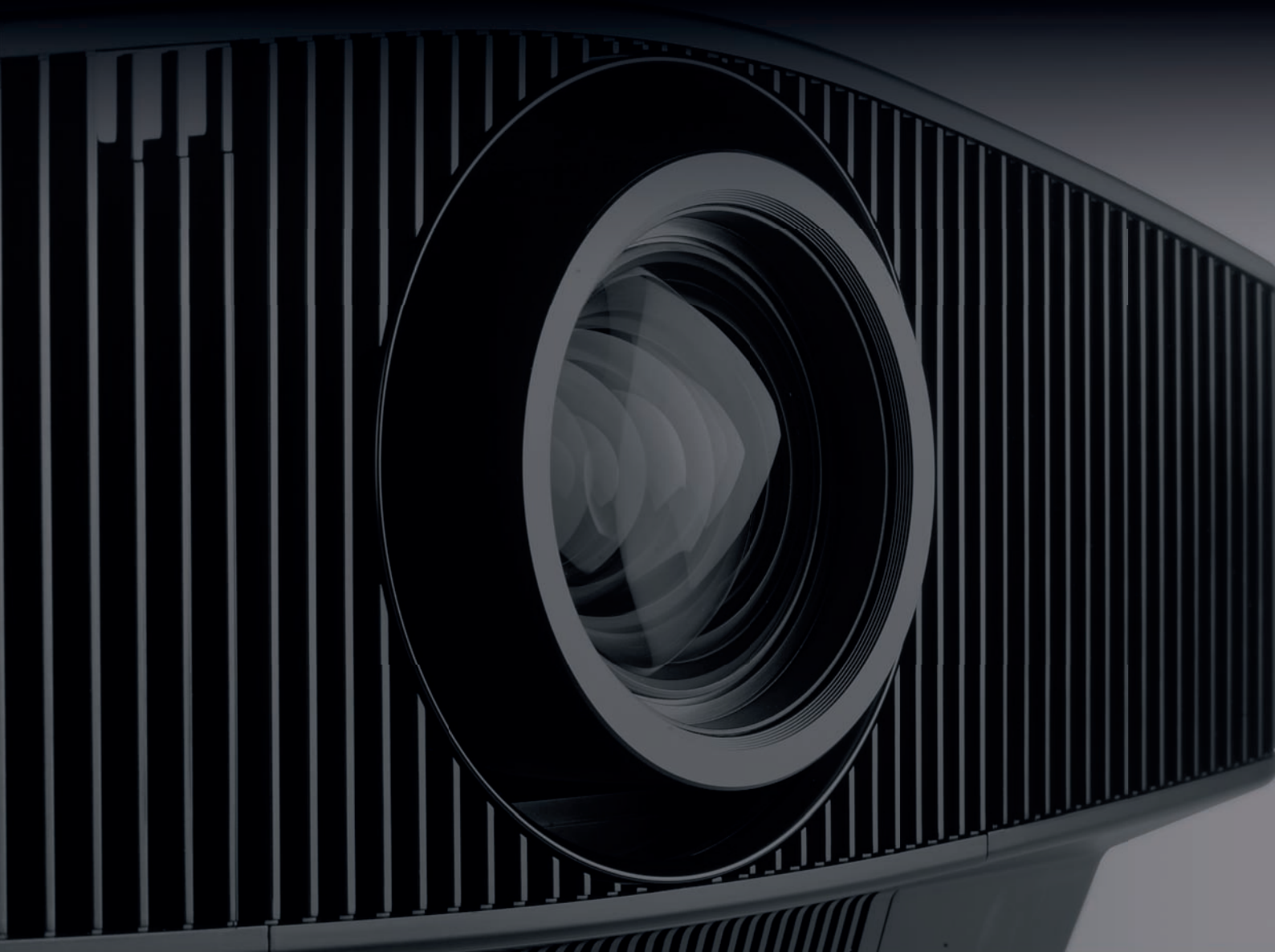


HOME CINEMA WORLD



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Michael E. Brieden
Verlag GmbH
The Test-Specialists
Duisburg - Germany



www.carhifi-international.com

TV or projector?

The answer to this question is probably: "Preferably both!" When it comes to cinematic film enjoyment with the largest, sharp and color-true image possible, the projector is clearly the first choice. In terms of quality, a good projector is in no way inferior to TV sets and, measured in terms of the possible image size, is even cheaper. However, a home cinema projector only develops its full potential in darkened rooms. When the ambient light is brighter, OLED and especially LED televisions have an advantage. In addition, the TV sets with tuners and extensive Smart TV functions usually offer better equipment. But here too, the projector manufacturers are now following suit. For „everyday use“ in the living room, the television is usually preferable, whereas the projector is preferable for a dedicated home cinema evening. So - as I said - preferably both. Whether television, projector or both, in this HOME CINEMA WORLD you will also find independent tests of different devices from both categories on the following pages so that you can find your personal favorites.

Have fun in your home cinema!
Dipl.-Phys. Guido Randerath



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



Image: Panasonic



50-53 Compact Soundbar from Denon - Test: Soundbar Denon Home Sound Bar 550



38-43 4K-TVs in 55 Inches - LED- und OLED-TV from Panasonic

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Sony HT-A9 home theater system

The Sony HT-A9 home theater system takes surround sound into a new dimension. The HT-A9 from Sony is a wireless, flexible home theater system that fits into any living room. The unique 360 spatial sound mapping technology delivers the most room-filling surround sound Sony has to offer. The sound field optimization creates an immersive listening experience that is precisely tailored to the room.

■ www.sony.com

Q Acoustics Concept series

Q Acoustics proudly presents: the latest stereo and home theater speakers from the award-winning Concept series. The Concept 30 shelf loudspeaker, the Concept 50 floor-standing speaker and the Concept 90 center speaker are based on the state-of-the-art technologies and design features of the tried and tested top models Concept 300 and 500. Q Acoustics is also introducing a number of new audio innovations which, while maintaining the excellent price / performance ratio guarantee real high-end sound quality. With the Concept series, the latest technologies minimize any housing vibrations and resonances. This leads to a first-class live performance in your own four walls with a precisely focused stereo image, a frequency response clearly defined from the deepest bass to the highest notes and an extensive holographic soundstage.

■ www.qacoustics.com/

Denon AV receivers

The Sony HT-A9 home theater system takes surround sound into a new dimension. The HT-A9 from Sony is a wireless, flexible home theater system that fits into any living room. The unique 360 spatial sound mapping technology delivers the most room-filling surround sound Sony has to offer. The sound field optimization creates an immersive listening experience that is precisely tailored to the room.

■ www.denon.com



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

Would you like 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

Bass-packed 7.1.5 Dolby Atmos motto cinema with a 21-inch subwoofer

BATCAVE CINEMA

Bass-powered motto cinema for the whole family. HOME CINEMA WORLD-Reader Patrick created a modern movie theater in a homemade cave where he and his family regularly experience exciting blockbusters. A 4K laser projector from Sony ensures the best picture quality. Find out what else to discover in the „Reader's Cinema of the Month“ in this report.

Equipment:

- » Size: 5.70 x 3.70 meters
- » Projector: Sony VPL-VW760ES
- » Screen: Alphaluxx Barium 6 Acoustic
- » Preamplifier: Marantz AV8805
- » Power amplifiers: 8 x T.Amp E800, 1 x T.Amp Proline 3000
- » Player: Mediaplayer + Vero 4K
- » Loudspeakers: 7 x Beat Club Cinema 2, 5 x Beat Club Cinema 1
- » Subwoofer: 4 x K13, 1 x Earthquake 21 inch
- » Other: 19-inch network switch with Gigabit from TPLink, Sky Receiver, Behringer DCX2496 Ultradrice Pro
- » Specials: preview monitor, Logitech Harmony Ultimate One, 21-inch Earthquake- subwoofer with 350 kg, EI-Wire-illumination

Today I visit HOME CINEMA WORLD reader Patrick's family of three, who lives within easy reach in Braunschweig. When I pulled up in the car with all my equipment, I was expected and greeted extremely cheerfully. „I hope you are hungry,“ my host beams all over his face. „We'll have delicious burgers later.“ I am completely overwhelmed by this cordiality. Now it's off to the generously proportioned dining room first. There I am supplied with delicious cake and a hot cup of coffee. Here, Patrick tells me about his home theater beginnings: „At the age of 16, I already started with a surround system and 16:9 tube TV, and since then, the topic has become more and more in-depth.“ With his professional move from Lower Saxony to Bavaria, he got to know the members personally in the Heimkino-club München (HCM). „A great helpful bunch!“ continues Patrick, grabbing a second piece of the cake that his wife Zaneta and their daughter Lola had baked together. „In the meantime, after all, I live back in my home state, but I'm still active on the forum.“

The idea to build his own cave in the basement came to the Batman fan when he saw a professionally built Batcave in the USA in a report. „We bought a house two years ago, and the plan could finally be implemented.“



Wipe your feet before entering. From the Batcave, you go directly through the metal-look door into the cinema

The Batcave

Well rested and refreshed from the journey, Patrick takes me to his Batcave. This term may be understood literally, because the eponym is a real bat, which decorates the cave preserved in a frame. First, we pass a few props. These are utensils and replicas from „Planet of the Apes,“ „Star Wars“ and other science fiction and fantasy films.

I see the home theater owner open a heavy door with shining eyes, and a cave opens up behind it—a real WOW moment for me. The floor is covered in wooden planks, and the rock design wraps the sidewalls and ceiling. Patrick painstakingly hand-sculpted the rocks out of Styrofoam and tile adhesive.

This looks impressively realistic. He has linked the whole thing with an industrial and lighting design integrated into the Batcave in a highly harmonious way.

Some details have been created using two 3D printers housed in the adjacent factory room. These include the Bat-

Patrick, Lola, and Zaneta are all cinema enthusiasts and regularly enjoy the local movie palace



Impressive: The Batcave is modeled after the cave of Batman's cave. In addition, there are numerous film paraphernalia on display

symbol attached to the entrance door to the movie theater, the „Wayne Industries“ nameplate, and all the rivets in the space. Patrick also created the „rusted“ metal surfaces on the heater and water pipes, which give the cave its authentic character because they look like they were created by actual moisture.

Home cinema with industrial design

Another metal-look door leads directly into the cinema room from the den, which is generously sized at 5.70 meters x 3.70 meters. The acoustic measures leave a net room length of 4.90 meters. In keeping with the Batcave theme, the cinema is consistently decorated in industrial motifs.



The cinema is named after a real bat from Indonesia, which decorates the Batcave in a frame

The ceiling and walls are entirely immersed in black to minimize stray light during the screening. Fake rivet strips support the industrial look. The so-called El-Wire provides colorful accents on the ceiling, which look like luminous ribbons. The podium is illuminated by LEDs, which are embedded in the edge in a tread-proof manner. Other lamps provide a cozy lighting atmosphere. A few of them have bulbs with flame effects.

A sofa and two armchairs provide comfortable seating for a total of four viewers. The sound-permeable screen takes up almost the entire width of the wall. I can't see any audio and video technology, even when I look closely.



