Micro and the SB-1000 Pro are also available in piano lacquer white*





## Lab and practice

All three SVS subwoofers measure excellently. The amplitude responses in standard settings are remarkably linear, and the frequency ranges extend to 20 Hz – even below that with the PB-100 Pro. With the PB, the DSP doesn't need to do anything. The two closed woofers, however, do not show the natural amplitude drop below the built-in resonance. Here the DSP helps out with theoretically 6 dB per octave to produce „home cinema suitable“ flat curves up to 20 Hz. When the level is increased, it becomes apparent that the DSP can model the amplitude response and intervene dynamically, i.e., depending on the volume. The lowest frequencies below approx. The SB-100 Pro and the PB-100 Pro behave as expected: The larger reflex woofer plays louder. The 3000 Micro, on the other hand, is a great performer. It doesn't manage the levels of the more than twice as thick colleague in the lowest bass, but it produces extremely deep and clean bass for the 15-liter volume – kudos. This continues in the listening room, where the SB-100 Pro plays very cleanly. It sounds lush and commanding - but also always to the point. This has nothing to do with the entry-level class; this is high-class deep bass for adults.

The PB-1000 Pro is perfect for low bass fanatics because the reflex woofer shoves the bottom end even harder. Explosions and low-frequency effects are fun! But the clean reproduction is also good with the PB. Again, the 3000 Micro provides the surprise. Ultra-deep and precise, it pushes the sound onto the eardrums and diaphragm: no one would expect that. Even when you want to let it rip, it keeps up amazingly, although it doesn't achieve the thrust of the reflex woofer. Here simply still applies: In the subwoofer area, a lot helps a lot. But if you're into quality (and a fair amount of punch), you'll be well served by the Micro. And by the way, it also wins the score for listening to music; it plays very balanced and super clean. The SB-1000 Pro follows in second place, and the PB-1000 Pro has to admit defeat due to slightly softened impulses. That doesn't mean that you can't listen to music excellently with it. If you choose a suitable preset in the app, clog maybe one or two pipes, the world is very much in order – even for jazz trio in stereo if necessary.

## Conclusion

The new 1000 Pro subs have become genuine hits. Except for the affordable prices, nothing reminds you of „entry-level“ subwoofers; there's very good quality and performance

here that's damn close to the 2000s. The 3000 Micro is a class above in terms of quality and ingredients, but on paper alone, it's more expensive and has less oomph. However, with its compactness and finished look, it doesn't compete with the big-and-cheap segment at all. It takes its place in home

theaters where SB and PB would not be tolerated, and it spoils with the most refined sound and incredible performance. This requires more effort, which more than justifies the price.

While the 1000 pro offers a lot of subwoofer for the money, the 3000 Micro wants to be little subwoofer with maximum performance. The highest possible integration with high-class technology, really cinematic and deep bass in the smallest space – so the 300 Micro is also a bull's eye.



*In addition to the control panel and analog inputs and outputs, there is an expansion port for wireless signal transmission*

