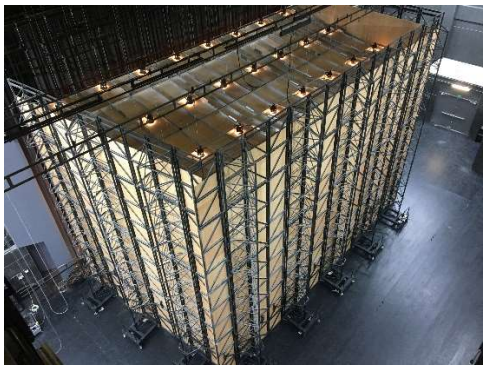
CHEMTROL

CONCERT SHELLS

Last decades´ cultural venues have been born with the requirement of being suitable for offering many different types of shows and events. This is specially applicable for theatres that has also to include music concerts into their programs, requiring some type of elements and structures that allowed this polyvalence. The most traditional solution to this has been the use of portable structures that, placed in the downstage area of the opening would reflect the sound towards the audience, without the negative effect of the high volume of the rest of backstage. These “acoustic shells” have to combine special acoustic and aesthetic characteristics with other also critical functional conditions to be very much present when defining the best solution for each project. Transportability, time and human resources necessary for assembly/disassembly, easiness and volume of storage, among others, are crucial aspects of the adopted solution.

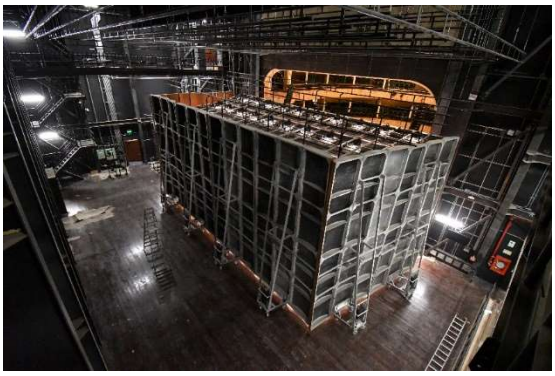
This makes very important that for each project, a detailed analysis of the venue´s needs and objectives is conducted, coordinating with its technical and acoustic directors the best possible product, taking into consideration the functional and economic resources available.

Chemtrol has more than 30 years of experience designing and building concert shells for all different types of venues and uses around the world, reaching an unquestionable reputation for the quality and functionality of its custom solutions, always tailored to its clients´ needs. Obviously, its stage engineering expertise together with the understanding on how entertainment venues operate, have been key elements for that.

Centro Cultural Mexiquense, Anáhuac, Mexico

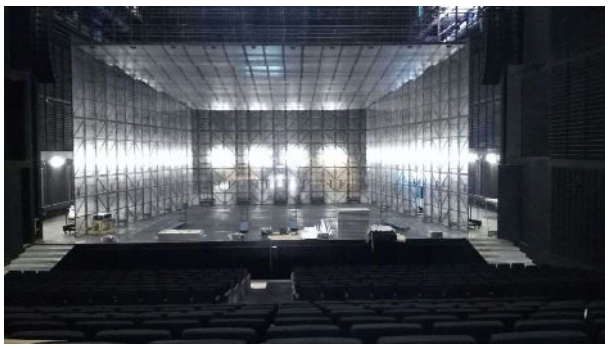

Teatro Kursaal de Melilla, Spain

Teatro Segura, Lima, Peru



Teatro Auditorio de El Escorial, Madrid, Spain

Teatro Regional del BioBío, Concepción, Chile

Palacio de Congresos de Huesca, Spain

Palacio Euskalduna, Bilbao, Spain

Municipality Theatre, Nicosia, Cyprus

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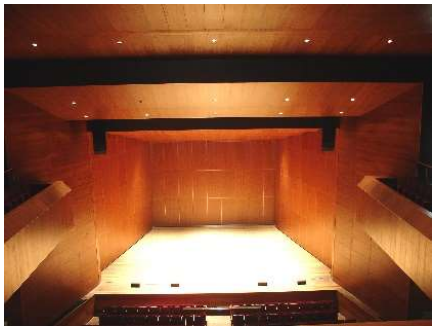







