



Active Noise Cancelation Technology and Applications



Environment and health

The environment is a major determinant of health, estimated to account for almost 20% of all deaths in the WHO European Region. In 1989, concerned about the growing evidence of the impact of hazardous environments on human health, WHO/Europe initiated the first ever environment and health process, towards a broad primary prevention public health approach, and to facilitate intersectoral policy-making.

[Read more](#)

Topics in this category



Air quality



Climate change



Health impact
assessment



Housing and health



Noise



Occupational health



Social inequalities in
environment and
health



Transport and health



Urban health



Water and sanitation

“Excessive noise seriously harms human health and interferes with people’s daily activities.”

“Traffic noise alone is harmful to the health of almost every third person.”

- WHO Regional Office for Europe -

Polluters

Zonal Noise Polluters

Noise coming from many sources surrounding us



Point Noise Polluters

Noise from a specific source that can be identified and controlled



Traditional Solutions

Passive Barriers



Block or abstract airflow



Not able to reduce low frequency

Personal Headphones

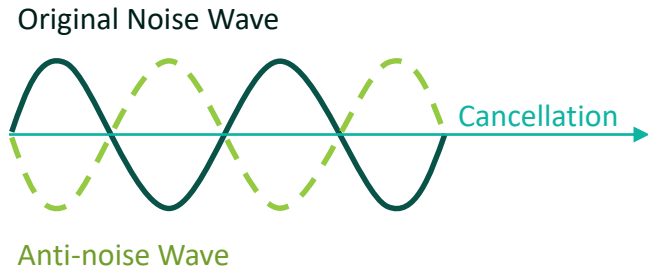


Require specific designated devices/structure



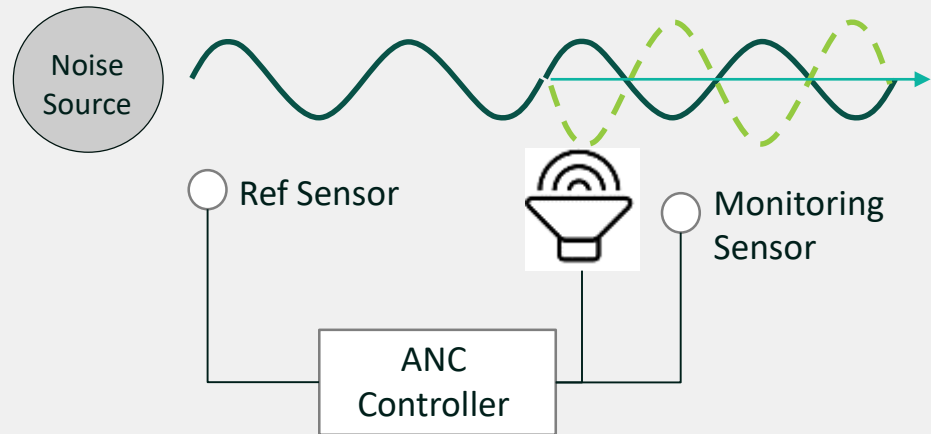
Cumbersome

ANC is a basic rule of Physics



An “anti-noise” signal which destructively interferes with the original sound and cancels it out

ANC requires a combination of hardware and algorithm



ANC has many advantages over traditional passive noise solutions, however...



Allow Airflow



Recue low frequency



Save weight



Save engineering

Technical challenges to overcome in applying ANC in real life.

Acoustic
Challenges

- Eco Canceling
- Group Delay
- Acoustic Field Overlap

Engineering
Challenges

- Durability
- Adaptability
- Available Space

Silentium provides *spatial, broadband, adaptive* Active Noise Reduction solutions.

