ADDMAN®

REV
Vehicles for life

CASE STUDY:
Empowering Production Through Effective 3D Printing

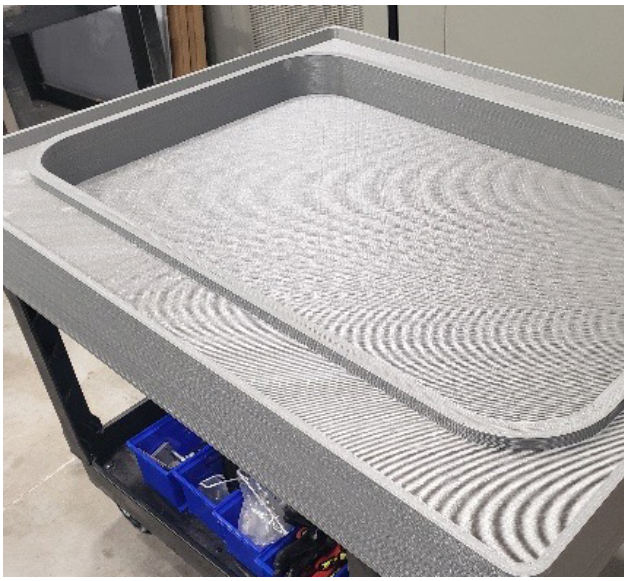
Partnership and expertise enabled REV Group to shorten lead times for their thermoforming process by utilizing AM to quickly and cost-effectively produce 3D printed molds. Additionally, this approach facilitated the adoption of digital inventory, eliminating the expenses associated with storing physical molds.

Introduction

This case study showcases ADDMAN's collaboration with a fire truck manufacturing client, aiming to enhance their thermoforming mold-making process. The traditional wood-based approach was replaced with 3D printing using the Titan Atlas Pellet Extrusion printers, resulting in significantly reduced production time and costs. This shift eliminated the need for a new tool maker and facilitated digital inventorying of molds, saving on storage costs. The 3D-printed molds optimized vacuum pulls and streamlined post-molding processes, achieving substantial time and cost savings for the client.

THE CHALLENGE:

Improve Thermoforming mold making process



REV Group, a fire truck manufacturer, faced the retirement of their in-house tool maker and sought a faster, cost-effective alternative to the traditional wooden mold approach. ADDMAN was tasked with implementing a solution that could produce molds efficiently and reduce both time and cost associated with mold creation, while also addressing storage challenges for legacy molds.

This innovation allowed for rapid and cost-effective production of thermoforming molds, circumventing the need for a new tool maker.

THE SOLUTION:

ADDMAN's solution involved implementing 3D printing technology using the EXT 1070 Titan Pellet 3D printers. This innovation allowed for rapid and cost-effective production of thermoforming molds, circumventing the need for a new tool maker. Additionally, ADDMAN digitized the existing wooden molds, creating a digital inventory for on-demand mold printing. This approach optimized the design and functionality of the molds, enhancing vacuum pulls in the thermoforming process and simplifying mold designs compared to traditional wooden molds. The adoption of additive manufacturing also extended to the production of trim tools, further streamlining the manufacturing process and reducing time and cost. Overall, this solution significantly improved mold production efficiency for the client.

ADDMAN | REV Vehicles for life

Benefits

Additively manufacturing molds enables the design and functionality of the mold to provide optimal vacuum pull. ADDMAN leverages pellet extrusion 3D printing and its own patented tool pathing process to control the porosity and density of the mold, allowing more or less airflow through specific areas of the mold as needed for the draw.

AM also allows for a simplified design of the thermoforming molds compared to the traditional wood molds, which had to be separated by baffles and boxes requiring drilling holds for vacuum channels. With AM, those features are no longer required and can be designed out of the mold.

Optimized Functionality: 3D-printed molds optimize vacuum pull by controlling porosity and density.

Optimized Mold Design: AM simplifies thermoforming mold design by eliminating the need for complex structures.

Time and Cost Savings: Shift to AM reduces turnaround times to a matter of days, improving cycle times and saving costs through automation and efficient material use.

In addition to printing all of its customer's thermoforming molds, ADDMAN is also utilizing AM to print trim tools for after the panel is formed on the mold. In thermoforming and vacuum forming processes, all formed parts have a piece of sheet stock that is larger than the final panel, and that extra stock must be removed by a secondary CNC process. By printing the trim tools that are designed specifically for the mold and panel, the customer can quickly and accurately trim the excess stock, saving additional time and cost.

The Results:

The shift from traditional methods reduced turnaround times from months to just a matter of days or one to two weeks. Furthermore, employing 3D-printed molds improved cycle times, allowing for faster draws and enhanced material manipulation during the molding process. These advancements resulted in substantial cost savings, primarily through reduced labor costs due to automation in mold production and the use of cost-effective pellet feedstocks. Additionally, the elimination of the need for a large warehouse to store legacy molds contributed to substantial long-term savings.