It appears that Q Acoustics’ Concept 40 loudspeakers are the result of a speaker design project that ‘went off the rails’... so to speak. It all started when the Concept 20i became so phenomenally successful for Q Acoustics that the company was inspired to build the Concept 20, which was equally successful. However, both were only small two-driver two-way bookshelf speakers with small cabinets and thus their deep bass response and maximum output levels were constrained by the immutable laws of physics. So when customers started asking for a model with more bass and more power-handling ability, Q Acoustics initially took the KISS (Keep It Simple & Straightforward) approach to design and simply added a second bass/midrange driver, while at the same time increasing the size of the cabinet to accommodate the second driver.

Alas, for once the KISS solution did not work... well it worked, but it didn’t give Q Acoustics’ hired-gun designer (none other than the famous Karl Heinz-Fink, of German design firm Fink Audio Konsulting, whose high-powered team includes Markus Strunk, Lampos Ferekidis, Henry Loch, and Bernd Sander) the increase in bass output he’d been aiming at, so he ended up souping-up both bass/midrange drivers by fitting them with much larger magnets, and adding additional Gelcore bracing inside the cabinet (which is itself made of Q Acoustics’ Gelcore material, about which more later).

This larger, ‘hotted-up’ design ticked all the boxes for Fink as well as his team and Q Acoustics’ product designer, Steve Reichert, so Q Acoustics went into production with the Concept 40 and having heard the back story, and been a huge fan of both the 2020i and the Concept 20, I couldn’t wait to get my hands on a pair of Concept 40s for review.

Q Acoustics Concept 40

LOUDSPEAKERS
I'm a huge fan of isolating tweeters, because the performance of a tweeter can be dramatically altered by cabinet vibrations...

THE EQUIPMENT

Although Fink souped-up the bass drivers with larger magnets, he didn’t take the seemingly obvious step of turning the Concept 40 into a 2½-way design so, despite its size, orientation and driver layout, the Concept 40 is still, electrically-speaking, a standard two-way design. Two identical drivers deliver bass and midrange and leave the delivery of high-frequencies to a single 25mm dome tweeter (the nominal crossover point is at 2.3kHz, slightly lower than the Concept 20’s 2.9kHz crossover point). As for those bass/midrange drivers, Q Acoustics’ website is surprisingly shy on technical detail, saying only that: ‘the low distortion drive units incorporate powerful oversized magnets to ensure wide dynamics and an ultra-fast transient response.’

You won’t see any signs of Fink’s souping-up on the exterior, because externally the driver is identical to the one used on the Concept 20, with a diameter of 125mm… or rather that’s the diameter specified by Q Acoustics. In fact the total moving diameter of the driver is 118mm, and the Thiele/Small diameter is 110mm. This puts the effective cone area (Sd) at 95cm². The cone material is a paper pulp that’s covered (on the visible side only, the rear of the cone is uncoated) by a thin coating of a material Q Acoustics says is made from ‘carbon-fibre and ceramic’. The speaker basket is made from pressed steel. However because the Concept 40 has two bass drivers covering the same bandwidth, the total effective area (Sd) available to deliver bass is 190cm². So if Fink had used a single driver to deliver this same equivalent area, it would have had a nominal diameter of around 165mm.

Why use two drivers, rather than simply fitting a single larger driver? Lots of reasons really: improved driver speed, increased dispersion at high frequencies, more seamless transition to the tweeter… all midrange issues but, as the late J. Gordon Holt, (founder and editor of famous US magazine Stereophile) once wrote: ‘If the midrange isn’t right, nothing else matters.’

The tweeter to which the twin bass/midrange drivers cross is exactly the same one that’s used in the Concept 20: a 25mm diameter soft-dome design with a very wide fabric suspension. So wide that my measurement put the overall diameter, including the suspension, as being 38mm, and the diameter of the dome on its own at 28mm. The tweeter operates from a shallow plastic horn and is powered by a neodymium magnet. But wait! There’s more… In common with many modern high-end loudspeaker designs, the tweeter is not fixed directly to the Concept 40’s front baffle, but is vibrationally isolated from it by means of a very flexible soft rubberised surround… though this has been done so artfully it’s difficult to discern.