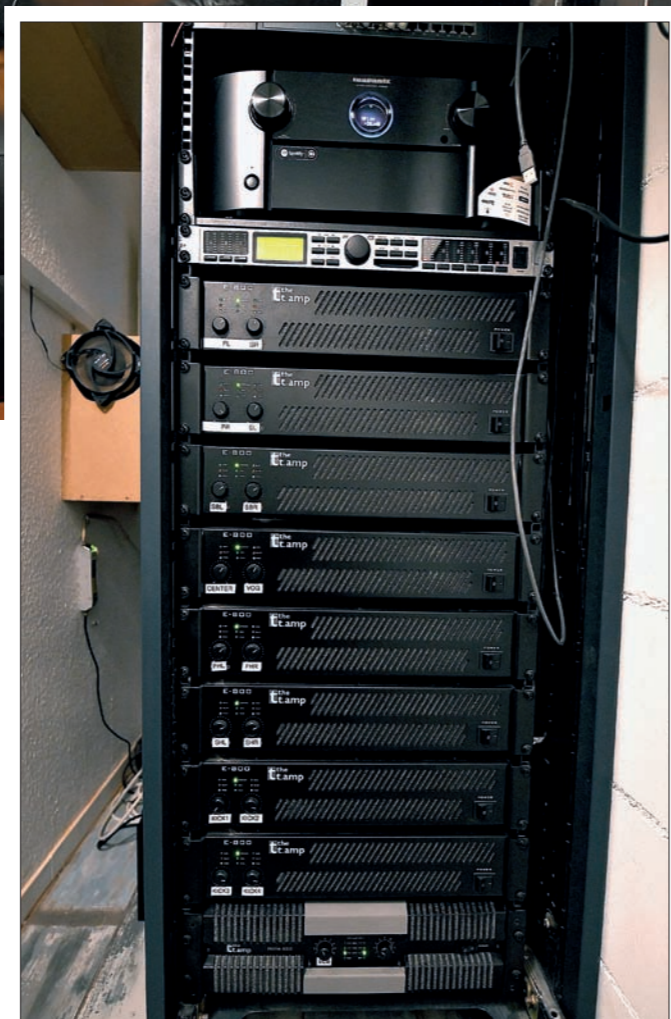
The baterang is an exhibit in the exceedingly rare press kit from the Batman games. The head next to it is Shakespeare, who serves as a door opener in the 1970s Batman series





The loveseat is made of genuine leather and has a recline function. The two armchairs behind it are made of faux leather and are just as comfortable. The armchairs have been placed on an exceptionally sturdy pedestal to allow a clear view of the screen from the second row of seats. In the background, the Sony VPL-VW760ES projects through the projection window from the equipment room.

„All speakers and subwoofers are self-built,“ explains the proud host, „and calibrated himself with laser and computer. Enormous levels and brute low bass make for a mega kicker experience.“ The front speakers are installed behind the sound-permeable Alphaluxx „Barium 6“ screen, which, due to its fine mesh, allows for exceedingly short viewing distances without any disturbing structure being visible. These are „Beat Club Cinema 2“ kits from Intertechnik. Four more of these speakers line the lower surround level behind the walls covered with acoustic fabric. Another five „Beat Club Cinema 2“ are used for the upper level. Four K13 subwoofers and a 21-inch Earthquake woofer, weighing in at an impressive 350 kilograms, extend the speakers in the lower frequency range.



In the equipment room, almost all image and sound components are housed in the huge rack

Dolby Atmos sound

3D sound formats such as Dolby Atmos, DTS:X, and Auro 3D are all supported. Patrick's experience at his two previous theaters has made an installation to Dolby Atmos specifications work well for him. Since the DTS:X setup is virtually identical, he has one speaker configuration covering the two sound formats most widely used on Blu-ray and 4K Blu-ray.

„The Auro-3D upmixer works very well over the Atmos setup!“ finds HOME CINEMA WORLD reader Patrick. „It's just important to keep in mind Dolby's angles etc., when doing so!“

4K projector in the projection room

The tech room measures 3.70 x 1.50 meters and is crammed with all the feed technology, the Sony VPL-VW760ES, and a preview monitor. The native 4K projector sits perched above the equipment rack and projects directly onto the large screen through a small projector window.

„A separate sub-distribution with integrated automation based on Homematic system was installed by an electrical company,“ Patrick explains, „Sockets, supply line, and fuse boxes were prepared by myself in advance.“ The cinema owner made the door breakthrough through the load-bearing wall for the technical room with the help of a friend. „The rest I realized with my family, that is, with my father and my wife, and I built most of it by myself. Only now and then did I need a helping hand.“

Room acoustics for better sound

Back in the cinema, we take a seat on the comfortable leather couch. Immediately, I notice that voices echo much less than in the Bat Cave outside the auditorium. No wonder:



Using the Logitech Harmony Ultimate One, the operation of the entire cinema technology is done with a few touches of a button



How imposing the 350-kilogram Earthquake subwoofer with 21-inch chassis is becomes clear here when Lola simply stands in front of it

Patrick has completely optimized the room acoustically. The sidewalls and ceiling are covered with Isover acoustics, and foil transducers are used throughout the back wall. Large amounts of acoustic wool are placed behind the screen to achieve precise bass. Everything was covered with special acoustic fabric to make the speakers and acoustic elements no longer visible to the audience.

Play!

Since I'm already sitting on the couch made of genuine leather and with a recliner function, the movie fun can begin immediately. Patrick dims the lights slightly via smart control and starts the Sony VPL-VW760ES. The logo designed by the house owner appears on the screen and welcomes me to the BATCAVE CINEMA. Then the light goes out completely, and for seconds I sit in total darkness. Then the Warner logo in rust optics appears on the screen.



Already on the way to the cave, several exhibits from well-known feature films and series line the walls



Next to the entrance door to the Batcave, several logos are embedded in the rock structure and backlit. Patrick himself designed the BATCAVE CINEMA logo at the top.

„Mad Max: Fury Road“ begins with the distinctly sonorous male voice of the main character. When Max starts his vehicle's engine, so much energy is pushed into the room that the couch begins to vibrate. No, there are no bass shakers at work here. This is actually coming from the subwoofers. A moment later, I'm speechless: when the first vehicle of Max's pursuers flies over the camera from the back to the front, I get a slap in the back, and my hair is blown forward by the „airstream.“ „Wow!“ I have never experienced anything like that before. I even feel the bass in my body, in my stomach! Madness. This is brutal. This is spectacular. This is enormous fun. Every deep bass effect, no matter how small, makes the entire home theater shake. Not booming, but with short tight impulses. In the midst of this - I'll call it inferno - the protagonists' voices can be heard clearly. Ambient sounds are excellently placed in the room.

Thanks to Dolby Atmos, the sound is homogeneous in the center. Sound events can be located like under a sound dome. Due to the identical speaker configuration, there is no discontinuity in the sound characteristics. Objects are also reproduced almost without gaps between the individual channels. But the powerful bass stands above everything. Next, we watch „Hans Zimmer - Live in Prague.“ Here, too, the three-dimensionality is pleasing because instruments

are reproduced in an excellently differentiated manner on all channels. The three drums are perfectly reproduced in the room. While the bass drum comes naturally from the center, the snare sounds faithfully on and between the ceiling speakers, just as it is present in the sound mix. Even here, the bass pounds supremely martially. It's not entirely faithful to the original. Still, it's great fun and leaves a lasting impression on me for days to come, just like the delicious burgers and the hours of talking shop with Patrick, his wife Zaneta, and their adorable daughter Lola afterward - what a charming, movie-loving family.



Interview:

The sound makes a lasting impression. Did you use professional help for this?

Since it's not my first cinema and I'm already deeply involved in the topic, planning and construction (1.5 months) went relatively quickly. The room dimensions and the desired sound experience were discussed with the company Intertechnik. Therefore, in the end, I chose the new speaker series „Beat Club Cinema,“ whose concept fit well with my wishes. For the low bass subwoofer, I adopted the 2-way concept from the Heimkinoclub Munich.

The bass is ferocious.

How did you get it to sound like that?

Everything was calibrated with the help of laser, Mac, and Behringer DCX 2496 Ultradrive Pro. The SBA (Single Bass Array) installed behind the screen runs with four kickers (K13), which play from 45 Hz to 120 Hz. The Earthquake Sub installed behind the seats plays from 45 Hz down to around 15 Hz. The signal used is the LFE + Main.

Your cinema looks pretty complete.

Is there anything you would still like to install in the future?

Yes, there is something: I plan four Magic Mirrors in 50 x 50 centimeters on the ceiling. Then it will look like air ducts. Moreover, the vertical masking is almost ready to conceal the screen above and below.

Which are your 10 favorite movies on Blu-ray?

The Dark Knight

Heath Ledger in the role of his life

Avatar

Wow, and I had to have my first 3D projector back then

The Greatest Showman

Our favorite movie for the whole family

Passengers

Great to enjoy HDR

Fear and Loathing in Las Vegas

Just laughing

Suicide Squad

Best Harley Quinn

Der Herr der Ringe Trilogie inkl. der Hobbit

Awesome atmosphere

Nip/Tuck

One series, but I already watched it three times completely, not least because of the two cool guys

Split

Just surprising

Lone Survivor

A lot of action



Conclusion

With the BATCAVE CINEMA, Patrick, as a Batman fan, has created a sensational motto cinema, which already impresses with the lovingly designed cave with all the replicas. The cinema hall in modern industrial design is consistently designed for the best picture and sound quality. Above all, however, is the sustainably impressive deep bass with its omnipresent physical palpability, which is a real WOW experience.

Sony VPL-VW890ES – Image Enhancement for the Flagship

The Flagship

Sony has upgraded all native 4K projectors. Almost all of them, because the flagship had to do without the new image processing chip – until now. We have finally been able to test the almost sinfully expensive VPL-VW890 in detail so you can decide whether the upgrade was worth the wait.



After the VW590, VW790, and even the VW290, it was finally time for Sony to give its flagship, the VPL-VW890, an image processing update, too. With the VPL-GTZ380, Sony can go one better, but in our opinion, it will break any home theater budget with a price of about EUR 80,000, even if Sony's marketing department disagrees. After all, the 25,000 EUR called for the VPL-VW890 already want to be justified. Especially the X1 chip, which now also supplements the image processing of the VW890, is supposed to inspire this argumentation.

HDR and more

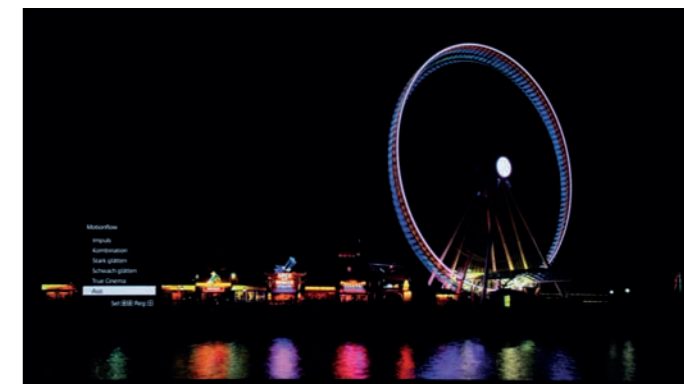
The X1 chip already works very successfully in Sony's Bravia TVs. Since a screen works a bit differently than a projector in principle, the chip was not simply soldered in but adapted to the special features of image processing in a projector beforehand. By the way, there was a reason why the 890 had to wait a bit longer for the upgrade since the flagship had already received a complex hardware upgrade before all its cheaper siblings. The „X1 for Projector“, as the chip is officially called, now puts the icing on the cake. The predecessor was already able to realize an astonishingly dynamic contrast with the active control of its laser light



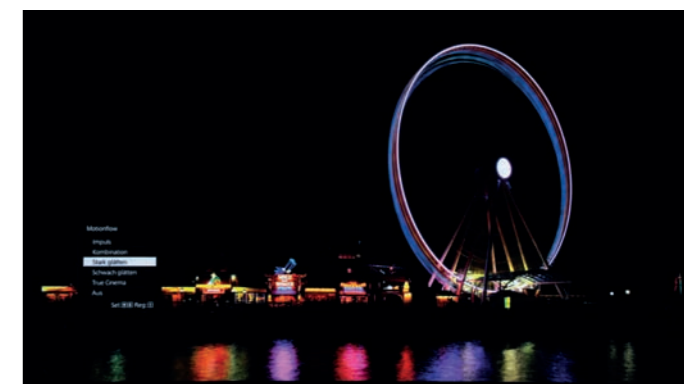
The new heart - the X1 image processor, was developed for televisions and is now optimized for projectors

source in combination with the adaptive iris diaphragm. The X1 chip, optimized for projectors, now juggles the video data even more sensitively and faster. You can definitely see that, or better: You don't actually see it because the technology now completely disappears behind the visual experience. Even the iris, which has always been extremely sensitive and above all quiet, can no longer be heard during its sensitive work at all. The only thing visible is that the picture adapts perfectly even to fast, hard contrast changes – the word „instant“ seems appropriate to me at this point. The interaction of laser dimming, as I would like to call it, and adaptive iris can be adjusted to the movie content or the individual viewing habits in the menu under „Advanced Iris and Laser Settings.“

The projector can be adjusted to the distance to the screen as before. The VPLLZ7013 optics for large projection di-



