

Carrier Shines at the 2008 Beijing Olympics



70 percent of the ventilation systems used at the 2008 Beijing Olympics facilities were provided by Carrier, the leader of the air conditioning industry.

The world's largest and most comprehensive “Green Building” initiative, designed for Olympic venues and facilities, was realized under the consultation of Carrier-EMSI.

The 2008 Beijing Olympics took place in the minds of people with its spectacular images at the opening and closing ceremonies, competitions where unbelievable records were broken, the glowing, already legendary stars and the rise of China to number 1 at Olympic sports.

The Beijing Olympics were truly astonishing not only with sports competitions and shows, but also with the futuristic architecture of the Olympic facilities, new construction technologies and new materials that will break ground in the construction industry; it was as if like a manifestation of a new era in architecture and construction.

Behind this manifestation was a great design that reflected the harmony of human, nature and technology: “Green Olympics”... >>>

The Green Building concept, which was developed for the purpose of environmental protection and energy saving due to rising environmental problems, was implemented for the first time in Beijing Olympics in such a large project and full scale.

This application was followed closely all over the world. Alarko Carrier Assistant General Manager for Marketing Hırant Kalataş, who holds the first and only LEED-AP (Leadership in Energy and Environmental Design) certification in Turkey, has evaluated the results as follows: "Together with the closing ceremony of the Olympics, the world was experiencing the indisputable superiority of the Green Olympics. Despite the severe problems created by the clash and conflict of humanity, nature and technology in today's world, the Green Olympic environment reveals the full splendor and comfort of harmony and balance between man, nature and technology. It has also proven its economical superiority. This is an advancement that means hope for the future."

Carrier Signature at the Olympics

Carrier was instrumental in the preparation and implementation of the Green Olympics concept with Carrier-EMSI (Carrier's Environmental Market Solutions), while at the same time playing a vital role in the implementation of this great project with its top quality, energy efficient and environmentally friendly air conditioning devices.

70 percent of the ventilation systems used in the Olympic facilities were provided by Carrier. Carrier's chillers, air conditioning stations, fan coils and complementary products were also used in the facilities.

Harmony in Action

While the Olympic facilities and public spaces were architecturally designed in accordance with the traditional architecture of China and its thousands of years old philosophy, the perfect shape of the circle and square that reflects harmony between man and nature, heaven and earth.

Designed for sporting events, the Water Cube National Aquatics Center and Birdhouse National Stadium provided beauty, stability and accuracy in terms of scope and construction technologies, and demonstrated the physical manifesto of excellence.



The role and success of Carrier in these designs was due to the fact that the it was aware of the cultural values Chinese tradition advocated and it embraced them.

Each Carrier product reflects a mixture of technical expertise, environmentally friendly refrigerants, sustainable production stages and promises, in line with the New Building concept for excellent service.

EMSI ... High Performance Green Buildings

Carrier's Environmental Marketing Solutions (EMSI) company is one of Asia's leading green building consultancy companies with construction projects over 3 million m2 area. The green buildings of EMSI bring together functionality, rules, economy, and most importantly environmental friendliness.



EMSI works with architects, engineers and project owners for the design of high-performance green buildings. Thanks to fulfilled promises and leader efforts in the Chinese green building market, EMSI has gained the trust of over five hundred international customers. EMSI helps companies to implement a low-cost green building concept and receive LEED certification and to achieve these strategic goals with its experience and performance.

In this issue, we provide a brief overview of the design features of the newly developed and prepared sports complexes for the Beijing Olympics and thereby used Carrier systems and devices.



National Water Sports Center: “The Water Cube”

The Water Cube has drawn attraction with its extraordinary architecture and “green building” concept as well as its swimming races and world and olympic records that took place during those races. Appearance of blue air bubbles outside the National Aquatics Center, also known as the Water Cube located at the west of the Olympic Green, reflected the perfect visual of water under different lights.

The Water Cube, unlike the sharp lines of its neighbor Bird's Nest National Stadium, was built in a softer and rounded appearance. The Water Cube is the only water sports center that is fully covered and open to the public.

The water cube creates a comfortable, peaceful and poetic environment in the interior with the design of the building covered with a transparent membrane. This building is quite literally the theme of water. Elegance of water with the blue air bubbles made of ETFE (Ethylene Tetrafluoroethylene) membrane



The bubbling, glowing and flashing “air bubbles” on the outer walls of the Water Cube offer truly unforgettable images. The Bird's Nest and the Water Cube, one of them rounded and the other in the angular form, complete each other in the Olympic Green Area and create an extraordinary environment.

