



Global Leader in Air Domes
since 2003



BREESEN

Authorized dealer of Broadwell Air
Domes
in Indonesia

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About Broadwell Air Domes



Broadwell Air Domes

Broadwell Air Domes are sturdy structure, made up of special type of PVDF membrane supported by patented design bias-harness cable system. More than 1000 Air Domes have already been implemented globally and it has proven its strength and durability.

Highly cost-effective

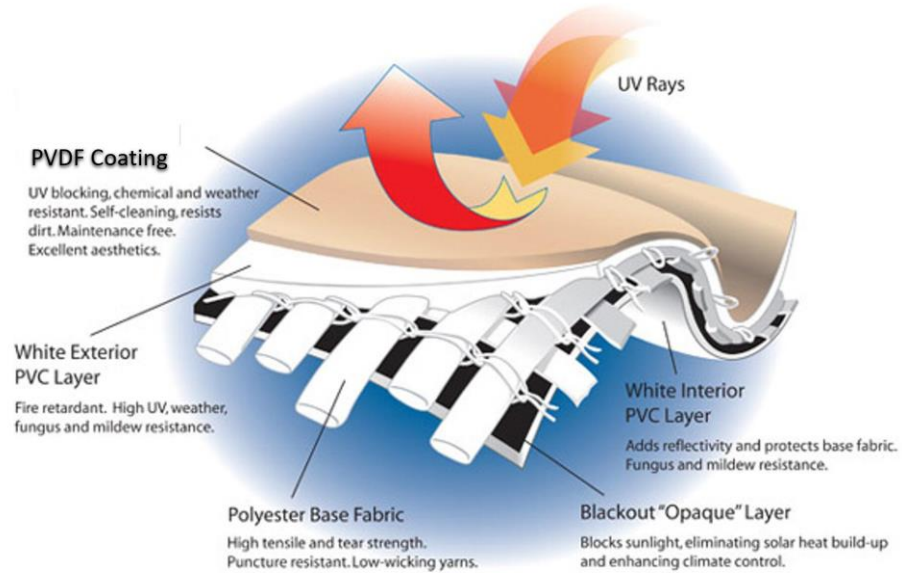
Very fast implementation

 Green Building Concept

- ★ *energy conservation*
- ★ *Pollution free air*
- ★ *Negligible construction waste*
- ★ *Consumes very less steel and cement*

The **PVDF membrane** used in Air Dome, which constitutes major part of Air Dome, is a highly durable material, which comes with **Warranty of 15 years.**





Air Dome uses specially designed petroleum by-product PVC membrane, which is made in several layers, with specific properties, like:

- **It reflects up 90% UV rays**, providing insulation properties against sun heat. Therefore, requires less power consumption for air conditioning inside.
- **Self cleaning characteristics**, requires no separate cleaning.
- **Fire retardant properties.** Membrane meets US Fire Code NFPA-701 and Chinese standards B1. Without flame, it doesn't burn itself.
- Designed with low-wicking yarns, for **high tensile and tear strength, and puncture resistance**
- Originally comes in white color. However, several **different color choices** are available.



Unique **patented bias-harness cable covers** completely outer membrane with designed wind load up to 67 m/s (level 16 typhoon), and more than 250 kg/m² load, based on 50 years return period.

Key Advantages *of* Broadwell Air Domes

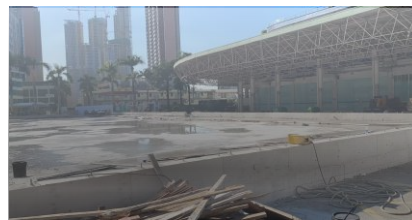
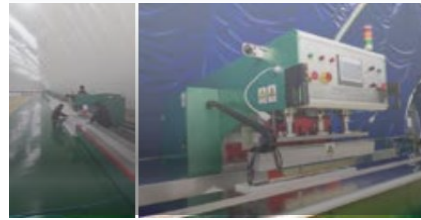


Fast Implementation



A typical 10,000 m² Air Dome can be completed within 3 months from the date of confirmation of order.

Majority of manufacturing works done at factory, and the whole system can be assembled in the site very quickly, and nearly no construction waste.



