The concept of Lean manufacturing was first seen in Japan, originally developed by the Toyota Motor Co. based on concepts pioneered by Henry Ford. The concepts, tools and techniques went through a lot of testing before they were accepted. Lean manufacturing means manufacturing without waste. Waste takes many forms and can be found at any time and in any place. It may be found hidden in policies, procedures, processes and product designs and in operations. Waste consumes resources but does not add any value to the product.
Helping New Jersey Manufacture Success

NJMEP’S GUIDE TO ELIMINATING 8 WASTES – LEAN MANUFACTURING

What exactly does it mean to be a Lean manufacturer and what are the characteristics of such enterprises? A Lean manufacturer is really a learning organization where the focus is on learning every day through problem-solving, connecting the business to the purpose and connecting the purpose of the business to the value proposition of the customer. Certainly, organizations are only as good as their people, and showing respect for people is an important and key principle for Lean manufacturing.

Many professionals believe that to “be Lean” is to eliminate waste and do only those things that add value for the customer. This is a crucial component of a Lean manufacturer, yet it does not cover what a true Lean manufacturer is. Thinking long-term as well as short-term is a challenge for many organizations when there are month end and quarter-end goals. The real power of a Lean culture is to continuously improve, to get better every single day.

Another misconception of the term “Lean” is when businesses think of it as only relating to operational excellence. For instance, if workers are only focused on optimizing a supply chain and eliminating waste in that area they may think that they are running a Lean work process, but they are only working on one piece of the puzzle; when in fact, there are numerous other levels in the hierarchy that can benefit from Lean manufacturing as well.

Lean thinking strikes a chord for manufacturers as it promises to reduce costs, improve quality and transform the bottom line, by eliminating waste in every area of the value stream, including factory management and supplier networks. Its goal is to eliminate non value added processing from the customers’ perspective, enabling less inventory, less space, less resource, less time and less cost to produce more — and all highly responsive to customer demand.

Lean manufacturing is essentially a consistent organizational culture that needs to be adapted wholly to a business and its manufacturing operations. This guide examines the impact of leveraging proven Lean principles and identifying the eight wastes of manufacturing, and how several manufacturers eradicated these wastes.

The Eight Wastes of Manufacturing

1. Defects
Producing defective parts or products results in rework and scrap and invariably adds significantly to manufacturing costs. Lean focuses on preventing the occurrence of defects, rather than improving the processes around finding and repairing them.

2. Over-production
Producing more than and / or ahead of demand. The result of producing to speculative (forecast) demand or supposed economic batches, it is visible as excessive, time consuming and costly material stores.

3. Waiting
Whether for the previous, current or next step in the process, the result is wasted worker time. The goal is to maximize the utilization and / or efficiency of operatives first and machines second.

4. Non-Utilized Talent
The only lean manufacturing waste that is not manufacturing-process specific, but rather manufacturing management related, is Non-Utilized Talent. This type of manufacturing waste occurs when management in a manufacturing environment fails to ensure that all of their potential employee talent is being utilized.
5. Transportation
Unnecessary transport of materials, WIP (work in progress) and finished goods adds zero value to the product. Instead of improving transportation processes and systems, Lean thinking first favors minimizing or eliminating them.

6. Inventory
Specifically referring to WIP between operations and purchased parts within the supply chain, frequently resulting from overproduction, usually due to excessively large batch manufacturing or processes with long cycle times — leading in turn to cost and clutter. This waste also creates additional waste in the form of increased lead times, excessive floor space requirements, extra handling, high interest charges, avoidable people movement and paperwork and, again, the associated costs.

7. Motion
When Motion occurs, value is not added to a product or material being manufactured. Motion can be either people or machine, but is most often a human resource whose effort and time are being wasted. Inefficient shop floor layouts, and improper equipment can contribute to unnecessary motion. The employee's efforts are not only being wasted, but Motion can also result in physical injury to employees which results in even greater cost to the business. Motion waste is closely related to wasted employee potential, commonly referred to as Non-Utilized Talent.

