

stereophile

ART DUDLEY

Stenheim Alumine

LOUDSPEAKER



The sound of the Stenheim Alumine loudspeaker—its openness, transparency, and freedom from temporal distortions, not to mention its good bass extension for such a small enclosure—reminded me at once of my favorite small loudspeaker from the late 1980s, the Acoustic Energy AE1. On reflection, the comparison is extraordinary: The two products are as different as night and day, the AE1 being a wooden loudspeaker with a metal-cone woofer, the Alumine a metal loudspeaker with a pulp-cone woofer. I suppose one can skin a catfish by moving the knife or by moving the fish.

Yet from there, similarities win the day. Both products originate from the school of thought that says a loudspeaker enclosure should be as inert as possible (as opposed to the school that permits some panel resonances). Both designs employ front-panel reflex ports (one in the Stenheim, two in the AE1). Both use decidedly nonminimalist crossover networks. Both are intended for use on purpose-built aluminum stands.

And both speakers are, or were, noted for being expensive, if not quite rapaciously so. In 1988, at a time when my loudspeaker budget could barely stretch to four figures, the Acoustic Energy AE1s—which I coveted—were out of reach

SPECIFICATIONS

Description Two-way, reflex-loaded dynamic loudspeaker. Drive-units: 1" (25mm) fabric-dome tweeter, 5" (165mm) fiber-cone mid/woofer. Measured crossover frequency: 2.2kHz. Frequency response: 45Hz–30kHz, –6dB (half-space); 60Hz–30kHz, –6dB

(anechoic). Impedance: 8 ohms nominal, 5.8 ohms minimum. Sensitivity: 90dB/2.83V/m. Power handling: 90W RMS, 200W peak. Recommended amplification: 20–200W. **Dimensions 13" (330mm) H by 9.1" (230mm) W by 10.8" (275mm) D. Weight**

(without stand): 37.4 lbs (17kg).

Finishes Dark aluminum; extra-cost options available.

Serial number of units reviewed 1102 (L & R).

Price \$12,795/pair. Stands: \$2275/pair. Approximate number of dealers: 5.

Manufacturer Stenheim,

Au Vieux Village 14, 1035 Bournens, Switzerland.

Tel: (41) 21-731-5886.

Fax: (41) 21-731-5887.

www.stenheim.com.

US distributor: Audio Arts,

1 Astor Place, Suite 11H, New York, NY 10003.

Tel: (212) 260-2939.

www.audioarts.co.

at \$1500/pair. In 2012, at a time when I continue to be delighted by my Audio Note AN-E SPe/HE speakers (\$8475/pair), the Stenheim Alumines are likewise more expensive by half: \$12,795/pair. *Plus ça change...*

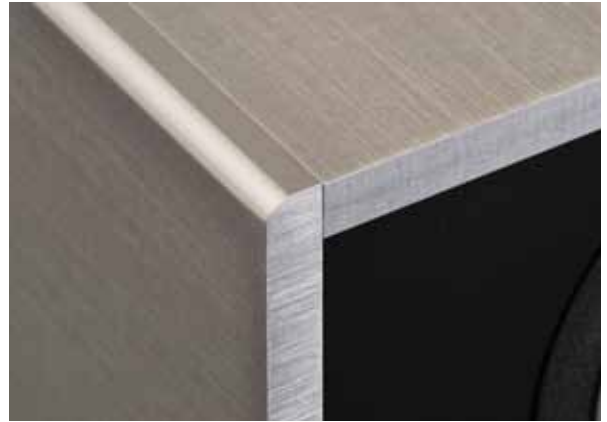
Description

Stenheim was founded in Switzerland by four former employees of Goldmund SA, the Swiss high-end audio company known for their perfectionist-quality loudspeakers, electronics, and source components. The Alumine is Stenheim's first commercial product—and I'm told that their startup costs were considerable, given that the Alumine's enclosure panels, made by the Swiss branch of an international high-tech machining firm, are specified perfect to within 0.01mm.

