

# Specifying the Invisible

AN INTRODUCTION TO SPECIFYING

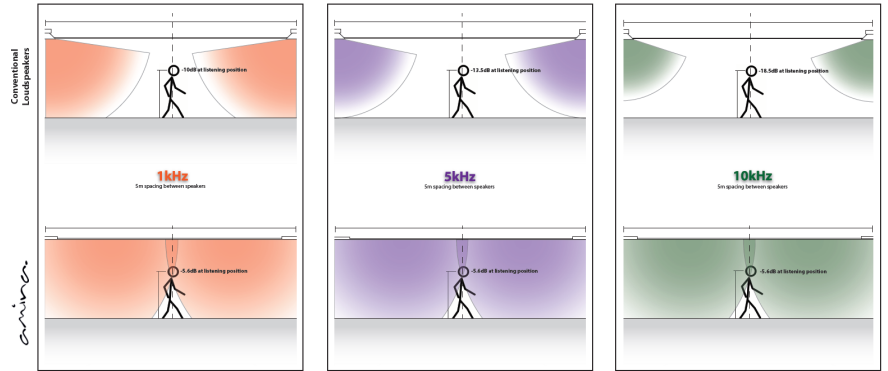
REV. 1.1 | 11-07-2022



## Introduction

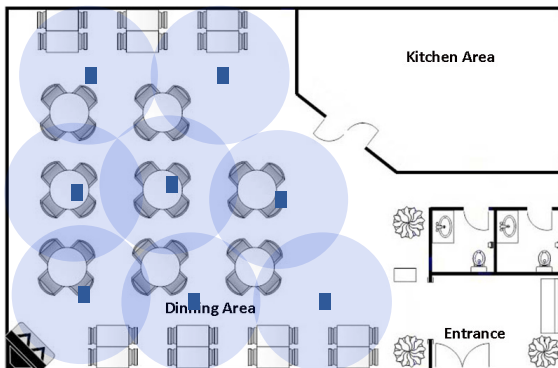
Amina invisible speakers utilise Distributed Mode Loudspeaker (DML) technology creating a hemispherical dispersion pattern right across the speakers frequency range.

This difference in dispersion characteristics provides many benefits in application including larger coverage patterns, reduced phase interaction and high feedback resistance, not to mention they are invisible! This is very different to how conventional, piston cone, speakers work and can result in up to 4x fewer speakers required for even coverage.



Dispersion of frequencies comparison

The most efficient starting point when specifying Amina DML speakers is to establish if the maximum SPL output of the selected speaker meets the application requirement both directly under and between the speakers. Room interaction is not covered in this introductory guide.



## Commercial

Commercial applications typically require three main things, background music, even coverage and high impedance compatibility. Most commonly, in commercial applications, speakers are installed into a plasterboard cavity ceiling.

It is important to check how the space is constructed as commercial techniques can include metal frame in place of timber studs, suspended ceilings and sound absorbing or other finishes.

As illustrated left, using the tools below, the expected coverage pattern and required number of speakers can be calculated.

## Starting Points

Scaled drawing, including ceiling heights - provides the dimensions necessary to calculate distance and thus SPL. It is important to understand the main use of the space and particularly the key areas for sound coverage needed.

Speaker spacing chart - provides details of how far apart to position Amina DML speakers depending on ceiling heights and anticipated room usage and whether listeners will be standing or sitting for the majority of the time. The chart includes options for 0db, 3db and 6db variances between speakers and can be used to generate visual illustrations of speaker coverage on a scaled drawing, as above.

Amina Loudspeaker Spacing Chart						
Ceiling Height (m)	0dB SPL Variation		3dB SPL Variation		6dB SPL Variation	
	Sitting (1m)	Standing (1.6m)	Sitting (1m)	Standing (1.6m)	Sitting (1m)	Standing (1.6m)
2	2.00	0.80	3.46	1.39	4.61	1.84
2.5	3.00	1.80	5.20	3.12	6.91	4.15
3	3.99	2.80	6.93	4.85	9.22	6.45
3.5	4.99	3.79	8.66	6.58	11.52	8.76
4	5.99	4.79	10.39	8.31	13.83	11.06
4.5	6.99	5.79	12.12	10.05	16.13	13.37
5	7.99	6.79	13.86	11.78	18.43	15.67

Datasheets - full datasheets for all Amina speakers, measured under fully installed conditions, are available online. These datasheets should be used when calculating max SPL and confirming that the selected speaker is appropriate for the intended application.