8. Excess Processing
Many organizations use expensive high precision equipment where simpler tools would be sufficient. This often results in poor plant layout because preceding or subsequent operations are located far apart.

Lean Manufacturing is About the Obsessive Elimination of Waste
Waste being defined by Lean practitioners as what customers would perceive as processes and actions that don’t add ‘value’, and for which they don’t want to pay. Given the current difficult conditions for much of manufacturing in the developed world, Lean is also commonly associated with getting more from less. But for the tightest definition, visit the US National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP), which describes Lean as: “A systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection.”

Succinct, yes, but useful too because implicit in that sentence is a clear warning for Lean manufacturing wannabes to avoid cherry picking Lean initiatives and methodologies — such as simply setting up kanban replenishment, focusing on reducing set-up times, or doing the workplace 5Ss (sort, set in order, shine, standardize and sustain) somewhere in production or a warehouse. Instead, this definition of Lean manufacturing leads instantly to the strategic, top down view, as enshrined in Lean's five basic principles.

1. Value is what your customers perceive as value.
2. Map out your operations to determine which processes create waste; find ways to improve.
3. Production flow should move smoothly from raw material to finished goods. If that’s not the case, identify bottlenecks and improve your processes.
4. Only produce what is necessary; avoid stocking goods. Instead of pushing your products out, let customer demand pull finished goods through the system. You design and produce products according to customer quantity, quality and cost needs.
5. Continuous improvement means there is always room to improve the way you do business by reducing time, cost, space, mistakes or effort.
Addressing Waste in the Real World – Lean Thinking is Pragmatic

Although Lean methodology drives towards zero inventory, zero waiting, rapid changeovers, zero duplication and so on, its practitioners recognize that much of production and distribution necessarily involves some batch, and even forecast, processes. They also understand that commercial pressures, often beyond a manufacturer’s direct control, influence purchasing and stocking strategies.

Thus, whether those issues concern material availability and pricing, or customer service strategies dictated by competition, there is scope in Lean thinking for some apparent waste, particularly in the areas of overproduction and transportation. However, while some waste might be justifiable, Lean’s principles consistently emphasize root cause analysis and a sharp focus on systemic improvement — focusing on value, using its improvement methodologies, practices and KPIs, and implementing systems and processes that sustain improvements.

Most importantly, Lean thinking also implicitly recommends judicious use of IT systems, particularly where the intention is to use Lean principles beyond the simple repetitive production environments for which it was originally intended — as in the Toyota Production System.

Quite simply, Lean practitioners recognize that in a volatile and / or complex supply chain, whether internal or external, modern manufacturers just cannot implement Lean practices on visual queues and takt times alone. Thus, with appropriate solutions configured to collect data, disseminate information, enable visibility and automate background processes — such as those around material replenishment and assembly finishing, including outside the four walls of the factory — even complex manufacturing organizations benefit from Lean principles.

That is the case no matter how prone production and supply chains are to the challenges of product mix, demand variability and / or the realities of breakdowns and resulting material availability problems. Timely information — aimed at delivering visibility of materials, WIP, scrap etc, as well as automating material flow and assisting with the understanding, communication and resolution of downtime issues — directly addresses the eight wastes.

THE BENEFITS OF LEAN

When implementing a lean approach, you can expect:

- productivity increases from 10% to 50%
- quicker detection of errors and quality problems
- a lower risk of obsolescence
- reduced space requirements and shorter travel distances
- increased ability to get to market faster
- reduced order processing errors
- better customer service

This should lead to:

- significant cost savings in reduced inventory costs (30% to 80%)
- less handling damage and lower material handling costs
- reduced set-up time (30% to 90%) and response time (30% to 70%)
- reduced turnover and costs of attrition
- less paperwork
A Continuous Improvement Initiative

Ever-changing customer expectations, new procedures and technologies, and the desire to run a better, faster and cheaper organization drive the need for continuous improvement. The process never stops. In order to make continuous improvement work, you need to have clear objectives and identify all problem areas.

