



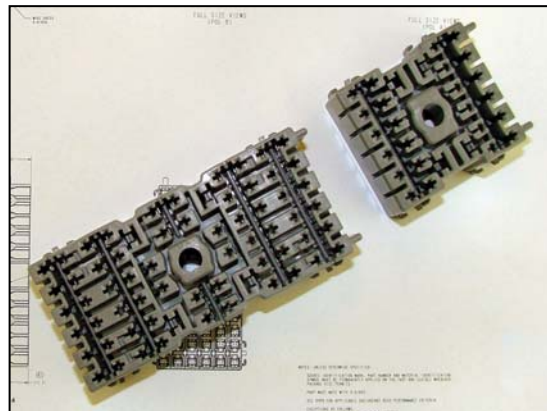
ENGINEERING ANALYSIS & PROBLEM SOLVING:

28 & 64 WAY CIRCUIT CONNECTORS:

A customer needed a solution to a very difficult cost problem on an important program.

Mol-Son was called upon to develop a solution utilizing our knowledge and expertise in engineering, design, mold making, and injection molding with our extensive library of design and analysis software.

Mol-Son was able to present a tooling strategy that allowed the concurrent manufacturing of two complex parts, which were very dissimilar in size, together in the same mold. We executed the strategy which allowed our customer to meet the competitive cost requirements outlined and successfully launch the program, producing these 28 circuit and 64 circuit connectors.

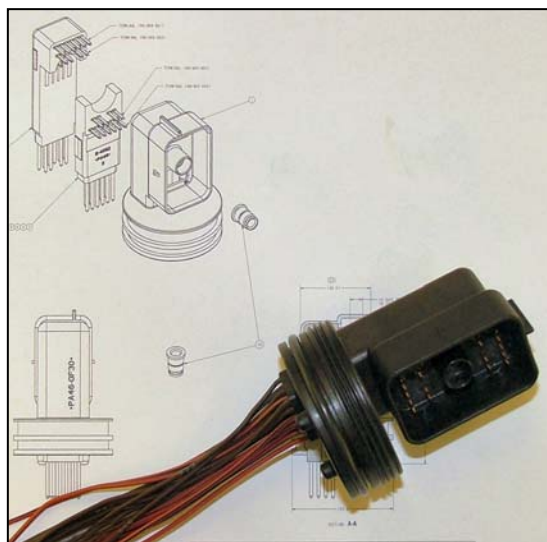


20 WAY MALE CONNECTOR SYSTEM:

A customer approached Mol-Son with a serious production problem. They had high scrap rates and low quality due to poor product and tool design engineering. They were unable to produce enough parts to satisfy their program commitments.

The Mol-Son team critiqued the product design and made modifications. Next, an evaluation of the tool design and construction yielded the need for significant design modifications to improve the retention / registration of the twenty 90 degree terminal / wire assemblies to be over molded into a sealed connector system. Additionally, a costly secondary heat staking operation was eliminated by engineering the required component as part of the existing molding operation.

Mol-Son's solution solved the customer's high scrap rate and low quality problems while additionally providing a significant cost saving of the offline secondary operation. This was accomplished in a timely manner, allowing Mol-Son's customer to provide product to their customer without causing supply interruption.





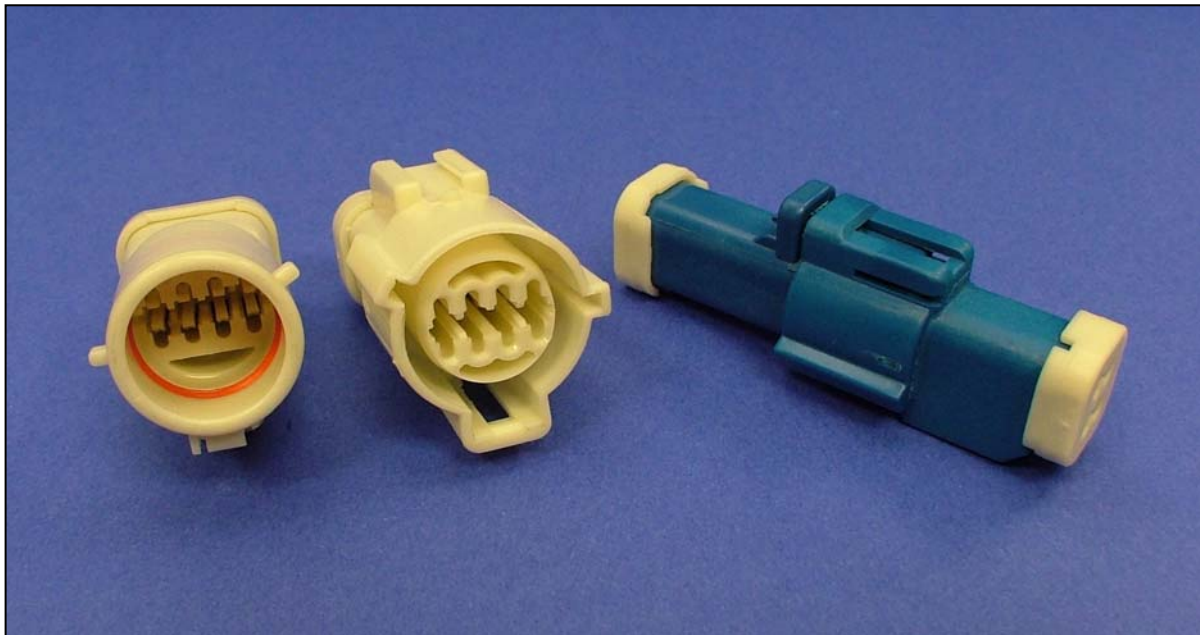
ENGINEERING ANALYSIS & PROBLEM SOLVING:

