Development of 5S Implementation Aids

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Abstract

The rationale for this effort was to help Saint Gobain save time in their operations by developing 5S training materials for Saint Gobain employees. The circumstances revealed that a Standard Operating Procedure and Educational Guide would accomplish this task. The methods used were interviews of plant personnel, observing operations, and reviewing documentation. This resulted in an autonomous Standard Operating Procedure and PowerPoint training guide. Saint Gobain will now be able to train employees with new documents tailored specifically for them.

Executive Summary

5S is a methodology for organizing a workplace that brings numerous benefits to any organization that utilizes it. In order to see the full benefit, a well-planned implementation is required. Our project's primary focus was to develop a way to improve the implementation of 5S at Saint Gobain's plant 5 and plant 8 in Worcester, Massachusetts. 5S, as an organizational philosophy helps reduce multiple kinds of waste that occur during the manufacturing process. Saint Gobain's facility in Worcester presented us with a number of unique cultural and organizational challenges that we had to understand. By the end of our project, our client hoped to establish a culture of continuous improvement at Saint Gobain, and to meet their implementation targets. We hoped to aid them in these goals by helping Saint Gobain save time and make the plant more efficient. To do this, we came up with two objectives for our project: Creating an Standard Operating Procedure (SOP) and creating an Education & Training Guide (E&TG).

In order to carry out our objectives and create the SOP, our team collected information by using several methodologies. First we analyzed the problems and found out the root causes and the relations among them by using Analyzing tools such as Axiomatic Design (Suh, 1990) and 5WHYs (Chase & Jacobs, 2016). Then we went to Saint Gobain and stood at the frontline of manufacturing to get a first-hand look at the initiatives in different zones by making observations. At the same time, we interviewed some employees from different level including operators and Autonomous Team Leads (ATLs) and Value Stream Coaches (VSCs). We also reviewed the existing documents in Saint Gobain. The documents provided us ideas in our deliverables and enlightened us on creating new documents.

By using these methods, we were able to come up with relevant information to achieve our objectives. We created an SOP with detailed step by step instructions on how to conduct 5S in any zone of the factory. This document contains ideas and instructions relating to Sort, Set In Order, Shine, Standardize and Sustain. It explains in details on how a worker should go about implementing 5S at their workspace by using various tool and methods that we created for them. It also incorporates the correct usage of materials and documents that Saint Gobain has already created. For the E&TG, we focused on introducing basic concepts relevant to each S in accordance with the philosophy of the 5S methodology. This guide is a supplemental material employees can refer to whenever they are stuck on a certain S. It contains the importance, significance and examples of the various tools and methods we introduced in the SOP.

At the end of our project we were able to learn a number of valuable lessons, such as the fact that working in a manufacturing environment is extremely challenging, and requires skills that cannot often be found in normal academics. We also found that it is imperative for project teams: to posses a clear goal and scope for their project, to plan their activities well in advance, to regularly perform self-assessments, to communicate in ways that are proactive, substantive, and honest- no matter how difficult it is to accomplish. We have learned a great deal from this project and will carry it forward to future efforts.

1.0 - Introduction

In today's world, a company must continuously improve its operations and manufacturing system in order to stay competitive. There is an invaluable tool that can help achieve this: 5S. In order to successfully implement an organizational philosophy such as 5S, a great implementation and education program is needed. Proper implementation of 5S has been proven to improve efficiency and to reduce manufacturing cost and time by eliminating waste. One organization seeking to implement 5S was Saint Gobain's abrasive manufacturing plant in Worcester.

Saint Gobain is a multinational corporation, established by King Louis XIV of France in 1665. For 350 years the company has endured and has evolved from producing mirrors and glass for monarchy, to a global enterprise with brands in every corner of the construction high-performance materials industries. In 1990, Saint Gobain acquired the Worcester-based Norton Company- a world leader in abrasives. Recently, Saint Gobain has begun to implement a new operating program: World Class Manufacturing (WCM) The program introduces new manufacturing techniques and philosophies, including 5S and Lean Manufacturing. Sustainability and efficiency practices are nothing new to Saint Gobain, but this program poses unique challenges. In Worcester, the goal has been set to reach a bronze level certification by the end of the year. To do this, plants 5& 8 need to push all 56 of their zones to obtain a 50% implementation score by year's end. The plant's model and pilot areas for 5S need to reach even higher: 80% by the end of the year.

Keeping this in mind, the main goal of our project was to help improve the implementation of 5S in Saint Gobain's Worcester facility. To do this, we provided the employees adaptable education and implementation resources. The tools we provided, unlike the

ones the company already had, are suitable for each of its unique 56 zones. During this project, we also hoped to learn more about manufacturing, operational management, and working with blue-collar employees. Along the way we would learn many lessons, and grow as students and future employees.

2.0 - Background

2.1 - 5S

5S is an operational philosophy that makes up part of the Lean Manufacturing. (Chase & Jacobs, 2016) The end goal of Lean Manufacturing is to make any given system more efficient by eliminating waste caused by unnecessary labor, and a lack of organizational agility or self-awareness. 5S as a component of that goal, seeks to implement visual management in a workplace. By making a space easily manageable at a glance, it becomes easier to track performance and ensures that a workplace is operating as it should. It also works to remove and control sources of waste in a workplace.

As the name implies, there are 5 key components of 5S; Sort, Set In Order, Shine, Standardize, and Sustain. (Chase & Jacobs, 2016) Sort entails the removal of clutter and unnecessary items from a workspace and helps create space for the rest of 5S to occur. The name comes from process of "Sorting" items into categories. A key part of Sort is the setting up of a Red Tag Area, in which items are tagged for removal and placed in a temporary storage area for a limited amount of time before they are disposed of completely. Using such a system makes sure that items are disposed of promptly while still providing an opportunity for an item to be claimed before disposal.

The next S is Set In Order, in which the workplace is organized and all tools are "set in order." The basic premise behind Set In Order is to place items that are frequently used by a worker closer to them, and placing less frequently used items farther away. Set In Order also puts visual aids and controls into place that make sure that items remain organized. In our project, we found the use of labels, foam cutouts, and shadow boards to be most applicable.

