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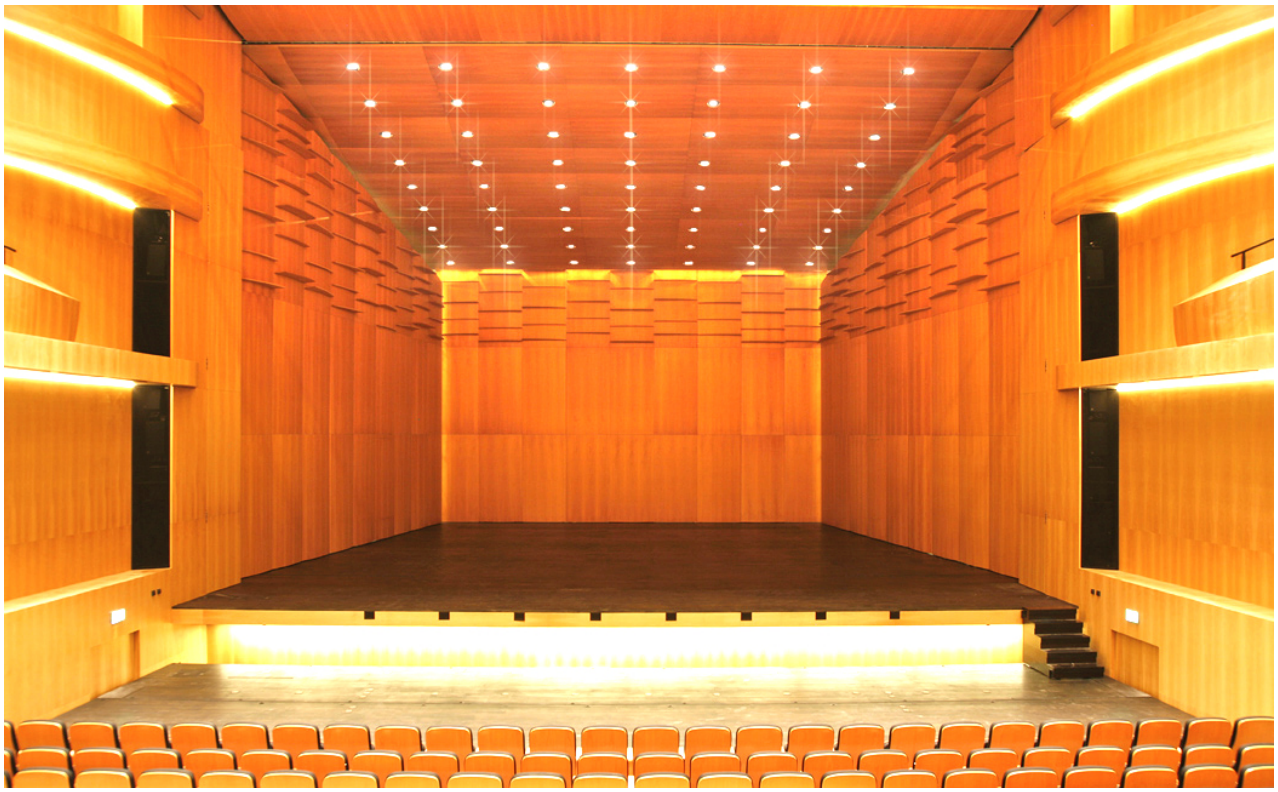
Acoustic Orchestra Shell *CERESIUM-GRANTEATRO-SYMPHONY*

Wood acoustic orchestra shells



The **Wood Acoustic Shell** (in our three models) is an excellent performing solution for full-stage acoustics in small-to-large size performance spaces including theatre venues, recital halls and auditoriums.
The **plywood material, the mass** and the **convex shape** of the panels, optimize the **reflection of the sound**, appropriately channeling music to the audience. It is very important to achieve mutual listening between musicians and conductor, through an appropriate geometry, material and weight around them, such as wall towers and ceiling.

The **modularity** of tower panels and ceiling panels allows to reduce or enlarge the volume included inside, to perform different kind of musical performances: symphony orchestra, chamber orchestra, chorus and soloist.

