

# Innovative structure solutions



[www.duol.eu](http://www.duol.eu)

## A Better Way to Build

Air supported structures

Textile architecture

Prefabricated structures

Modular structures









# DUOL company

DUOL company designs, manufactures and installs some of the most unique and versatile fabric structures in the world. We are **experts** in **AirDomes**, Prefabricated frame (**wooden/metal**) **structures** and **Tent Structures**. DUOL Air domes / Air-supported structures are our most popular and familiar product.

## We are innovation-driven

Innovation fuels us like nothing else. For this reason today DUOL remains **the global AirDome leader**.

DUOL air domes have many unique advantages including **innovative membrane technology, certified quality, officially certified thermal insulation and more**.

## Focus on quality



As a certified company with the **ISO 9001:2015 quality standards**, we apply this standard to every operation within DUOL organization. DUOL follows strict ISO 9001:2015 quality standards in every process to ensure client **safe and on time delivery**.



Solid company organization, worldwide references, innovative solutions: In 2013 DUOL was awarded **"Best managed company in Slovenia"**.



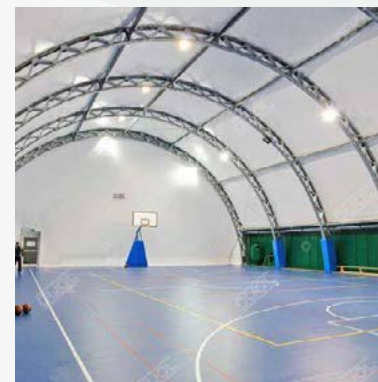
Creditworthiness certificate warrants for the **business excellence**. Our certificate guarantee, that we will be a reliable partner also in the future.



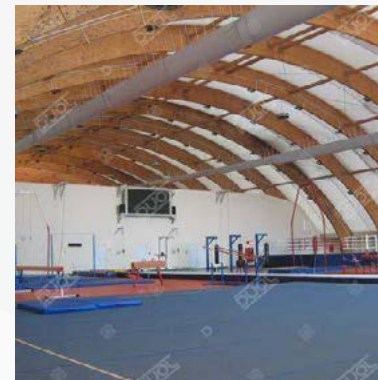
The Slovenian Chamber of Commerce and Industry's Award for **exceptional business and entrepreneurial achievements** of 2018.



*Air Domes*



*Metal structures*



*Wooden structures*



*Tension structures*



Member of  
SLOVENIAN  
BUSINESS CLUB



# Our projects speak for themselves

We are the **global leader** in the field of **air-supported structures** and since the company foundation **30 years ago**, DUOL has covered **more than 1600 objects worldwide**.

## MORE THAN

**30**

years  
experiences

**1600**

covered  
objects

**45**

different  
countries



*DUOL AirDomes – a legacy of innovation, quality and service.*

From the very beginning, our goal has always been to **provide the best custom-designed air-supported domes** available to meet the **specific needs** of our customers.



# Complete project support

*from the start to the project finalization = **Quality and Liability***

DUOL provides the full service including **initial consultation, design, production, groundworks, dome installation and after sales support.**

The AirDome is handed over to the client after a detailed maintenance course with **complete operation, maintenance and equipment manuals for the AirDome.**

*Complete control over all phases of operations*

*Object handover with complete client support*

*Efficient and fast after sale service*



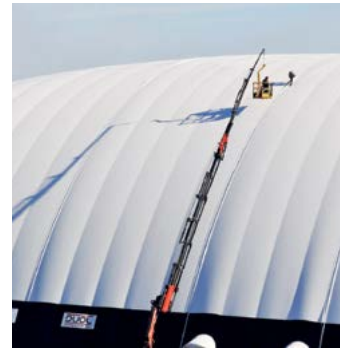
**R&D and Engineering**



**Production**



**Assembling**



**Maintaining**

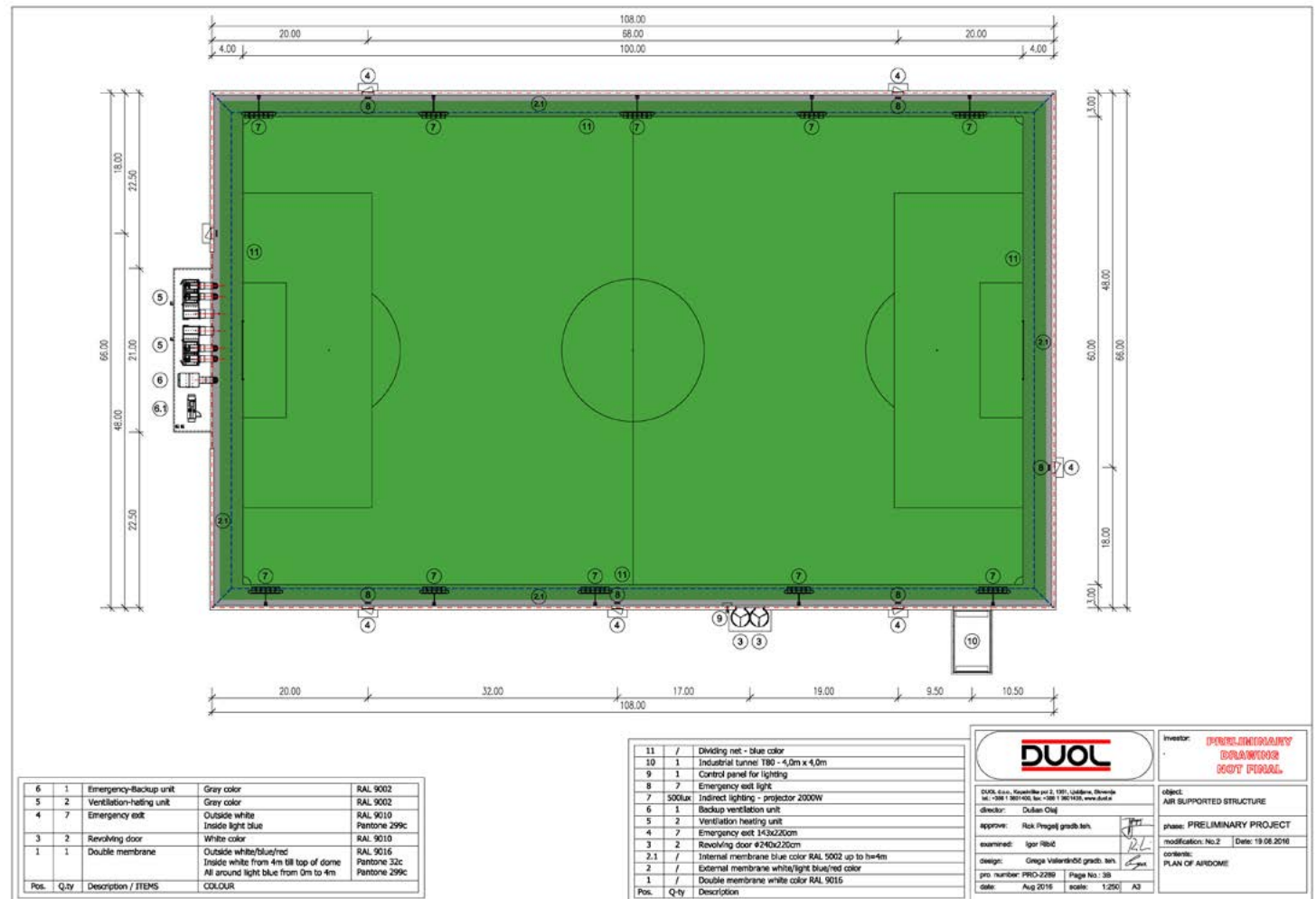
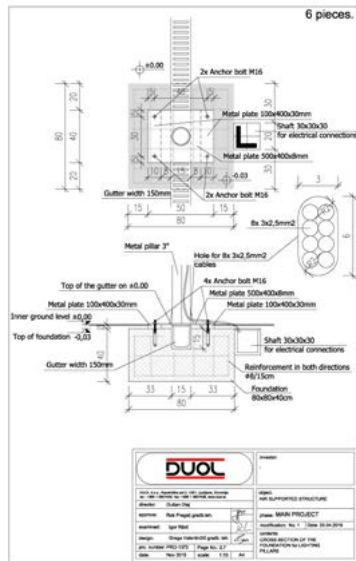


