ARCHITECTURAL MARVELS IN BOLTED SOLID BALL JOINT TECHNOLOGY

Innovative ● Aesthetic ● Durable ● Ecnomical 3D Structural solutions

TRIOCON

SPACE FRAME TECHNOLOGIES PVT.LTD.

IND ● K.S.A ● BAHRAIN ● U.A.E.

ALTECH SAUDI

A subsidary of Altech Saudi Trading & Contracting Co.Ltd.
Kingdom of Saudi Arabia

CREATIVE VERSATILE GEOMETRIC FORMS
IN LONG SPAN LIGHT WEIGHT STRUCTURES

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INTRODUCTION

Triocon Space Frame Technologies Pvt. Ltd,(TSF) is an integrated customized design and manufacturing company specializing in design development, production, and installation of aesthetic, 3D Space Frame Structures using our "Advanced Bolted Solid Ball Joint & Hollow Tube Technology" in Steel, Stainless Steel and in Aluminum. We also design, manufacture and service other building forms, miscellaneous steel works and building materials to the construction industry.

Space Frames can span large spatial area without intermediate columns by interlocking struts in a geometric pattern which are extremely advantageous in projects like Coal, Cement & Sugar Storage Domes, Sports Stadiums, Airports, Shopping Malls etc.

It can also form architectural marvels in long Skywalks, Pedestrian Bridges, Domes and can add aesthetic, rigidity and long life to smaller span structures like Metro Railway Stations, Swimming Pool covers, Toll Gates, Border Security Gates, Petrol / Gas Stations.

OUR MISSION

Our mission is to build on our history of product excellence and technology innovation to provide the highest-quality light weight, most reliable and safe space structure products and services to the changing needs of the society and individuals.

With our hands on experience over two decades in execution of various long span and complex geometry space frame & other steel structure projects globally and thus acquired expertise, we assure strength, beauty, colour and pace to the metal building construction and also stamps our commitment to a greener world.

To sustain our vision and mission by constantly seeking continuous improvement by education, learning to serve the customers with the highest level of technical knowledge of the industry.

To create a cordial, pleasant, nurturing and growth oriented environment which encourages our employees to be highly productive and to develop themselves personally and professionally.

To adopt best business practices to conduct our business in ethical, transparent and profitable manner.

To develop diversified markets to provide us adequate financial returns which enable us to achieve our goals and value to society.

VISION

Create and sustain a Greener world by providing Quality as well as Aesthetic 3D Structural and Architectural solution to the world of constructions

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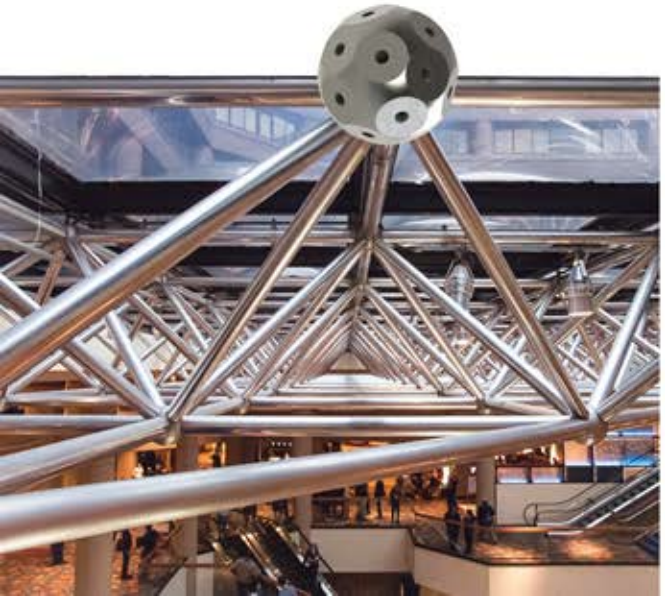
salient features of TSF