There are 2 general types of improvement activities: Breakthrough improvements and incremental improvements.

Breakthrough improvements typically are made by one or a few individuals who bring a new theory, invention or technology to solve an old problem.

On the other hand, incremental improvements are generally less significant improvements carried out by many people over time in gradual and constant small steps. Incremental improvement may not produce a dramatic result, but the results are long lasting. The accumulation of numerous small improvements is often equal to or greater than the value of one or two breakthrough improvements.

Here are some of the steps you can take to keep the momentum going:

- Put a team in place with people who are accountable.
- Do the simple and less costly things first; you don’t have to tackle your entire production line. Instead, you can focus on a specific initiative such as reducing inventory.
- Always get feedback from your employees and set up a way for them to share their opinions, e.g. a suggestion box, forums, etc.
- Engage everyone in the organization to gradually and continuously improve how they work on a daily basis.
- Put continuous improvement on your business agenda, and make sure it’s a regular item at company meetings.
- Be sure your customers are involved in your initiatives. Their input is invaluable, and they can help you develop products that add value.
- Keep an eye on your industry and follow best practices.
- Make continuous improvement a part of your business culture.

KEY LEAN TOOLS AND TECHNIQUES

In order to apply Lean principles in operation management, some tools and techniques are Kan-ban, Kaizen, operator care program, setup/quick change over, and 5S. These have proven especially effective in reducing waste and improving sustainability in operations. Some of the Lean tools are briefly explained as follows:

- Kan-ban System or pull-systems: A Kan-ban is a card containing all the information required on a product, at each stage along its path to completion. It also states which parts are needed for subsequent processes. This concept focuses on reducing excess inventories of raw or work-in process materials which cannot be consumed immediately by the production cycle.
- Operator care programs: These IT focused programs develop standard practices within the operating units that help decrease variation in the manufacturing process. This in turn, reduces the amount of product and raw materials wasted.
- Set up/Quick change over or SMED (single minute exchange of dies): The practice helps the organization reduce changeover durations in order to adjust the manufacturing process based on product demand. It has the potential to reduce the amount of waste generated from raw and unprocessed materials left over in the manufacturing processes.
NJMEP Lean Success Stories - SABERT CORPORATION

New Processes and Procedures Improve Packaging Manufacturer's Competitiveness

Sabert Corporation is a global leader and innovator in the food packaging industry. Since 1983, Sabert has been designing, manufacturing and distributing quality, cost-effective solutions for packaging, displaying, serving and storing fine food. The company, which is headquartered in Sayreville, New Jersey, employees 248 people. Sabert also has North American facilities in California and Kentucky, as well as manufacturing facilities in Belgium, Europe and Zhongshan, China.

Sabert's founder, Albert Salama founded the company when he was 32 years old. Based on a vision he had, that lifestyles would eventually drive food choices just as much as taste and against the advice of friends and colleagues, he resigned from a position as vice president of a major global bank and began selling plastic food trays out of his apartment. He launched the company with his own modest savings and no investors, and it is now an industry frontrunner serving many businesses, from small independent caterers to multinational clients. The company's original mission, to enhance and advance the way people enjoy food, continues to guide the company's success today.

Over the past decade, Sabert's annual sales revenue has grown significantly, with a compound annual growth rate of 16 percent. Along the way, Salama built new headquarters in Sayreville, and added or expanded facilities in Kentucky, California, Belgium and China. Today, Sabert is one of the largest providers of short-life food containers, and unlike its peers, almost all of its growth has been organic. Mr. Salama's vision was on target and twenty-four years later, he received the Ernst and Young Entrepreneur of the Year™ 2014 Award. Sabert has never rested on its laurels. In 2002 Albert Salama and two others from the company participated in a Lean Manufacturing workshop and followed up with New Jersey Manufacturing Extension Program, Inc. (NJMEP) on a Product Development project.