The Water Cube was built in accordance with water conservation design concepts in green architectural concerns. The membrane structure of the Water Cube was covered with ETFE airbags. This implementation is not only China's but the world's largest and also the most economical water protected ETFE project.

The membrane structure of the water cube consists of 3000 pneumatic cushions and has a surface area of 110,000 square meters. Each air bubble can resist the weight of a car; has good crushing and softening resistance. At the same time, it has a high resistance to fire and intense heat.

There are different density airbags between the membrane layers to solve the heating problems caused by direct sunlight. Thus, the heat rising from direct sunlight is partially reduced and the indoor temperature can be kept under control. The gaps between the airbags and the walls form an insulating layer. (Continued at Page 4)



水立方
WATER CUBE

Carrier Devices and Systems in Use

Centrifugal water chiller groups

Air conditioning stations

Fan coil units

Carrier Comfort Network (CCN) Control System

Carrier Building Systems and Services Head of Asia Ross Shuster has stated that there are 4 Carrier centrifugal water chiller groups, many air conditioning stations and fan coil units in the interior of the Water Cube which is one of the most important locations for the Olympics. He has added, “While the technology used prevents the spread of heat in the environment, it also minimizes the energy spent for heating. Our top-class air conditioning stations reflect very intensive anticorrosive processes and elegance.

In this way, we guarantee their durability in humid and high chlorinated interiors.”

Carrier has created a Remote Monitoring Center to control the ventilation system in all areas where the Olympics are organized. This advanced technology center can monitor the operations of ventilation systems, read data and create warnings.

Design Specifics: The system reuses the heat of condensation to heat the swimming pool and domestic hot water. System control checks all the key devices to improve energy efficiency and coordinate them.

Benefits: Carrier devices use refrigerants that do not harm the ozone layer thus the devices do not harm the environment. The energy recovering air conditioning stations use return air to pre-treat the fresh air, thus significantly reduces the energy consumption of the system.

Chief engineer Zheng Fang has stated, "Interior requirements of the Water Cube was created by considering athletes and spectators. The most advanced ventilation systems were used in both the main competition hall and the water entertainment hall."

The air from the eight fans placed on the roof is sent to the body of the Water Cube. During summer, using the high capacity ventilation system, the hot air inside is drawn out of the roof and during winter, the ventilation is closed and the indoor temperature remains constant.

The illumination effect of blue colored "hubble-bubble" material is similar to that of traditional materials but lighter. Thus, less material was used for the steel structure carrying the membrane coating. ETFE membranes save energy. The friction coefficient of the material is very small and it is naturally self-cleaning as it is difficult to stick on the dust. Even if dust accumulates,



that the resistance of the membrane structure of the Water Cube met the expectations even in the worst weather conditions. Solutions were developed at the design stage to address the possible problems related to high humidity of swimming pools. A solid temperature and humidity control system was created with recirculating hot water that feeds the air conditioning system in the living areas and swimming pool.

In addition, a comfortable temperature and a constant humidity of 50-60% were created using other cooling methods such as indoor and outdoor air recirculation systems, solar energy, dual channel ventilation systems.

Another potential problem affecting the swimmers in the pool is the dripping of the condensation on the roof.

In order to solve this problem, the designers calculated the thermal requirement of the building shell and kept the heat transfer coefficient for the building shell very low from the glass walls. In the meantime, they used the building's air supply, return air inlets and outlets to increase the ventilation frequency in the upper areas of the building. In addition, a heating air supply system was installed on the top of the roof connected to the lower end of the roof when the ventilation system was installed in the facade of the building shell.

ETFE was used in around 600 to 800 architectural structures in the last 20 years. ETFE membranes have been protecting light transmittance and resistance for over 20 years. The life of the Water Cube is estimated as 100 years.

Trenches were dug around the structure to prevent people from harming them by touching the Water Cube. In the interior, the membrane was placed above the people's reach.