Proprietary Algorithms

Based on unique algorithms developed by Silentium to overcome the acoustic challenges in applying ANC

Unique Patents

Uniquely patented in many countries



Experienced and Dedicated Team

15 years of experience in ANC technology development and application

45+ professional engineers dedicated only to ANC technology

Proven Performance

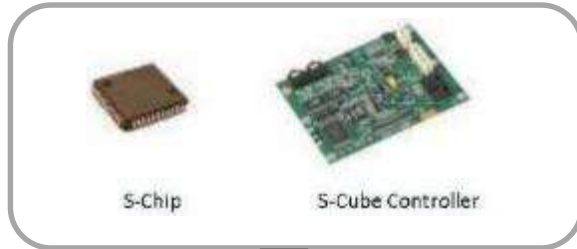
Outstanding effectiveness in low frequency and broadband

A number of applications are already in mass production or production intent programs



-  -Israel, Tel Aviv
Headquarters and R&D
-  -UK, London
-  -Korea
-  -China, Shanghai
Engineering center
-  -Hong Kong
-  -USA, Boston

Building Blocks



ANC Headsets :

Noise Reduction at Ear



Earphones, Headphones



Quiet Bubble :

Zonal Noise Reduction



Automotive, Trains, Aerospace



Ducted ANC :

Point Noise Reduction



White Goods, Industrial
Equipment




ANC Headsets: Solution and Applications

Proven high performance based on advanced algorithm

Flexible customization to enhance Audio and Voice applications

Immerse Perform Focus
Algorithms · Acoustics design · Audio Tuning
by Silentium

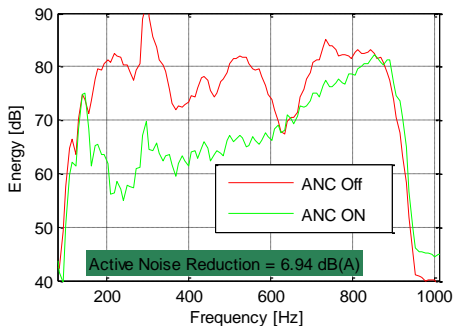


Silentium Active Noise Cancellation Libraries combined with years of Acoustic Tuning Expertise deliver ANC technology from initial Silicon Integration to the final End User Acoustic Experience.

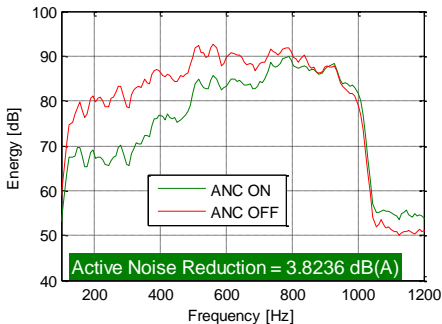
Soft ANC solution reduces BOM cost

Short time to market by leveraging Silentium's wide technical support coverage

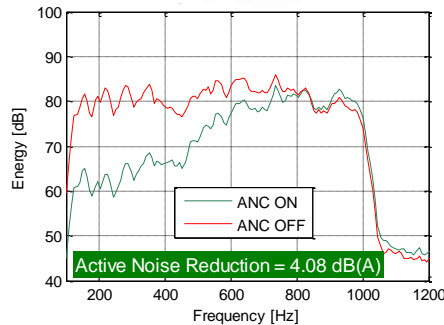
A Headphone
(Professional)



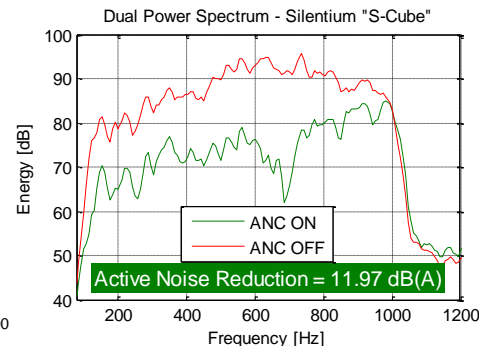
B Headphone
(Consumer)



C Headphone
(Consumer)



Silentium Algorithm on
C Headphone



- **Broadband Reduction:**
Silentium up to 1000 Hz vs. others up to 600 - 800 Hz.
- **Overall Performance:**
Silentium 12dB(A) vs. others 4dB(A)



QB™: Quite Bubble Solution and Applications

The “Quiet Bubble™”