**Service**

- *Worldwide service, immediate response, quick actions, and efficiency in fixing problems.*
  - *Analysis and resolution of issues are safely solved by phone or e-mail.*
  - *Sending parts or immediate fly-in interventions of DUOL technicians.*
  - *After-sales service with a first degree of intervention carried out by a local partner.*
- 5-20 year manufacturer warranty on the fabric and up to 2 years on equipment.  
Life expectancy more than 40 years.*

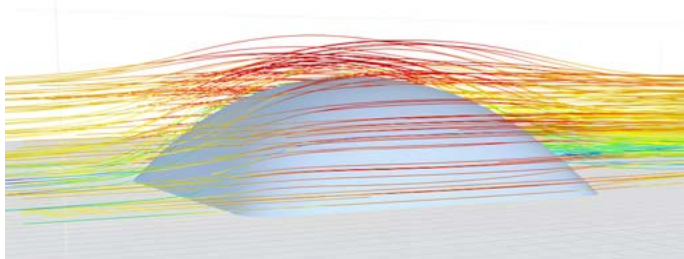
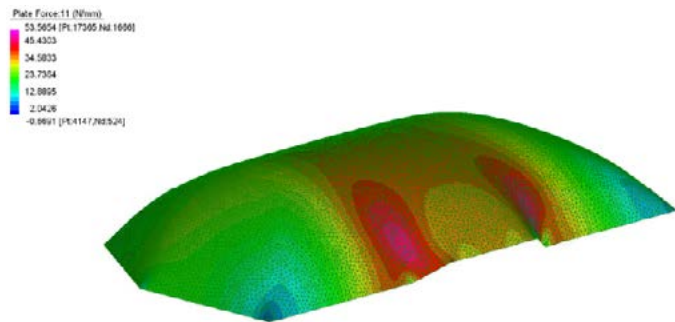
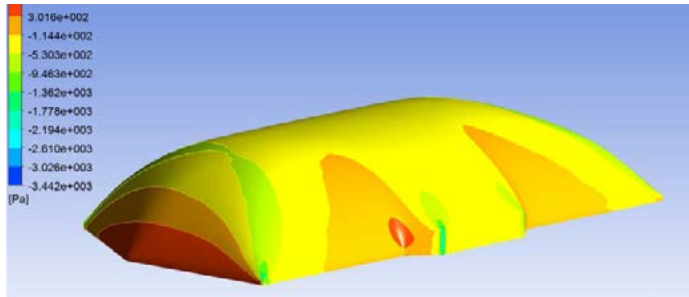
# Complete engineering support drawings and static calculations

- Study of standard references
- Determination of loads
- FEM modulation of the structure
- CFD analysis
- Pattern drawings
- 3D visualization





DUOL engineers design fabric structures (air supported structures, tension, steel and wooden structures) upon your request. We can completely **custom design** your fabric structure to meet your **specific needs**.



## Multi-purpose structures

We are specialized in several types of structures. We construct multi-purpose sports facilities, agricultural halls, logistics and industrial structures, temporary buildings (exhibition halls, entertainment venues, temporary warehouses), structures for civil purposes (hospitals, refugee camps, emergency centers) and military purposes.

## No wasted space

One of the important advantages of DUOL domes is the space saving inside the structure as they do not contain traditional buildings frames and pillars which allows several design options without wasting any available space.

## SmartDome

DUOL structures are featured with an intelligent and advanced control and monitoring system that automatically controls the entire dome settings. The airdome can also be managed remotely via internet and smartphones.

## Resistance to extreme weather

Withstands temperatures from -55°C and up to +70°C, strong winds, storms, heavy snow, ice.

## Very short project execution time

Only few weeks from the date of agreement until the structure is completed and ready for use.

## Seasonal flexibility

Only few days to assemble and disassemble the airdome easily and with minimal effort.

## Easy to relocate

DUOL structures can be used as permanent or temporary structures which can be easily relocated.



11 SmartDome



10 DUOL ECO Membrane system

- 1 Vehicle & Equipment Airlock Access Door
- 2 Ventilation and heating system
- 3 Emergency Back-up System
- 4 Electric generator
- 5 Air conditioning system

- 6 Anchoring system
- 7 Emergency door
- 8 Revolving door
- 9 Accessible door



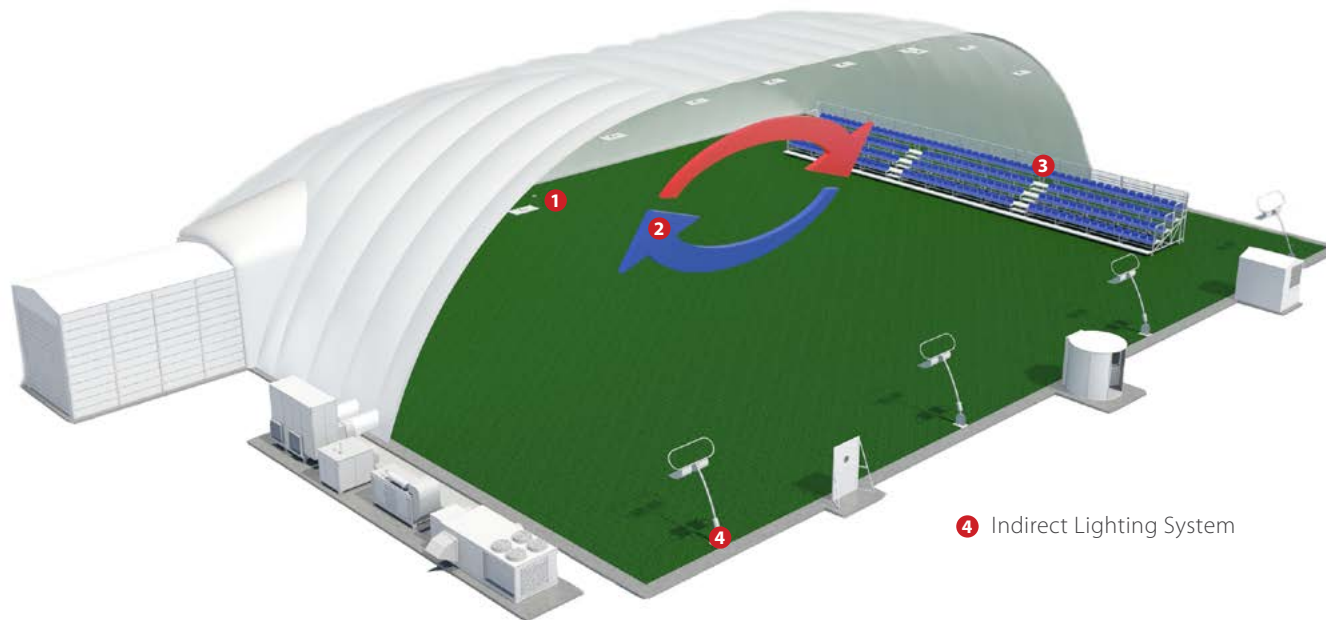
# DUOL innovative technologies

DUOL domes have many unique advantages including **innovative DUOL ECO** membrane system, which provides **highest thermal insulation** with rock-solid weather resistance.

