WHITE PAPER

MH&L MATERIAL HANDLING & LOGISTICS

PENTON MANUFACTURING & SUPPLY CHAIN GROUP

10 REAL-WORLD TIPS FOR SMARTER INVENTORY MANAGEMENT

Inventory is a prime indicator of how well a business is being managed. At the plant and warehouse level too much inventory or obsolete inventory is a sign of poor scheduling, ineffective forecasting, long cycle times and other inefficient manufacturing practices. Worse yet, excess inventory ties up cash that could be used to invest in new equipment, finance acquisitions or for other more productive purposes.

Despite the operational and financial benefits, more than half of U.S. manufacturing plants don't use many common inventory-optimization practices, such as just-in-time supplier deliveries, vendor-managed inventory, or material pull systems, according to one industry study.[1] And one out of every five factories doesn't use any of these techniques for optimizing inventory levels.

In addition to inefficient production processes, poor inventory management practices put manufacturers at a global disadvantage. Market demands for ever greater product variety and shorter lead times cannot be met, profitably at least, with more and bigger warehouses. Today's manufacturers must build greater flexibility and smarter inventory management practices into their production and order fulfillment processes.

Here are 10 real-world strategies that can help manufacturers optimize inventory levels and respond more effectively to market demands.

[1] The MPI Group, "Inventories Grow – Can They Be Managed?" (www.mpi-group.com/2011-manufacturing-study/inventories-grow-can-they-be-managed)

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1 Track and Report Key Metrics

Managers can't manage any process that isn't measured. Key inventory performance indicators from a business and operations perspective include customer service levels, back orders, lost sales and on-time/in-full delivery rates. Internal inventory measures—line item and order fill rates, cycle times, safety stock, shrinkage and inventory accuracy—can reveal opportunities for process improvements and more effective inventory storage tactics.

Financial measures—weeks-on-hand and inventory turns (cost of goods sold divided by average inventory levels)—while used primarily for accounting purposes, offer some perspective on how overall performance may be improving or declining over time. Because these figures are widely reported by publicly traded companies, comparing inventory turns between similar businesses in similar industries can provide an indication of exactly how well a business is performing from an operations perspective. Operations with higher inventory turns require less capital to finance the business.

BENEFIT: The core activity of tracking inventory performance and communicating it to employees—thereby demonstrating that it's a management priority—can be enough to drive inventory improvements. In addition, when employees understand the importance of tracking and reporting key metrics they learn *how* to improve when they don't meet their goals. They begin to recognize trends and factors that impact performance and how to control them.

2 Slash Setup Times

Long setup times kill productivity and contribute to costly accumulations of inventory. As one machine shop manager noted, "You don't make money setting up machine tools."[2] Shorter setup times allow manufacturers to produce smaller batch sizes, which reduces work-in-process and finished-goods inventory. By shortening setup processes, manufacturers can fulfill more orders on a just-in-time basis.

The machine shop manager cited above replaced old machines, computerized the remaining equipment, and implemented rapid die changeovers to address long setup times. These investments reduced setup times from as long as 12 hours to less than two hours, and in some cases down to seven minutes.

BENEFIT: Shorter setup times allowed the shop to hold one-tenth of the inventory it had previously carried. "Today, we don't have to make 30,000 parts when we need 5,000 parts, and now we can make those parts at the last possible moment. We can make what we need when we need it," the plant manager said.

[2] Bruce Vernyi, *American Machinist*, "Production on Demand," Nov. 27, 2007, (www.americanmachinist.com/features/production-demand)

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3 'Pull' High-Volume Material and Parts

A traditional "push" material replenishment strategy schedules production based on a forecast rather than actual demand. Forecasts include high levels of safety stock because of unreliable suppliers, high defect rates and long setup times, as well as suboptimal line-side material replenishment practices. Push systems can create piles of inventory that hide production problems.

In a "pull" system the line draws material and parts as needed, typically using visual cues, or kanban signals. The use of kanbans to restock a workstation or trigger production reduces work-in-process (WIP) inventory and exposes production issues.

BENEFIT: To address excessive WIP and material shortages that were contributing to significant overtime costs, a California manufacturer created an inventory shelving system where material handlers pull plastic materials and deliver them to assembly cells.[3] When the cells use all of the parts, the empty bin signals the need for replenishment. In this case, after deploying the pull-based system, the plant slashed WIP from 10 days to three days and reduced parts shortages by 90%.