Design works

Manufacturing

Civil Works

Shipment

Installation

2 weeks

5 weeks

8 weeks

3 weeks

2 weeks

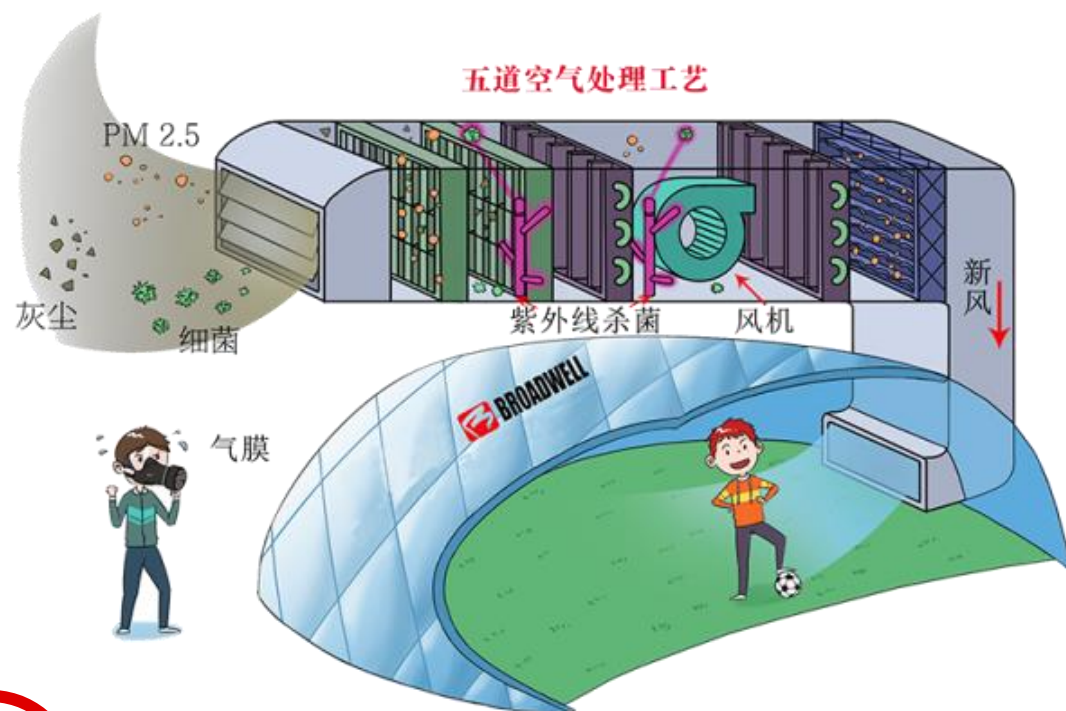


WEEKS

- ➊ **Very less civil construction works.** Air Dome requires very simple and light foundations and in most of the cases, no piling is required. Overall consumes very less steel and cement which makes the Air Dome substantially cost effective as compared to normal building structure.
- ➋ **Very short time site-works.** The installation and commissioning of Air Dome at site takes 3 to 4 weeks and requires very less manpower. Hence, practically no site establishment cost as compared to normal building construction works. For example, an Air Dome of 15,000 m² floor area will require 3-4 weeks for installation and commissioning after receiving the material at site and will require about 20 manpower. Whereas a normal building of same size will require 12-14 months, with hundreds of workers and several construction equipment which requires full site establishment.
- ➌ **Large span without columns and beams.** The Air Dome proves extra-ordinarily cost effective for applications which requires large span construction without column supports, mainly for bulk material storage where columns supports can not be made due to equipment movement. Air Dome may be built with span up to 200 mtr. Due to no columns and beams, Air Dome provides greater space utilization.
- ➍ **Simple equipments; low operation cost.** Air Dome uses simple equipments, like Blowers, Gensets, Filters, etc. which are easy to maintain and with less operation cost.

CLEAN AIR

Air dome is a positive pressure structure, generally with interior air pressure 300-350pa higher than outside, and the air only go into the Air Dome with inflation system through filtration, which makes the dirty air outside of Dome, maintaining clean air inside.



BETTER EMERGENCY RESPONSE

- The membrane is flame retardant materials, without the flame, it doesn't burn itself.
- In the fire situation, generally people gets hurt by smoke instead of fire. In Air Dome, the height is generally very high which makes the smoke to be accumulated in the top area, which give more time for people to escape. Secondly, due to positive pressure inside the air dome, smoke will escape fast from the Air Dome in case of fire which has created a hole/space.
- Air dome is constructed without columns and beams, so in the emergency case, people can easily find the emergency exit. All Air Domes are provided with sufficient emergency exits.
- Due to light weight structure, it is unlikely to create any damage incase of earthquake or collapsing of structure due to any extreme calamities. (Earthquake proof)



Air Dome provides substantial energy conservation, mainly for lighting and cooling/heating of building. Air Domes generally provided with some strips of transparent membranes which saves lighting power during daytime, and high insulation property of membrane, results in low energy consumption for cooling & heating.

A typical case study of a Sports Air Dome of area 3,000 sq.m. shows saving of about US\$ 35,000 – 40,000 per year.

CASE STUDY Air Dome v/s Traditional Bldg. Sports Complex – Area 3,000 m²

	Air Dome (kwh annually)	Traditional Bldg. (kwh annually)
Mechanical System	15,768	7,300
Lighting System	63,875	122,640
Cooling System	57,057	361,358
Total	136,700	491,298

Annual Savings : 354,598 kwh
: ~ US\$ 35,000 – US\$ 40,000



Remote monitoring interface on Mobile App.

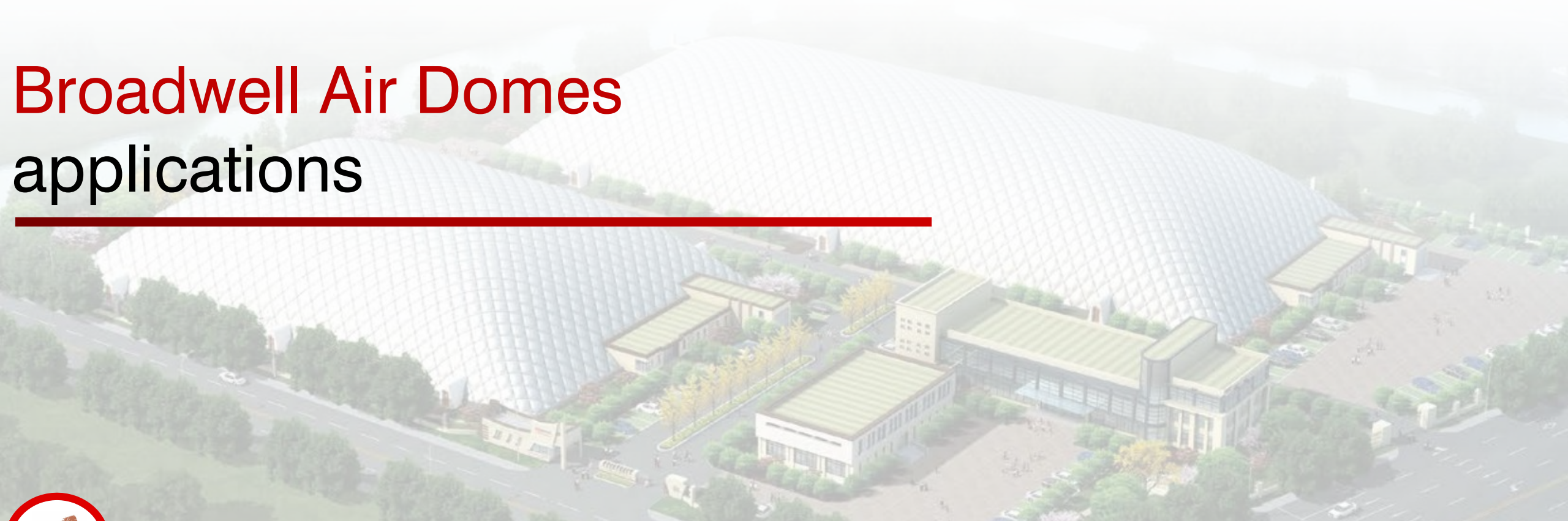
Broadwell Air dome building adopt PLC intelligent control system, through RS485 interface connect PC or through cell phone APP, to remotely control the various parameters of Air Dome, including mechanical systems, air pressure, temperature, humidity, wind speed, snow pressure, air quality etc. The control system with alarm system can remotely deal with sudden weather and unexpected events.

