



# AS<sup>®</sup> Acoustic Shell<sup>®</sup>

AS<sup>®</sup> Acoustic Shell<sup>®</sup> is a brand that sells and rents out highly specialised acoustic shells which are conceived in the laboratories (R&D) of the Portuguese company JOCAVI<sup>®</sup> Acoustic Panels Lda. The AS<sup>®</sup> brand belongs to the JOCAVI<sup>®</sup> Group. We prepare projects to advise on our products by seeking the best shell for each space. We rent out through "*long term rental*" contracts for events to be carried out on a continuous basis on the same spot.

We sell for permanent installation in theatres and auditoriums where the main activity requires the use of these acoustic diffusers. We also carry out the installation and acoustic checking and enter into maintenance contracts for our shells. We are AS<sup>®</sup> Acoustic Shell<sup>®</sup>, a company specialised in acoustic diffusion shells.



# FIXED DIFFUSION ACOUSTIC SHELLS

EFFECTFUSER® AcSh® • DYNAMICFLOW® AcSh® • WOODFOIL® AcSh® • PLURA® AcSh®



## DESCRIPTION

The diffusing acoustic shells are acoustic treatment elements intended for large volume rooms, such as theatres or auditoriums with a stage where orchestral concerts or mere recitals take place. These acoustic diffusing components are meant to project the non-amplified original sound from the stage to the audience. This will enable people to hear the sound coming directly from its sound sources and instruments, without the electro-acoustic inherent characterization or colouring. This panel also aims to enable the stage and the room to be within the same space and not separate in two by the mouth of the stage. JOCAVI's EFFECTFUSER®, WOODFOIL®, PLURA® and DYNAMICFLOW® models have been designed at the specific scale of these needs. Due to its shape and depth, they also have a high diffusion coefficient on medium/low frequencies. They are all large-sized diffusers that provide a very homogeneous diffusion within the diffuse and sound spectrum.

Manufactured in ABS (except WOODFOIL® in wood) with a rigid framework, these pieces can be coupled and multiplied in order to suit each project's demands. When mounted, several modules should be grouped so as to obtain an area that is proportional to each space. Mounting: They can be hung from the ceiling in a strategic position in order to obtain sound diffusion in the required angles. They can also be mounted with a motorized rigging system from the stage ceiling. These elements / modules are fastened with steel cables by using appropriate mounting accessories. Their low weight makes mounting easier. As with any other JOCAVI® diffusion panel, these models can also be applied on false ceilings, flat ceilings or walls.

The combination of the various EFFECTFUSER® COMBI and the other models Plates, diffusing pieces must be optimised so as to obtain a diffusion as uniform as possible in the entire room.

## MAIN FEATURES

To adjust the diffusing properties of these models to the room where this product is applied, the placement of the pieces must be taken into account in order to obtain its best performance, bearing in mind these two types of diffusion:

### DIFFUSION WITH COMPRESSION EFFECTS (only EFX COMBI and EFX Plate)

It emphasizes the sound diffusion with a smaller covering angle, effective at a longer incidence distance.

Features: efficient at a longer distance; smaller incidence angle; higher sound level.

### DIFFUSION WITH SCATTERING EFFECTS (only EFX COMBI and EFX Plate)

It emphasizes the sound diffusion at a wider covering angle, effective at a shorter incidence distance.

Features: efficient at a shorter distance; less sound level; wider incidence angle.