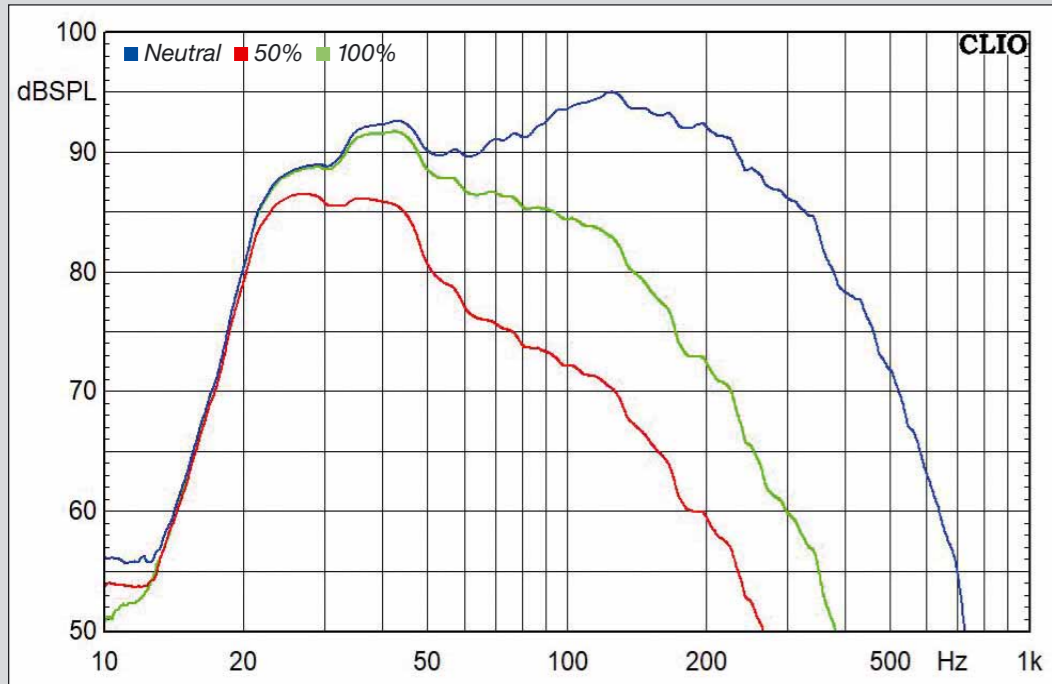




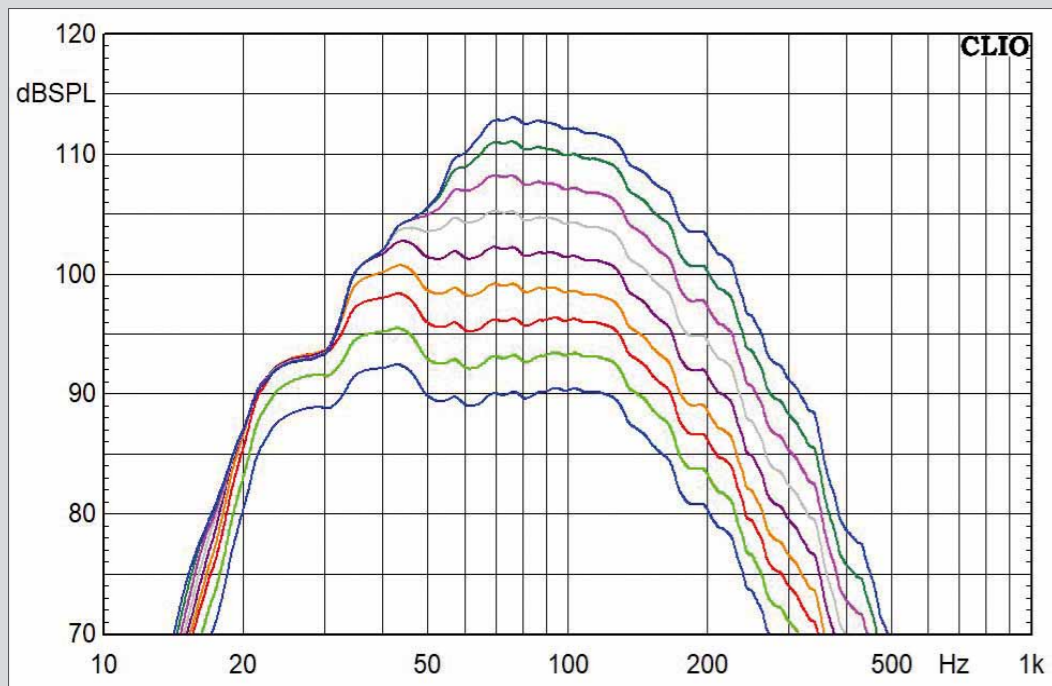
*The 3000 Micro uses two opposing 8-inch drivers equipped with powerful drives and sturdy aluminum cones*



## HOME CINEMA WORLD Laboratory



**Frequency response**  
The SB-1000 Pro delivers a perfect frequency response. Despite having only 25 liters of internal volume, it plays down to 21 Hz, which means rich low bass for cinema. App Features: Slope low-pass, room correction (high-pass), and 3-band parametric EQ.



**Dynamic Range**  
The level stability of the SB-100 Pro is excellent for a compact closed subwoofer. Thanks to DSP support, SVS maxes out at 102 dB in deep bass and about 108 dB in the „normal bass“ range.



