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WELCOME
WILLKOMMEN
BIENVENUE
BENVENUTO
BIENVENIDO
歓迎
ようこそ
환영합니다

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A loudspeaker:

- *5 years in making*
- *Of holistic design principles*
- *Borrowing technology from many disciplines*
- *Where beauty has a purpose*
- *Packed with innovation*
- *That you will never hear*

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factfenestria

The loudspeaker you'll never hear

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fenestria

/fi'nɛstrə/

(anatomy) window to the inner ear

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- 3-way passive, twin cabinet **ATL**™ design
- With **Laminair**™ aerodynamic venting
- Every element is new & tailor-made, nothing borrowed from an existing design

Which includes:

- Drivers
- Crossovers
- Cabinets

The objective:

“To make the best passive loudspeaker we could, with the purest most transparent sound, using an open minded approach to materials & technologies”

The design philosophy:

To eliminate everything that isn't music

(ie: colouration, distortion and noise)

How this is achieved

- Producing the best drive units with the lowest colouration
- Using **ATL**[™] bass loading with **Laminair**[™] aerodynamic venting
- Rigorous component measurement & selection
- Reducing component interaction
- Measurement & analysis
 - *Vibration analysis*
 - *Laser interferometry*
- Removing unwanted vibration
 - *By isolation*
 - *By cancellation*

Incorporating cutting edge technologies & materials unrelated to audio design:

- Motorsport engineering & materials science
 - *New ultra-lightweight carbon fibre*
 - **Laminair™** venting
- Laser based test & measurement techniques
 - *NPL (Opto-acoustic interferometry- RIOS)*
- ACTUAL GROUNDBREAKING technology
 - *Tuned mass damping used by structural Eng. for protection against earthquake damage*



Laser interferometry at NPL (National Physical Laboratory)

Accurate & rapid mapping of sound

“So we can see exactly what you can hear”

Vibration analysis

- *Every element that might suffer from unwanted vibration was analysed with accelerometers*
- *Results honed the design of the isolation techniques*

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The structure



- 4 components

1. Upper & lower mirror-imaged LF cabinets
2. 'Nest' Module HF & MF
3. Plinth housing the X-over

Cont'd...



- 4 components

4. Planar wings (The mass dampers)

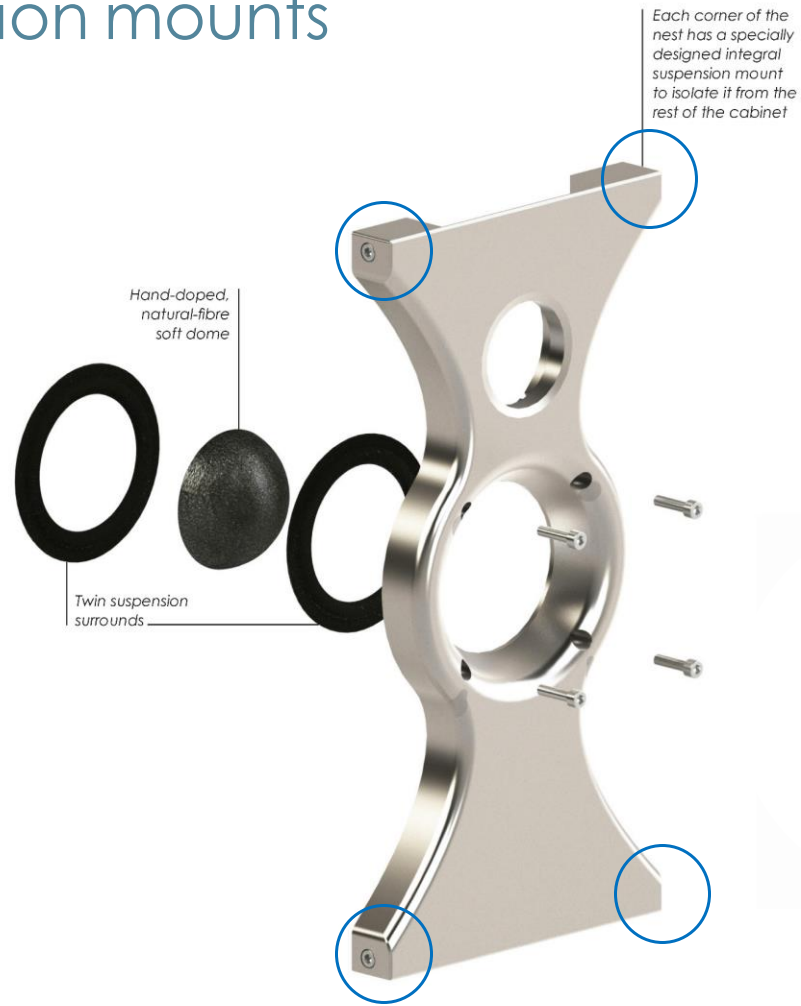
We will expand upon this

The 'Nest'

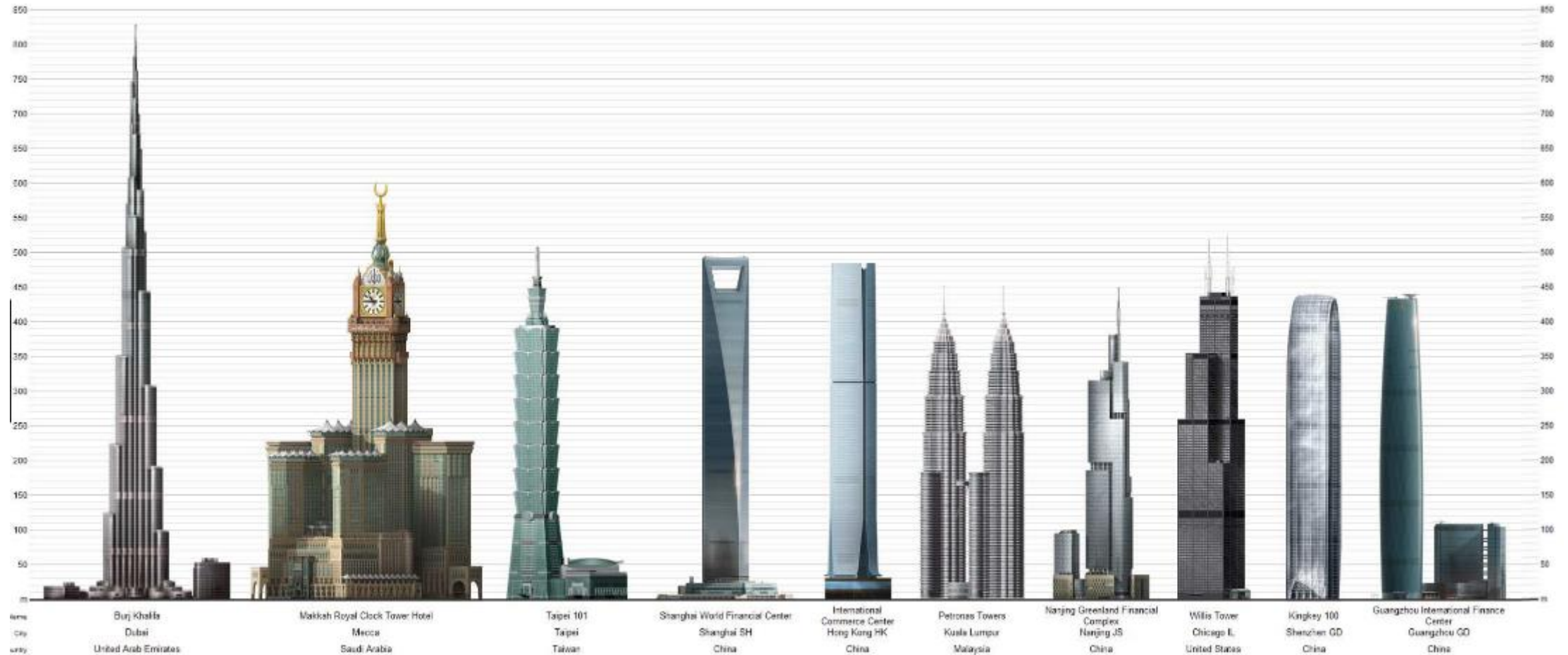
- *Housing for HF & MF*
- *Precision milled from solid aluminium billet*
- *Minimal sculpted form, excludes baffle reflections*
- *Isolated & decoupled from the cabinet*



