PLM*is*Green: Enabling a Green Product Lifecycle

CIMdata Commentary

In recent years, manufacturers across all industries have had to contend with an expanding list of increasingly stringent and complex regulations governing issues such as health, safety, recyclability, and materials traceability. Complying with these regulations is now a fact of life in most industries, where the new business mantra is "comply or die."

Tough New Green Regulations & Requirements

For years, regulatory compliance applied mostly to pharmaceutical, food and beverage, medical devices, and aerospace companies—industries with governmental regulations requiring them to be able to identify the precise components or sources of materials/ingredients (e.g., in the case of an identified problem such as pharmaceutical side effects in patients, food recall, or accident).

Considerable focus is now being made on environmental regulations and sustainability (or "greenness") issues for companies around the world that are "going green." Some of the toughest such regulations are in the European Union (EU), including the Restriction of Hazardous Substances (RoHS) and closely related Waste Electrical and Electronic Equipment (WEEE) directives. An even more detailed directive is Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)—an 849-page set of regulations described as the most complex in the history of the EU. End of Life Vehicle (ELV) is another "green" directive aimed at reducing the amount of waste from vehicles when they are finally scrapped. China, Japan, South Korea, and various other countries along with a number of US states are adopting many of these regulations and in some cases authoring similar ones.

Failing to comply with these regulations can be extremely costly in terms of fines, penalties, recalls, and negative publicity that can haunt a company for years and damage brand value. Products may be banned for sale in certain countries, even if a hazardous material threshold is exceeded on a single part such as a resistor, capacitor, or power cable. Also, delays in demonstrating compliance can slow or halt a product launch, potentially leaving products stacked in warehouses while forms are retrieved, material levels verified, and approvals sought. The impact to profitability can be staggering and long lasting.

Further complicating this is the consumer's view and opinion regarding what makes a "green" product. Not only does a product need to meet all applicable regulations, but it also has to be considered to be "green" in the ever-changing eyes of the consumer. This requires new and innovative approaches to design for lifecycle sustainability. This is a holistic design approach that requires an understanding of all aspects of a product's life so that the lifecycle impact on the environment is minimized, for example:

- The product is designed to use the least amount of raw materials that in turn are the most eco-friendly available
- The product and manufacturing processes are virtual designed, simulated, and optimized thereby eliminating or significantly reducing the number of physical prototypes

- The product's work instructions, assembly instructions, operating manuals, etc. are delivered electronically thereby eliminating or significantly reducing the amount of paper used
- The product is manufactured and shipped in the most eco-friendly manner possible
- The product is serviced and recycled in the most eco-friendly manner possible

This approach requires the application of product lifecycle management in a broad sense—one that utilizes a consistent set of business processes, and data creation and management tools focused on optimizing a product's greenness.

The Critical Role of PLM

In complying with the increasing number and complexity of green regulations and requirements, too much is at stake to rely on manual operations and analyses performed late in development. For a growing number of companies, Product Lifecycle Management (PLM) enabling technologies and processes are becoming indispensable in optimizing a product's greenness. PLM technologies and processes are enabling organizations to compile, correlate, analyze, support, and report against a growing list of green regulations and requirements.

By giving people access to product data when they need it in a form they can readily use, PLM's data management solutions serve as a unified conduit of data exchange and efficient workflow for a wide range of product-related processes, including green lifecycle design. Additionally, simulation and analysis, computer-aided design, and other PLM enabling technologies are providing the data creation and optimization capabilities needed to truly optimize a product's greenness.

Independent software solution companies have developed a variety of industry-specific compliance management solutions over the years. Now the major comprehensive PLM solution suppliers are either establishing working relationships to satisfy these needs or developing targeted solutions of their own. With a specialized PLM solution targeted toward compliance with particular regulations or green focus, users can readily check and optimize product content from a range of sources—including bills of materials, design specifications, and parts lists. This data can in-turn be cross-checked against applicable regulation requirements in the early stages of development and the product's overall green requirements.

Analytics and reporting capabilities generally found in PLM solutions are often used to determine and help communicate the status of compliance to appropriate individuals so that corporate risk is minimized and the product's environmental sustainability can be measured. In such solutions, material content may be automatically analyzed against acceptable levels for individual components as well as the entire product. Reports can be automatically generated to conform to appropriate governmental agency requirements as well as specialized formats used by the company to track the product's green targets for material content, weight, manufacturing waste and energy use, packaging composition, etc. Solutions also may provide comparative views, tabular listings, and analytic reports for substance use, threshold levels, recyclable content, and more.

The Value of Designing for Green

The good news for the entire industrial community is that companies of all sizes in all industries can now utilize PLM-enabling technologies in this manner to integrate green concepts into every phase of product development up-front rather than merely check it at the end of the process. With such an integrated approach, manufacturers streamline the process and avoid expensive late-stage changes as well as explore alternatives to improve green designs while meeting various governmental and market requirements.

The value of these solutions is that companies can take a proactive approach to gain a significant competitive advantage now and in years to come by efficiently speeding green products to market, avoiding the oppressive costs of non-compliance, and establishing themselves as leaders in concerns for environmental issues. An overall green approach to product lifecycle management not only enables a company to design, produce, and deliver greener products to the market, but it also can help the company increase the product's perceived value to the consumer as well as decrease associated lifecycle costs for the consumer and the company. PLM is truly a green enabler.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. Visit http://www.CIMdata.com for more information.