

## Implementing 5S Workplace Organization Methodology Programs In Manufacturing Facilities



Consolidating stored items into the smallest possible footprint yields benefits ranging from more efficient use of space, faster and easier retrieval and an improved appearance.

Many manufacturing facilities have opted to follow the path towards a “5S” workplace organizational and housekeeping methodology as part of continuous improvement or lean manufacturing processes.

5S is a system to reduce waste and optimize productivity through maintaining an orderly workplace and using visual cues to achieve more consistent operational results (see chart on page 3). The term refers to five steps – sort, set in order, shine, standardize, and sustain – that are also sometimes known as the 5 pillars of a visual workplace. 5S programs are usually implemented by small teams working together to get materials closer to operations, right at workers’ fingertips and organized and labeled to facilitate operations with the smallest amount of wasted time and materials.

The 5S system is a good starting point for all improvement efforts aiming to drive out waste from the manufacturing process, and ultimately improve a company’s bottom line by improving products and services, and lowering costs. Many companies are seeking to making operations more efficient, and the concept is especially attractive to older manufacturing facilities looking to improve the bottom line by reducing their costs.

“A place for everything, and everything in its place” is the mantra of the 5S method, and storage and workspace systems such as those provided by LISTA International allow improved organization and maximum use of cubic space for the highest density storage. The result is an improved manufacturing process and the lowest overall cost for goods produced.

### The 5 Pillars of a Visual Workplace

Implementing the 5S method means cleaning up and organizing the workplace in its existing configuration. It is typically the first lean method that organizations implement. This lean method encourages workers to improve their working conditions and helps them to learn to reduce waste, unplanned downtime, and in-process inventory.

A typical 5S implementation would result in significant reductions in the square footage of space needed for existing operations. It also would result in the organization of tools and materials into labeled and color coded storage locations, as well as “kits” that contain just what is needed to perform a task.

The 5S methodology is a simple and universal approach that works in companies all over the world. It is essentially a support to such other manufacturing improvements as just-in-time (JIT) production, cellular manufacturing, total quality management (TQM), or six sigma initiatives, and is also a great contributor to making the work-place a better place to spend time.



Fewer steps and greater organization mean less waste.



Small teams work closely together to plan the greatest efficiency and productivity in operations and processes.

Table 1 (page 3) provides an overview of the 5 pillars, with a brief definition of what the step means in a manufacturing context, why it's important, and the list of problems it avoids if implemented.

Benefits to the company from using the 5S methodology include raising quality, lowering costs, promoting safety, building customer confidence, increasing factory up-time, and lowering repair costs.

The 5S methodology is typically implemented using a 3-step process, which includes establishing a cross functional team (including employees that work in the associated areas), touring all areas associated with manufacturing process under review, and brainstorming on ways to improve organization to reduce waste. For example, factories have more than their share of searching waste. It is not unusual for a three hour changeover routine to include 30 minutes of searching. When attempting to reduce changeover time radically (for example, going from 3 hours to 10 minutes), there is clearly no room for 30 minutes of searching waste.

Value stream mapping (VSM) can be used in the 5S process to analyze the material, process, and information flow. The information is used to develop a current state map, which sets out how things have been done in the past. The team then analyzes the current state map to identify opportunities for workplace organization and house-keeping improvements. A wide range of ideas is considered – while all ideas won't end up being viable, all are worthy of investigation. The key is to observe non value added processes and create an environment to promote value added work through waste elimination.

Finally, the team envisions a future state based on the exercise and begins implementing the future state. The process is iterative; the future state becomes the current state, and a continuous improvement process should be used to identify

new ways to reduce waste. Waste is defined very broadly, and includes things like waste in the movement of material, carrying too much inventory, defects or rework, producing scrap, waiting or unnecessary motion.

Some examples include waste of motion because the person sent to get a part or tool could not find it; searching waste because no one can find the key to the locked cabinet that contains needed tools; waste of defective products because defective parts were not separated properly and used by mistake; and even waste caused by unsafe conditions, as boxes of supplies that are left in a walkway, causing someone to trip and get injured.

For example, team members might observe workers walking long distances to obtain needed parts, or spending time reaching into bins on shelves to find parts. Or they may identify hardware, like nuts, bolts and screws that are used in a certain area, but stored in a central storage facility far away from the point of use. The goal of the VSM is for the team to walk the process, and identify what operators really need versus what they receive.



Open shelving (left) is very inefficient at storing small items. High density drawer and shelf storage (right) enables storage of small items in right-sized compartments, increasing cubic capacity and organization.