The Nest's four isolation mounts



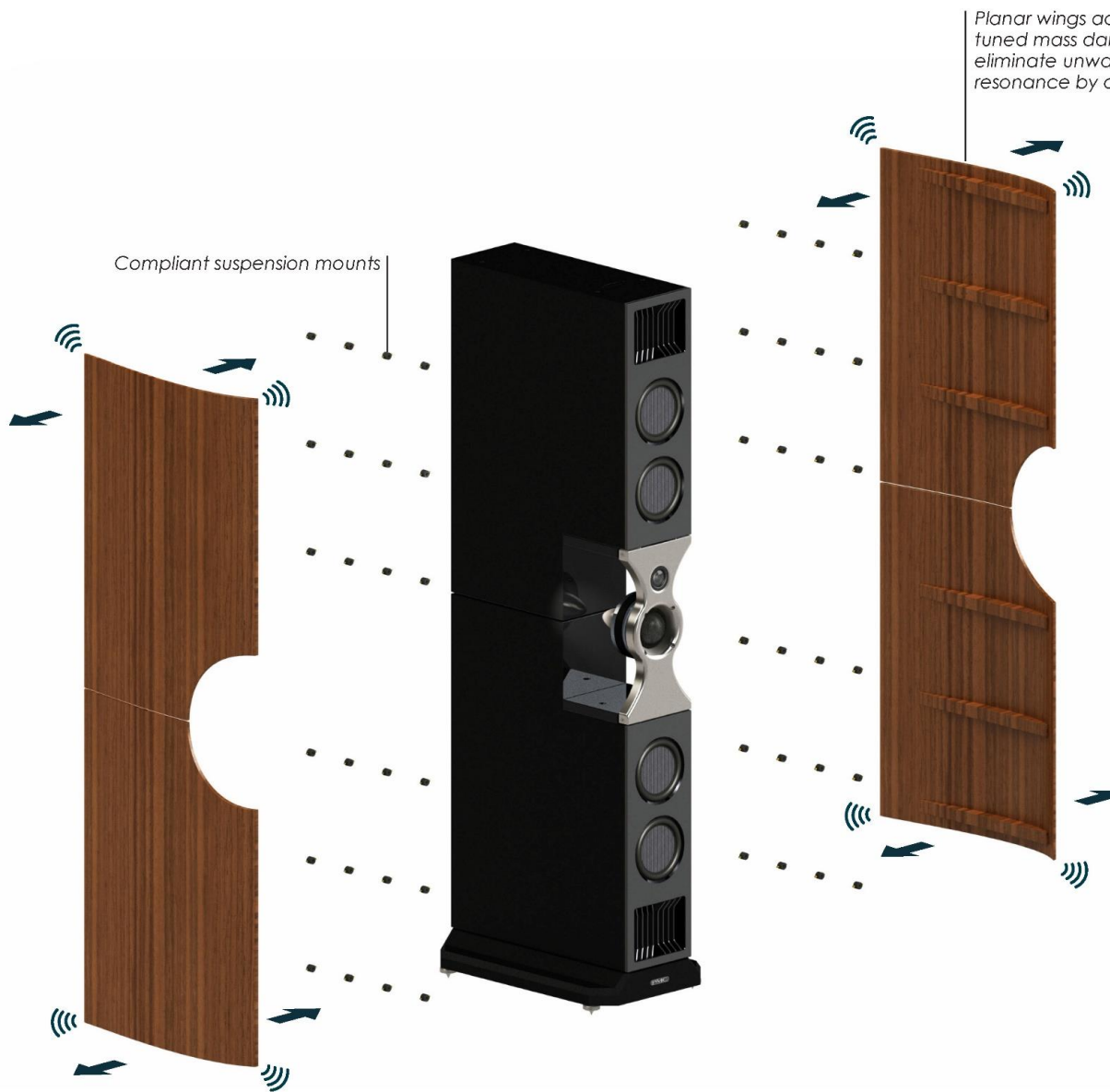
Incorporating cutting edge technologies unrelated to audio design:





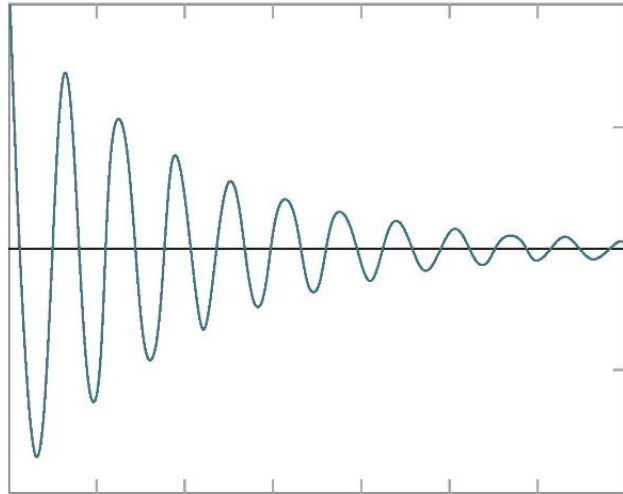
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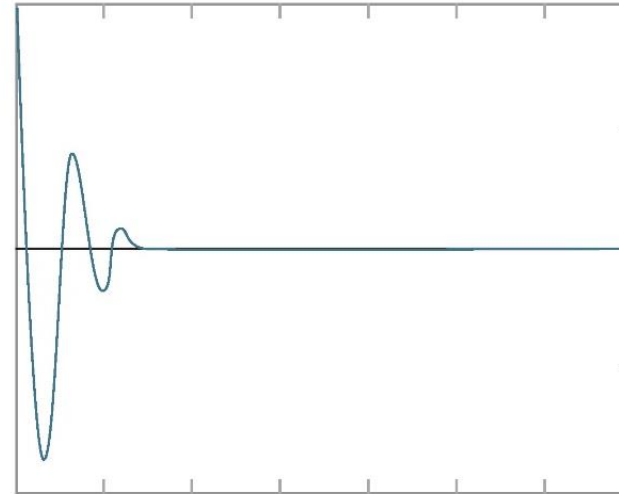


The Planar wings

- High mass
- Suspended on compliant mounts
- Free to vibrate
- Moves in opposition to unwanted vibration
- Causing cancellation



Without planar wing mass damping



With planar wing mass damping

The diagrams above show how unwanted cabinet vibrations, left untreated, continue to resonate and distort speaker output, and, by comparison, how the vibrations are cancelled by mass damping in fenestria.