## SVS SB-1000 Pro

### • Equipment

Versions	Black ash foil, high-gloss piano white/black lacquer (+ 100 Euro)
Dimensions (W x H x D)	330 x 342 x 352 mm
Construction principle	Closed cabinet
Principle	Frontfire
Weight	12 kg
Power according to manufacturer	325 W RMS
Nominal diameter	300 mm
Level control	controller knob, via app
Crossover frequency	40 – 140 Hz
Phase	0 – 180°; pole reversal
Time correction	-
EQ	3 presets, 3-band parametric
High level input/output	• / -
Low level input/output	RCA stereo, LFE, •
Automatic On/Off	Sensitivity adjustable
Remote control/app	- / •
Features	optional wireless signal

### • Sound

	<b>70 %</b>	
Precision	20 %	★★★★★
Level stability	20 %	★★★★☆
Dynamics	15 %	★★★★☆
Physical effect	15 %	★★★★☆

### • Laboratory

	<b>10 %</b>	
Frequency response	5 %	★★★★★
Distortions	5 %	★★★★☆

### • Practice

	<b>20 %</b>	
Processing	15 %	★★★★☆
Equipment	5 %	★★★★★

Upper class



HOME  
CINEMA  
WORLD

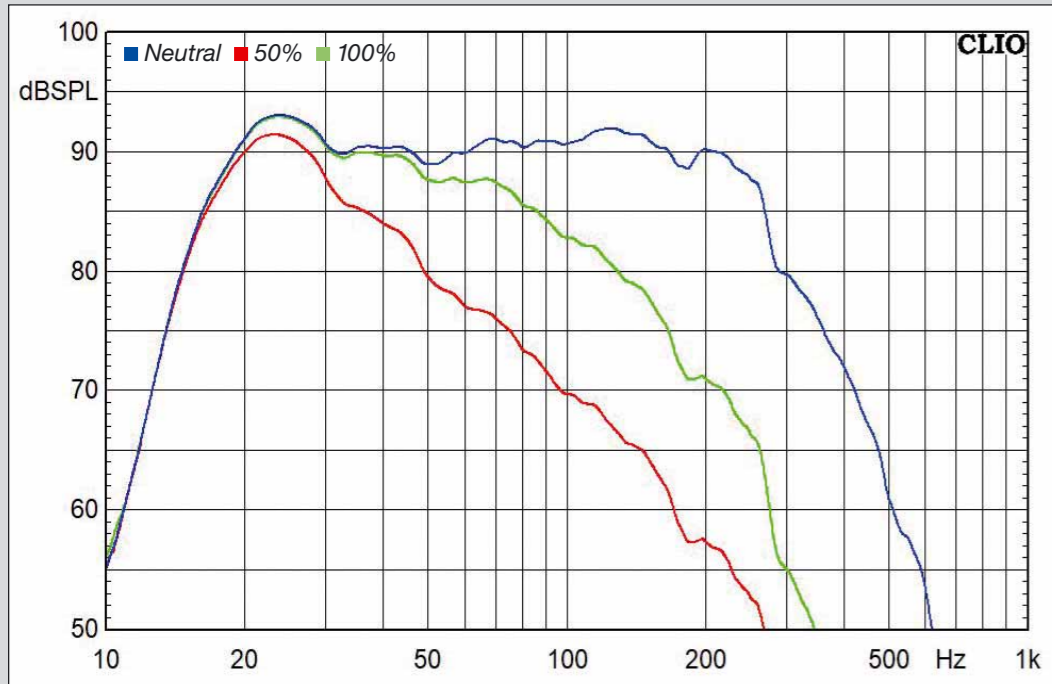
Germany 2/21

Price/performance: excellent

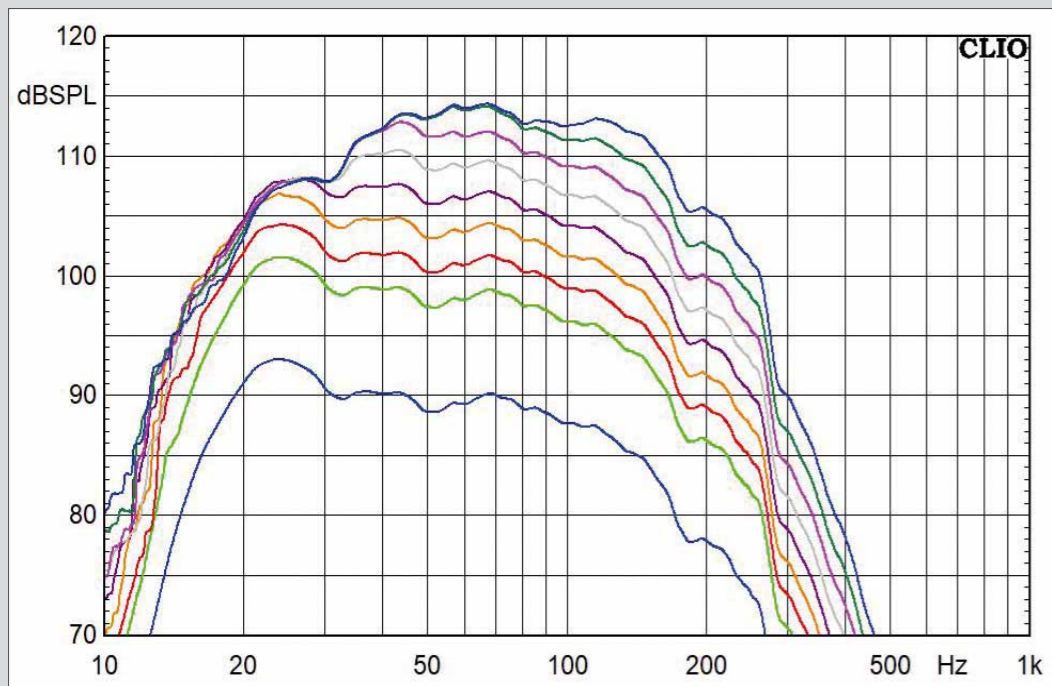
- + Control via app
- + very clean sound
- + variably adjustable



## HOME CINEMA WORLD Laboratory



**Frequency response**  
In the default setting, the bass reflex tuning spoons extra levels around 23 Hz onto the otherwise smooth amplitude response. The lower cutoff frequency is breath-takingly low at 17 Hz. App Features: Slope low-pass, room correction (high-pass), 3-band parametric EQ, and frequency response correction for closed ports.



