



ENGINEER-TO-ORDER MANUFACTURING

Multi-Modal Industry Brief

Engineer-to-Order (ETO) manufacturers design products using external manufacturing engineering applications like computer-aided drafting and design (CAD) or product lifecycle management (PLM). Other companies manage bills of material and operation revisions inside their ERP system with engineering change control and approval workflows.

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Streamline the Engineering to Manufacturing Hand-Off with a Modern Engineer-to-Order System

Engineer-to-order (ETO) manufacturers build custom products based on customer specifications or a supplied CAD design. Other ETO manufacturers design stock products using project accounting to track engineering activities for research and development with connections to engineering systems for part design and lifecycle management.

While some ETO manufacturers may stock raw materials, many order raw materials and outside services for each job. However, the bill of materials is not defined, and production does not begin until the design is approved. New materials may be sourced using purchase requisition systems. For many manufacturers, production begins when the design and the order are approved.

ETO manufacturers using entry-level accounting systems or limited legacy ERP systems struggle to manage complex bills of materials with disjointed engineering change processes that do not synchronize data with CAD or PLM design applications.

Further, simpler business systems and older applications provide limited features to automate the engineering process. Conversely, modern ERP platforms like Acumatica seamlessly connect to CAD and PLM with embedded engineering change control, flexible approval workflows, and role-based insights to streamline processes.

This industry brief explains engineer-to-order manufacturing with an overview of ERP technologies and features. Discover how industrial and commercial equipment, automotive, aerospace and defense, electronics, and other manufacturers thrive with a modern ERP platform designed for engineer-to-order manufacturing.



ERP applications must harmonize CAD and PLM engineering bill of material (eBOM) data with manufacturing bills of material (mBOM) with labor instructions inside the ERP system. Further, ETO manufacturers need tools to streamline engineering change requests and engineering change orders with configurable approval workflows and utilities to quickly identify, update, and process bill of material changes.

Manage BOMs and Changes with a Modern ERP Application

Many ETO manufacturers need help managing new product development and revisions with standalone engineering applications that do not synchronize product data with entry-level accounting or legacy manufacturing production systems. This disconnect disrupts product development, causing issues with bills of material definitions that trickle down to accounting, planning, and scheduling. Further, few systems provide flexibility to streamline the change management process.

BOM Management

Some manufacturers are predominantly engineer-to-order. They design unique products based on customer specifications or supplied CAD files. However, most manufacturers use multiple methods of manufacturing. For example, they may engineer some finished goods in CAD or PLM apps with other bills of materials created manually or with rules-based product configurators or manufacturing estimates.

Acumatica is one of the few modern cloud ERP platforms that support multi-modal manufacturing for engineer-to-order, configure-to-order, make-to-stock, and make-to-order strategies on a single platform.