4 Establish An Effective Sales and Operations Planning Process

Pull manufacturing practices can't respond to every magnitude of demand variability. Sales and operations planning (S&OP) helps companies recognize, plan for and smooth out demand fluctuations. S&OP is a cross-functional planning process focused on achieving alignment among all functions in the organization.

S&OP software integrated with existing sales and inventory management systems—such as enterprise resource planning (ERP) and customer relationship management solutions—can provide a comprehensive view of inventory data. Such simulation tools can show supply chain managers how changes to forecasts or production plans may impact inventory as well as future production and capacity levels. If a plant must respond to seasonal demand spikes, an S&OP system can send alerts to build the appropriate inventory levels exactly when necessary.

BENEFIT: Data analyzed during a typical S&OP process—such as weeks-on-hand calculations—can allow managers to lower inventory buffers throughout the supply chain and reduce the associated carrying costs.[4]

[3] Darren Dolcemascolo, EMS Consulting Group, "Value Stream Mapping: A Case Study," May 1, 2008 (www.emsstrategies.com/dd050108article.html)

[4] Andy Duncan and J.B. Kuppe, *IndustryWeek*, "Five Things Manufacturers Should Be Able To Do With S&OP Data," Aug. 11, 2010 (www.industryweek.com/companies-amp-executives/five-things-manufacturers-should-be-able-do-sop-data)

5 Scrap Manual Tracking Systems for Enterprise Resource Planning (ERP)

Many smaller to mid-size industrial plants still manage inventory using manual tools, such as PC-based spreadsheets. These outdated inventory-tracking methods consume excessive administrative time and lack intelligence analysis capabilities. Integrated ERP systems can provide real-time intelligence on production activities so plant managers can make more informed decisions about optimal inventory levels.

ERP systems that enable data sharing with customers and suppliers can display what products are in stock and related delivery lead times.[5] Such visibility helps manufacturers keep materials and parts moving and respond faster to inventory variations, which reduces storage and handling requirements.

BENEFIT: A rubber processing company implemented an ERP system to improve its inventory control methods. After implementing the ERP system, changes in inventory were reflected within minutes within the database so a worker taking an order could immediately see if the necessary raw materials were in stock.

"The more accurate your inventory is, the more certain you are when you make a decision on whether we can process that order," said the company's president. "If your inventory is not close to real time, you don't know if you can make that order." [6]

6 Switch to Vendor-Managed Inventory

Vendor-managed inventory (VMI) allows manufacturers to focus on their core value-adding activities.[7] VMI requires enhanced supplier visibility of downstream demand because the supplier is responsible for maintaining its customer's inventory levels. Suppliers participating in a VMI program undertake bar code labeling of the parts and the establish min/max replenishment limits.

BENEFIT: Supplier management of MRO materials can identify opportunities for volume discounts that might not be available if a maintenance technician sporadically places parts orders. Vendor-managed inventory also reduces inventory transactions since manufacturers typically pay for material when it is used. Setting a regular invoicing schedule reduces purchase orders and related processing costs.

[5] Ian Whiting, *CIO*, "Six ways to reduce expenses using ERP," March 5, 2012 (www.cio.com.au/article/417414/six_ways_reduce_expenses_using_erp)

[6] Doug Bartholomew, *IndustryWeek*, "Associated Rubber: ERP Improves Inventory Management, Financial Closings," June 14, 2006, (www.industryweek.com/companies-amp-executives/associated-rubber-erp-improves-inventory-management-financial-closings)

[7] John M. Donnelly, *SupplyChain247*, "Five Basic Practices That Can Quickly Close the Gap with Best Practices in MRO Inventory Management," June 13, 2013 (www.supplychain247.com/article/five_basic_practices_that_can_quickly_close_the_gap_with_mro_inventory)

7 Optimize Maintenance, Repair and Operations (MRO) Inventory Management Strategies

MRO inventory replenishment strategies should reflect material value and actual demand. For instance, costly supplies or parts with low or infrequent demand would be replenished on a "use-one/buy-one" strategy.[8] A consumption-driven replenishment process may be best for high-value parts that are easy to forecast because of steady demand. An actively managed replenishment strategy is ideal for inventory that is critical and costly enough that it justifies active oversight. Manufacturers should conduct frequent manual reviews to manage inventory risk factors, including high cost, volume and downstream uncertainty.

