

JOCaVI® Acoustic panels  
[www.jocavi.net](http://www.jocavi.net)

*the diffusion treatment you will ever need*

AS



ACOUSTIC SHELLS  
[www.acousticshell.net](http://www.acousticshell.net)



- THEATRES
- AUDITORIUMS
- CONCERT HALLS



# 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.

When symphony and chamber orchestras, soloists and opera singers perform in conventional theatres, they encounter problems with the projection of the sound and their voice due to the fact that the sound produced on stage is not properly scattered by diffusion materials. The sound produced by the orchestra is scattered unevenly in all directions, depending on the instruments, and requires an acoustic shell to project it towards the audience. The only way to not lose the sound level and musicality of the orchestra is to place acoustic diffusion shells around it.

To project the sound, diffusion panels shaped like a shell need to be installed facing the audience, which direct and project the sound in that direction. Acoustic shells may be portable so they can be placed around the stage and/or suspended from the ceiling above the stage and there are a number of models available for this.

Spaces such as theatres and auditoriums, where classical music performances are held, are usually high volume rooms. Audience noise all too often leads to reliance on electro-acoustic amplification which can alter the sound of the instruments. Musicians, singers and musical directors prefer the natural colour of their instruments and voices and therefore prefer to avoid the use of microphones etc.

The use of our AS<sup>®</sup> acoustic shells increases the natural sound level as produced by the instruments. This means that the sound is directed towards the audience instead of being lost in the orchestra pit, naturally increasing the acoustic pressure level in the room, producing a balanced diffusion over the whole range of the sound spectrum.

Our acoustic study uses ray tracing simulation, which is perfect for previewing the sound. We can therefore guarantee an increase in sound level, an homogeneous dispersion of acoustic energy and the consequent increase in the room's reverberation time.

#### AS<sup>®</sup> WHO WE ARE

On the market for 10 years, AS<sup>®</sup> is a brand of the JOCAVI<sup>®</sup> group, which specialises in the sale and hire of highly specialised acoustic shells, conceived in Jocavi<sup>®</sup> Paineis Acústicos Lda.'s R&D labs in Portugal.

We prepare projects to advise clients on the best shell for each space.

We do long duration rental contracts for events that are regularly held in the same venue.

We sell for permanent installation in theatres and auditoriums where these acoustic diffusers are suitable for the main activity.

We also carry out the installation and acoustic verification of our shells and can provide maintenance contracts.

We are Acoustic Shell, AS<sup>®</sup>, a company dedicated to acoustic diffusion shells.

#### SHELL VERSATILITY

Unlike the original acoustic shells made of stone in Roman open-air amphitheatres, today's acoustic shells used in performance rooms have to be versatile and discreet so that their placement does not hinder the use of the space for the different types of performances held there. Our shells were developed and built with lightweight, attractive materials, which facilitate their practical use as much as possible. They can be adapted to the orchestra by changing the number of modules needed and by adjusting their positioning for each orchestra layout.

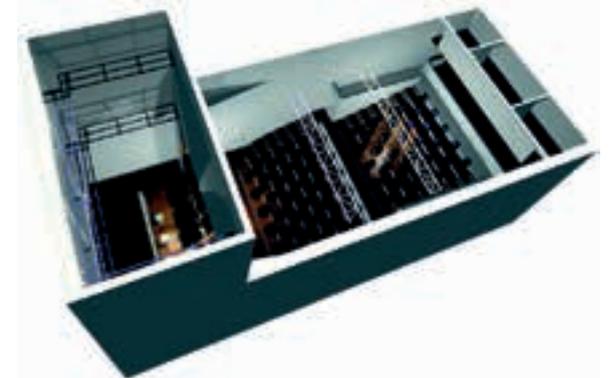
This stage equipment is easily assembled and disassembled and is inconspicuous when not in use.

#### ACOUSTIC BEHAVIOUR

The purpose of acoustic shells is to prevent acoustic energy, sound, from being lost or wasted in the orchestra pit, and direct it towards the audience.

How this is done is particularly important. Normally acoustic shells are used that are no more than a flat, convex or concave pieces of varnished plywood. Due to their large size, these shells return the acoustic energy in very tight angles of incidence and also do not have a balanced scattering coefficient versus frequency. Or rather, they do not scatter all the frequencies uniformly, scattering high frequencies more than mids/lows.