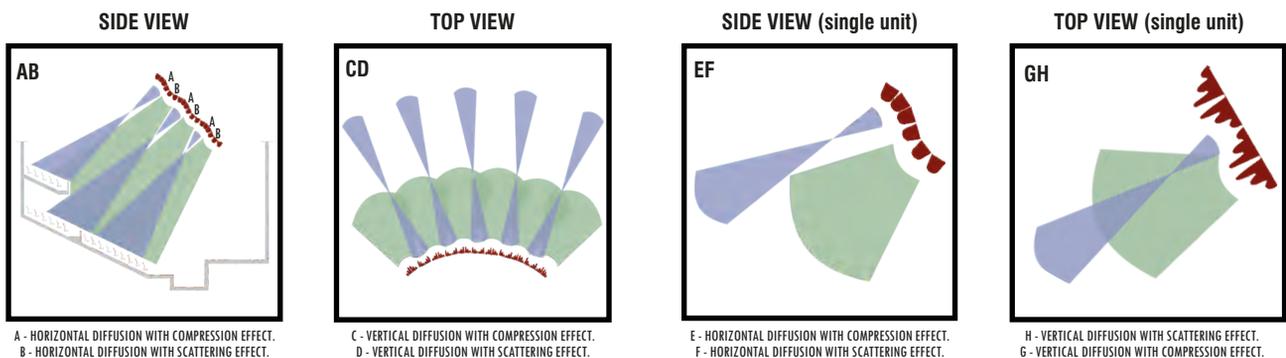
## MOUNTED MODELS AND SIZES

| MODELS        | HEIGHT | WIDTH  | DEPTH | WEIGHT |
|---------------|--------|--------|-------|--------|
| EFX COMBI 180 | 180 cm | 120 cm | 32 cm | 57 Kg  |
| EFX Plate 120 | 120 cm | 120 cm | 32 cm | 38 Kg  |
| DYN Plate 180 | 180 cm | 120 cm | 11 cm | 34 Kg  |
| DYN Plate 120 | 120 cm | 120 cm | 11 cm | 25 Kg  |

## MOUNTED MODELS AND SIZES

| MODELS        | HEIGHT | WIDTH  | DEPTH | WEIGHT |
|---------------|--------|--------|-------|--------|
| WFL Plate 180 | 180 cm | 120 cm | 19 cm | 26 Kg  |
| WFL Plate 120 | 120 cm | 120 cm | 19 cm | 21 Kg  |
| PLR Plate 180 | 180 cm | 120 cm | 16 cm | 33 Kg  |
| PLR Plate 120 | 120 cm | 120 cm | 16 cm | 24 Kg  |

## SCATTERING EFFECTS (example for the EFX180COMBI)



## STANDARD ABS COLOURS



## WOOD VENEER FINISHINGS



## IMPORTANT NOTICES

- JOCAVI® accepts no responsibility for any printing errors. Specifications can be modified without prior notice, if technical or commercial reasons so require.
- RAL® is an international independent colour standard system partner for industry, trade, architecture and design. Should be consulted before placing any order.
- The colours shown on this catalogue are only a reference and an illustration of the products finishing. The colours shown are not binding because brightness, contrast and colour balance may vary due to the printing process.
- Colours may vary due to raw-material suppliers' changes and some differences may occur in tonal range.
- Typical Indoor Comfort Standards state a temperature range of 20°C - 27°C (68°F - 81°F), and a relative humidity of less than 60%. These would be considered as normal operational levels of JOCAVI® products' range.
- Sizes may vary slightly due to their production method and some inherent raw-materials characteristics.



# PORTABLE DIFFUSION ACOUSTIC SHELLS

DYNAMICFLOW® AcSh® • WOODFOIL® AcSh® • PLURA® AcSh®



## DESCRIPTION

Based on works and experiments in the field of sound wave diffusion and the positive aspects that result from the presence of diffusers in rooms, we have built this acoustic diffuser.

Therefore, we are presenting new design proposals that are less common in diffusion structures designed for mobile use.

The DYNAMICFLOW® AcSh®, the WOODFOIL® AcSh® and the PLURA® AcSh® are an easy-to-install portable acoustic diffusion shells meant to be used in certain types of musical concerts.

It is a piece that changes the room's acoustics by enhancing its features.