❶ Direct Lighting System

❷ Destratification system

❸ Turnkey projects



## Energy efficient structures

The combination of the latest materials and technologies used in DUOL AirDomes offers you low operating costs.

## Conforms to all safety standards

All DUOL structures conform to all safety standards and regulations as they are resistant to fire, earthquakes and UV. Structures are made of a multi-layered extremely durable membrane which is vandalism-proof. All structures are provided with an emergency backup unit and they are eco-friendly and 100% recyclable.

## Lower costs than conventional buildings

DUOL structures require much less construction cost than traditional structures as it doesn't need sophisticated site preparation such as concrete foundation and framing and other complications that conventional buildings have. Furthermore it does not require a construction permit as it is not considered as a permanent structure.

## Long lifespan

DUOL AirDomes have a lifespan of more than 40 years.

## Modern customizable design and branding

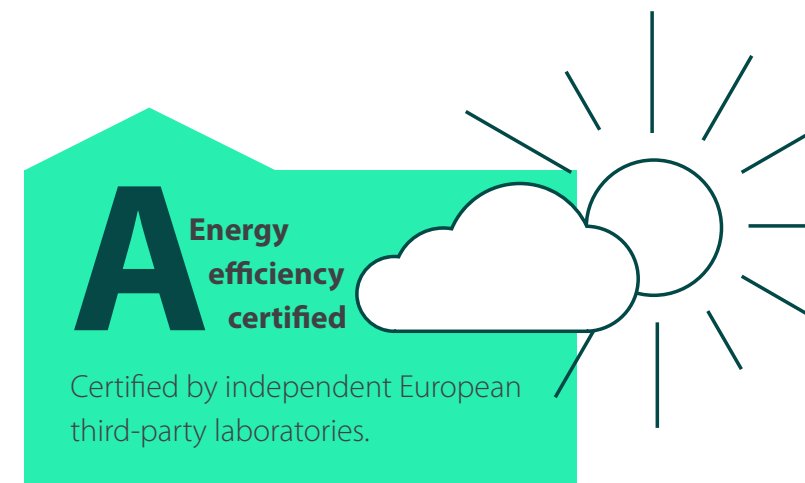
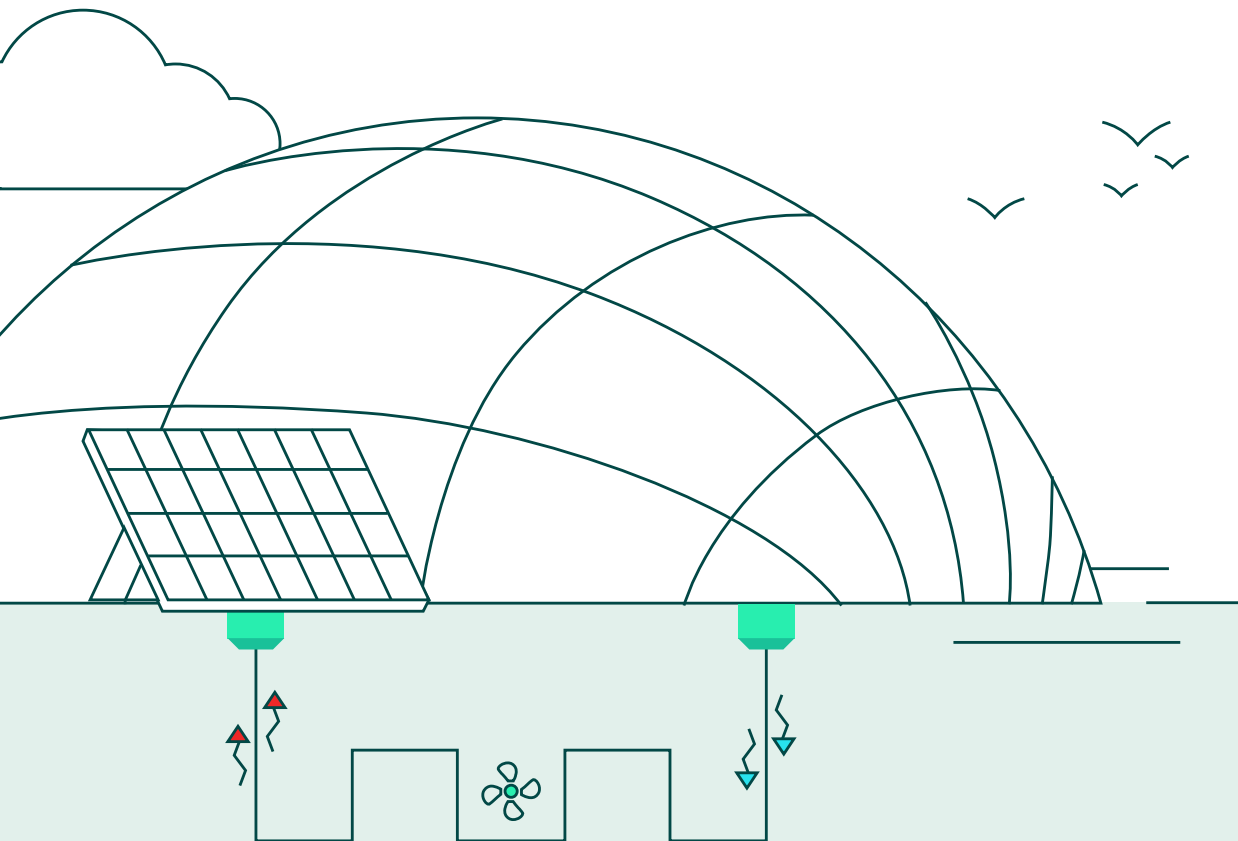
DUOL air supported structures have a modern design and could be -unlike traditional building- easily branded and customized in terms of colors and logos to fit the marketing and branding plan of the client.

# Our green solution

People are familiar with sustainability for private houses, but less so for other types of buildings. When investing in your new facility you have to consider initial investment, running costs, environmental, and profitability of your new project.

DUOL always takes environmental, sustainability and profitability factors into account, when designing, manufacturing and constructing air domes.

DUOL is leading the industry with the introduction of DUOL ECO Membrane system. With multilayer insulation option, it ensures highest thermal insulation.



## Less material

A unique quality of air dome is the fact that less material is needed to enclose large spaces.



## Pre-assembled

Pre-assembled and compact, there is no welding, cutting or on-site fabrication.



## Light-weight components

The lightweight components are easily transportable, rapidly deployable, require smaller teams and less equipment to install.



## Our domes run on nature

Our air domes are designed to utilize alternative energy sources such as earth heating, solar energy and other alternative sources in order to compensate energy for its operation.













# Increase safety, comfort and efficiency with SmartDome

For outstanding energy performance & comfort our engineers developed smart system for air dome, which objectively shows the owner how energy and money can be saved.

**Easy. Intuitive. Enjoyable. Efficient.**



## Energy

Why spend when we can save. Environment and wallet friendly.



## Ventilation Control

Ventilation is completely automatic with DUOL SmartDome.



## Scenes & Schedules

Control everything at once with SmartDome scenes. Think less, do more.



## Remote Control

Air dome in your pocket, wherever you are with free apps for all devices.



## Temperature control

Heating & cooling are as intuitive and cost effective as anybody would want it.



## Lighting Control

Individual lights or groups of lights, dimmed ambient lighting and scenes.



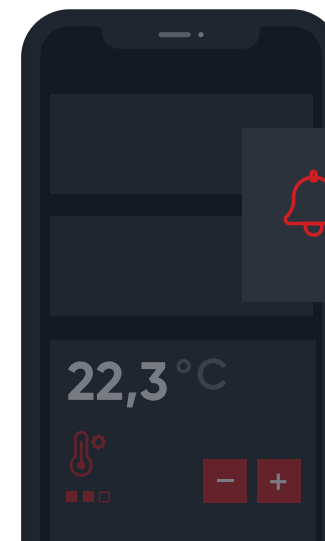
## Sensor data

Want to measure something? Snow, wind, temperature? Be aware of your surroundings.



