

Hummer Storage Box Product Line



Molder: PAPP Plastics & Distributing Limited

Moldmaker: Integrity Tool, Pangeo & Service Mold

Material Supplier: LyondellBasell Polymers

Designer: DW Product Development & Productive Design Service

OEM: General Motors Corporation Accessory Division

Supporting Documentation:

[Papp-Hummer Presentation](#)

Product Description

Papp Plastics was awarded the “Hummer H3 Storage Box” program from the General Motors, based on our experience and expertise in designing and developing after market automotive



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products. The challenge was to design (3) premium boxes, which would typically be blow molded or metal formed but which had to be injection molded within stringent styling requirements. Other challenges included box joining, structural integrity, integrating a codeable lock assembly, water management, mold design and processing. Design techniques included FEA to assess load and crash impacts, mold flow analysis to determine shrink and warp of the resin selected, and daily Webex meetings utilizing Unigraphics 3D software to keep the ideas flowing and evolving on the fly. The product line was subject to rigorous cycle testing in the lab and field. This team effort included the Papp Plastics Engineering Group, GM Accessory Engineering, DW Product Development, Productive Design Services, LyondellBasell Polymers, Integrity Tool, Service Mold, Pangeo Corporation, Mega Mold and Williams Machine. Papp Plastics was able to successfully tool and manufacture a premium brand automotive accessory product line utilizing our engineering, mold design and mold process acumen.

Why is the product innovative?

The Hummer product line of injection molded storage boxes is an industry first as other manufacturers utilized metal forming or blow molding technologies to manufacture components for large storage box assemblies. The Hummer boxes we manufacture range in sizes from:

- Carry Off - 26x12x12 inches
- Full Width - 50x19x17 inches
- Full Length - 55x17x12 inches

The molds feature wall stock thickness that is 30% greater than the industry standard to give the box structural integrity. Ribs running across the lids were added to provide strength and a rugged look. Custom manifold and gating systems were designed to minimize visual impacts of molding variations on the Class A surface. This required several processing and gating adjustments to remove flow line, shear and minimize part warp to achieve the visual aesthetic requirements. A custom designed aluminium extrusion allows easy mounting to the H3 bedrail. This construction insures each box remains secured when fastened in the truck bed. The Carry Off features a cam lever system that was incorporated into the design to allow for quick removal of the storage box from the truck bedrail. Each box features recesses into both ends to accommodate a styling requirement that allows the user to carry the box. The Carry Off and Full Width incorporate a metal internal brace to add reinforcement. The boxes are capable of withstanding loads in excess of 200lbs when secured to the bedrail of the truck. The Storage boxes had to be waterproof when exposed to extreme elements. A special tongue and groove feature was incorporated between the upper and lower box to prevent water leaking in the joint without messy sealants. A compression D seal mounting, water dam rib and water runoff trough were incorporated into the upper box design to interface with a perimeter compression rib molded into the lid. A flap seal was secured to the front edge of the lid in conjunction with the seal on the upper box. To hide box joining fasteners in several locations around the perimeter of the box, robust looking recess soldiers were designed into the lower box. Doghouse features were molded into the upper box to receive a



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series of push clips for automated assembly. Special lifter mechanisms on compound angles were required in the upper box mold to accomplish this molded feature. Each box features unique lid design function. The Full Width has side by side doors, which allow the user to access either side of the box. The Full Length reverse hinge assembly allows for easy access over the side of the truck bed. For the Carry Off and Full Width a specially designed modular lid latch assembly with an over travel limiter was utilised to accommodate a code able lock that can be used with the ignition key of the truck. The Full Length features a unique multipoint lid latch activated by a rod and push plate, which allows for simultaneous engagement. Experts said it could not be accomplished by injection molding!