Depending upon the application of Air Dome, i.e., whether it is built for Exhibition Hall, Sports Complex, Bulk Material storage, etc., and depending upon location, the control system shall be tailor made to suit specific application.

Control system will greatly help in monitoring and controlling power consumption and therefore results in energy saving.



Broadwell Air Domes applications





Bulk Material Storage



Factories/ Workshops



Warehouses



Sports Complex



Exhibition/ Event Halls



Concert Halls

Broadwell Air Domes

Bulk Material Storage



1. | Shenhua Group – Bayannur Coal Domes 2012 Inner Mongolia

L 232 m x W 100 m x H 36 m 23,200 m²

L 400 m x W 110 m x H 42 m 44,000 m²

Shenhua Group Bayannur Coal Domes is the first coal dome project in China. The two Air Domes provide **total storage capacity of coal more than 650,000 ton**. These Air Domes were provided with patented technology of belt conveyor sealing and both Air Domes are using Stacker and Reclaimer with fully mechanized coal handling system. The location experiences heavy wind and dust due to desert area and Air Domes are working with no problems since last more than ten years.





Belt Conveyor sealing technology is one of the many patented designs of Broadwell, which is a cost-effective, pollution-controlled and safe operation solution. Depending upon type of bulk material, storage capacity and storage method, Air Dome may be designed to perfectly suit the requirements.

2. Renqiu Thermal Power Plant 2018 Coal Storage, Heibe Province

L 169 m x W 106.5 m x H 39 m 17,998.5 m²

L 113 m x W 106.5 m x H 39 m 12,034.5 m²

This Power Plant is using two Air Domes for coal storage, and both coal storage is equipped with Stacker Reclaimer for coal handling operations.



3 | Yanzhou Coal Company – Coal Domes 2018 Jining, Shandong

With a total area of 18,300 m², the coal Air Dome has reduced the pollution drastically and emission of toxic gases, like carbon dioxide, sulfur dioxide, nitrogen oxides, ammonia, nitrogen, etc.

These Air Dome were built on the original site without disturbing the existing equipments like Stacker, Reclaimer, Belt Conveyors, etc. Also, the coal storage yards divided into multiple compartments/units for storing multiple coal types.

Theses Air Dome coal storage adopts the trestle bridge coal falling design (Broadwell Patent) for accumulation of coal, equipped with vehicle access system (Broadwell Patent), airtight doors for personnel movement, fire escape access system and other systems which makes coal handling pollution free, convenient, and safe.

L 110 m x W 90 m x H 30 m 9,900 m²

L 120 m x W 70 m x H 26.5 m 8,400 m²



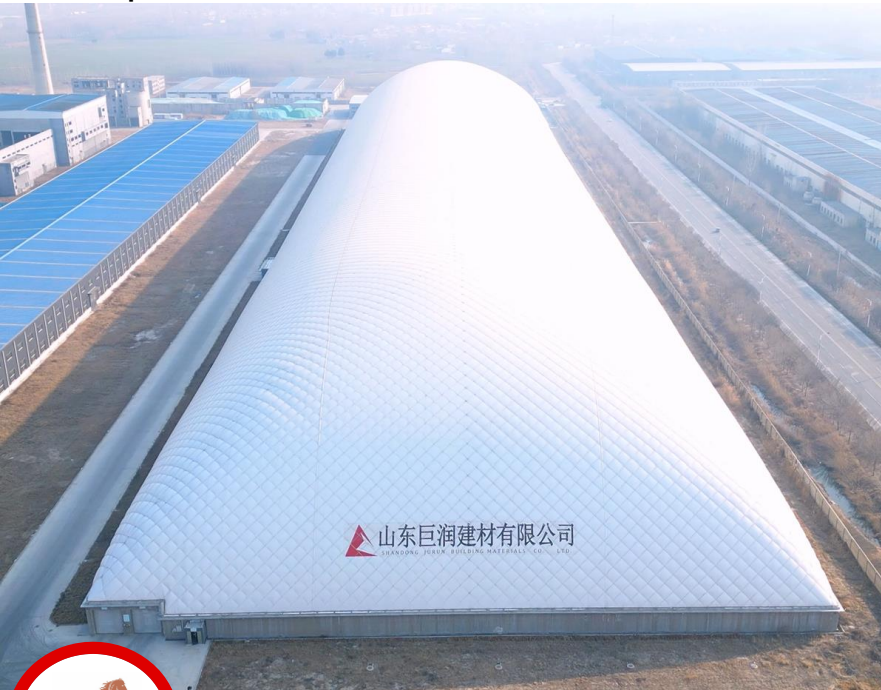
4. Shandong Jurun Building Material Co. Ltd. 2016 Sand raw material storage, Glass Indl. Park, Shandong

L 570 m x W 120 m x H 40 m

68,400 m²

The Shandong Jurun Air Dome was created for storage of sand for glass manufacturing industry, with primary aim of pollution control, energy conservation and safe operation.

The Air Dome is provided with transparent strip at top which allows sun light inside and saves substantial electrical consumption by switching off day lights, and other parts of Air Dome provided with opaque membrane which ensures no excessive temperature inside.



5. Xixiang Aluminum 2018 Al. raw material storage, Henan Province

L 200 m x W 110 m x H 36 m

22,000 m²

The membrane is specially designed with seven layers, each with specific purpose.