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The custom drive units

The hand built, 75mm Mid-range Soft dome driver

- The best 75mm mid we have built to date
- Lower mass than cone driver
 - *Supreme transient response*
- Extremely wide & smooth dispersion
 - *Natural in-room response*



The hand built, 75mm Mid-range Soft dome driver

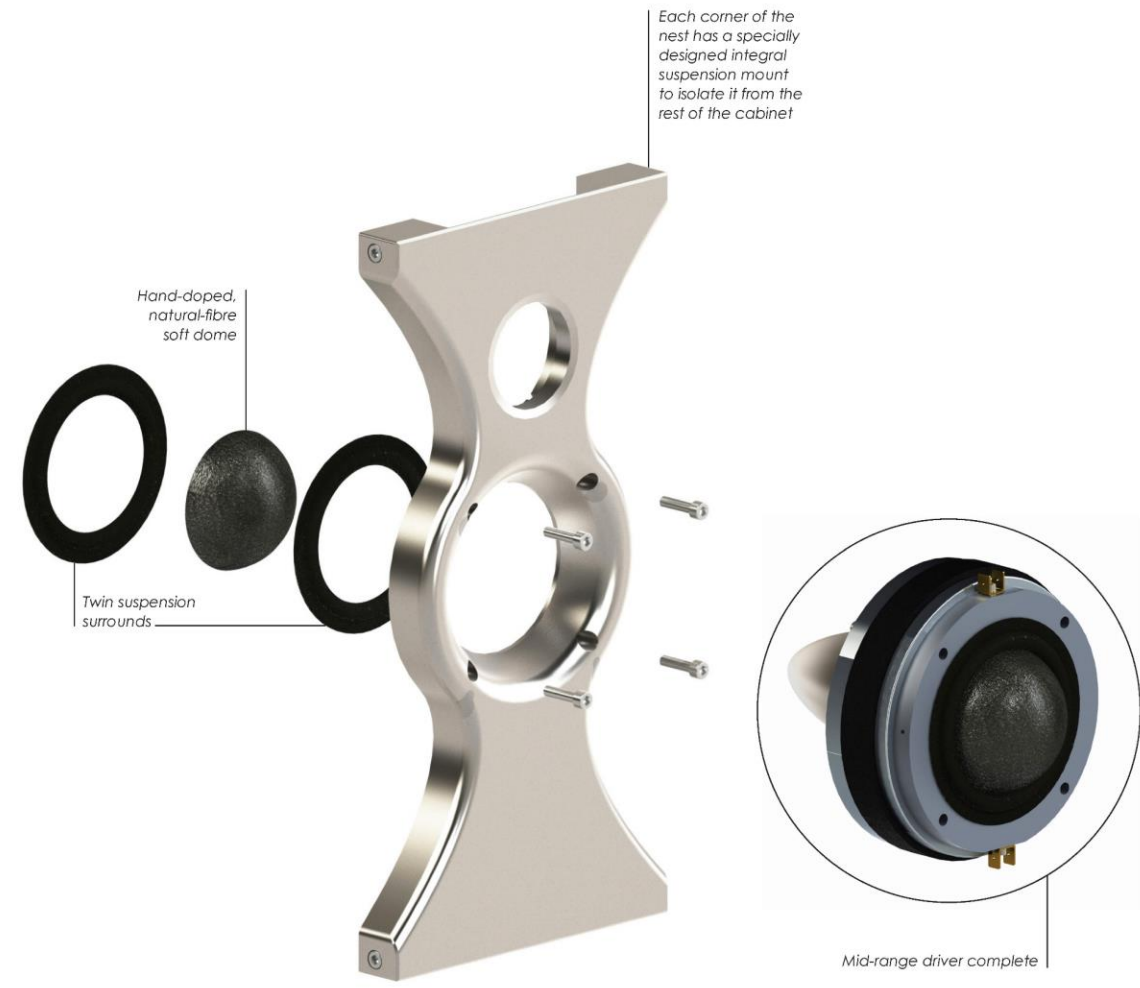
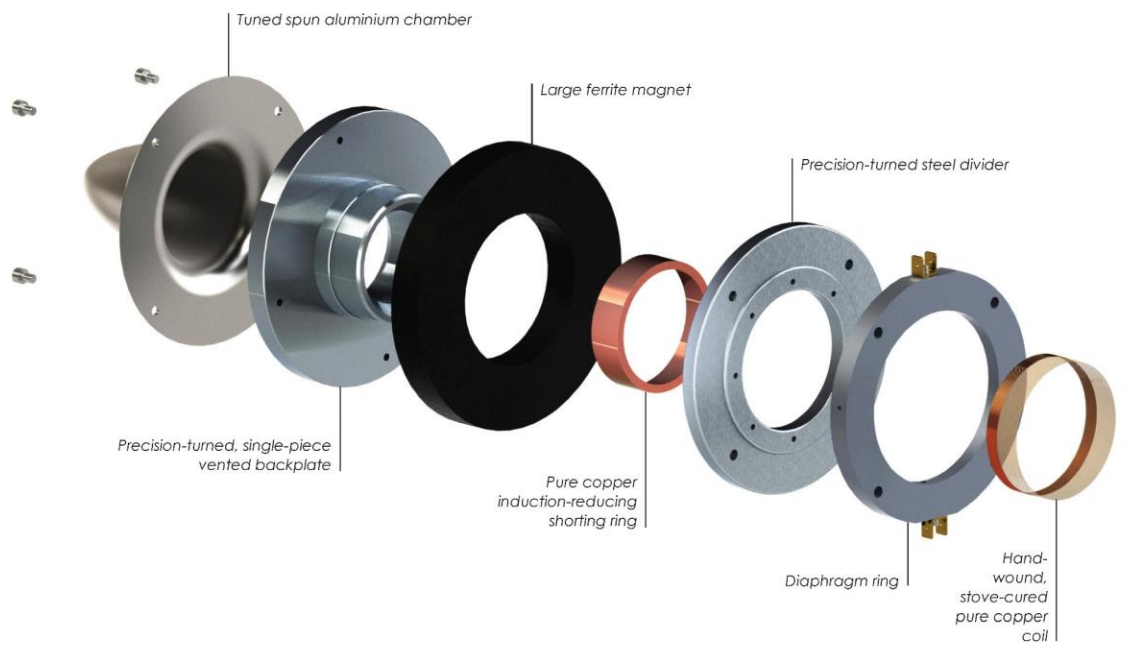
- 75mm, large coil
 - *High power handling, extremely low colouration*
- Large magnet & motor assembly
 - *High efficiency – The highest made*