Our acoustic shells are specifically designed to also return the mid/low frequencies to the room. These use JOCAVI<sup>®</sup>'s acoustic diffusion panels which are developed to obtain the best balance in diffusion over the sound spectrum. This gives an excellent, distributed angular coverage and better balance in diffusion values over a broader range of the sound spectrum, which is therefore better for the mid/low frequencies.



## BENEFITS FOR THE ORCHESTRA AND THE MAESTRO

Acoustic comfort for musicians and musical directors is fundamental. It is impossible to get a good sound in a room with bad acoustics. This is frustrating for musicians, maestros and sound technicians alike as there is little or nothing they can do to improve the sound.

A room's acoustics is a fundamental problem that has to do with its physical structure, which can only be attenuated by the use of acoustic materials.

The quality of the interpretation of musical pieces may be enhanced when conditions are excellent. The acoustic shell harmonises the sound, enabling musicians to hear each other clearly, which is more enjoyable for them and facilitates playing in unison. It also allows the several groups of instruments of the orchestra to be enhanced or moderated according to the Maestro's taste.

## AS<sup>®</sup> FIXED SHELLS

Fixed acoustic shells come in lateral, background and ceiling modules. These allow various angulations to be defined according to the degrees of incidence towards the audience.

These modules are suspended above the stage using aluminium and steel cables. They may be moved manually or using a system electric engines where the most common positions can be pre-programmed.

When not in use, the shells can be placed together completely inconspicuously.

## AS<sup>®</sup> PORTABLE SHELLS

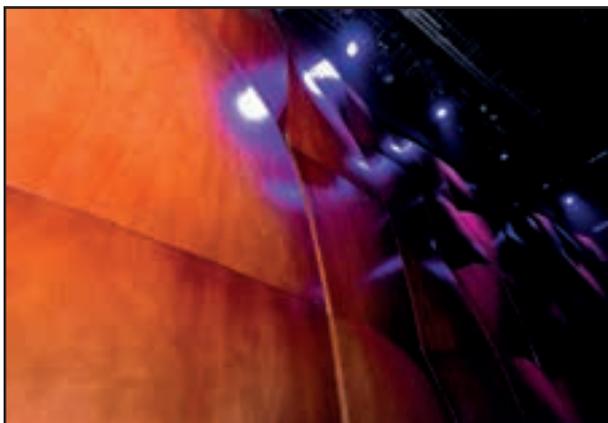
Portable acoustic shells are composed of four 120cm x 120cm modules which can be transported in flight cases. The casing is part of the shell's structure which means the case does not have to be stored away when the shell is used. The various modules are just placed in an arc on the stage floor. Their placement and number can be adapted to each orchestra according to the number and position of the musicians.

Portable shells are versatile, allowing diverse configurations according to the musical formation, and the easy access of musicians and instruments, besides quick assembly and disassembly.

Its wheeled box is easily transported, and when not in use can be kept out of the way in storage.

## FEATURES

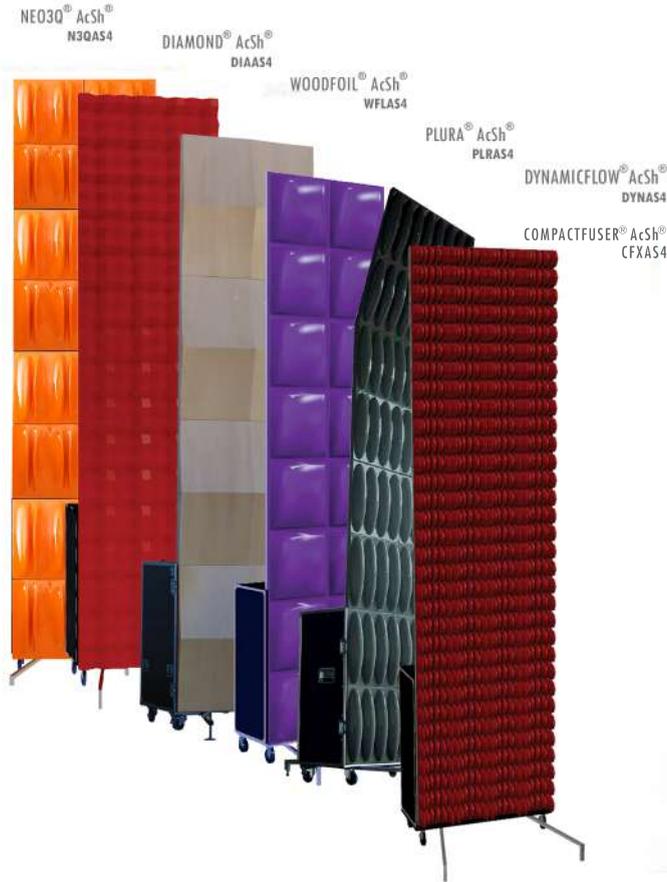
- Naturally increases the acoustic pressure level in the room, enhancing diffusion.
- The natural sound level actually produced by the instruments is increased.
- Offers unique acoustic diffusion characteristics.
- The AcSh<sup>®</sup> shell system enhances the real dimension of a concert hall.
- Versatile options for any performance room, easy and quick to assemble.
- Attractive, in a variety of colours and models.
- For theatres, auditoriums or spaces for classical orchestra concerts.