Diffusion shells are acoustic treatment elements used in large volume rooms, such as theatres and auditoriums. They may also be used outdoors for the performance of concerts by large orchestras or just recitals.

The installation of these acoustic diffusion components is meant to project the non-amplified original sound from the stage towards the audience.

This will enable to hear the sound that comes directly from the sound sources and instruments, without the characterization or colouring inherent to the use of electro-acoustics. These shells also enable the stage and the room to be within the same space and not separate in two by the mouth of the stage. These pieces do not need any preparation prior to their installation, just a free stage with good access.

They must be coupled and multiplied in such a way that is adequate to each project in order to obtain a diffusing area that is proportionate to the space in question.

## MAIN FEATURES

Depending on the space available on the stage, more or less elements may be used in order to form the shape of a perfect shell.

Built on a modular configuration with 120 x 120cm pieces, up to four modules can be coupled in height, thus totalling a diffusing homogeneous surface of 480 x 120cm.

The DYNAMICFLOW® AcSh®, the WOODFOIL® AcSh® and the PLURA® AcSh® are a large-sized diffusers that provides a very homogeneous diffusion within the sound and diffuse spectrum.

## DIFFUSION WITH SCATTERING EFFECTS

It emphasizes the sound diffusion at a wider covering angle, effective at a shorter incidence distance.

Features: efficient at a shorter distance; less sound level; wider incidence angle.

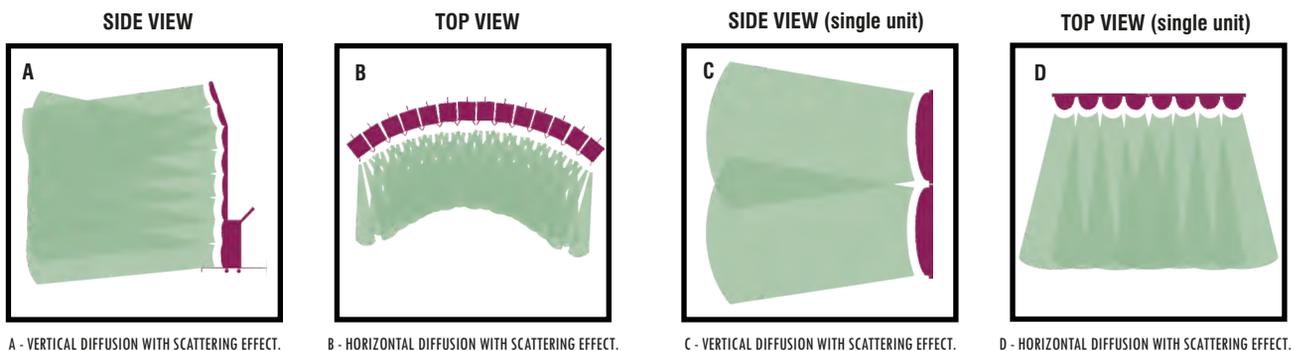
## MOUNTED MODELS AND SIZES

| MODELS       | HEIGHT       | WIDTH  | DEPTH | WEIGHT     |
|--------------|--------------|--------|-------|------------|
| DYNAS3 / AS4 | 380 / 500 cm | 124 cm | 78 cm | 55 / 70 Kg |
| WFLAS3 / AS4 | 380 / 500 cm | 124 cm | 78 cm | 55 / 70 Kg |
| PLRAS3 / AS4 | 380 / 500 cm | 124 cm | 78 cm | 55 / 70 Kg |

## MODELS IN FLIGHT-CASE

| MODELS       | HEIGHT | WIDTH  | DEPTH  | WEIGHT     |
|--------------|--------|--------|--------|------------|
| DYNAS3 / AS4 | 165 cm | 124 cm | 78 cm  | 65 / 80 Kg |
| WFLAS3 / AS4 | 165 cm | 124 cm | 106 cm | 65 / 80 Kg |
| PLRAS3 / AS4 | 165 cm | 124 cm | 82 cm  | 65 / 80 Kg |