The hand built, 75mm Mid-range soft dome driver

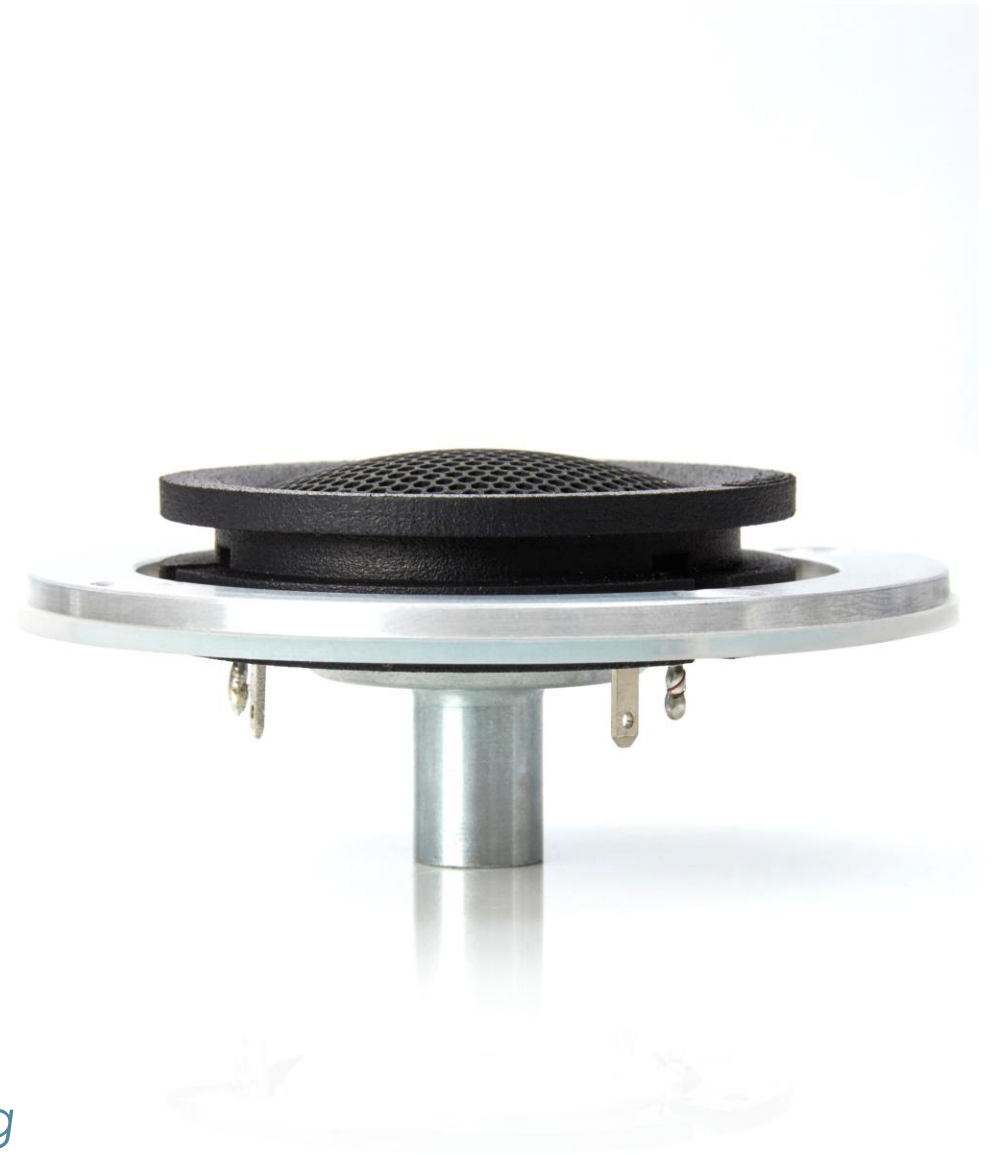
- Hollow pole piece
 - *Avoiding internal reflections/colouration*
 - *Venting into damped, inert chamber*
- Performance maximised by isolation from LF energy



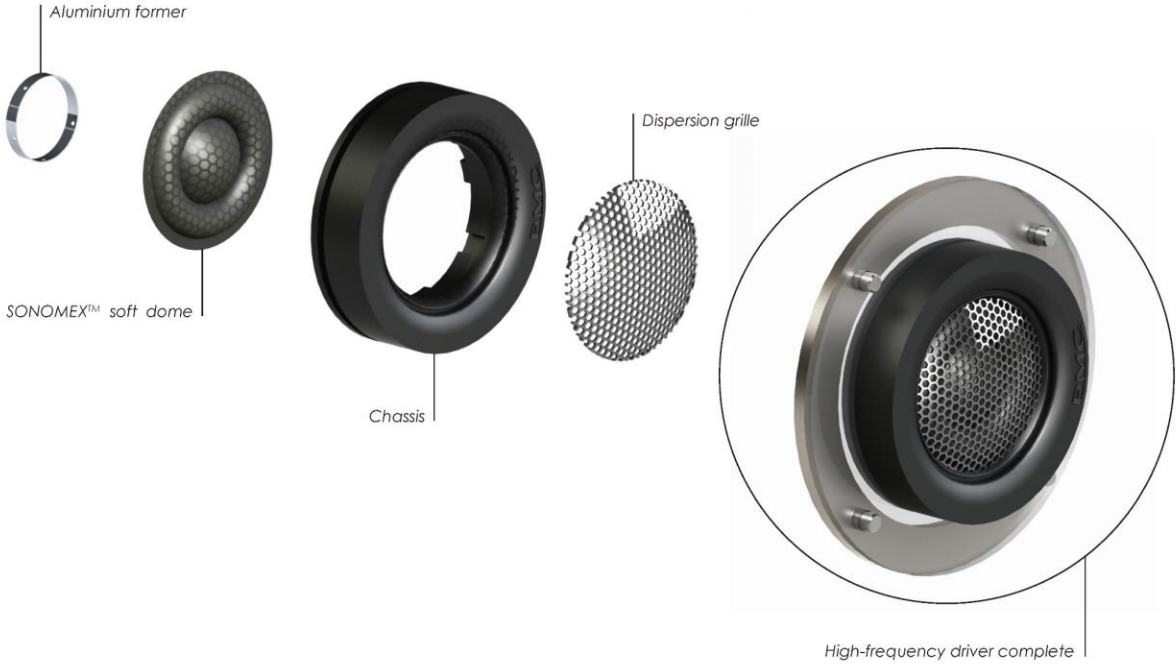
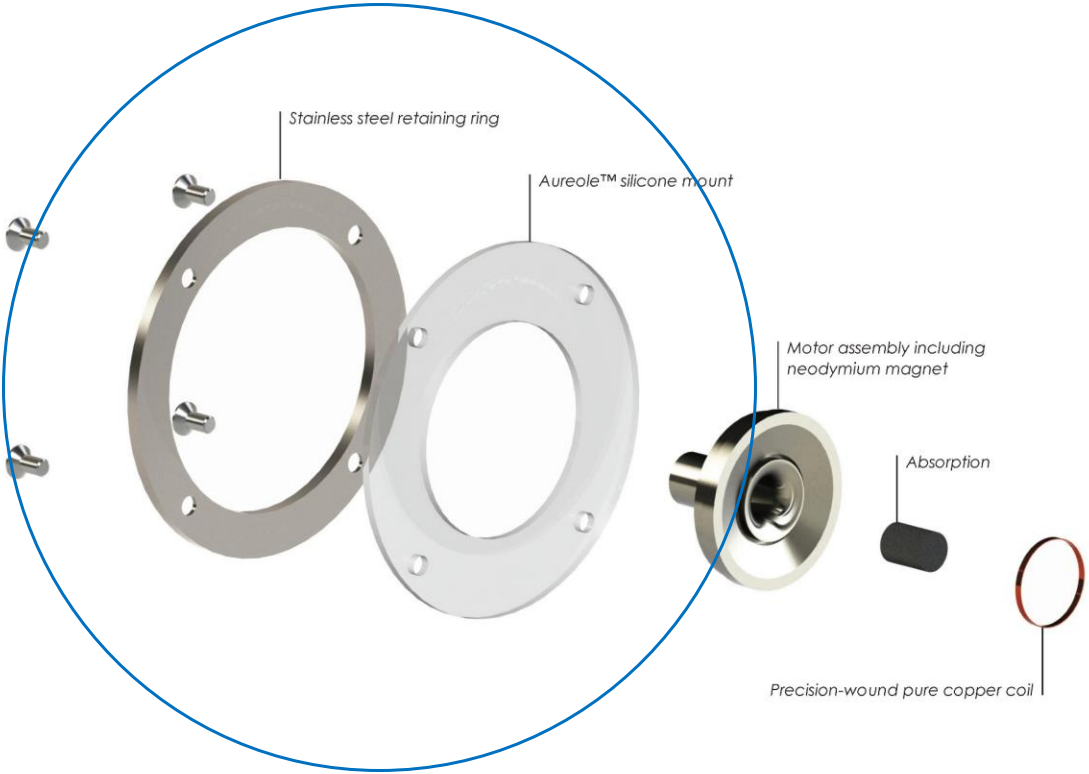