## Security & Safety

Feeling safe is essential. Protection from burglary, storms, fire and more.



Wind



Snow



Pressure



Security & Safety with  
**Alarming**



Fire



Electricity



Lock control

# Applications

## *Industry*



## *Sports*



## ***Agriculture***



## ***Science & Military***



## ***Others***

- Leisure
- Exhibition halls
- Landfill AirDomes
- Emergency shelters
- Temporary shelter
- Cultural Venue



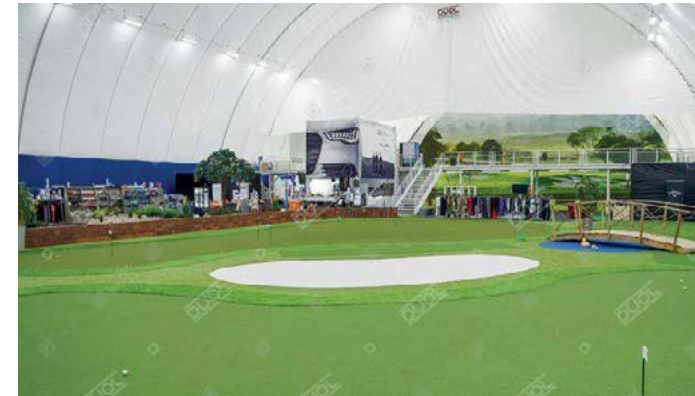






# Extend your playing season

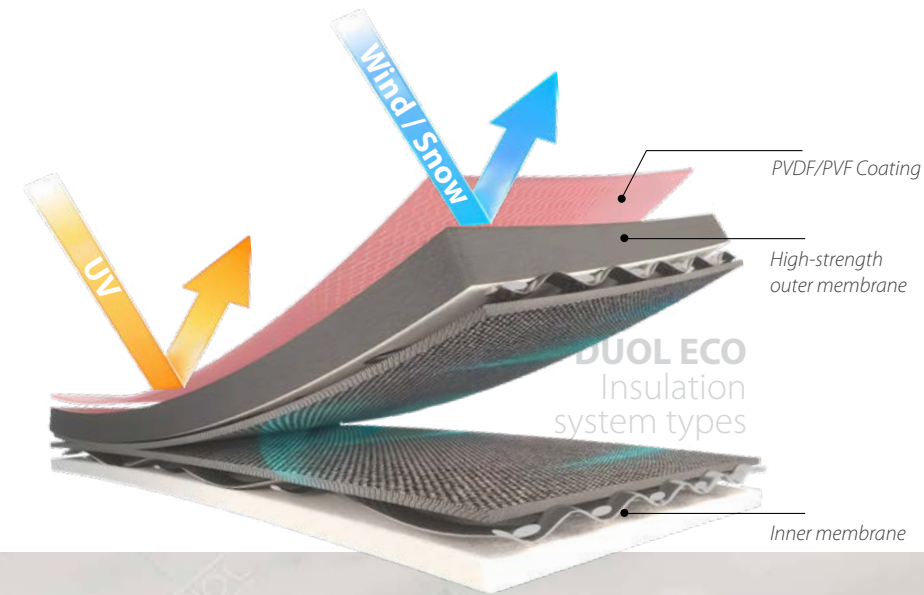
DUOL AirDomes are a cost-effective and flexible means of **covering outdoor sporting areas permanently** (or during the winter months). The domes can be used for many sports including **football, tennis, padel, swimming pools, indoor hockey, golf ranges, basketball, beach volleyball** and others.





# DUOL **ECO** Membrane system

**DUOL ECO Membrane** is the unique DUOL membrane system which ensures the **structural stability, excellent thermal insulation, the ultimate strength**, and has an **amazing flexibility** at the same time. Thanks to its outstanding properties there is no condensation inside the air dome. **DUOL ECO** Membrane is coated with a **special lacquering finish** like polyvinylidene fluoride (PVDF), titanium dioxide (TiO<sub>2</sub>), polyvinyl fluoride (PVF, Tedlar) which increases the material's quality, lifespan, and dirt resistance. **ECO** Membrane is certified by independent European third-party laboratories.



- Unique system with two independent layers\*
- Rock-solid design with double pressure lock\*
- Super low U-Value. Huge energy savings
- No condensation
- Effective system upgrade (at any time)\*
- Easy installation/dismantling including insulation\*
- Unique glass design option
- Higher side walls
- Simple lights fixation
- Electric cables hidden between membrane\*
- UV, chemical and weather resistant fabrics
- Dirt, fungus and mildew resistance
- Fire retardant
- Very high tensile and tear strength
- Long lifespan
- Environmentally friendly, recyclable

\* for certain ECO Membrane types

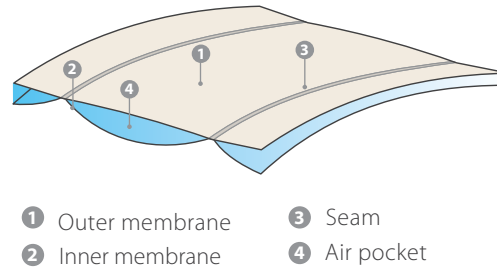




# DUOL **ECO** types

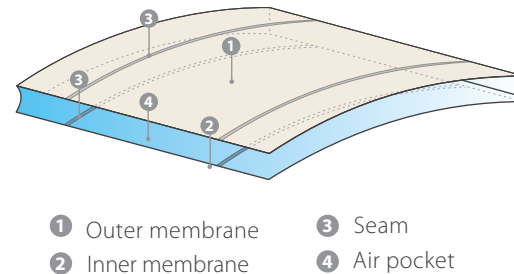
## **ECO Basic**

ECO Basic is a DUOL classic membrane system which offers DUOL high quality within your budget.



