BATTERY CONTAINER DESIGN SIMULATION AND MACHINE OPTIMIZATION

Project 1: Q200AH Container Design – Mould Flow & Machine Size Optimization

Mangal Industries Toolworks SBU approached the Digital Engineering Solutions vertical to recommend an optimized machine size and conduct the mould flow analysis. This initiative is aimed at enhancing product quality and reliability for their Battery container.

CASE STUDIES



PROBLEM Statement

To assess and recommend clamp force (optimum machine size) requirement for Q200AH container using simulation software.

APPROACH

Fill-time & Pack time analysis is carried out using the Moldex3D tool

- Flow time is used to evaluate.
- Predict melt front and flow patterns.
- Optimize gate locations and designs.
- Simulate multi-component interactions.
- Diagnose short shots, air traps, weld lines, and flow imbalance.

Pack time is used to evaluate.

- Evaluate gate-freeze time.
- Avoid sink marks or flash.
- Optimize packing profile.



evaluate. e time. flash. rofile.



OUTCOME

The Digital Engineering wing recommended a 712-ton machine as the optimal choice for container production. Moreover, the Toolworks design process now integrates "simulation" as a crucial step in product development, enhancing its robustness. Interested in leveraging cutting-edge solutions for manufacturing optimization? Reach out to us today and embark on a journey towards greater efficiency and success.

E: nrpp@amararaja.com M: +91 93817 29292 W: mangalindustries.com

Project 1: 26AH Lid-Cover Design

Mangal Industries Toolworks SBU approached the Digital Engineering Solutions vertical to recommend an optimized machine size and conduct the mould flow analysis. This initiative is aimed at enhancing product quality and reliability for their Battery container.

PROBLEM STATEMENT

To assess and recommend clamp force (optimum machine size) requirement for Q200AH container using simulation software.

CASE STUDIES



OBJECTIVE

Anticipating quality errors ahead of manufacturing will significantly cut trial costs and time. Our project aims to predict quality issues and engineer technical aspects of the 26AH cover using digital simulation software.

APPROACH

Full-time, Pack time, Cooling performance, and Warp predictions are analyzed using Autodesk Moldflow.

Cooling performance is used to evaluate

- Improve cooling efficiency.
- Predict hot spots and reduce the cooling cycle.
- Support multiple cooling/heating systems, conformal cooling and CFD.

Warp prediction analysis is used to evaluate

- Forsee final part shape.
- Identify warpage causes.
- Support residual stress, anisotropic, in-mold constraint effect analysis.



Cooling Temperature







CASE STUDIES

OUTCOME

We meticulously analyzed all key parameters before physical trials and proactively implemented preventive actions for quality output. Our emphasis lies in minimizing trial runs, leading to cost and time savings in product development.

As described, Mangal Industries Toolworks optimized production processes and upheld quality standards through cutting-edge digital simulation software. It was able to anticipate and prevent quality issues, slash trial costs, and accelerate production timelines.

Ready to elevate your manufacturing efficiency and ensure top-tier quality? Reach out today to embark on a path of streamlined production and cost-effective solutions.

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