General Cabinet Parameters

All cabinets are constructed from best quality Latvian birch ply.

Unless otherwise stated, all cabinets are of the closed box type with low Q factors between 0.5 and 0.6 where size permits.

The controlled resonance of vented enclosures gives rise to excessive group delay at low frequencies which should be avoided.

Fig 1. shows a comparison of typical group delays for MC loudspeakers with 180, 220 and 270 mm drivers having 3dB frequency points at 80, 50 and 40 Hz respectively.

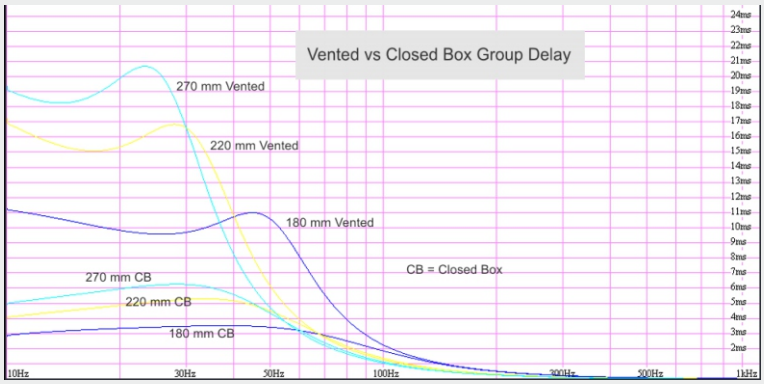
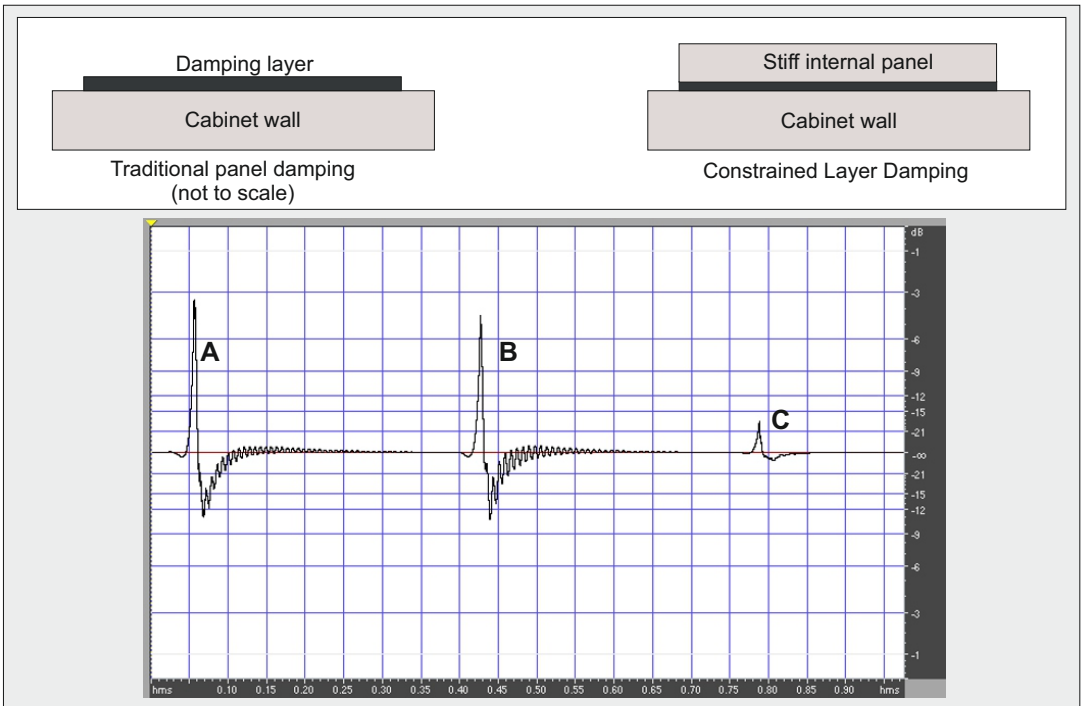


Fig 1.

Constrained Layer Damping (CLD)

Panel damping is used on all products with a considered compromise between panel stiffness and damping effectiveness. A comparison between typical simple damped panel cabinets and CLD is shown in Fig2. The materials used have been upgraded to the current Mk-2 specification and do not use bitumen materials, which have a tendency to flow when under pressure or pvc sheet, which is much better than bitumen but not as stable as Mk-2 damping material.



Impulse test on typical speaker panel materials
A. Untreated beam, amplitude vs time
B. With traditional single layer damping
C. With Constrained Layer Damping

Fig 2.

Note the panel vibration without CLD lasts for up to 300 ms.

All panel areas are damped unless internal crossovers are used and the current products have an improved heavy stiffening panels. All bracing panels use fully triangulated designs typically spaced every 180 mm of cabinet height.

Driver Technology

All drivers are manufactured by Scanspeak and have shorted turn technology which is important to reduce distortion across the full mid range.

Critical drivers use underhung voice coils giving exceptional low level intermodulation distortion.

Damped and coated paper cones are used except where a driver is used for woofer applications in which case aluminium may be specified. Neodymium magnetic materials are used when possible.

All tweeters are soft fabric roll surround types with a bandwidth extended to 40 kHz.

Crossovers

2nd order Linkwitz-Riley crossovers are used for passive crossovers.
4th order Linkwitz-Riley crossovers are used for active design.

Air cored inductors are used above 200 Hz and substantial polypropylene capacitors are specified.

Above 2.7 mH, high powered, low distortion (<0.02%) bar inductors are used in high end designs.

Cabinet Finishes and Veneers

MC uses real veneers on all products with a standard 0.6 mm thickness. A mixture of traditional materials and glues are used throughout with a view to using sustainable sources wherever possible.

Final finishing is usually with British manufactured danish oil followed by wax polishes.

Standard veneers are typically as follows:

Floor standers: American White Oak
Smaller cabinets: Cherry or the above

Connectors

We use a gold plated screw terminal produced in the UK by Michell.
We recommend the use of soldered 4 mm multiple contact “lantern” terminals produced in Switzerland by Staubli .

Amplifiers for Active Systems

The amplifiers are mono with a separate amplifiers for each driver. The only passive crossover components in the system are zobel networks that correct the driver inductances. The modular construction is split into the following components:-

1. Standby supply circuitry which controls soft start and global fault shutdown mechanisms.
2. Main power supply.
3. Input equalisers, audio controls and crossover circuitry
4. Class AB amplifier circuit boards which have self contained protection.

All modules with signal inputs and outputs have balanced connections. The vertical aluminium cabinet panels are used as the main heat sinks. Minimum sensitivity for full power output is 1.4 V rms balanced signal with switched gains of +3, +6, +9 and +12 dB giving 1.4, 1.0, 0.7, 0.35 V rms sensitivity.

For systems with unbalanced signals, Marshall Choong will provide an active 2 channel unbalanced (phono) to XLR adapter.