I’m a huge fan of isolating tweeters in this fashion, because the performance of a tweeter can be dramatically altered by cabinet vibrations. By way of example, consider this extreme example: To deliver an audio signal at 10kHz, a tweeter dome has to move back and forward ten thousand times every second, and this forward/backward movement amounts to only a few microns of travel. So if a loudspeaker cabinet is also vibrating at 10kHz (sympathetic vibration induced in it by the movement of the tweeter itself), and the cabinet moves ‘backwards’ at the same moment the tweeter’s dome moves ‘forwards’, the net movement of the dome in the air would be zero, so no sound would be produced at all. Such a scenario (total sound cancellation) is impossible, but in reality any vibration of a speaker baffle has the potential to adversely affect the performance of a tweeter… and in turn the quality of the high-frequency sound you will hear from it. But with the Concept 40, Q Acoustics has done more than prevent cabinet vibrations from reaching the tweeter… it’s tried to prevent the cabinet from vibrating because, as Q Acoustics’ Steve Reichert says: ‘Cabinet vibrations are the elephant in the room in speaker design, because (…) they mask the low-level detail in the music.’

It’s to prevent the cabinet from vibrating that Q Acoustics makes the sides, top and bottom of the Concept 40 cabinet from a material it calls ‘Gelcore’, which is a three-layer ‘sandwich’ where the outer (‘bread’) layers are made from 10mm medium density fibreboard (MDF) and the ‘filling’ is a 1mm layer of non-hardening adhesive material that bonds the two layers together but never sets. The idea is that vibrations in one layer of MDF are not transmitted to the next layer, because the adhesive material absorbs them and converts them into heat.
However, although Reichert says this is a 'cabinet within a cabinet' this is not strictly true, since the front baffle and rear panel are made not from Gelcore but from conventional—albeit thicker—MDF.

Size-wise, the Concept 40s check in as being 972mm high, 288mm deep and 170mm wide. They weigh in at 18.5kg. They're available in two finishes—both of them stunning, I have to say (they're available in either high-gloss black or high-gloss white... I prefer the white), whose appearance is further enhanced by the use of alloy plating around the drivers. Each speaker cabinet is supported by three beautifully chromed feet, two of which are attached to a piece of angled safety glass that has to be bolted to the rear of the cabinet (it's held in place by a rubber-backed section of powder-coated steel plate) prior to installation. The third foot is attached to the front of the cabinet itself. I'd be the first to admit that the visual effect of these glass/chrome 'wings' is stunning—it looks absolutely fabulous, and it means the speaker can't 'rock' like one with a four-footed support. However the threepoint design compromises the stability of the speakers in the forward/sideways direction, such that a small amount of angular force from either rear corner of the cabinet will see them topple over. So careful positioning and/or some type of anchor would be advisable.

**IN USE AND LISTENING SESSIONS**

As with the Concept 20s, I had no doubt that the Concept 40s' high-frequency performance was the high point when I was listening. The tweeter's ability to reveal even the most microscopically small acoustic details in the upper treble region will make your jaw drop. To experience it, listen carefully to the shimmer after a drummer has hit a cymbal and let it ride... but the trick here is to listen not just to the sound of the cymbal but instead to the other high-frequency sounds being reproduced at the same time. I used one of my favourite test tracks, *Lover's Mask*, from Michael Ruff's album 'Speaking in Melodies', which also has precisely picked guitar riffs. My only minor niggle was that, as had happened with the Concept 20s, if I played these speakers for extended periods of time at very high volume levels, I heard the treble 'soften', so it became a little laid-back compared to the midrange, but once I turned the volume back down to 'normal-to-loud' levels, the correct tonal balance quickly reappeared.

But if I thought the high-frequencies were the stand-out area of sonic performance for the Concept 40s (and I hope I've made it obvious that I did), this time around they were definitely competing with the bass response for my highest accolades. The additional bass driver, the increased magnetic force, and the much larger cabinet compared to the Concept 20s means the bass digs far deeper into the bottom octaves and also meant that I was able to wind up the volume considerably higher, so the bass become deeper, harder-hitting and much, much louder... a winning trifecta for any loudspeaker. Moreover, the 'feel' of the bass was super-comfortable to my ears, being tuneful, nicely paced and well-mannered, with none of the 'false' upper bass that's often deliberately engineered into some speakers to make them stand out on the showroom floor during a quick audition. This is bass that's been perfectly balanced for the long haul in your own living room. Indeed the bass of the Concept 40s is so perfectly balanced against the midrange that your first impression might be that there's too little of it. Don't be fooled... what you're hearing is exactly right.

I also found the midrange to be outstanding, hearing excellent clarity when listening to vocalists, and also accurate timbral reproduction. I thought there was a very slight loss of articulation compared to the Concept 20s, but the Concept 40s more than compensated for this by sounding 'way fuller and richer across the entire midrange, while at the same time imbuing a greater overall sense of smoothness to the overall sound... complementing the smoothness I remarked on that also characterises this speaker's delivery of bass.