Each tower module is composed by 3 **rotating convex panels**, to allow different orientation and to save room during the storage phase. Also the ceiling panels system is conceived to rotate to permit **different orientation**, through the rigging system.
The tower system is **self-supported** through an aluminum back-frame and is movable through a **wheel system**.
The ceiling could provide an **integrated lighting system**, to permit the full closure of the shell, while it is possible to add **lateral doors** in the tower system for the entrance of performers and piano.
The **Ceresium**, **Granteatro** and **Symphony** acoustic shell can integrate a **chorus step platform system** within theirs performing space.

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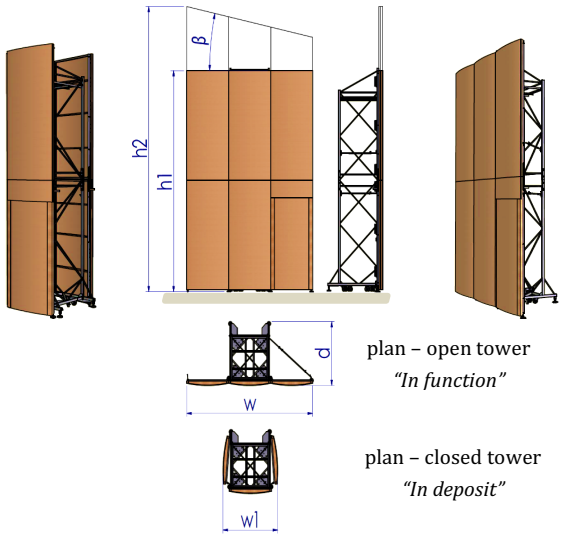
CERESIUM Tower Panel System



plan – open tower
"In function"

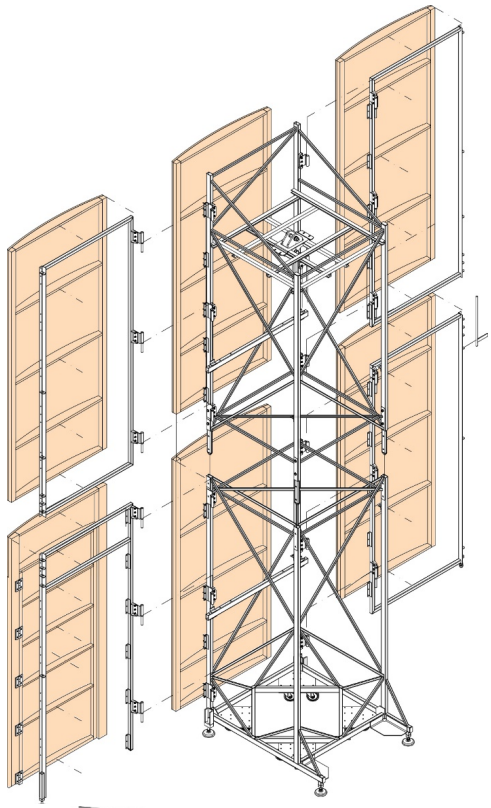
plan – closed tower
"In deposit"

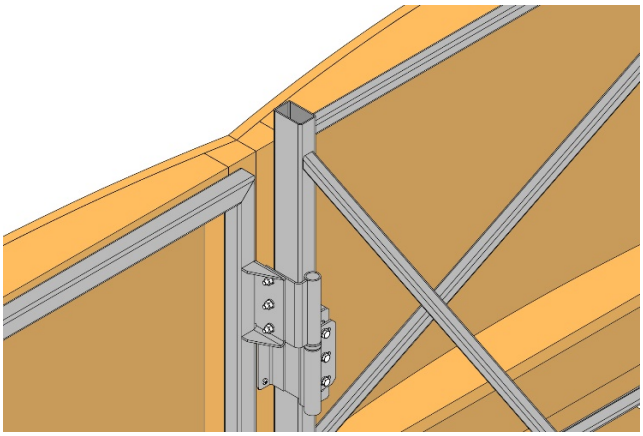
Width (w) can vary from 3,60 to 4,80 (m), while the max height (h) can reach approx. 13,00 (m); β is the angle of the upper elements (if present) of the side towers and it determines the roof inclination of the acoustic chamber.