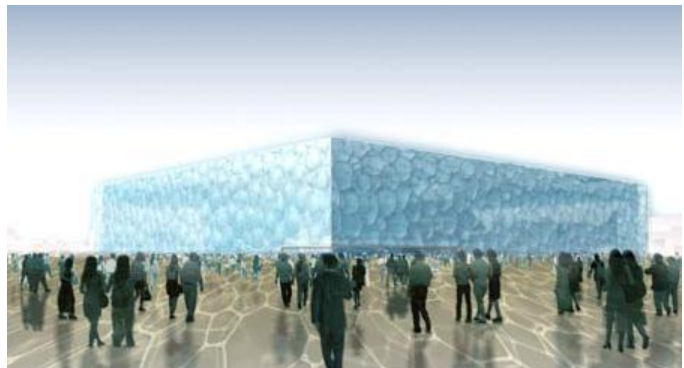
According to the studies of the ornithologists, birds do not land on semi-transparent surfaces. The only place where birds could land Water Cube was the rainwater collection system. The designers placed metal wires on collection system to prevent birds from landing on bubbles.



the membrane surface is cleaned as long as it rains. The Water Cube also "breathes". While the material of the German EFTE is 400-500 Euro per square meter, the traditional materials are 500-600 Euro per square meter.



The water cube is designed in accordance with water and environmental protection rules, and its outer surface and roof can accumulate 10,000 tons of rain water, 70,000 tons of clean water and 60,000 tons of swimming pool water annually. It also saves up the 140,000 tons of used water. The water cube offers a warm air environment, similar to spring, with a comfortable humidity level. Thus, even in the moist August of Beijing, dew formation could be prevented. Tests showed



National Stadium “Bird’s Nest”

Known as the Bird's Nest, the National Stadium located in the Olympic Green was the center of the 2008 Olympic Games. The unforgettable opening and closing ceremonies and football matches of the Olympic Games were held at this stadium.

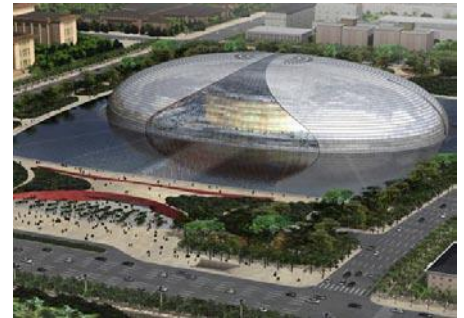
National Stadium's construction began in December 2003 and it has a height of 68 meters and a seating capacity of 91,000. It covers an area of 258,000 m² with 333 meters from north to south and 298 meters from west to east.

The steel structure of the National Stadium, designed as a bird's nest, was covered with a membrane. The light-permeable membrane is double-layered, but also has impressive decorative properties such as sound, wind, rain and sun-proofing.

Membrane coating, which provides a transparent transition between the inside and the outside of the stadium, softens the hardness of the steel construction and makes the bird's nest form more visible, while at the same time it becomes a ball of light with the interior lighting during night games. A large pool at the front of the stadium provides a unity with the Water Cube near the musicality provided by the water and fountains.

The outer layer of the membrane was completed in November 2007 using 884 ETFE panels and it covered a total of 38,500 m² area.

Membrane made of ETFE material and 1044 panels cover an area of 53,000 m² and purpose is to make the stadium acoustic and to support steel carcasses and devices and equipment. The membrane also helps the lighting inside the stadium and saves energy; it creates a desired environment for competitions by reducing glare and ghosting.



Carrier Devices in Use

Air conditioning stations

Design Specifics: The first Chinese production HVAC device with EN 1886 certification and high international standards. Air leakage rate is less than 1%.

Each unit is equipped with Carrier's high-voltage electrostatic (ionization chamber) air cleaner.

Benefits: Refrigerants that do not damage the ozone layer protect the environment.

Highly efficient AHU reduces energy use.

Complete destruction of airborne impurities improves indoor air quality.



National Indoor Sports Hall

Located in the south of the Olympic Green Area, the National Indoor Sports Hall is located just behind the Bird Cage and Water Cube, and with its unusual architecture, it complements the two ultra-modern buildings of the 2008 Olympics.

Construction area of the hall is 81 thousand m² and it has a seating capacity of 18 thousand.

Outdoor area of the hall is 44 thousand m².

Artistic gymnastics, trampoline and handball competitions of the Olympics were held in the hall. The hall was organized in September at the Paralympic Games for wheelchair basketball matches.

Traditional folding fan of China inspired the creative design of the hall. The steel roof of the hall is 144 meters long and 114 meters wide. 14 steel beams and 2,800 tons of steel were used on the roof.