The Air Dome is provided with 4 doors for trucks movement, 1 revolving door for personnel movement, and 4 emergency doors.

Ventilation system ensures fresh and dry air inside the dome.



6. China Merchants Port 2015 Granary Storage, Shenzhen

L 160 m x W 50 m x H 20 m

8,000 m²

The project is the first granary storage using Air Dome structure in China. The granary dome is not only leakproof, moisture-proof, heat-insulated, closed and ventilated, but also has the advantages that traditional steel structure granaries can't match, i.e., good sealing performance, strong anti-corrosion ability, seawater erosion resistance; light weight, suitable for construction in soft coastal areas. Additionally, the membrane has self-cleaning characteristics, hence maintenance-free, and cost effective.

The granary dome is equipped with a vehicle door and an intelligent mobile monitoring system to monitor the warehouse in real time to ensure stable operation of air pressure, temperature, humidity and air volume, saving energy and ensuring safety.



7 | Shen Zhen Grain Group Co. 2016 Grain Storage, Dongguang, Guangdong

L 115 m x W 50 m x H 21.5 m

5,750 m²

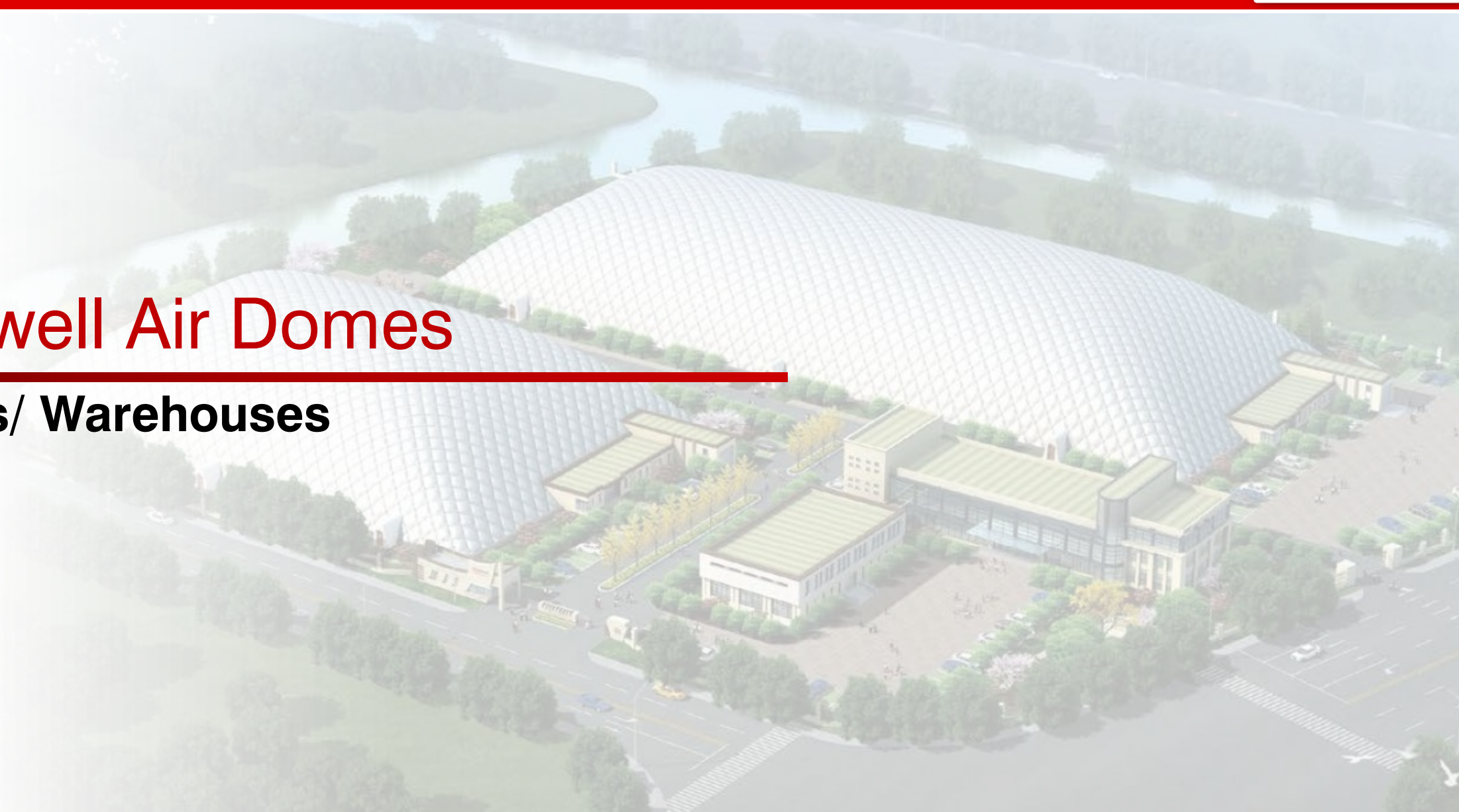
The project is the second granary storage using Air Dome structure in China. The storage capacity is 20,000 ton.

The air dome is a maintenance-free building with excellent self-cleaning properties. Since no steel, iron and other traditional building materials are used, there is no need to worry about rust protection in the future. During operation, maintenance costs will extremely low.



Broadwell Air Domes

Factories/ Warehouses



1. Foxconn's Clean Room Factory 2011 Chengdu

L 61 m x W 42 m x H 17 m

2,562 m²

L 61 m x W 42 m x H 17 m

2,562 m²

The Foxconn facility for Apple Mobile Phone was built with following specific criteria:

- High clean air. Equipped with high quality air filtering and circulation system, Air Dome is an ideal solution to keep space fully dust free.
- Energy conservation. Transparent membrane partially provided which resulted in energy saving by about 40%.
- Movable Plant. Built with containers air domes, made it easy to move the whole plant to another location in least time and least cost.