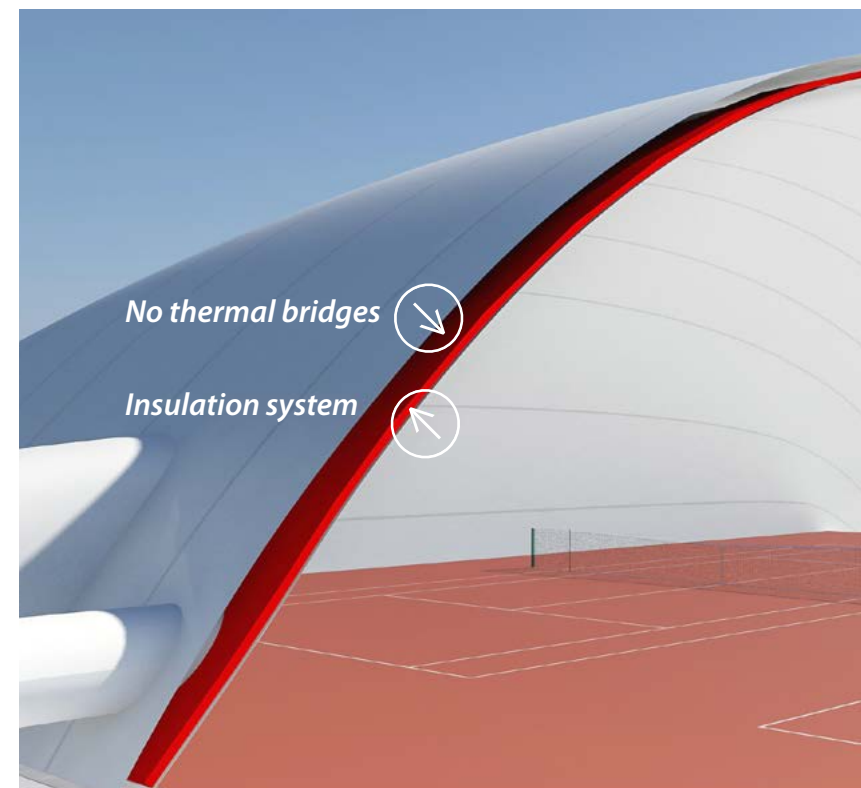
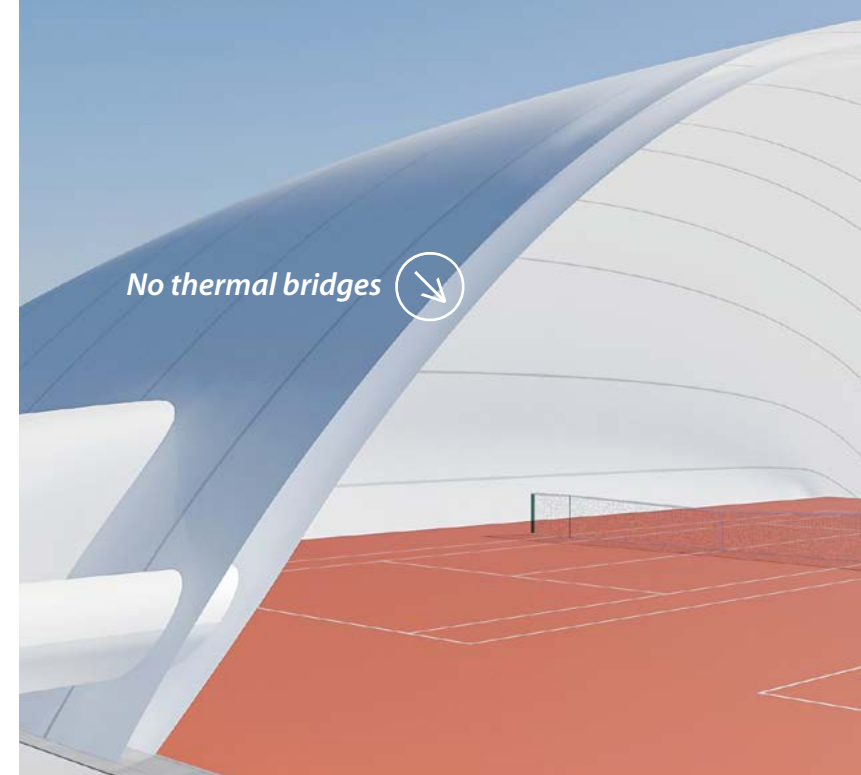
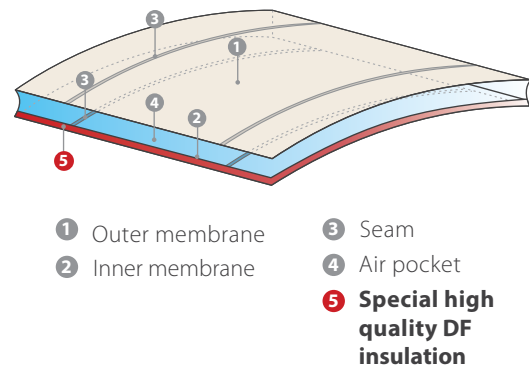
## **ECO Advance**

ECO Advance is the new generation of membrane system which completely eliminates thermal losses through thermal bridges. This innovative design offers higher thermal insulation and many other advantages over ECO Basic.



## **ECO Ultra**

ECO Ultra is the latest DUOL innovation with the most advanced membrane technology. A state-of-the-art insulation system between the membranes ensures the lowest possible U-value.

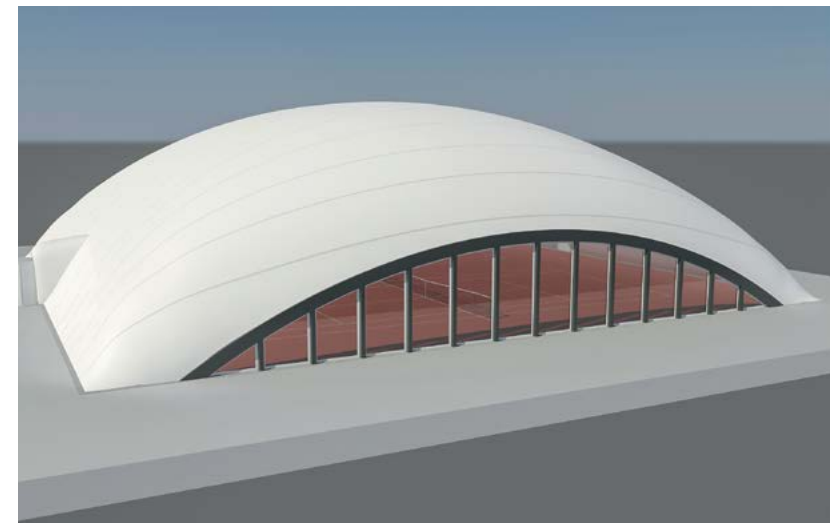
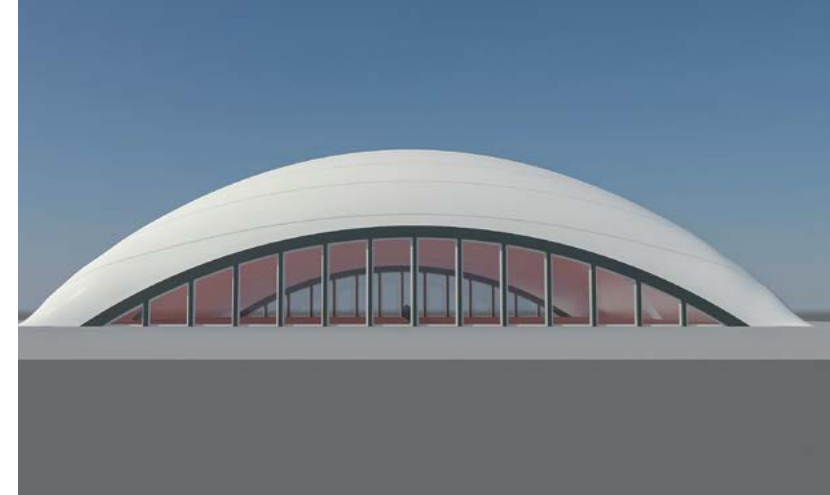
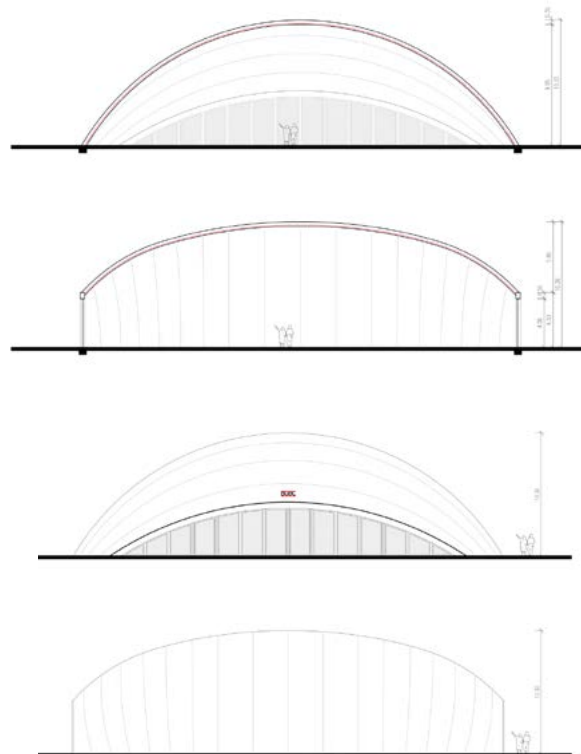


# Design options

**DUOL ECO** allows new design concepts with options of higher side walls and panoramic windows.

Higher side walls provide more indoor space which results in more vertical playable area and overall more pleasant indoor experience.