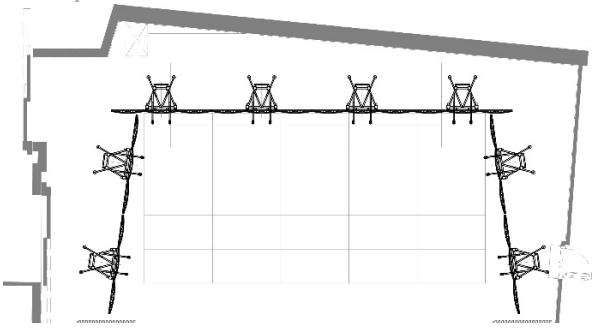
Tower Weight:

- approx. 18 Kg/m² (aluminium frame structure)
- approx. 27 Kg/m² (steel frame structure)

considering the entire wooden surface of an open tower (as represented here on the left).
These value is due to the wooden mass greater than 12 Kg/m² so that the frame structure must be solid and counterweighted when the tower is "in function" i.e. when its lateral panels are opened.







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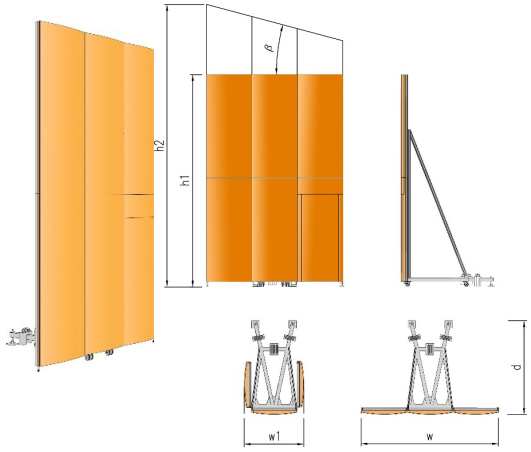
GRANTEATRO Tower panel system



plan – closed tower *"In deposit"*

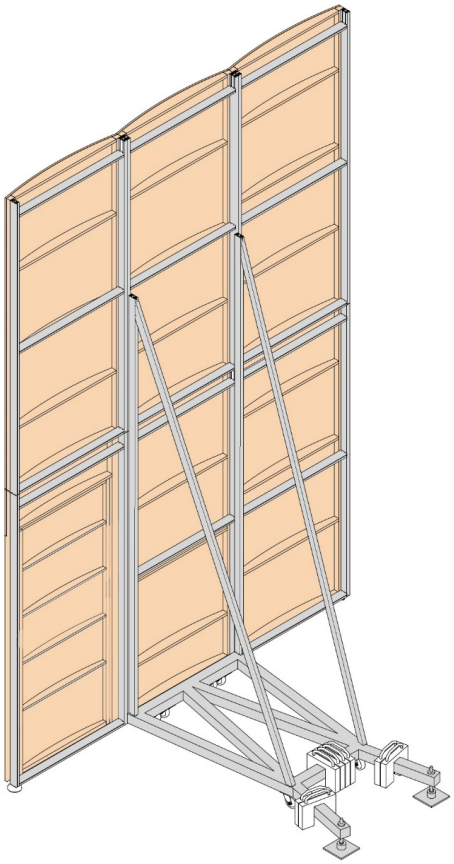
plan – open tower *"In function"*

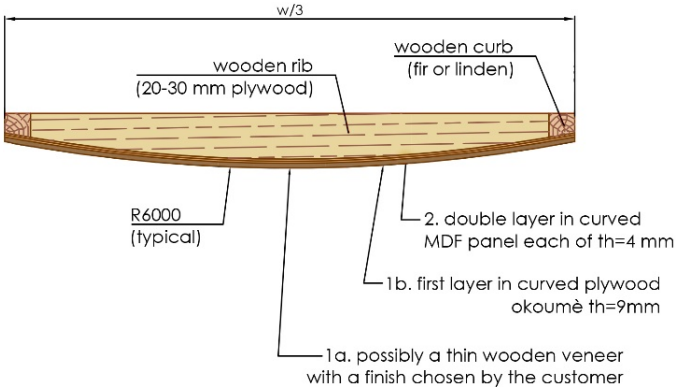
Width dimension (w) can vary from 2,70 to 4,20 (m), while the max height (h) can reach approx. 11,00 (m); β is the angle of the upper elements (if present) of the side towers and it determines the roof inclination of the acoustic chamber.