If MotionFlow is off, there is no motion blur; everything is sharp

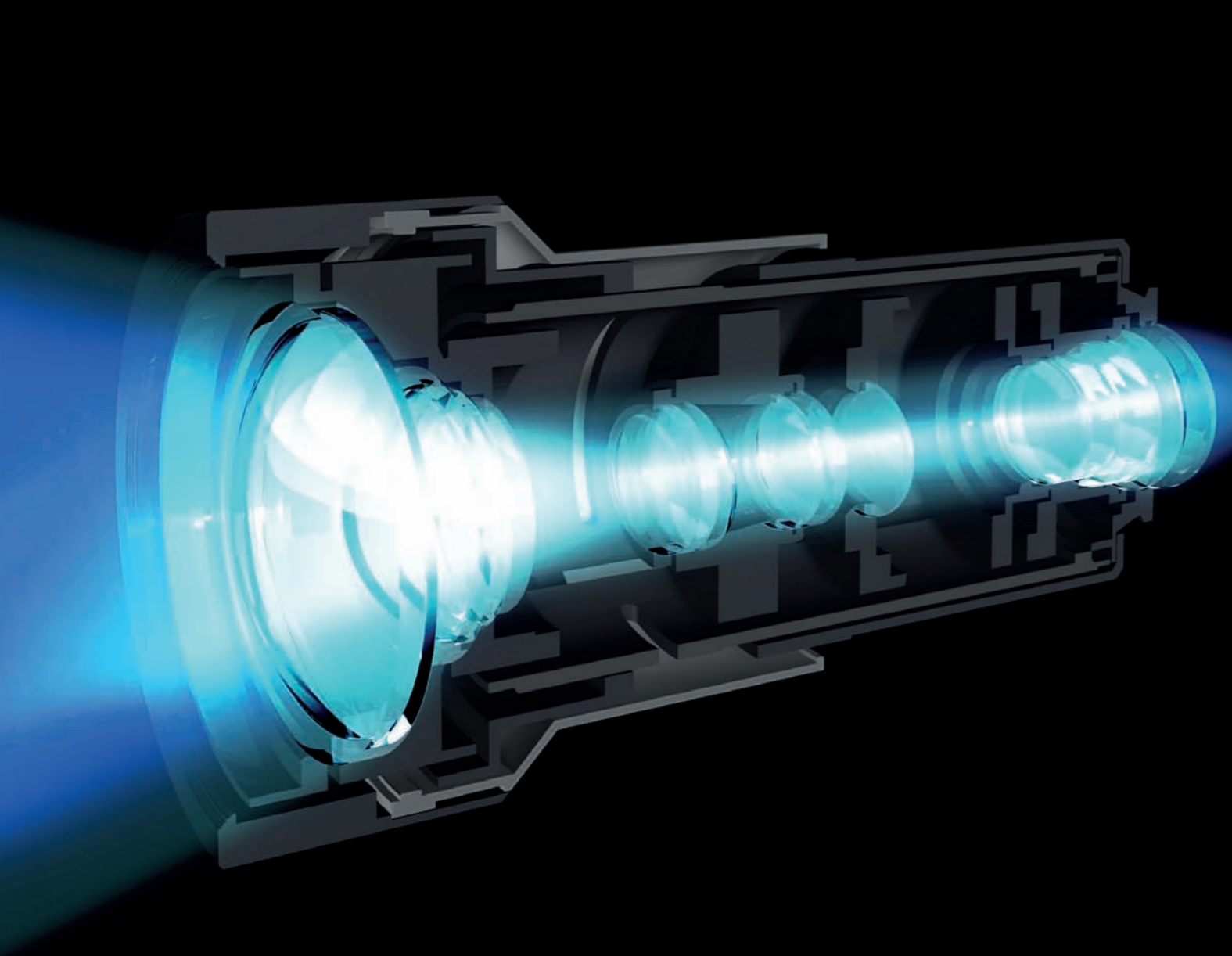


With active MotionFlow, the image processing adds intermediate images, the movements appear smoother with motion blur

stances of 2.5 to approx. 5.5 meters are included in the scope of delivery. The VPL-VW890 can alternatively be ordered with VPLLZ008 for shorter distances between 1.5 and 2 meters. The projection distances refer to an image width of two meters. In combination with the optics used, the X1 processor comes into play once again. Sony's 4K projectors already deliver an outstandingly sharp image, but that doesn't necessarily mean that's the end of the story. Even the best optics can't reproduce the image sharply down to the last corner, but the X1 chip has stored the physical data of the used optics so that it can compensate for the physical limits with its computing power. With success, because even with the tip of the nose against the screen, everything is crisp and sharp right into the image's corners.



Two HDMI connections



Even from the high-quality optics, the X1 image processor can still bring out the last bit of sharpness

Last but not least, the intermediate image calculation, or MotionFlow, also benefits from improved image processing. In the case of fast movements, camera pans, and other movements in the picture, you can use the settings Strong, Weak, Off, and True Cinema to make these movements appear more or less fluid. For sports broadcasts, the Strong setting is preferred for a particularly smooth reproduction. On the other hand, in the True Cinema setting, the slight judder known from the cinema becomes visible.

Setup and image quality

We start with the factory-set picture mode „Film Cinema 1“, together with the brightest setting of the laser. The color temperature already looks perfect, confirmed by the subsequent measurement with 6500 Kelvin throughout in all brightness levels. The standard color space of HDTV is generously covered, and there are only minor color deviations

in the picture. However, the gamma curve is flatter than it should be, which results in a lack of detail. The gamma value can, of course, be corrected in the menu, which we then also did. We also set the color space to BT.709, which is necessary for HDTV. The gamma curve now corresponds pretty closely to the setting and exactly



Basic operation on the device



Impressive lens



to our expectations. The color reproduction has also changed astonishingly: The BT.709 color space is not only perfectly covered, but our measurement shows that the color fidelity is completely preserved even with lower saturation. Consequently, we measured a color deviation DeltaE of 2.2, but you can't see anything. The color temperature is still 6500 Kelvin.

Finally, we have the supreme discipline, and we feed the VPL-VW890 with an HDR-encoded UHD signal. No matter in which picture mode the projector is currently set, the „HDR“ is immediately added to the menu. The gamma value is then always fixed, and the extended color space BT.2020 is also available for selection. The picture mode „Reference“ seemed to make the most sense to us. Additionally, we selected the extended color space BT.2020. From a purely metrological point of view, we

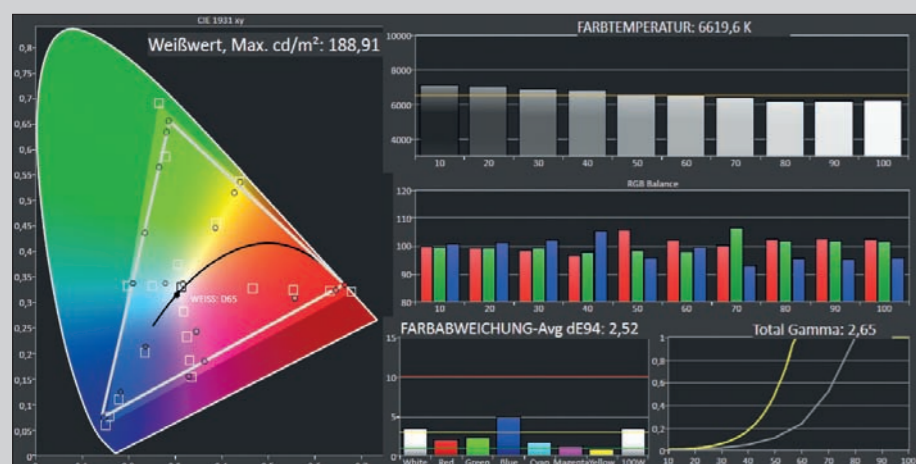
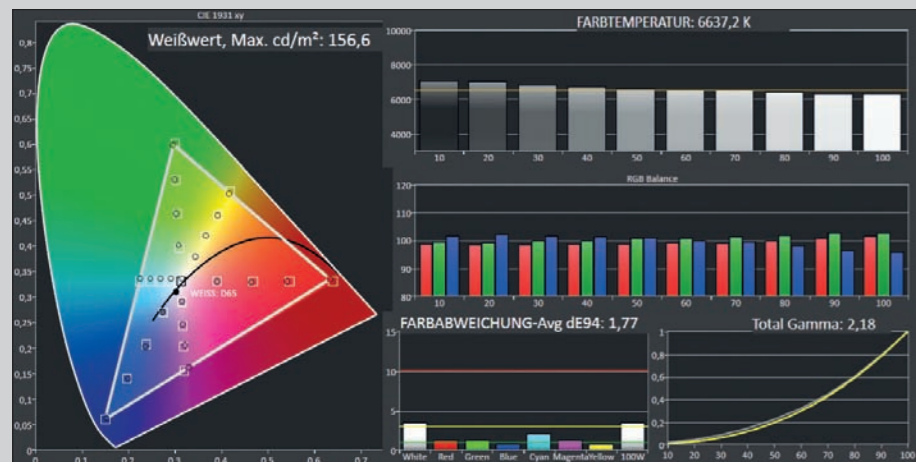
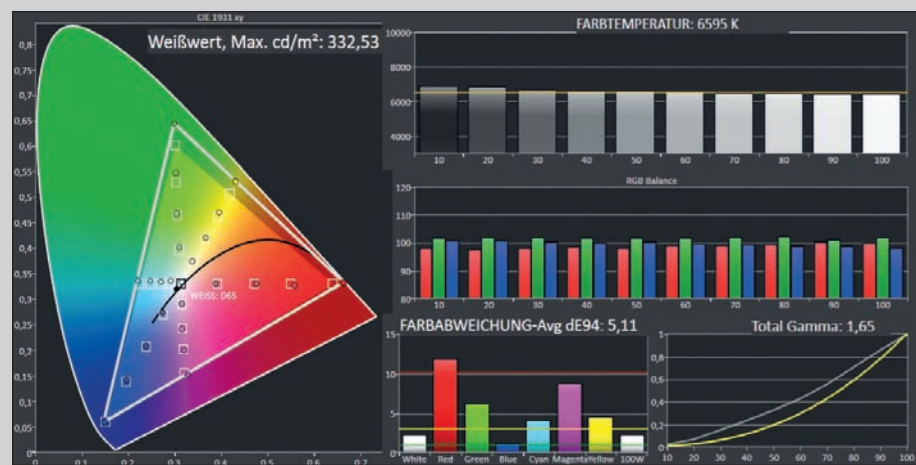
The keys in the directional pad are still too tight; a revision is urgently needed

can certify that the projector covers almost one hundred percent of the extended color space and a color deviation that is on average below a DeltaE of 3.0 and thus invisible to the naked eye. After the measurement and test procedure has been completed with such good results, we can finally move on to the freestyle. We put the UHD HDR disc „Bladerunner 2049“ into the player and feel like we are in the cinema after a few minutes.

Conclusion

The VPL-VW890 is, without a doubt, currently the projector with the best HDR performance in its price range. So, if you have the wherewithal and the appropriately equipped home theater, the VPL-VW890 is well worth the sin. On the other hand, if you bought the predecessor VPL-VW870 two years ago or already own the VW790 that costs just under half as much, you can spend many more years of satisfying hours in your home theater.

HOME CINEMA WORLD Laboratory



Technology: Color reproduction

The VPL-VW890 is set to Cinema Film 1 mode ex-works, with the laser shining at its brightest level. The color temperature of 6500 Kelvin is already ideally within target A across all brightness ranges. The HDTV standard color space is generously covered linearly in all saturation levels B. The color deviations are already pleasingly low with a DeltaE of 5, related to the BT.709 standard color space C. The gamma correction is set to level 7, a gamma of 1.65 is achieved, with a somewhat flattened curve D.

We keep the Cinema Film 1 mode and set the laser to a minimum and the gamma to 2.4. We also specifically select the BT.709 color space. The color temperature remains as far as possible in the range around 6,500 Kelvin A. The standard color space BT.709 is accurately reproduced in all saturation levels B. The color deviations are below a DeltaE of 2, so they are no longer visible C. The gamma value of 2.18 is not entirely within the target but still ensures an excellent definition D.

With the connection of an HDR signal, the adjusted setting options are automatically available in the color management. With the picture mode set to „Reference HDR,“ the color temperature of D65, and the color space BT.2020, we find an excellent result; the laser remains at minimum brightness. The color temperature averages 6600 Kelvin, slightly above 6500 Kelvin A in the dark areas, and slightly below in the bright ones. The extended BT.2020 color space is covered by almost 100% B. The color deviations are again clearly below 3 and are at most measurably visible C. The gamma curve follows pretty closely the PQ curve required for HDR content D.