Broadwell Air Domes – Broadwell Factory

2. Broadwell Manufacturing Unit 2015 Yancheng, Jiangsu Province

Air Dome -1	9,000 m ²
Air Dome - 2	6,400 m ²

Broadwell's own manufacturing unit is made up of two Air Domes. The unique features of these Air Domes are

- Air Dome designed as **Green Building**, using solar panels for power, saves substantial energy for Air Conditioning including cooling and heating.
- Total area of 15,400 m² with two air domes of 9,000 m² and 6,400 m² respectively, which includes office as well as manufacturing facilities.
- Equipped with the most advanced membrane and steel cable production and processing equipment to ensure high quality and efficient production. Annual production capacity is 5 million square meters.



3. Sewage Treatment Pool Air Dome 2015 Yancheng, Jiangsu, China

5,900 m²

The application of air dome technology to sewage treatment plants has many advantages, like superior sealing characteristics, achieves excellent results in avoiding secondary pollution when it is used for sewage pools, sewage floors and landfills. The sewage treatment air dome pool can be quickly installed, relocated and reused. PVC membrane has excellent airtightness characteristics, can effectively block toxic and harmful gases, and has good corrosion resistance & UV resistance. STP Plant steel structures normally subject to severe corrosion and rusting which causes damage to building structure, which all can be eliminated by using Air Dome.



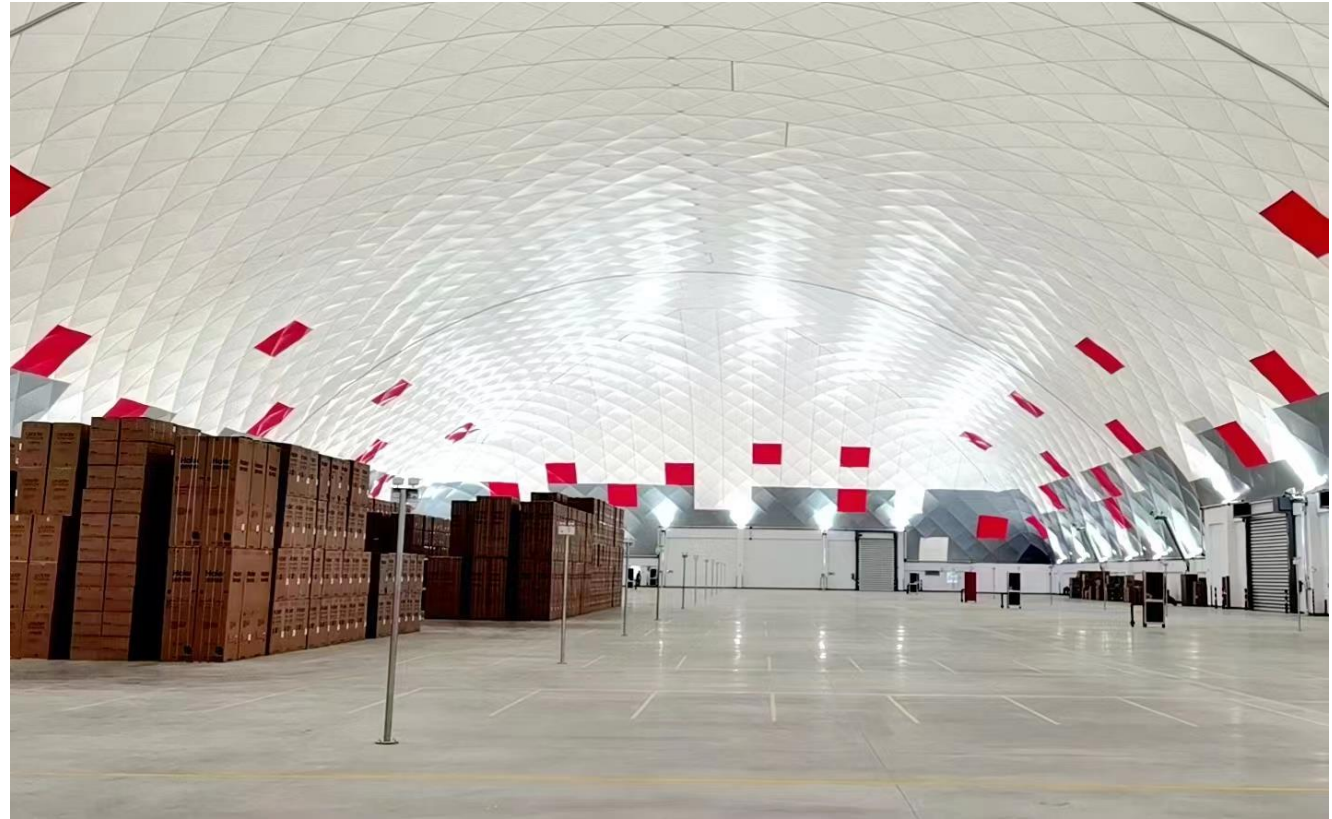
4. Home Appliances Storage 2021 Zi Bo, Shandong Province

L 145m x W 100 m

14,500 m²



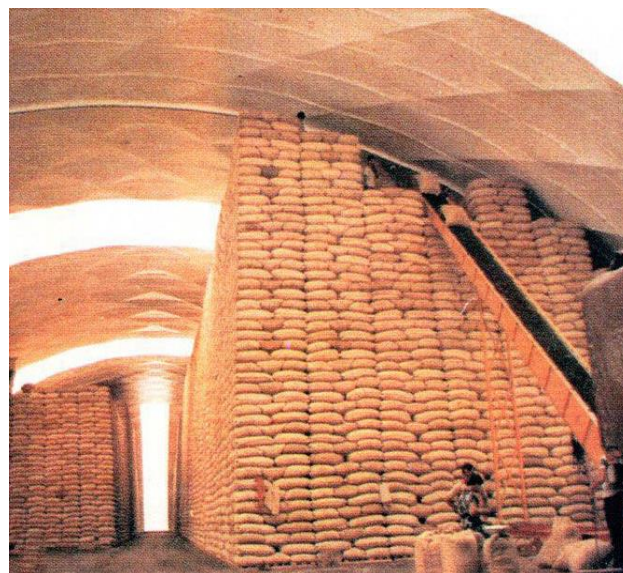
The Air Dome is used as storage of home appliances which is a logistic building. It was built in 5 months.



