



Manufacturer of Oxide Single Crystals Reduces Engineering Change Cycles by 16% and Achieves \$250,000 in Cost Savings

Customer

Since 1967, Crystal Technology, Inc., an EPCOS company, has been a manufacturer of oxide single crystals and selected optical components based on these crystals. Located in Palo Alto, California, CTI products are shipped to satisfied customers around the world for a wide variety of applications in electronics, optics, and acoustics. Crystal's focus is on quality and cost leadership in the products they manufacture.

Challenge/Situation

Highly customized product lines and increasing customer demands

Volume manufacturing is Crystal's specialty with a notable annual production of 60 tons of single-crystalline lithium niobate. Running a 24x7 operation, Crystal Technology has a staff of over 150 people, broken up into various product development teams, working to deliver a number of highly customized product lines. This environment, coupled with increasing pressure from customers for solutions to be delivered in a much faster timeframe, required Crystal to take a look at their existing product development processes and find ways to improve efficiencies.

"First and foremost, we needed to eliminate wasted time associated with filing and searching for information," stated Fred Garderes, director of supply chain management for Crystal Technology, Inc. "We could no longer search through file cabinets to find information where one hour could be spent looking for one piece of information."

Crystal's processes were all manual and paper-based. Sharing information among the multiple product development teams - internal and external - needed to be automated so that information could be available throughout the organization for faster reviews and evaluation. "We needed our data to be consistent and available across all of our systems," added Mr. Garderes.

Customer Goals

Centralized Product Data

Crystal wanted a central repository that would be the 'bearer of the truth' for all data. With many product lines, and mostly customized products (each part is a custom application), they required a solution that could manage a large amount of

Key Benefits

- Centralized Product Data
 - Streamline communication among internal and external teams
 - One version of the truth for all data
 - Easy access to information for better design decisions
- Automate Manual, Paper-based Processes
 - More efficient design processes
 - Eliminate errors due to manual entry of data
 - Direct data sharing between engineering and manufacturing
 - Meet ISO and RoHS compliance requirements
- Time and Cost Savings
 - **Reduced ECO cycle time by 16%**
 - **Estimated overall savings of \$250k over 5 years**
 - Support parts re-use
 - Reduce re-design
 - Eliminate wasted time in manually searching for information
- Business-ready Solution
 - Easy to use/intuitive interface
 - Fast user adoption
 - Open technology platform for integration with existing engineering system, **Cadence OrCAD**
 - Open technology platform for integration with existing ERP system, **Infor ERP Baan**
 - Cost-effective

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part information such as specifications, package size, and specific output. Crystal needed to make sure the path they selected for designing new product enabled the re-use of some of their parts to cut cost and eliminate the re-design of something that is already available.

Crystal was looking to automate their processes in order to streamline product development and change management information between their **Infor ERP Baan** system and **Cadence® OrCAD®** design environment. “We were looking for continuity of information among these systems with some consideration for migrating information to our outsource partners, whether on the manufacturing or design side,” said Mr. Garderes.

In addition, some of Crystal’s electronic assembly design is outsourced. They wanted a system that would simplify the packaging of information for output to their Contract Manufacturing (CM) partners including Bill of Materials (BOMs), part information, assembly instructions, and test specifications.

“A key benefit of the Omnify system is the simple, yet efficient interface. You can do a lot with one screen which makes information very easy to access and the ease of use helps with user adoption.”

-Fred Garderes, Director of Supply Chain Management, Crystal Technology, Inc.

Omnify Solution

Addressing all of Crystal’s requirements at the right price

After initially exploring their existing Infor ERP Baan system as a potential solution, Crystal realized that a Product Lifecycle Management (PLM) system was what they needed to manage all of their in-depth product information. “Although it is excellent for our manufacturing environment, we found that Baan did not have the features we needed for managing our detailed design information nor did it have the level of access control we required,” commented Mr. Garderes.

Crystal evaluated three key PLM vendors, including Omnify. After assessing each product, Crystal selected the Omnify PLM solution because of its ability to address all of their requirements at a much more reasonable cost, easily integrate with their existing design and manufacturing systems, and the willingness of the Omnify team to support their needs.