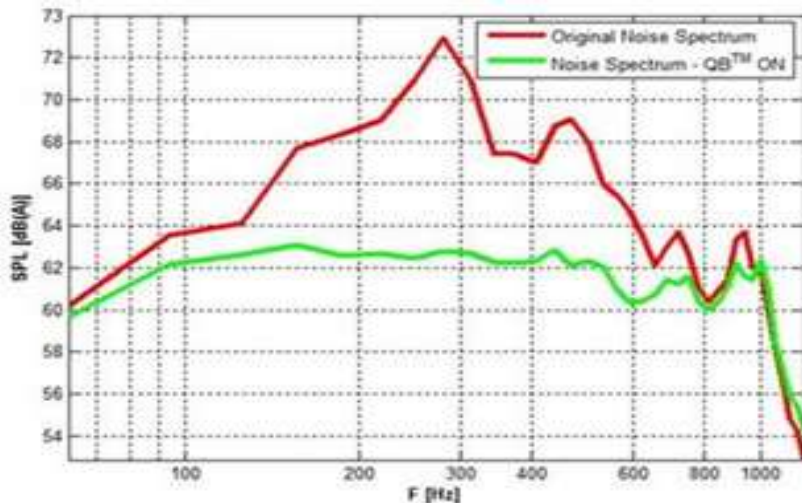
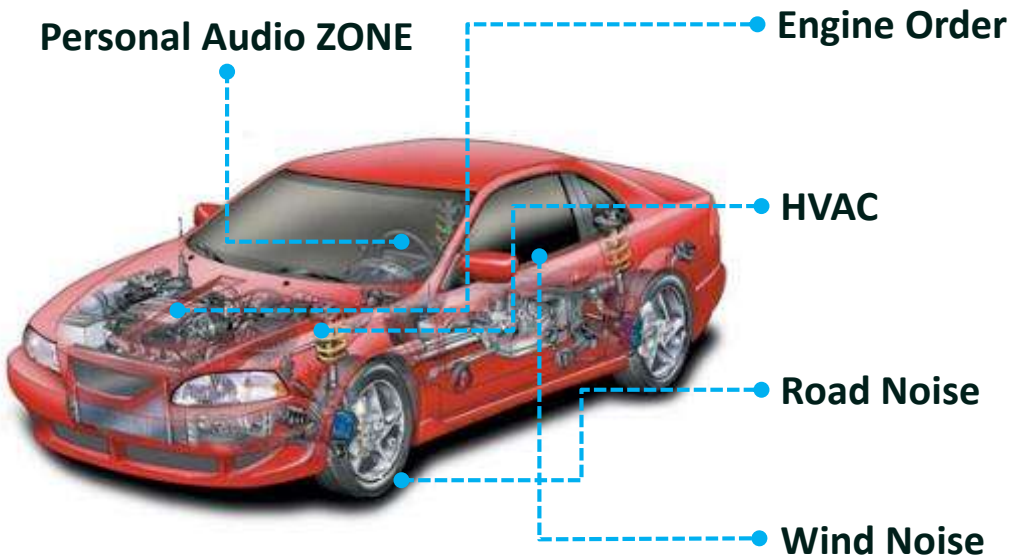
The Quiet Bubble™ is a spatial Active Noise Reduction solution introducing a personal quiet zone around the driver/passengers head.

Solution embedded into seats, infotainment/audio systems etc.

Already installed in vehicles in collaboration with OEMs and proved to be efficient in low-medium frequency noise reduction



Silentium's QB™ ANC technology for Automotive delivers **more than 5dB(A)** noise reduction across the entire audible spectrum and **more than 10dB(A)** at the dominant frequencies.