5. Logistics - Warehouse Various Applications

Air Dome is an ideal solution for other general logistics purpose. It has been used for courier services, storage of bulk material in bags, and several other applications. Air Dome may be tailored according to specific needs of logistic companies.

Air Domes may be provided with insulation material and temperature control system for maintaining suitable temperature inside the Air Dome.



Broadwell Air Domes

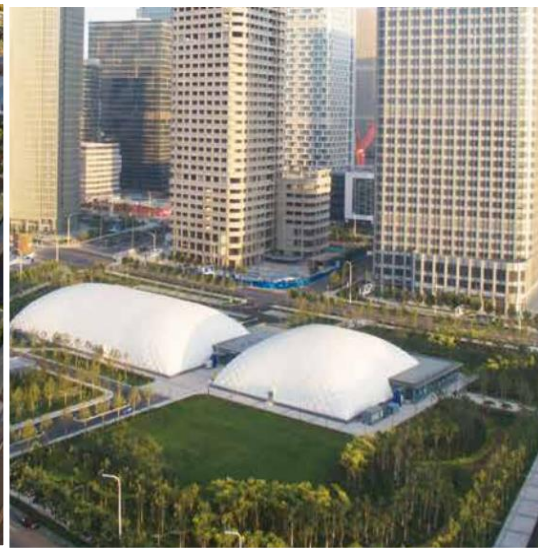
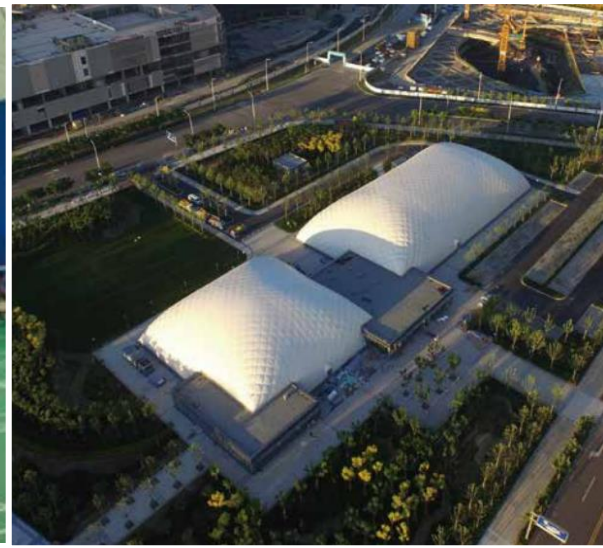
Sports & Recreation Centers



1. Tianjin Xiangluowan Sports Center 2015 Badminton & Tennis Center

L 70 m x W 37.5 m x H 14.1 m	2,625 m ²
L 40 m x W 40 m x H 14.1 m	1,600 m ²

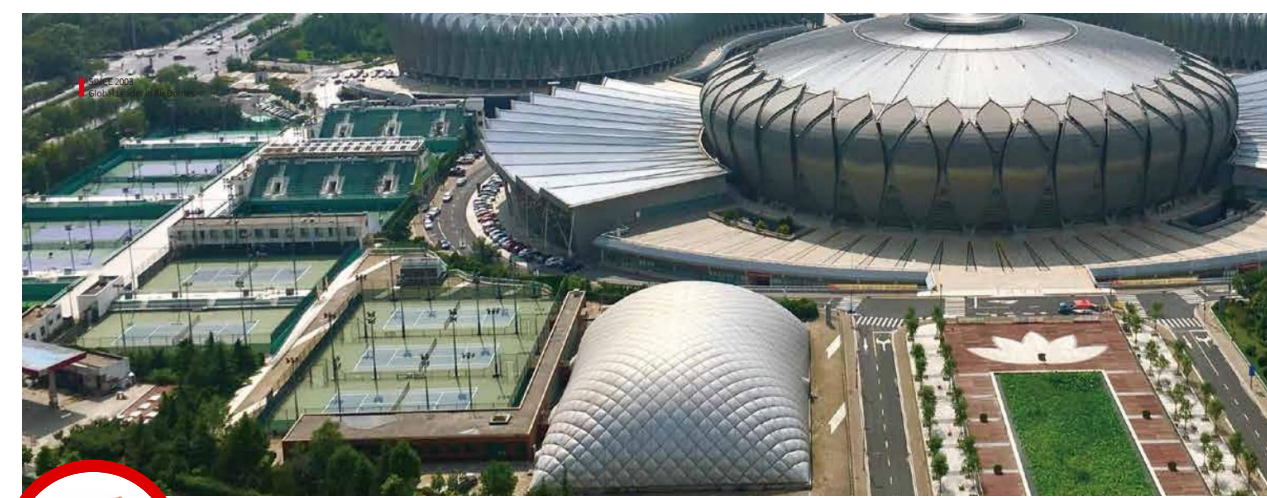
Tianjin Xiangluowan Sports Center is consisted of two Air Domes, both as fully closed indoor sports hall, and equipped with Broadwell patent “Blue Sky” air purification system. Total 16 badminton and 2 tennis courts were built inside the Air Domes, where about 100 players can play simultaneously. The air dome is having controlled temperature and humidity, and it is unmatched comfortable and clean. By providing transparent membrane at top, the energy consumption is extremely low, which consumes only 1/6 of energy consumption of traditional indoor venues. It particularly provided an ideal place for sports even in the haze and chilling winter seasons.



2. Jinan Olympic Sports Center 2011 Badminton & Swimming Center

L 62.1 m x W 41.5 m x H 16 m	2,577.15 m ²
L 54.6 m x W 23.4 m x H 11 m	1,277.64 m ²

The Jinan Olympic Sports Center, where The 11th National Games in 2009, and the 2012 London Olympics Asian qualification games were held, owns reputation of "one of the most beautiful sports stadiums in the World". Badminton and the swimming pool facilities are made inside Air Dome building equipped with Broadwell's unique active fresh air circulation system to provide comfortable sports environment for athletes and spectators. Compared with traditional buildings, the maintenance cost and operating cost of the air dome structure are very low due to its unique design and system by Broadwell.