## SCATTERING EFFECTS (example for the DYNAS4)



## STANDARD ABS COLOURS



## WOOD VENEER FINISHINGS



## IMPORTANT NOTICES

- JOCAVI® accepts no responsibility for any printing errors. Specifications can be modified without prior notice, if technical or commercial reasons so require.
- RAL® is an international independent colour standard system partner for industry, trade, architecture and design. Should be consulted before placing any order.
- The colours shown on this catalogue are only a reference and an illustration of the products finishing. The colours shown are not binding because brightness, contrast and colour balance may vary due to the printing process.
- Colours may vary due to raw-material suppliers' changes and some differences may occur in total range.
- Typical Indoor Comfort Standards state a temperature range of 20°C - 27°C (68°F - 81°F), and a relative humidity of less than 60%. These would be considered as normal operational levels of JOCAVI® products' range.
- Sizes may vary slightly due to their production method and some inherent raw-materials characteristics.



When performing at a conventional theatre, symphonic and chamber orchestras, as well soloists and opera singers, encounter problems related to the projection of the sound and voice, due to the noise that is produced on the space of the stage box and the absence of diffusion materials.

The sound that is produced by the orchestra is dispersed heterogeneously in all directions, depending on the instruments. It needs an acoustic shell to channel it towards the audience. In order not to lose the sound level and all the musicality of orchestras, acoustic shells should be placed around them.

To project the sound, it is necessary to install diffusion panels shaped like a shell, open towards the audience, in order to scatter the sound in that direction. The Acoustic Shells can be installed hanging on the stage's ceiling and/or on the floor around the musicians.

Following the research on acoustic panels, JOCAVI<sup>®</sup> adopted four of its models of acoustic diffusers to create these models of AS<sup>®</sup> acoustic shells.

Spaces, like theatres and auditoriums, where classic music performances are programmed, are usually big-volume rooms. Thus, due to the noise from the audience and the lack of an acoustic shell, electro-acoustic equipment (microphones, power stages and loudspeakers) is overused in these spaces. Musicians, singers and musical directors do not tend to overuse electro-acoustics in order not to distort the natural colour of the instruments and voices. The use of our AS<sup>®</sup> acoustic shells increases the natural level of the sound that is genuinely produced by the instruments and naturally increases the level of the acoustic pressure of the room, thus leading to a balanced diffusion throughout the whole range of the sound spectrum.

#### AS<sup>®</sup> ACOUSTIC SHELL<sup>®</sup> - THE BRAND

AS<sup>®</sup> Acoustic Shell<sup>®</sup> is a brand that sells highly specialised acoustic shells which are conceived in the laboratories (R&D) of the Portuguese company JOCAVI<sup>®</sup> Acoustic Panels Lda. The AS<sup>®</sup> brand belongs to the JOCAVI<sup>®</sup> Group. We prepare projects to advise on our products by seeking the best shell for each space.

We sell for permanent installation in theatres and auditoriums where the main activity requires the use of these acoustic diffusers. We also carry out the installation and acoustic checking and enter into maintenance contracts for our shells. We are AS<sup>®</sup> Acoustic Shell<sup>®</sup>, a company specialised in acoustic diffusion shells.

#### VERSATILITY OF A SHELL

Unlike the most ancient and original open-air acoustic shells made of stone in roman amphitheatres, today's acoustic shells used in performance rooms have to be versatile and discreet, so that their presence does not hinder the use of the space for the most varied types of performances.

