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# TAKING WORK OUT OF METAL WORKING

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# METALWORKING AND LEAN MANUFACTURING: Taking Some of the Work Out of Metalworking

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Lean manufacturing is designed to eliminate waste at every production stage leading to increased value to customers. It considers the expenditure of resources in any aspect other than the direct creation of value to the end customer to be wasteful – and therefore a target for elimination from the manufacturing process. Applying the principles of lean manufacturing to metalworking can result in significant productivity gains, a higher quality product and reduced cost.

**Lean manufacturing prevents and eliminates waste from a process.** Within lean manufacturing, waste is commonly defined as a component of seven categories: over-production, waiting, transporting, inappropriate processing, unnecessary inventory, unnecessary/excess motion and defects. All of these wastes add cost to the process, and none of them add value to the customer. Lean manufacturing removes or minimizes non-value work from the manufacturing process. Top reasons for implementing lean processes into metalworking operations include:

1. Lean streamlines processes to improve efficiency, reduce manufacturing costs and speed time to market of products
2. Lean removes waste to eliminate time spent on unnecessary tasks
3. Lean manufacturing can create a safer working environment for employees because the elimination of waste reduces unnecessary steps in the process
4. Because continuous improvement is a key element of lean, it requires the focus of all team members which can build teamwork, cooperation and employee commitment

This white paper will provide best practices for eliminating waste within the metalworking production cycle and improving worker efficiency. These tips will help organizations improve productivity and enhance their metalworking operations.

## **Tip 1: Touch it once (or as few times as possible)**

Limiting the number of times anything is “touched” during the metalworking process enhances productivity. To help reduce the number of times anything is “touched,” **use products that have a long life**. For example, different coolants require different change out rates – ranging from weekly or monthly to semi-annually or annually. By reducing touches from 12 or even 52 times in a year to one, organizations can drive significant productivity gains by selecting a coolant with a long life. Another area that is frequently overlooked but is an area for substantial productivity gains is metal marking. **Use marking products that are resistant to coolants** so that when the metal is machined, the markings don’t wash off and need to be reapplied.

## **Tip 2: Have the right tools at the right place**

For an operation to run leanly, it is imperative to **have all of the tools necessary to complete the task readily available – and nothing else**. For example, a cell for assembling a part may require a 5/16 wrench. Therefore, it is necessary to have this wrench at the workstation – but having a full

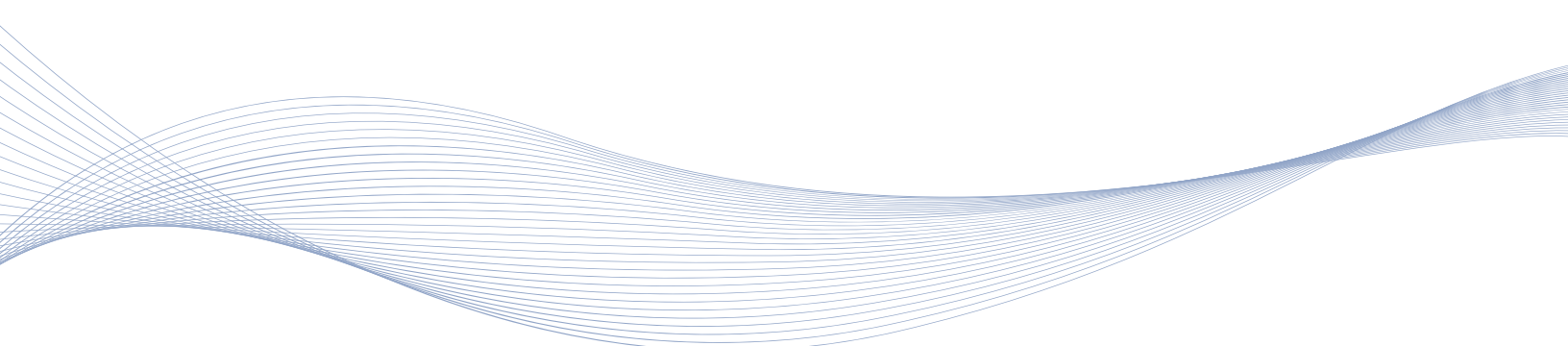
set of wrenches present will clutter the station and confuse the process. Another important area to consider when developing a plan to improve workstation efficiency is coolant dilution. Workers frequently waste time looking for tools to mix and dilute coolant. Make sure each station has a mixer to dilute the coolant at the proper dilution ratio. If the process is done manually, ensure that each station has a measuring cup marked appropriately for easily mixing five gallon buckets of coolant.

For every product used in metalworking, the details regarding how to properly use the product and its composition should also be readily available on the product label and the manufacturer's website. Use products that come with good (and easily accessible) MSDS sheets. Easy access to the products and good information about those products will improve productivity and ensure the products are being used at an optimal level.