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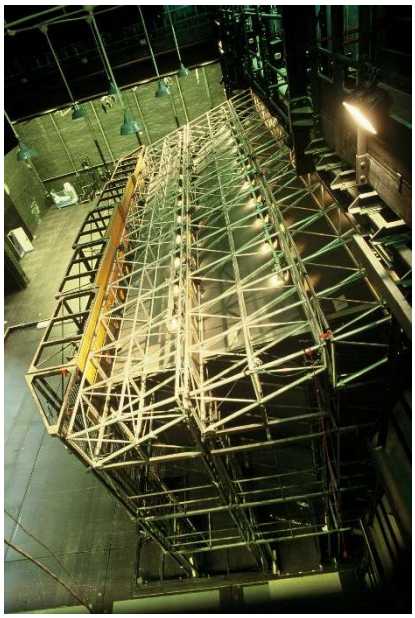
Case Study 1: Gran Teatre del Liceu, Barcelona

Within the continuous search for new solutions for improving the operation and functionality of a lyric venue, historically, one of the most critical but not less complex issues has been the design of a concert shell which is easy to assemble, disassemble and store. These three variables, in addition to the unquestionable need of being acoustically efficient, clearly condition the construction characteristics of any shell regarding its materials, geometry, modulation, setup, etc.

This problem; however, reaches its maximum level when, even meeting the above, it is essential to minimize the stage used time for mounting/dismounting the shell. For this we must understand the program of a large Opera Coliseum like the Liceu, combining such number of different events that makes the availability of the stage a critical matter.

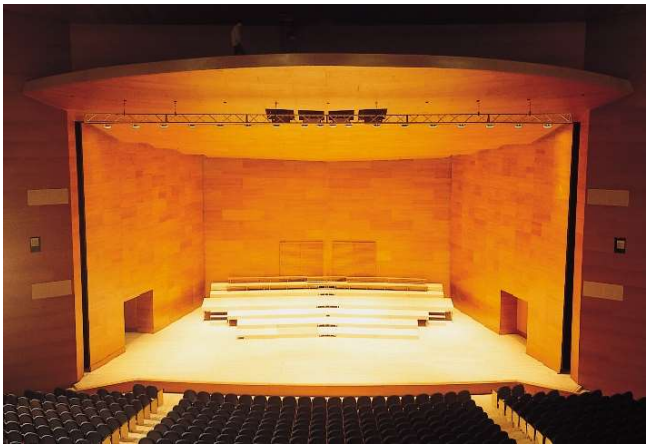
Under these conditions, Liceu´s technical team always ambitioned the possibility of a concert shell as much independent from the stage use as possible, regardless of the assembly methodology. That is, they preferred a shell a bit longer to mount as far as its movement into stage was fast and safe. For that, Chemtrol worked very closely with them and after a detailed preliminary study we all concluded that the ideal acoustic shell for the Liceu should permit its full assembly in the basement on any of the motorized wagons´ storage areas, which could be moved over the main stage elevators and then up directly into its play position. We are talking about a modular, self-supporting structure with the capability of moving into position, fully assembled including ceilings, in less than 30 minutes!

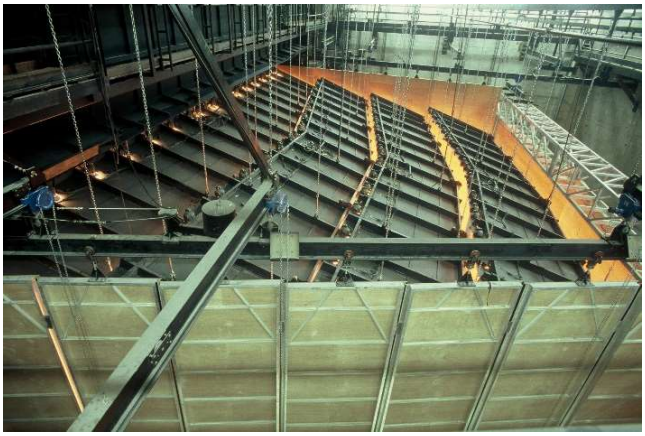
The final shell engineered and built by Chemtrol under the above premises, presented a 13.35m depth, 13.9m width and 9.1m height at the opening and 5.1m at the back. Its design is based on 4 modular sections, each one with one ceiling and 2 side tower, complemented with 4 back towers. All side and back towers are built in steel structure and include a perimetral gallery for the transit of the technicians. Ceilings are made of aluminium profiles sitting on the side towers. Ceilings include lighting fixtures and HAVC ducts. All audience visible surfaces are cladded in 22m think oak veneer plywood. This shell also includes a chorus risers' system and an independent, smaller shell to be used for small concerts and soloists´ recitals.



