



KVÅLSVOLL DESIGN AS

New Generation Loudspeakers



Now developing the new generation loudspeakers

Good sound is addictive. It makes you want to hear just one more album of your favorite music, and movies become a totally immersing experience. Even watching a documentary is never the same, once you experience the difference really good sound makes.

The goal is to achieve some of the true dynamics and clarity from large, custom made loudspeaker systems, in a much more compact and less expensive package. Large sound requires large speakers, but there are some tricks that can be used to reduce size and improve visual appearance and still get some of the large, addictive sound.

This has resulted in loudspeakers providing a sonic presentation rather different from the usual home entertainment offerings.

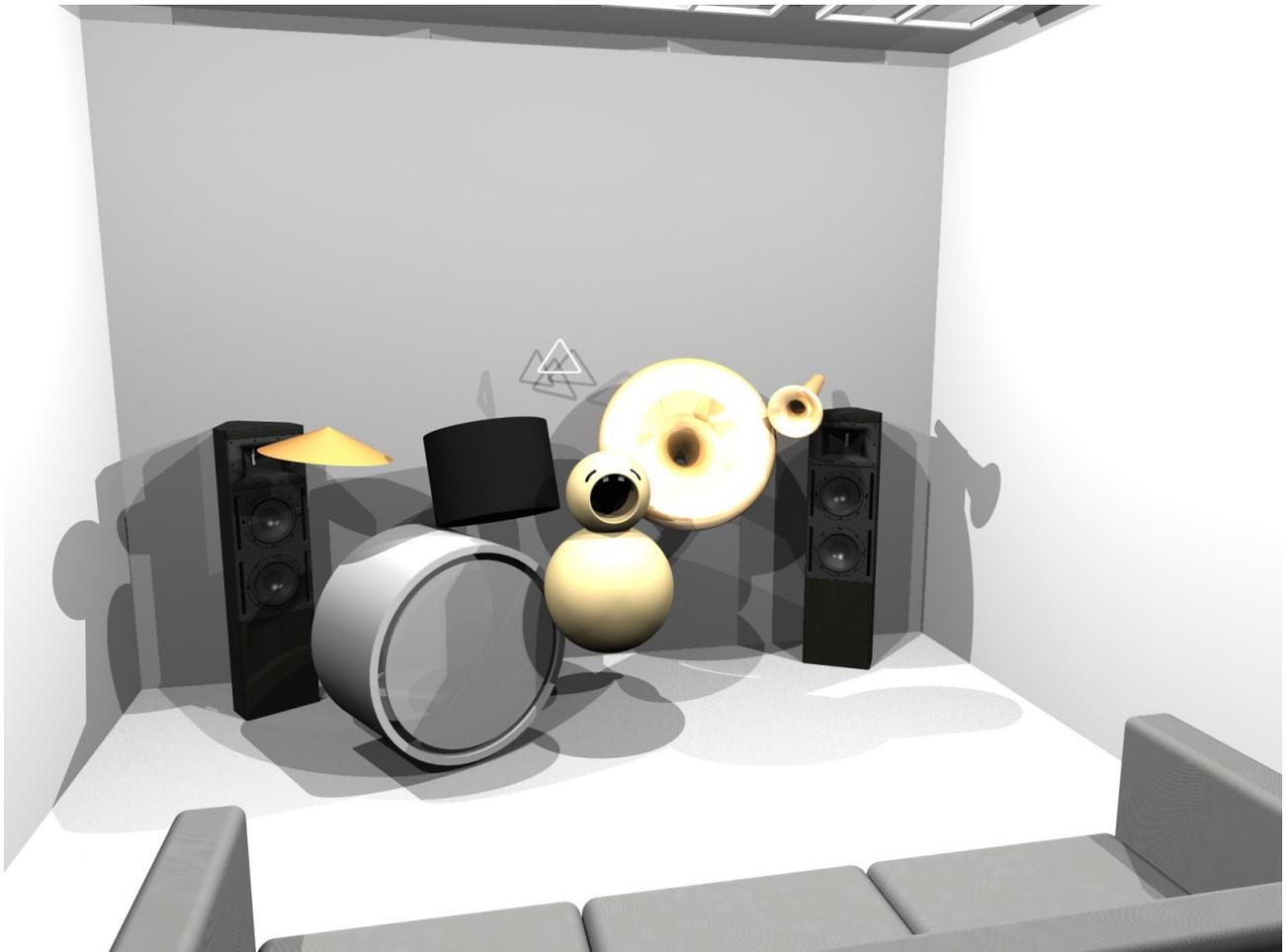
The difference for the casual listener

The sound – a totally new experience

You will get a totally immersing, physically present three-dimensional sound stage, where the individual sound sources like instruments, sound effects or actors in a movie takes on a physical dimension inside your room.

If you close your eyes, it is no longer possible to tell where the speakers are, sounds seem to appear from virtual locations all around the room – and this is with only two stereo speakers. It is quite common that people think the surround speakers are playing on 2-channel music, because the sound appears to come from locations even outside the front left and right speakers.

When sound appear like physical objects inside your living room the experience is taken to a different level