3. Beijing Shunyi International School 2012 Air Dome with high ambient air quality

L 75.6 m x W 56.5 m x H 18.8 m 4,271.40 m²

Beijing Shunyi International School (ISB) is an international school established in the 1970s. It is a wholly foreign-owned institution that provides education for the children of foreigners working and living in Beijing. Equipped with Broadwell's patented "Blue Sky" purification system, the ISB Air Dome Sport Stadium can filter pm2.5 and meet the healthy indoor environment of AQI (the highest standard of Ambient Air Quality Index), and provide an absolutely clean and healthy environment



4.

Beijing Jingxi International School Stadium 2013

L92.4m×W34.4m×H13.7m

3179 m²

This Air Dome made for gymnasium center in Jingxi international school in Beijing. The Air Dome color is made with grey color to avoid light reflection to classroom because it is close to a school building.



5. Zhengdong Dragon Lake 2018 National Sports Center

**L 100 m x W 40 m x H 13 m, 3 air
domes**

Total 12000 m²

The whole center consists of three air domes, one swimming pool, one basketball and one trampoline. Each one is 4,000 sqm. It is located in the high tech park of Zhengzhou, the center of China. It is a mutual function sports park and allow thousands of people to have sports in the same time.



6.

Swimming Center, Zhaoqing, Guangdong 2016 PaoPao Sport Center

L52×W21m×H9m, 1092m², L75m×W21m×H9m, 1575m², 2 Air Domes

This project consists two air domes, one for Tennis and other for swimming pool. This project is in a very famous tourist area, so it was designed with green color, to match with the environment around and to provide special aesthetic appearance.



7. Henan Dengfeng JUNMEI Sports Stadium, 2018

L90 m×W70.5 m×H23 m, 4970m²

This sports stadium is built with oval shape and it was built for International Kong Fu competition. This is designed with central area for Athletes, Coaches, Journalists and other workers. Audience sitting arrangement is made on surrounding area.



8.

Gustavus Adolphus Swanson Tennis Center,
Minnesota, USA 2019

L55 m x W85 m x H18 m – 4,675 m²

This Air Dome for Tennis is located in Gustavus Adolphus College, St. Peter, Minnesota, which is a very heavy snow area in USA. Complete Air Dome was built in 40 days, including design, manufacturing and installation.



9. | NCWC Tennis Center Dome, North Carolina

L43.28m x W104.24m x H15.8m, 4511 m²



The tennis center of Wesleyan College in North Carolina, US is the best indoor sports facility for the students there in the winter.



10. Pohang City Disaster Evacuation Center, S. Korea 2019

L50m×W30m×H12 m, 1500 m²

This is a government evacuation center in Pohang, Korea. Comparing with many other structures, Pohang government choose Broadwell Air Dome as the solution after the earthquake in 2017. This whole facility is powered entirely by solar energy. And in the normal days, it is used as sports center for the citizens nearby.



11. Sanya Qidi Ice & Snow Sports Center 2017 Ice/Snow Stadium at Hainian

L 70 m x W 45 m x H 16 m	3,079.50 m ²
L 60 m x W 45 m x H 16 m	2,598.30 m ²
L 54 m x W 27 m x H 9 m	1,366.50 m ²

Sanya Qidi Ice and Snow Sports Center consists of three air domes of unique design with curved shape. It is China's first indoor snow dome, which was built in Sanya, Hainan Province, the southernmost city of China. The air domes can withstand the attack of extremely strong typhoon. Under the annual average outdoor temperature of 25.7 °C, the Air Domes can maintain low temperature for ice rink and the snow hall, create a perfect indoor snow environment, with minimum energy consumption. As per the record, the annual power consumption for the total 3 Air Domes is 1.5 million kWh, which is very economical compared with any other structure.



12. Henan Medical School 2016 Multipurpose Sports Center

L 102 m x W 68 m x H 23 m 6,764 m²

The Multipurpose Sports Center of Henan Medical Technician School is equipped with a 200 m runway around the hall, in addition to other sports facility, including several badminton courts. These courts can be easily converted into tennis courts, basketball courts and even football fields.



13. Children's Park of Balikesir 2015 Turkey

L 87 m x W 52 m x H 17 m

4,524 m²

Turkey's Balikesir is a province in the west of Turkey, located near Marmara Sea and the Aegean coast. Balikesir is famous tourist destination. The Children's Park Dome Project built by Broadwell was invested by the local government to support tourism in the region. It provides a full range of facilities for children and adolescents. This Children Part in Air Dome becomes a great attraction in that region and the public's response has been unprecedentedly enthusiastic.



14. Air Dome Water Park 2016 Xinjiang Shenmu

Diameter 110 m x H 14 m 9,500 m²

The Xinjiang Shenmu Water Park is the largest indoor water park dome in the world. It is located in Urumqi, where the seasonal temperature difference can reach nearly 50°C (-18°C to 30°C), and the regional yearly average wind speed can reach by 6.2m/s. There are about 50 snowy days in a year, and snow thickness can be as much as 40 cm during winter. By using Broadwell Air Dome technology, the safety of air dome is guaranteed.



Broadwell Air Domes

Exhibition/ Conference Centers



Broadwell Air Domes – Exhibition Center

1. Zibo City Center, Shandong Province
2019

Dome #1: 6231sqm, Dome #2: 9960sqm, Dome #3: 9960sqm



The city center of Zibo City, Shandong Province, is used as exhibition center and other city activities. These Air Domes are landmark of Zibo City.