Shine, the third S, is focused on a very simple premise: regular cleaning. In any workplace, it is typically expected that the area should be clean enough to be safe and functional- but according to 5S, it also serves another purpose. In theory, having a clean working environment is critical to preventative maintenance and controlling issues that can cause defects, waste, lost time, and accidents. For example, it can be far easier to notice an oil leak on a machine and floor that is clean compared to one that is stained or dirty. To accomplish this goal, Shine requires people to create a standard of what their area should look like to prevent such problems, and then to create a schedule and set of instructions that ensures each area of a workplace is cleaned regularly and correctly.

The 4th S, Standardize, is largely focused on setting standards for work and adds preventative measures to each of the other S's. A common exercise is to create a written document that describes in detail how each and every work process should be done correctly. Once done, a person can compare employee behavior against those standards to locate inconsistencies, sources of waste, and potential systemic inefficiencies. Standardize also works to make sure that a workplace does 5S activity regularly, and helps ensure that workspaces do not slip back into their pre-5S states.

Finally, the 5th S, Sustain, works to establish a culture that embraces 5S and Lean concepts, and actively practices self-improvement of the workplace and the 5S program itself. A key part of Sustain is the process of auditing, in which areas are scored and compared based on their level of 5S implementation and commitment to Sustain concepts. Performing regular audits helps operators and employees get a better idea of what is expected of them, helps them to identify problems that they can fix, and helps promote more robust communication about 5S. The most important outcome of 5S is a workplace culture that facilitates continuous

improvement, and a commitment to waste reduction, efficiency, and a transparency that makes the workplace easier to manage. By implementing all 5S's, a workplace can become more self-aware, better organized, and easier to change further- important factors not only in Lean Manufacturing, but in any organizational philosophy.

2.2 - Saint Gobain Pre-project Status

2.2.1 - Piecework

Saint Gobain has a number of unique traits that made its implementation of 5S and the creation of our primary deliverables more challenging. Before our project at Saint Gobain, a number of organizational changes had been implemented or attempted. One of the most influential in some areas was the introduction of piecework manufacturing in years prior. Under this program, employees received compensation on a per part basis rather than by an hourly rate or salary. While this program did have the desired outcome of increasing production, it was found that the program had also lead to a substantial drop in the quality and consistency of the product and generated worker dissatisfaction. Eventually, the project was abandoned and compensation was reverted to its prior format. One positive outcome of this program was the inspiration in some employees to better organize their tools and areas so as to optimize their work processes and reduce wasted time and energy. Employees that adopted such measures were found to be more receptive to 5S concepts and more open to change. These unique circumstances influenced the way in which we constructed our deliverables. In particular, these circumstances prompted us to frame Sort and Set In Order as programs possessing fundamental

concepts that Saint Gobain employees already embraced, and that work on 5S would only really be an abstraction of those concepts.

2.2.2 - Cultural Factors

Throughout the course of our project, we found that Saint Gobain's Worcester facility possessed a strong and unique workplace culture that posed significant challenges to our project and to our client. This context is important in understanding the scope and circumstances of our project. Throughout our project, we were able to make a number of useful observations. Beginning with the background of the employees themselves, we found that many of the plant's more influential figures, and in fact, most of its machine operators had deep roots. Many employees were hired directly out of high school or a trades school by Norton during the 1980's and had worked at the company for twenty or thirty years continuously. Many employees grew up in Worcester area and were themselves the children of blue-collar families. Their long history in the area and at the company allows them to identify strongly with their work and makes them unlikely to seek other form of employment. Many of the operators in the plant are skilled veterans of their craft, and possess a unique body of knowledge gained only through experience. These factors have also influenced the development of a more conservative working culture that does not readily embrace change. In light of Saint Gobain's acquisition of Norton in 1990 and the challenges created by globalization, many employees have natural concerns about job security. A general lack of reinvestment in equipment and facilities has also reinforced this perception. Many employees expressed a general attitude of doing what is required of them, and not pushing for change within the workplace.

Although Saint Gobain appeared not to have any plans to alter its workforce, and although the requirements of WCM had strict standards timelines to achieve- our project needed to take these concerns into account, and needed to expand upon employee's best attributes. Throughout our work, we took care to avoid any suggestion that implementing 5S might make employees easier to be replaced, and stressed the goal of making the workplace better organized and more efficient. During our observations, we also observed that employees took pride in their work and cared about making a quality product. Ultimately, we attempted to expand upon these positive traits and link them to aspects of 5S.

2.2.3 - Prior Organizational Efforts & WCM

In addition to piecework, Saint Gobain in Worcester had implemented a number of other programs prior to our arrival. Among these programs was an emphasis placed on quality control at all levels of production. Although we could not locate documentation for this general program, evidence of it can be found in employee attitudes and behavior. In combination with the qualities of craftsmanship as described in 2.2.2, this resulted in a workplace practice in which parts are routinely checked for defects or errors and are sent back to be repaired or replaced before they reach the end of the production line. Another major project at Saint Gobain occurred six years ago, when several production processes were moved from one building to another and areas were consolidated. After the move, a number of areas and teams had less space to work with than they did before or were forced to reorganize their workspace. The program helped ensure that areas were collocated, and that less effort was expended in moving materials back and forth; but it also alienated some employees and would make future changes more difficult.

Finally, the World Class Manufacturing (WCM) program implemented most recently, possesses multiple traits that had an effect on 5S implementation at Saint Gobain prior to our arrival. One key factor was the uniqueness of the program. Compared to a more conventional program, WCM has several key distinctions. First, is an inclusion of a 6th S: Safety. Given the unique challenges associated with this S, and our client's desire to address this aspect of WCM on their own, this 6th S was largely placed outside the scope of our project. We did however, at our client's request, include some safety-related concepts in coverage of the other S's. In addition to a 6th S, WCM and its interpretation by our client placed greater emphasis on improving the plant's implementation of Sort and Set In Order, and less emphasis on Shine. Finally, we were able to observe that the WCM program had affected a relatively mild impact on the Worcester facility until now, and that significant effort would be required to keep pace with its implementation timetable.

3.0 - Objective

Our overall objective was to help Saint Gobain with their endeavors in implementing 5S throughout the factory to ultimately be organized and save time. In order to achieve that we came up with two objectives to reach our goal.

First objective was to develop a Standard Operating Procedure in the form of a set of Instructions on each S of the 5S methodology to guide employees and improve their work in the factory. In order to achieve this we delved deep into the inner-workings of 5S. We came up with detailed step by step implementation of 5S across the plant for Tier 1 and Tier 2 employees: Operators, Leads and Supervisors.