Crisp and sharp – like real world sounds

The character of the sound is very crisp and sharp, and contrasting – sharper sounds stand out crystal clear and creates a realistic illusion of a clearly defined sonic image, while other sounds can be totally immersing with a large, diffuse cloud-like appearance. The contrast between different sounds are augmented in the new generation speakers – some sounds are small, some soft and large, and some are big and powerful and sharp at the same time.

The bass range is powerful with physical impact and there is no rumble or muddiness. Full range bass means that even ordinary music get that special feeling of large size and weight, and in movies that really adds to the experience both for a subtle sense of atmosphere and realistic impact on sound effects.

This is something that can not really be fully described, you have to experience it for yourself.

Loud or soft – your choice

As you increase the sound level it sounds even more clear and when playing loud the sound effects in movies and also music will take on a physical presence, especially in the bass. With clean sound you will find it pleasant to listen at higher volumes, which will give you that live feeling of being there.

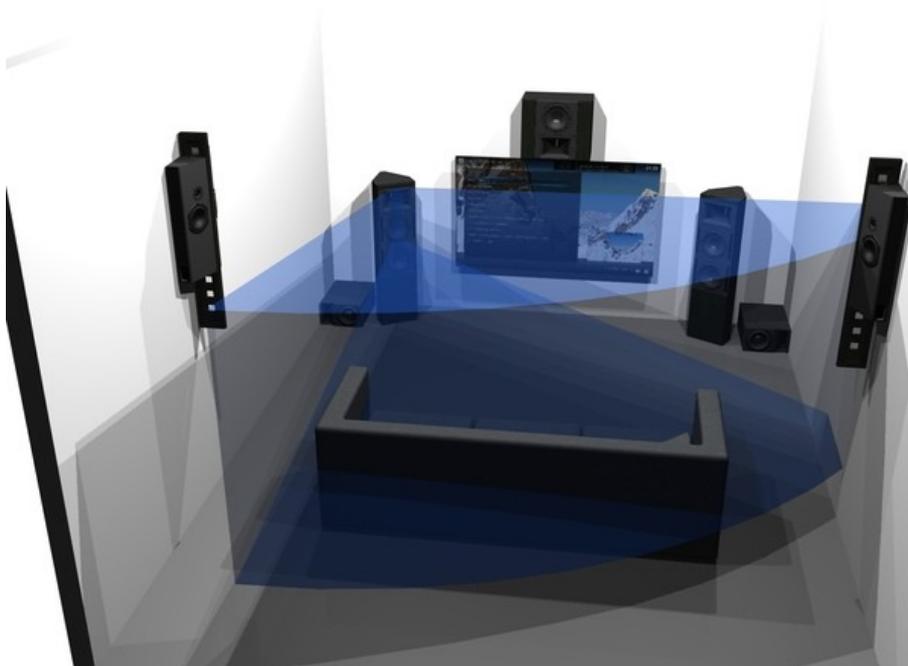
The same performance parameters that makes it sound pleasant at higher volumes, will also lead to better sound at lower volumes, in fact, it will be possible to play at very soft and low volume without missing much of the sound experience, part from that physical presence.