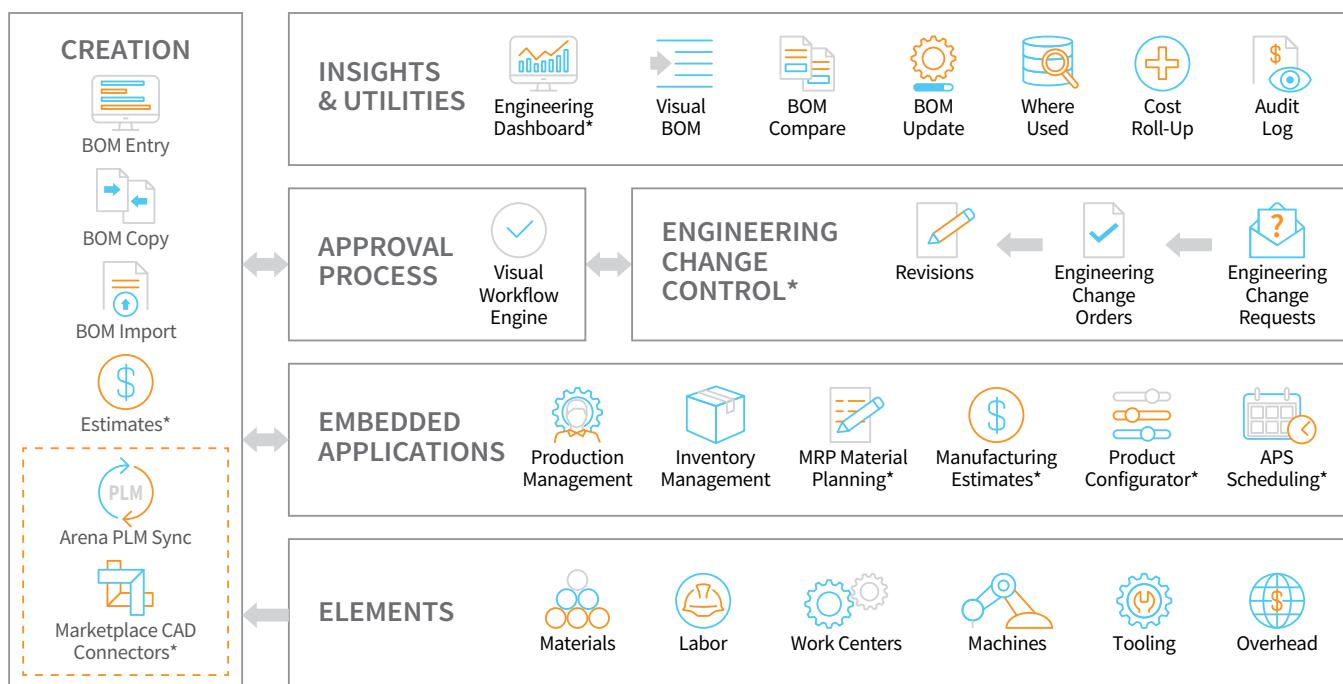
Change Management

There are two sides to change management. First, engineers need tools to manage new product designs. New products and prototypes are often tracked as projects with engineering specifications in CAD or PLM systems. Second, engineering change requests and change orders are used for revisions after new product introductions.

Acumatica's **Engineering Change Control** application provides engineering change request and change order features with native project management and configurable approval workflows to streamline revisions with documented and secured procedures.

Acumatica BILL OF MATERIAL AND ROUTING

The Cloud ERP



*May require additional license



Enterprise resource planning (ERP) systems are essential for engineer-to-order manufacturers. Without ERP, engineering designs and revisions are disconnected from production systems resulting in incorrect costs and variances that negatively affect material planning and production scheduling. Further, labor cost soar as manufacturing engineers waste time manually entering and verifying data between multiple systems.

Grow with an Engineer-Friendly ERP System Designed for ETO Manufacturers

Armed with the right features, ETO manufacturing leaders have the tools they need to get products to market faster while minimizing risk, exceeding customer expectations, empowering users, and boosting profits.

Boost Revenues and Profits

Streamline product revisions with engineering change requests, change orders, engineer workbench applications, and utilities to automate the engineering process. Hold costs down with insights into material, labor, and overhead with automated alerts when situations require attention. Generate high-quality leads with embedded CRM and sell more with up-sell, cross-sell, substitute items, and multiple sales channel support, including direct sales, online direct-to-consumer (D2C) apps, and business-to-business (B2B) storefronts.

Exceed Customer Expectations

Get products to market faster with CAD and PLM bill of material synchronization. Faster engineering to manufacturing handoffs ensure that custom-engineered products are designed and approved faster to meet stringent customer deadlines. Foster customer relationships with native CRM for customer communication and opportunity management. Manage customer issues with native customer support management with customer self-service portals.

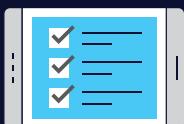
Manage engineering changes by exception with Acumatica's role-based engineering dashboard to monitor change requests and change orders with automated approval workflows via email and mobile SMS text messaging.