Panoramic windows are an attractive solution with an awesome view to surroundings.





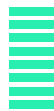
# Ventilation / Heating System

DUOL Ventilation/Heating System is **pre-engineered for stability**. Furthermore, it provides the desired climate conditions inside the dome. The system is **completely automatically-controlled**.

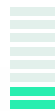
- Automatic pressure regulation- frequency converter reducing overall energy costs and noise
- DFS – Double Fan System; modular fan operation, increased reliability
- Improved modulating system (saving up to 50%)
- High efficiency heat exchanger
- High efficiency condensing units (up to 105% efficiency)
- Full automation (wind mode, snow mode, heating mode)
- Silent operation - radial fan of low noise, silencers
- **Heating options:** natural gas, LPG, oil, hot water or steam, electricity, heat pump, biomass, geothermal, combined source



As quiet as an air conditioning unit used in residential houses.



Regular  
operational  
costs



DUOL  
operational  
costs



# AC system

DUOL has accomplished many projects in the Middle East, Gulf region and other regions with very hot climates. We have installed domes in Saudi Arabia, United Arab Emirates, Qatar, Egypt, Kuwait, Oman and other countries in Asia and South America with extreme climatic conditions. Our AirDome membrane is **uniquely designed** to withstand temperatures up to **70 degrees** Celsius. Our domes are designed AC system ready together with high thermal membrane insulation which reduces the heat entering the dome and maintains the climate inside the dome. A ventilation system ensures the fresh air circulation inside the dome to keep a healthy, fresh and cool environment for the visitors inside the dome. The air conditioning system withstands heat up to 70 degrees Celsius.

## *Opaque membrane*

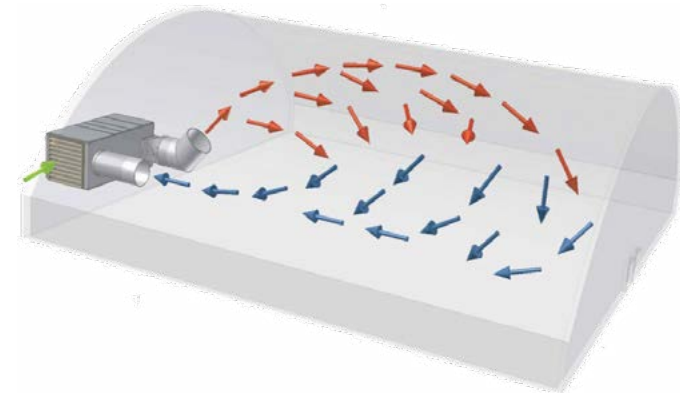
Opaque membrane ensures that AC works with maximum efficiency. It is a type of membrane that is mainly designed for extremely hot regions where sun protection is vital. The membrane withstands heat up to 70 degrees Celsius. The membrane comes with all colors. You choose the color that you like and we make it.

## *De-stratification system*

De-stratification system is mounted on the top of the dome and improves temperature distribution inside the dome – pushing the warmer air down from top to bottom. The result is lower energy consumption and a pleasant indoor environment.



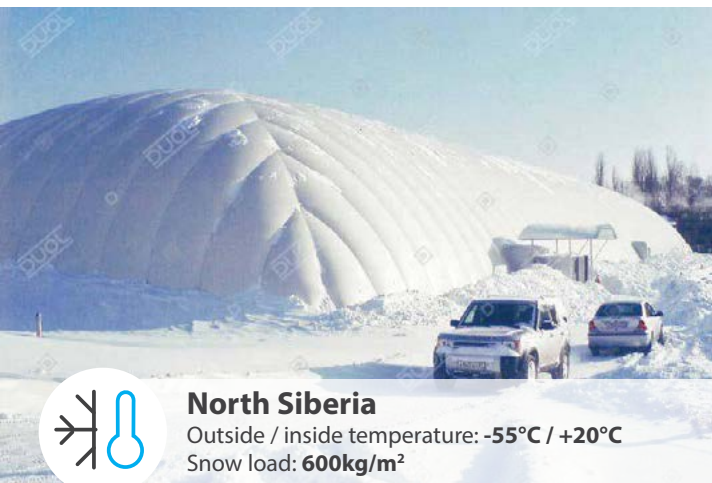
*Air dome with AC system and Opaque membrane in Khobar, Saudi Arabia.*





# Extreme weather conditions expert

DUOL is an expert in airdomes construction in **extreme weather conditions**. We enhance all elements (membrane, air generators, anchoring system...) to withstand **extremely low or high temperatures** with **strong winds** and **heavy snow**.



## Emergency backup system

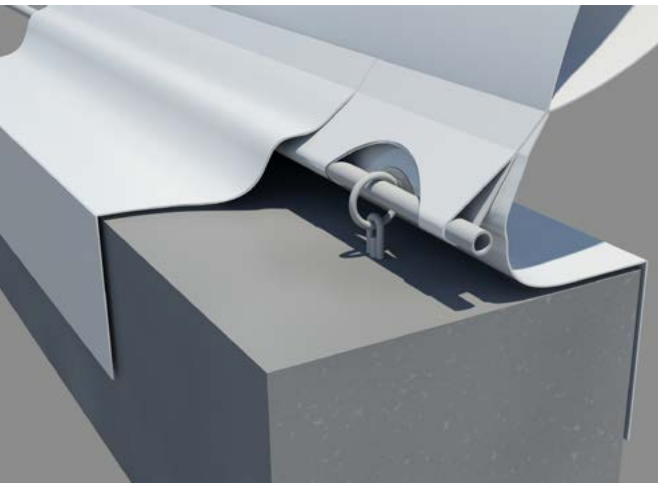
**Reliability** and **safety** are the most important DUOL AirDome features.  
**Constant power supply** is a critical item that must not be left to chance.

- *Auto start function and automatic shutdown*
- *12-24 h autonomy, which can be extended up to 100h*
- *Equipped with tested and reliable engines of well-known manufacturers (Iveco, Cummins, Perkins, Volvo ...) and alternators (Mecc Alte ...), which have a service network practically all over the world*

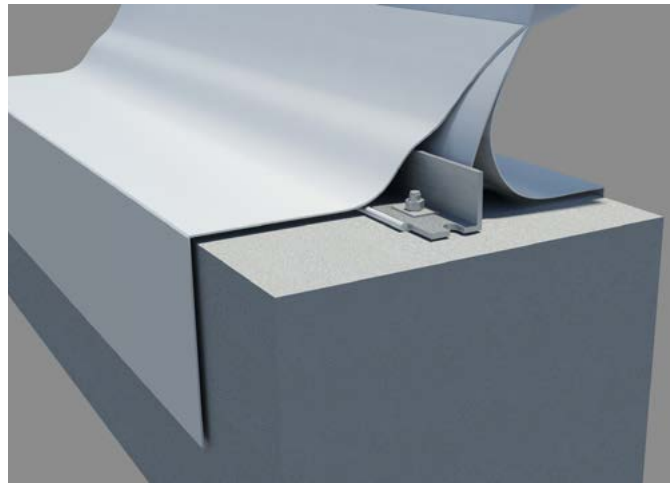


# Anchoring

Every structure needs a solid foundation to keep it anchored and secure. With the **DUOL advanced anchorage system**, air loss around the base perimeter is significantly reduced, providing **savings** on running costs.