We can say that since 1999 the Liceu Opera House has a technical jewellery of which to be proud of, as a result of a detailed functional study in combination with years of tradition and experience on these types of elements.

Case Study 2: Auditorio Kursaal, San Sebastian





One of the most symbolic and characteristic elements of this 2000-seat auditorium is, doubtless, its concert shell, which was engineered by Chemtrol in close collaboration with the venue´s technical team and the project´s consultants under some clear objective the objectives of modularity, flexibility and fast assembly/disassembly. Its construction is based on aluminium structured cladded with 19mm natural wood finishing, providing a 20,15m opening, 14,42m depth and 10.4m height.

The shell is composed of 4 independent modules, each with one ceiling and 4 side walls, plus a large back wall. By a sophisticated and ingeniuous storage system, each section of the shell can be used or stored independently, enhancing the functional possibilities and minimizing the time required for its set up or storage. The side panels are suspended from trolleys that run along a side track underneath the first gallery and with a telescopic system that allows its side movement for achieving the desired geometry.

These tracks, one at each side of the stage, connect with another fixed track on which the side panels can be parked when not in use. In the same manner, the large back wall also moves, in this case upstage-downstage, on the same side tracks. The ceilings are suspended from motorized fly bars, with the possibility of being stored in the fly tower by the rotation of the ceilings.

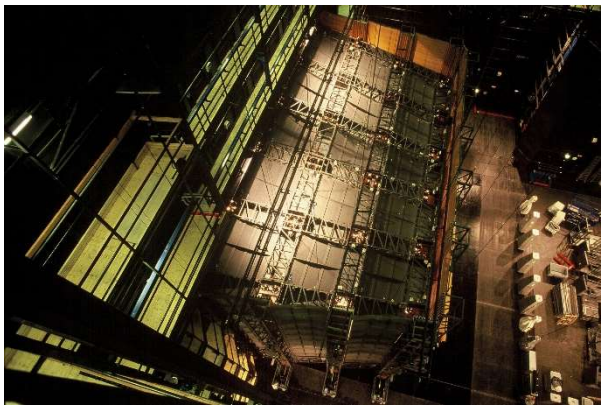
Case Study 3: Teatro Real, Madrid

During the renovation of this Royal Theatre as first-class Opera House, it was clear a large acoustic shell would be needed in order to maintain a concert program under the best possible conditions of sound, functionality and aesthetics. After an acoustic model was created, Teatro Real awarded the construction of the shell to Chemtrol. This shell, for its dimensions, use and construction characteristics deserves de following case analysis.

In order to understand the complexity of this shell, in addition to the acoustic requirements, a number of restrictions of this 1850 building also played an important role in its design. Thus, the limited heights on certain storage and transit areas plus the restrictions derived from its special productions organization forced that more than 85% of the shell structure is made of aluminium profiles and most of its elements are on wheels or require special carts for their storage. In addition to that, the finishing material selected was boxwood.

The walls of this shell are made of towers and panels. The towers are finished imitating the audience area, as neoclassical columns. Each tower, for the height limitations mentioned above, require a dual electrical /pneumatic system for both, rotating and raising the upper half of each tower from 7.3m (retracted) until reaching the 12.4m of height when fully extended. The walls are completed with panels stored on portable carts which, when in position, allows the insertion of the panels in between each pair of towers and then lifted with chain hoists.

The access doors, three on each side, follow the same design as the walls and are transported and installed with carts similar to the other panels.



The ceiling is made of a special number of aluminium long and cross beams, also demountable in sections for easy and fast storage, with the assistance of an hydraulic elevator. The spaces between the primary and the secondary beams a special box type structure is inserted offering most of the surface visible from the audience and also the assembly for the suspension of the lighting fixtures.

Without any doubt, this is a unique piece that because its dimensions, aesthetics and acoustic performance, has become a symbol in the new era of this emblematic venue.