Minimize Risk

Implement an ERP system with security controls and configurable processes to document engineering changes. Ensure high-quality products compliant with industry and government regulations with connected quality management for raw materials, intermediate components, and finished goods with quality testing, non-conformance (NC) tracking, and corrective and preventative actions (CAPA).

Empower Employees

Automate data synchronization between engineering design and ERP systems freeing up high-paid engineers to focus on product designs. Create business events to notify employees of pending change requests that require their approval. Provide every employee with secured and audited access to ERP data with pre-defined and configurable security roles and unlimited ERP user licenses. Manage the engineering process with role-based dashboards, flexible Generic Inquiries, and insightful reports with drilldowns to source transactions.



The Acumatica [Manufacturing ERP Evaluation Checklist](#) provides a high-level overview of major features required by most manufacturers. The table below highlights specialized features for engineer-to-order manufacturers.

FEATURE	BENEFIT	PRIORITY	Acumatica	
R&D Projects	Manage product development with native project accounting, expense management, and time entry.		✓	
Product Revisions	Streamline BOM changes with engineering change requests and engineering change orders.		✓	
Approval Workflows	Create approval workflows to notify employees when changes require their attention. Use notifications and mobile devices to automate approval processes.		✓	
CAD and PLM	Harmonize engineering bills of materials and changes between connected CAD and PLM applications and manufacturing bills of material inside the ERP production system.		✓	
Engineering Workbench	Manage bills of material with an interactive engineering workbench with side panels to view related information without leaving the application.		✓	
BOM Utilities	Copy or import bills of materials. View an indented bill of materials, find items with where-used inquiries, and compare changes between revisions. Mass update and replace BOM components globally.		✓	
Multi-Modal Manufacturing	Use engineering change control to manage bills of material created manually, from estimates, and the native rules-based product configurator for job shop, make-to-order, make-to-stock, and configure-to-order production environments.		✓	
Effective Dates	Define BOM effective and retirement dates with MRP integration for time-phased material planning.		✓	
Order-Specific Production	Tag sales orders and purchase orders to production orders for one-off engineering jobs.		✓	
Distribution Management	Automate inventory and warehouse operations with kitting, lot and serial tracking, barcoding, and native WMS features for put-away, paperless wave or batch picking, packing, and shipments.		✓	
Sales Automation	Create marketing campaigns and manage sales opportunities with embedded CRM. Sell online directly to consumers or businesses with connected B2C and B2B storefronts.		✓	
Planning & Scheduling	Streamline purchasing and production plans with material requirements planning (MRP) and advanced planning and scheduling (APS).		✓	
Quality Control	Perform QC testing with AQL and sampling, certificate of analysis (COA), and checklists. Track non-conformances (NC), manage corrective and preventive actions (CAPA), and audit activities.		✓	
Compliance	Securely store and access data required for government and industry compliance reporting.		✓	
Comprehensive Accounting	Access a comprehensive financial suite including general ledger, accounts payable, accounts receivable, cash management, fixed assets, payroll, and more. Automate intercompany transactions and manage currencies and taxes.		✓	
Business Intelligence	Gain insights with role-based engineering dashboards, low-code and no-code reports, flexible Generic Inquiries, business analytics, and alerts.		✓	
Future-Proof Cloud Platform	Build your business on a future-proof, secure, and mobile cloud platform with an intuitive user interface and hundreds of connected applications.		✓	



“CADLink has been fundamental in our company’s quest to implement a brand-new ERP system. Without CADLink our engineering team would be completely inundated with error-prone data entry causing unacceptable project deadlines. The team at QBuild have been very supportive during training, integration, any troubleshooting to refine the software to our needs. Thankfully with CADLink our engineering team can quickly get through the initial meta data bulk uploading and get back to our day-to-day responsibilities.”