**Dynamic Range**  
The PB-1000 Pro plays without noticeable compression to 108 dB. At this point, the low bass is limited below 30 Hz, but in the „normal“ bass range, it goes on so that the PB-1000 Pro proves to be an extremely level-capable subwoofer.



## SVS PB-1000 Pro

<b>Price</b>	<b>around 700 Euro</b>
Distribution	SVSound
Internet	www.sv-sound.com

<b>• Equipment</b>	
Finishes	foil ash black
Dimensions (W x H x D)	380 x 467 x 509 mm
Construction principle	bass reflex
Principle	Frontfire
Weight	19,5 kg
Power according to manufacturer	325 W RMS
Nominal diameter	300 mm
Level control	controller knob, via app
Crossover frequency	40 – 140 Hz
Phase	0 – 180°, pole reversal
Latency correction	–
EQ	3 presets, 3-band parametric
High level input/output	•   –
Low level input/output	RCA stereo, LFE / •
Automatic on/off	• / •, sensitivity adjustable
Remote control/app	– / •
Special features	optional wireless signal

<b>• Sound</b>		<b>70 %</b>	
Precision	20 %	★★★★☆	
Level stability	20 %	★★★★★	
Dynamics	15 %	★★★★★	
Physical effect	15 %	★★★★★	
<b>• Laboratory</b>		<b>10 %</b>	
Frequency response	5 %	★★★★★	
Distortions	5 %	★★★★☆	
<b>• Practice</b>		<b>20 %</b>	
Processing	15 %	★★★★☆	
Equipment	5 %	★★★★★	