BENEFIT: The benefits of active material replenishment practices include reduction in expedited deliveries, fewer parts shortages and the reduction of obsolete inventory.[9] Inventory reviews can help manufacturers prioritize and rationalize MRO components, as well. Rationalization efforts eliminate duplicate items and excess inventory.[10]

For instance, one manufacturer launched an inventory analysis project at four of its 11 sites to eliminate duplicate items and excess inventory. The company returned excess inventory to the supplier for credit, saving $1.1 million.[10]

8 Rationalize Suppliers Based on Delivery Performance

Unreliable suppliers can wreak havoc on inventory levels. Poor on-time delivery rates force manufacturers to carry high levels of safety stock. Supply chain managers should regularly evaluate suppliers to ensure they are meeting their inventory needs. By separating suppliers into categories such as critical and non-critical or primary and secondary, manufacturers can devote more time to measuring the performance of their critical suppliers.[10]

Steel products manufacturer Marlin Steel Wire, for example, not only looks at on-time performance, but how quickly vendors respond to requests for quotes.[11] If a supplier is habitually late with shipments, corrective actions may include a three-strike policy, requesting monetary compensation or a combination of both.[12] On the whole, strong, collaborative relationships with suppliers can help facilitate any evaluation process.

BENEFIT: Supplier evaluations help companies identify risks, such as late deliveries and out-of-stock inventory, and eliminate poor-performing suppliers. This improves overall competitiveness by focusing on suppliers that help companies slash inventory levels, reduce cycle times, cut costs and increase productivity.

[8] Deloitte, "Smarter MRO 5 strategies for increasing speed, improving reliability, and reducing costs – all at the same time," (www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Consumer%20Business/us_thl_smartermro_072612.pdf)

[9] Ralph Rio (ARC Advisory Group), *ReliablePlant*, "ARC examines MRO inventory rationalization and optimization," (www.reliableplant.com/Read/28112/MRO-inventory-rationalization-optimization)

[10] Mary Cenedese, *Reliable Plant*, "Show me the money: an MRO inventory analysis," (www.reliableplant.com/Read/3220/mro-inventory-analysis)

[11] Carolyn M. Brown, *Inc.*, "7 Tips for Rating and Evaluating Your Suppliers and Vendors," Dec. 30, 2010, (www.inc.com/guides/2010/12/7-tips-to-rate-and-evaluate-your-suppliers-and-vendors.html)

[12] Mike McDonald, *Metalforming Magazine*, "Identifying and Maintaining a Reliable Supplier Network," Dec. 1, 2013 (www.metalformingmagazine.com/magazine/article.asp?iid=107&aid=8910)

9 Partner With Logistics Providers

Competent third-party transportation and logistics providers can help manufacturers navigate logistics issues—such as customs clearances—that can cause delays and have historically created a need for inventory buffers. Major logistics companies also offer paperless invoicing and the ability to process shipper's export declarations.

For example, Gleason Cutting Tools Corp., which exports about 35% of its orders, relies on UPS to clear supplies and product through customs in each of the 45 countries where it conducts business. UPS provides Gleason with an automated global shipping program that processes all shipments electronically.[13]

Major logistics companies also offer advanced supply chain management technology that make it possible to efficiently track incoming and outgoing shipments at a granular level.

BENEFIT: The increased visibility reduces the need for safety stock since manufacturers can receive alerts when there are any issues in real time, and respond accordingly.

10 Manage Customer Order Sizes

Manufacturers that provide price incentives for bulk orders can unintentionally create production inefficiencies, including excessive work-in-process (WIP) and finished-goods inventory. Smaller orders mean customers don't have to spend money on parts they may not use for months.

If possible, customer service representatives should encourage customers to place smaller, more frequent orders in line with actual demand to reduce production tie-ups. Working with marketing, they should try to avoid repeated, end-of-the-month discounts that incent customers to delay orders and stockpile product.[14]

"We even work with customers to explain to them that if they order 50 pieces and only consume five a month, they really don't want to tie up their money in 50 pieces," says Spencer Greenwaldt, the manufacturing supervisor at the previously cited Gleason Cutting Tools. "Not only is that bad for them, it hurts our flow to supply other customers."

BENEFIT: Efforts to reduce inventory levels by encouraging smaller customer orders at Gleason have given the company a competitive advantage. "Because of our lean efforts we can receive an order, get it designed, manufactured and shipped to a customer in Japan faster than they can get it from a domestic supplier," Greenwaldt says.

[13] Tom Andel, *Material Handling & Logistics*, "Make: Lean is a Supply Chain Exercise for Gleason," Nov. 11, 2013 (www.mhlnews.com/technology-amp-automation/make-lean-supply-chain-exercise-gleason)

[14] Robert Martichenko and Kevin von Grabe, Lean Enterprise Institute, "Lean Logistics & Supply Chain Networks: 8 Guiding Principles," (www.lean.org/common/display/?o=1693)