The Alumine's high-frequency driver, made in Norway by SEAS, is built around a 1" fabric-dome diaphragm with a half-roll surround. That driver fires from a shallow and slightly compliant elliptical waveguide that measures a little over 3" on its largest dimension. The mid/woofer, made by the French company PHL, has a 5" cellulose-fiber cone (it appears to be coated on both sides), and a 1.75" dustcap of carbon fiber. Also featured are a sturdy cast-aluminum frame and an S-shaped (in cross section) surround of moderately soft rubber, intended to restrict cone excursions to the most linear portion of the driver's range.

Both of the Alumine's drivers are hardwired to a sizable crossover network that comprises four chunky air-core inductors, various M-Cap polypropylene capacitors, and a surprisingly large number of Dale metal-film resistors, all on a PCB just a little bit smaller than the inside-top surface to which it's fastened.

The plastic bass-reflex loading tube, which is cemented to the baffle, is 3.25" long, with a 2" diameter and a flared



The Alumine's enclosure panels are specified perfect to within 0.01mm.

port. The baffle is the only cabinet wall whose inner surface is undamped; bituminous pads and thick sheets of sound-absorbent material are applied to all the rest. Only one pair of input terminals is provided, suggesting that the designers are not fond of biwiring (*cf* Wilson Audio Specialties and a number of other speaker manufacturers who feel similarly about the multiway speakers they make).

Then there's the real star of the Alumine show: the aluminum-alloy enclosure. Its individual panels, which indeed seem to be made and finished with the utmost precision, are 0.6" thick. Those metal sheets are held together by more than 60 concealed machine screws per cabinet—among the principals of Stenheim, all of whom are in their 30s, is a former watchmaker—with silicone gasket material, sparingly applied, to enhance the seal.

MEASUREMENTS

I measured the Stenheim Alumine using DRA Labs' MLSSA system and a calibrated DPA 4006 microphone. The Alumine's B-weighted sensitivity on its tweeter axis was 89.5dB/2.83V/m, which is both higher than average and within experimental error of the specified 90dB. The Stenheim's plot of impedance magnitude and electrical phase angle (fig.1) suggests that it is an easy speaker to drive, the impedance remaining above 8 ohms for much of the audioband and dropping to 5.5 ohms in the lower midrange. The phase angle is also fairly benign, meaning that, in conjunction with its high sensitivity, this speaker will work well with low-powered tube amplifiers.

There is a sharp discontinuity in the impedance traces just above 500Hz, and I did find some very high-Q resonances present in the enclosure's panels in the same region. Fig.2, for example, is a cumulative spectral-decay plot calculated from the output of a simple plastic-tape accelerometer fastened to

the center of one of the side panels. Two fairly severe resonances can be seen, at 527 and 645Hz, with a third at a lower level and lower in frequency, 406Hz; these were also present, at lower levels, on the top panel. Art Dudley didn't comment on any midrange coloration that might have resulted from this behavior; it's possible that the resonances are of sufficiently high frequency and Q not

to be excited by musical signals. (In general, the higher a resonance's Q, or Quality Factor, the longer it needs to be stimulated with sound at precisely the same frequency as the resonance to be fully excited.)

The saddle centered on 52Hz in the Alumine's impedance-magnitude trace suggests that this is the tuning frequency of the large reflex port on

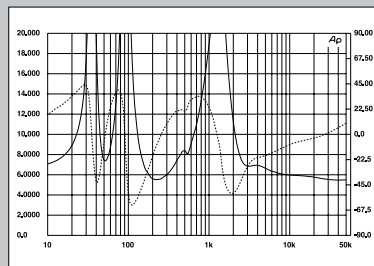


Fig.1 Stenheim Alumine, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.).

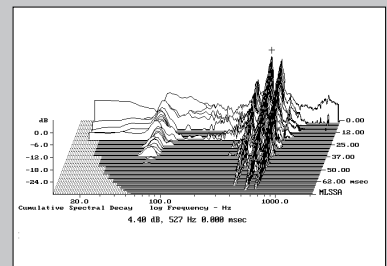


Fig.2 Stenheim Alumine, cumulative spectral-decay plot calculated from output of accelerometer fastened to center of side panel (MLS driving voltage fastened to speaker, 7.55V; measurement bandwidth, 2kHz).