The 19.5mm Soft dome tweeter

- Natural, even and smooth
- Extremely wide dispersion
 - 19.5mm centre dome & dispersion grille
 - 34mm outer surround & ferro-fluid cooling
- Pre-coated SONOMEX™ soft dome
 - Consistent response - supreme matching
- Miniaturised using Neodymium magnet
 - Approaching a point source, MF grouping



The Aureole™ HF isolation mount

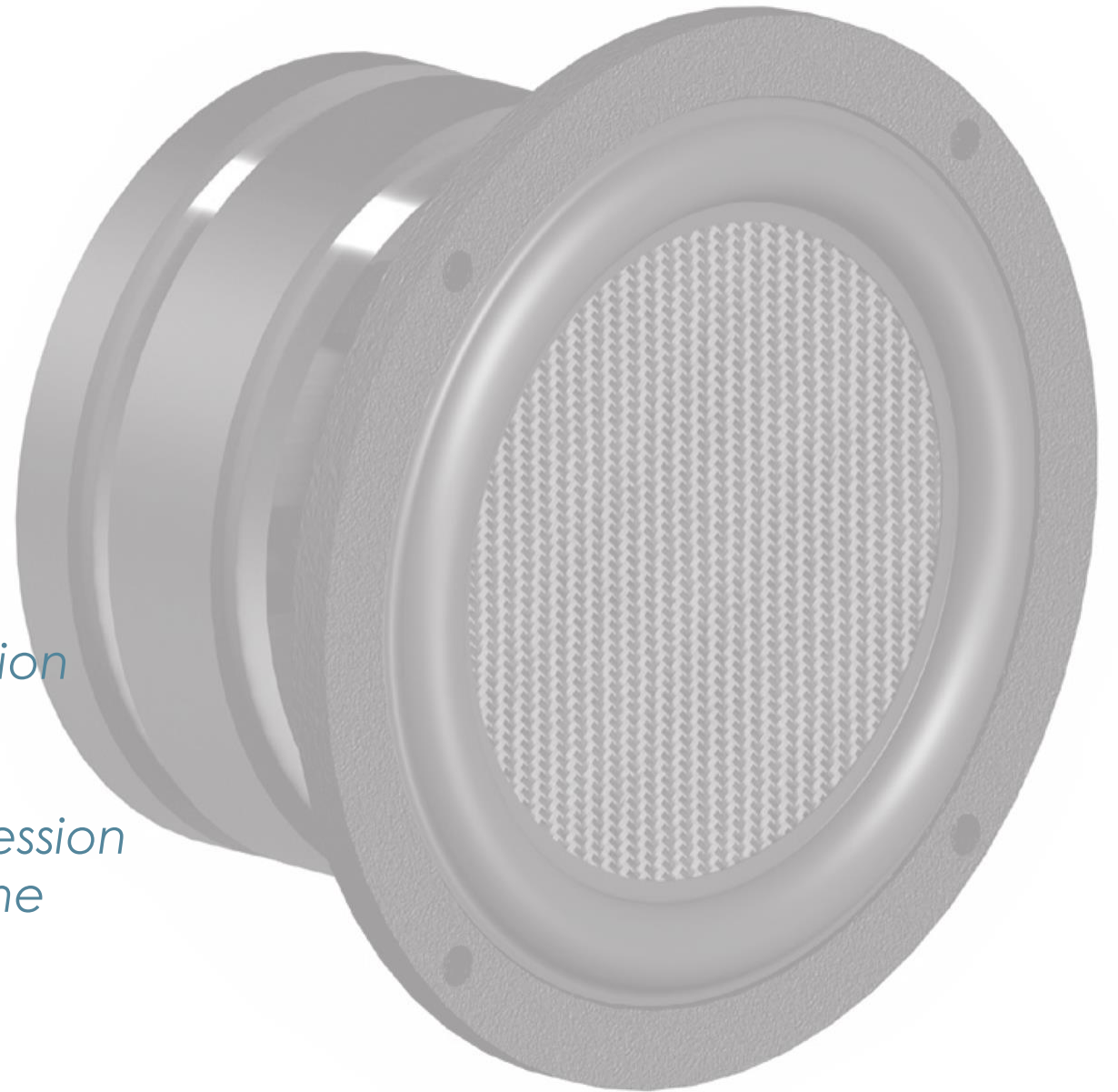


The 6.5" Long throw, piston driver



The 6.5" Long throw, piston driver

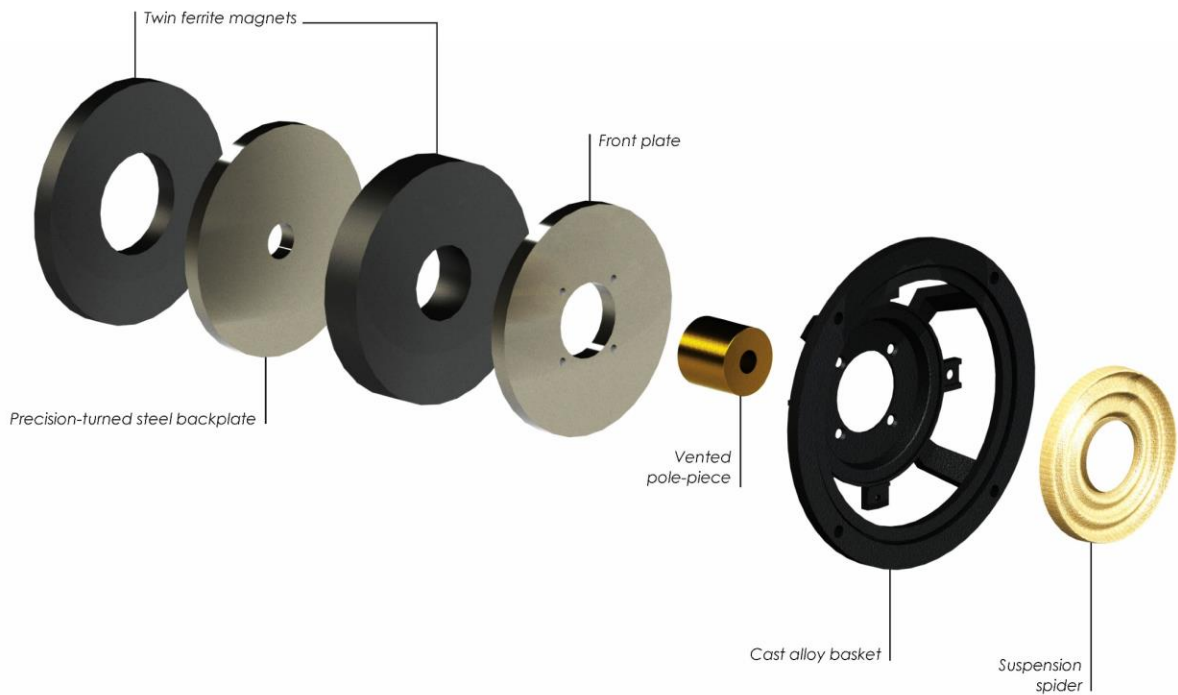
- Huge roll surround and twin suspension
- Huge linear travel
- Ultra stiff
 - *No cone break up, lower distortion*
- High power motor
 - *Powerful - Drives the high compression ATL™ with ease*
- Extensive rear venting
 - *Avoids the effects of power compression*
 - *Flatter response at all levels over time*
 - *Superb reliability*