Our second objective was to develop an Educational and Training Guide with descriptive information on each part of the 5S methodology. This included importance and significance of each S in accordance with the philosophy of 5S. In order to achieve this we went into descriptions of every S with definitions and examples of various visual tools and techniques that were tailored specifically for Saint Gobain workers at the shop floors.

4.0 - Methodology

4.1 - Gantt Chart

The goal of this project is to help Saint Gobain save time and improve efficiency by implementing 5S, and our sponsor's goal is to reach at least 50% 5S goals in all the areas and 80% at model/pilot areas. The project started from end of august and went all the way to mid-December. Our plan was making observations in the first month, and then creating an SOP document in the next stage. Our team created a Gantt Chart (Wilson, 2003) to follow in order to track our work. Here is our Gantt Chart:

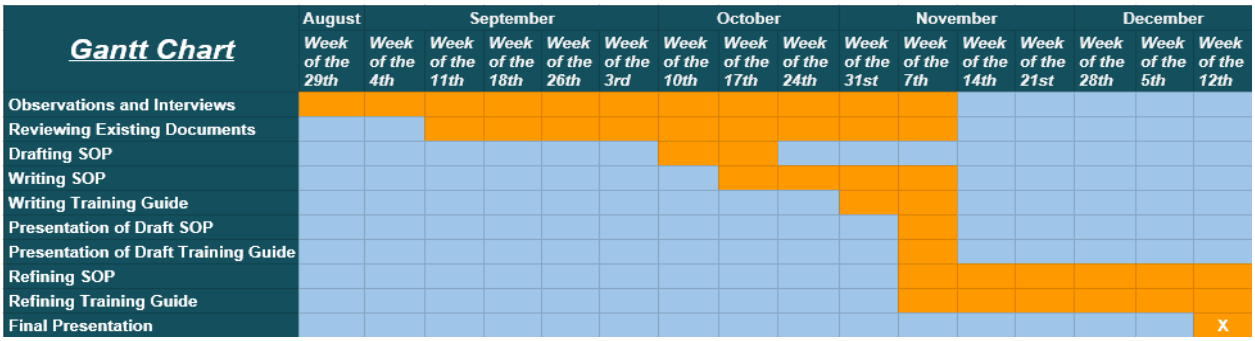

Figure 1: Gantt Chart

4.2 - Defining the Problem

Saint Gobain has started the implementation of 5S by educating and training their staff. However, the biggest challenge lies with the workers not spending enough time on learning the philosophy behind 5S knowledge and subsequently implementing 5S activities. In order to help our sponsor with finding 5S implementation problems immediately and easily rectifying them, we decided to develop a 5S SOP document and an Education & training guide to go with it.

4.3 - Analyzing Tools

We used the following analyzing tools in order to help us figure out the root causes of problems about 5S in Saint Gobain with their relationships between each other. Then we can easily come up the solution.

4.3.1 - Axiomatic Design

Axiomatic Design is a hierarchical decomposition methodology that employs a coupling matrix to decompose design problems into small pieces. It clearly shows the functional requirements and corresponding design parameters that fulfill them. The X indicates that DP will influence the FR. The O indicates that DP will not influence the FR.

	DP 0: 5S SOP, training & education guide	DP 1: Inventory list, red tag area, sort procedure	DP 2: Mapping, labeling, floor marking, set in order procedure	DP 3: Cleaning standards, visual standards, shine procedure	DP 4: Visual tools, standard labeling, standardize procedure	DP 5: Communication methods, audition, 5S culture, sustain procedure
FR0: Save time & improve efficiency	X	X	X	X	X	X
FR1: Sort	X	X	O	O	X	O
FR2: Set in order	X	O	X	O	X	O
FR3: Shine	X	O	O	X	X	O
FR4:Standardize	X	X	X	X	X	X
FR5:Sustain	X	X	X	X	X	X

Figure 2: Axiomatic Design Matrix

4.3.2 - 5WHYs

5WHYs is a technique used to explore the cause-and-effect relationships for a particular problem. (Chase & Jacobs, 2016) To find out and determine the root cause of a defect or problem, we repeat the question: 'Why?'. We used this technique to determine why the workers do not satisfactorily implement 5S at the factory.

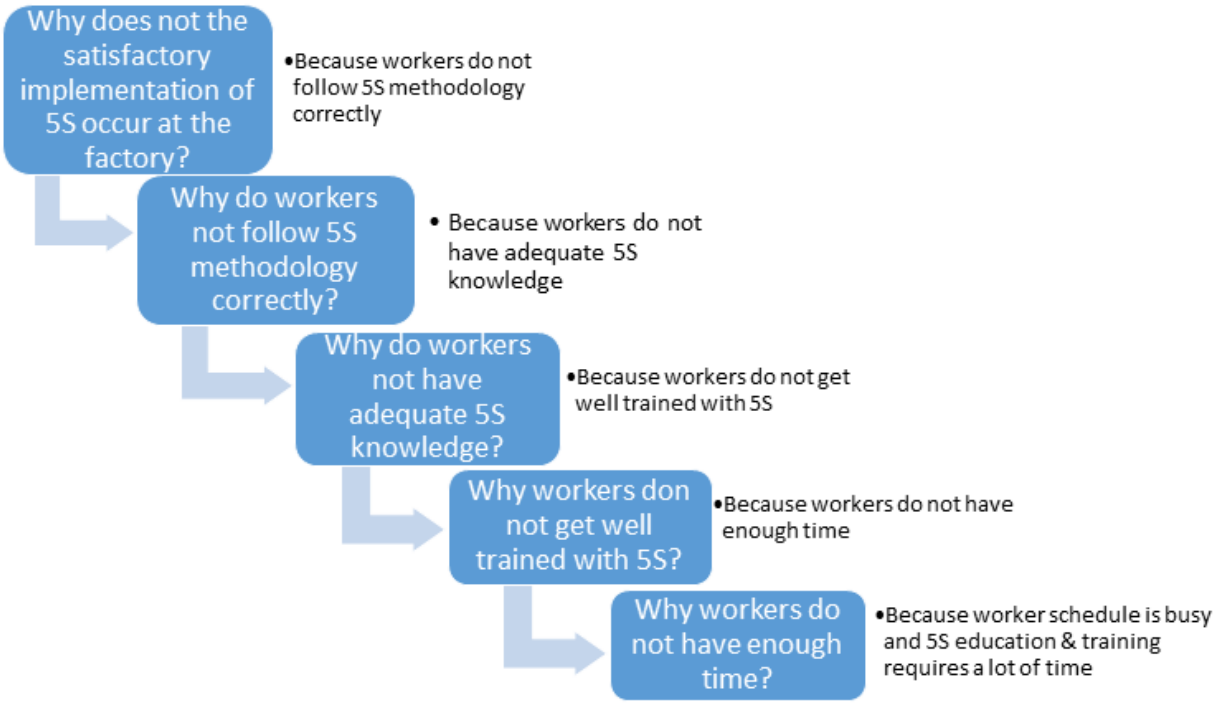

Figure 3: 5WHYs Chart to determine root cause of poor implementation of 5S at the factory