The companion stand is about 28.75" tall when assembled. Its pillar comprises two concentric aluminum-alloy tubes of rectangular cross-section, and its upper and lower surfaces are, like the panels of the speaker cabinet itself, machined from aluminum alloy to a thickness of 0.6". Integral to the latter are generously sized channels that lead from the stand's inner channel to discreet openings at the rear, both top and bottom; thus the user can route the speaker cable from the amp into the stand's lower support, up through the pillar, and out through the stand's upper support, where it can connect easily to the speaker's gold-plated WBT terminals.

The upper support of the Alumine stand is machined with three circular recesses, each measuring about 0.4" in diameter: one each at the rearmost corners, and one centered near the front edge. These correspond to similar, but smaller and shallower, recesses in the bottom surface of the speaker enclosure, allowing for a unique interface between the two components: a trio of 0.4"-diameter stainless-steel ball bearings. Fully set up, there is a very slight gap between the top of the stand and the bottom of the speaker—and the latter is unambiguously stable.

Setup and installation

Products that are poorly made are a drag to set up. Products whose shipping materials are indifferently designed are a drag to set up. The Stenheim Alumines were a delight to set up.

My review pair of Alumines arrived in two foam-lined flight cases; another such case contained the disassembled stands, which were very easy to put together, owing to the clean, precise fit between their parts and their fasteners. After fitting the four threaded feet to the stand's bottom plate and putting the three ball bearings in their recesses on the upper plate, I lowered the rather heavy (37.4 lbs) Alumine

speaker into place, and felt a satisfying *dunk* as each ball and its corresponding recess lined up with one another and settled together perfectly: The cabinet's front and rear edges were now precisely aligned with the front and rear edges of the stand. I love the Swiss.

After my recent experience with the Sonus Faber Guarneri Evolution loudspeakers (see my review in the January issue), I wondered if there was anything to gain by leveling the tops of the Alumine cabinets with one another; surely there was nothing to lose. That was easy to do, using a ball-end hex key from above to adjust the stands' feet. Working thus, it was also easy to stabilize the stands against my listening room's hardwood floor—something I recheck and readjust often for all loudspeakers, to compensate for the settling of the speaker's weight and the seasonal expansion and contraction of the wooden floor.

It was easy to find places at which the Stenheims performed well—my review samples wound up about 5' from the wall behind them and a little less than 2' from their respective side walls—but getting them to “disappear” required a bit more trial and error with regard to toe-in angle and distance from the listening area. Ultimately, I wound up aiming the cabinets directly at a single, centered listener, with the listening seat closer to the speakers than is the case with my Audio Note AN-Es, which I place against the front wall.

Listening

Listening to Malcolm Sargent and the London Symphony's recording of Prokofiev's Symphony 5 (LP, Everest/Classic

The real star of the Alumine show is the aluminum-alloy enclosure.

the front baffle. However, in the plot of the woofer's nearfield response (fig.3, blue trace), the minimum-motion notch is a little lower in frequency, at 48Hz. (This is the frequency at which the back pressure from the port resonance holds the woofer cone stationary and all the acoustic output comes from the port.) The port output itself (red trace) peaks sharply between 40 and 60Hz, and

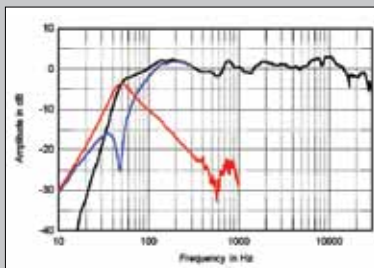


Fig.3 Stenheim Alumine, anechoic response on tweeter axis at 50", averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer (blue trace) and port (red) responses and their complex sum (black) plotted below 300Hz, 1kHz, and 300Hz, respectively.

rolls off smoothly at higher frequencies. Although there is a slight interruption of the rolloff between 600Hz and 1kHz, there are no pipe resonances of the sort I often find in small, reflex-loaded loudspeakers. Though there is a slight bump in the upper bass, this is entirely an artifact of the nearfield measurement technique; the Alumine's low-frequency alignment appears to be somewhat over-