The 6.5" Long throw, piston driver – The piston face

- Transverse weave ultra-light carbon fibre
 - Developed with UK's leading motorsport Eng.
 - Two layer sandwich with multicellular core
 - Multicellular core damps/inert
 - Max resin removed retaining strength
 - Low mass, supreme transient response





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Bass loading technology

At the heart – **ATL™** bass loading
Providing advantages over sealed or ported designs

- Ultra low colouration
- Open natural mid range
- Deeper bass from a small cabinet
- Superior power handling
- Defined bass at all volume levels



At the heart – **ATL™** bass loading
Advantages of twin outputs

- Room driven full height of room
- Smoother LF response throughout



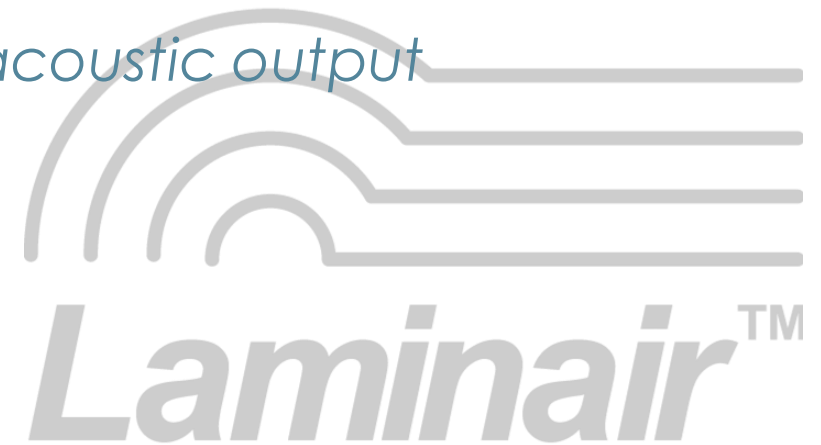


Laminair™ maximising **ATL™** bass loading

At high SPL's, airflow at the vent is turbulent

Result:

- *Unwanted noise & distortion at the vent*
- *Wasted energy by vortices, rather than acoustic output*

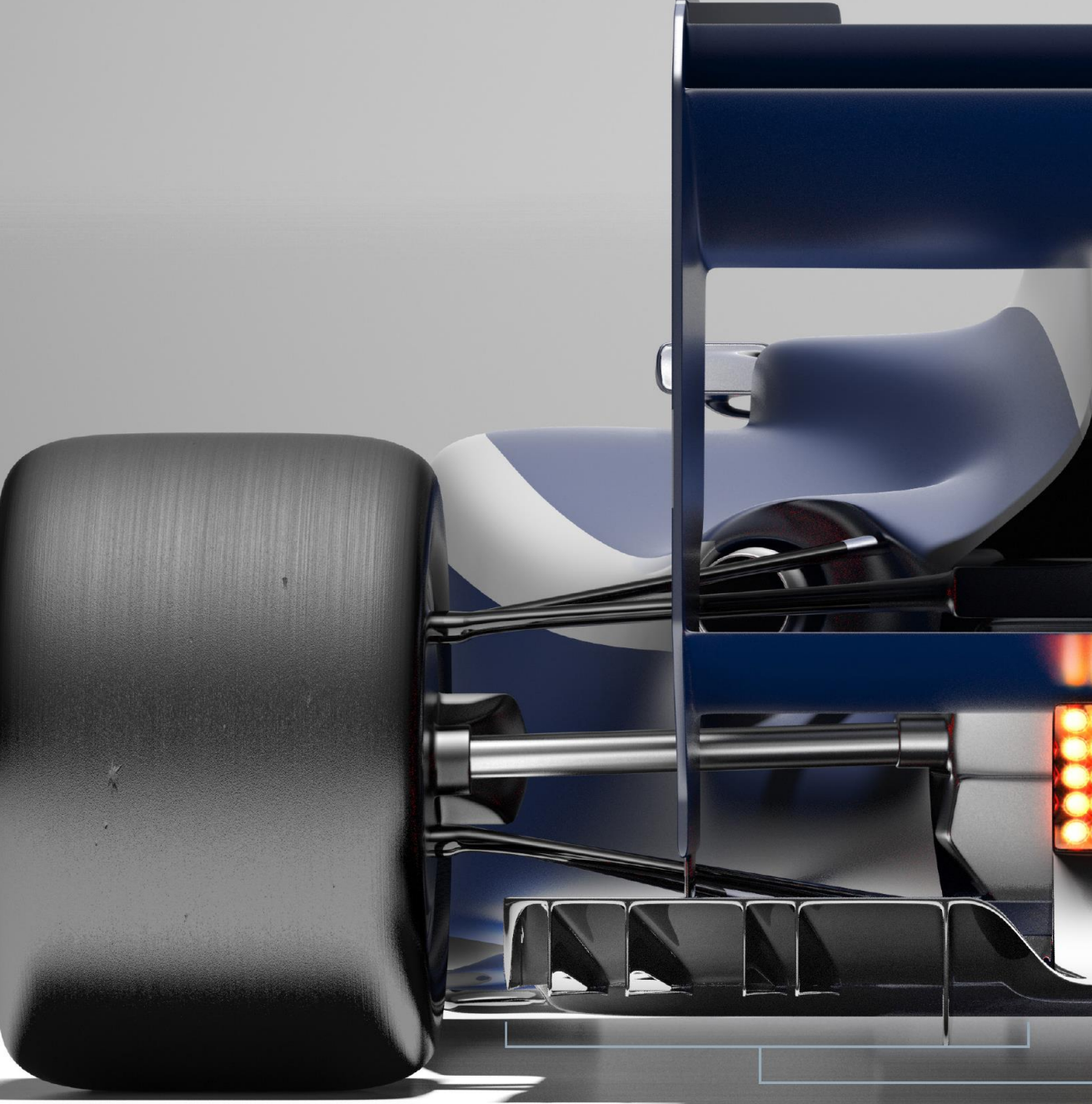


Laminair™ maximising **ATL™** bass loading

How we remedy this:

*“Increases the efficiency of the **ATL** by reducing turbulent losses”*





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Aerodynamically honed duct for efficient airflow

Laminair™ Vent

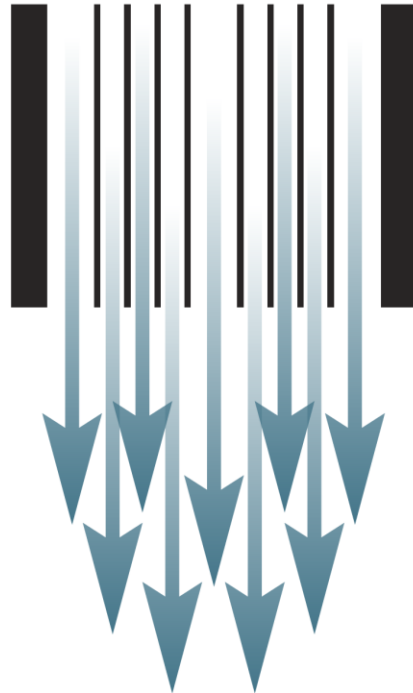


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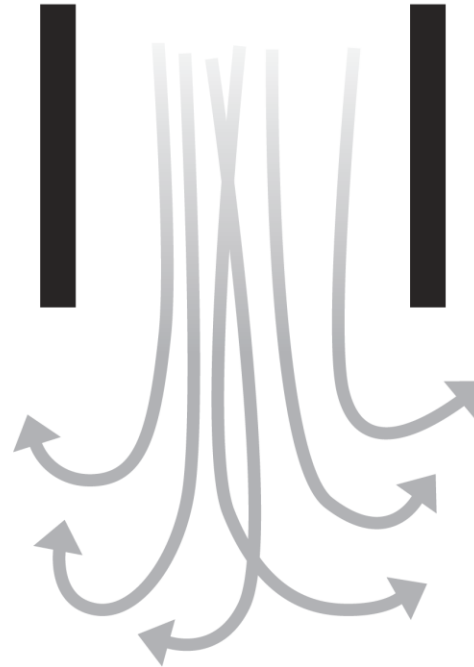
*Laminair*TM maximising *ATL*TM bass loading

