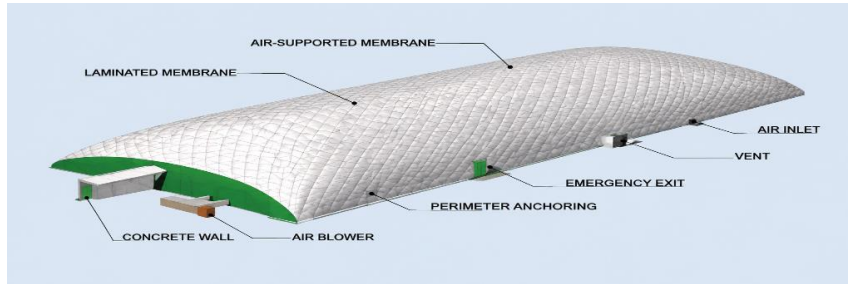


# CITADEL AIR DOME FAQ



- What are the standard dimensions and configurations of air domes?
- AS: The general plan size of the air film building is rectangular, square or circular. The special-shaped structure supports size customization, and the height-to-span ratio is generally 1/3-2/3.



- Are custom sizes or shapes available?
- AS: Air dome buildings can be customized in size and shape, but drastic changes should be avoided as much as possible. The overall length and widths are related so they have to be co-related.
- What materials are used in the membrane/fabric? (fire resistance, UV resistance, insulation properties)
- AS :The types of building membranes generally used in air film buildings are: PVDF, PVC, PVF and the materials are selected according to the characteristics of the end use application, which have good fire performance (the lowest is B2, the highest is A2), ultraviolet resistance, thermal insulation performance. When the thermal insulation performance requirements are high, the insulation material (such as thermal insulation layer) should also be filled between the multi-layer membranes.
- What is the lifespan of the dome material?
- AS: The service life of air film building materials (PVDF, PVC, PVF) is generally 15-30 years;
- What is the internal pressure maintained to keep the dome inflated?
- AS: Under normal use, the internal pressure of the air film is generally about 250Pa, and the internal pressure is slightly different according to the thickness of the air film and the end use application n;



- What type of ground/foundation preparation is needed?
- AS: The requirements of the foundation of the air film building are to meet the pull-out resistance generated when the air film is inflated (or under the combination of the most unfavourable working weather conditions). The ground can be hardened ground, grass, or even simple site levelling according to the use function; Based on the final design the civil and ground preparations can be provided.
- Are concrete footings or anchoring systems required?
- AS: In order to resist the uplift force, the air film building must need a foundation or anchoring system and different foundation or anchoring systems can be designed according to the form and use scenario;
- How is the dome secured against strong winds or extreme weather?
- AS: In the event of extreme weather such as strong winds and snowfall, the intelligent control system will start emergency pressurization measures after monitoring the critical value to increase the internal pressure of the air film and enhance the stiffness of the air film building to resist extreme weather such as wind and snow
- What are the maximum wind speeds or seismic conditions the dome can withstand?
- AS: The membrane building is generally designed according to the local once-in-a-century wind speed, which can appropriately increase the design wind speed, and the corresponding membrane strength grade and cable net standard will be improved accordingly. At present, the wind speed of super typhoon "Capricorn" in our country is 68m/s, and the air membrane building has withstood the test; Air dome buildings are ultra-light structures that generally do not consider the impact of earthquakes, but earthquakes may cause damage to foundations, anchoring systems or ground;
- What is the typical lead time from order to installation?
- AS: Customized production lead time is about 10-8 weeks, excluding infrastructure and transportation;
- How long does installation take on-site?
- AS: Usually the installation is completed in about 2 – 3 weeks (including commissioning)
- Is any heavy equipment required for setup? Whose scope will it be under?
- AS: Cranes, forklifts, etc. are required for installation; Generally, the lifting equipment for domestic installation is prepared by the construction unit itself, and the installation of foreign projects needs to be coordinated by the owner – Citadel will take the responsibility of the installation and lifting equipment will need to be provided by the client.