As with most organizations, employees are resistant to change. The engineers at Crystal were comfortable with paper processes and were hesitant about using a new automated system. Omnify’s intuitive interface helped to overcome any reluctance and made it easy to get the engineers on board. “A key benefit of the Omnify system is the simple, yet efficient interface. You can do a lot with one screen which makes information very easy to access and the ease of use helps with user adoption,” commented Mr. Garderes.

“Omnify Empower is now the master database for all of our parts and products from cradle to grave at Crystal,” added Garderes. “The system was easy to configure and required little customization to reach our key needs, including the interface to Baan. In order to maintain full integrity between Omnify and Baan, we decided to mirror a number of tables from Baan to support the parts creation process in Omnify. Today, 140 fields are passed between Baan and Omnify.” All of Crystal’s product documentation is solely vaulted in Omnify. “We plan to eliminate all of the file cabinets we have filled with paper and deposit that information in Omnify as well.”

Efficient Design Processes

Omnify helps to create more efficient design processes by providing engineers with instant access to product information from their desktop through a direct interface to OrCAD. All of the detailed part, BOM, and document information that is stored and managed in Omnify is now available right at the fingertips of Crystal’s design engineers.

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“Omnify is used as a sandbox for our engineers to play with designs by adding items to BOMs, scratching off items from BOMs, creating parts, and changing drawings,” added Fred. Omnify also facilitates communication of information to Crystal’s outsource design partners. Crystal can now easily package required information from Omnify to send to their CM’s and avoid redundancies

Engineering Change Orders (ECOs) are implemented and controlled within Omnify and automatically pushed to Infor ERP Baan. “By controlling all of our engineering changes in Omnify, I will see who made a change and if there is a mistake, allowing me to catch issues early on,” commented Mr. Garderes. Crystal currently has 28 workflows in place for a specific product team where changes are reviewed and approved in Omnify and then automatically released from document control to Baan, eliminating any previous inconsistencies due to manual entry of data.

Making supply chain information available at the time of design was another process Crystal wanted to implement to improve efficiencies. “We wanted Approved Vendor Lists, costs, suppliers on the AVL, and potential switches from supplier to supplier available to engineers to better meet customer requirements and save on costs,” said Garderes. “Having all of this data available in one view in Omnify lets engineers know the inventory on hand and on order, who the supplier is, the availability, etc. so they can make better design choices.” Supply chain parameters are also updated in Omnify. For example, if there is a change in the lead time for a part, that change is made in Omnify and automatically routed to Baan. A similar process is in place for cost information.”

As an ISO 9001:2000 and ISO 14001 registered company, Crystal is required to document certain procedures and maintain adequate records to conform to both regulations. By providing an automated process for documenting items such as ECOs, parts maintenance, and document maintenance, Omnify provides a more effective solution for Crystal to pass future audits and maintain their accreditation. Crystal is also required to meet Restriction of Hazardous Substances (RoHS) requirements and uses Omnify’s capabilities to identify, track and report compliance information to meet RoHS guidelines. “Omnify does a great job of helping us identify non-compliant BOMs and items, and is of great support consequently to map the conversions,” stated Mr. Garderes.

Customer Success/Return on Investment

Reduced ECO cycles and \$250,000 in cost savings

Implementing the Omnify PLM solution has helped Crystal meet their goal to improve product development processes and effectively meet customer demands while maintaining its focus on quality and cost leadership. “We are very satisfied with the results of our Omnify implementation,” stated Mr. Garderes. “We have been able to reduce our ECO cycle by 16%, from 12 to 10 days, and this is trending towards even further reduction.”

Crystal is realizing significant time savings in finding information. Centralizing product information within Omnify allows Crystal to retrieve historical and current information much faster than previous manual searches that consisted of diving into file cabinets. Now this information is available with a simple mouse click.

In addition, the company has achieved substantial cost savings, running at a return rate of approximately 2.5 times their investment over the first five years, with a projected ROI rate of 6.25 thereafter. “We have estimated a substantial cost savings of about \$250,000 over a 5-year period due to the enhancements made to our product development processes.”

As Crystal expands its use of Omnify Empower with the new Quality Management and Project Management modules, Crystal will truly eliminate all paper processes and home grown systems. Crystal will have all document control and quality information in one central location, giving engineers added knowledge about what issues accompanied a part during its lifetime. Crystal plans to leverage the Project Management module as a management platform around their New Product Introduction (NPI) process to help shrink their NPI cycles.