IBM Product Lifecycle Management

Product Housing and Packaging Engineering

Accelerating Product Enclosure Part Development Process

Industry Business Drivers

No industrial sector has penetrated our way of life more than electronics. Electronics are becoming more and more pervasive as a common enabler across industry sectors and a key driver for innovation. Every day we discover that electronic systems have entered a new industry segment, driving the market differentiation of a new product. High-Tech and other companies that manufacture electronic components are facing top-level business drivers such as shorter product lifecycles, fewer resources, or the integration of global design, manufacturing, and test teams.

The process of defining product enclosure parts can be tedious and inflexible, adding a significant time lag between engineering and manufacturing phases. The challenges are even greater when the enclosure parts are not made from the same material. Plastic, sheet metal, and composite parts demands different design methodologies to be implemented. Having a complete toolset that can address all product housing and packaging engineering challenges from design to manufacturing will accelerate design maturity and reduce late-cycle changes.

The Solution

As part of IBM's comprehensive Product Lifecycle Management (PLM) V6 solution, the Product Housing and Packaging Engineering solution delivers an end-to-end process for engineers to accelerate the definition of product enclosure parts from part design to tooling design and manufacturing simulation. Advanced knowledge management capabilities enable manufacturing specifications to be captured and embedded in design templates, making it available to the engineers from early on in the design phase.

Highlights

- **Tracks and minimizes costs related to plastic and sheet metal part design and manufacturing**
- **Covers the complete process from detail design to tooling design and NC toolpath generation using the same user interface and 3D model**
- **Ensures process Standardization by capturing, sharing and reusing company rules, know-how, and expertise**
- **Dramatically reduces design labor with rapid design for molded parts and automatic updates of associated tools**
- **Improves product quality by facilitating automatic design validations driven by knowledge capture and expert system**
- **Shortens response time for Request-for-Quote by re-using valuable experience from previous projects**

CATIA DELMIA ENOVIA 3dvia

Supported by dedicated CATIA® products, mold and stamping dies can be automatically generated from product design, saving the engineers hundreds of labor hours. Easy-to-use and innovative NC (Numerical Control) programming and machining simulation capabilities are available to reduce manufacturing time. With this solution, the OEM and tool makers can now optimize the entire development process of product housing and packaging parts, from bidding preparation to design and manufacturing.

The Product Housing and Packaging Engineering solution covers the entire development process of plastic parts and associated molds. To avoid inconsistencies and costly iterations, tooling design are automatically created within the same product definition as the part. CATIA enables automatic core/cavity extraction from the product design and allows design modifications to be automatically propagated to the tools. Engineers can also simulate the filling process of injection of thermoplastic materials so that design and material usage can be optimized.

This solution also offers features dedicated for rapid sheet metal part and associated tool generation, covering a wide range of processes for ruled and non-ruled sheet metal parts. Designers can benefit from already capitalized know-how and are able to take into account manufacturing constraints in the design stage by using design templates. This helps ensure that sheet metal parts are fully compliant with company rules and standards for efficient manufacturing. As more and more parts are made of composite materials nowadays, functionalities are available to address composite part design to manufacturing processes.

IBM provides an integrated system for design, analysis and manufacturing to support smooth transitions from 2D to 3D modeling, analysis and manufacturing. By enabling collaboration between engineers from various disciplines, IBM's PLM system accelerates performance based decisions and reduces the need for costly and time consuming physical prototypes and testing.

3D-based technical documentation can be quickly generated and kept in-synch with each design iteration. Animated and interactive 3D instructions help accelerate assembly and maintenance processes and reduce the time needed to train manufacturing or support personnel.

The Product Housing and Packaging Engineering solution helps High Tech companies track and minimize costs related to plastic and sheet metal part design and manufacturing, while capturing and re-using valuable knowledge from successful projects.

The Product Housing and Packaging Engineering solution integrates the following sub-processes:

- Plastic Molded Part Engineering
- Sheet metal Design
- Composite Part Design
- Concurrent Relational Design
- Mold and Die Design
- Manufacturing Simulation (Plastic Mold Injection)
- NC Programming and Machining Simulation
- Technical Documentation

The Product Housing and Packaging Engineering solution is supported by the following products:

- ENOVIA® 3DLive
- ENOVIA® Engineering Central™
- ENOVIA® VPM Central™
- ENOVIA® Live Collaboration
- CATIA® Reserve Engineering
- CATIA® Generative Shape Optimizer
- CATIA® Realistic Shape Optimizer
- CATIA® Mechanical Design
- CATIA® Fabricated Part Design
- CATIA® Plastic Part Design
- CATIA® Live FTA Review
- CATIA® Jigs and Tooling Design
- DELMIA® NC Machine Builder
- DELMIA® Mechanical Device Builder
- 3DVIA Composer

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PLS03037-USEN-01