

Fabric Covering

APPLICATION NOTE

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AMINA
IMMERSIVE INVISIBLE SOUND

Introduction

Amina loudspeaker panels can be installed behind decorative and / or functional fabric coverings without compromising audio performance.

There are three main points to consider when planning a speaker installation behind fabric- acoustic performance, panel technology, and speaker alignment.

This guide will discuss these considerations and make recommendations based on typical uses of fabric in interiors.



Acoustic Factors

When covering speakers with fabric, it is important to be aware that different materials will have varying acoustic properties, and will affect sound differently. These acoustic properties determine the best method of installation for a given application, and are a factor in deciding which invisible panel technology should be used for an application.

Non-Acoustically Transparent Fabrics

Most fabrics fall into this category unless specifically stated otherwise. Leathers, plastics, burlap/hessian, cottons etc. will absorb and/or reflect different parts of the frequency spectrum, changing the character of reproduced sound.

Non-acoustically transparent fabrics are slightly more restrictive in terms of speaker installation options, particularly in heavy and / or closed cell fabrics where the sound could be significantly obscured. In this case the fabric must be adhered to the face of the speaker panel, making alignment critical to achieving an invisible installation.

Natural, lightweight, open-weave fabrics will tend to suffer less from acoustic reflections, and the absorptive qualities tend to be minor and restricted to higher frequencies. These lightweight breathable fabrics can be used in much the same way as acoustically transparent types, and any noticeable deficiency in high frequency can be compensated for by using digital signal processing to boost deficient frequencies.

Acoustically Transparent Fabrics

These are specially designed fabrics that allow sound to pass through unaffected. That is without reflecting, or absorbing, any significant portion of the sound.

Commonly used in acoustic treatment panels, speaker grilles and cinema screens, acoustically transparent materials will always be breathable, and often have visible perforations.

Fabric manufacturers will usually provide acoustic performance details for different products, particularly in fabrics advertised as acoustically transparent. If acoustic performance of a fabric is not specified, it is safe to assume that it is not transparent.

Acoustically transparent fabrics give the greatest flexibility when it comes to installation, allowing either panel technology to be used in any application. The main advantage of acoustically transparent materials is that the speaker can be set back from the material, making an invisible installation particularly easy to achieve.

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Panel technology

Amina's two core speaker panel technologies give different options in terms of how speakers can be installed behind fabric:

Mobius: Full 1.5-2mm covering



Edge: No covering required



The Mobius panel technology requires a 1.5-2mm covering directly on the face of the speaker for proper acoustic performance.

Heavy and / or closed cell fabric coverings like leather and vinyls with a thickness of 1.5-2mm can be bonded directly to the face of the speaker. The covering effectively becomes part of the active surface of the panel.

Where fabrics are less than 1.5mm, the speaker covering thickness will need to be built up - the method of which depends on the substrate material.

Once prepared, (more details in the next section) contact adhesive should be used to adhere the fabric over the speaker and surrounding wall. It is very important that the fabric bonds to the entire surface of the speaker panel with no air gaps or loose material, which could cause unwanted noise.

Edge panels are designed to function properly with no covering on the raised, center section of the soundboard.

This is particularly useful in applications with acoustically transparent fabrics as the surface of the speaker panel does not have to be in contact with the fabric, and no additional covering thickness is required. By being set back from the fabric, alignment is not as critical to achieve a truly invisible installation.

Alternatively, in a plasterboard substrate, Edge speakers can be installed as normal; flush with the wall and edge filled, and covered by bonding a thin, lightweight fabric over the surface along with the rest of the wall. A low level of high frequency attenuation is to be expected with non-acoustically transparent materials, and can be compensated for with EQ if necessary.

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Alignment & Installation

Fabric wall coverings are usually installed in one of two ways: they can be applied directly like wallpaper over a smooth, prepared wall, or stretched over frames (like a canvas) and applied in sections with a small void between the fabric and substrate. The method of covering will inform the choice of panel technology as well as the installation procedure, with these common cases outlined below:

Mobius: Direct application of fabric

Where fabrics are bonded directly to wall surfaces Mobius will usually be the most appropriate loudspeaker choice. In this application preparation is everything, as fabric bonded directly to the wall will reveal even minor imperfections in the wall surface.

Mobius speakers require a total of 1.5-2mm covering for proper performance. Materials of this thickness will be adhered directly to the face of the speaker, which should be aligned flush with the surrounding substrate. The edge fill around the speaker must be applied as usual (the scrim tape should be omitted), finished to a high standard and allowed to thoroughly dry before finishing to allow for any shrinkage that may occur. A mist coat of white emulsion can help to reveal imperfections when shining light across the surface.

Thinner materials will require the speakers to be set back from the surrounding substrate with additional covering applied to the face of the speaker to create a total covering of 1.5-2mm. Different substrates will achieve this in different ways:

- In a plasterboard wall the edge-fill must be applied as mentioned above, and the recess that is created by setting the speaker back in the substrate should be filled flush with a plaster skim. Speakers should be mounted in plasterboard or solid walls using backboxes or mounting blocks as usual, and shims can be used to adjust the alignment if necessary - please refer to the plaster-over installation guide.
- In a wooden or MDF substrate, the best finish will be achieved by following the wood installation guide; either by routing a pocket for the speaker in the back of the substrate, or by using a laminate covering over the speaker and surrounding substrate.

Edge: Speaker set back from fabric

Where acoustically transparent or lightweight, breathable fabrics are stretched over frames before being applied to the wall, the ideal speaker choice will usually be Edge. In this case, alignment is not critical.

The speaker should be mounted in the substrate behind the fabric in a backbox or with mounting blocks. The alignment should leave a sufficient gap between the active surface of the speaker and the fabric to avoid any unwanted noise from contact. Ideally, there should be no material obstructing the face of the speaker other than the lightweight or acoustically transparent fabric.

If the fabric installation includes wadding behind the finish fabric, we have found that light wadding only causes a minor reduction in high frequency, which can usually be compensated for by using the tone balance controls of the audio system. Light wadding should not be removed from in front of the speaker as this may show through the finish material. Heavier wadding will absorb more of the sound, and should ideally be avoided.

Instructions for mounting the speaker and backbox/mounting blocks into the substrate are somewhat dependent on the construction but the standard installation principles, particularly testing procedures, should be followed. Please refer to the Edge installation guide for detailed instructions. The edge-fill process can be considered optional (it provides a very minor performance benefit), but the finishing process is clearly not necessary, since the substrate will not be seen.

If non-breathable covering materials are being used, the Mobius method should be used and alignment is critical.

Note: The speaker model recommendations in this guide are intended to provide the most straightforward installation method for each fabric and construction type, but if different speaker models are desired for any reason this can usually be achieved with a little extra effort as long as the basic installation principles (covering thickness, alignment etc.) are observed. Please contact Amina technical support to discuss further.

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