When Sabert wanted to improve production efficiency, they met with NJMEP. The company felt that the skills of their current workers needed improvement as well as communication between workers and management. Low productivity as a result of inefficiencies was also a problem. Long changeovers of almost 2 hours negatively impacted production. Although Sabert had a number of internal experts experienced in Lean, and a QA person with a black belt in Six Sigma the company wanted to work with NJMEP to design and implement a training plan for its workforce.

After assessing the needs of the client, a plan to introduce Lean Manufacturing to Sabert was proposed and accepted. In addition to the Lean implementation plan, NJMEP identified the company as an excellent candidate for a New Jersey Department of Labor Customized Training Grant. Assisting in both the application and administration of the grant, NJMEP was able to make the implementation of Lean a simple and cost effective process. When asked about the grant process, Kregg Salvino, Director EHS, responded, "NJMEP assisted Sabert from start to finish with every NJ DOL requirement on this grant. They made the initial application submittal process very simple which we knew without their help would have been a nightmare."

Over a course of one-year, Sabert and NJMEP educated 107 employees in the principles and tools necessary for transitioning to a Lean organization. Upon completion of the training the company's employees were able to improve productivity by becoming more efficient in their practices i.e. changeover times were reduced and organizing the workplace based on 5S saved time and steps. In addition, communication throughout the organization improved as a result of the Team Building work.

When surveyed by an independent group 6-12 months after completion of the project on the impact the program had on its company, Sabert reported they:

- Achieved 2% in cost savings
- Increased sales by 9.3%
- Hired 10 new employees
- Invested $75,000 in workforce development and $500,000 in new processes and products
- Saved $73,600 in training cost as a direct result of the NJDOL investment in the company

Kregg Salvino, Director EHS, Sabert Corp., spoke of his work with NJMEP, "NJMEP showed competence and experience in regard to the Lean Initiative in which they helped us implement. They demonstrated to us why they are considered one of the best Lean Implementation Experts in New Jersey. The project helped us identify wasted efforts and help us reduced costs in our manufacturing operations. We intend to utilize NJMEP on additional training and cost savings projects in the future."
NJMEP Lean Success Stories - CALIFORNIA CLOSETS

Commitment To Continuous Improvement Results In Major Process Improvements

California Closets is a national franchise that pioneered custom storage solutions in 1978. Marty and Ruthie Ginsberg first opened California Closets doors in Fairfield, New Jersey 28 years ago. The Ginsberg’s motto since day one has been to provide North Jersey residents with the quality materials, beautiful craftsmanship and impeccable customer service California Closets is famous for across America. Their deep understanding of the particular storage challenges in North Jersey homes helped them build a highly successful company.

Manufacturing locally has many benefits, it also has many challenges when running a manufacturing facility as well as a topnotch design and problem-solving company. No project is too large, small or unconventional, so having efficient manufacturing processes is key to remaining profitable. Mr. Ginsberg needed assurance that his production floor was just that.

Over the years, Marty worked closely with New Jersey Manufacturing Extension Program, Inc. (NJMEP) to transform his shop by implementing Lean Manufacturing. Lean is a journey, not one stop and you’re done. Now it was time to take another step, the introduction of Lean to Middle and Upper management. Naturally, he turned to NJMEP. NJMEP laid out a plan including the Introduction of Upper and Middle management to Continuous Improvement/Lean concepts via access to E based Lean Focused Manufacturing Software provided by Radical Transformation LLC.

To begin the process, the team physically value stream mapped the order to cash process from inception to loading the vans and trucks. This included a current state value stream map and a future state value stream map with ongoing refinements discovered through Kaizen events. The goal – eliminate any bottlenecks found in the system in order to accommodate a 1.5 times increase in sales in the same footprint currently in use.

Specific attention was made towards developing the mindset and lean culture of the three identified members of the operations management team to think and act Lean. The strategy for this segment California Closets Lean Journey included:

- Increase cycles at the saw
- Increase Meters of banding
- Improve Defect Management
- Reduce payroll to revenue ratio to less than 4%
- Implement parts Kanban systems
- Reduce scrap material at both the pole cutting stations and saws
- Improve first-time pass rates.
- Develop root cause analysis skill with the management team

CALIFORNIA CLOSETS
General Devices Grows to Meet Demand

For over 30 years, General Devices (GD) has been the leader in providing products and solutions for connecting EMS prehospital care providers with emergency medicine in the hospital.

