

## ATLAS architectural membrane as a core element for larger and energy efficient air domes

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### Abstract

The properties of membranes allow nearly unlimited possibilities for the realization of building projects.

Thanks to its multitude of special characteristics like tensile strength, elastic performances, translucency and higher yarn density, large areas can be covered and thus exceptional constructions can be built.

For the success of a project, the right choice of material is crucial. Including the membrane supplier at an early stage of the project ensures that all advantages of a membrane regarding costs, longevity and maintenance intensity can be used to its fullest extent.

The Al Maryah project represents precisely this cooperation between the project participants, a close coordination between project-specific features and material-specific requirements. The largest air dome in the Middle East, with a surface area of 17.000 sqm, required a high-quality and functional coated membrane for a smooth surface that prevents soiling, especially with regard to the desert sand. The special ATLAS fabric process allows for a state-of-the-art architectural membrane with a flat and even fabric structure in combination with the latest protective coatings and guarantees a high resistance to soiling and excellent UV protection, which has a very positive effect on the durability of the fabric.

Another important issue were the local site conditions in the Middle East. Normally, a high degree of light transmission is sought in order to bring natural light into the interior of a building. In this case, the opposite was required: sunlight has to be kept out of the sports dome. Our task was to develop a blackout version without increasing the weight of the material, as the static and technical project requirements did not allow for additional loads.

The ATLAS membrane is a core part of this efficient system that allows to increase energy and

acoustic performance under extreme weather conditions.

The combined application of durable coated and strong high-tech fabrics with a multiple layer system leads to a tremendous increase in insulation efficiency of the membrane roof and significantly reduces the U-value.

It also ensures sound insulation as well as the implementation of challenging requirements such as cooling or heating functions. The insulation system reduces the required cooling by 70%, minimizes the heating and cooling costs.

The versatility of the PVC coated membrane creates new possibilities and offers new architectural experiences.

**Keywords:** aesthetics, strength, air domes, lightweight system, membrane system, sustainability, performance, optimization of costs, manufacturing, durability

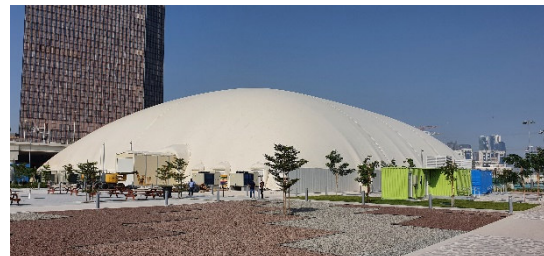


Figure 1: External view of Sports dome Al Maryah

### References

- [1] Al Maryah Island Sports Dome Abu Dhabi, UAE, *TENSINEWS NR. 41 – OCTOBER 2021*, pp 4-5