*Road noise reduction example

- Target applications for Quite Bubble solution are global markets of:
 - Passenger Cars - all segments inc. HEV/EV
 - Sport Utility Vehicles - SUV
 - Light Commercial Vehicles – LCV
 - Autonomous Driving Vehicles
 - Heavy Duty Trucks, Construction Vehicles
 - Agricultural Vehicles /Tractors
 - High speed train
 - Airplanes and helicopters



Reduce Car Weight

- Weight reduction is one of most important challenges Automotive OEMs are facing due to CO2 emission reduction target
- Silentium QB™ saves significant amount of passive materials while maintaining the same or lower noise level

Enhance Speech Recognition

- The biggest obstacle to performance of in-car speech recognition system is noise from HVAC and Road
- Reduced noise from HVAC and Road enhances speech recognition performance

Silentium QB™ Benefits

Improve HEV & EV

- Without noise from the engine or power train, and reduced weight, the road and HVAC noise will become more important for HEV & EV
- Silentium QB™ is particularly effective in reducing road noise and HVAC noise

Enable Personalized In-Car Audio

- Silentium QB™ can enable the personalized audio system



ARNC

Offering customer experience
Weight saving

No.1
in terms of performance and cost



AWNC

Offering customer experience
Weight saving

Unique
Provider in the world



HVAC

Offering customer experience

Unique
Provider in the world



Hands Free Communication

Enabling communication spaces

Enabler



Personal Audio

Enabling Personal & Private Audio

Enabler

The Silentium Comfort-Shell™

Noise cancelling shield creates a "quiet zone" in virtually any location

"An Oasis of Quiet"

The Comfort-Shell™ delivers personal sound control filtering out unwelcome external noise - creating a space for you to talk, relax, work or just play online.

- Ability to create desired environments at home
- Boost productivity at home and at work
- Get a moment's peace while out at the mall, cafe, airport, train station and more
- Only hear what you want to, when you want to
- Feel better - controlling your noise environment leads to better health and restful sleep

link:

https://www.youtube.com/watch?v=oG9sfbsUJuw&feature=player_detailpage





Ducted ANC: Applications and Examples

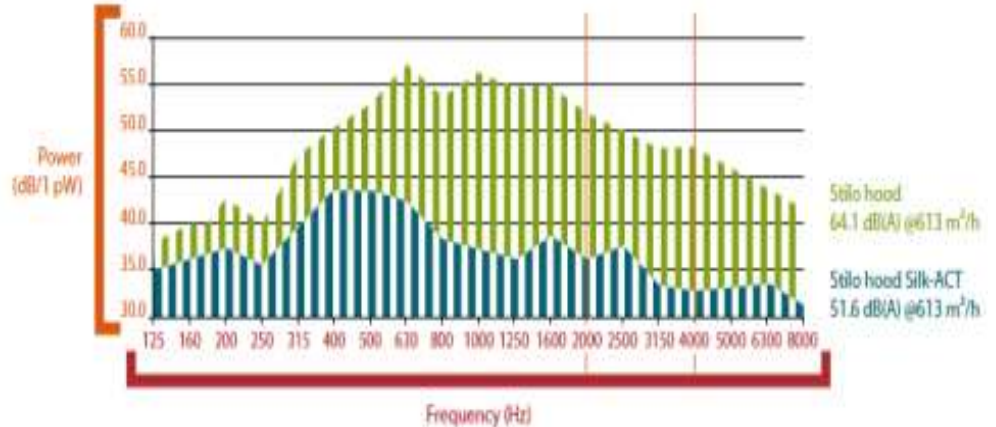
- Target applications for S-Fan solution are global markets of:
 - Cooker hoods
 - Air Purifiers
 - Air-conditioning/Heat Exchangers
 - Other consumer electronics
 - Automotive HVAC
 - Servers and computers
 - Industrial cooling towers/fans/turbines