25 cm thick 9 layered concrete slabs, glass wool, waterproof planes and sound insulation materials were used for sound insulation in the hall.

Total of 1.124 solar panels with 90 W peak power output and 120x150 cm in size were used for the lighting needs of the hall.

The photovoltaic system was concealed by a 19,000 m² wall made of low emission (Low-E) glass.

Thus, UV rays are filtered, heat transfer is reduced and energy efficiency is increased. Solar energy generated 100 kW of energy per day.

Renewable energy sources such as heat pump heating, fresh air and natural lighting were fully utilized in the hall.



Carrier Devices in Use

Fan coil units



Carrier Devices in Use

Screwed cooling groups: Air conditioning stations

Beijing Workers Stadium

The Beijing Workers Stadium, which was constructed in 1959 and was known as National Stadium, was one of the most spectacular and most famous buildings in the Chinese capital. It has hosted many international sports events over the last half century. The stadium was a live witness to the developments in sports and sports industry in China.

The stadium had an area of 350,000 m². It had a length of 282 meters from north to south and 208 meters from east to west. In April 2006, re-organization of the stadium for the football matches in the Olympics was started. At the end of the renovations, the capacity was increased to 62 thousand spectators and the stadium was equipped with the state of the art technology. The lighting of the stadium was bad. The traditional four-light system was replaced with the dazzling six-light system and shadowing was prevented.

The concrete structure of the stadium was far from meeting the Olympic standards. Primarily, the columns had to be supported. The project for supporting the 50-year-old building contained many challenges. For this reason, carbon fiber reinforcement technology was used to make the stadium resistant to seismic vibrations.

A giant screen with 120 m² and 180 degree rotation was placed on the stadium. This has ensured for the fans in the stadium to view the screen at all times.

Thus, this old building became a symbol of the idea of "High-Tech Olympics" at the end of the renovations.

The stadium project is designed to be energy-efficient at the highest level. Air conditioning, water and drainage, automatic irrigation and fire systems were renewed with the most advanced technologies in accordance with the Green Olympic idea.



Carrier Devices and Systems in Use

- Centrifugal cooling groups*
- Air conditioning stations*
- Fan coil units*
- Carrier Comfort Network (CCN) control system*

Beijing Shooting Range

The Beijing Polygon, the construction of which started in July 2004 for the Beijing Olympics and where the shooting contests were held, has an area of 45,645 m² and includes competition halls, warehouses, administrative units, heating, cooling and air conditioning units and electrical transformer rooms.

There are 10 m, 25 m and 50 m shooting ranges in the competition hall. In this hall with a capacity of 8,600 spectators, there are 2,170 permanent and 6,430 temporary seating places.

The Beijing Shooting Polygon Hall was designed to reflect a hunter's bow. In this design, hunting, which was the beginning of the shooting sports, was taken into consideration.

After the games, this range will host international and national shooting contests and will be used as a training place for the Chinese national team.



Shenyang Olympic Stadium

The Shenyang Olympic Sports Center Stadium is one of the five stadiums where football games will be held in the 2008 Olympic Games. The construction of the stadium began in March of 2006 and was brought to the Olympics with a very intensive work. In this complex, which has a futuristic architectural design, structural problems have been successfully solved by using new technologies.

The stadium is located right in the center of the sports complex and includes a gymnasium for 10,000 people, a natatorium for 4,000 people (indoor swimming pool) and a tennis court for 4,000 people with a total area of 260,000 m².



Carrier Devices and Systems in Use

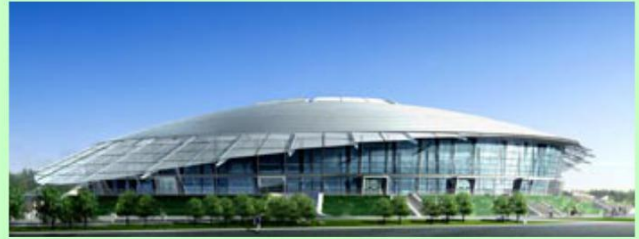
- Centrifugal cooling groups; Screwed cooling groups;*
- Air conditioning stations; Fan coil units*