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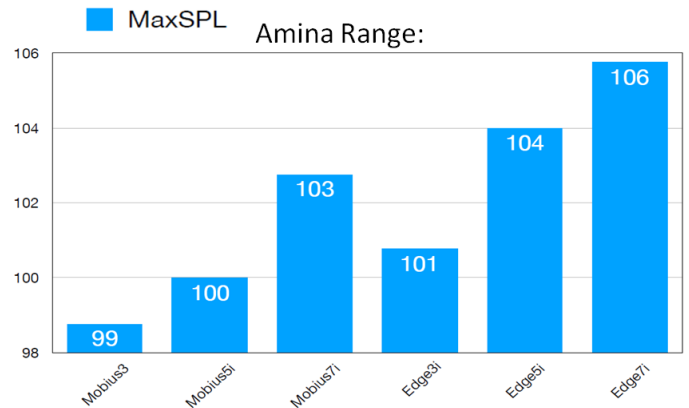


## Residential

Residential applications could include anything from background music in a single room, a house wide multi room audio system, to a dedicated multi-channel surround sound solution. Properties also vary in age and construction techniques, which can influence the available options for fully installed loudspeakers.

In many cases clients opt for a combination of applications across an entire project. This provides the perfect opportunity to make full use of the Amina range by using the appropriate speaker for the differing room sizes and applications.

Typically, the Mobius3 and Edge3i would be used for BGM in small to medium rooms with the Edge7i and Mobius7i used for party level music in larger rooms.



	Room Size								
	<12m <sup>2</sup>			12-32m <sup>2</sup>			>32m <sup>2</sup>		
	Background Music	Foreground Music	Multi-Channel Surround	Background Music	Foreground Music	Multi-Channel Surround	Background Music	Foreground Music	Multi-Channel Surround
Edge3i	●	●	●	●			●		
Mobius3	●	●	●	●			●		
Mobius Duall	●	●		●			●		
Mobius5i/S200	●	●	●	●	●	●	●		
Edge5i	●	●	●	●	●	●	●	●	
Mobius5i	●	●	●	●	●	●	●	●	
Mobius7i		●	●		●	●	●	●	●
Edge7i		●	●		●	●	●	●	●

Speaker selection guide

## Starting points

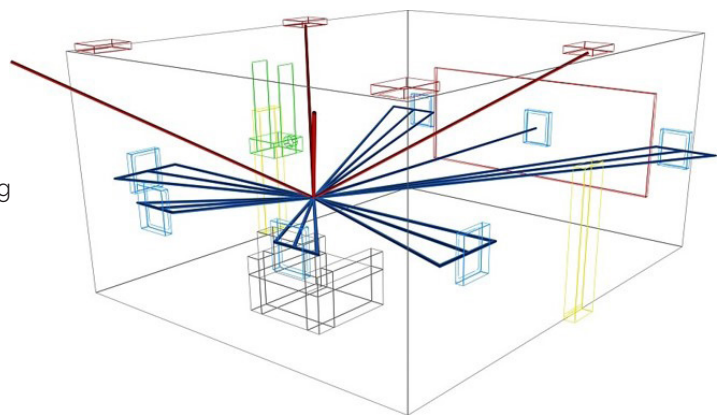
**Scaled drawing**, including ceiling heights - provides the dimensions necessary to calculate distance and thus SPL. It is important to understand the main use of the space and particularly the key areas that require adequate sound coverage.

**Speaker selection guide** – a quick reference guide to select the appropriate speaker based on the size of room and intended use.

**Speaker spacing chart** - as pictured on page one of this document.

## Multi-Channel

Amina invisible speakers offer an excellent solution for multi-function media rooms enabling full surround / 3D surround sound without impacting on the aesthetics of the lounge, snug or bedroom at a variety of price performance points. Additionally, DML speakers provide a larger sweet spot creating an immersive experience for the whole family.



Support and guidance for larger and more complex projects can be found via your local distributor or our website.

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