### **Tip 3: Eliminate waste**

Waste elimination (from any part of the business) is one of the most effective ways to increase profitability. To eliminate waste, it is important to first understand what waste is and where it exists. So, what exactly is waste? Traditional lean manufacturing identifies seven key areas of waste, which are typically referred to as "The Seven Deadly Wastes." These include:

- 1. Overproduction** - This means producing something before it is needed. This can be costly to a manufacturing plant because it leads to excess inventory which can create excessive lead times, result in high storage costs and make it difficult to detect defects. The easy way of fixing this problem is simply to slow down production. However, overproduction often occurs because it is being used to mask other underlying problems and inefficiencies. Ideally, an organization will schedule and produce only what can be immediately sold and improve changeover/set-up capability.
- 2. Waiting** - When goods are not moving or being processed, they are wasting time waiting for the next step in production (no value is being added). The bulk of a product's lead time is tied up in waiting for the next step in the process. This is generally because the distances between work stations are too great, material flow is poor and/or production runs are too long. Linking processes so that the flow is continuous and there are minimal (or no) buffers between steps can dramatically reduce waiting.
- 3. Transporting** - Transporting raw materials, work-in-process or finished goods adds no value to the product. Movement and excessive handling may cause damage to the product and offer another opportunity for a finished good to deteriorate. Furthermore, shipping adds another cost that adds no value to the customer. Because of the perceived costs of moving processes and equipment closer together, transportation can be difficult to optimize within the process. Mapping product flows can make this easier to visualize however.
- 4. Over-processing** - This involves using more processing than is necessary to produce what the customer wants. Many organizations use high-end, expensive equipment when it isn't necessary. Organizations should compare customer requirements to manufacturing specifications and look for areas that can be simplified within the manufacturing process. Areas to consider include using smaller, more flexible equipment when possible, creating manufacturing cells and combining steps.



5. **Excess motion** – This refers to the unnecessary moving of people and is related to ergonomics within the manufacturing operation. Organizations should ensure that work areas are logically organized and use equipment that limits stress on a worker’s body wherever possible.
6. **Unnecessary inventory** – Excess inventory consumes space, delays the identification of problems, increases lead times and inhibits communication. By achieving a better flow between work centers, organizations can greatly reduce their inventories and associated costs while improving customer service.
7. **Defects** – Production that results in scrap or requires rework has a direct impact on an organization’s bottom line. In fact, the total cost of defects can be a significant portion of an organization’s total manufacturing costs. By designing processes that are less likely to produce defects and detect abnormalities quickly, organizations can reduce the costs of defects. Companies should look for the most common defect and determine why it occurs, then create a consistent method of manufacturing that product.