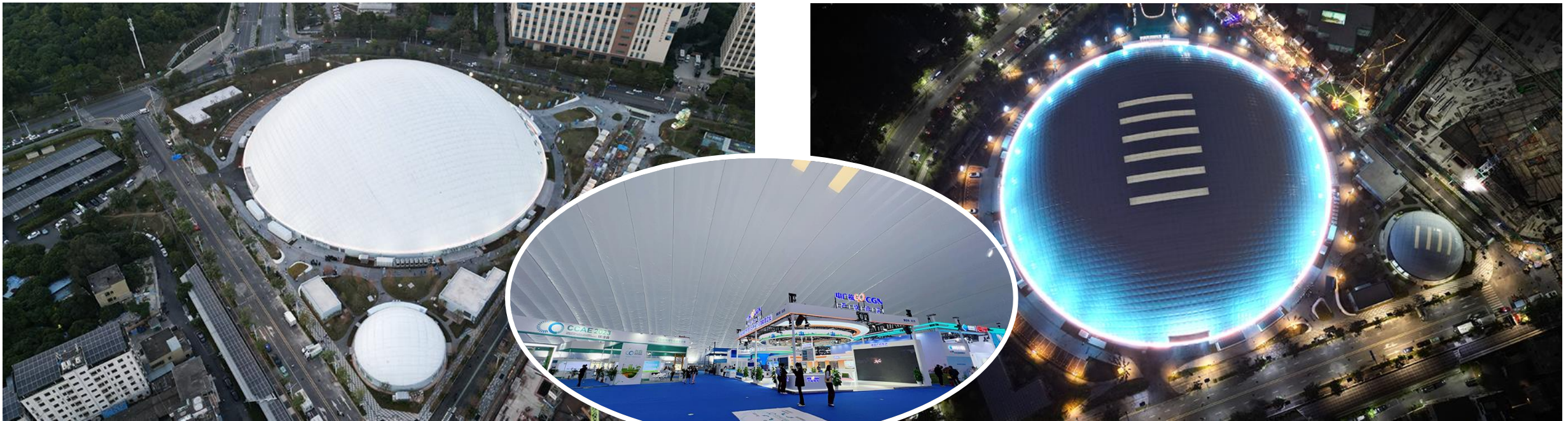


2. Shenzhen International Low Carbon City 2023, Shenzhen, Guangdong

**Dome #1: D143m, H38m, Area
16758sqm**

Dome #2: D30m, H11m, Area 707sqm

SILCC is consist of two air domes, dome No.1 is exhibition center, No.2 is banquet hall. Dome No. 1 with area of 16,758 m², is the single largest air dome exhibition center in the world, for which total 16 revolving doors, 44 exit doors and 2 interlocking doors were built. The dome material is made of 3 layers, with transparent strips on top to allow natural light to penetrate. In nighttime, architecture lighting gives it a extra-ordinary aesthetic appearance.



3. Yinchuan Municipal Planning Exhibition Hall Gansu Province

L70m x W48.8m x H16.5m
3416m²

This Yinchuan City Municipal Planning Exhibition Hall is in the Yinchuan Botanical Park, which now is one of the landmark in this area because of the colorful design.



4. Tongji University Zhihui Yunding Conference Dome 2018 Shanghai

L 80 m x W 60 m x H 20 m 4,800 m²

Located in the Future Square, Jiading Campus, Tongji University, the Multi-function Conference Dome can accommodate nearly 5,000 people at the same time. It was used as the main venue for the 2018 World Entrepreneurship Innovation Expo, where total seven essential forums and summits were hold



5. Jilin Changbai Mountain Ice & Snow Dome 2017 International Event & Training Center

L 45 m x W 45 m x H 17 m 2,025 m²

L 45 m x W 34 m x H 11 m 1,530 m²

Ideally located at 42 degrees north latitude, known as the world golden snow belt, Changbai Mountain has world class powder snow resources. The Changbai International Event & Training Center, made of two air domes, was built as full-fledge training hall for multi-functional indoor training venues, exhibition and event venues.



6. Yangzhou Conference Hall 2019

L70m x W36m x H12.5m **2529 m²**

This dome is the main conference hall of Yangzhou International Tourism Festival, with fiber sound-proof board on the roof, makes it a perfect place to hold the conference.

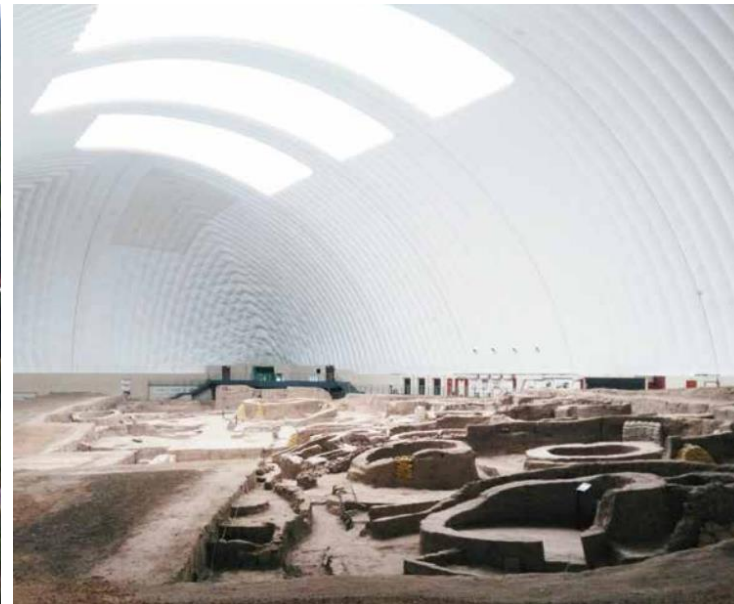


7. Sites of Museum Dome 2016 Chifeng, Archeology Museum

L 137 m x W 70 m x H 25 m

9,590 m²

This archeology site is the one of the most important archaeological discovery in Northeast Asia since 2000 and one of the 2009 Top Ten New Archaeological Discoveries in China due to its about 4000 years history. Air Dome was built to protect the archeology by completely separating the site with external environment due to its perfect sealing characteristics. The temperature and humidity inside the air dome can be adjusted through the smart monitoring system, which meets the indoor environment requirements for cultural relics. Another reason to choose air dome as building structure is because there is a railway tunnel under the site, no pile foundation can be made, due to which traditional structure could not be built.



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