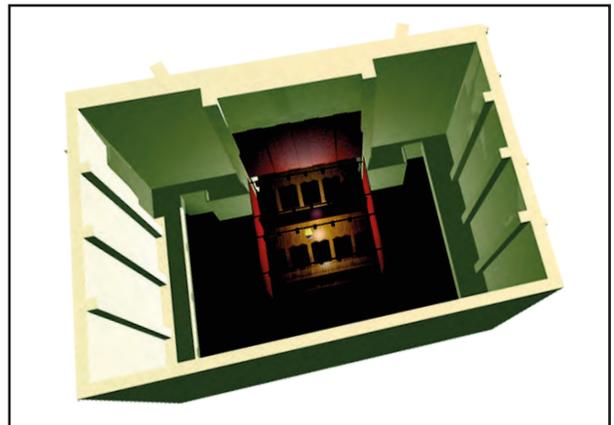
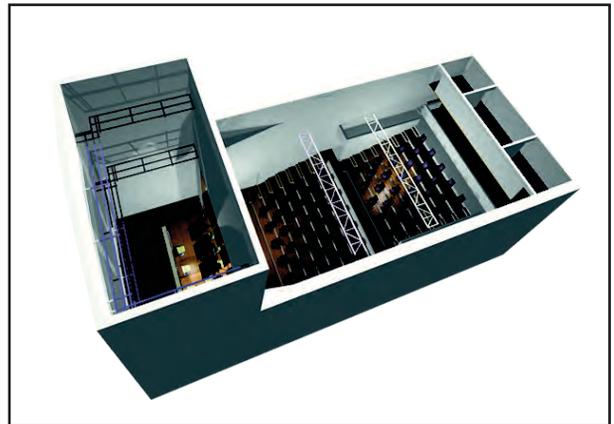
Our shells have been developed and built with light and attractive materials, which facilitate as much as possible their practical use. They adapt to the orchestra by increasing the number of the necessary modules and by adjusting their application according to the type of performance. It is a stage equipment that is easily assembled and disassembled and that is imperceptible when it is not being used.

#### ACOUSTIC BEHAVIOUR

The purpose of acoustic shells is to use both the acoustic energy and sound, which were beforehand wasted in the stage-box, and direct them towards the audience.

It is particularly important how this is done. Acoustic shells, which are simply a flat, convex or concave piece of varnished plywood, are normally used. These pieces, due to their big size, return the acoustic energy in very tight angles of incidence. Their scattering coefficient versus frequency is not balanced either, meaning that they do not scatter all frequencies in a uniform way. They scatter high frequencies much more often than medium/low frequencies.

Effectuser<sup>®</sup> AcSh<sup>®</sup>, Dynamicflow<sup>®</sup> AcSh<sup>®</sup>, Woodfoil<sup>®</sup> AcSh<sup>®</sup> and Plura<sup>®</sup> AcSh<sup>®</sup> acoustic shells come from duly characterised JOCAVI<sup>®</sup>'s acoustic diffusion panels, in order to obtain the best diffusion balance throughout the sound spectrum. Therefore, a good and distributed angular coverage and a better balance of the diffusion values over the several frequencies are obtained.



## BENEFITS FOR THE ORCHESTRA AND THE MAESTRO

Acoustic comfort for a musician or musical director is fundamental. It is impossible to win a battle against a room with bad acoustics.

It is a frustrating situation for musicians, maestros and sound technicians when that happens and there is nothing within their reach that they can do.

The quality of the interpretation of musical pieces may be enhanced when conditions are excellent. The acoustic shell harmonises the sound and enables musicians to listen to each other clearly, thus making their performance pleasant and perfectly harmonious. It also allows to highlight or mildly moderate the several groups of instruments of the orchestra in accordance with the Maestro's taste.

## AS<sup>®</sup> FIXED SHELLS

The EFFECTFUSER<sup>®</sup> AcSh<sup>®</sup>, DYNAMICFLOW<sup>®</sup> AcSh<sup>®</sup>, WOODFOIL<sup>®</sup> AcSh<sup>®</sup> and the PLURA<sup>®</sup> AcSh<sup>®</sup> fixed acoustic shells consists of lateral background and ceiling modules. These elements enable several angulations among themselves, which are defined according to the degrees of incidence towards the audience.