Beijing Technical University Gymnasium

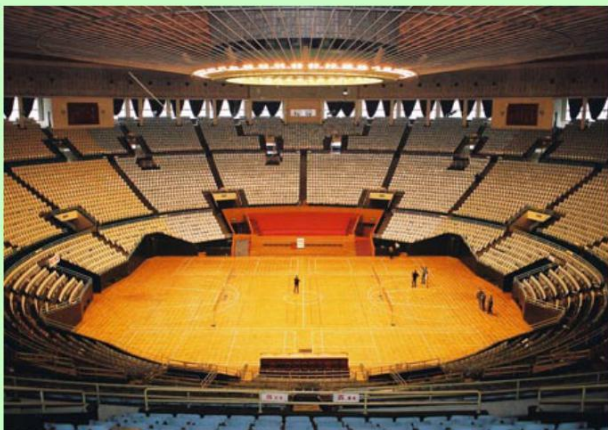
Beijing Technical University Gymnasium is the only complex built for the 2008 Olympics in the north-east of Beijing. The construction of the facility where badminton and rhythmic gymnastics competitions will be held started in 2006. In 2007, the international badminton and international rhythmic gymnastics tournaments organized under the Good Luck Beijing project before the Olympics were held at this facility. After these tournaments, the facility was prepared for 2008 Olympics.

With a seating capacity of 7,500, the gymnasium covers a total of 24,400 m² construction area. There is a warm up and competition hall located inside the gymnasium. Before the records were achieved during the gymnastics competitions, the gymnasium broke its own world record with its prestressed suspension dome with a diameter of 93 meters. In the construction of the dome, a total of 1,200 tons of steel was used in a 1 m² area.

Strict rules apply in terms of wind speed in badminton and rhythmic gymnastics competitions. Especially in badminton competitions, according to International Badminton Federation (IBF) standards, ambient temperature should be 26°C constant and wind speed should be less than 0.2 m/s. With the Carrier devices used in the gymnasium, the wind speed was maintained in accordance with the standard while the ambient temperature was fixed at 25°C.



Carrier Devices in Use
Screwed cooling groups
Air conditioning stations



Carrier Devices in Use
Screwed cooling groups

Beijing Workers Arena

For the 2008 Olympics boxing matches, the former Workers Closed Arena was reconstructed.

The area of building was expanded to 41,800 m² with the construction works that started in May 2006. The complex has a match ring and hall, two heating halls, administrative offices and a 1,600 m² machine and energy room. The hall has 12,000 permanent, 1,000 temporary audience seats.

In gymnasium many implementations have been developed for disabled people. In this context, wheelchair ramps were placed in all four entrances of the arena. Restrooms for disabled viewers, VIPs and athletes were prepared. It was also possible to watch the match comfortably on a specially designed platform near the boxing ring for the disabled spectators. 240 press seats, 30 VIP seats and a VIP lodge were added to the hall.

During the renovation of the Arena, ventilation, light, electrical equipment, sound and acoustic insulation, and audience seats were completely rebuilt with the latest technologies and hardware.

Officials state that the Arena may withstand an earthquake in the magnitude of eight after the renovation.

Arena has gained a new appearance with the newly opened windows. The new windows were made from environmentally friendly aluminum material and significant energy saving was achieved.

Workers Arena which was built in the year 1961 for the 26th World Table Tennis Championship and in addition to table tennis, where basketball and volleyball matches were organized, carried a symbolic value for the Beijing people. This Arena was returned to life for the 2008 Olympics as box and judo field.



Beijing "Olympic Green Area" Tennis Court

The Beijing Olympic Green Area Tennis Court, with a seating capacity of 17,400, used advanced technologies such as shading and insulation technologies, solar energy and geothermal heat pumps for energy efficiency.

The waste water used on the tennis court is processed on the basis of zero discharge by biological treatment methods. 100% of the waste water, 1,200 m³ storage, 120 m³ equilibrium tank, 180 m³ natural water tank and biological membrane reactors are used in irrigation.

The tennis court number 2 is equipped with a geothermal heat pump indoor unit, which uses underground sourced energy for heating or cooling the court.

The system consists of a flow center for the connection of the heat pump, underground loop, indoor and outdoor units.

In the system, a loop is placed vertically or horizontally with pumps close to the surface which is relatively fixed temperature under the ground. A loop placed between 37 vertical walls is located inside the court.

Carrier Devices in Use

Screwed cooling groups
Air conditioning stations
Fan coil units



Olympic Sports Central Gymnasium

The project for Olympic Sports Central Gymnasium which was renovated for the 2008 Olympics was designed in three main concepts. These are: "green olympics", "high technology olympics", "people's olympics".