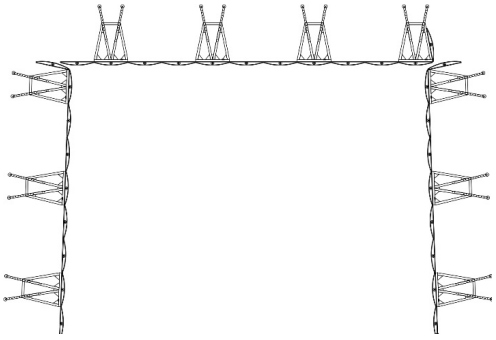
Tower Weight:

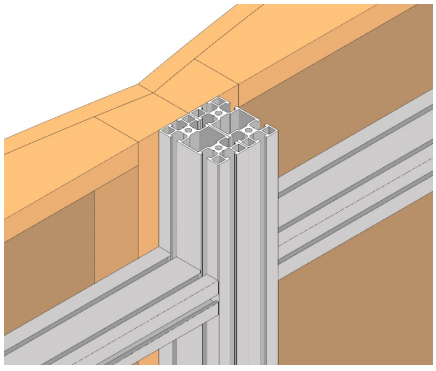
- approx. 18 Kg/m^2 (aluminium frame structure)
- approx. 19 Kg/m^2 (mix steel & aluminium frame structure)

considering the entire wooden surface of an open tower (as represented here on the left).
These value is due to the wooden mass greater than 12 Kg/m^2 so that the frame structure must be solid and counterweighted when the tower is "in function" i.e. when its lateral panels are opened









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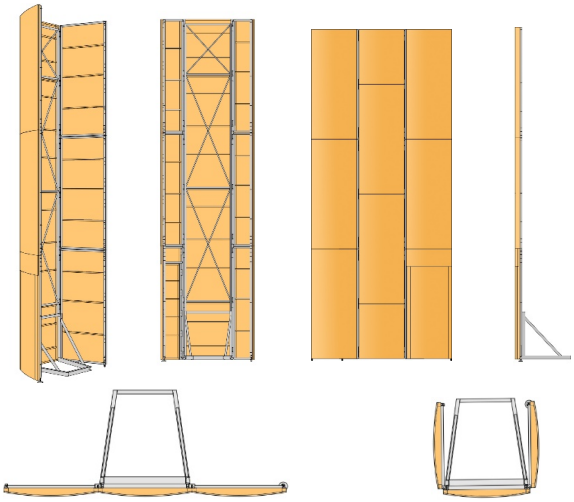
SYMPHONY Tower panel system



plan – open tower
"In function"

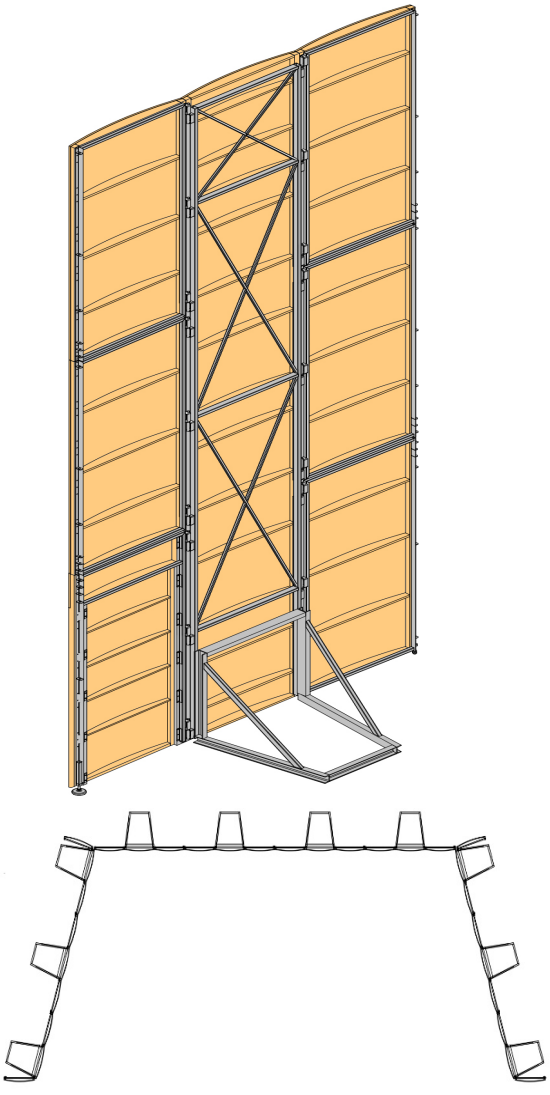
plan – closed tower
"In deposit"