After a 5 WHY analysis we came to the conclusion that the root cause of our problem was that the worker schedule is very busy and retraining them would require a lot of time that is unavailable to Saint Gobain. As a result, we concluded that our materials would have to be designed in a way that made sure that we could convey a great deal of content in as little time as possible.

After using our analyzing tools and discussing with our sponsor we scoped out what we were going to write for our Standard Operating Procedure (SOP) and our Education Training Guide. We came to the conclusion that our deliverables are going to be a set of documents that the workers can refer to whenever they are unclear about a certain S or whenever they are stuck at particular point in their work and need to know how to forward with conducting 5S in their area.

Before we could create documents that would benefit Saint Gobain, we researched instructions on how to write an SOP. We also looked at SOPs from various industries and companies and came up with our own templates.

Further, we collected information from within Saint Gobain by observing, reviewing existing documents, and interviewing employees to best suit the needs of our sponsor.

4.4 - Observations

Our team visited the following zones in Saint Gobain: Cementing, Mixing, Machining, Finishing, Large Bay, Electronics and Pack & Ship. They were divided into Model Areas, Medium level implementation areas and Low level implementation areas.

Here is the map of Superabrasives and Electronics areas of Saint Gobain that we visited.

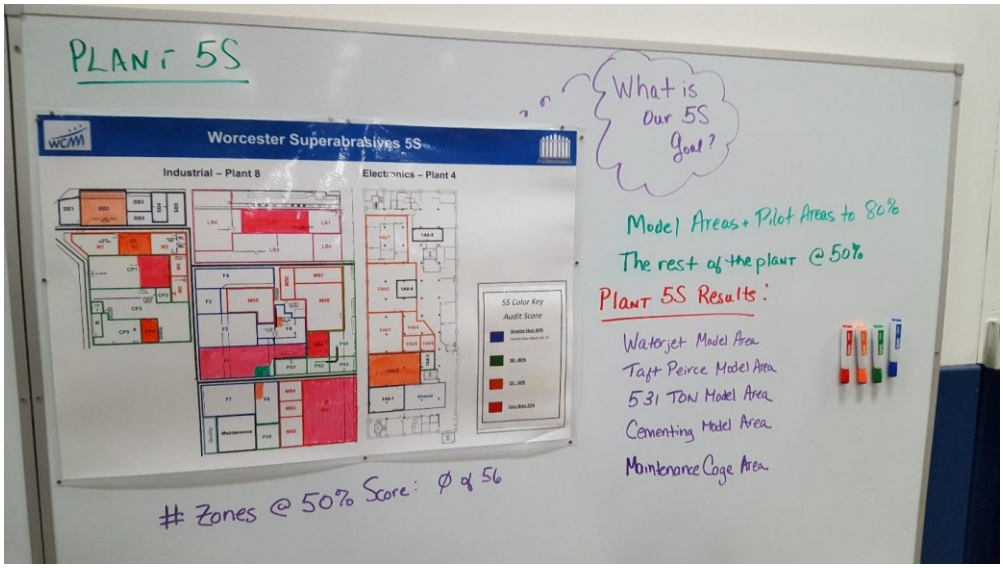

Figure 4 Saint Gobain Zone map

By our observations in these zones, we noticed that workers in different zones had different working styles, cultures and environments, and significantly varying performances on

5S. We also observed a varying degree of knowledge, understanding, enthusiasm and implementation in individual zones. In the instance of electronic and lapping areas, we noticed that workers require a very clean and tidy working environment for the longevity of their tools. Therefore, workers there have very high level of 5S knowledge and implementation.

4.5 - Reviewing the existing documents

We were able to obtain some Saint Gobain official documents after meeting with the client. After reviewing those documents, we realized that we did not have to re-invent the wheel when it came to developing visual management tools. There were a lot of visual controls already set in place in the factory, and we decided the best course of action would be to incorporate them in our deliverables. At the same time, these resources enlightened us in creating our own documents and tools while using Saint Gobain jargon.

4.6 - Interviews

During our factory visits, we interviewed many different levels of employees. This got us acquainted with their responsibilities and duties for everyday work. We stood on the frontline of manufacturing with those employees and got a look at different 5S initiatives across different manufacturing zones.

Our meetings with operators and leads helped us get familiar with the processes in each zone. We also asked them questions, such as what is 5S? What does 5S mean to them? How do

they involve 5S in their everyday life? Their answers directed our attention to the level of their understanding of 5S. This helped us in knowing what we should focus on while creating the future Education & Training guide

We also met with Autonomous Team Leads (ATLs) and Value Stream Coaches (VSCs). These employees were skillful and knowledgeable in 5S methodology and helped us walk through how 5S is being implemented in each zone under them. They also helped us gauge the level of employee participation across their zones. They informed us about various hurdles faced by teams while implementing 5S. For instance we were told that time is the biggest challenge for operators when it comes to conducting 5S in their areas. Another challenge was that some of the workers have been working in Saint Gobain for more than 20 years, and it can be very hard for them to accept new techniques and they do not think 5S is necessary. There were also hurdles caused by gap in communication between operators and management. For instance, in one of the zones, visual markings were painted on the ground and then the standards for marking such zones. Consequently, the ground had to be marked again.

5.0 - Results

This chapter shows the results for each of the objectives. These consist of a Standard Operating Procedure and an Educational & Training Guide to help with the implementation of 5S at Saint Gobain. Both of these documents are attached in Appendices A and B respectively. These documents were made with the intention of teaching 5S to workers who have limited to no knowledge about 5S.