The renovation project for the Gymnasium mainly encompassed the expansion with additional reinforcements. Thus the requirements of the Olympic Games would be met.

First of all, the thermal insulation of the doors and the windows on the front and top of the building with the old technology was redesigned to save energy.

Entrance location of the gymnasium was changed and reconstructed with a completely new and modern concept.

Just as in the as Beijing Workers Arena, wheelchair ramps, special resting rooms and monitoring platforms were created for handicapped viewers in the gymnasium. In addition, an ideal environment and high quality facilities were provided for disabled athletes with a special training area.

Olympic Sports Center Gymnasium covers a total of 47,400 m² area with a 28 thousand m² gymnasium, 15,000 m² training hall and 4,400 m² additional areas. After the renovation, the capacity of the gymnasium was raised to 6,300.

Handball selections and quarter finals were held at the 2008 Olympics.

Gymnasium 2008 Paralympic (Disabled) Games hosted wheelchair basketball, fencing and rugby matches.

Gymnasium will then serve as the training ground for Chinese teams and for the various events of the Beijing people.



Carrier Devices in Use

Air conditioning stations
Fan coil units

Laoshan Velodrome

The closed Laoshan Velodrome, which has a permanent seating capacity of 6,000 and temporary seating capacity of 3,000, is built on a 33,000 m² area for bicycle races at the Beijing 2008 Olympics with the height of 34 meters with 3 floors. The Velodrome showcases a new design compared to similar buildings.

The top of the velodrome was closed with a dome in the form of an inverted plate and 200 lights were placed in the dome. The 250-meter-long racetrack is covered with a special wood. There are blue seats around the runway.

Velodrom was built on a steel cage structure with a diameter of 150 meters. 1,400 tons of steel was used in the construction. Engineers and workers skillfully performed the structure as if knitting on the soil. Two platforms with a length of 500 meters were built in the Velodrome.

Velodrom has a super daylight system with a 56 meter diameter rising upwards 33 meters. Daylight enters into a large number of buildings from the daylight system consisting of double-layered polycarbonate panels. Polycarbonate panels also break the light. This feature works very well in Beijing's bright August light. The speed of the bikes during the race reaches up to 85 km/h. During these races, daylight may cause serious accidents. In addition, daylight helps to ventilate the structure. With the fire warning, the windows of daylight open automatically and the smoke is thrown out.



Carrier Devices in Use

*Air conditioning stations
Fan coil units*



Carrier Devices in Use

Fan coil units

Olympic Village

The Olympic village is located in the northern corner of the Olympic Green Area and integrates it to the south of the Olympic complexes. The Olympic village was designed to accommodate 16,800 athletes, coaches and national team officials.

The village is separated into two neighborhoods: The first neighborhood has administrative, social and sportive areas. In this neighborhood there are not only residences but also clinics, restaurants, multifunction libraries, entertainment halls, hobbies and fitness, swimming, tennis, basketball, training areas with walking roads.

This neighborhood covers an area of 370 thousand m² and has 22 buildings with 10 floors and 20 buildings with 10 floors.

The second neighborhood consists of residences where national team athletes and managers are hosted. The residences were designed to accommodate 22 m² living space per person.

In order to let athletes sleep comfortably, the length of the beds were designed 2.2 m. For athletes with a height above this size, for example, the famous Chinese basketball player Yao Ming has a height of 2.26 m, the bed can be extended with an addition.

Each athlete's room has a wide-band line, telephone network and remote circuit TV programs, anti-theft infrared warning equipment and a finger-locked lock-out door. During the Olympics, athletes can shop online with an ID card issued to them and have free communication to their families. In the village there are also places of worship for different religions.

The international neighborhood, which occupies an area of 20,000 m², showed the flags of over 200 countries which are members of the International Committee.



Carrier Devices in Use

Centrifugal cooling groups: Screwed cooling groups

Beijing University Gymnastics Hall

Beijing University Gymnasium hosted table tennis matches at the 2008 Olympics.

Table tennis matches will be held for the first time in the gymnasium, which was opened a while early from the Olympics. Table tennis was set as a olympic sport at the 1988 Olympic Games in Seoul. Table tennis, which is an important sport that can be called as national sport in China, took place in five Olympics from that day until the 2008 Olympics.