Sony VPL-VW890

Price	24.990 Euro
Distributor	Sony, Berlin
Phone	+49 1805 252586
Internet	www.sony.de

• Measured values	
Lumen (Lt. Manufacturer)	2200
Lumen (measured in Eco mode)	1430
Image brightness (at 6500 Kelvin) ...black/white	0.04/1430
ANSI contrast	340:1
Full-on / Full-off contrast	35750:1
Illumination (in %)	99
Operating noise (0.5 m/dB(A), in dB)	< 30
min. / max. distance (at 2 m image width, in m)	2.54/5.46
Projection ratio / zoom factor	1,27-2,73:1/2.06
Gamma (D65)	2.18
Dimensions W x H x D (in cm)	56/22.3/49.6
Weight (in kg)	22
Power consumption	
Standby / operation	< 0.3 W / 350 W (max), 330 W (80%), 200 W (min)
Lamp type	Laser
Price replacement lamp	not provided
Lamp life (in hours) Standard / Eco Cost per hour (in cents)	ca. 30000
Costs per hour (in cent)	0

• Image	60 %	
Contrast	10 %	★★★★★
Color reproduction	10 %	★★★★★
Sharpness	10 %	★★★★★
Geometry	10 %	★★★★★
Noise	10 %	★★★★★
Image smoothness	10 %	★★★★★
• Praxis	15 %	
Zoom factor	5 %	★★★★★
Fan noise	5 %	★★★★★
Operating costs	5 %	★★★★★
• Operation	15 %	
Device	5 %	★★★★★
Remote control	5 %	★★★★☆
Menus	5 %	★★★★★
• Features	5 %	
Build quality	5 %	★★★★★

• Equipment	
Projection principle	LCOS (3 x 0,74" SXRD panel)
Native resolution	4096 x 2160 (aspect ratio 16:9)
3D method	Frame Packing (Full HD 3D), Side-by-Side, Top-and-Bottom Frame Sequential (3D Ready)
Connections:	
...video / s-video	- / -
...VGA / RGB / DVI / HDMI	- / - / - / •
...Audio / 12 Volt Trigger / RS-232C ...Full HD	- / - / - / •
Motorized zoom	• / •
focus back pro / ceiling pro keystone compensation	• / •
Lens shift (manual / motorized)	- / •
Format switching 4:3 switching + various zoom modes	• / •
Remote control/illuminated	• / •
Signal compatibility	
480/60p, 576/50p, 720/60p, 720/50p, 1080/60i, 1080/50i, 1080/60p, 1080/50p, 1080/24p, 3840 x 2160/24p, 3840 x 2160/25p, 3840 x 2160/30p, 3840 x 2160/50p, 3840 x 2160/60p, 4096 x 2160/24p, 4096 x 2160/25p, 4096 x 2160/30p, 4096 x 2160/50p, 4096 x 2160/60p	
Special features	Laser light source, DolbyVision compatible

Reference class



Germany 3/21

Price/performance: good

- + excellent image quality
- + excellent HDR performance

Ultra-short distance projector: BenQ V7000i reviewed

BenQ V7000i – Ultra-Short Distance with Android TV

The BenQ V7000i not only looks very similar to the V6000 from the same manufacturer, both even use the same housing. However, that is where the similarities end because the V7000i now not only has a remarkably accurate color reproduction, it is also completely SmartTV capable thanks to the Android interface.



The BenQ is also available in black as the V7050i. The technology and the image quality are the same

The BenQ V7000i arrived in a living room-friendly white case with a fabric front. As V7050i, it is also available in black. Here, too, the design is based on the 6000 series, which is also available in both colors. Thanks to the metal cover, which opens with a whirring sound and reveals the laser optics when switched on, the V7000i delivers just as elegant an appearance as its siblings. Behind the fabric cover, which faces forward into the room when in use, are two speakers that can provide impressive sound with five watts each and the lush case volume. When it comes to know-how, BenQ was able to draw on its own experience and developers at the in-house brand treVolo, which is responsible for audio.

Huge but discreet

To achieve the impressive 100-inch screen diagonal, the V7000i's distance to the screen is only about 63 centimeters. As always with ultra-short-throw projectors, we refer to the distance of the optical unit and not, say, that of the back to the screen. For perfect alignment to the screen, BenQ has two extendable rulers on the back. This allows it to be set



In white, the BenQ blends in with a modern ambience

up absolutely parallel to the screen. If necessary, it can still be balanced with the help of screw feet, making the final, automatic keystone correction much easier. Eventually, the BenQ stands as inconspicuously on the sideboard as a medium-sized soundbar. When the screen is up, whether by motor or hand, you can't see anything until the blockbuster is inserted into a connected player. The screen rolls out, the metal lid above the laser optics elegantly moves to the side, and the cinema fun can begin.

Android TV on the projector

Ultra-short distance projectors with a laser light source such as the BenQ V7000i are now called Laser TV. The bundled dongle also includes a complete Android TV installation, so the projector can easily compete with the smart features of any TV. The user interface should look familiar to every owner of other Android-based devices. You will quickly find your way around, especially since many apps, such as the streaming services Amazon Prime, YouTube, and Sky, are already preinstalled. Other apps can be installed quickly because both the Play Store and a browser are only a click away.



The remote control is completely optimized for the Android interface. Even the microphone button for Google Assistant can be found immediately



Elegant fabric front

Nevertheless, you can access the typical projector settings just as quickly, namely with a single keystroke, when the familiar, clearly arranged settings menu from BenQ appears. Two of three USB ports are available for the integrated media player, and a third port supplies said dongle with power. What is still missing is a TV tuner for the classic reception via satellite, cable, or terrestrial antenna. However, there is still an HDMI input for a set-top box or a UHD player.

Setup and image quality

Apart from the Android interface, the entire imaging unit also distinguishes the V7000i from the 6000 series. Instead of the simple RGB color wheel, an RGBRGB color wheel is used, which minimizes the so-called rainbow effect. Furthermore, additional filters provide for a somewhat darker image. In return, the color fidelity and contrast range are significantly higher, which is especially good when playing HDR encoded movies.

The BenQ is set to „Bright Cinema“ picture mode ex-works, and the laser shines in economy mode. The color temperature is then pretty much at the desired 6500 Kelvin, and the standard color space for HDTV is generously covered. This is a good result right away, and we were curious to see what the newly integrated Filmmaker mode conjures up on the screen. In Filmmaker mode, the picture is reproduced precisely as the director and producer imagined it. The appropriate settings are already stored in many movies, and the BenQ V7000i can read and implement them.

Thus, it is hardly surprising that the result leaves nothing desired in terms of color temperature and color space coverage. The HDTV standard color space BT.709 is covered

so accurately that the color deviations have a DeltaE of just over 3.0 and can only be detected by a measuring device. The same applies to the extended cinema color space DCI P3, which can be selected directly in the BenQ's settings. When fed with an HDR signal, the BenQ delivers a high-contrast picture with exceptionally natural color reproduction in this setting. This is not only visible, but our measurements also show that BenQ has done everything right with the V7000i in terms of image quality.

Nevertheless, the contrast, in particular, depends considerably on any stray light that may be present and on the screen. These two factors result in poor black levels and thus a low contrast range in the worst case. This, in turn, reduces the quality, especially for HDR images, and can only be remedied with specially coated screens. Ideally, these screens absorb the annoying ambient light and reflect mainly the light coming from the projector. Especially ultra-short distance projectors are predestined for a contrast upgrade via



Connections on the backside



Even with the dongle inserted, two more USB interfaces are available for the integrated media player



screen because the light from the projector can be channeled particularly well here. BenQ has a suitable screen in its portfolio: However, the ALR Screen Ambient easily costs another EUR 2,250. The total package then approaches an impressive EUR 6,000. In return, you get a majestic screen diagonal of up to 120 inches! A corresponding TV of this size is not yet available, and even the currently available 80-inch TVs quickly reach similar price regions.

In dark living rooms, the BenQ knows how to put any TV in its place with the sheer size of the projected image. Beyond that, the two built-in two-way speakers can effortlessly provide the right soundscape for the picture. Here, too, there are various setting options to adjust the sound. You can also

easily connect external audio solutions to the digital audio output.

Conclusion

The V7000i adds a veritable home theater machine to BenQ's ultra-short distance projectors. The color reproduction and the excellent HDR performance will please every movie lover. The smart Android TV interface is not a drawback, quite the opposite; now, the UHD content of the various streaming services is directly available to the projector without a detour.

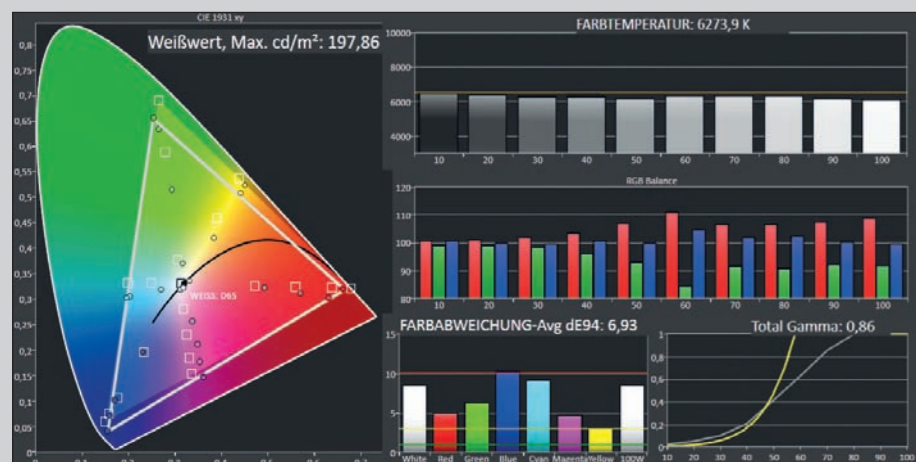
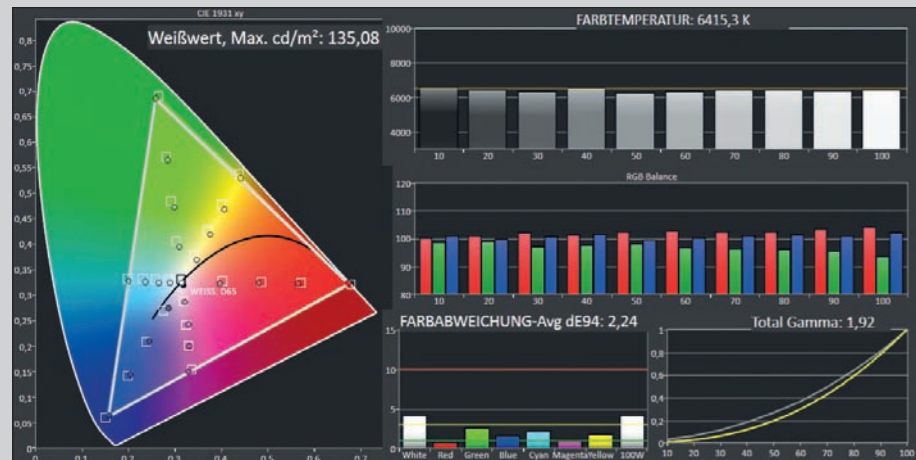
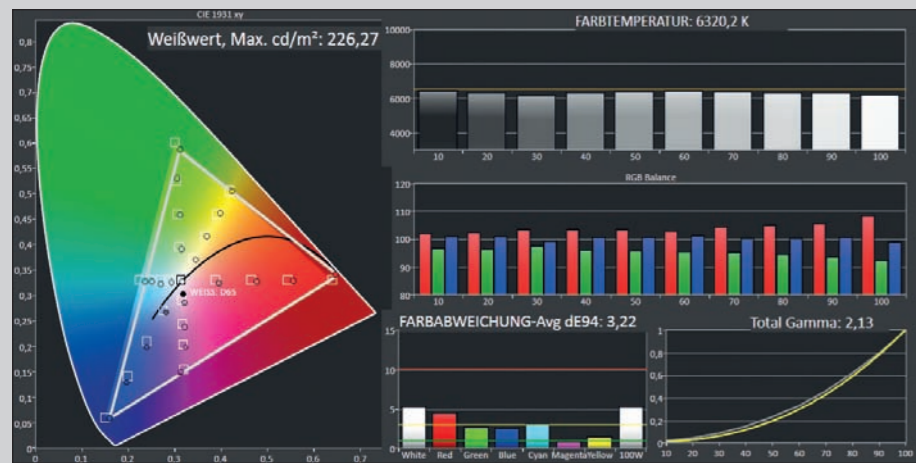


The dongle with the Android operating system is plugged into one of the two HDMI sockets, and it also occupies a USB socket that supplies it with power.



