Dome structures may be designed in several patterns:
the spiral-woven Lamella, the efficient Geodesic or Projection, or the ring and segment Kiewitt pattern.
G e o m e t r i c a®
INSPIRED BY NATURE, ENGINEERED FOR LIFE
Since F. Castano Sr. founded Geometrica’s precursor in the 1960’s, we have used advanced information technologies and materials science to bring the beauty and efficiency of nature’s designs to unique architectural structures. Over the decades our integrated approach has proven its value in hundreds of applications around the world. Architects and design professionals today are realizing the potential of Geometrica Freedomes and space-frames for artistic expression.

FORM AND FUNCTION
A building’s form defines its character, delineates its usefulness, demarcates its artistic legacy. The Geometrica® system gives design professionals an exciting and versatile tool to create new forms for extraordinary buildings.

Inspired by nature
The Geometrica Freedome® draws its strength from nature, following forms that have evolved over the millennia for strength, efficiency, load-carrying capability and beauty. Here is a structural solution that provides space-shaping forms of timeless distinction.

Engineered for life
The Geometrica system covers great expanses of space without intermediate supports. Its strength lies in a graceful web of tubes and hubs designed with our custom software.

Geometrica means flexibility and affordable cost. Components include corrosion-resistant galvanized steel or aluminum tubes joined with our patented hubs, finished with powder- or wet-coatings in any color of the rainbow and clad with any roof or ceiling system, including translucent or transparent skylights.

Geometrica design software controls manufacturing, producing the exact tubes and hubs needed – all bar-coded, labeled and packaged in the correct order for easy, flawless and fast assembly.
Stunning space and distinctive lighting make the 120m x 80m Velodrome in Mexico City a national landmark.
Stadiums, arenas, swimming pools, gymnasiums and other sports structures play an active role in the event itself. They should be both functional and striking, works of art and paragons of advanced technology.

Geometrica gives architects the ability to create a distinctive style while meeting the challenges for open spans, unobstructed views, light weight and easy assembly.

**Strength and beauty**

Modular patterns can vary to accommodate heavier stresses; for example, double-density mesh reinforces the corners of Monterrey Tech’s Lamella swimming pool, a 40 x 30m Freedome®.
A curving Geometrica wall of smoky polycarbonate intersects with the rectangular main body of this library to shade the building and redefine internal and external space.

Aviaries and greenhouses are perfect applications of the Geometrica system since cladding can consist of wire mesh, netting or glass.

Purlins fixed to the tubing create a uniform flat surface for cladding of all types.

Geometrica structures define and beautify space, flying above or wrapping around. Structures can be asymmetric in plan or profile and curved in multiple directions. Simple and non-invasive supports can be designed allow for any clear span or column pattern. Geometrica Freedomes and space frames invite visitors and delight them with superior aesthetics.
The light weight of Geometrica atria and canopies – whether in space frames or domes – allows architects to create unique geometric patterns. It’s the perfect way to link buildings or stores within a mall. Signature enclosures not only define space but enhance the guest experience of light, airiness and freedom.

The Geometrica system is perfect when adding to or renovating an existing building, since our structures require few if any changes to existing supports and foundations. Geometrica’s light weight also simplifies the design of retractable roofs.

Beyond pure function, Geometrica gives architects and planners the freedom of design to create landmark structures that help travelers feel comfortable and free.

Complex environments can be enclosed under a single Geometrica cover, maintaining visual and physical continuity while allowing natural light to enter in creative and changing patterns.

Geometrica can be the perfect solution for airports, train and bus terminals, hangars and border facilities.
**Durability as timeless as the**

**Geometrica design**

Geometrica frameworks are built to last: The hubs are aluminum, and tubing members are aluminum or galvanized steel. Aluminum can be anodized for lasting brilliance, and both aluminum and steel can be powder- or wet-coated in all the colors of nature.

A double-layer translucent vault ceiling helps make patients feel comfortable and protected in this medical center.

Conventional low ceilings can make traditional markets feel crowded or stuffy. A Geometrica dome gives visitors a relaxed and open atmosphere for shopping.

A retractable glass-clad Geometrica atrium is the center of this facility.

The 60m span of this enclosed hangar provides cover for the largest executive jets.

At the Mexico-US border, 40,000 square meters of Geometrica space frames cover one of the busiest international cargo crossings in the world.
Let the mind and spirit soar! Geometrica helps architects realize their most moving inspirations. The discipline of order and balance and the freedom of form that our creations bring to an open space inspires students and congregations alike.

Slender structures stand on their own, free of columns, masts or other visual noise. Vast enclosures house complete environments under one unifying envelope.

Hulhumale Mosque in the Maldives is recognized as one of the most beautiful places of worship in South Asia. The geometric patterns of the interior enrich the contemplative atmosphere.

This university courtyard offers protection from the elements and the clear light of day.

This paraboloid church structure reflects the aspirations of its members.
Since 1992, Geometrica has been a leader in building expansive, column-free environments that permit the free flow of products and equipment in environments where traditional post and beam systems are restrictive and inefficient.

Our Freedomes® can be installed over any production operation. The structures are self-supporting during construction, and they span up to 300m when complete. No expensive rigging or assembly equipment is needed, and no welding is required. Because the hub is simple and the pieces are all packed in order, local labor can easily assemble this system. Geometrica also provides accessories such as insulation, ventilation, lighting, etc.

The Nemak domes span a breathtaking 224 meters without internal columns or support.
**Structure**

Geometrica structures use simple geometrical principles in new ways. Never have geodesics been so flexible or so beautiful. The basic module is a triangle, combined into 3-D lattice structures that are far stronger and more stable than 90-degree frames. The slender members share and distribute loads, making the structure more efficient and lighter than a conventional two-dimensional frame. For the first time, architects can build doubly curved geometries that span great distances and offer almost infinite possibilities for free-style designs.

**Cladding**

Both the exterior and interior surfaces of a Geometrica structure may be clad, typically with galvanized steel or aluminum formed-metal panels. Translucent and transparent panels can be combined with these to produce aesthetic patterns and provide natural light.

**The hub is stronger than the tubes**

The unique Geometrica hub connection requires no welding, supports the full yield strength of structural steel and transfers moments across the joint, resulting in lighter and more affordable structures.
Geometrica domes up to 30m wide usually employ a single-layer network. Double layer geometries are ideal for larger domes up to 300m and for space frames that carry large shear loads.

**Double layers, “sparse diagonals”**

Because of the bending strength of the Geometrica hub, double-layer space frames may use “sparse diagonals”, in which only one out of every four joints in each layer is connected with the other layer. This reduces the weight of the structure, saving material, freight and installation costs. It also it increases the module depth, which adds strength.