These modules are fixed to the stage's ceiling with duralumin and steel cable structures. They are moved through a system of electric engines, which allow pre-programming some points on the most usual positions. When not in use, shells are gathered on the stage's ceiling and go completely unnoticed.

This type of study is available by our company and prepared through simulation of ray tracing, the only way to preview the objective. Therefore, we assure the homogeneous scattering levels of the acoustic energy and the subsequent increase of reverberation time in the room.

## AS<sup>®</sup> PORTABLE AND REMOVABLE SHELLS

DYNAMICFLOW<sup>®</sup> AcSh<sup>®</sup>, WOODFOIL<sup>®</sup> AcSh<sup>®</sup> and PLURA<sup>®</sup> AcSh<sup>®</sup> removable acoustic shells are composed of four 120cm x 120cm modules which are set on a flight-case type box. This box is part of the basic structure of the shell itself and there is no need to store the box while the shell is being used. Two people are enough to install it on the stage floor.

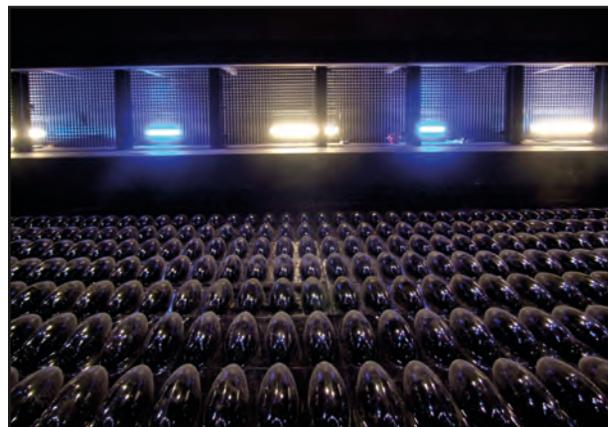
This shell adapts to each orchestra according to the number of musicians, groups of instruments and the stage area by adjusting the quantity of modules to be used.

It is versatile since it allows several configurations in accordance with the musical formation, as well as the easy access of musicians and instruments and a quick assembly and disassembly.

This shell is easily carried on its wheeled box. When not in use, it is kept in storage in order not to interfere with the good functioning of the performance room.

## MAIN FEATURES

- The AcSh<sup>®</sup> shell system gives the dimension of a big concert hall.
- AcSh<sup>®</sup> provides excellent options of acoustic shells for any performance room.
- AcSh<sup>®</sup> provides a wide range of applications in theatres, auditoriums or smaller concert spaces.
- The AcSh<sup>®</sup> products from JOCAVI<sup>®</sup> have the right practical solutions for what you want.
- The AcSh<sup>®</sup> shells are an added-value, since they provide acoustic features which are precise, simple, easy to install, attractive and are available in all colours.
- AcSh<sup>®</sup> Acoustic Shells<sup>®</sup> are a must in theatres and auditoriums where classic music performances are programmed.



# SOME WORLDWIDE WORKS



Rehearsal Rooms



Acoustic Shells



Pavilions



Recording Studios



Concert Halls



Auditoriums



Night C lubs



Radio Stations



Health Clubs



Home Theatre / Cinema



Class Rooms



Restaurants



Anechoic Chambers



Food Courts



Mastering Studios



JOCA VI, Acoustic Panels, Ltd.  
 Av. Pedro Álvares Cabral  
 Centro Empresarial Sintra - Estoril V, Armazém B18  
 2710 - 297 Sintra - Portugal

Phone +351 21 9 243097 - Fax +3 51 21 9 243098  
[www.jocavi.net](http://www.jocavi.net) - e-mail: [info@jocavi.net](mailto:info@jocavi.net)  
[www.facebook.com/jocavi.net](http://www.facebook.com/jocavi.net)  
<http://www.youtube.com/user/jocavigroup>