5.1 - Sort

For this initial step of the 5S process in the Standard Operating Procedure we developed a set of instructions on how workers throughout the factory might be able to achieve 5S at their work. For this purpose we started off with obvious fixes around the workplace such as removing waste, excess, and hazardous materials from their areas. Second we created a scanning tool to identify problems regarding Sort in a given area. This involves drawing a simple workplace map of your workplace and then taking pictures of the areas that have been drawn on the map. Whenever an issue or issues have been observed in the pictures they are marked. This is known as a Tag Map (N.Zea, personal communication, 2016). Then a summary of where, when and what issue was observed is written down in a document called a Tag Register (N.Zea, personal communication, 2016). Once the items that are not needed are identified they are sent to the Red Tag Area to be discarded. Next an inventory list is created with the items needed by the workers based on the frequency of use.

In the Educational & Training Guide Sort was introduced and addressed why it was an important part of the 5S methodology. Then an example of a successful Sorting and brief

summary of Sort method that we developed was given. Next the team provided them information describing what Inventory lists are, and their importance to work at the factory. A template of the inventory list that we developed for Saint Gobain was also provided. The team then went into descriptions of what a Red Tag Area is and its importance in the 5S process. Then a description of figuring out what items go to the Red Tag Area, and subsequently what happens to those items was given. The team also created a Red Tag card template to document who, where, when, and for what reason an item was moved to a Red Tag area. At the end a set of questions were given to test the worker's implementation as a form of self-assessment.

5.2 - Set in order

For the next step of the 5S process in the Standard Operating Procedure we developed instructions that built upon the first S. Using the workplace map that we developed for Sort, we start by updating it after removing excess items. Next work zones need to be divided up and boundaries clearly marked on the workplace map. Next is determining the quantity of particular items that are needed and the locations of where these items would go that would be closest to the workstation. In order to do this properly, marking them on the workspace map is a technique that can be used. While marking them in their new locations, factors such as Frequency of Use, Clear Organization, Efficient Use of Space and Ergonomics are to be taken into consideration. After determining new locations and quantities, items were to be physically moved to the new locations. After the organization of the workplace is completed, the items and their home locations would be labelled. We also explained how Shadow Boards can be used to place items in them and keep them organized. Next we provided instructions on how to make floor and wall markings and provided with standards to use while marking.

In the Educational & Training Guide Set In Order was introduced and why it is important in the 5S process. Next a brief summary of how to conduct Set In Order at the factory was provided. Next, a description of what Mapping is and why it is important in our process was given. Then a description of what Labeling is and why it is important was given. Places where labeling is used was then identified with examples. After that floor markings and their importance was described with examples. Lastly, the team provided the workers with a set of questions to test their implementation.

5.3 - Shine

The third step of 5S is Shine. The team built instructions on how to implement Shine in the workplace. It is important to define and communicate the standard and cleaning requirements in each specific zone before doing Shine. Then the workers can follow the instructions and standard to clean the areas. Next Visual Standard as means to define what cleaning in a specific area means is introduced. To create a Visual Standard, an area's sources of dirt, oil, dust and waste need to be identified and then written down. Then these sources need to be controlled or eliminated if possible. This ensures that cleaning problems do not appear as frequently. Finally, pictures are taken throughout the zone as well as inside and outside any machines. These pictures are posted in our Visual Standard that is to be used as guide to target areas for future cleaning. Another document we introduced in our SOP is the Cleaning Standard. It acts as a central document that helps make Shine routine and convey information to clean effectively. The information which needs to be included in this document is ID numbers, name of the area, name of the item, visual standard or picture, cleaning tools, cleaning methods, machine status, expected time, frequency, people who are responsible and when to do the cleaning. This detail

not only provides in detail about how tackle this part of 5S but also provides accountability by defining cleaning roles and responsibilities.

In the Education & Training Guide, Shine was introduced and its importance was described in the 5S process. Then a brief summary of how we clean was introduced. Next the importance of it, and examples of Visual Standards and Cleaning Standards were provided. Finally, there is a Test Your Implementation section for workers to test their knowledge and the implementation in their area.

5.4 - Standardize

The fourth step in the Standard Operating Procedure is Standardize. It begins with locating work instructions relevant to one's workspace. If work instructions do not exist then they are to be created with the help of the supervisor. Then workers have to determine if the work instructions detailed enough and if they are consistent with their actual work. If they are not then these have to be revised. In making revisions, guesswork should be eliminated wherever possible and clear instructions should be written the revised steps. As 5S itself is a continuous process once revision is completed, regular checks on these instructions need to happen in case an engineering or process change takes place. Next, management needs to help with Standards that need to be set in place so the workstation does not revert from the 5S methods. These include routine times for conducting 5s, defining responsibilities for employees, providing general guidance to workers and providing examples of what good practices of 5S look like. Next, effective communication needs to happen within and across teams to eliminate redundancy and duplication of work. One such way is through posting Visual Tools that contain well defined, easy to understand and comprehensive information about specific goals that the plant is

trying to achieve. Visual Tools need to be posted in a visible location and have to be maintained regularly.

In the Education & Training Guide Standardize was introduced and why it is important for 5S implementation. A brief summary of the Standardized method was given. Next examples and descriptions of standardized labeling were given. Then the team described what Visual Tools are and what should be taken into consideration when making Visual Tools. In the end questions were given to test the implementation of St Gobain employees.

5.5 - Sustain

The final step in the Standard Operating Procedure is Sustain. It is the step that makes sure that 5S is implemented well and continuously. To verify the implementation for employees, the SOP provides a question list to help them figure out if 5S is implemented well each step. If the questions on testing implementation cannot be answered or the workers are not sure of their answers, then the workers should check their work or ask for assistance. Next our team introduced the practice of continuous improvement. If the worker notices a problem regarding the implementation of 5S then an initiative should be taken to fix it as soon as possible. Regular feedback from employees to supervisors and vice versa to make the plant more efficient. The team then introduced quick kaizens in the Sustain part in order to make sure the system is improving continuously. Supervisors should verify implementation, and assess the SOP documents and Education & Training Guide and check whether the workers are following the documents or not. Supervisors need to check if their workers require any help, motivation or resources to complete their tasks. Also the supervisors should assess visual control of areas to test if the areas are in or out of control. To promote continuous 5S and improvement, it is

important to shape a workplace culture. To implement a culture of sustain, 5S should be involved in habits, promoted 5S as ‘a way of life’.