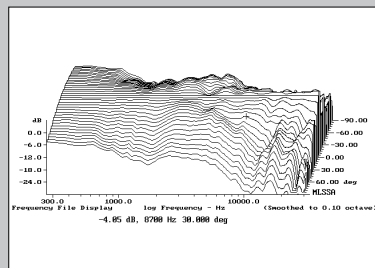


Fig.4 Stenheim Alumine, lateral response family at 50", normalized to response on tweeter axis, from back to front: differences in response 90°-5° off axis on tweeter side of baffle, reference response, differences in response 5°-90° off axis on port side of baffle.

damped, with the output down by 6dB at the port tuning frequency. Nevertheless, I note that AD found the Alumine's bass response “satisfyingly deep.”

Higher in frequency, there is a suspicious-looking peak in the Stenheim's farfield response between 700 and 900Hz. This is a little low in frequency to be the result of a termination problem in the cone surround, but I do suspect that this behavior correlates with Art's finding that, with piano recordings, “the right hand sounded brighter—and thus louder and more forward—than the left.” The Alumine's treble is impressively even, though the top octave rolls off earlier than the norm. Together with the usual narrowing of the tweeter's dispersion above 10kHz (fig.4), this will tend to make the Stenheim sound a little dark or lacking in “air.” This graph also indicates that the dispersion of the relatively large-diameter woofer narrows above 800Hz or so, giving rise to the often-found off-axis flare at the bottom of the tweeter's passband. Vertically

SDBR 3034), I heard what would endure, throughout my time with them, as the Alumines' greatest strengths: very good musical involvement (including excellent musical timing); a sound that was open and clean but neither sterile nor colorless; and bass response that was satisfyingly deep—notably so, for such a small loudspeaker. The Stenheim also gave respectable weight, plus superb color and definition, to the kettle drums in the marches and canzonas of Purcell's *Music for the Funeral of Queen Mary*, recorded in the late 1970s by John Eliot Gardiner and the Monteverdi Orchestra and Choir (LP, Erato STU 70911). Better still, the Stenheim captured the manner in which the sound of those drums increased in scale as their loudness increased.

Make no mistake, there remained low-frequency tones that escaped the Alumine's abilities. When I listened to *At Shelly's Manne-Hole*, a 1963 live album by the Bill Evans Trio (CD, JVC 0036-2), Chuck Israel's string bass didn't have the depth, body, or scale that it did through my Audio Note speakers. And the sound of the Commendatore's statue knocking on the door in Bernard Haitink and the London Philharmonic's recording of Mozart's *Don Giovanni* (LP, EMI 157-1436653) lacked a certain menace. But the Stenheims sounded well-balanced enough, from bottom to top, that their low-frequency limitations seldom came to mind in day-to-day listening.

Even with my modestly powered (25Wpc) Shindo Corton-Charlemagne monoblocks, the Stenheims had satisfying impact, drama, and touch. With recordings of very loud choral singing, such as the Purcell LP, the Alumines remained slightly more listenable than my Audio Notes, with less of the very subtle audible breakup to which, I would imagine, we've all become accustomed at one time or another, and with less confusion and spatial "smearing" between choral sections. Solo vocal crescendi, of which there's no shortage in

ASSOCIATED EQUIPMENT

Analog Sources Garrard 301, Thorens TD 124 turntables; EMT 997, Schick tonearms; Ortofon SPU & Xpression, EMT TSD 15 70th Anniversary & OFD 25 pickup heads.

Digital Sources Sony SCD-777 SACD/CD player; Wave-length Proton USB D/A converter; Apple iMac G5 computer running Apple iTunes V.10.2.2, Decibel V.1.0.2.

Preamplification Auditorium 23 Standard (SPU version), Silvercore One-to-Ten step-up transformers; Shindo Masseto preamplifier.

Power Amplifiers Shindo Corton-Charlemagne monoblocks. LOUDSPEAKERS Audio Note AN-E/SPe HE.