Good sound everywhere

Persons not located in the best position between the speakers will still get good sound, because the sound coverage is even across the whole seating area.

Also, sound is restricted inside the listening area, reducing the disturbing effects of surroundings such as walls.

Same sound for all listeners, but less sound in to walls



Interior design and sound

Small size is a relative term. It is a requirement that the speakers should have a size and visual appearance that makes them blend in and be possible to place in a home interior. So, the speakers are small, compared to the larger, custom installations, but for those who envisioned great sound from tiny plastic boxes hidden behind curtains – that is simply not possible, nor desired.

Speakers should appear as part of the total interior decoration, they should not be hidden. They should augment the interior style chosen by the owner, just like any other furniture or interior item. This demands great care must be taken in the visual design of the speakers, and the shape must be appropriate so that it is easy to place them properly.

Modern homes often have a minimalistic styling which unfortunately lead to less ideal acoustics for sound. The new generation speakers reduces the problem of bad acoustics by carefully designed sound radiation characteristics, so that you can enjoy good sound regardless of the interior style you choose.

And for the experienced

Exciting and entertaining

Exciting and entertaining sound is the primary goal, to combine life-like dynamics and contrast with neutral and uncolored sound.

Relatively small

The first thing noticed by some is the size of the speakers – rather modest, with small drivers, and even though there may be several subwoofers, each one is not very large. Can this sound good..

Compared to ordinary hi-fi speakers available in a nearby store, the size and appearance at first seems to fit nicely in between all the other offerings.

Direct and transparent sound

As for the sound, anyone who has experienced a very good system is familiar with a true three-dimensional soundstage and other aspects of high quality sound reproduction - full frequency range that extends below audible range, that dry, refined bass with punch and impact, and it is always clean and clear. All really good setups have this, more or less.

If you have never listened much to controlled directivity speakers or horns, it may take some time to get used to the forward and direct type of sound. They sound more transparent, but also a lot more forward, they do not mask anything, everything that is on the recording gets through.

Another thing that may come as a surprise is the bass – extension to well below 20Hz in combination with punch and impact is something that would usually require large bass arrays or bass horns.

Controlled directivity

The lack of early reflections makes it sound kind of like really good headphones, but with the sound field in front of you.

The controlled directivity means it is easier to integrate the speakers in rooms that has little acoustic absorption, like in modern minimalistic styled rooms.

However, if really excellent sound is the goal, proper placement and reasonable acoustics are required. This is where the experienced enthusiast can manage to take out the full potential from the speakers and get a result that one might not think possible compared to a quick and casual setup.



Full dynamics

Full dynamic range means the possibility to play at any level desired, and have full dynamic impact on transients.

The lack of early reflections and the clean impulse response of the speakers gives the sense of realism and impact on transients known from large horn loaded systems. This dynamic and entertaining sound character is present at lower listening levels as well, meaning you can actually play at lower volumes and still have the sense of liveliness.

