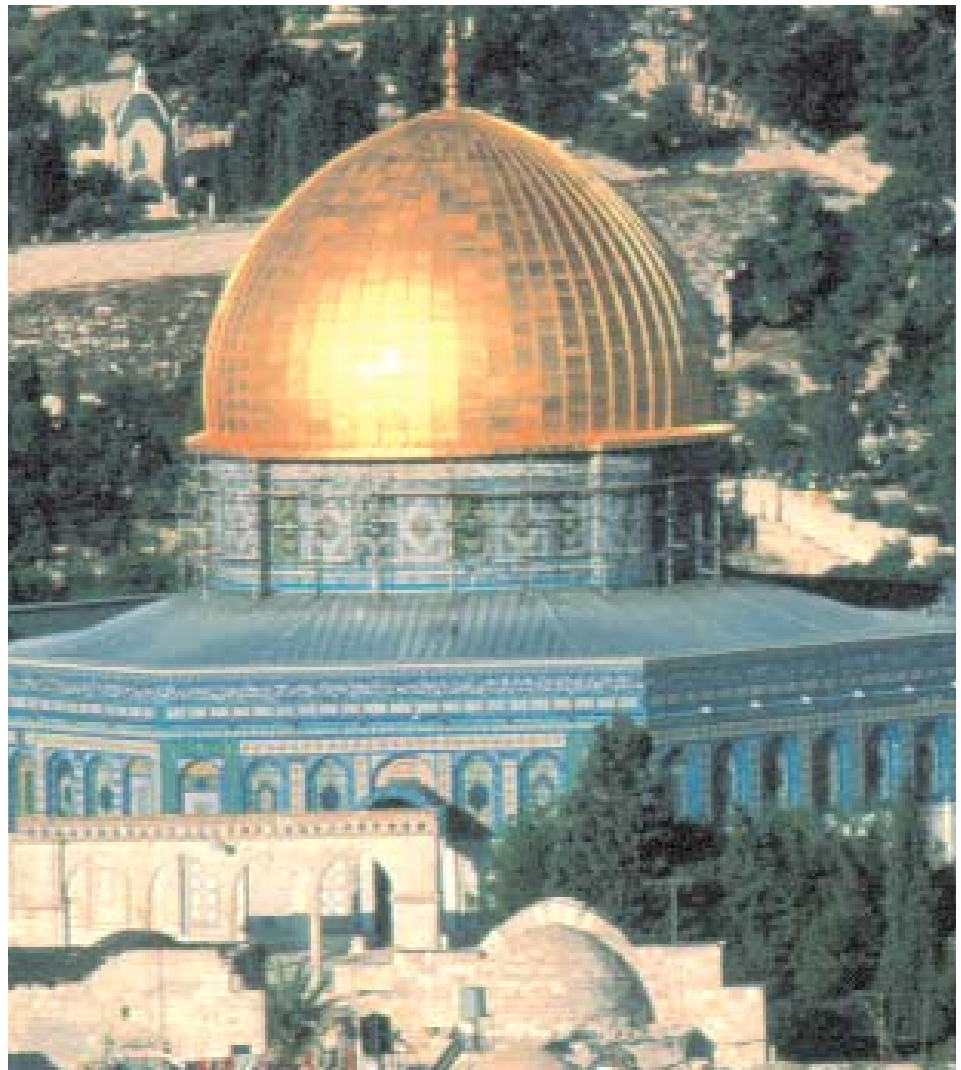


# Aluminium: the architectures from a thousand and one nights

Architects and local administrations in **Arabian Countries** have been largely using aluminium for many years in buildings that are in **perfect harmony** with the background of **traditional Islam architecture**.

**I**n our last issue I anticipated, and apologised in advance for this, that I would have insisted in soliciting our readers who would like to ask questions to write to our editorial office or directly to my e-mail address ([gia.botta@tiscalinet.it](mailto:gia.botta@tiscalinet.it)) or to send a fax (06-8804319) so that these conversation pages about subjects concerning aluminium coverings can be useful to solve the problems that attract the curiosity or that are obstacles for the realization of projects or works.

At the moment I have received questions about two subjects. One of these is an architectural curiosity and the other one is exclusively technical. As there is no need to be too specific I only say that the first e-mail asked for some examples of aluminium applications in Arabian countries architectures. Obviously the question, as I understood, concerned the aluminium applications in the background of traditional architecture, as in the modern centres of the big Arabian cities the use of ventilated walls is really widespread because of their modernity and their characteristic of thermal insulation.



For this reason I looked for examples of applications on buildings that had to be in harmony with the traditional architectural background instead of applications on skyscrapers.

It has not been easy, but I successfully found two examples that were even realized many years ago, showing that Arabian architects and local administrations did not have any qualm in using a modern material like aluminium.

This example is directly linked and completes the subject that I begun in my first article published on the last June article, where I illustrated examples of aluminium architecture in the centres of European capitals, that are in perfect harmony with historical buildings.