- Pillar less long and clear spans and cantilevers up to 180 meters.
- Minimum structure weight and Minimum deflections.
- Space frames are pinned jointed hence all loadings are on solid sphere nodal joints.
- Members transmit only Axial Forces (Compressive and Tensile forces only) in the truss envelope.
- All service lines can run through the frames.
- Accommodate concentrated loads.
- Suit irregular support positions.
- Variable depth and module sizes can be selected.
- Variable depth for roof drainage is built-in.
- Pre-Assembly allows Project acceleration and accuracy.
- All space frame parts are manufactured in factory, no site fabrication or painting required at project site.
- Accommodate any kind of metal roof /cladding materials, glass, poly carbonate, PVC fabric etc.
- Hot dip galvanized & powder coated structure having corrosion protection and colour retention for a period of 20 years for first maintenance.
- Double or triple layer powder coating techniques to withstand extreme corrosive environment like near sea, chemical industry etc.
- Coating can be selected according to the corrosion classification of the location
- Simple Modification or dis-assembly of entire structure for re-use.
- Full or partial assembly of structure at work site and lift on to position using suitably sized crane.
- Where there is no access to crane the structure can be installed using full or on mobile scaffold.
- Triocon's "Advanced Space Structure Technology" is unique and are formed by structurally sealed hollow sections concentrically connected to solid spherical metal balls
- No punched or drilled holes in any of the structural components like pipe, bolt and sleeve.
- This special feature not allowing any replenishment of oxygen and moisture hence there is no question of internal corrosion of primary structural elements so these structures extremely corrosion resistant .
- As supported nodes are also pin jointed the supporting media is subjected to Horizontal and Vertical forces only without any moment at support making the supporting media more economical
- Reduces dust formation on the structure due to rounded tubular members (pipes) when structure is adopted for coal and lime storage sheds in thermal and cement plants.
- Unlike other conventional steel structure, static redundancy of the 3D design of the structure prevents the collapse of the entire structure even when some members are detached.

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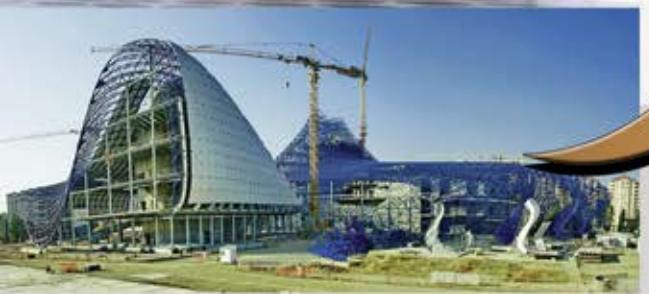
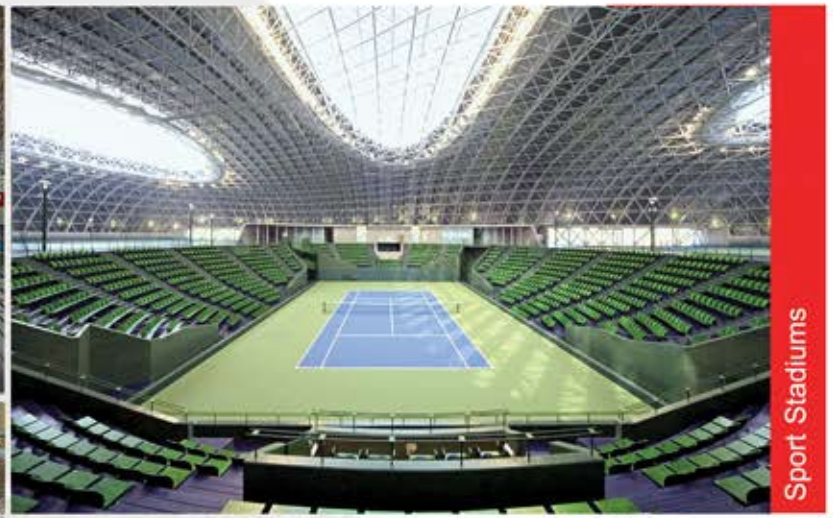
APPLICATIONS OF SPACE FRAMES

- Power plant bulk coal storage domes/ barrel vault
- Cement plant bulk limestone, gypsum storage domes
- Auditoriums
- Convention centers
- LPG gas boiling plant
- Sports stadium
- Airport Facilities
- Warehouses
- Factories / industrial sheds
- Architectural Monuments
- Exhibition Halls / Showrooms
- Recreational and Sports areas
- Pedestrian Overpasses
- Shopping Malls
- Atriums and Courtyards Areas
- Car Park Sheds
- Gas / Petrol Stations
- Metro Railway Stations
- Highway Toll Gates
- Solar Panel
- Bus Stations
- Commercial building composite beams