In the Education & Training Guide, our team introduced What Is Sustain and Why is it Important. After that methods about how to sustain were provided. Next introduction and importance of various sustaining methods with examples were given. These included communication methods, auditing, and kaizen. Then broadly categorized 5S responsibilities were given. Next, we provided with information about developing a 5S culture and about the benefits of 5S. Finally there is a test of implementation for workers to test themselves after learning about Sustain sectors.

6.0 - Recommendations & Conclusions

Looking back on this project, it was much more challenging than we first expected. But along the way, we were able to learn a great number of lessons. We learned that manufacturing is a complex affair, and that the human factor plays a critical role. Learning to work with people is a skill that can only be learned through practice and in a real working environment. We also learned about working in industrial and corporate environments and were able to expand our understandings of everything that we had learned in academia up to that point. We were also able to walk away with a firsthand experience in using 5S to change the behavior of an organization and picked up invaluable skills in how to communicate ideas to others in an efficient and meaningful way.

Through working on such a challenging long term project, we were also able to learn a great deal about working as a part of a group. We found communication to be paramount in making sure that individuals pull together as a team. Through our experiences, we learned the importance of being proactive and thoughtful communicators, and learned how to work through difficult situations. We also found that every project, no matter its nature, absolutely requires a clear and well defined goal, and a definite scope. Without this, a project can, and will, stray from its mission. Another necessary skill is being able to plan things well in advance. We found foresight, and the ability to make plans that can adapt to change, to be critical to our eventual success. Finally, we found that self-assessments need to be performed regularly. Honest self-reflection is the only way to determine if you are on a path to meet your goals, or miss them.

7.0 - Reflections

Yuanhao:

What did you expect going into the project?

This is the first time for me to work in a real factory environment. It is a very good opportunity for me to get working experience and get familiar with the working process. Although the reality and the theories in the books are significantly different, I would like to find out what are the relations.

What happened during the project?

5S theory looks simple, it involves in our everyday life, it can be implemented everywhere even in the offices, bedrooms or kitchens. However, we found the difficulties when the project moved on. It is hard for people to accept a new idea when they do not understand, and they need to spend time and put effort on it.

What did you learn? How did you grow in this project?

The academic knowledge about 5S is very valuable and I believe it will benefit me in my future life. Besides the knowledge, the precious parts that I learnt from this project are I understand the importance of communication and the way to work with different kind of people. All four members in our team come from different countries; we have big cultural differences, backgrounds and very big different personalities. It improved me a lot by working with them as a team and finished project successfully.

Nafisat:

What did you expect going into the project?

Going into this project, I was excited to work in a manufacturing environment and apply my Industrial Engineering skills. I expected the project to be challenging because it is a final year project. I also expected to grow from this project because it is the closest to an internship and a real job I have ever gotten. Lastly, I expected this project to be a resume builder for my future projects and jobs.

What happened during the project?

During the project, as predicted, we encountered numerous challenges. One of the challenges was understanding the client's expectations, so we could meet these expectations without deviating from the project scope. Secondly, we encountered a lot of group dynamics issues due to communication, individual personality and individual behavior. Thirdly, we had issues properly communicating with the client, our professors and our group members, which caused a lot of repeating deadlines, frustration and project setbacks. These challenges motivated us to get more organized, to communicate better and to deliver quality deliverables to our client and our advisors.

What did you learn? How did you grow in this project?

All in all, my group dynamic skills improved. I learned how some Industrial Engineering skills and knowledge are applied in a manufacturing environment. I also learned the importance of 5S and how hard it is to encourage people to implement and adapt to 5S concept. Next, I learned how to make official documents such as a Standard Operating Procedure and a 5S Education and Training Guide. Last but not least, I learned how the different cultures in factory environments affect the understanding and application of different concepts and philosophies.

Abdullah:

What did you expect going into the project?

I expected going into this project that we would be providing our sponsor with ways to fix problems relating to 5S in individual micro manufacturing zones. I was also hoping to see a trial with our recommendations in these micro zones.

What happened during the project?

During the project we came across a lot of challenges especially with regards to scheduling because of our very different time table. Next we also had contrasting views to go on how to move forward with our project, making it a challenge for all of us. However, our efforts to overcome these problems required a certain level of compromise that enabled us to grow and finally enable us to complete our project.

What did you learn? How did you grow in this project?

I learned a lot about Group Dynamics and how to adjust my working style in a team setting by taking a backseat. On the other hand working in a different manufacturing environment has given me the opportunity to understand manufacturing processes from the viewpoints of different tiers of employees. Especially looking it from a managerial point of view had been interesting.

Leif:

What did you expect going into the project?

I expected this project to be an extremely challenging one- one that would require me to utilize everything that I had learned during my time in college. I also expected this to be an opportunity with which I could build my career, or at least, something that I could point to as a point of pride. I also began with the hope that we would be able to deliver a substantial product to our client that would make a significant and lasting difference.

What happened during the project?

The challenges that I encountered during this project, were not ones that I expected to encounter. I found it challenging to adapt to the changing circumstances of our project, and worked to overcome challenges related to social dynamics and management. This project tested not only my talents and skills as a student or potential employee, but also my attributes as a manager, and a person.

What did you learn? How did you grow in this project?

I learned and grew a great deal during this project- more than I ever thought I would have. I also practiced skills and developed new ones in areas I could never have foreseen. As a result of this project, I think that I have become more experienced, more knowledgeable, and more confident than I was before. I also learned more about my weaknesses, how to overcome them, and how to know myself more clearly than I did before. But I feel that most of all, I learned how to work as a part of a team, how to manage difficult situations, how to motivate, how to inspire, how to communicate, and how to lead. Overall, I feel that I've simply become a better and more resilient person.

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10.0 - Appendix

5S Standard Operating Procedure (S.O.P.)

This Document provides Employees with a written procedure to follow when implementing 5S. This document is the primary resource to be referenced; all other materials derive from it. Contact a supervisor for guidance when utilizing this document.