Upper class



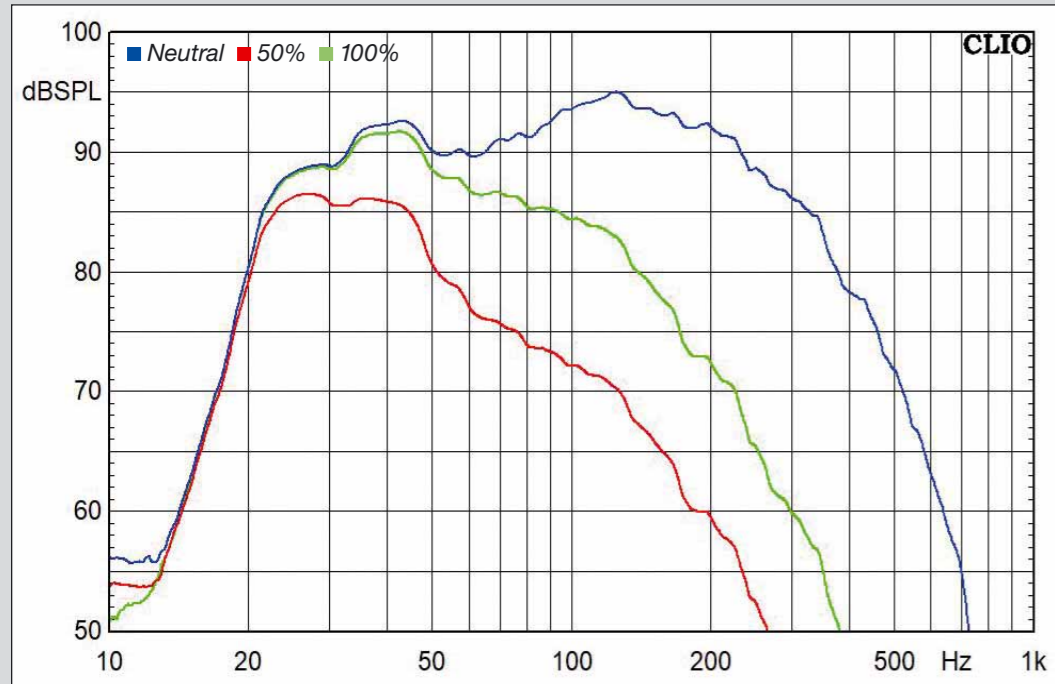
Germany 2/21

Price/performance: excellent

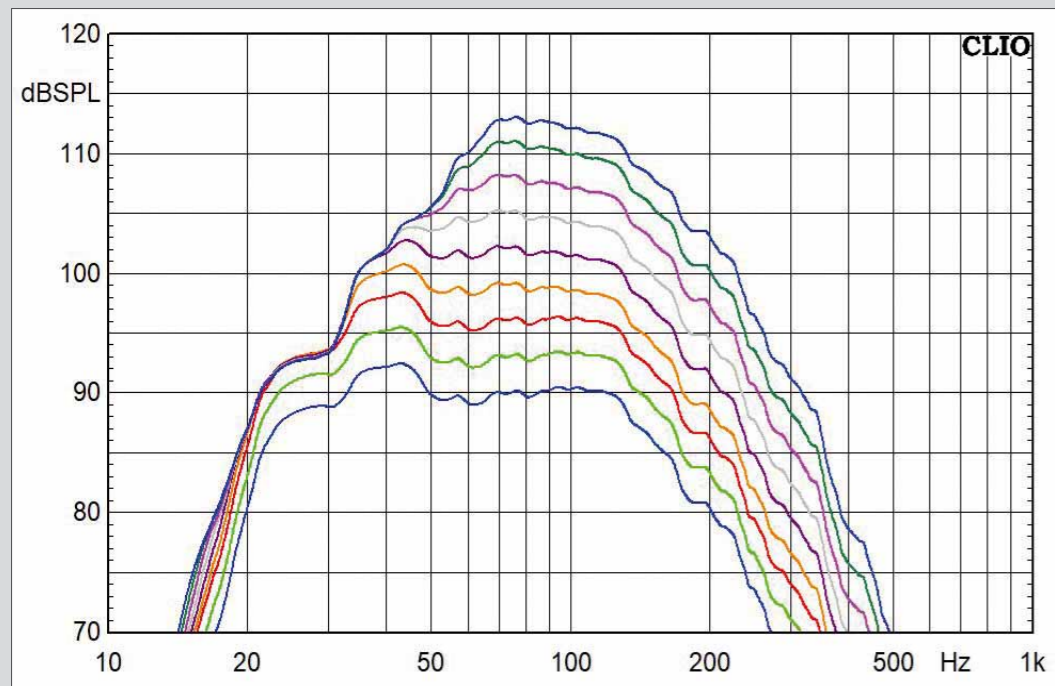
- + control via app
- + deep, powerful sound
- + variably adjustable



## HOME CINEMA WORLD Laboratory



**Frequency response**  
Despite the compact dimensions, the 3000 Micro plays deep into the frequency basement; 22 Hz is astonishing. Thanks to DSP support, the 3000 Micro manages to reproduce the lowest frequencies like a big one. App Features: Slope low-pass, room correction (high-pass), and 3-band parametric EQ.