As GD’s products handle thousands of ambulance emergency calls a day, GD believes strongly in streamlining response time for efficient customer service. Designing such product innovations as the CAREpoint™ Workstation and e-Bridge Mobile Telemedicine, enabling hospital emergency departments to access all EMS-hospital communications from a single device, GD has made it their mission to provide Responsive Innovation to those first responders and hospitals working to provide emergency care to the public.

In keeping with their goal of delivering top quality products to their clients, GD acquired new technologies to offer the most modern means of service and expand their reach. As the need for their services continued to grow, GD became concerned they would not be able to meet the rapidly increasing demand. Along with this growth came a need for a more streamlined sales approach, as well as the management teams necessary to handle the increase.

NJMEP employed Lean manufacturing techniques to help implement newer, more efficient business practices into GD’s operation. By doing so, NJMEP enabled GD to integrate the latest technology into their services, allowing them to better help clients and continue their growth by incorporating NJMEP’s expertise. Several training programs were initiated to facilitate GD’s needs.

Training Programs Included:
- Admin Lean
- GMP Awareness
- Customer Service
- Managing People and Performance
- Innovation Training

Using the newly acquired Lean training, General Devices was able to parse out administrative roles to an expanded Admin team. This addition not only increased productivity but enabled them to add products to their product line, further increasing sales.

NJMEP provided the knowledge and resources necessary to implement Lean Manufacturing practices for General Devices. The following are a direct result of those improvements.
- Increased Sales: $50,000.00
- Retained Sales: $200,000.00
- Cost Savings: $80,000.00

Along with employing Lean to reduce waste and increase productivity, GD was able to grow the size of their sales team, enabling them to focus on growing their business.

“As a New Jersey-based manufacturer of medical devices and software, we appreciate NJMEP’s assistance in improving our company’s operations through their training programs, which have helped us maintain our competitive advantage.”

Curt Bashford, CEO
Mincing Spice Streamlines Operations For Greater Success

Mincing Overseas Spice Company, owned and operated by the Ruparelia Family for over thirty years, has been a mainstay in the spice market since 1927. Offering a full complement of herbs and spices, Mincing Overseas Spice Company provides premium ingredients to clients across the world.

In 1978, Mincing entered the spice cleaning and manufacturing field to complement its trade business. In 1986, Mincing purchased Overseas Spice Company, a grinder and blender of spices, and longtime supplier to the bakery industry with special expertise in cinnamon, ground nutmeg, mace, and ginger.

Mincing continued to expand, concentrating its business activities to industrial users of spices. Along with growth, came the need for a larger facility to accommodate their success. With the acquisition of more modern technologies, it became necessary for Mincing Overseas Spice Company to relocate into their current 50,000 square foot manufacturing facility.

Their rapid growth coupled with the increased facility size demanded a different way of doing business. NJMEP was there to assist with customized training programs and practical industry improvements for success.

NJMEP utilized its resources to introduce Lean HR and Manufacturing concepts to streamline their business and internal development. Furthermore, NJMEP assisted in the acquisition of an ERP system to manage the increased need for supply chain management, sales order processing, and human resources support.

- Provided guidance in the Selection of an ERP system
- Lean Manufacturing Training
- Lean Human Resource Development Training

The following statistics are a direct result of NJMEP’s involvement with the Mincing Overseas Spice Company, and Mincing’s willingness to adopt key business improvements to ensure continued success.

- Increased Sales Amount: $800,000.00
- Retained Sales Amount: $1,500,000.00
- Cost Savings Amount: $15,000.00
- Plant Equipment Savings Amount: $250,000.00
- Info System Savings Amount: $150,000.00

The President and CEO of Mincing Spice, Manoj Ruparelia, had this to say about his experience working with NJMEP, “Mincing Spice Company and NJMEP’s relationship began in 1996. Since then, Mincing has grown to be globally recognized in the food industry, and contributions by NJMEP have been beneficial in Mincing’s growth.”
Conclusion

Lean manufacturing reflects a business’ approach towards applying effective solutions to overcome workforce and manufacturing problems, that create competitive products that are embraced by customers.