Adjustable stands

HOME CINEMA WORLD Laboratory



Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral

Technology: Color reproduction
We set the BenQ to the new „Filmmaker Mode,“ with the color temperature set to „normal“ and the laser at the bright normal position. The color temperature is slightly below the desired 6500 Kelvin and very linear across the entire brightness range A. The HDTV standard color space BT.709 is accurately covered B. The color deviations are just above a DeltaE of 3, so they are no longer perceptible to the naked eye C. The gamma curve is more like 2.2, despite the 2.4 setting, but this is still okay D.

We then selected the extended cinema color space DCI P3 in the menu and set the gamma value to 2.2, leaving the brightness and other settings as they were. The color temperature is now 6,400 Kelvin A across all brightness levels. The BenQ also reproduces the extended DCI P3 color space exactly in all saturation levels B. With the larger color space, the color deviations are now at a fabulous 2.2 DeltaE C. The gamma value is slightly below 2.0 on average and does not quite follow the curve shape D.

The V7000i is now fed with HDR signal and set to Filmmaker Mode, the gamma value can now no longer be influenced, and we set the color temperature to „cool“ by sight. The color temperature is again slightly below 6500 Kelvin A. The extended D65 P3 color space is covered completely, but not quite as accurately B. The color deviations have increased again C. The gamma values, on the other hand, follow the prescribed PQ curve very well D.



BenQ V7000i

Price	around 3,800 Euro
Distributor	BenQ, Oberhausen
Phone	+49208409420
Internet	www.benq.de

• **Measured values**

Lumen (Lt. Manufacturer)	2500
Lumen (measured in Eco mode)	765
Image brightness (at 6500 Kelvin) ...black/white	0.4 / 765
ANSI contrast 566:1	566:1
Full-on / Full-off contrast	1913:1
Illumination (in %)	88
Operating noise (0.5 m/dB(A), in dB)	> 30
min. / max. distance (at 2 m image width, in m)	0.5 / 0.5
Projection ratio / zoom factor	0.25:1 / 1
Gamma (D65)	2.13
Dimensions W x H x D (in cm)	50 x 15.7 x 38.8
Weight (in kg)	10
Power consumption standby / operation	< 0.3 W / 330 W
W (hrs.) / 220 W (Eco)	

Lamp type / Lamp wattage (in Watt)	Laserdiode
Price replacement lamp	not provided
Lamp life (in hrs)	
Standard / Eco / Cost per hr (in cents)	20.000
Cost per hr (in cents)	0

• Image	60 %	
Contrast	10 %	★★★★☆
Color reproduction	10 %	★★★★★
Sharpness	10 %	★★★★☆
Geometry	10 %	★★★★☆
Noise	10 %	★★★★☆
Image steadiness	10 %	★★★★☆

• Practice	15 %	
Zoom factor	5 %	★★★★☆
Fan noise	5 %	★★★★☆
Operating costs	5 %	★★★★★

• Operation	15 %	
Device	5 %	★★★★★
Remote control	5 %	★★★★★
Menus	5 %	★★★★★

• Features	5 %	★★★★★
• Build quality	5 %	★★★★★

• **Equipment**

Projection principle	DLP0.47"
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	- / -
... VGA / RGB / DVI / HDMI	- / - / - / •
... audio / 12 volt trigger / RS-232C	• / - / •
... Full HD	•
Motorized zoom / focus	- / -
rear pro / ceiling pro	- / •
keystone adjustment	Vert.: +/-30°, automatic
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
Features	HDMI dongle with Android TV included, integrated soundbar

Reference class



Germany 3/21

Price/performance: very good

- + outstanding image quality
- + accurate color management



Test: UHD-HDR-DLP-LED-Projector XGimi Horizon Pro

4K Streaming Cube

The borders are becoming increasingly blurred, and the XGimi Horizon Pro opens new horizons; the relatively compact projector can project 4K HDR movies onto the screen and is open for all streaming services thanks to its comprehensive network capability.

Although the compact Horizon Pro does not have a built-in battery, it can still be used very well on the go. The only requirement is a power outlet nearby so that it can prove its high luminosity. After all, even with optimized color reproduction, there are still just under 1000 lumens left for a brilliant picture. This would also be possible with a battery, but it would have to be quite large to guarantee this luminous efficiency for a whole movie. XGimi prefers mains operation and small dimensions that allow for flexible installation. There is even a tripod thread integrated, just in case.

With Android TV streaming like on the TV

The first thing you have to do is log in with your Google account via the projector. Nothing works before doing that. Afterward, you can find your way around the interface just as easily as on a smartphone - including the special projector settings, which are easily accessed via the gear wheel in the top right corner. Most interesting, however, are the streaming capabilities offered by the Horizon Pro. Netflix, YouTube, Amazon Prime Video, Google Play movies, and games are pre-installed, and additional apps can be downloaded from the Playstore at any time. The XGimi connects



Immediately after switching on or when the projector has been moved, it automatically refocuses the image via autofocus

to the Internet via Wi-Fi or LAN cable. The variety of movies can be browsed either via keyboard input or much more conveniently via voice input. Just press the „Google“ button on the remote control, and the Horizon Pro opens its ears.

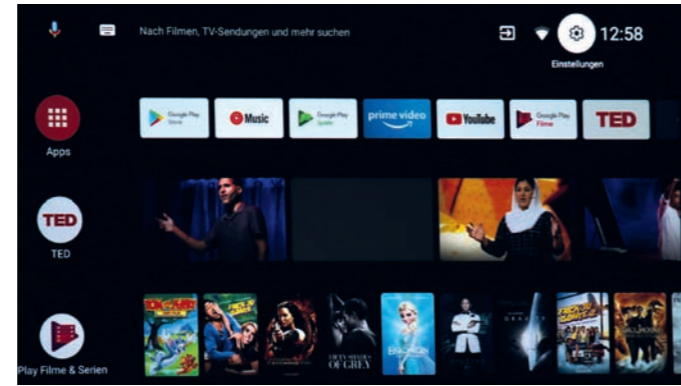
Sound from the audio experts

XGimi has been cooperating with Harman Kardon for a while now for proper audio reproduction. Thus, it is hardly surprising that the comparatively compact projector can output an astonishingly rich sound. It even does this in stereo, thanks to the two built-in speakers. In many cases, you can, therefore, even do without an external solution, enabling flexible use. The projector can also connect to an external soundbar or even a complete surround system via analog or digital audio output. However, the transmission via Bluetooth is particularly elegant because it is wireless.

Setup and image quality

There is not much to adjust on the XGimi. The projector automatically focuses the image after switching it on with the help of an extra test picture. Of course, this can also be done manually, although the automatic function worked excellently in our test. Since the XGimi has no zoom, the image size can only be varied by increasing or de-

Content can be transferred to the projector via HDMI, USB, LAN, and wirelessly via Bluetooth and Wi-Fi.



The most important streaming services are already installed; further apps can be easily loaded like on a smartphone

creasing the distance to the projection surface. Thanks to its compact dimensions, this also works very well and even better with the help of a screwed-on tripod. The same applies to the keystone correction, which can be done either automatically or manually. The button with the small gear wheel takes you directly to the projector settings. There you will find the menu for selecting the desired picture mode next to the keystone correction. The picture modes Film, Football, Office, Game, and Custom are available. The latter allows the most profound interventions in the projector's imaging performance, including the color temperature and the motion compensation.

The brightness can be adjusted separately. Again, five modes are available: „Standard,“ „Bright,“ „Eye Protection,“ „Performance,“ and „Custom.“ The „Eye Protection“ setting corresponds to the evening mode of a smartphone display, where the blue content is reduced in favor of a warmer display. In the „Custom“ mode, the intensity of the three primary colors, red, green, and blue, can be adjusted in ad-



The slim remote control also integrates the microphone for the voice assistants

dition to the overall brightness.

The individual brightness modes are no longer available when the environment adjustment is active. The projector then automatically adjusts the image to the ambient light. In our perfectly dimmed test room, it reduces the brightness to just under 600 lumens in this setting. As a pleasant side effect, the black level improves and thus the HDR experience.

Even when it is not pitch black, the compact Horizon displays a high-contrast image with natural colors. The use of an LED lamp helps to keep it that way for a long time, and no lamp has to be changed during the entire life of the projector.

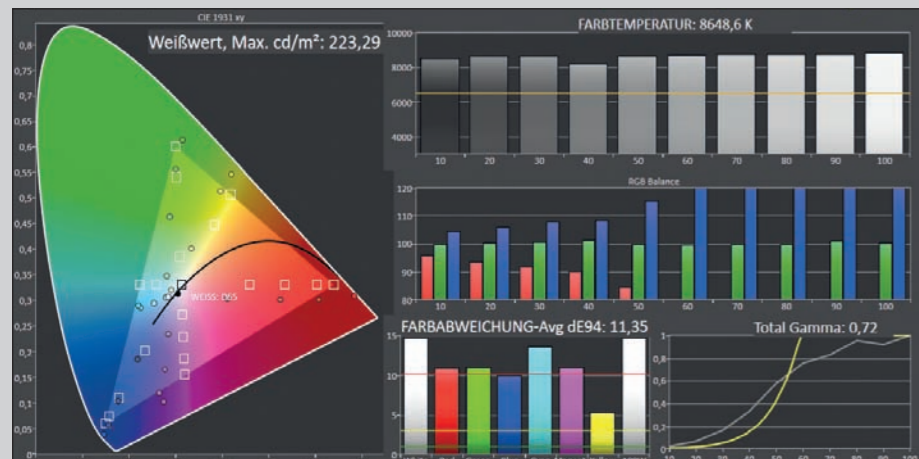


Conclusion

The XGimi Horizon Pro literally plays on all channels. Thanks to its extensive connectivity, it is perfect for streaming. In addition, it is uncritical in terms of placement. Picture and sound are of high quality, so it does without external support. Thanks to the Android TV interface, you also have everything in your sight and under control.

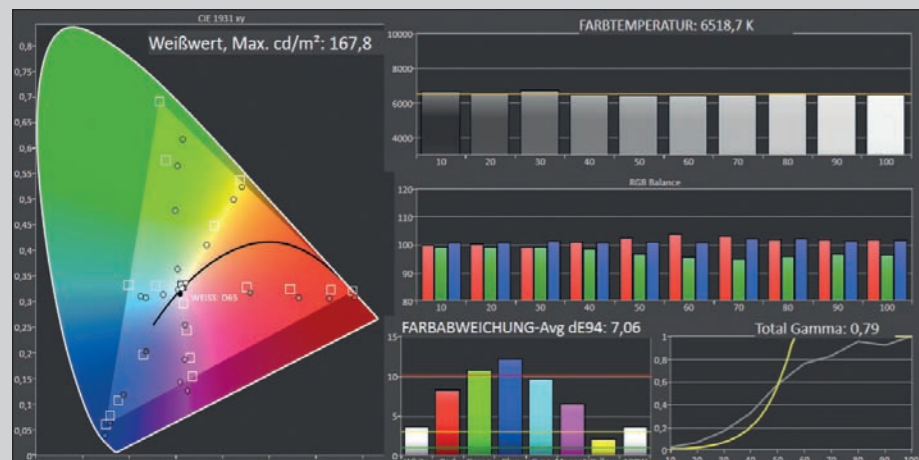
Only a few control buttons are necessary on the projector

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Technology: Color reproduction

We fed the XGimi directly with HDR material, and it promptly adjusts automatically to the high-quality input. However, the color temperature is relatively high at well over 8000 Kelvin, and the picture has a corresponding blue cast A. The standard color space for HDTV is generously covered B. The color deviations are pretty large, not least due to the widely shifted white point C. The gamma, on the other hand, approaches the required PQ curve very well D.



To get a better grip on the color temperature, we set the color management to user mode, where you have the option of making further adjustments. At first, we set the color temperature to „warm.“ This is now at the target with 6500 Kelvin across the entire brightness range A. The extended D65 P3 color space is largely reproduced B. The color deviations are now at a DeltaE of 7 C. The gamma value remains close to the required PQ curve D.

Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral



XGimi Horizon Pro

Price	1.700 Euro
Distribution	powered4YOU, Würzburg
Internet	www.powered4you.de

Measured values	
Lumen (According to manufacturer)	2200
Lumen (measured in Eco mode)	585
Image brightness (at 6500 Kelvin) ...black/white	1.2/585
ANSI contrast	232:1
Full-on / Full-off contrast	488:1
Illumination (in %)	97
Operating noise (0.5 m/dB(A), in dB)	< 30 dB
min. / max. distance (at 2 m image width, in m)	2.4/2.4
Projection ratio / zoom factor	1,2:1/1
Gamma (D65)	0.79
Dimensions (W x H x D in mm)	21.9/20.9/13.6
Weight (in kg)	2.9
Power consumption	
standby / operation	< 0,3 W/145 W (std.) / 165 W (power)
Lamp type / Lamp wattage (in watts)	LED
Price replacement lamp	not provided
Lamp life (in hrs)	Standard / Eco 25.000
Cost per hr (in cents)	0

Image	60 %	
Contrast	10 %	★★★★★
Color reproduction	10 %	★★★★★
Sharpness	10 %	★★★★★
Geometry	10 %	★★★★☆
Noise	10 %	★★★★★
Image smoothness	10 %	★★★★☆
Practice	15 %	
Zoom factor	5 %	★★★★★
Fan noise	5 %	★★★★★
Operating costs	5 %	★★★★★
Operation	15 %	
Device	5 %	★★★★★
Remote control	5 %	★★★★★
Remote Menus	5 %	★★★★★
Features	5 %	
Build quality	5 %	★★★★★

Features	
Projection principle	DLP 0.47"
Native resolution	1920 x 1080 (3840 x 2160 with XPR2 technology)
Connections:	
...Video / S-Video	- / -
...VGA / RGB / DVI / HDMI	- / - / - / •
...Audio / 12 Volt Trigger / RS-232C	• / - / -
...Full HD	•
Motorized zoom / focus	- / -
Rear pro / Ceiling pro	• / •
Keystone adjustment	Vert.: +/-40°, Hori.: +/-40° automatisch
Lens shift (manual/motorized)	- / -
Format switching	-
Remote control / illuminated	• / -
Signal compatibility	Pal, SECAM, NTSC, HDTV 720p, 1080i, 1080p, EDTV 480p, 576p
Special features	Android TV 10.0 installed

Top class

★★★★★

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Germany 3/21

Price/performance: very good

+ very good image quality
+ great sound



LG 75QNED99: 75 „Giant in a Class of its Own

8K Mini LED TV

LG's new large-screen TV features an LCD layer with a whopping 7,680 x 4,320 pixels and a backlight consisting of nearly 30,000 tiny LEDs.

The illumination with numerous so-called mini-LEDs offers several advantages compared to the conventional LED backlight. The extensive distribution of almost 30,000 lamps offers optical benefits with consistent illumination, higher brightness, and a wider viewing angle. The large number of LEDs also allows for significantly more dimming zones, in which the brightness can be controlled individually depending on the picture content. According to LG, the 75QNED99 has almost 2,500 dimming zones. Thus, bright areas in the picture appear radiant, while dark ones come close to the perfect black. LG also relies on Quantum

Dots, i.e., nano-particle doping, which provides bright, natural colors thanks to their optical properties.

Processor

Intelligent software and a fast processor with high computing power are required to control the numerous mini-LEDs. Thus, LG also employs the $\alpha 9$ Gen4 AI processor in the 75QNED99. It also masters AI Picture Pro and AI Sound Pro, which means it optimally prepares picture and sound scene by scene with the help of artificial intelligence.



The LG can be mounted on the wall or on its stands

webOS 6.0

As with its top OLED TVs, LG relies on the new, in-house smart TV operating system webOS 6.0. The various streaming contents are now displayed more clearly and are easier to access, and the Magic Remote has been given hotkeys for Netflix, Prime Video, Disney+, and LG Channels. A „Sports Alert“ now provides games, results, and other information about the favorite team. In addition, the individual menus have been revised and partly reorganized, which makes operation and settings more accessible. Of course, the TV

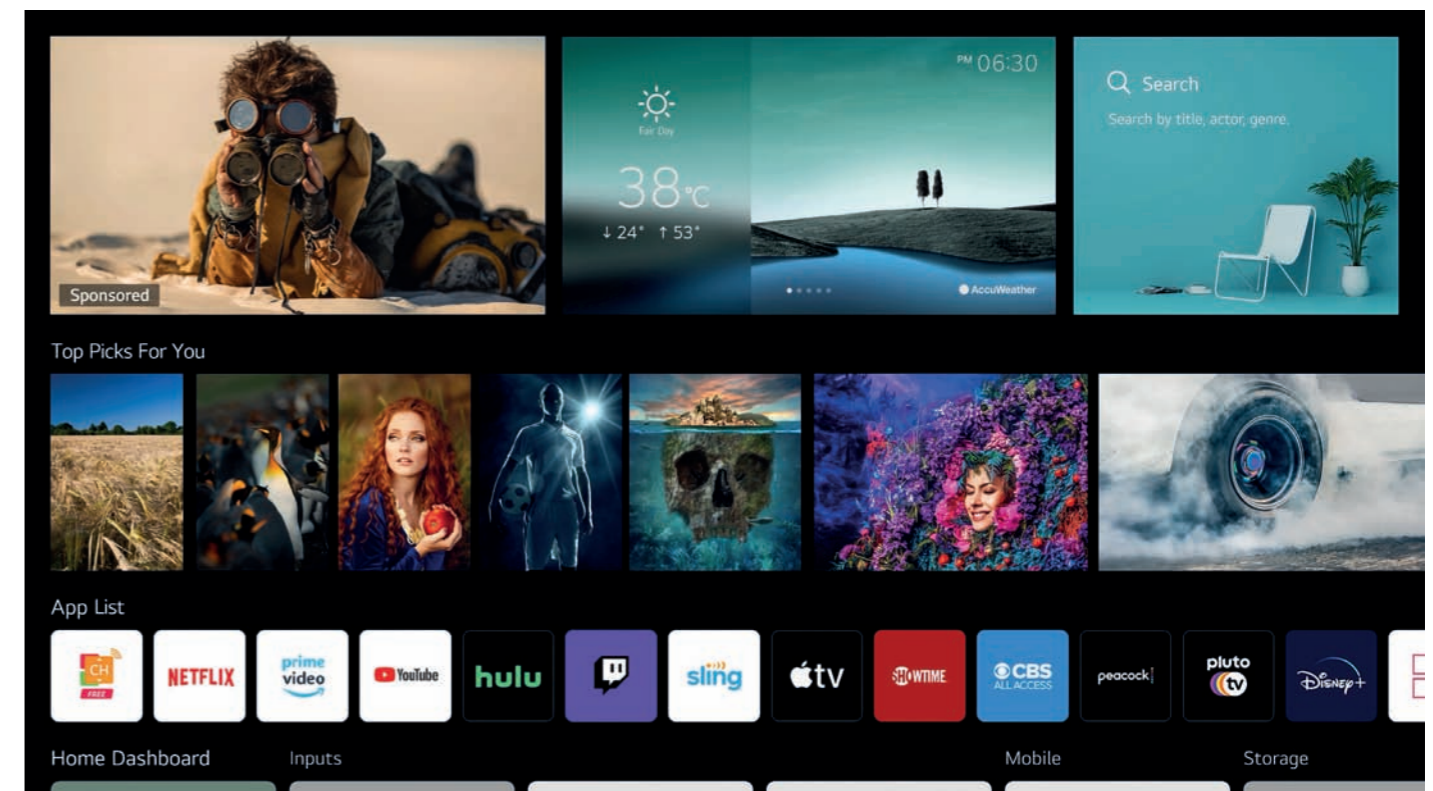
also supports Google Assistant, Amazon Alexa, and Apple AirPlay.

Equipment

Appropriate for the price range, the equipment is complete in terms of both hardware and software. HDR, including Dolby Vision IQ, is supported, as is Filmmaker Mode. Double tuner capabilities, 4x HDMI 2.1, and 3x USB 2.0 offer the complete entertainment program. LG has also thought of gamers and equipped the QNED99 with Auto Low Latency Mode (ALLM) and HGIG for smooth gaming experiences.

Picture quality

Of course, the 75-inch screen impresses directly with its sheer size. At a short viewing distance, it mercilessly reveals bad source material with its enormous resolution - just like a good hi-fi system exposes bad sound recordings. This is not a flaw but speaks for the quality of the panel. The 75QNED99 is at its best with 4k HDR material. The colors are incredibly brilliant without looking exaggerated or even unnatural. The contrast and depth of the picture almost come close to the performance of very good OLED TVs.



The new webOS 6.0

The image is also excellent in bright rooms, even at oblique viewing angles, thanks to the high peak brightness. If you feed the TV with native 8K material, it becomes breathtaking: You can confidently forget the traditional seating distance rules with this resolution.

Measurements

The excellent subjective picture impression is also confirmed in the lab. The LG does not show any weaknesses when viewed with the help of the UHD test pictures from www.hifi-test.de/shop, so there's no reason to tweak the picture parameters. Our incorruptible Minolta sensor confirms this, and the Calman software used certifies the 75QNED99's almost perfect measured values right out of the factory. A subsequent calibration is, therefore, unnecessary for our test sample.

Conclusion

Quantity meets quality: The LG 75QNED99 offers a great movie experience in every respect.



Price	approx 7000 Euro
Distribution	Panasonic
Internet	www.panasonic.com

• Measured values

Dimensions with base (W x H x D, in mm)	1665/1032/405
Weight in kg	40.8
Black level (cd/m2)	0.1
ANSI-Contrast	1.200:1
Color temperature in Kelvin (film mode)	6504
Power consumption operation / standby in W	170/0
EU energy label	G

• Image

40 %

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

• Sound

5 %

★★★★☆

• Features

30 %

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

• Build quality

5 %

★★★★☆

• Operation

20 %

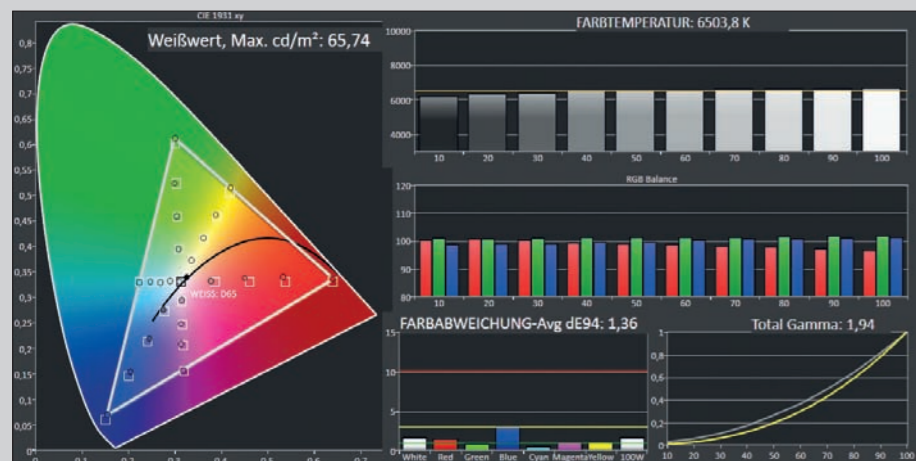
Remote control	5 %	★★★★☆
Recording	5 %	★★★★☆
Menu Smart TV	5 %	★★★★☆
Television menu	5 %	★★★★☆

LG 75QNED99

• Equipment

Screen diagonal in inch / cm / resolution	75/189/7.680 x 4.320
Tuner: DVB-T2 / -C / -S/S2	2/2/2
CI+ interface	•
HDR: HDR10 / HDR10+ / HLG / Dolby	• / - / • / •
HDMI / Scart / Cinch-AV	4/0/0
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

HOME CINEMA WORLD Laboratory



Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral

Technology: Color representation
Measurement with CalMAN software from Portrait Displays: The LG is excellently adjusted in Filmmaker mode, among other things. Color fidelity and temperature are already on point in the factory settings without any further calibration.

Lab measurements supported by Portrait Displays with CalMAN software from Spectral

Reference class



Germany 3/21

Price/performance: very good

- + Brilliant colors
- + Real 8K

LED- und OLED-TV from Panasonic

4K-TVs in 55 Inches

Panasonic has upgraded its new LED flagship JXW944 considerably. How close is the LED LCD TV to the new OLED JZW1004 from the same manufacturer?