- Who is responsible for installation — your team or ours?
- AS: During installation, our company can arrange technical personnel to assist and guide the installation, or labor dispatch by domestic skilled workers to install – also Citadel will undertake the complete installation
- Is reinstallation or relocation possible and how is that handled?
- AS: Theoretically, the air dome building can be repeatedly disassembled and used many times during its service life (with certain damage), but it needs to be determined by combining the size and specifications of the old and new use scenarios. The dimensions need to be same to be able to shift the air dome.
- Is there an HVAC system included? Can it support extreme climates?
- AS: Can include an HVAC system to ensure proper operation in extreme weather conditions – generally this is an extra item.
- How is air pressure controlled and monitored?
- AS: The intelligent air film building is equipped with a standard air pressure monitoring system, including a barometric pressure detection tube, a barometric pressure numerical simulator and an intelligent barometric pressure control module, which can be automatically adjusted according to the size of the air pressure combined with the setting program, and no manual intervention is required during normal use.
- Is lighting integrated? If so, what kind?
- AS: Roof chandeliers or wall lamps commonly used in air film buildings are LED lights, which have low power and high brightness, and are controlled by the lighting system module, which can be controlled by partitions and can be opened and closed regularly;
- Are power and water connections needed, and how are they handled?
- AS: The owner needs to provide the main power supply to connect to the air dome building M&E unit - power control cabinet; We determine power based on electricity consumption;
- Are sound insulation or ventilation options available?
- AS: The air dome building is composed of 1-3 layers of membrane, usually with a good sound insulation. If the owner has a high demand for sound insulation, the solution can be customized to achieve the sound insulation effect; Conventional air film buildings are equipped with ventilation systems (inlet and outlet air), and if you need to add a fresh air system or configure dust removal, we can customize it separately;



- What are the fire safety standards and certifications the dome meets?
- AS: The air film building material itself is a class B or even a class A fireproof material, and its entrance and exit settings meet the requirements of fire emergency evacuation in public places;
- Is there an emergency deflation system?
- AS: The air film building does not need an emergency deflation system, if necessary, the inflator can be turned off and all the outlets can be opened, if there is a higher need to customize separately;
- Are there backup power systems in case of electricity failure?
- AS: The standard power supply of the air film building is a self-starting and stopping generator set, which can meet the power supply demand of about 3-8 hours
- Are emergency exits provided and compliant with local codes?
- AS: Equipped with emergency exits to meet the requirements of fire emergency evacuation – customization can be done for local building codes and requirement.
- What is the maintenance schedule and requirement?
- AS: The regular maintenance cycle of the air dome building is nothing elaborate - if there is no special extreme weather encounter, then a comprehensive overhaul can be carried out every 3 years. After 10 years, it will be overhauled once a year; A comprehensive manual for the maintenance of the air dome and the equipment will be provided.
- How much space is required to set up the blowers?
- AS: The size of the equipment room is about 30 square meters per 5,000 square meters of air dome;
- How often must the blower/air system be inspected or replaced?
- AS: The blower/air system can be overhauled every 3 years; After 10 years, it will be overhauled once a year; There is no change in the appearance of daily maintenance, and there is no abnormality in the normal operation parameters of the equipment;
- Are spare parts readily available?
- AS: Accessories are sufficient, easy to purchase; these can be shipped by courier or air freight
- What is the estimated downtime during maintenance or repair?
- AS: The maintenance of the inflatable unit can be carried out in sections and rotations to achieve non-stop maintenance/repair;



- Does the dome comply with local/national building codes?
- AS: Air membrane building is a relatively mature building structure in our country and meets the requirements of the code; we will need to study the building codes in India if these are applicable to similar buildings
- What certifications (CE, ISO, ASTM, etc.) does the product hold?
- AS: The air-dome building meets the ISO certification;
- Is the membrane fire-rated to international standards (NFPA, EN, etc.)?
- AS: The fire rating complies with the international standard ENB2 standard
- Do we require any special permits or approvals from local authorities?
- AS: This will need to be checked locally with the government agencies.
- Can you assist in the permitting process?
- AS: Our company can provide the technical support information required for licensing procedures – the actual permissions will need to be taken by the client.
- How would you handle accidents or injuries during installation?
- AS: As one of the earliest enterprises in China to develop air film building products, safety has always been our primary guarantee, our installation operators and management personnel have a high level of professionalism and safety awareness, the installation process is carried out according to the specification manual, of course, we will also purchase accident insurance for project personnel; In the event of an accident or injury, the emergency plan will be implemented as soon as possible to protect personnel and property, minimize losses, comfort and psychological counselling for injured or trapped personnel, and report to the company's senior management and competent departments in a timely manner;
- What is the duration and scope of your warranty?
- AS: The overall warranty of the project is 2 years, the warranty of building membrane materials is 15-20 years, and the warranty period of mechanical and electrical equipment is 2 years;
- What does the warranty cover — structure, fabric, HVAC, installation?
- AS: The overall warranty of the project is 2 years, the warranty of building membrane materials is 15-20 years, and the warranty period of mechanical and electrical equipment is 2 years;



