

CASE STUDY | Architecture: Adaptable and Accurate Casting Designs

THE PROJECT

Dean Group was approached with an architectural design requiring a significant amount of high-quality metal casting. The complex web of polycarbonate panels and wire connections was needed to complete the installation. This involved an in-depth collaboration to design, engineer, and cast nodes that would connect the cables to the panels and be castable within the fixed installation deadline.

THE CLIENT

Stage One UK is an innovative manufacturing and engineering company that delivers high-end projects. Working in 46 countries, their precision engineering, project management, manufacturing, and installation include ceremonies, live events, entertainment, and experimental architecture, such as the Cloud Cities in Barcelona.

The Cloud Cities installation in Barcelona is a permanent artwork designed by Tomás Saraceno. The project pushed the boundaries of creativity and engineering for complex architectural projects with our investment casting services.

DESIGN CONSTRAINTS

The project's defining feature was the web of polycarbonate panels connected with cables. This sculpture must be aesthetically pleasing and user safe, as visitors can climb on the panels to view Barcelona in a unique experience. All the nodes we created were required to meet the specifications for visitor interactions without infringing on the desired visual look of the attached panels and to keep the results uniform across the specifications required.

Time was the most significant constraint. Meeting the installation deadline was vital without compromising on any design aspect or quality. The customer needed these nodes in different sizes and variants quickly. The project involved creating thousands of these nodes in various sizes and quickly.

THE STRATEGY

We used an NPI (New Product Introduction) approach to work closely with Studio One UK and ensure each stage of the process was approved.

With the initial drawing provided by Stage One UK, our engineers were tasked to develop a single cast node to be a foundation for the design of future pieces. To

KEY CHALLENGES

- Developing a process to cast 12 variations of inner net nodes, all in stainless steel, with the integrity of the design being crucial.
- Guarantee product integrity with variable specifications with minimal lead time.
- Conducting machining on the nodes to the required tolerances needed for installation.

THE OUTCOME

- Successfully manufactured thousands of nodes in various sizes and variants, meeting the customer's requirements.
- The intricate nature of the project pushed creativity and engineering in architecture to new heights.
- Visitors seemingly float effortlessly, surrounded by a 360° view of Barcelona whilst safely seated on panels with our cast nodes.



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accommodate the short time constraints of the project, we used our 3D wax printing service to create the required design quickly. Once this first node design was approved, our team was tasked with creating twelve variations to be cast in stainless steel without sacrificing the pieces' integrity.

Our simulation software accurately predicted the performance of each of these designs when subjected to the planned stresses, and failed variations were eliminated until there were only twelve successful options.

Dean Group was also required to conduct the machining needed to connect the panels and wires to the nodes. This involved meeting exact specifications to ensure the safety of the visitors who'll see it and climb on it. Over ten-thousand individual machining operations were conducted, each with its own requirements to suit its place in the installation.



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