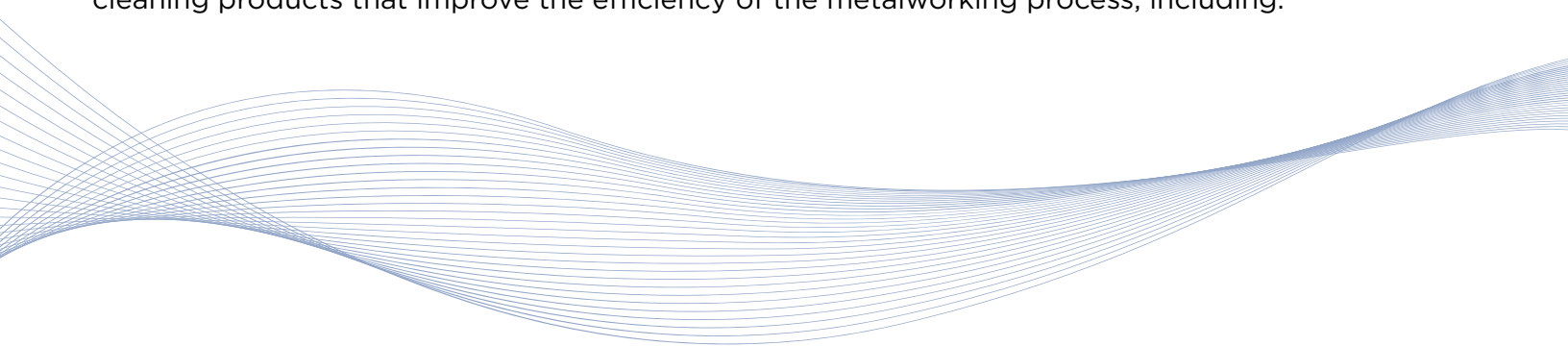
#### **Tip 4: Work safe**

In order to run a lean manufacturing operation, **organizations need to protect their highly skilled workers.** A critical element of running a safe manufacturing plant is cleanliness. It is important to keep work areas clean and sanitary to limit the spread of infection and viruses. Quality cleaning solutions and tools are essential to this process. To save time and eliminate the need for unnecessary solutions, provide workers with an EPA-registered, professional strength, multi-purpose cleaner and disinfectant. Select a versatile solution that has the power to clean, disinfect viruses and bacteria, sanitize, kill fungus, deodorize, degrease and remove stains on virtually any hard surface. Be sure the cleaner has a dwell time of 45 seconds or less. Some products require a 10-minute dwell time which increases the likelihood of human error when cleaning. Germicidal wipes are another time-efficient, yet effective cleaning product to employ. They are easy-to-use and can clean, disinfect and deodorize. Plant managers should provide these wipes to all employees to help them keep their workstations sanitized.

Germs also must be stopped at the source – people’s hands. According to the Centers for Disease Control and Prevention (CDC), washing hands properly is one of the most effective ways to limit the spread of infection. Be sure to heavily promote handwashing on the plant floor, especially during flu season. For further protection, supply workers with disposable hand sanitizing wipes that have the capability to destroy 99.9 percent of germs and MRSA. Select pre-moistened wipes as they offer the precise dilution ratio to successfully remove disease causing germs and bacteria from skin. Because they are disposable, wipes also prevent contamination that its gel counterparts may cause. By making them easily accessible throughout the plant floor, workers will be more productive since they won’t have to waste time walking to washing stations or restrooms to clean their hands.

#### **Choosing the right products**

From just-in-time inventory delivery to optimizing plant floor layout, there are numerous ways to implement lean manufacturing philosophies within the manufacturing process. A frequently overlooked and easy way to do so however is through proper MRO chemical, marking product and cleaning product selection. ITW Pro Brands manufactures several lubricants, marking products and cleaning products that improve the efficiency of the metalworking process, including:



- **Accu-Lube Minimum Quantity Lubricants & Applicator Systems** - Accu-Lube offers a complete line of advanced metalworking lubricants for near-dry micro-lubrication cutting and grinding. Accu-Lube's near-dry lubrication applicator systems use innovative technology to focus droplets of lubricant directly onto a tool's cutting edge, providing lubrication and protection precisely where it is needed.
- **Rustlick High-Performance Metalworking Fluids** - The Rustlick product line consists of a variety of eco-friendly cutting and grinding fluids designed to lubricate and cool. Rustlick coolants are known for long sump life, advanced bioresistance and heavy-duty formulations that reduce coolant use and cut costs. Rustlick also offers dielectric fluids, rust preventatives, sump-side additives and coolant maintenance equipment.
- **LPS MRO Lubricants and Cleaners** - LPS provides high-performance maintenance chemicals to industrial, aerospace, military and telecommunications facilities worldwide. From lubricants to industrial degreasers to power fluids, LPS offers a complete line of products to eliminate redundant inventory and minimize costs, while maximizing equipment efficiency and productivity.
- **DYKEM Industrial Marking Products** - DYKEM is one of the world's most popular brands of paint, ink and specialty markers, and layout fluids and staining colors. The products are formulated for the most rugged industrial environments and designed to withstand the test of time. DYKEM industrial marking products deliver vivid color and durable identification wherever a mark is needed.
- **SCRUBS in-a-Bucket®** - Thoroughly clean hands and surfaces ANYWHERE, ANYPLACE, ANYTIME!® For decades, professional workers have relied on the cleaning power of SCRUBS® Hand Cleaner Towels to clean their hands, tools and surfaces when soap and water are not available.
- **Spray Nine® Multi-Purpose Cleaner and Disinfectant** - Spray Nine, is not only one of the most effective cleaners and degreasers available, but it's also a disinfectant and deodorizer that sanitizes in 10 seconds, disinfects for viruses in 30 seconds and kills 99.9 percent of germs in 45 seconds. It's a single product that does the job of 9 separate cleaners.








## Conclusion

Organizations are constantly looking for ways to increase productivity, reduce costs and improve their bottom lines. To do so, many companies are implementing lean manufacturing principles within their metalworking operations. To help companies improve metalworking efficiency, organizations should adapt lean manufacturing best practices and evaluate the MRO chemicals and products they are using within their processes. It is important to consider how those products contribute to leaner and more efficient processes. Additionally, companies should ensure they are protecting their workers by providing hand sanitizing wipes and cleaning solution at workstations to create a safe and sanitary working environment. By employing best practices, organizations can realize significant savings, while ensuring a safe and productive working environment.

***To learn more about how ITW Pro Brands can help you  
 “take the work out of metalworking,”  
 contact your ITW Pro Brands rep today,  
 visit [www.itwprobrands.com](http://www.itwprobrands.com) or call 1-800-443-9536.***