- What voids the warranty?
- AS: Man-made damage, war damage and force majeure damage other than the design load are not covered by the warranty;
- What is the tentative cost breakdown (structure, shipping, installation, etc.)?
- AS: The tentative cost of an air dome includes project design, procurement and processing of main and auxiliary materials of the project, procurement and installation of relevant machinery and equipment of the project, transportation of materials to domestic ports in our country and on-site installation costs. Costs can be provided on project to project basis. Citadel will also work out the import duties and landed costs in India.
- Are there optional add-ons (HVAC, lighting, anchoring, etc.)?
- AS: In addition to maintaining the normal operation of the air film structure, modules are optional, such as HVAC, lighting, dust removal and filtration (such as PM2.5, etc.), sound insulation, heat preservation, wind pressure and snow pressure monitoring, solar photovoltaic modules, etc. – these can be customized from project to project
- Is there a lease or rental option?
- AS: No
- Are there long-term use discounts or bulk order rates?
- AS: Prices can be considered based on requirements.
- What are the payment terms and conditions?
- AS: Material Supply : 35% in advance, 65% before shipment. Engineering installation: 50% advance payment, 50% installation progress. This will be communicated on project to project basis.
- What is the typical lead time from order to delivery?
- AS: According to the existing project volume, the delivery time from the order to the contract delivery is around 3 months
- How do you handle shipping logistics?
- AS: We deliver our goods to domestic ports in China – Citadel will get the material shipped and also clear and deliver to site.
- Are there extra charges for remote or difficult locations?
- AS: This would be discussed from project to project – it is difficult to comment on this currently.

- Do you offer technical support after installation?
- AS: This will be provided including but not limited to: remote technical guidance, user training, after-sales guidance, etc.
- Is training included for our on-site team?
- AS: After the installation of the project is completed, normal use and emergency training will be provided and the user manual will be provided at the same time
- Are you equipped to provide rapid-response servicing in case of emergency?
- AS: We can remotely guide the handling of emergencies, and arrange staff to rush to the scene to deal with related matters for about 72 hours during the warranty period.
- What are your service level agreements (SLAs) for maintenance or repairs?
- AS: AAA rating, allowing re-power after a temporary power outage
- Can you provide case studies or references from similar construction site projects?
- AS: List of projects executed can be provided.

#### 北京金隅红树林污染土存储气膜（北水）

项目简介：位于北京市昌平区北京水厂厂区内，长120米，宽60米，最大高度为4.2米，容积为13万立方米，采用气膜气库控制系统和监测系统，膜材料采用国内PVDF材料，于2007年10月投入使用。



#### 河北金隅红树林污染土存储气膜（燕郊）

项目简介：项目位于河北燕郊，长125米，宽60米，最大高度为28米，容积为17万立方米，两个车辆通道，两个应急通道和一个旋转门通道。膜外部采用斜向索网结构，2011年5月投入使用。



#### 贵钢贵定气膜大棚修复车间

项目简介：该工程属于气承式充气膜结构，包含两个气膜单体，依山势比邻而建，膜单体平面投影为矩形，尺寸142米\*70米，膜顶部标高29.5m，膜内部容积约20万方。



- Are there any documented ROI or efficiency improvements after dome use?
- AS: We don't have any ROI figures currently worked out in the Indian scenario.



- Can the dome be installed over partially completed structures?
- AS: The air pillow membrane structure can be built on the completed building, but it is necessary to ensure that the bearing capacity of the completed project is sufficient and relatively regular. This issue can be discussed based on exact project requirements.
- How does the dome impact crane, forklift, or heavy machinery access?
- AS: The air-closing door is designed to meet the entry and exit of relevant equipment. The design height of all foundation pit air pillow projects will meet the safe working height.
- Can the dome be kept inflated while construction activity continues inside?
- AS: The dome has the highest inflation power at the beginning of installation, and only the required pressure is required in the normal production operation process in the dome, and the inflation efficiency is relatively low at this time, but the overall inflation needs to be maintained continuously – also the air dome can be kept inflated while the construction is continued inside.
- Are there dust/fume extraction systems compatible with the dome?
- AS: The dome provides a dust suppression sprinkler system as well as an overall fresh air system.
- Can tools and materials be safely stored inside the dome long-term?
- AS: The dome is a temporary structure and can be used for safe storage of materials and tools, as well as personnel entering and exiting during the service life.
- What are the temperature and humidity control capabilities for curing materials like concrete?
- AS: The temperature and humidity of concrete setting should be in accordance with the relevant domestic regulations in China, or in accordance with local regulations – these can be customized.
- Is the dome suitable for phased construction or multi-level builds?
- AS: The implementation of the project is mainly divided into three stages: 1. Foundation and related concrete civil construction. 2. Laying of membrane and cable net. 3. Construction of mechanical and electrical parts. As regards to the construction within the air dome there is a limitation of the height to around 40 – 50 meters and construction can be carried out for the same.



