



Citadel Architectural Solutions Pvt. Ltd, A pioneer in the field of architectural solutions provide state of the art technology in Space Frame Structures.

Citadel has a team of highly qualified professional structural engineers & innovative production designers excel to convert your dreams into reality.

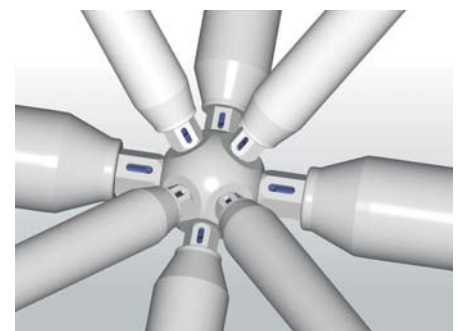
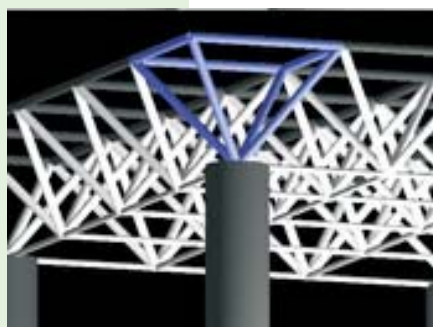
Citadel brings you a comprehensive and complete solution with its technically proficient infrastructure, thus encompassing all activities right from survey, design and supply of material till its erection and commissioning.

A space frame is a truss like, lightweight rigid structure constructed from interlocking struts in a geometric pattern. Most often their geometry is based on platonic solids (Platonic solid is a convex regular polyhedron).

Space frames usually utilize a multidirectional span, and are often used to accomplish long spans with few supports. They derive their strength from the inherent rigidity of the triangular frame; flexing loads (bending moments) are transmitted as tension and compression loads along the length of each strut.

The simplest form is a horizontal slab of interlocking square pyramids built from aluminium or steel tubular struts. In many ways this looks like the horizontal jib of a tower crane repeated many times to make it wider. A stronger purer form is composed of interlocking tetrahedral pyramids in which all the struts have unit length. More complex variations change the lengths of the struts to curve the overall structure or may incorporate other geometrical shapes.

Simplified space frame roof with the half-octahedron highlighted in blue



Space Frame

Lightweight Rigid Structure



Why Spaceframes ?

Structural Features

- Light weight structure
- Flexible, easy to install and dismantle.
- Dynamic, can be extended or joined with additional units.
- Can achieve a wider span roof.
- Has higher safety factor.
- Rigid structure but still has the ability to absorb changes of unexpected load.
- Aesthetic, due to the decorative geometrical structural pattern.

Space Frame Geometry

- Squares
- Triangular
- Rectangular
- Hexagonal
- Octagonal
- Domes

Design Parameter of Space Frame

- Grid size (Bigger the module are more economical)
- Span (Column to column distance)
- Type of support
- Load to be imposed
- Type of material
- Type of finish.
- Floor plan/ area of structure (Larger area costs less)

Space Frame Material

- Mild steel
- Stainless steel
- Aluminium

Space Frame Cladding Material

- Polycarbonate sheets
- FRP sheets
- Glass
- Galvalume/ G.I. Sheets

Technical Data

Construction System : In principle, a space structure system adopts steel pipe as tension/ compression member and solid/ hollow steel ball joint as point of connection.

The ends of each member are equipped with cones, collars, hexagon and high tension bolt which are locked together with the ball joint.

The composition of certain member and ball joint pattern will construct a rigid and strong space structures. All shapes of trigonometric octahedron are able to be constructed, with ordinary angle i.e. 45 degree, 60 degree, between each member, either in horizontal or vertical direction.

Special angles can be achieved in accordance with the architectural design requirement but the ideal minimum angle is 30 degree.

Basic Dimension

Solid / Hollow ball joint/ node: The effective diameters of ball joint are ranged from 46mm up to 300 mm. The Maximum number of holes in a standard ball joint is 18.

Tension/ compression : The tube diameter ranges from 0.5" up to 14". The member length can be produced in accordance with design requirement starting from 0.2m up to 6 m.

<p>Dimensions</p> <p>Frame Depth $0.5 = d/a = 1.0$</p> <p>Chord Angle $30^\circ = k = 60^\circ$</p> <p>Aspect Ratio (Member Length / Diameter) 25:1</p>	<p>Bay Size</p> <p>Maximum Bay Size $L/5 = a = 30 \text{ Ft}$</p> <p>Typical bay size $4 \text{ Ft.} = a = 12 \text{ Ft.}$</p>	<p>Span to Depth Ratio</p> <p>Horizontal Double Layer</p> <ul style="list-style-type: none"> • One way, 12:1 • Two way, 15:1 • Three Way, 20:1 • Cantilever Spans, 9:1
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