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"SAY NO TO POLLUTION ,SAVE NATURAL RESOURCES"

INDUSTRIAL ENCLOSURES

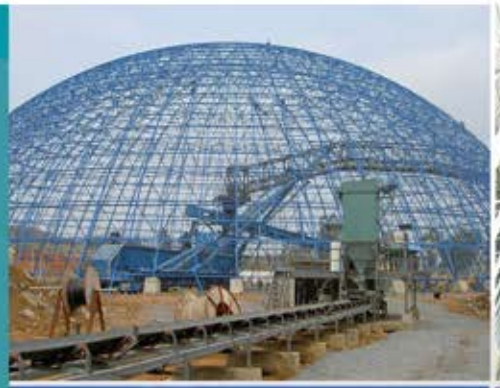
"Cover your stock piles"

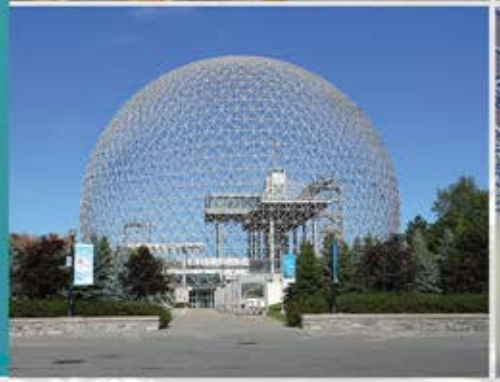
TSF is one of the experienced designers and builders of industrial enclosure shed structures for cement plant, thermal power plants to check and control environmental pollution and to save natural resources .

We use the most modern Bolted Solid Steel Ball Joint technology (Pinned Joints) to span large spatial areas with out intermediate columns to produce the light weight and stiff steel structures in various geometric forms such as Barrel Vault (Linear shed up to 1 KM) and spherical dome shapes of any practical diameters.

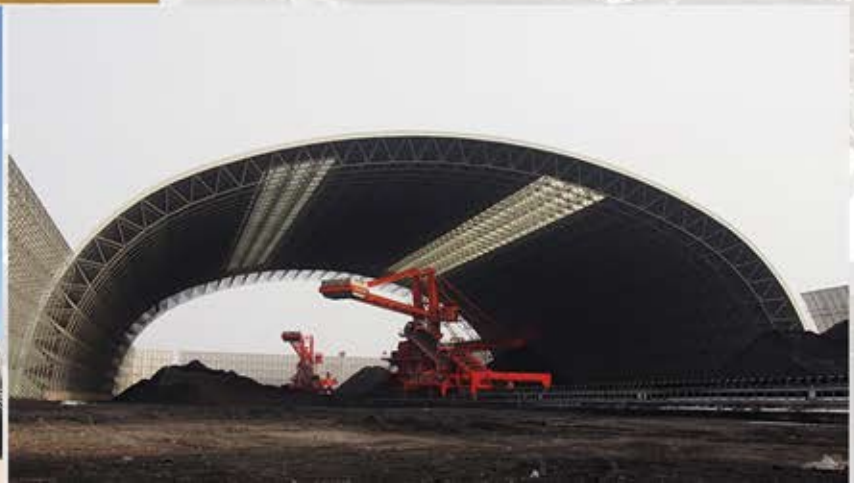
Our structures can span up to 200 meters with out middle column, thus its the most economical, light weight, rigid structural solutions for Lime stone storage shed, Additive sheds, Coal handling shed where stacker reclaimer to be accommodated.

Industrial enclosures





Coal Handling Sheds



STAINLESS STEEL SPACE FRAME

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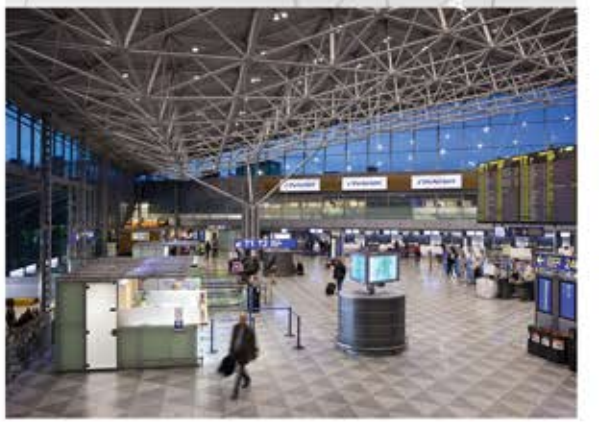
OUR CAPABILITIES