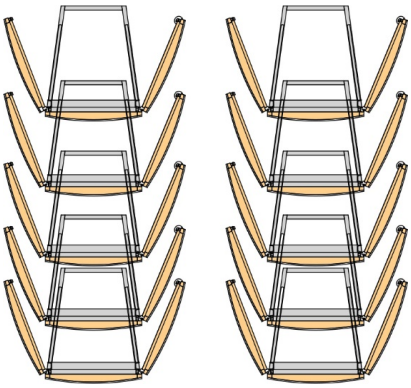
Width dimension (w) can vary from 2,70 to 3,60 (m), while the max height (h) can reach approx. 9,00 (m); β is the angle of the upper elements (if present) of the side towers and it determines the roof inclination of the acoustic chamber.

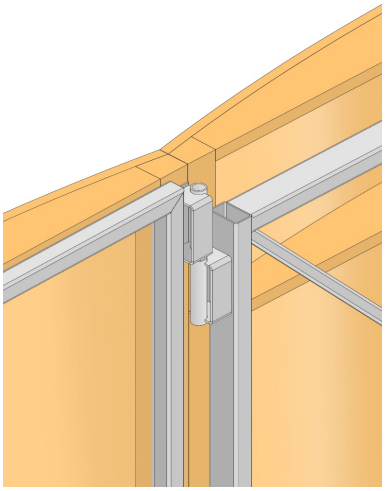
Tower Weight:

- approx. 18 Kg/m² (mix steel & aluminium frame structure)

considering the entire wooden surface of an open tower (as represented here on the left).
These values are due to the wooden mass greater than 12 Kg/m² so that the frame structure must be solid and counterweighted when the tower is "in function" i.e. when its lateral panels are opened.







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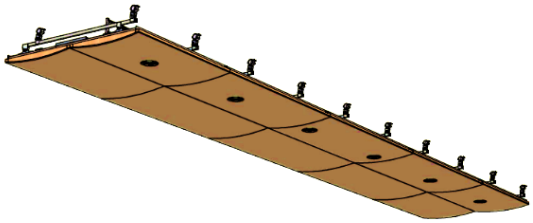
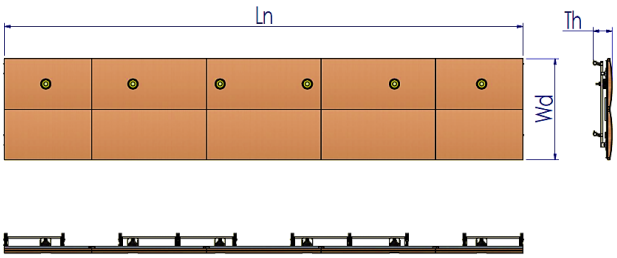
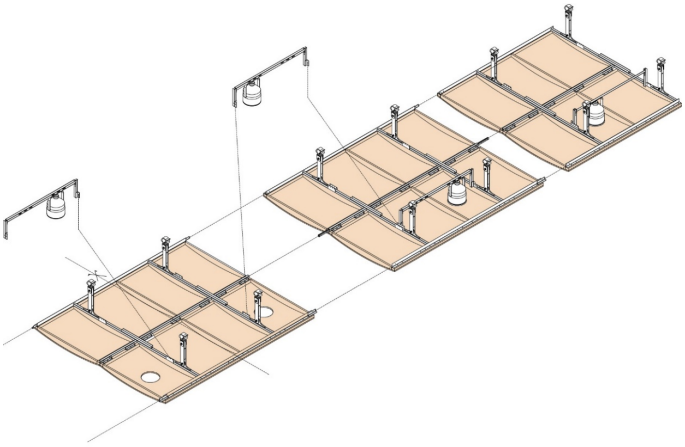
CERESIUM-GRANTEATRO-SYMPHONY Ceiling Panels