4 & 8 WAY SEALED MICROPIN CONNECTOR SYSTEM:

An automotive customer's very high volume sealed connector design required a molded connector shell to be machined with a complex secondary operation to produce an inside diameter "o" ring type seal groove. This product design was time consuming and costly to manufacture. It also created significant quality problems and extremely high scrap rates. Mol-Son's management approached the customer and asked if they could propose a product redesign to solve the customer's problems.

Mol-Son's experienced engineers utilized their extensive knowledge of tooling, molding, plastic materials, manufacturing, and assembly to develop a multi-piece ultrasonically welded product design that not only eliminated the costly secondary operation inherent in the original design, but also improved the seal-ability of the connector.

In addition, Mol-Son's design for manufacturing analysis allowed the multi-piece ultrasonically welded assembly to be incorporated into the manufacturing process with a reduction in cycle time, virtually eliminating scrap and quality issues, resulting in a significant product cost reduction. This design was the basis for an entire family of products as well as subsequent generations of connectors.



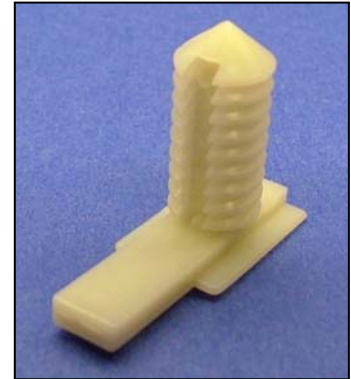


ENGINEERING ANALYSIS & PROBLEM SOLVING:

WIRE HARNESS RETAINER:

A customer brought Mol-Son a wire harness "Christmas Tree" retainer mold which they complained was inefficient and prevented them from being competitive.

Our team analyzed the product requirements and the tool construction to produce the part as designed. A subtle design change was suggested, which would eliminate the need for side action slides. This change allowed a more efficient compact cavity layout allowing for more cavities, while additionally reducing mold base size, allowing the mold to run in a smaller molding machine. In addition, elimination of the slides allowed a reduction in cycle time, mold maintenance costs, and down time. All of which greatly enhanced the customer's productivity and competitiveness.

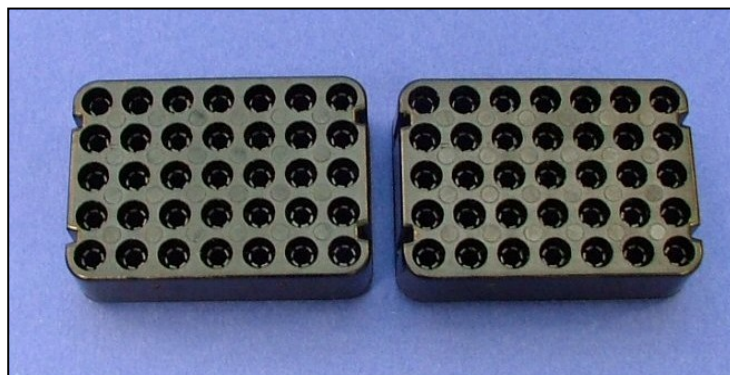


70 WAY PIN / SOCKET CONTACT RETAINER:

Our customer came to Mol-Son with an existing mold. The four cavity mold could not be run in production and the customer was forced to run only two cavities at a time. Even at this, the molding processing window was so limited that they continued to have production and quality problems. Mol-Son was asked if we could provide a solution to improve their molding conditions.

Mol-Son's team reviewed the product design and mold construction utilizing our extensive tooling and molding knowledge complimented by our extensive engineering and software library including Moldflow analysis.

We were able to identify opportunities to solve our customer's problem. Subtle changes to the product design, without compromising function, as well as runner, gate, and insert venting resulted in a significantly improved processing window. These changes provided a significant cost savings to our customer allowing them to run four cavities versus two, reducing cycle time, and minimizing scrap rates to improve quality and productivity.





MOL-SON LLC



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ISO 9001

ENGINEERING ANALYSIS & PROBLEM SOLVING:

WIRE HARNESS RETAINER:

One of Mol-Son's customers approached us with a problem on an existing wire harness retainer product. They had an issue with the design because the component as tooled would not meet their customer's retention requirements.

The Mol-Son experienced design and engineering team reviewed the product design utilizing Mol-Son's Abaqus Finite Element Analysis (FEA) to re-design the product. The revised product design exceeded the customer's requirements.

Mol-Son's engineering experience and analysis eliminated the need for multiple costly trial and error engineering changes as well as doing so in a timely manner to support our customer's program timing.