① SORT

- Obtain a basic understanding of 5S:
  - Read the 5S Education & Training Guide, test your understanding and know why 5S is important.
  - Ask your supervisor or other coworkers for advice in following any of the steps below

- Look around for easy improvements:
  - During your first round of sorting, you will want to identify items that are clearly unnecessary, or have no use, and tag them for removal. Trash, excess material, waste, and the like, are good candidates for removal during this step. Be sure to consult with you Safety Coordinator for instructions on the removal of hazardous waste.
  - Once you have run out of easy improvements, follow the steps below.

- Scan the area for clutter:
  - Why are we “scanning”?
    - The first step in sorting is to identify problems with Sort in a particular area. We need to identify problems before we can fix them. Any employee can use this tool to improve their workspace, though employees may request guidance and assistance from ATL’s when taking on 5S.

  - Taking Pictures:
    - Draw a simple map of your workplace. Example below:

Figure 5: A simple map of the workplace

- ◇ If you have previously drawn a picture, you may copy it and re-use it instead. Make sure, however, that it is accurate and up to date.

- ◇ Make a copy of your map, you will keep the original for future reference. You will use your copy to mark where you have taken pictures.

- ◇ Take pictures up, down, and around each area on your map. Draw an X with an arrow on one of your maps to show where you standing when you took your picture.

- ◇ Print out your pictures

- ◇ Sit down as a team and circle issues with Sort in the picture.
    - Compare the picture with what you know about Sorting. Ask yourself:
        - ➢ "Are there any places in this picture that look cluttered?"
        - ➢ "What in this picture could be removed to create more space?"
        - ➢ "Is there anything in this picture that I don't need?"
        - ➢ "When was the last time I used this item?"

    - When you circle an item or issue, mark it with a number and draw a line to the side of the page and write down a number. This type of document is known as a Tag Map.

Figure 6: Example of a Tag Map

- On a separate sheet of paper make a list of all the items you have identified. Write down the number associated with each item, then write down the item's name, what the problem is, and when you made your observation- along with any other details you think are necessary. This type of document is known as a Tag Register.
- If you have access to a computer, you may wish to use Saint Gobain's electronic Tag Register in Microsoft Office Excel. Ask a supervisor for assistance in using this tool.

Item Number	Name	Issue	Date	Other Observations
1	Spare Rods	Excess supplies, not needed in immediate area	12/2	Heavy
2	Dirty Rags	Should be disposed of	12/2	Used to clean up chemicals, hazardous waste
3	Cabinet	Unused	12/2	Rusty, Bent

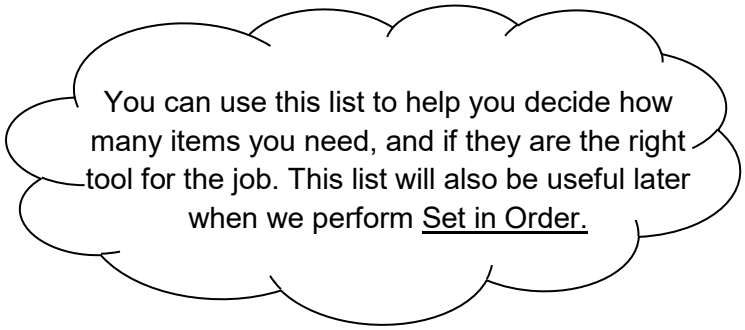
Figure 7: Example of a Tag Register

- Repeat this scanning procedure until all issues in your area have been identified.

- Keep your map of the workplace, Tag Map, and Tag Register for your records. If you notice a recurring item or problem the future, try to determine the root cause of the issue to prevent it from happening again.

- Decide what should be done with each item identified.
  - Try dividing your items into 3 categories:
    - Frequently Used (Used Daily)
    - Infrequently Used (Used at least once a year)
    - Never Used (Items not used for any current manufacturing, used less than once per year)
  - The less frequently an item is used, the better candidate it is for removal.

  - Create an Inventory List. An Inventory List is a document that lists all of the tools, supplies, and other resources that you use. Include details like how old the tool is, how many of the same do you have, and where a person can find it. (See Appendix A for an Inventory List Template)



  - By now, you should have an inventory of all of the problematic items in your area, what their problems are, and you should have made a determination of whether they should stay or go. If you are having trouble knowing if you have identified all of the issues with sort in your area, ask your supervisor to help you.

  - Once you have identified items that should be removed, you should send them to your Red Tag Area.

- Red Tag Area
  - Read the Red Tag Area section of the Education and Training Guide and the One Point Lesson: Red Tag Area
  - Designate a space in your general area to be set aside for Red Tagging
    - Make sure that the space is large enough to accommodate items that you will be tagging
  - Maintain your Red Tag Area according to the standards described in the One Point Lesson (See Appendix B for the Red Tag Area One Point Lesson)

- Test Your Implementation
  - Take a picture of your area now that you have Sorted it, can you see any positive changes? Keep a copy of the picture for your records.
  - Ask yourself:
    - Is my area free of clutter?
    - Is it the best it can be?
    - Do I not have enough space in my area?
    - When was the last time I used this item?
  - Make Sorting a part of your daily routine, think about what is needed and what is not.
  - Think about what might be causing problems or creating clutter

② SET IN ORDER

- Understand Set in Order
  - Ensure that you have read the appropriate section of the 5S Education and Training Guide, and that you have a basic understanding of Set in Order.
  - Ask your supervisor or other coworkers for advice in following any of the steps below

- Evaluate the Area
  - Define a Work Zone
    - Create copy of your workplace map from Sort, update it if necessary
    - Examine your workplace, and ask yourself:
      - How is it naturally divided up?
      - Is your space built around a particular task? Is your work centered around a large, immobile machine?
      - Where are people standing or sitting when they work?
    - Use these questions and your observations to define "Work Zones." A Work Zone might be the area surrounding a large machine, a workbench, or a large space shared by multiple people.
      - Other clues might be if an area has been personalized, or if an employee might not need to leave an area during their shift
    - Once you have divided your workplace into zones, mark their boundaries on your map, and mark the locations where people most frequently

  - Obtain an up to date and accurate copy of the Inventory List that you created during Sort. (See the Appendix A for a sample inventory list template)
    - Determine how much quantity of a particular item you need to have on hand for a typical day of work. If you have a set of items that are perishable or used up over the course of a day, think carefully about what amount should be in your immediate area and what can be stored in a more remote location.