Usually the width of a single panel is identical for both towers and ceilings. This is due to many factors related to each other and it is important to remember the chamber inner dimensions, the curvature radius of the wooden panel and its thickness, the sound reverberations, the aesthetics and the continuity between the roof and the side walls. Besides, each independent element of ceiling may be composed of a single, double (such in the figure), triple row of panels and the number of independent ceiling elements is typically not greater than 3 No.

The total length (Ln) depends strictly to the stage dimensions and can vary from 7000 to 20000 (mm), the width (Wd) from 2000 to 5000 (mm).



Ceiling Elements Dimensions (typical):

(wd) x (Ln) x (Th) = 2200 x 11000 x 250 (mm)

Ceiling Weight: approx. 15 Kg/m^2, if we consider a ceiling element with wooden area (wd) x (Ln). This value is due to the wooden mass greater than 10 Kg/m^2 and thus, a solid back structure in aluminum that must guarantee only slight deflections in both positions “in function” and “in rest”.

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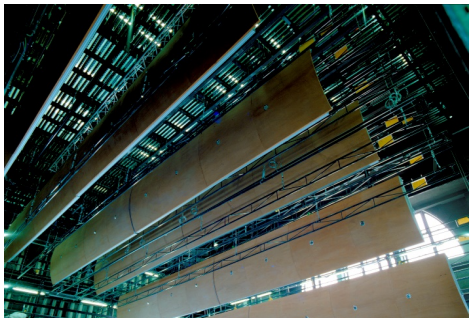

TECHNICAL DATA		
Ceresium Tower standard sizes	(1,5+1,5+1,5) = 4,5(W) x 12(H) m	(different sizes: feasible)
Granteatro Tower standard sizes	(1,2+1,2+1,2) = 3,6(W) x 9,5(H) m	(different sizes: feasible)
Symphony Tower standard sizes	(1,0+1,0+1,0) = 3,0(W) x 7,5(H) m	(different sizes: feasible)
Ceiling standard sizes (Valid for Ceresium, Granteatro and Symphony)	Typically, the width of the single curved module follows the size and shape of the respective matched element of the tower. Along the width, the combination of the modules in a single suspended element depends also on the rigging system. The length depends strictly on the wideness of the stage.	
Granteatro Tower standard sizes	(1,2+1,2+1,2) = 3,6 L x 8 h m	(different sizes: feasible)
Symphony Tower standard sizes	(1,2+1,2+1,2) = 3,6 L x 7 h m	(different sizes: feasible)
Ceiling standard sizes (Ceresium, Granteatro and Symphony)	2,20 L x 12,00 l m	(length depend on the rigging system)
Ceresium tower weight	27 kg/m² (steel structure + wooden panels); 18 kg/m² (aluminium structure + wooden panels)	
Granteatro tower weight (**)	19,5 kg/m² (steel structure + wooden panels); 18 kg/m² (mix steel and aluminium structure + wooden panels)	
Symphony tower weight (**)	18 kg/m² (mix aluminium and steel structure + wooden panels).	
(**) valid for Granteatro and Symphony tower system	Weights are applied to the structure, removable during handling.	
Ceiling and tower outwards panels	Varnished curved Okoumè plywood (9 mm) on MDF (8 mm) curved double under-layer; solid wood frame on the rear part. 12 kg/m² timber sound reflecting surface.	
Reaction to fire of the wood components	Plywood: Euroclass Bs 2d0; solid wood; painted with fire retardant coating.	
Optional		
On demand – extra charge	*Ceiling light set and wiring*	
On demand – extra charge	*Truss and rigging system for ceiling*	
Valid for Symphony model	*Trolley System for handling*	
On demand – extra charge	*Performer and piano entrance doors on tower panel system*	
On demand – extra charge	*Outward veneering of panels with different wood essences*	