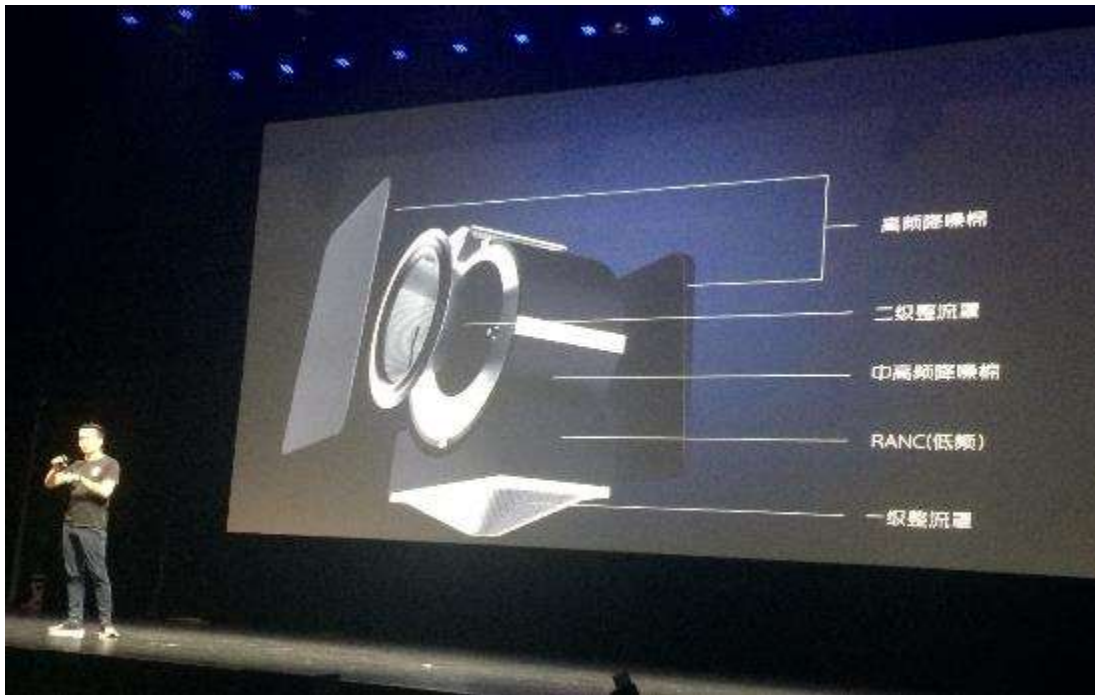
World's leading range hood maker, Faber is currently selling silent range hood models with Silentium ANC technology.



powered by
 **Silentium**
Silence in a Chip



China's leading range hood maker, Robam also announced they applied Silentium's ANC technology in their new Range Hood model.



- A Range of Soundproofed Rackmount cabinets with Active Noise Reduction & Active Heat Dissipation
- Up to 30 dB(A) server noise reduction
- Available in the following standard dimensions.

AcoustiRACK™ ACTIVE 15U usable (23U High)

AcoustiRACK™ ACTIVE 33U usable (41U High)





4 MINUTE READ | MOST INNOVATIVE COMPANIES 2014

The Top 10 Most Innovative Companies in Israel

Creativity blossoms in the Middle East.

4. MOBILEYE VISION TECHNOLOGIES

For enabling self-driving cars to see better (and cheaper). While it may be less impressive than Google's self-driving vehicles, Mobileye's technology has helped pave the road to our robot-car future. Its EyeQ system, which uses components that cost only a few hundred dollars per product, has advanced image-sensing of lanes, traffic signs, vehicles, and pedestrians, and has been installed by 19 car manufacturers—including major companies like Volvo, GM, BMW, and Audi. Mobileye was on track to sell 1.5 million of its single-camera devices by the end of last year, and its own semiautonomous car is poised to hit roads commercially as early as 2016.

5. SILENTIUM

For silencing the noise of our lives. Silentium (meaning "silence" in Latin) has produced a chip and controller system that can be applied to a number of products to easily reduce noise pollution. Installed in systems for IT, HVAC for the residential and automobile markets, and medical equipment, Silentium's solutions cut 90% of a device's unwanted hums, whirrs, and clangs. With its new technology, Silentium aims to diminish stress and hearing impairment, and improve communication, work productivity, and health.



THANK YOU

For more information, please contact

Sang Hun Lee, Managing Director of Asia

sang@silentium.com

www.silentium.com