*Rings with peg crossed by a metal tube*



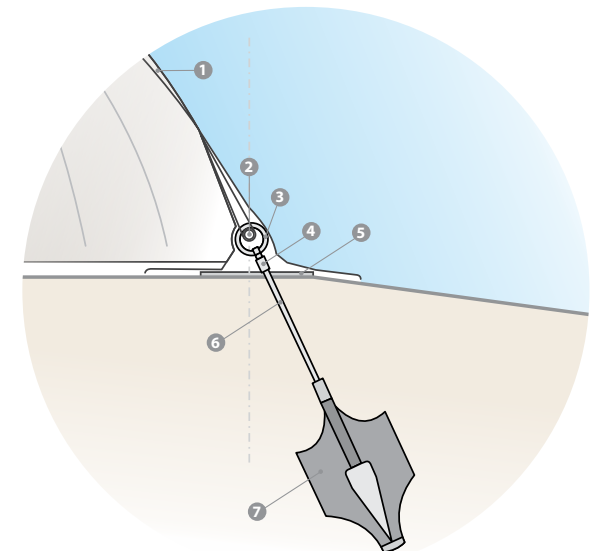
*Metal profiles*

- *Perfect airtightness*
- *Powerful fixation*
- *Suitable for extreme weather conditions*
- *For permanent or seasonal use of the dome*
- *Durable hot galvanized steel. Maintenance free*

## ***Anchoring without concrete foundation***

With a **ground-anchoring system**, there is no need for a concrete foundation around the air dome. By using ground anchors, the air dome is **anchored directly into the ground** with minimal ground disruption.

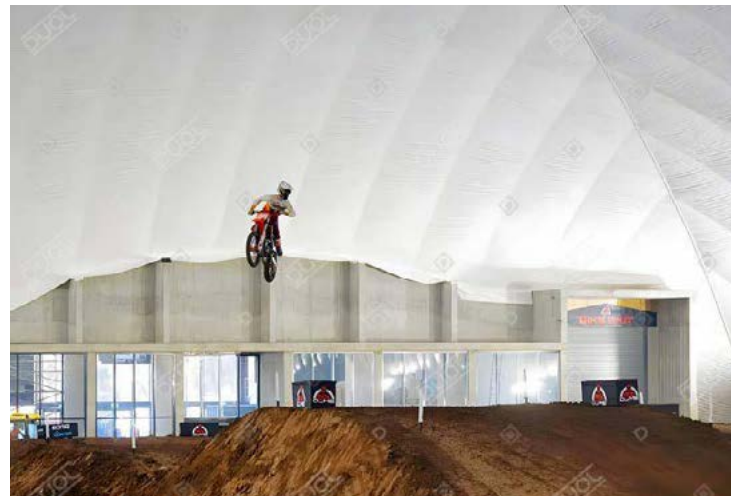
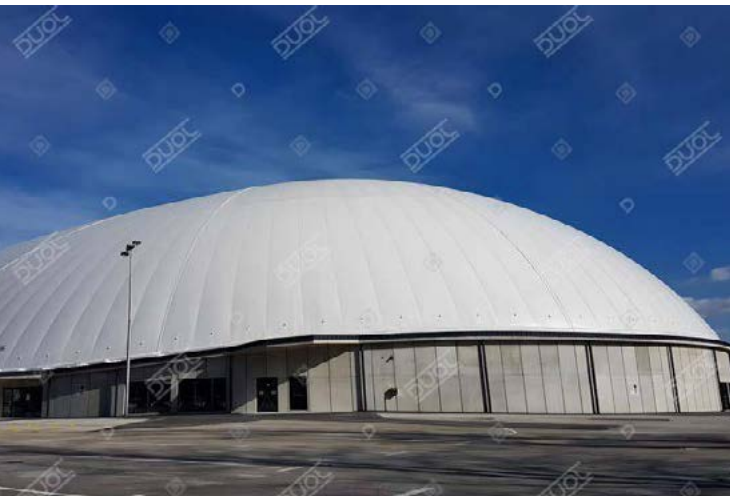
- Double membrane ①
- Metal pipe 1" ②
- Metal ring ③
- Flange ④
- Anchor stabilization ⑤
- Anchor metal rod ⑥
- Anchor plate ⑦





# Connection options

Air structures can be fixed to other buildings in a variety of ways. If the need arises for a larger facility, expanding or modifying an air structure is a simple procedure and can be accomplished with minimal disruption. The Air dome can be **shortened, lengthened or relocated at any time**, even doors, tunnels and connections to buildings can be added additionally.



# Air dome on the top of buildings

Air dome has a **flexible design** that can be installed even **on top of existing buildings**.





# Laser LED luminaries

Laser Led luminaries are using LED source for light emission. They are **suitable for operation under most difficult sports applications**. Specially designed technology for precise and high-intensity light source. System efficiency up to 210 lm/W. Construction with the optical part is designed for high-intensity light source with a low glare as well as a “no-shadow” effect. The construction is made of steel and aluminum to ensure **best possible heat dissipation and a long lifetime**. One of the great advantages of LaserLed is its **simplicity of construction** where **all parts can be substituted** as well as having standard power supply. LaserLed has the possibility of **remote control for dimming** purposes if needed.

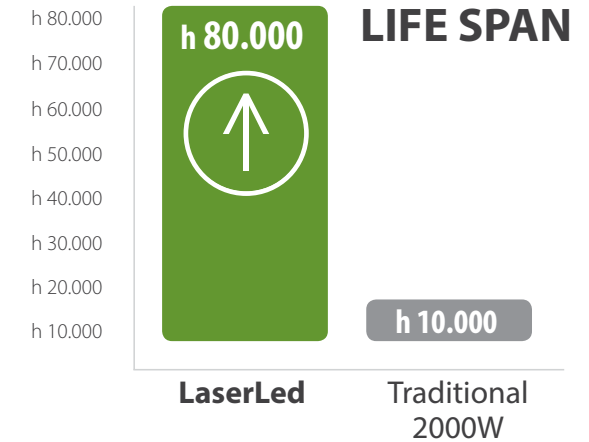


① Luxembourg, football  
1000lux  
NEW LaserLED: **85kW/h**

② United Arab Emirates, football  
500lux  
NEW LaserLED: **50,5kW/h**

## Laser LED Indirect

- For indirect light applications. Air dome structure height up to 45m
- Power 800W
- Luminaire flux: 110.000lm





Excellent  
performance  
standards



Lower costs,  
better  
efficiency



Protection  
degree:  
IP66



Dimmable  
driver

## Laser LED Direct

- For direct light applications.
- Air dome structure height from 5m-22m height
- Power 200W
- Luminaire flux: 27.000lm



❶ Estonia, football  
500lux

NEW LaserLED: **36.4kW/h**

❷ United Kingdom, tennis  
600lux

NEW LaserLED: **9.2kW/h**

❸ Germany, tennis  
500lux

NEW LaserLED: **7.6kW/h**

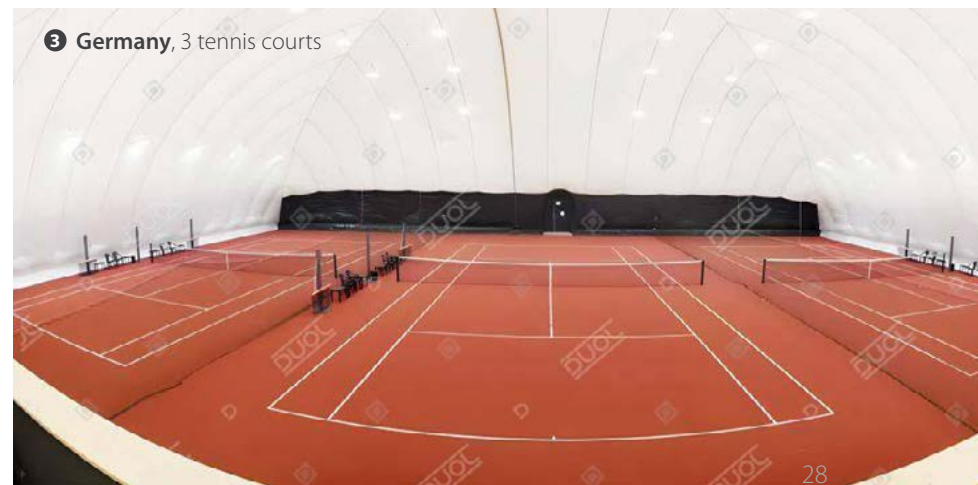
❶ Estonia, football



❷ United Kingdom, 3 tennis courts by LTA



❸ Germany, 3 tennis courts







# Turnkey projects

As a company involved in sport industry for **more than 30 years** we have been closely linked to trusted suppliers of air dome interior and we can deliver for you **completely equipped turn-key** sports object, including stands, offices, locker rooms, toilets, sports flooring, sports equipment, dividing nets etc.