–Chislett, Chad, CenDek Railings

Fire-Protection Products Manufacturer STI FireStop Plans for Growth with Acumatica

Headquartered in Somerville, NJ, with global offices throughout Europe, EMEA, and APAC, Specified Technologies, Inc. (STI) leads the industry in developing innovative fire protection systems that help stop the spread of fire, smoke, and hot gases. Since 1990, STI has worked hand-in-hand with the construction industry to create simple solutions to complex fire-stopping problems.

For over 14 years, STI relied on Sage ERP products serving the company well until Sage discontinued development for the aging platform. Director of Information Technology Kevin Boyle said, “STI was a long-time user of Sage MAS 500. The product was built on an older platform and was due for retirement. We were looking for an up-and-comer that had a product built on a more current platform, that was easy to customize, that was flexible for us to use going forward.”

“I highly recommend Acumatica for any type of company that is going through a transformation and looking to grow their business.”

–Kevin Boyle, Director of Information Technology, Specified Technologies, Inc.



“We’re a heavy engineering company for our product development. So we use SolidWorks...and we’re also evaluating an alternative product life cycle management, PLM product called Arena,” Boyle [said](#), “... The engineers and our product development people are just thinking about, you know, the product itself all the way through the evolution and the iterations to be able to get the product to market. All that is pretty exciting for us to integrate that right into Acumatica and into the manufacturing and the MRP.”

STI is thrilled with Acumatica Manufacturing Edition in tandem with Tableau for data warehousing and reporting and electronic data interchange (EDI) with SPS Commerce. Boyle said, “I highly recommend Acumatica for any type of company that is going through a transformation and looking to grow their business.”



“Having now spent the last four months using CADTALK in conjunction with Acumatica, I have found it to be a very useful tool. We create very large assemblies in Autodesk-Inventor and use CADTALK to upload our files/BOMs into Acumatica . . . I was impressed how customizable the software was to link Inventor file properties to the location it was intended for in Acumatica. It took a day or two working with CADTALK to iron out the links, and the rest is history.”

–Jake Stickney, Stahl



CONCLUSION

Transform Product Design with a Future-Proof Cloud Manufacturing Platform

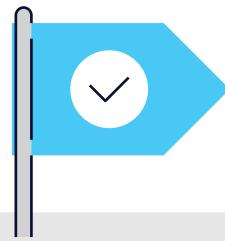
Technology is advancing faster than at any point in history. Advances in materials and customer expectations for faster production turnaround challenge engineer-to-order manufacturers to keep pace with more nimble competitors.

Acumatica provides a full suite of manufacturing applications to streamline the engineering change control process. Control versions and updates to bills of material and routings while controlling effectivity dates that impact material planning, costing, and scheduling. Gain insights into pending changes with full audit capabilities for historical changes.

Multi-modal manufacturing features automate business processes in make-to-stock, make-to-order, configure-to-order, project-driven, and other manufacturing environments.

Grow revenues, thrill customers, minimize risk, and empower employees with a future-proof cloud ERP platform with unlimited users, low-code and no-code personalization, and an intuitive user interface.

Manage every aspect of your business with robust order management features, extensive inventory and warehouse automation, pre-built connections to B2C and B2B storefronts, embedded CRM, and an exhaustive suite of best-in-class accounting applications.



“I walked by engineering, and the stacks of paper for a day were this tall [about two feet above the desk]. Bill [Ferron, the Director of Information Technology] went to the engineers, discussed their requirements, and created electronic checklists stored in the cloud. There’s no paper roaming around anymore, and that was very exciting.”

— KIMBERLY MCELROY
DIRECTOR OF OPERATIONS
PORTACOOL LLC

ABOUT ACUMATICA

Acumatica Cloud ERP provides the best business management solution for digitally resilient companies. Built for mobile and telework scenarios and easily integrated with the collaboration tools of your choice, Acumatica delivers flexibility, efficiency, and continuity of operations to growing small and midmarket organizations.

Business Resilience. Delivered.

Learn more about how Acumatica can work in your business by visiting us online at www.algorithmicinc.com.

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The Cloud ERP