- Do you offer a site assessment service before purchase?
- AS: Before the overall design and production, on-site survey is required to evaluate the existing site, nearby buildings, geological forms and other indicators. Follow-up work can also be carried out directly according to the survey report provided by the customer – in short we can do the site survey as required.
- Can you provide a simulation or model for specific site layout?
- AS: Yes, but only after confirming the final location, final practice and related business matters.
- What are the space clearance requirements around the dome?
- AS: The membrane structure does not exceed the original boundary line after the overall inflation, but the strip foundation needs to reserve more than 2.0m of space with the surrounding buildings.
- Are the external motors & machines fire resistant/fire proof?
- It is not fireproof.
- What are the repair options if the fabric is damaged?
- On-site heat sealing repair can be done.
- How can repairs be carried out if both the inner and outer fabrics are damaged?
- It depends on the degree of damage. Generally cracks can be repaired by on-site heat sealing in both the membranes.
- Are flame-proof LED lighting and fixtures available?
- Generally, emergency lighting needs to meet fire protection requirements. Ordinary lighting needs to be customized if it needs to meet fire protection requirements; We can match the client requirements on this.
- What are the earthing provisions for all electrical equipment?
- The earthing and neutral connection of electrical equipment are important regulations to ensure the normal operation and safe use of electrical equipment; We will adhere to this requirements.
- What is the typical cost for  $250 \times 100$  m and  $100 \times 100$  m construction site structures?

- Excluding foundation civil engineering, the cost is approximately Rs. 15000 per sq. mtr of plan area plus gst and other costs.
- What is the typical cost for a warehouse structure without additional systems like HVAC or heavy duty dust/fume exhausts?
- Excluding foundation civil engineering, the cost is approximately Rs. 13500 - Rs. 14000 per square meter plus gst and other costs.
- How long does it take for the structure to deflate after the air pump is turned off? What are the contingencies to prevent any mishaps?
- It depends on the situation. If it is an active shutdown and the airtight integrity is not damaged, the stability of the air film can be maintained for a certain period of time. At this time, deflation only occurs through the air outlet, and the time can be calculated according to the designed air output. If there is damage, the deflation time will be shorter; The air film is an air-supported structure. Even if the inflatable dome collapses due to sudden situations such as air leakage and rupture, it will take several hours to completely collapse to the ground and the dome is equipped with sufficient emergency evacuation doors to ensure safe evacuation.
- Which components of the structure are fire-proof?
- The fabric membrane is made of fire-resistant material of B1 grade or above, and the emergency evacuation doors are made of fire-resistant materials; The anchors are coated with fireproof paint.
- What is the occupancy limit for a 150×100×100 m structure?
- First of all, an air film with a scale of 150 × 100 meters should not be built to a height of 100 meters and the height which is achievable with these dimensions is about 35 meters. The number of occupants needs to be determined according to the function of the building. According to the "Standards for the Construction of Urban Public Stadiums", a venue of similar scale corresponds to a third-level stadium (with 5999-3000 seats), and the floor area per seat is 3.7-4.1 square meters. Calculated according to the maximum threshold, the number of occupants is about 4,000, but it needs to be adjusted according to actual event needs.
- Is vehicular movement possible and what door opening sizes are available?
- Vehicle entrances and exits can be set up which are determined according to the vehicle size; We can adjust this according to your requirements.
- Can you provide photos, videos, and methodology for installation and removal?
- Of course, we can provide them and technical personnel can be sent for guidance if necessary.