# Custom design possibilities

DUOL air domes can be **custom-designed** according to the client's specifications.  
Different colors, patterns and logos are possible.





## ***Panoramic windows***

Panoramic windows are an attractive solution with an awesome view to surroundings.



## ***Top windows***

Choose top windows and enjoy in a pleasant indoor ambiance. Transparent membrane on the top has an impressive **light transmittance**.





# Prestigious references all over the world



Bern, Switzerland



Kaunas, Lithuania



Tromsø, Norway



Hveragerði, Iceland



Dubai, UAE



Limoges, France



Freiburg, Germany



Kemi, Finland



Astana, Kazakhstan



Ataköy, Turkey



Brussels, Belgium



Novo Mesto, Slovenia



Astana, Kazakhstan



White Hart Lane, UK



Illertissen, Germany



Copenhagen, Denmark



Abu Dhabi, UAE



Kemerovo, Russia



Meudon, France



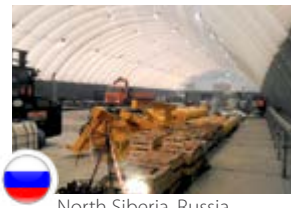
Minsk, Belarus



Batingen, Switzerland



AlKhobar, Saudi



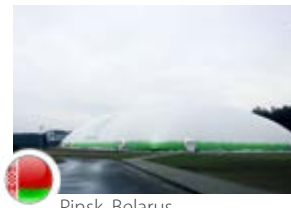
North Siberia, Russia



Tallinn, Estonia



Paris, France



Pinsk, Belarus



Donetsk, Ukraine



QPR FC London, UK



Cairo, Egypt



Tbilisi, Georgia



Rijeka, Croatia



Kungsbacka, Sweden



Thessaloniki, Greece



Newcastle, UK



Helsinki, Finland





Karlstad, Sweden



Nanjing, PR China



Granada, Spain



Augsburg, Germany



Mondercange, Luxembourg



Volgograd, Russia



Nordberg, Norway



India, Military RaDomes



Boden, Sweden



Riga, Latvia



Moscow, Russia



Amsterdam, The Netherlands



Annaba, Algeria



Čapljina, BiH



Helsinki, Finland



Vienna, Austria



Tallinn, Estonia



Tignes, France



Abu Dhabi, UAE



Batumi, Georgia



Niort, France



Sundsvall, Sweden



Krasnodar, Russia



Istanbul, Turkey



Kamchatka, Russia



Valkenswaard, The Netherlands



Naryn, Kyrgyz



Imatra, Finland



Athens, Greece



Sofia, Bulgaria



Cardiff, UK



Mumbai, India



Graz, Austria



Bunnik, The Netherlands



Moscow, Russia



Khorog, Tajikistan



Ashgabat, Turkmenistan



Copenhagen, Denmark



Hormozgan, Iran



Kőszeg, Hungary



Gmund, Germany



Valparaíso, Chile





Sydney, Australia



Istanbul, Turkey



Grodno, Belarus



Savonlinna, Finland



Kaunas, Lithuania



Peterborough, UK



Eindhoven, Netherlands



Tartu, Estonia



Viriat, France



Maribor, Slovenia



Zagreb, Croatia



Cardiff, UK



Split, Croatia



Espoo, Finland



Abu Dhabi, UAE



Viljandi, Estonia



Munich, Germany



Voronezh, Russia



Munich, Germany



Brežice, Slovenia



Utrecht, Netherlands



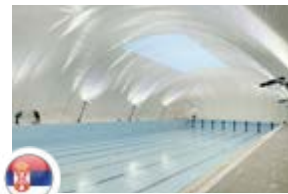
Neom, Saudi Arabia



Oulu, Finland



Essen, Germany



Belgrade, Serbia



Regensburg, Germany



Vaasa, Finland



Šal'a, Slovakia



Novi Sad, Serbia



Vipiteno, Italy



Rēzekne, Latvia



Belgorod, Russia



Raisio, Finland



Belgrade, Serbia



Abu Dhabi, UAE



Senart, France



Phnom Penh, Cambodia



Basel, Switzerland



Sundsvall, Sweden



St. Petersburg, Russia



Copenhagen, Denmark



Ljubljana, Slovenia

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# Clients about DUOL

*From order to completion the project has run like clockwork; we formed a great working relationship with DUOL and they were professional and efficient throughout, keeping us up to date with progress and dealing with any issues promptly and professionally. Importantly the project was delivered within the agreed timescale and we would not hesitate in recommending them to others, in fact we are already planning our next project with them.*

**Queens Park Rangers Football Club, United Kingdom, Mark Donnelly, Chief Operating Officer**

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*Nach 20 Jahren hatte die alte Traglufthalle des HTC B ausgedient. Wir suchten deshalb eine neue Halle für die drei Tennisplätze (36m x 54m). Nach einer intensiven Evaluation entschieden wir uns für eine Traglufthalle der Firma DUOL aus Slowenien. Die Vorteile gegenüber der alten Halle waren: Heller, besser isoliert, weniger Energie verbrauchend. Trotz der geografischen Distanz waren die Verhandlungen stets sachlich, fair und zielführend. Der Transport klappte tadellos. Die erste Installation wurde zusammen mit DUOL-Mitarbeitern und Klubmitgliedern durchgeführt. Die Klubmitglieder sind sehr zufrieden mit der neuen Halle und freuen sich darauf, nächsten Winter wieder in der Halle spielen zu können.*

**Hallentennisclub Bern, Schweiz, Dr. Wolfgang Neugebauer**

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*In 2008 company DUOL supplied and installed football dome dim. 70x110x24m in Seinäjoki, Finland. Company DUOL proved itself as a trustful business partner making its business obligations according Agreement. The dome is representative object in our community. From our point of view a decision to purchase an air supported structure was correct and done in right time due to rising needs in investments into sport. Thank to DUOL air supported structure playing football is able in every weather conditions, no matter on a season. We do hope that our community has neared an attractive kind sport such football is to wide population. And finally the most important is that our football team has got own facility for undisturbed trainings.*

**Wallsport Oy, Finland, Raimo Sarajarvi, Chairman**

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*This letter is written to express our satisfaction with the services provided by DUOL in engineering, manufacturing and installation of a football airdome made of double membrane with dimensions of 108x66m. The airdome has been installed in a very professional manner as agreed in the contract. Today we can openly say that we are very pleased with our DUOL airdome. The airdome has perfectly filled our needs for a covered full-sized football pitch that provides the opportunity for quality training and matches during the months when the autumn and winter weather creates problems for training and playing process. We can wholeheartedly recommend DUOL to any institution or club deciding for a new sports airdome.*

**Fédération Luxembourgeoise de Football, Joël Wolff, General Secretary**







## Contact us

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