Before the Olympics, the gymnasium was reorganized to be fit for table tennis matches. In the meantime, the ventilation system was adapted to the Olympic conditions.

The gymnasium which is located in the Beijing University campus, has an area of 26,900 m². There was an indoor swimming pool in the gymnasium with a length of 123 meters and a width of 88 meters.

For tennis matches, eight table tennis tables placed above the swimming pool which was covered with a floor of 47 meters length and 40 meters width. A total of 7,577 spectator seats were arranged in two layers around the site.

This renovation project was carried out with a steel structure placed on a seven-part support system with a pre-stressed tensile cable, horizontal, vertical and other support elements.

The roof of the Gymnasium, called the Chinese Roof, was designed like a tennis ball between two hyper-bolt surfaces.

Table tennis qualifiers and finals were held at the 2008 Olympics. Table tennis matches were also held in Gymnasium in September during Paralympics (Disabled) Games.

Gymnasium will later be used as a multipurpose facility for table tennis, handball, basketball, badminton, volleyball, indoor football, gymnastics competitions, special sports training, physical education, congress meetings, art and sports performances.

Beijing International Convention Center (BICC)

The Beijing International Convention Center was built along with the majestic Asian Games village.

The front side of the main building faces the National Olympic Sports Center. The center has an area of 77,000 square meters, and includes the conference hall and western annex structure, Chenxin House and Chenyun House. The center is the largest building in China in its field with 50 conference and meeting halls, 300 exhibition stand areas in international standards, dozens of offices.

The center also has a business center, audio-visual studio, post office, consultation, large recording room, VIP lounge and bar on every floor.

The halls are equipped with advanced simultaneous translation systems, first-class sound arrangements, a live TV news system, internal and external communication equipment, and video conferencing system.

This splendid congress center was used during the Olympics for various conferences, publicity meetings etc.



Carrier Devices in Use

Centrifugal cooling groups

China Agricultural University Gymnasium

Olympic wrestling competitions were held at the China Agricultural University which is located in the east of the campus. The area covered by the complex is approximately 24,000 m² and has a spectator capacity of 8,500 people.

While the complex is mainly used for wrestling competitions, it was designed as a multi-purpose facility.

Gymnasium was first used during the Youth World Wrestling Championships in 21-26 August 2007 and later in the Olympics. During Beijing Games between 6-18 September 2008, volleyball matches will be held in this hall. Later, it will be used by university students, employees, teachers and people living around.



Carrier Devices in Use

*Absorption cooling groups
Air conditioning stations
Fan coil units*



Carrier Devices in Use

*Screwed cooling groups; Air conditioning stations;
Fan coil units*

Quinhuangdao Olympic Sports Center Stadium

Quinhuangdao is a coastal city known for its beautiful port in the Hebei region, north of China. It has a 2.7 million population, a beautiful climate with its thermal springs and warm summers between the mountains and the sea.

Football matches were held at the 2008 Beijing Olympics in the Quinhuangdao Olympic Sports Center Stadium.

The construction of this stadium started in May 2002 and was completed in July 2004.

The stadium covering 168,000 m² has a capacity of 33,572 spectators and 67 of them are reserved for disabled spectators.

Beijing Basketball Gymnasium

Built for the 2008 Olympics in Beijing on a 168,000 m² area, the basketball gymnasium has seven floors, three of which are located underground and four of them located above the ground. It has a capacity of 18,000.

The viewing system in the hall was designed not only as a real-time broadcast and score screen during the matches, but also as a giant LED display where performances were replayed, artistic performances were presented and various presentations were made.

Furthermore, all rows of viewers are designed to provide very comfortable viewing. The second floor has 45 luxury viewing rooms, 29 of which are large and 16 of which are small.

The Olympic Basketball Gymnasium is very aesthetically pleasing with its appearance and the architecture of steel and glass. At the same time, the transparent building shell makes the building very soft and especially turns it into a light cube at night. The Olympic Basketball Gymnasium was similarly designed to Beijing Olympic Basketball Hall with the re-use of rainwater, easy-to-clean windows and other technologies and in accordance with the concepts such as "Green Olympics", "High-Tech Olympics", "People's Olympics".



Carrier Devices and Systems in Use

Centrifugal cooling groups; Screwed cooling groups;
Air conditioning stations; Fan coil units;
Carrier Comfort Network (CCN) control system