Cables USB: Nordost Blue Heaven, AudioQuest Diamond. Interconnect: Audio Note AN-Vx, Shindo Silver, AudioQuest Columbia. Speaker: Auditorium 23. AC: Ocellia Reference.

Accessories Box Furniture Company D3S rack (source & amplification components); Keith Monks record-cleaning machine. —Art Dudley

the great recording of Mahler's Symphony 8 by Leonard Bernstein and the London Symphony (LP, Columbia M2S 751), were also remarkably clean through the Stenheims.

At the softer end of things, the first of guitarist Joe Pass's series of *Virtuoso* albums (CD, Pablo/JVC VICJ-60256), while not a great-sounding record in absolute terms, was a one-instrument ambassador for almost everything that's good about the Stenheims. The speakers communicated the attack components of every note—every bend, slur, slide, and rest stroke—and Pass's sense of the dramatic came across as well as I've ever heard from a non-horn loudspeaker. The

measurements, continued

(fig.5), a severe suckout centered at 2.2kHz—the crossover frequency?—develops more than 10° above the tweeter axis, with, as AD noted, a severe rolloff in the top octaves. The Alumine must be used with its dedicated, 28.75"-tall stand, which places the listener's ears close to the tweeter axis.

In the time domain, the Stenheim Alumine's step response on the tweeter axis (fig.6) suggests that both

drive-units are connected in inverted acoustic polarity, with the tweeter's output leading that of the woofer by a greater time difference than is usual in a two-way design. Though there is a slight amount of delayed energy at 800Hz, the Alumine's cumulative spectral-decay plot on the tweeter axis (fig.7) is remarkably clean.

There is much to admire in the Stenheim Alumine's measured perfor-

mance, though that somewhat lively cabinet raised my eyebrows. When I examine a speaker's cabinet-resonant behavior, I support it with three upturned cones at the edges of the speaker's base, which allows resonances to develop to their fullest. I didn't have the Alumine's dedicated stands when I performed the measurements; it's possible that the stand modifies the cabinet's behavior. —John Atkinson

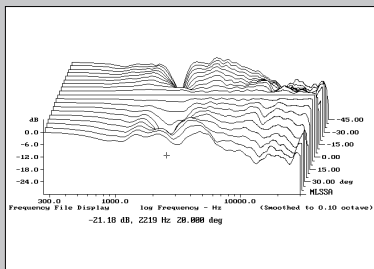


Fig.5 Stenheim Alumine, vertical response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 45° above axis, reference response, differences in response 5–45° below axis.

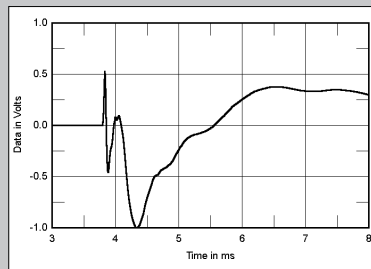


Fig.6 Stenheim Alumine, step response on tweeter axis at 50° (5ms time window, 30kHz bandwidth).

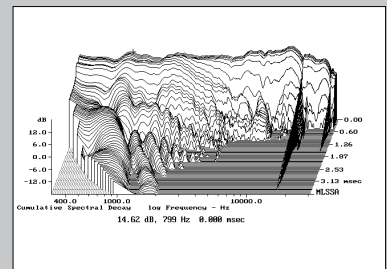


Fig.7 Stenheim Alumine, cumulative spectral-decay plot on tweeter axis at 50° (0.15ms risetime).

guitar's spatial presence, and the reproduction of its unique timbral signature, were also remarkable. Dumb audio-reviewer cliché though this may be, there were times, while listening to Joe Pass through the Alumines, that I could have been fooled into thinking I was hearing the real thing.

The Alumines' sense of scale was good, especially considering their size. I'm sure that had at least something to do with the speaker's installation requirements, and the fact that I sat closer to them than to my reference Audio Note AN-Es; the latter speakers, by contrast, are meant to stand close to the corners, and to consequently use the room itself, and early reflections therefrom, to develop *their* sense of scale. Suffice to say, the two speakers loaded the room differently, yet each succeeded in allowing music to sound enjoyably large.