Three-driver two-way speakers can never deliver quite the imaging precision of two-driver two-ways, but I was still impressed with the spatial accuracy of the Concept 40s' presentation. Sit in the sweet spot and you will hear a hugely wide spread of sound, extending 'way beyond the actual physical positions of the left and right speakers, with musicians positioned accurately across the full width. Image height is there in abundance... this is an important component of imaging that the Concept 40s do really well... as they also do with image depth.

**CONCLUSION**

I have to say it again: the design and execution of Q Acoustics' Concept 40 speakers is unbelievably good. The superb gloss finish, the rounded corners, the fact they look equally good with or without their grilles, the stylish chrome/glass tripod support system... these speakers look so good they really wouldn't be out of place as an exhibit in a museum of modern art. And the even-better news? They sound every bit as good as they look. 'Win-win' is what I say.

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**greg borrowman**
LABORATORY TEST RESULTS

Newport Test Labs measured the overall frequency response of the Q Acoustics Concept 40 loudspeakers as being 42Hz-33kHz ±3dB, which is an outstanding result, and this is the response that’s shown in Graph 1. As you can see from the caption, the trace shown is the result of using two different measurement techniques, one for low and midrange frequencies, and the other for high frequencies. Using two methods allows both frequency resolution and level accuracy over the entire audio frequency range—something that is not possible when using any single measurement technique. The response isn’t only within ±3dB over a very wide bandwidth, it’s also spectrally neutral, so the minor variations in the response are spread equally over the bandwidth—that is to say the response isn’t ‘skewed’ at all (such a skew would tend to emphasise either the bass or the treble), neither is there any specific spread of frequencies that is higher or lower than the average. You can see there’s a slight discontinuity around 4–5kHz, but it’s very small, and only obvious because the remainder of the frequency response is so flat.

An expanded view of the Q Acoustics Concept 40’s high-frequency response is shown in Graph 2, this time showing the difference between using the speakers with the grilles on (red trace) and with the grilles off (black trace). You can see the response is marginally flatter when the grilles aren’t fitted, but the differences are so slight, and at such a high frequency (well above the highest notes on a piano keyboard), that I’d recommend leaving the grilles in place.

Low-frequency response is shown in Graph 3. You can see that the bass/midrange drivers start rolling off fairly smoothly below around 120Hz, but the bass reflex port takes over nicely to compensate, with its output peaking at 50Hz and only 6dB down at 34Hz and 110Hz. The maximum output of the port has been tuned slightly below the bass/midrange drivers’ minima at 53Hz. The port has a little unwanted high-frequency leakage centred at 700Hz, and you can see this has a slight effect on the bass/midrange drivers’ output, visible on the traces immediately above, as well as on Graph 1, though you can see from Graph 1 how slight the effect is... less than 0.5dB. The slight dip in the response of the bass/midrange drivers at around 180Hz appears to be caused by a resonance of some sort. It’s fairly minor and so sharp that I doubt it would be audible and because each of the two drivers is affected differently, they tend to cancel each other out.

Newport Test Labs’ graph of impedance shows firstly that the pair-matching between the left and right speakers is excellent (the red and yellow traces). It also shows that the electrical crossover point is at around 1.7kHz, so presumably the 2.3kHz figure quoted in the specification is the acoustic crossover point. Judging by these results, I’d suggest the nominal impedance of the Q Acoustics Concept 40 is actually 6Ω rather than the 8Ω quoted, but the impedance is mostly above this, and never drops below 4Ω, so the speakers will be an easy load for any amplifier, not least because the phase angle (blue trace) is benign. I noted that the discontinuity on the trace shifts from 180Hz to 200Hz when the lower section of the crossover is disconnected, so what I thought was a resonance might also be related to the crossover network. However, since I can’t see any effect on the overall frequency response (Graph 1) around this frequency it would appear to be just a curious artefact of the design.

The sensitivity of the Q Acoustics Concept 40 was measured by Newport Test Labs as being 87.5dBSPL at one metre, using a 2.83Veq input and that lab’s standard, rigorous test procedure. This is quite a bit lower than the 90dBSPoL quoted by Q Acoustics, which obviously uses a different measurement technique, but it’s still a solid, above-average result that will mean you’ll be able to get high sound pressure levels from these speakers with only modest amounts of power.

Overall, the Q Acoustics Concept 40 speakers performed outstandingly well in all Newport Test Labs’ tests. This is a really well thought-out and implemented design with impressively-extended bass response, a superbly-extended high-frequency response and excellent overall linearity. -

Steve Holding
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