Music or movies

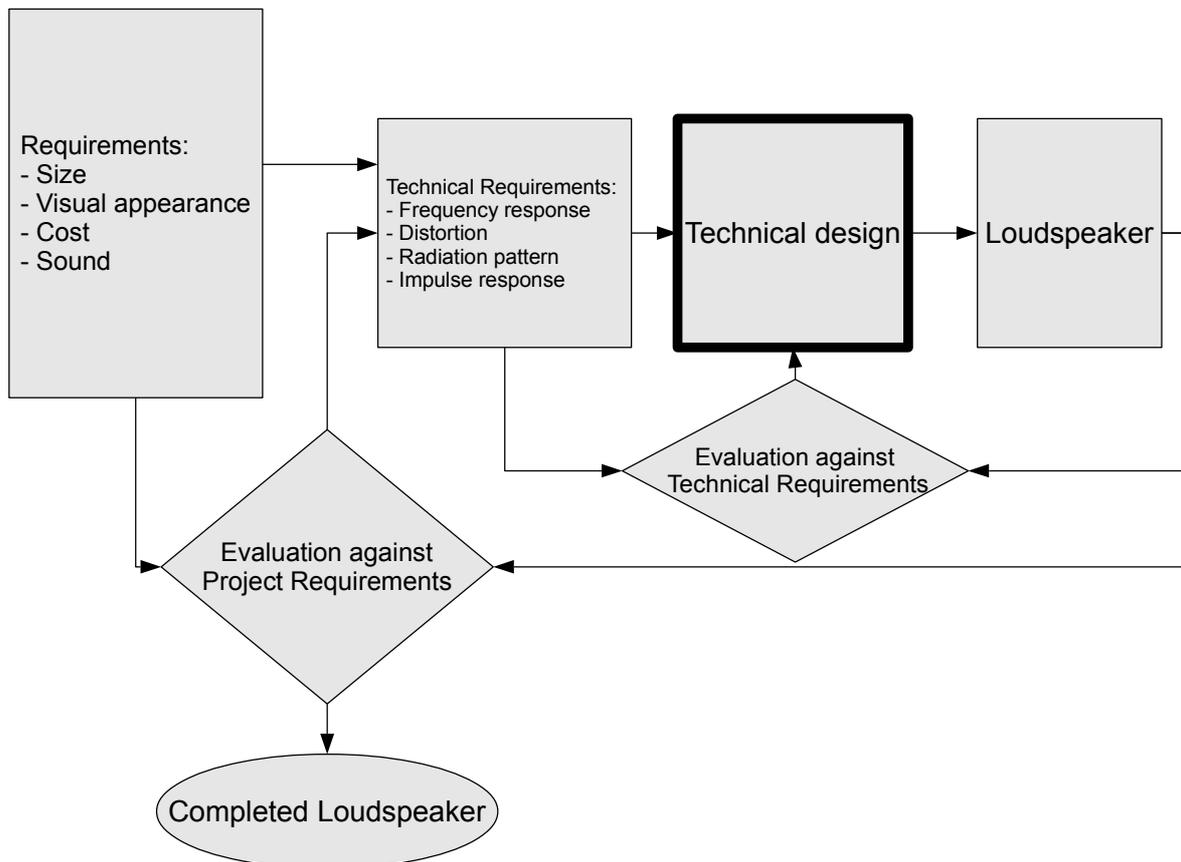
A good speaker sounds good on both music and movies. There are, however, some differences in requirements in the bass range.

For music it is generally more important to have a physical midbass with impact, if this is lost, it will easily sound flat and boring. Full frequency range is still required for lots of music, but there is rarely need for extremely large sound pressure levels at the lowest frequencies below 20Hz.

Movies require much greater capacity at the lowest frequencies down to and below 20Hz, for realistic reproduction of sound effects. Peak transient levels exceeding 120dB at the listening position is not uncommon.

Development process

Loudspeaker project development process



Requirements define the end result

The initial requirements will define and also limit the end result. This is especially important for sound quality, as it is the requirements set for sound character that defines how the end result will be.

Technical knowledge enables properly engineered solutions to satisfy those requirements, but proper initial requirements are mandatory to create a truly great sound.

Simulation

Behavior of physical systems can be predicted accurately by developing mathematical models to be run as simulations on a computer. This makes it possible to predict how a loudspeaker design performs, which then makes it possible to develop new and advanced high performance solutions with realistic and reasonable use of resources.

Simulation is the core of the engineering part of the development process at Kvålsvoll Design. This makes it possible to invent new solutions and predict how they perform even before building the first prototypes.