The Alumine's vertical dispersion was a bit discontinuous, with rolled-off trebles when I listened from a standing position. (This was similar to what I experience with my Quad ESLs, though not nearly as severe; by contrast, with my Audio Note AN-Es, vertical dispersion anomalies make themselves known much more as upper-midrange colorations than as a rolled-off treble.) Side-to-side dispersion was more even in my room. Unsurprisingly, the Alumines sounded a bit brighter and more open on axis, yet remained musically and spatially enjoyable when heard from a chair off to one side. I first noticed that one evening while sitting at my desk, listening to Louis Armstrong and Ella Fitzgerald perform "You Can't Take That Away from Me," from an HDtracks download of the classic Verve album *Ella and Louis*: Despite my being way off center, when Armstrong entered, the very real sound of his voice startled the hell out of me.

The Stenheims' spatial performance was of the sort that may appeal to traditional high-end audio enthusiasts. Image placement with stereo recordings was precise, with good stage depth and, perhaps more remarkably, good differentiation between upstage and downstage performers, as heard with some well-recorded operas (including that Haitink *Don Giovanni*). In addition to good image specificity, the Alumine allowed individual performers to sound solid and whole, enhancing my enjoyment of the decent-sounding 1997 recording of Bob Fosse's *Chicago* (CD, RCA 68727-2); the duet between Bebe Neuwirth and Marcia Lewis in "Class" was especially convincing.



The doped pulp-cone woofer uses a surround with an S profile.

With most of the recordings I tried, the Alumines had a freedom from obvious coloration that was in keeping with their openness and transparency. But after weeks of close listening, I noticed a slight departure from neutrality with recordings of piano music. While listening to the Bach-Busoni Organ Chorale-Prelude, BWV 659, played on the piano by the late Mindru Katz (AIFF, ripped from Cembal d'Amour CD 112), it dawned on me that Katz's right hand sounded brighter—and thus louder and more forward—than the left, which sounded muffled by comparison.

This characteristic remained in place with all the piano recordings I tried. The imbalance seemed less severe during loud passages—the "storm" section of the Chopin Prelude No.15, Op.28, for example—but even so, my reference speakers did a better job of allowing the piano's lowest notes to retain their full spectrum of higher-frequency overtones.

Bear in mind that my reference Audio Note speakers tend to allow, with some recordings, a slight and subtle prominence to the pianist's *left* hand, owing no doubt to cabinet resonances that favor the affected range of notes. But that effect has never been more than subtle—and besides, lower-range piano notes through the Alumine didn't sound weak so much as a little bit dulled, and lacking in their higher overtones. Later, I paid close attention to some good spoken-word recordings—portions of the above-mentioned *Chicago*, as well as *Stereophile's* own cannily titled *Test CD* (STPH-002-2)—and heard the same very subtle distinction, transposed to voices: Through the Alumines, men sounded just a little chestier than usual. This was a subtle distinction—and, I admit, a curious one in a loudspeaker that didn't otherwise lack treble content.

Conclusions

The Stenheim Alumine was just plain fun in virtually every way. I'm impressed with every aspect of its sound: its good scale, drama, openness, color, texture, spectral balance, and, perhaps most of all, its ability to do all this with a modestly powered amplifier. And because both speaker and stand are so well made, they were fun to use—or, at the very least, not unpleasant to install.

For those who are in the market for a small, high-sensitivity, monitor-quality loudspeaker, the only real concern might be the Alumine's five-figure price. The manufacturer and distributor suggest that the price is being kept as low as possible, given the considerable cost of machining the Alumine's high-tech cabinetry. As so often happens in high-end audio, a designer has pushed the performance envelope by taking perfectionism in manufacturing to a new extreme: Only the prospective buyer can decide if the one is worth the other.

Loudspeakers that combine good sound with high sensitivity and easy drivability are usually fussier than this—and often wind up imposing too much *character* on the listening experience. Given that, the unambiguously high-performance Stenheim Alumine has already made a place for itself in an otherwise jumbled marketplace: Notwithstanding its high price, the Alumine is one of the most recommendable small speakers I have heard. ■

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