The new JXW944 is available in 49, 55, 65, and 75-inch sizes, while the OLED JZW1004 is available in 48, 55, and 65-inch sizes. We tested both devices in the popular 55-inch format. In principle, the OLED is somewhat slimmer than the LED LCD TV, although the JXW944 is already very thin for an LCD. The most striking design difference between the two sets is the stand. The JZW1004 is mounted on a central, rotating base, while the JXW944 rests on two individual feet. The feet can be mounted in two positions: on the outside or more central. This allows the TV to stand steadily, even on smaller furniture.

AI processor

At the heart of both TVs is Panasonic's new HCX Pro AI processor, which is also used in the top model JZW2004. It analyzes the picture scene by scene in real time and compares it with over one million stored reference images. This allows it to optimize the picture parameters for the respective content - whether cinema, sports, games, music, or entertainment.

Equipment

The equipment lists of both TVs are almost identical. They have twin tuners for all types of reception and can even record two TV programs simultaneously. With four HDMI inputs, three USB sockets, and more, there are many connection options. Via TV>IP, content can even be streamed to other rooms. They also support dual Bluetooth, which means that two Bluetooth devices can be paired with the TV independently of each other.



The new version 6.0 of Panasonic's My Home Screen is on board as the smart TV system. Thus, all contemporary applications beyond classic TV are available. It is also praiseworthy that both TVs, including the inexpensive LED, support all common HDR formats, including the dynamic standards HDR10+ and Dolby Vision.

Picture modes

In contrast to its predecessor, HXW904, the LCD JXW944 now also supports Filmmaker Mode. The available picture modes are Auto AI, Dynamic, Normal, Cinema, True Cinema, Filmmaker Mode, User, Professional Photo, Professional1+2 (isfccc), Sport, Game, and Dolby Vision (Vivid / IQ / Dark). The OLED JZW1004 also offers Netflix Calibrated Mode. Of course, the various picture parameters can also be manually adjusted in both models.

Gaming

Both TVs offer gamers Game Mode Extreme with low latency and smooth, fluid images. They support HDMI 2.1 with variable frame rate (VRR) and high refresh rate (HFR). ALLM (Auto Low Latency Mode) automatically selects the lowest latency mode when connecting compatible consoles.



The JZW1004 is mounted rotatably on the central stand

The differences

The 800-Euro cheaper LED TV can thus definitely compete with the noble OLED TV in terms of processor, software, and equipment. Panasonic did not skimp here. The crucial difference, which also accounts for the price difference, is in the panel itself. OLED displays are still more expensive to manufacture than LED-LCD screens. Furthermore, the TVs differ in the sound system. While the JXW944 uses Panasonic's Cinema Surround Sound Pro, the JZW1004 has Reference Surround Sound Plus.



The stands of the LCD can be mounted central or at the sides of the TV

Image quality

The JXW944 doesn't show any weaknesses in the optical lab measurements with CalMAN. The color fidelity is impeccable, with a DeltaE below 2.5. And the contrast is also excellent for an LCD TV. Of course, the OLED knows how to go the extra mile here. Its perfect black exceeds the sensitivity of the highly sensitive sensor. The color reproduction of the JZW1004 can also be described as almost perfect. DeltaE is below 1 here; all measuring points are exactly where they belong in the color space.

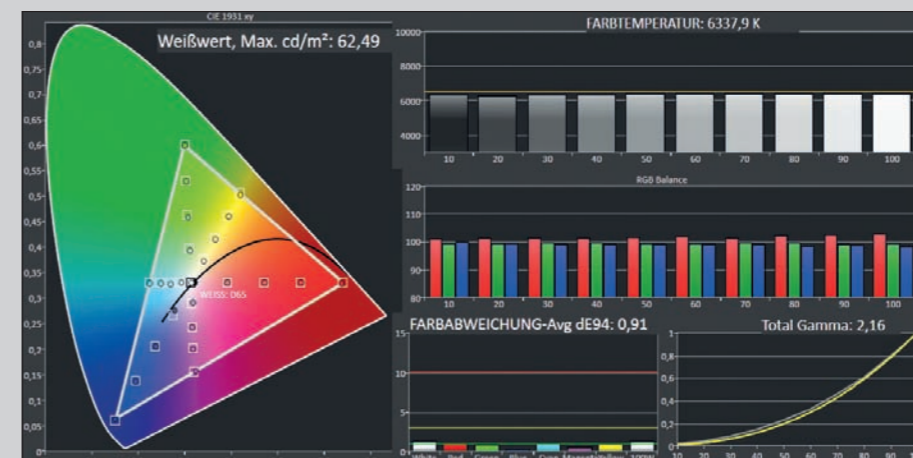
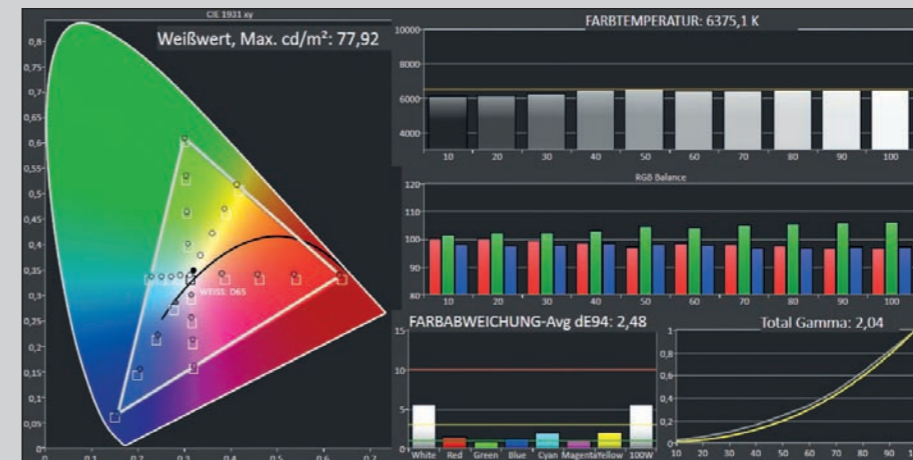
And both TVs also prove their high quality in the practical test with the test images from hifitest.de and various film material. The JXW944 shows bright, natural colors and also copes very well with demanding HDR material. Movies from Ultra HD Blu-ray are really fun. Another plus: The live TV picture in standard mode also excels with good quality and harmonious colors.

Unsurprisingly, the OLED is in no way inferior. On the contrary, it does everything a bit better, especially in darkened to subtly lit rooms. Panasonic has managed to bring the inexpensive LED a bit closer to the quality of the OLED JZW1004. However, the latter remains the benchmark together with some other OLED TVs in terms of picture quality.

Conclusion

With the TX-55JXW944, Panasonic has released an excellent LED-LCD TV with many of the top OLED TVs genes from the same company. There is enormous quality at a comparably low price. The TX-55JZW1004 offers even more image quality with its OLED panel and is recommended for movie enthusiasts who do not want to compromise.

HOME CINEMA WORLD Laboratory



Laboratory measurements supported by Portrait Displays with CalMAN software from Spectral



Price	approx 1200 Euro
Distribution	Panasonic
Internet	www.panasonic.com

• **Measured values**

Dimensions with base (W x H x D, in mm)	1,231 x 778 x 270
Weight in kg	19.5
Black level (cd/m ²)	0,028
Contrast	2286:1
Color temperature in Kelvin (movie mode)	6375
Power consumption operation/standby in W	80 / 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 %	★★★★☆
• Features	30 %	
Hardware	15 %	★★★★★
Software	15 %	★★★★★
• Build quality	5 %	★★★★☆
• Operation	20 %	
Remote control	5 %	★★★★☆
Recording	5 %	★★★★★
Menu Smart TV	5 %	★★★★☆
Television menu	5 %	★★★★★

Panasonic TX-55JXW944

• **Equipment**

Screen diagonal in inch / cm / Resolution	55 / 140 / 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 / - / 1
HDMI: CEC / ARC	• / •
Audio-out: analog / opt. / coax / ARC	- / • / - / •
Headphone jack	•
Bluetooth	•
Cardreader / LAN / WLAN	- / • / •
USB / player / recorder	3 / • / •
Smart TV system	My Home Screen 6.0
White balance/color calibration	• / •
Room light sensor	•
Voice / motion control	• / -
Other	Auto AI



Price	approx 2000 Euro
Distribution	Panasonic
Internet	www.panasonic.com

• **Measured values**

Dimensions with base (W x H x D, in mm)	1.227 x 771 x 348
Weight in kg	19,5
Black level (cd/m ²)	0,0003
Contrast	> 500.000:1
Color temperature in Kelvin (movie mode)	6338
Power consumption operation/standby in W	90 / 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 %	★★★★☆
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• Features	30 %	
Hardware	15 %	★★★★★
Software	15 %	★★★★★
• Build quality	5 %	★★★★☆
• Operation	20 %	
Remote control	5 %	★★★★☆
Recording	5 %	★★★★★
Menu Smart TV	5 %	★★★★☆
Television menu	5 %	★★★★★

Panasonic TX-55JZW1004

• **Equipment**

Screen diagonal in inch / cm / Resolution	55 / 140 / 3.840x2.160
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	My Home Screen 6.0
White balance/color calibration	• / •
Room light sensor	•
Voice / motion control	• / -
Other	Auto AI

Upper class



Germany 3/21

Price/performance: very good

- + very good image quality
- + all standard HDR formats
- + HDMI 2.1

Top class



Germany 3/21

Price/performance: very good

- + outstanding image quality
- + all standard HDR formats
- + outstanding image quality

Test: 5.1 Surround Set Polk Reserve Surroundset

High-Quality Surround Set from Polk Audio

A pair of good stereo speakers is a perfect basis for a good surround set. And if the manufacturer has done his homework, as Polk Audio shows us, you can even make it an excellent surround set.



Sound

5.1 SurroundsetHome Cinema World Sound Tip

Long story short: In the last issue, we featured a pair of floor-standing speakers that we liked exceptionally well - in this issue, we completed them to a home theater system.

Features

The Polk Audio Reserve R600s are slim columns 28 centimeters wide that rise a little over a meter in height. While they have two 160-millimeter drivers, the small R100 rears each feature a 130-millimeter woofer, and the R350 center has four 100-millimeter drivers. The set is completed with a subwoofer equipped with a 12-inch woofer and an active module that leaves hardly anything to be desired with a continuous output of 200 watts and 400 watts of peak power. The cabinet edges of the speakers are very rounded, which minimizes sound diffraction at the edges and gives the speakers a pleasing look. The surface is immaculately covered with a black textured foil. Especially when the gray cloth covers are mounted, the Polk speakers have an elegant understatement look, while things get much more technical with open drivers. The bass-midrange drivers are particularly striking due to their „turbine cone“ diaphragms. They consist of a core made of Polk's foam. The structured turbine shape of the Turbine Cone diaphragms is supposed to provide significantly more stiffness and damping.

In the bass, the drivers in the reflex speakers are supported by Polk's new Power Port 2.0, a downward bass reflex port. This port distributes the airflow more evenly and significantly reduces airflow noise, a technique also used in the subwoofer.

At 2.7 kilohertz, in all speakers, the one-inch ring radiator takes

over. It features a waveguide that improves the radiation of high-frequency energy, optimizing omnidirectional sound dispersion. A specially damped rear chamber suppresses unwanted resonances at the back. In the center, the outer two bass-midrange drivers are cut off at 1.4 kilohertz.

The similar construction of the drivers and the identical crossover frequency and tweeter are ideal conditions for a tonally homogeneous surround sound reproduction, which, by the way, can be produced across the entire Reserve family with the most diverse speaker sizes: There are three different floor-standers, two compact speakers, two centers and two subwoofers that can be combined with them. There should be something for every taste and every living room size.



The center R350 has a total of 4 bass-midrange drivers and the same fabulous ring radiator as tweeter that all the other reserve speakers also use

Suppose you want to go into the third dimension of surround with Dolby Atmos or DTS:X. In that case, Polk Audio has the R900 attachments on offer - basically, a two-way compact speaker that radiates diagonally upwards for this purpose.

