

Lean practices in the metal finishing industry

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Abstract:

Lean practices are production practices that target the expenditure of resources for any goal other than the creation of value for the end customer. Therefore the practice works to identify and eliminate wasteful practices and focus on the value creation process. The objective in the practice is to focus on value creation by working smarter and preserving value with less work.

From the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for. The essence therefore is to achieve maximum efficiency by evaluating production processes and identifying anything that is being done that a customer will not pay for. For example, waiting for the parts to start a production process on the finishing line is not something the customer will pay for if the company tries to "bill" for wait time.

All anodizers can use lean practices to work smarter and be more profitable without a large capital investment. The investment is in and with the people that work in the shop; identifying bottlenecks, inefficient flow, lack of resources and steps that do not have value to the customer.

"Lean" as used in manufacturing and particularly metal finishing is a state of mind. By this I mean that it is not a plan or prescription that you can acquire and give to the plant manager and expect implementation and results. Lean is a philosophy and a never ending, ongoing process like the institution of comprehensive quality program.

Lean is about eliminating "waste".

"Waste" is traditionally defined (when addressing "lean" concepts) as anything that does not add value to the end product, but has attendant cost, and for which the customer would be unwilling to pay. "Value Added" activity is one that increases the market value of the product or service. "Non Value Added" does not add market value to the product or service and is therefore unnecessary. The concept of "value added" can vary according to who is looking at the operation or activity. There are many examples of "non value added" activities for which the customer is willing to pay. Take for example, compliance testing for certification to a specification that is required by the customer. The testing does not change part that has been anodized or coated.

The part is done; the process is over. By our definition the testing of coupons for compliance adds no value to the physical part yet the customer wants the assurance and will pay for the "required" non-value-added service. Therefore, the essence of "lean" is to measure all activity from the customer's point of view.

The typical examples are:

1. **Excess Inventory;** too much finished goods held in inventory and therefore representing unproductive use of capital.
2. **Over Production;** tied to excess inventory, over production represents the use of production resources when they could be used for product that is in demand and salable currently.
3. **Transport;** the unnecessary or excessive movement of parts or components both internally (in the shop) and externally (via freight carrier or truck).
4. **Process;** this refers to excessive process steps or unnecessary handling, paperwork, dealing with customer caused problems (i.e. unnecessarily dirty parts).
5. **Scrap and Rework;** parts that fail inspection due to process errors are extremely costly and time consuming. This is an area of great opportunity for committed anodizers who understand proactive vs. reactive management.
6. **Waiting;** there are many reasons why people wait; for material, tools, inspections, information from management, engineering, etc., equipment cycle times.
7. **Motion;** this is a waste category that refers to people in the shop and how the work flows through their work area and how efficient that flow is. If workers need to look for tools or parts it is wasted motion.
8. **Underutilized people;** watching the process running with nothing else to do.

The examples of waste listed here are symptoms of inefficiency and lack of control of the operations. Recognizing waste leads to identifying the "root cause" of the problem. Underlying any waste is the systemic problem that reflects on the people, materials, machines, operating systems and information used in the operation.

How do I make my metal finishing shop a “lean” operation?

Embracing Lean requires a company-wide, top-down commitment to a philosophy of change for the better of everyone that works for the company. That’s why it is a “state of mind”. The implementation takes great commitment but more importantly, the continuation of that commitment must be relentless. In order to carry out this implementation one must acquire certain skills or tools of “lean” to be successful.

The tools have familiar names but usually people without familiarity with lean disciplines have only a superficial understanding of the exact disciplines. They are:

- 1. Standardized Work**
- 2. 5S System**
- 3. Visual Controls**
- 4. Plant Layout**

1. Standardized Work is the implementation of standard processes that have been proven reliable, repeatable, safe and applicable to all tasks or processes in a sequence that is known to be successful; and done by the best combination of material, machines, methods, and people.

2. 5S System:

Sort to eliminate clutter: if it isn’t needed, get rid of it.

Set in order: Organize and label everything; have a place for everything.

Shine: Clean the whole building inside and out.

Standardize: Keep everything maintained and in good repair.

Sustain: Maintain discipline throughout the organization and support this culture.

Workplace organization is the objective of the 5S System. In an organized workplace, people know where things belong and can visually understand when things are in order. It affects workers very positively, reduces accidents, improves efficiency, reduces wasted motion because search time is reduced, reduces contamination (chemical, biological, etc.), provides visual workplace control and becomes the platform for other improvements.

3. Visual Controls: Simple visual signals give shop workers information to make the right decisions. They are efficient, self-regulation, and worker managed. This is management of the processes in the shop by using “sight” of signals that alert

workers and permit quick, automatic action. Examples include color coding of tools, masking materials, traveler folders and papers, work areas, lining the work floor to delineate use of certain areas. These techniques permit ease of understanding, support a diverse workforce, support workplace safety, and permit both workers and managers to assess the workplace quickly and accurately.

4. Plant Layout: Plant layout can affect efficiency in a number of ways. By co-locating processes that integrate easily, one reduces the movement of people and materials, work in process and permits a better flow of production. Additionally it facilitates better communication and maximizes floor space utilization and shortens material handling.