## The Role of Storage in the 5S Workplace Organization Methodology

As noted, one of the 5S pillars is identifying and eliminating many kinds of waste, including time wasted searching for items, waste due to difficulty in using items, and waste due to difficulty in returning items. Storage solutions play an important part in implementing waste elimination through space reduction, organization improvement, and inventory

## TABLE 1 – THE PILLARS OF 5S

PILLAR	WHAT DOES IT MEAN?	WHY IS IT IMPORTANT?	WHAT PROBLEMS ARE AVOIDED?
<b>SORT</b>	<ul style="list-style-type: none"> <li>Remove all items not needed for current production operations.</li> <li>Leave only the bare essentials: When in doubt, throw it out.</li> </ul> 	<ul style="list-style-type: none"> <li>Space, time, money, energy, and other resources can be managed and used most effectively.</li> <li>Reduces problems and annoyances in the work flow.</li> <li>Improves communication between workers.</li> <li>Increases product quality.</li> <li>Enhances productivity.</li> </ul>	<ul style="list-style-type: none"> <li>The factory becomes increasingly crowded and hard to work in.</li> <li>Storage of unneeded items gets in the way of communication.</li> <li>Time wasted searching for parts/tools.</li> <li>Unneeded inventory and machinery are costly to maintain.</li> <li>Excess stock hides production problems.</li> <li>Unneeded items and equipment make it harder to improve the process flow.</li> </ul>
<b>SET IN ORDER</b>	<ul style="list-style-type: none"> <li>Arrange needed items so that they are easy to use.</li> <li>Label items so that anyone can find them or put them away.</li> </ul> 	<ul style="list-style-type: none"> <li>Eliminates many kinds of waste, including:               <ul style="list-style-type: none"> <li>Searching waste.</li> <li>Waste due to difficulty in using items.</li> <li>Waste due to difficulty in returning items.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Motion waste.</li> <li>Searching waste.</li> <li>Waste of human energy.</li> <li>Waste of excess inventory.</li> <li>Waste of defective products.</li> <li>Waste of unsafe conditions.</li> </ul>
<b>SHINE</b>	<ul style="list-style-type: none"> <li>Keep everything, every day, swept and clean.</li> </ul> 	<ul style="list-style-type: none"> <li>Turn the workplace into a clean bright place where everyone will enjoy working.</li> <li>Keep things in a condition so they are ready to be used when needed.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of sunlight can lead to poor morale and inefficient work.</li> <li>Defects are less obvious.</li> <li>Puddles of oil and water cause slipping and injuries.</li> <li>Machines that do not receive sufficient maintenance tend to break down and cause defects.</li> </ul>
<b>STANDARDIZE</b>	<ul style="list-style-type: none"> <li>Integrates Sort, Set in Order, and Shine into a unified whole.</li> </ul> 	<ul style="list-style-type: none"> <li>By ensuring conditions do not deteriorate to former state, facilitates implementation of the first three pillars.</li> </ul>	<ul style="list-style-type: none"> <li>Conditions go back to their old undesirable levels.</li> <li>Work areas are dirty and cluttered.</li> <li>Tool storage sites become disorganized and time wasted searching for tools.</li> <li>Clutter starts to accumulate over time.</li> <li>Backsliding occurs.</li> </ul>
<b>SUSTAIN</b>	<ul style="list-style-type: none"> <li>Making a habit of properly maintaining correct procedures.</li> <li>Instill discipline necessary to avoid backsliding.</li> </ul>	<ul style="list-style-type: none"> <li>Consequences of not keeping to the course of action greater than consequences of keeping to it.</li> </ul>	<ul style="list-style-type: none"> <li>Unneeded items begin piling up.</li> <li>Tools and jigs do not get returned to their designated places.</li> <li>No matter how dirty equipment becomes, nothing is done to clean it.</li> <li>Items are left in a hazardous orientation.</li> <li>Dark, dirty, disorganized work-place results in lower morale.</li> </ul>



Customizable storage solutions allow the creation of storage that accommodates a wide variety of stored item sizes. What you need, where and when you need it.

management. Storage cabinets and workbench products that allow dense storage, a smaller foot-print, and visual organization near where the tool is needed, become a key factor in implementing the 5S program.

Systems should be set up so everything has a place that is available when needed, including the manufacturing floor, areas where products are being packaged, through the equipment maintenance area. Everything should be labeled and identified. Local storage minimizes travel time, and adjustable storage and workbenches make it easier to adapt to the differing needs of individual employees.

Using Storage Walls organized with barcoded handles can reduce wasted time due to lost inventory and searching. Such systems also facilitate quick tool changes for different product lines. Storing tools next to machines in use rather than in multiple storage locations around the facility can save hours each day.



The 5S visual workplace, where tools are easy to find and located right at the work area, leads to a clean, efficient work environment.

Modular drawer storage cabinets that allow the maximum use of cubic space for the highest density storage are ideal for high-density storage of parts, tools and items of virtually any size and type. They are scalable enough to adapt to future requirements, provide maximum weight-bearing capacity, tailored drawer organization, and ergonomic item handling and access.

For example, LISTA International, a leading manufacturer of storage and workspace systems, assists companies in implementing 5S methods as part of lean manufacturing programs to drive waste out of manufacturing processes. The LISTA products offer waste elimination through space reduction, organization improvement, and inventory management.

Designed to allow dense storage and a smaller footprint, the storage cabinets make it very easy to add flexibility to production lines to facilitate faster turnaround time. The photos to the right illustrate how the proper storage unit meets the number one mantra of a 5S system for a manufacturing facility – A place for everything and everything in its place.

Storage solutions can go a long way to improve using the 5S methodology to improve manufacturing processes, enabling quicker, more efficient production, which contributes to lower overall costs.

*References:*

<http://www.epa.gov/lean/thinking/fives.htm>



A place for everything and everything in its place, clearly labeled.