**Dynamic Range**  
The 3000 Micro delivers exceptional levels for its size. To prevent the dainty 8-inch cones from fluttering and distorting at the lowest frequencies, the electronics lock down at 93 dB. Above a still remarkable 30 Hz, the 3000 Micro plays considerable volumes.



## SVS 3000 Micro

<b>Price</b>	around 1.000 Euro
Distribution	SVSound
Internet	www.sv-sound.com

• <b>Equipment</b>	
Finishes lacquer	high gloss piano white / black
Dimensions (W x H x D)	297 x 278 x 271 mm
Construction principle	closed cabinet
Principle	Sidefire, impulse-compensated
Weight	10,5 kg
Power according to manufacturer	800 W RMS
Nominal diameter	2 x 200 mm
Level control	controller knob, via app
Crossover frequency	40 – 140 Hz
phase	0 – 180°, pole reversal
Latency correction	–
EQ	3 presets, 3-band parametric
High level input/output	• / –
Low level input/output	RCA stereo, LFE / •
Automatic on/off	• / •, sensitivity adjustable
Remote control/app	– / •
Special features	optional wireless signal

• <b>Sound</b>		70 %	★★★★★
Precision	20 %		★★★★★
Level stability	20 %		★★★★☆
Dynamics	15 %		★★★★★
Physical effect	15 %		★★★★★
• <b>Laboratory</b>		10 %	★★★★★
Frequency response	5 %		★★★★★
Distortions	5 %		★★★★★
• <b>Practice</b>		20 %	★★★★★
Processing	15 %		★★★★★
Equipment	5 %		★★★★★

Top class



HOME  
CINEMA  
WORLD

Germany 2/21

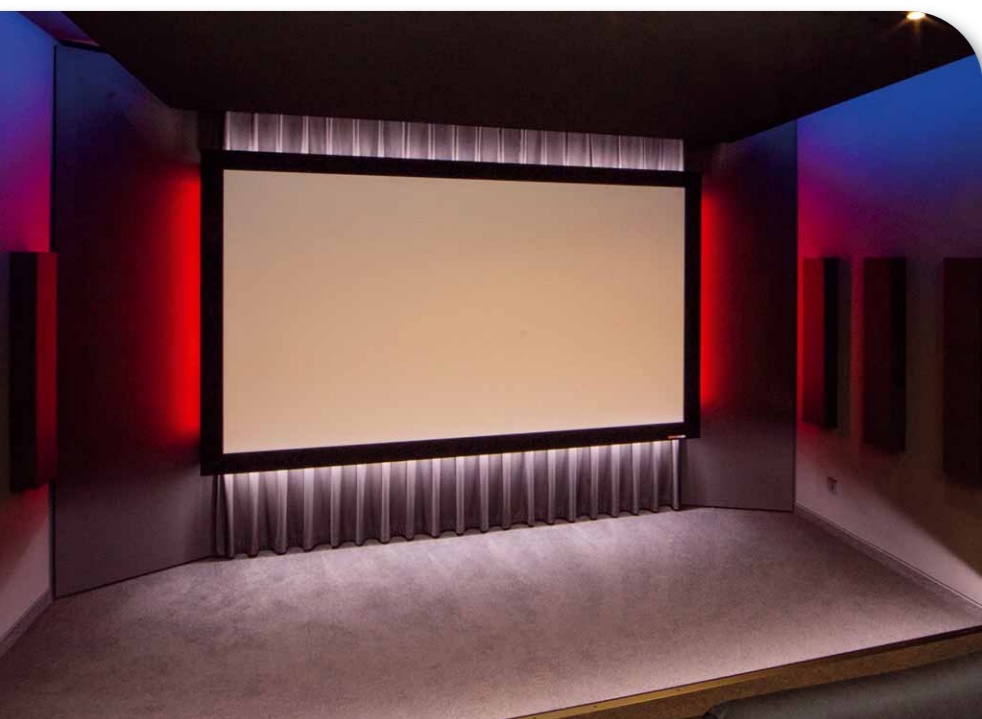
Price/performance: excellent

- + control via app / variably adjustable
- + immaculate sound
- + also great for music