# PORTABLE DIFFUSION ACOUSTIC SHELLS

DYNAMICFLOW® AcSh® • WOODFOIL® AcSh® • PLURA® AcSh® • DIAMOND® AcSh® • NEO3Q® AcSh® COMPACTFUSER® 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 these acoustic diffuser. Therefore, we are presenting new design proposals that are less common in diffusion structures designed for mobile use. These models 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.

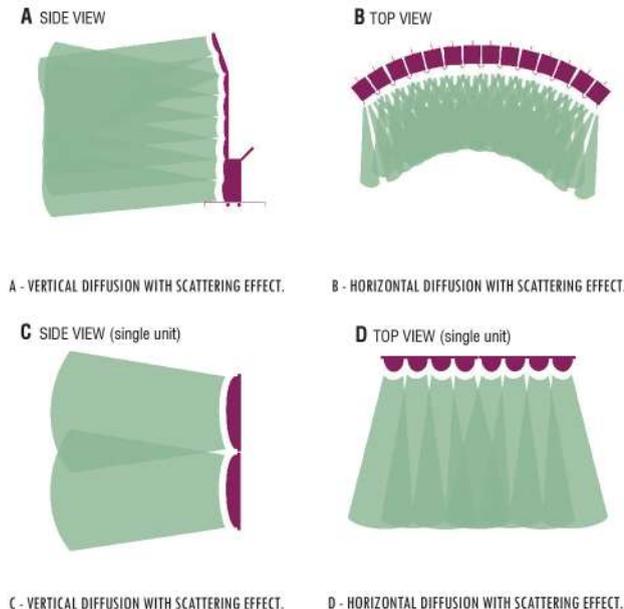
## MAIN FEATURES

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 120x120cm pieces, up to four modules can be coupled in height, thus totalling a diffusing homogeneous surface of 480 x 120cm. All AS4 models have 500x125cm (196.9"x49.2") and the AS3, 380x125cm (149.6"x49.2"). These models 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.

## SCATTERING EFFECTS (example for the DYNAS4)



## MODELS AND SIZES IN FLIGHT-CASE\*

MODELS	HEIGHT	WIDTH	DEPTH	WEIGHT
DYNAS4	165 cm (65.0 in)	127 cm (50.0 in)	73.3 cm (28.9 in)	170 Kg (374.79 lbs)
DYNAS3	165 cm (65.0 in)	127 cm (50.0 in)	56 cm (22.0 in)	145 Kg (319.67 lbs)
WFLAS4	165 cm (65.0 in)	127 cm (50.0 in)	114 cm (44.9 in)	175 Kg (385.51 lbs)
WFLAS3	165 cm (65.0 in)	127 cm (50.0 in)	85 cm (33.5 in)	152 Kg (335.10 lbs)
PLRAS4	165 cm (65.0 in)	127 cm (50.0 in)	85.3 cm (33.6 in)	170 Kg (374.79 lbs)
PLRAS3	165 cm (65.0 in)	127 cm (50.0 in)	65 cm (25.6 in)	145 Kg (319.67 lbs)
DIAAS4	165 cm (65.0 in)	127 cm (50.0 in)	79.3 cm (31.2 in)	165 Kg (363.76 lbs)
DIAAS3	165 cm (65.0 in)	127 cm (50.0 in)	60.5 cm (23.8 in)	140 Kg (308.65 lbs)
N3QAS4	165 cm (65.0 in)	127 cm (50.0 in)	85.3 cm (33.6 in)	165 Kg (363.76 lbs)
N3QAS3	165 cm (65.0 in)	127 cm (50.0 in)	65 cm (25.6 in)	140 Kg (308.65 lbs)
WFLAS4 (120)	165 cm (65.0 in)	127 cm (50.0 in)	120 cm (47.2 in)	250 Kg (551.16 lbs)
WFLAS3 (120)	165 cm (65.0 in)	127 cm (50.0 in)	92 cm (36.2 in)	207.5 Kg (457.46 lbs)
CFXAS4	165 cm (65.0 in)	127 cm (50.0 in)	90 cm (35.43 in)	170 Kg (374.79 lbs)
CFXAS3	165 cm (65.0 in)	127 cm (50.0 in)	75 cm (29.53 in)	145 Kg (319.67 lbs)