1. Customized In-House Design software tested and validated for over three decades to all global codes and standards
2. Over 25 years of experience and expertise in execution of 3.5 million sq. meter of space frames in various complex & large span structural forms globally.
3. Products supplied to International Specifications and Quality standard
4. Low cost manufacturing facility exclusively for Space Frame components.
5. Capacity to produce about 30,000 Square meter a month.
6. Our Advanced Technology in the design of bolted ball joint helps reduction in weight of Space frame considerably without compromising on the structural needs and stability,Thereby it helps us to be competitive amongst the space frame suppliers.

DESIGN SERVICES

The competent and dedicated team of professional engineers turned technocrats of the space frame industry create customized software for design and related structural analysis. We are well equipped with most modern and sophisticated engineering tools to meet the architectural and structural needs of variety of customers for complex geometric and larger span structures. In-house developed software programs are so designed to perform specific tasks of structural analysis to international codes AISC, ANSI, ASCE, etc. as well as to generate manufacturing data and installation drawings to ensure speed and accuracy throughout construction.



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INSTALLATIONS

The method chosen for Installation of a space frame depends on its behavior of load transmission and constructional details, so that it will meet the overall requirements of quality, safety, speed of construction, and economy. The scale of the structure being built, the method of jointing the individual elements, and the strength and rigidity of the space frame until its form is closed must all be considered

1. SCAFFOLD METHOD

Individual Elements are Assembled in Place at actual Elevations, members and joints or prefabricated sub assembly elements are assembled directly on their final position. Full scaffoldings are usually required for this type of erection. Sometimes only partial scaffoldings are used if cantilever erection of space frame can be executed. The elements are fabricated at the shop and transported to the construction site, and no heavy lifting equipment is required.

2. BLOCK ASSEMBLY METHOD

The space frame is divided on its plan into individual strips or blocks. These units are fabricated on the ground level, then hoisted up into its final position and assembled on the temporary supports. With more work being done on the ground, the amount of assembling work at high elevation is reduced. This method is suitable for those double-layer grids where the stiffness and load-resisting behavior will not change considerably after dividing into strips or blocks, such as two-way orthogonal latticed grids, orthogonal square pyramid space grids, and the those with openings. The size of each unit will depend on the hoisting capacity available.

3. LIFT-UP METHOD

The whole space frame is assembled at ground level so that most of the work can be done before hoisting. This will result in increased efficiency and better quality. For short and medium spans, the space frame can be hoisted up by several cranes. For long-span space frame, temporary posts are used as the support and electric winches as the lifting power. The whole space frame can be translated or rotated in the air and then seated on its final position. This method can be employed to all types of double-layer grids.

SPACE FRAME TENSILE & COMPRESSIVE LOAD TESTING

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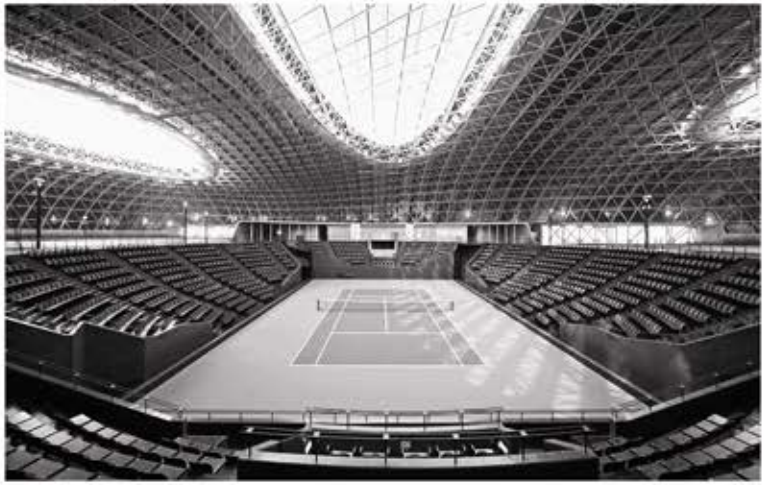

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