Lean manufacturing can only be considered “Lean” because it consumes less of all the available organizational resources relative to traditional “mass” production.

A strength-based approach towards Lean thinking creates a focused and committed mind set that takes improvement initiatives with a keen search for new, lasting possibilities rather than overcoming problems in the short run. The Lean approach to managing the workforce is an effective way to achieve these objectives. With Lean labor, manufacturers gain a proven way to attain new efficiencies, reduce and control costs, and increase overall productivity.

It is a people process, not a tool installation exercise. It is a journey, not an event. It’s an intense and proactive effort that requires planning, resources and day-to-day management attention and coaching. It will take time to change and create a new Lean culture. Those who endeavor to pursue it holistically will reap the significant performance gains that will allow them to win in increasingly competitive markets, provide significant shareholder value and by enabling an organization of engaged and empowered problem solvers.

About NJMEP

NJMEP has been a national leader and advocate of New Jersey manufacturers for more than 20 years. Our value is provided through available services most meaningful to helping companies improve performance - in developing a company’s purpose, their processes and people.

Our connection through the NIST MEP national network distinguishes us from other consulting firms and training providers. We offer a wide range of services and initiatives to enable manufacturers to identify opportunities that will accelerate and strengthen growth and competitiveness in the global marketplace.

We use continuous improvement engagement methodology to build a culture that is receptive to change and focused on sustaining long-term improvements. Our team utilizes proven tools and techniques to implement a broad range of services – including growth strategies, organizational change, Lean, Six Sigma, quality management, supply chain information technology, export, energy, workforce development and apprenticeships.

NJMEP’s Services Include:

- Growth and innovation strategies
- Change management techniques
- Information technology
- Training and retraining employees for technology adoption and skill enhancements
- Energy and environmental services
- Assistance in meeting quality certification improvements, such as those as for ISO 9001 and AS9100
- Productivity improvements
- Food and safety compliance
A TEAM OF EXPERTS
NJMEP Has built an accomplished team of carefully selected leaders who know the food industry and excel at working across the entire food supply chain. Our team averages over 25 years of hands-on experience working for industry, as consultants, and as operational managers. We have dealt with many of the challenges our clients face; we have lived the types of processes we help design and implement.

ABOUT THE MEP NETWORK
NJMEP is a not-for-profit 501(c)3 organization affiliated with The National Institute of Standards and Technology’s (NIST) Hollings Manufacturing Extension Partnership (MEP), a network of approximately 60 MEP centers across the U.S. and Puerto Rico. NJMEP receives some investment and support at the federal level by NIST MEP. NJMEP also provides fee-based consultative services to the New Jersey business community.

INTEGRALLY INVOLVED
Our senior staff is integrally involved on every project, offering perspective and interacting directly with our clients to reduce risks and verify compliance. We have led management, compliance, and assurance activities to meet business strategy, HACCP, FDA GMP, GFSI, EHS, and overall operations management requirements. Our team members are certified to a number of standards. Staff certifications include HACCP, Internal Audit, BRC, FSSC22000, SQF, and IFS.

For more information, please contact your account manager or:
phone. 973-998-9801
e-mail. info@njmep.org
    njmep.org

SINCE 2000, NJMEP HAS HELPED MANUFACTURERS REALIZE MORE THAN $3.8 BILLION IN VALUE.

$2.8 Billion increased sales/revenue  $390 Million in process savings  $672 Million in capital investments  33,632 Jobs created and retained  $3.8 Billion in realized value

ROI IMPACT
For more than twenty years, NJMEP has helped manufacturers become more productive, profitable, and globally competitive. We don’t just claim results – NJMEP’s impact on the manufacturing community is collected by an independent, third-party.

Connect with NJMEP

facebook  twitter  linkedin  rss