# Coming soon

Next issue October 29, 2021



## Imprint

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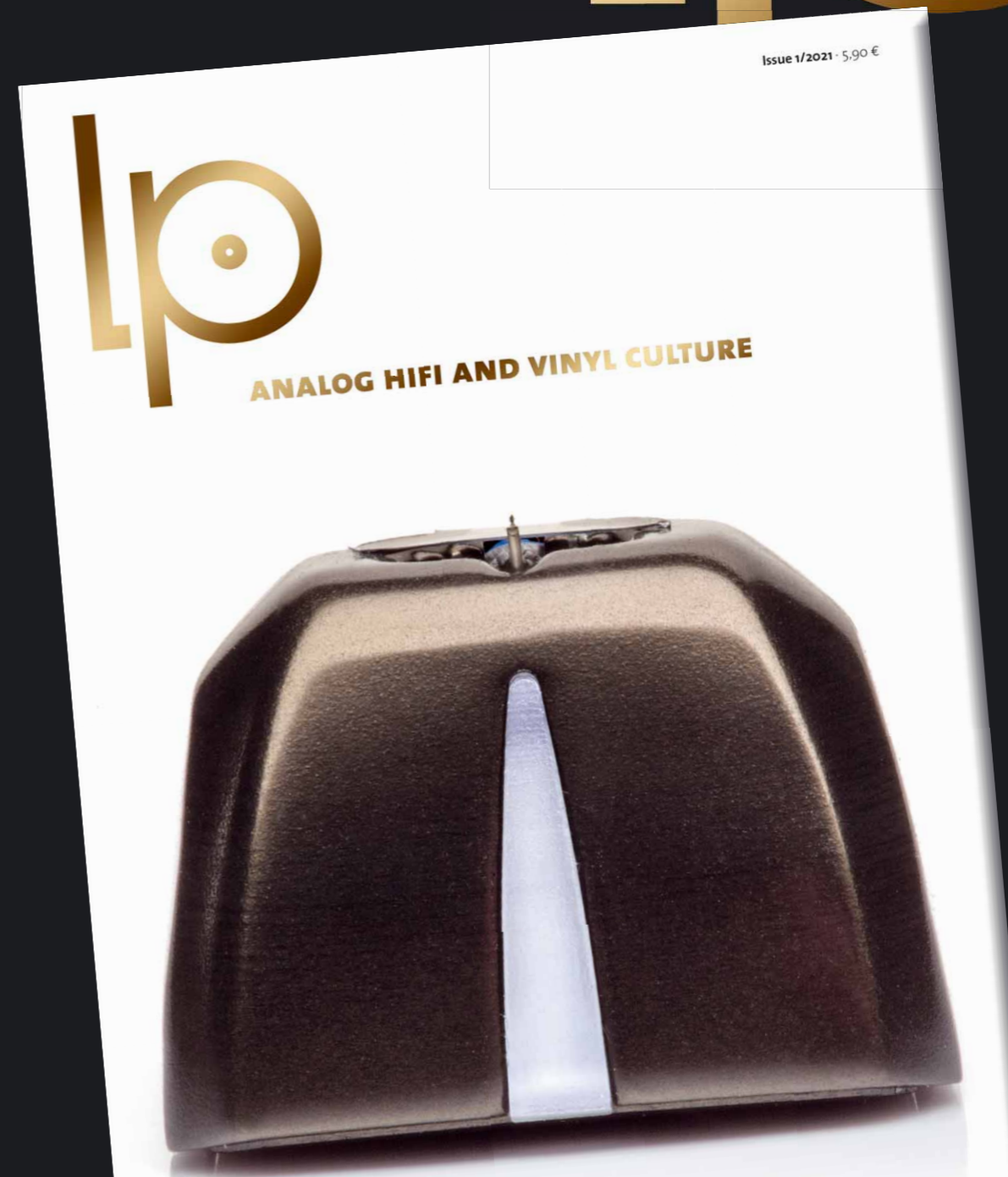
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# Coming soon





# READ IT!



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