\*Specifications can be modified without prior notice, if technical or commercial reasons so require.

## STANDARD HIPS COLOURS



## WOOD VENEER FINISHINGS



## IMPORTANT NOTICES

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- 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.



# FIXED DIFFUSION ACOUSTIC SHELLS

EFFECTFUSER® AcSh® • DYNAMICFLOW® AcSh® • WOODFOIL® AcSh® • PLURA® AcSh® • DIAMOND® AcSh® • NEO3Q® 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® 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. The all are large-sized diffusers that provide a very homogeneous diffusion within the diffuse and sound spectrum. Manufactured in HIPS (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.

## 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:

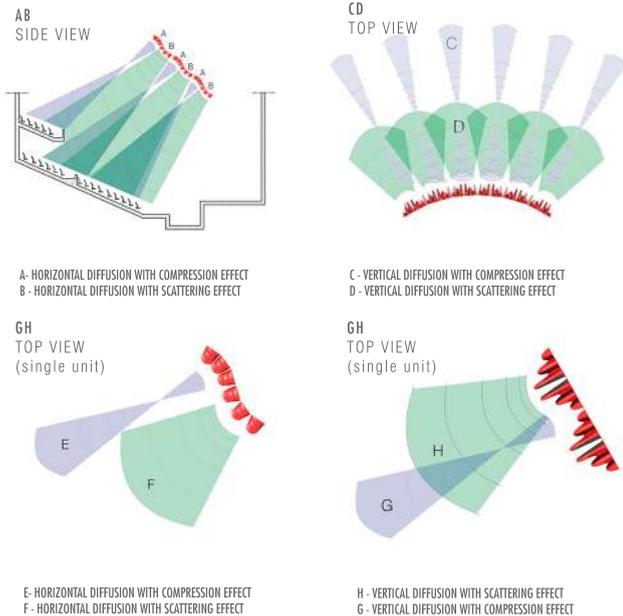
### DIFFUSION WITH COMPRESSION EFFECTS (only EFX COMBI and EFX Plate)

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.

## SCATTERING EFFECTS (example for the EFX180COMBI)



## MODELS AND SIZES\*

MODELS	HEIGHT	WIDTH	DEPTH	WEIGHT
EFX COMBI 180	180 cm (70.9 in)	120 cm (47.2 in)	32 cm (12.6 in)	57 Kg (125.66 lbs)
EFX Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	32 cm (12.6 in)	38 Kg (83.78 lbs)
DYN Plate 180	180 cm (70.9 in)	120 cm (47.2 in)	13 cm (5.1 in)	34 Kg (74.96 lbs)
DYN Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	13 cm (5.1 in)	25 Kg (55.12 lbs)
WFL Plate 180	180 cm (70.9 in)	120 cm (47.2 in)	23 cm (9.1 in)	38 Kg (83.78 lbs)
WFL Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	23 cm (9.1 in)	27 Kg (59.52 lbs)
PLR Plate 180	180 cm (70.9 in)	120 cm (47.2 in)	16 cm (6.3 in)	33 Kg (72.75 lbs)
PLR Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	16 cm (6.3 in)	24 Kg (52.91 lbs)
DIA Plate 180	180 cm (70.9 in)	120 cm (47.2 in)	14 cm (5.5 in)	34 Kg (74.96 lbs)
DIA Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	14 cm (5.5 in)	25 Kg (55.12 lbs)
N3Q Plate 180	180 cm (70.9 in)	120 cm (47.2 in)	16 cm (6.3 in)	33 Kg (72.75 lbs)
N3Q Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	16 cm (6.3 in)	24 Kg (52.91 lbs)
CFX Plate 120	120 cm (47.2 in)	120 cm (47.2 in)	16 cm (6.3 in)	25 Kg (55.12 lbs)

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# SOME WORLDWIDE WORKS



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31 YEARS



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