Practice

The Polk Audio surround set delivers what the R600s tested in the stereo setup in the last issue promised: The modern drivers and innovative design provide a homogeneous surround sound that meets the

highest standards. With the floor-standing speakers, you already have two excellent Hi-Fi speakers for stereo music. The powerful subwoofer helps to even more definition and dynamics in the lowest frequency ranges. The slim center, which fits wonderfully under any TV, also provides a lot of dynamics for speech and effects with its four drivers. At the same time, the rear speakers integrate perfectly into the overall positive impression. Between us: Even the R100s are complete hi-fi speakers on their own, which can impressively fill small rooms with stereo sound. And as a team, our setup is virtually unbeatable for music and Hollywood.

The complete EISA-award-winning Reserve series, from which we put together a medium-sized setup for our test

Conclusion

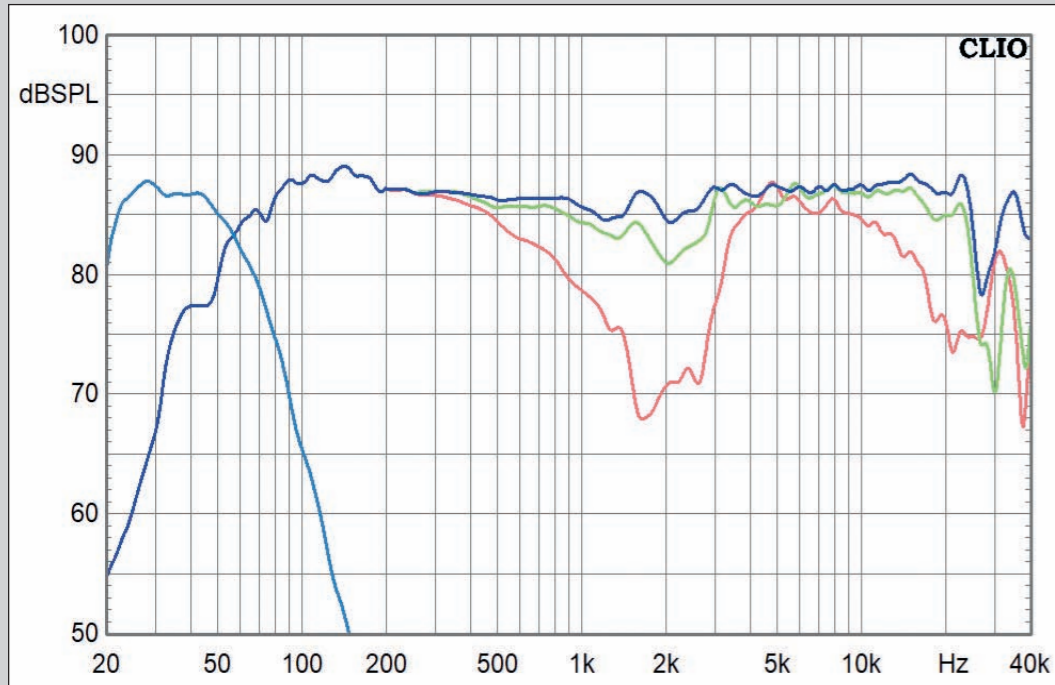
Each of Polk Audio's loudspeaker components is a real gem on its own - in combination, they become a fantastic surround set.



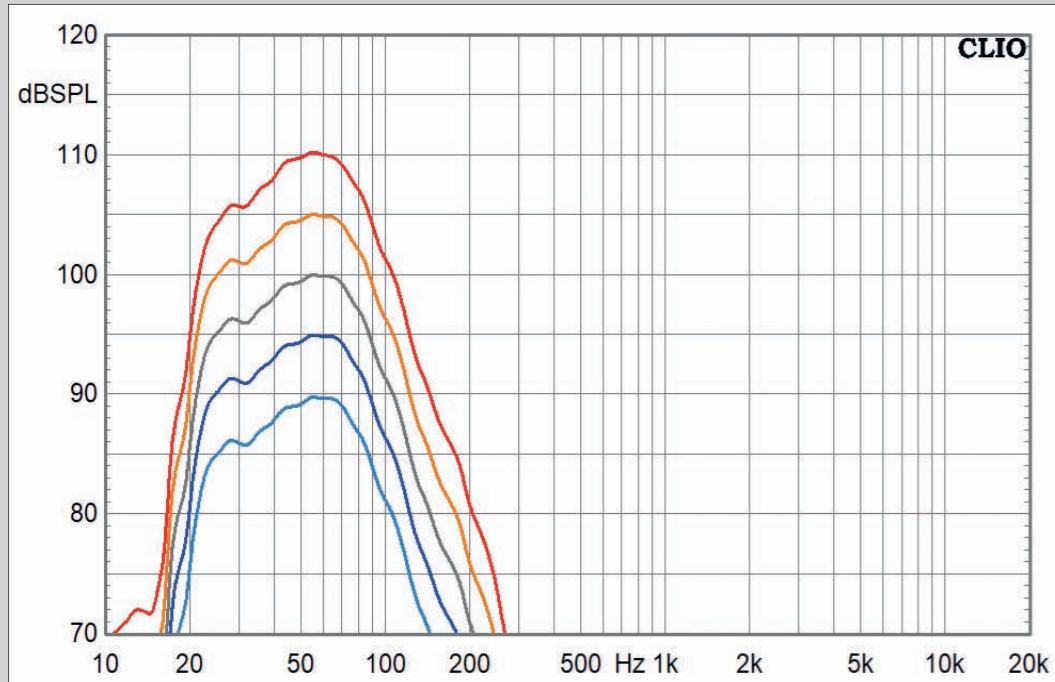
The HTS 12 subwoofer actually is not from the Reserve series, but it uses the same technology for the reflex tube.

HOME CINEMA WORLD Laboratory

■ Neutral ■ 50% ■ 100%



Frequency response center + subwoofer
Optimal interaction of the center and the subwoofer with an outstanding broadband and an excellent omnidirectional response for the chassis arrangement. Distortion and resonance play no role.



Dynamic range subwoofer
The subwoofer can make full use of its power and the excursion capability of the driver so that hardly any compression effects occur up to a level of 110 decibels. The frequency response extends into the 20-hertz region with a slight level drop.



Price	around 3650 Euro
Distribution	Polk Audio Deutschland, Netteta
Phone	02157 1208-0
Internet	www.polkaudio.com
Warranty	5 years

• **Features**

Dimensions (H x W x D in mm):	
Front R600	1064 x 281 x 382
Center R350	762 x 141 x 188
Rear R100	324 x 166 x 260
Subwoofer HTS12	435 x 470 x 460

Weight:	
Front R600	21,5
Center R350	9
Rear R100	5,5
Subwoofer HTS12	22,6

Construction	bass reflex
Center	closed
Connection	SingleWiring
Impedance	4 Ohm

Low-midrange driver (nominal diameter):	
Front	2 x 160 mm
Center	4 x 100 mm
Rear	1 x 130 mm
Subwoofer	1 x 305 mm
Tweeter 1 x ring radiator (Polk Pinnacle tweeter)	

• Sound	70 %	★★★★★
• Laboratory	10 %	★★★★★
• Practice	20 %	★★★★★

Polk Reserve Surroundset

Top class

★★★★★

HOME CINEMA WORLD

Germany 3/21

Price/performance: excellent

+ excellent sound
+ combination possibilities

Test: Soundbar Denon Home Sound Bar 550

Compact Soundbar from Denon

Even though we often associate the term soundbar with a highly integrated total solution, you can also choose the path of building a spartan base model focusing on sound quality and then expanding it as needed.





Four full-range drivers, two tweeters, and three passive diaphragms provide a rich sound

Denon is one of the veterans of the audio industry. With a company history that stretches back a whopping 111 years, they have plenty of experience with every kind of music reproduction and, of course, a high quality standard. The new Sound Bar 550 is a fine example of how Denon masters the demands of modern home entertainment.

Features

Let's look at the cute soundbar first: in black with a front covering in elegant anthracite. Behind it, there are six active speaker systems - 2 tweeters and four full-range drivers - and several passive membranes that ensure an adequate cut-off frequency. This can, of course, be lowered even further with an active subwoofer while at the same time increasing the dynamic capabilities of the overall system.

This subwoofer can be controlled wirelessly via Denon's HEOS system, as can the optional rear speakers. Denon is thus entirely in line with the trend that most manufacturers

are following today: A soundbar as the central unit of the system, which enhances the TV sound and can be expanded into a proper surround system if desired. Of course, a multi-room system can also be set up with HEOS. And with the corresponding app from Denon, the Home Sound Bar becomes a universal client for all relevant streaming services. On the input side, no wishes remain unfulfilled: There is a Toslink input for directly connecting the TV, while signals from external HiRes players enter the device via HDMI and are also looped through. The 550 connects to the network via LAN or WLAN and, of course, also supports Bluetooth. Controlling the device via Amazon Alexa or Apple AirPlay 2 goes without saying.

Praxis

The start-up and networking with the connected devices happen virtually by themselves and are done quickly. The Home Sound Bar 550 is operated via the built-in touch panel, the app, or the included remote control. As a special



If required, the Home Sound Bar 550 can also be mounted on the wall. In terms of connections, everything your heart desires is there



feature, the device can also be programmed for some essential functions on any external remote control, such as the user's TV.

Despite the comparatively meager configuration in terms of the number of built-in speakers, the sound is full and balanced in stereo mode: Here, the sophisticated DSP management of the chassis, each of which is controlled with its dedicated power amplifier, has an effect. An intelligent loudness function can adjust the frequency response to the human hearing curve depending on the selected volume and thus ensure perfect sound quality.

When a certain level is exceeded, a protective function also kicks in to protect the compact full-range drivers from excessive excursions. But as already mentioned: For live concerts at the original volume, you have to use the appropriate subwoofer, which offers different volume possibilities. Surround formats are also processed in the device's DSP and passed on so that the base width of the speakers is significantly expanded - for real rear effects, there are then the matching satellites in the Denon range. On its own, the Denon Home Sound Bar 550 shines with crystal-clear TV sound with excellent speech intelligibility and music playback quality that convinces even demanding Hi-Fi fans.

Conclusion

The Denon Home Sound Bar is a music-oriented compact solution with excellent sound that can easily be expanded into a high-quality surround and multi-room system.

Denon Home Sound Bar 550

Price	around 730 Euro
Distribution	Sound United, Nettetal
Phone	+49215712080
Internet	www.denon.de

Measured values

Dimensions (W x H x D in mm)	650 x 75 x 120
Weight	3,5 kg
Color	black
Functional principle	2.0 with virtual surround
Programs	dynamic EQ programs
Connections	HDMI, LAN, WiFi, Bluetooth, Aux, USB
Special features	Dolby Atmos, DTS:X, HEOS

- **Sound** 5 % ★★★★★
- **Praxis** 30 % ★★★★★

Top class



HOME CINEMA
WORLD

Germany 3/21
Price/performance:
good - very good

- + compact design
- + very good sound
- + versatility top class 1.1

Coming soon



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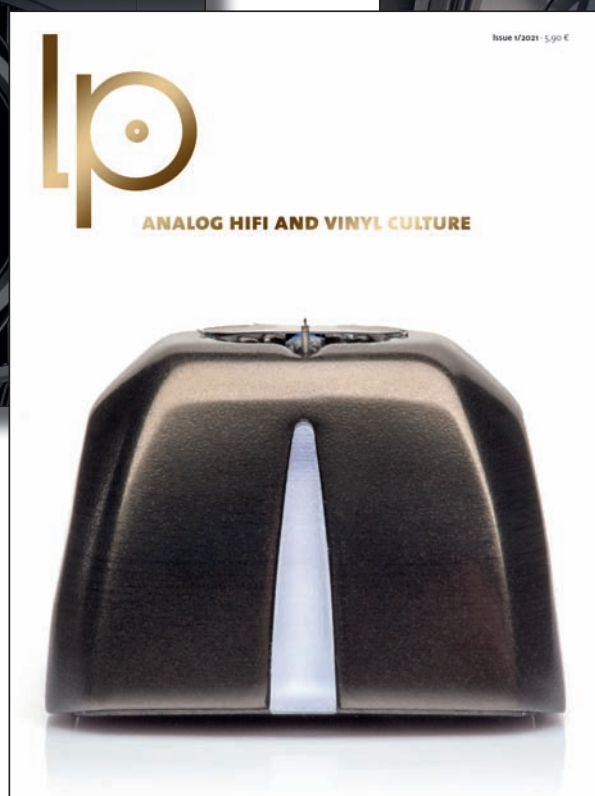
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