- Is it possible to modify or resize the structure after installation?
- Reduction or expansion can only be realized in the short-span direction, and it is necessary to reserve space for size changes at the beginning of the design.
- What is the LED light strength in lux?
- The LED light intensity is usually between 500-1000 lux.
- Is there any insurance/warranty for the material? How can it be enforced?
- Insurance can be purchased as a whole and insured as property but this has to be done locally by the client himself.
- What is the power rating of the air pump motor and how many units are required for 250×100 m and 100×100 m structures?
- The motor power and air volume are customizable parameters, which can be customized on demand; This can be provided specific to projects.
- What type of exhaust system is provided for dust, fumes and by-products?
- Fresh air filtration system, fog cannon dust removal.
- What is the emergency procedure in case of a system failure or other emergencies?
- Standby power supply and emergency evacuation.
- What is the power consumption and supply requirement for 250 × 100 m and 100 × 100 m structures? Are the systems going to run 24x7? How long can the systems run in case of power failure?
- There is a back up generator if your main electricity trips. Yes the system has to run 24 x 7 to keep the pressure going inside the air dome.
- Can you provide fabric and cable samples with MTC or TDS?
- Can be provided.
- Can you share MTC, TDS, and connection details for all systems?
- Can be provided during detailed design.
- Do you have certificates for fire resistance, UV resistance, and heat resistance compliance?
- The fabric membrane has the above test items and the test report can be provided.



- Can the system handle continuous 24×7 welding by at least 20 welders, including fume and heat extraction?
- The ventilation rate and smoke exhaust volume can be calculated and designed according to the calculations of the heat and smoke generation to adjust the required climate within the air dome.
- Can an oxygen level monitoring system be integrated?
- Yes an oxygen concentration detection module can be added.
- Can humidity monitoring be included for heavy excavation and welding work?
- Yes temperature and humidity monitoring detection modules can be added in corresponding positions.
- Is it possible to remove the structure after the monsoon and reinstall it over the same or a built-up area?
- It can be disassembled and reinstalled, but there will be costs and certain losses; This is not a recommended option in our suggestion.
- What is the process for removing the structure after work is completed?
- General demolition process:
  1. All structural equipment in the room is transferred, no foreign objects
  2. Start equipment shutdown
  3. Door opening and removal
  4. Cable net system removal
  5. Membrane removal
  6. Electrical unit removal.
- What is the maximum time a vehicle entry door can remain open and how is air pressure maintained if it stays open for 30 minutes?
- There are 2 vehicle access doors, which are in a mutually opening and closing state. The two doors cannot be opened at the same time and the air pressure inside the air film is always relatively stable;
- Can AC units be installed after ground excavation is complete?
- During use, air conditioners can be added at any stage, but it is necessary to plan in the early stages for better planning
- Can you share testimonials, photos, and videos of executed projects?
- Can be provided with the customer's permission at a later date

- Are there any Air Domes currently in use at oil refineries or similar facilities?
- The application scenarios are gradually expanding, but there are currently no completed cases in oil refineries.
- What is the air loss per hour and what is the electricity consumption per day to the make up for it?
- The air loss rate is approximately 3-15% which is determined by the frequency of door opening and closing as well as ventilation requirements; The power consumption of variable frequency fans is generally not large. If accurate energy supplement data is needed then detailed further calculation is required.
- Can the size of the Air Dome be reduced or expanded during relocation for one site to another?
- The Air Dome can be relocated. Reduction or expansion can only be realized in the short-span direction and space for size changes needs to be reserved at the beginning of the design – it may be difficult to make drastic changes subsequently.
- What is the recommended lux level of light for construction purpose air dome?
- For non-indoor competition sports fields, the recommended illuminance is generally 150-250 lx; For the construction work this can be discussed and planned.
- For an area of  $25 \times 25$  m, what would be the height of the Air Dome, The client has a plot same of the dimension?
- The height of the dome is generally about 1/3 of the length of the short span. That is to say, for a 25-meter width, the height of the dome is approximately 8-10 meters.
- How much noise reduction is possible with sound insulation they want sound be reduced from 110 dB to 85 dB?
- If sound-absorbing insulation is filled in the air film, reducing the sound from 110 decibels to 85 decibels is completely achievable. (There are actual measured data from cases where the sound was reduced from 100 decibels to 70 decibels).
- What is the emergency evacuation plan in case the air dome collapse?
- The air film is an air-supported structure. Even if the inflatable dome collapses due to sudden situations such as air leakage and rupture, it will take several hours to completely collapse to the ground, and the dome is equipped with sufficient emergency evacuation doors to ensure safe evacuation.



- Are there any Air Domes constructed near India or in APAC? Please share details of use for constructing application
- Our company currently has no air film projects implemented in India, but there are many projects available in China.
- If the client visits China, are there any operating sites available for him to see air dome project for construction?
- Of course. We can inform you of similar projects in advance for the client to select and arrange a visit itinerary.