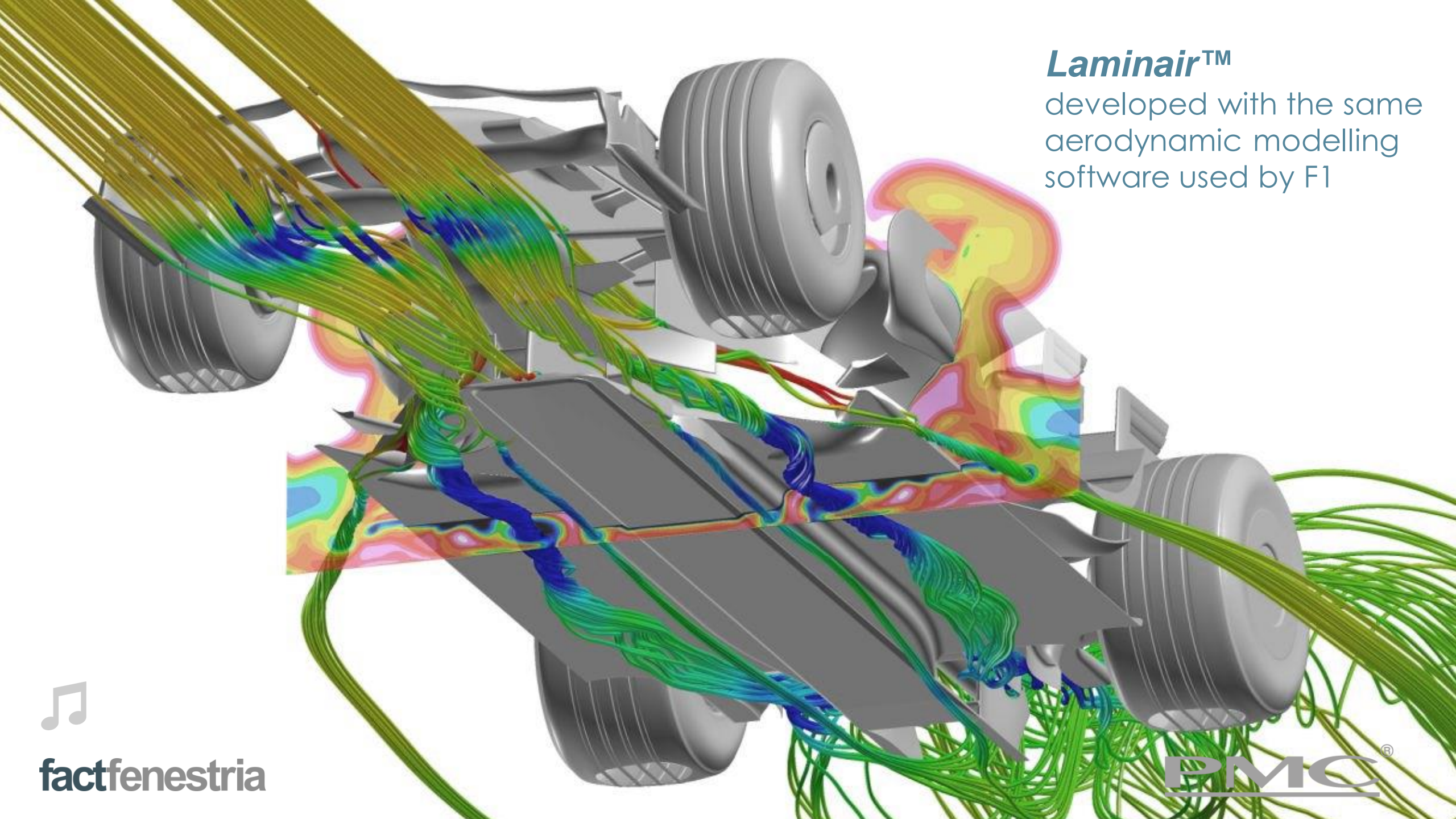
How it works

Streamlined, efficient airflow with *Laminair*TM



Turbulent airflow at the *ATL*TM vent without *Laminair*TM





Laminair™

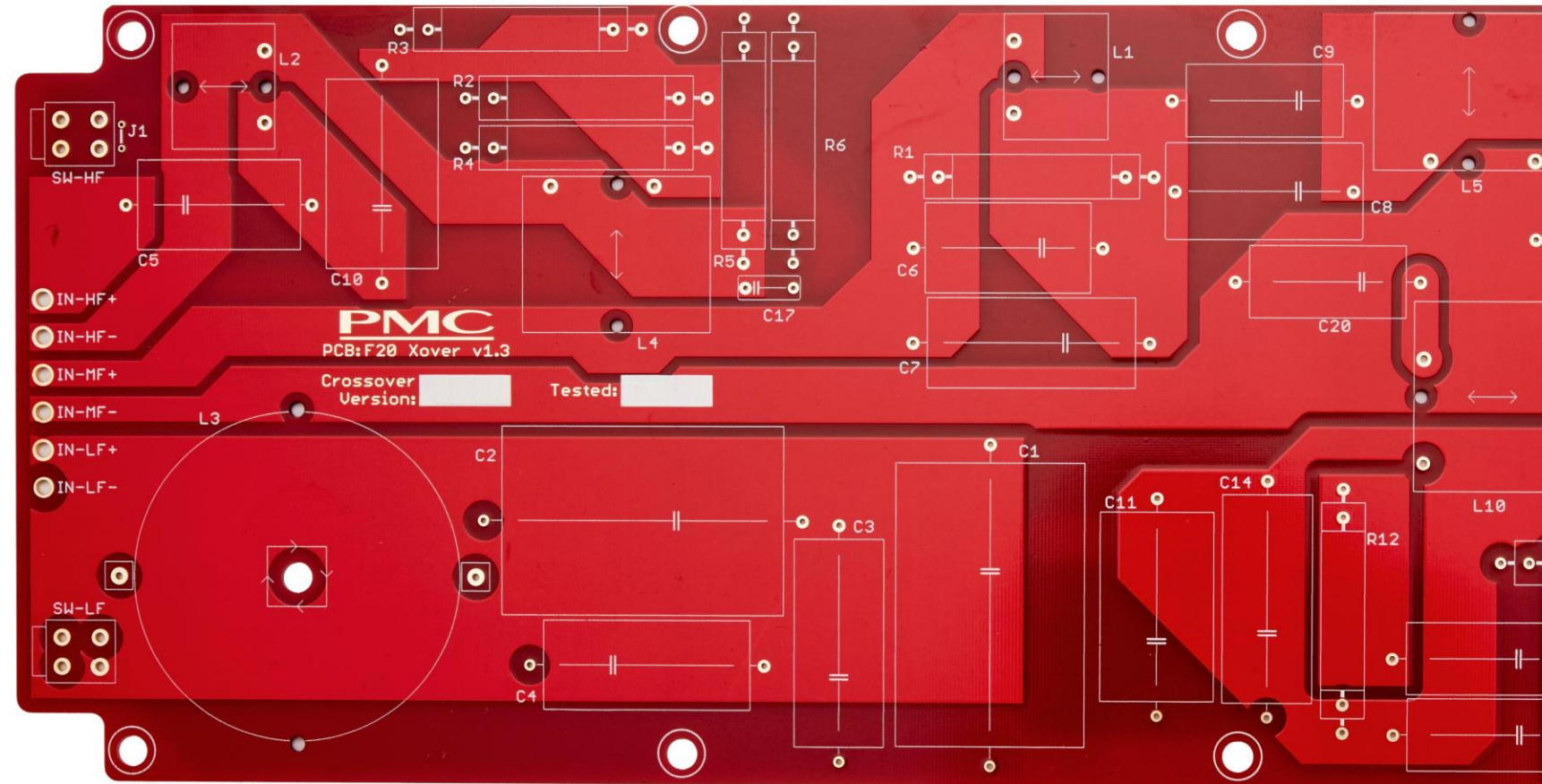
developed with the same
aerodynamic modelling
software used by F1



