

## THE CACHET CHAIR

Entered by: Steelcase Inc.



### Molder (frame)

Morton Custom Plastics  
655 Industrial Drive, Lebanon, KY 45233

### Molder (Seat and Back)

GAC Plastics, LLC.  
65 Fochtman Industrial Dr., Petoskey, MI 49770

### Moldmaker

Steelcase Inc. Rapid Tooling Group  
6100 East Paris Ave. Caledonia, MI 49316

### Other Moldmakers

Cinpres Gas Injection; Caropreso Associates;  
LNP Engineering Plastics, Inc.; Steelcase, Inc.

### Entry Description

The Cachet chair is part of a line of seating products designed and developed for the contract office furnishings market. Cachet is a chair designed for use outside your primary workspace; it is a chair that you share with other people in your organization—a chair for the rest of your day. Some examples of these spaces are team spaces, conference rooms, multi-purpose rooms, cafeterias, lecture halls, etc. There are two versions available: the 4-leg base and the swivel base. The 4-leg base version is the more innovative of the two as it provides unprecedented comfort with extreme lightweight in an innovative design. Furthermore, the Cachet chair was designed to meet all office furniture industry standards for strength and durability. The Cachet chair was designed from day one for recyclability. It is 99% recyclable by weight in all versions and is easily disassembled with simple hand tools. In order to meet both structural and aesthetic needs for the chair, a hollow tube design was chosen for key structural components. This allows each part to achieve the required visual appearance while simultaneously providing the necessary structure without additional reinforcement. An additional benefit of the hollow tube approach is the strength and weight optimization. The frame components are constructed of long glass fiber reinforcement nylon, with most parts molded hollow using a unique variation of gas-assist injection molding. The seats and backs are molded in polypropylene and glass fiber reinforced polypropylene using a combination of 2-shot injection molding and gas-assist injection molding.

### Why is this Part Innovative?

First and foremost, the Cachet chair was designed with virtually all plastic structural components. Most traditional chair designs utilize metal (steel or aluminum) for the structural framework, and plastic components for the comfort surfaces and to cover up the metal framework. There are only a handful of metal parts in the chair; most are fasteners. The chair started out utilizing an “open section” design, but quickly evolved into the present hollow tube structure for the primary reasons of superior aesthetics and structural efficiency. As a result of this efficiency, the final weight of the product is 11 lbs. For the 4-leg base and 20 lbs. For the swivel base version. For the frame components, a highly loaded long glass fiber reinforced nylon provides the necessary mechanical properties. The parts are molded hollow using the overspill gas-assist molding process in which the mold is filled completely, the part is allowed to cool partially, and the molten core is evacuated into the overspill by the gas. This process was carefully tuned to achieve the required wall thickness and allow a glass matrix to be maintained in the center of the part. The resultant part is strong, light, and aesthetically pleasing. The seat and back are molded using an unfilled polypropylene comfort surface and a glass fiber reinforced polypropylene perimeter frame. They are molded using a 2-shot rotary platen injection-molding machine. In this process the comfort surface is shot first; the mold is then opened, rotated 180 degrees, and closed for the second shot of the perimeter frame. As above, the part is allowed to cool for a specified time; then the overspill is opened, allowing the gas to evacuate the molten core of material. The resultant part combines the flexibility and ductility of the unfilled material for the comfort surface with the superior structural properties of the glass reinforced material for the perimeter frame. Overall, the Cachet chair was designed with the end of its life in mind—recyclability. The chair can be disassembled with simple hand tools and is 99% recyclable by weight regardless of the version. This was achieved through the careful selection of compatible materials and consideration of how the chair will be taken apart when its useful life is over.