**“Harmony” between tradition and modernity**

At Jeddah, one of the most important cities of Saudi Arabia, there is a complex of four towers linked to a lower, almost elliptical shaped central building. It has perfectly combined its gentle volutes and arches, typical of the local architecture, - re-elaborated in a modern and audacious way -, with a covering completely made of aluminium: ventilated walls made up of solid aluminium sheets perfectly studied to grant the best comfort and energy saving.

This architecture represents an example of combination between the traditional Islam plasticity and gentle arches and the modern technology of a cheap material which makes possible a deep thermo-acoustic analysis and energy saving possible.

It is not for hazard that the building, which has soon become a symbol of that part of the city is named “Harmony” because of the studied harmony between modern materials and traditional architecture.

The Harmony Center at Jeddah has been designed by the architect Fritz Petrwiack (BIC- Bavarian International Consulting, Munich Bavaria) and built by the society Fressynet with the help of a staff made up of local technicians like an engineer, who is professor at



NEARBY:  
THE JERUSALEM  
MOSQUE.

BELOW:  
THE RIYADH  
SCULPTURE  
MADE UP OF 4  
STELLS WHICH  
TOGETHER  
REPRESENT THE  
NAME OF ALLAH.  
EACH STELE IS  
CONSTITUTED BY AN  
INTERNAL STEEL  
TRESTLEWORK  
STRUCTURE,  
COVERED WITH  
BRONZE COLOURED  
ALUMINIUM SHEET.  
THE ALUMINIUM  
COVERING TOTALLY  
WEIGHS 10 TONS.

the Beirut university, as works manager.

This project was born in Germany where ventilated walls are really widespread, but it is also an Italian project as all the metallic part has been made by the society Pierimattei Lavorazione Metalli in Rome.

**Sacred and profane**

In our last issue we already underlined the malleability of glass and aluminium, which makes possible the realization of plastic and fanciful shapes, almost sculptures, that are not possible with stony materials.

In the Islamic countries the introduction of aluminium has been made possible even by bold interventions like religious sculptures.

One of the most beautiful examples is at Riyadh, in Saudi Arabia, made by the same Italian company we said above.

It is made of a steel reticular structure completely covered by aluminium sheets and represents the stylised letters composing the name of Allah.

The sculpture is dozen meters of height (precisely twenty-nine) and its bending continuously changes in a sequence of upwards bended panels.

What we have just described would have been impossible with any material which has not the same lightness and malleability as aluminium.

Both the Harmony complex and the aluminium sheet sculpture have been accepted as new, representative symbols of the architecture of these cities so that you can find them- with a certain surprise- on illustrated postcards at Jeddah airport.





### All in a dome

The domes covering of mosques and synagogues was traditionally made, still now, of mosaic or hand-made ceramic tiles, but examples of aluminium coverings are not unusual: In Jerusalem there are many domes covered with gold-coloured aluminium sheets and in the Medina, according to an innovative and audacious project made ten years ago, it has been designed a dome with a steel structure completely covered with aluminium, with the outer white painted and the interior with anodised gold/copper (with traditional Islamic pictures, combining many colours). The lightness of the dome let to design an opening ceiling sliding on tracks, in order to give airing during the night, but above all, to have the sky effect from the interior.

Obviously only a light steel and aluminium structure made possible the combination of traditional shape and colours with the motorised structure movement.

Unfortunately, in Saudi Arabia is strictly forbidden to take photo of religious places, so the photographic material is really poor.

If I would have the possibility to gather photographic material I will deal again with aluminium project which is really interesting.

### Some anticipation about fixings

The second topic that I was asked to discuss concerns fixings.

I will just introduce this subject in this article as it needs to be better deepened, so we will discuss it again in the next issue.

Now we are only going to outline the different possibilities of fixing panels:

- 1) Flat sheets fixed to perimeter, in frame or substructure.
- 2) Shaped panels with perimetrical folds, however always monolithic, made up of one single sheet.
- 3) "Sandwich" panels, that is: an outer and interior sheet and an insulating one in the air space.

In the first case you should use screws or rivets for the fixing, so that the solicited sheet is fixed to the perimeter acting as a plate with four supports and the perimeter cannot rotate, in order to avoid an excessive deformation.

In the second case the fixing has

generally to be made in the window of the connection joint with screws or simple hooks leaving the dilatation free. In the third case the "sandwich" panel is more rigid but it needs a frame - generally an aluminium one - containing it with an external press panel.

Usually the fixing is made in sight, or better, in a window which is useful both in marking modularity and giving a rhythmic sense to the surface and it is very useful in limiting deformations. We have carried out a compared study between panels with side folds (case 2) and simple flat sheets. The results of confrontations, also obtained by loading tests in laboratory, have been filed in a static document included in the "Mira System" CD-Rom, where it is possible to see a great difference between the deformations of flat sheets and the ones with folds exposed to the same pressing and with the same geometrical dimensions.

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