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The crossover



The crossover

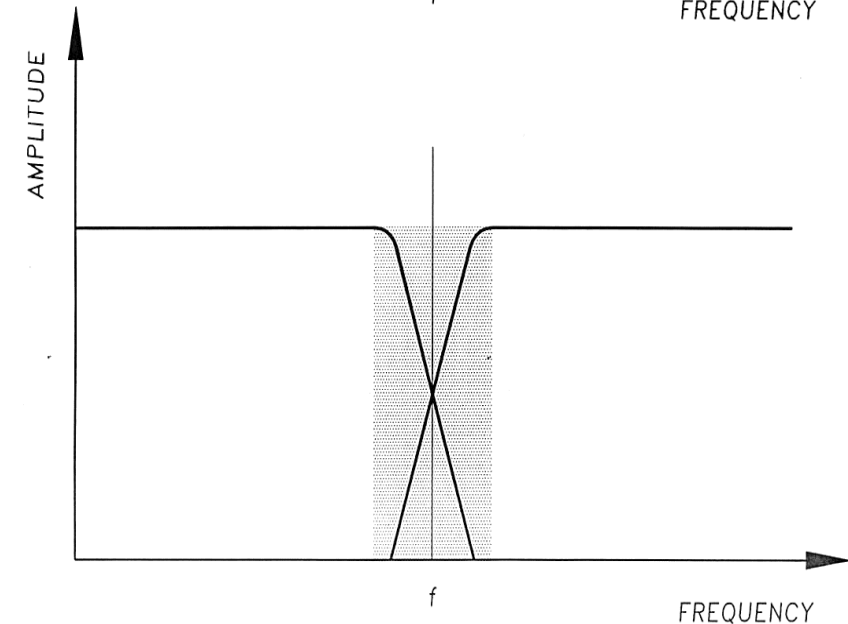
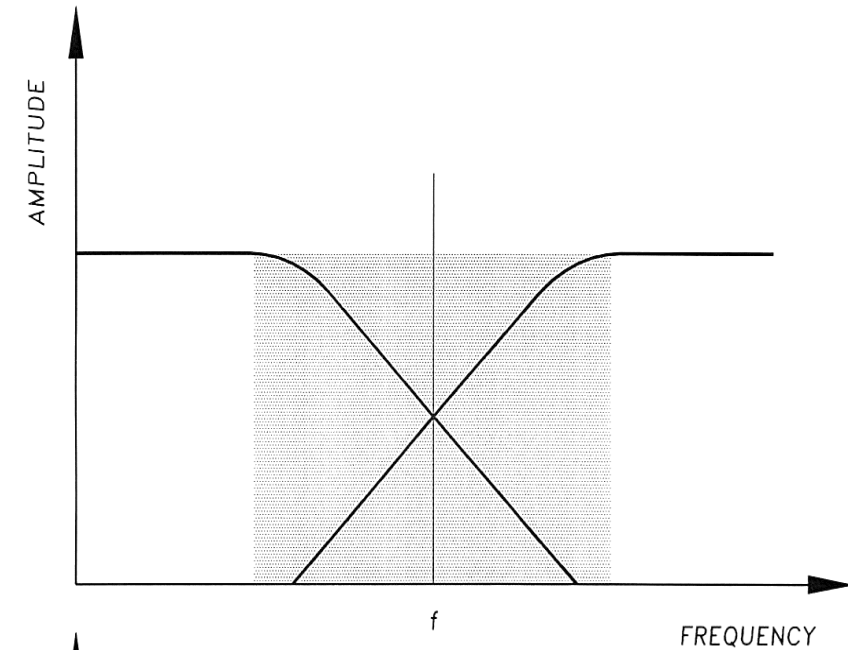
- Military grade glass fibre board
 - *Robust & less resonant*
- Extremely wide & ultra thick pure copper tracks
 - *Non inhibited current flow*
- Gold through plating
 - *Greater reliability, better performance*
- Optimise track and component positioning
 - *Low interaction*
 - *Low colouration*

The crossover

Sophisticated, steep 24dB per octave slopes provide

- *Higher power handling*
- *Greater reliability*
- *Controlled dispersion*

'No LF to MF driver, No MF to HF driver'



The crossover

- 3.8kHz & 380Hz crossover points

Smooth off axis response, huge listening window for HF & MF

Seamless integration between drivers

- Precision matched components

Perfect pair matching, perfect central image & consistency over a long period of manufacture

The crossover

- All components chosen by
 - *Measurement*
 - *Comparative listening tests*
 - *For maximum transparency*



The crossover

- Components
 - Various capacitor manufacturers
 - Resistors – ceramic & non capacitive
 - Inductors – air & laminate core



The crossover

- 10 points of isolation

Avoiding microphonic effects from all sources of vibration



Ideal integration with all rooms
& source equipment

Tuning

HF -

HF +

LF -

LF + (Boost - a unique feature)



Connecting with the music

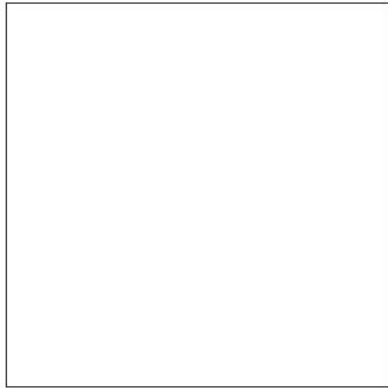
Custom Hex-Rhodium connectors for:

- Pure copper with matte rhodium plated
- *Very high conductivity*
- *Extremely low resistance*
- *Shortest signal path*
- *Accommodates all popular connectors*

- Single wire
- Bi-wire / Bi-amp
- Tri-Wire/Tri-amp



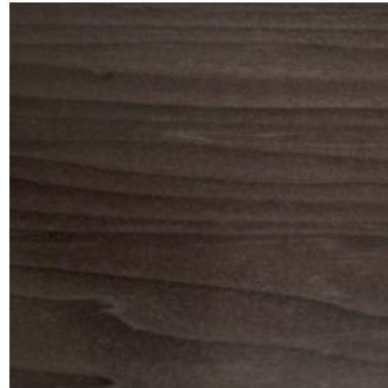
Finishes (*Silk*)



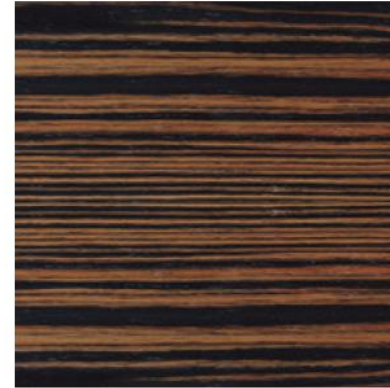
White silk



Rich walnut



Graphite



Tiger ebony

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*Thank you for listening to us &
the loudspeaker you will never hear*

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Any questions?



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