Handling a Three Molding Process Solution

Tobey Hayden

The Project: Design a bed handle that will fit onto existing Joerns beds, increase patient comfort, and enhance caregiver safety.

The Solution: Use three molding processes to develop an FDA compliant bed handle that offers a high degree of cleanability and reduces the number of required components, thereby decreasing costs.

Tobey Hayden is the technical content writer who worked in close collaboration with IPL Inc. She can be reached at 418-931-1903 or thayden@heymarketing.ca [1].

Joerns Healthcare is recognized as a leader in the post acute care market. It understands the value of partnering with key suppliers in providing innovative solutions to drive competitive market strategies. This partnering philosophy supports the dedication required for implementing advanced engineering solutions in the post acute care industry. This is why Joerns Healthcare partnered with IPL, a leading North American producer of injection-molded plastic products.

Introduction of a Restraint-Free Environment

The *Guidance for Industry and FDA Staff, Hospital Bed System Dimensional and Assessment Guidance to Reduce Entrapment*, issued March 10, 2006, required a fundamental change from market leaders in the post acute care industry. The intent of the new guidelines was to provide a safer restraint-free environment focused on improving the quality of life and increased patient independence, while enhancing caregiver safety.

To help customers comply with the new guidelines and to help them provide safe resident care, Joerns designed an assist device that would replace the post acute

care industry standard. The Deluxe Assist Handle was developed to be installed on new and existing Joerns beds, including the EasyCare (5, 7 and 9), and the UltraCare 700 Series and XT.

Search for a Winning Partnership

Joerns collaboration with IPL was critical in the development and implementation of the handle. The partnership added to the facilitation and development of an engineering solution that would meet FDA guidelines and medical equipment standards in a limited amount of time. Gary Schmitz, project manager at Joerns, said "IPL had the technical expertise and knowledge that we needed to help us add value to the product while respecting the business and project requirements."

IPL's technical sales staff and engineering team delivered a high level of support and knowledge, from finite element analysis, flow analysis, and rapid prototyping to full product development. "The responsiveness of IPL was extremely impressive. By proactively testing parts for approval, effectively communicating process steps, and quickly responding to our needs, IPL demonstrated the sense of urgency needed to keep the project on track," said David Genske, director of engineering for Joerns.

Synergy and New Product Development

A critical aspect of the design challenge and product development was the processes and tooling required to ensure easy product attachment to existing Joerns bed lines. This meant a steel-to-steel connection was necessary to maintain the ease of integration of the new assist handle. Joerns original design concept was based on molding two plastic shells that would be assembled together using screws on a welded steel frame to form the assist handle. IPL suggested a more advanced design concept that would incorporate three different molding practices. The processes used for development of the final Deluxe Assist Handle were insert molding, gas assist, and overmolding of a thermoplastic elastomer (TPE) material.

Insert molding was applied for the precision insertion of a powder-coated steel tube. The tooling design and mold construction was developed to deliver a clean fit to the steel tube providing proper seal off required for assembly. IPL's utilization of advanced materials enabled optimal flexibility to the insertion of the powder-coated

steel tube without scratching and deforming. This eliminated the need for secondary processes normally required for masking and preparing the parts for the painting process. The result was tighter production controls and tolerances in product uniformity, efficiencies, durability, and reliability, delivering the final seamless, easily cleanable Deluxe Assist Handle.

Gas assist technology was applied to consolidate the unique structural lightweight seamless and aesthetic one-piece design, creating the hollowed sections required for the aesthetic flow of the steel tube. Gas assist delivered superior durability and functionality to the part's structural elements that otherwise would have been economically impossible. The hollowing of the inner core increased product efficiencies while reducing material, labor, and overall system costs for assembly of the component. Another benefit of using gas assist technology was realized in the rapid production process, which attributed to the lower cooling time required for the final product.

An overmolding process using a TPE material was introduced into production to strategically place a "softer touch" in high usage areas. Application of the TPE material provided increased patient and caregiver security and comfort when gripping the handle. All aspects of the design and product usage were taken into consideration prior to this process, from the thin wall to the hollowing of the inner core, to drive the highest levels of material tolerance and consistency. IPL ensured that a high level of tolerance was applied, ensuring the overmolded pieces were consistent and free of flash, while maintaining part appearance and integrity.

A Product That Exceeds Expectations

The result of this partnership was a high-quality product that was well received by the marketplace. IPL and Joerns engineering teams worked together in reviewing designs and developing adaptations. Together, they created a seamless design that offers the highest level of cleanability while increasing patient and caregiver comfort through the incorporation of multiple technologies. Finally, reducing the number of components from 37 to 11 allowed Joerns' to reduce costs by minimizing assembly, inventory management, maintenance, and service.

"This project was part science and part advanced technology," said James Risk, senior product manager at Joerns. "IPL understood the design challenges very early on. They proactively met these challenges in a short time frame, creating great synergy in the partnership."

Online

For additional information on the technologies and products discussed in this article, see *MDT* online at www.mdtmag.com [2] and the following websites:
- www.ipl-plastics.com [3]
- www.joerns.com [4]

Source URL (retrieved on *03/09/2014 - 11:51pm*):
http://www.mdtmag.com/articles/2009/08/handling-three-molding-process-solution?qt-most_popular=0

Links:
[1] mailto:thayden@heymarketing.ca
[2] http://www.mdtmag.com
[3] http://www.ipl-plastics.com
[4] http://www.joerns.com