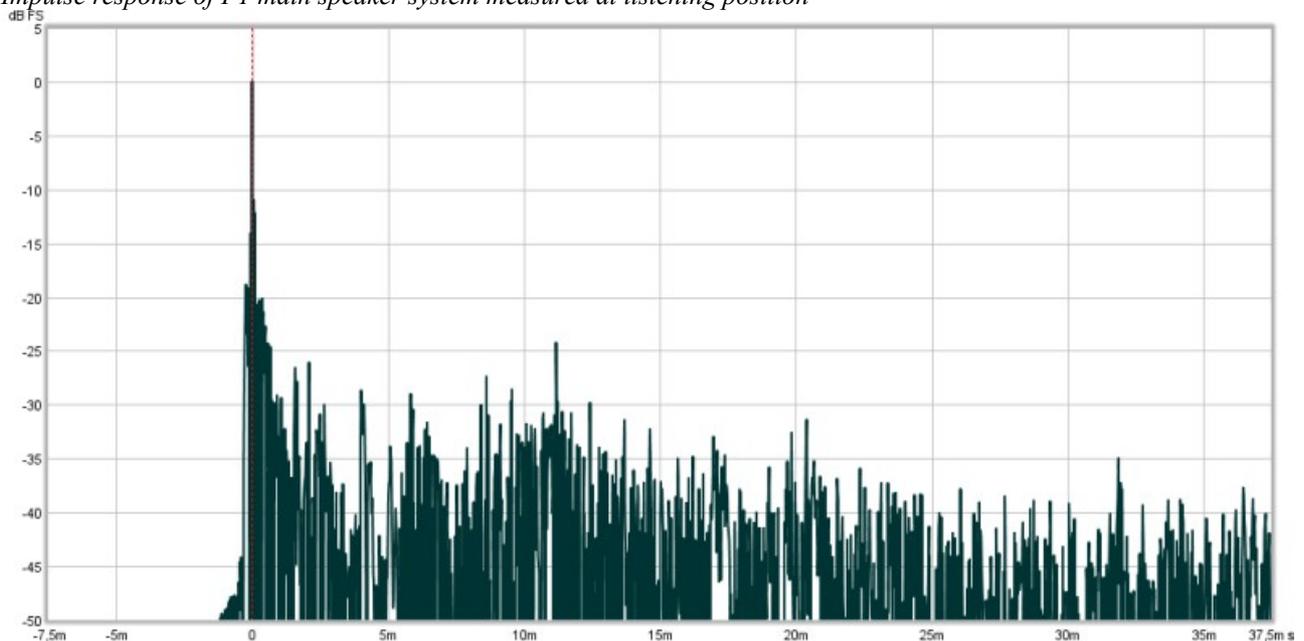
Some selected tech details

Studio-standard performance in your living room

This is the impulse response of a system with F1 front main speakers measured in an ordinary living room, with minimal acoustic treatment. The measurement shows studio-standard performance, in fact, many studios do not perform this well. This achievement is a result of the radiation characteristic and impulse response of the speakers. After 160 μ s the level is 20dB down, and well within 1ms the level is further down to below -25dB. This performance can now be obtained in your living room as well, with these speakers.

This is a difference that is very audible, early reflections disturb imaging and masks detail and clarity.

Impulse response of F1 main speaker system measured at listening position



Engineering and perfection

Acoustic ports for bass enhancement leaks unwanted sound in the midrange, unless appropriate measures are taken. Advanced computer simulation that accounts for internal shape and damping of the enclosure and acoustic ports reveal such issues even before the speaker is built. The same simulation techniques are then used to find and verify a fix. After the speaker is built, the performance is verified by acoustic measurements, and adjustments are made if necessary.

Is this audible, or is it just making the speaker more expensive to build and more resourceful to develop? The thing is, that even though every small improvement may not necessarily have a large impact on the end result, the sum of it all makes for a better end result and a very significant improvement in sound performance.

X-ray showing internal construction of the C1 center speaker



The addictive bass

How is it achieved, that addictive bass, with the combination of impact and weight, in relatively moderate size. The answer is horn loading and carefully selected acoustic alignment, based on the Compact Horn Subwoofer Technology.

You can read more about the Compact Horn subwoofers in the article at www.kvalsvoll.com/Articles/CompactSubwooferTechnology.htm.

Where to find the new generation speakers

Pay attention to announcements on the [Kvålsvoll Design web site – www.kvalsvoll.com](http://www.kvalsvoll.com) - for information on loudspeaker product releases and information on where to buy and see them.

And you are of course welcome to contact us for questions and more information on the new generation loudspeakers:

Contact information: www.kvalsvoll.com/contact.htm