- Identify constraints that might limit what you can do during Set In Order.
  - Note the size of the room that you work in, you will almost certainly have a finite amount of space to work with.
  - Note the locations of important pathways, entrances, and exits, you may be required to keep these areas clear of obstructions.
  - Be mindful of the fact that you may have to work around large machines that can be difficult to relocate, or are set up in a specific way. You may have to build your workspace around such items.

- Make a Plan
  - Pick a Work Zone
    - Before you start shifting objects around your workplace, you should attempt to create a plan to do so. Thinking ahead will save you time and effort later.
    - You will probably not be able to implement Set In Order on your entire area at once. Try to focus on one zone at a time, but also try not to encroach on other zones. If there are items that should belong in a shared space, or if boundaries need to be redrawn, you may do so.

  - Mapping Technique
    - Mapping is simply a visual tool which will help you better understand the locations of items and their relative distance from your workspace. You will use it to evaluate the current locations of items and decide where to relocate them.

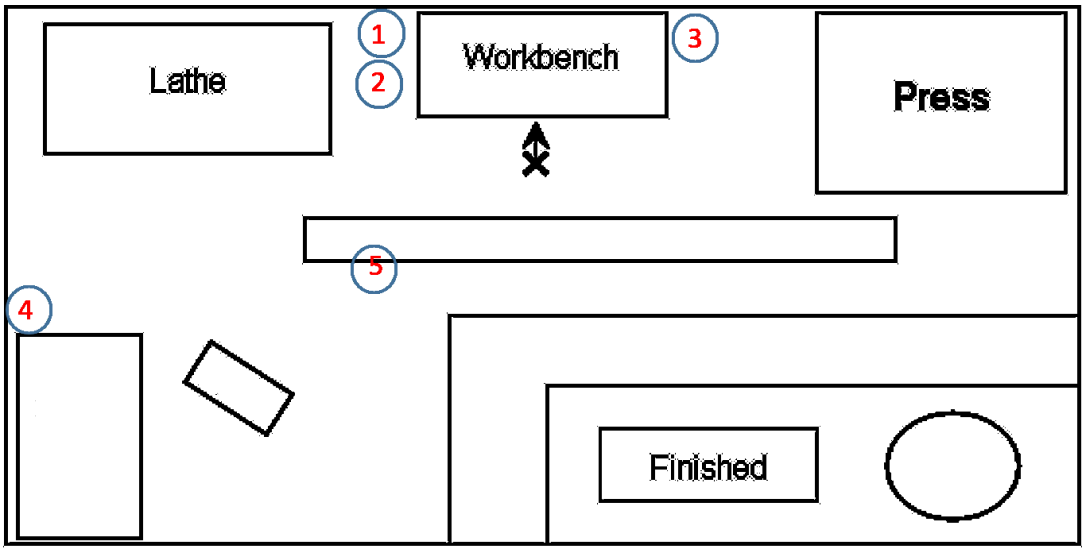


Figure 8: Simple Example of Mapping

- ◇ Create several copies of the map that you created during “Evaluate the Area.” You will use this to draw out various iterations of your plan before deciding on the best one.
- ◇ It may also help you to take a picture of the area you are working on. This could be useful if you are having difficulty visualizing the space, or if you can’t do all of your planning on site.
- ◇ Now, we will decide where items actually go. During this process, you will need to keep several things in mind:
    - ➢ You will probably have to use some trial and error.
    - ➢ You will use all of the observations you have collected about your workplace, your inventory list, your maps, and your experiences working in the area to help guide your decisions.
    - ➢ You are not only Setting your tools In Order, but the containers that house them as well.
    - ➢ You may need to compromise or make decisions on which items you keep closest to you, or even what items can be kept in your immediate workspace. You will need to balance your criteria and constraints.

- ◇ With these in mind, use the following criteria to prioritize which items to Set In Order first, and how they should all fit together:
    - ➢ Frequency of Use
        - ■ This will probably be your most important criteria for deciding where things go. Items that you use frequently should be placed closer to you for easy access. Items you use less frequently should be kept farther away.
    - ➢ Clear Organization
        - ■ In order to make the process of finding something easier, you should group similar items together, and organize them in a way that makes sense. The simpler the system, the easier it will be to find something.
    - ➢ Efficient Use of Space
        - ■ You will almost certainly have a limited space to work with. As such, you will need to organize your various containers and tools to that there is less wasted space.
    - ➢ Ergonomics
        - ■ Try to keep safety and comfort in mind when designing your space. Try to avoid placing objects at floor level and placing heavy objects at arm's length. The less you have to bend over or strain to manipulate items, the better.

- ◇ A simple process for Setting items In Order might be:
    1. Select the item or set of items you use most

2. Locate the best space for them (Generally, the closer to your person, the better)
3. Organize them so that they are easy to find and take up as little space as possible
4. Make sure that it fits in with your other constraints and concerns
5. Repeat the above steps until every item has a home

- Implement Your Changes
  - Once have a solid plan and have made sure that you won't disrupt anything, attempt a first round of Set in Order.
  - You may find that items don't fit together as planned or that you may have to make unexpected changes. This process will probably entail some trial and error- you may even need to develop a new plan.
  - If you are encountering difficulties, you may want to speak to your coworkers or supervisor, develop solutions with them. Together, you may be able to develop unique solutions neither of you could do on your own.

- Repeat
  - Repeat this process until every work zone in your area has been Set In Order.
  - Check to make sure that the entire area functions well, that your space is well used, and that your area complies with all 5S guidelines and Saint Gobain requirements before continuing.

- Update Documentation
  - If your inventory list or some other document records the location of tools in your workplace, be sure to update it.
  - Make sure that any signs you may need posted are moved to a new location. In our next section we will be creating new labels, signage, and visual indicators. If you are going to be replacing or creating new signage, use the instructions below to guide you.

- Implement Visual Controls
  - Labelling Containers
    - Once you have completed your organization of the workplace, it is time for you label your environment. This will help you remember where items are and will help others in case they need to operate in your environment, borrow a tool, or perform some other action.

    - Determine labels to use
      - First, you will need to survey your workplace and determine what you want your labels to say and where you would like to place them.

- Get a sheet of paper, you will be making a list of all the labels you need.
- Examine the tools and items you have set in order. For now, focus on any containers, drawers, or other objects that hold them.
- For each container, write down a potential label or series of labels that could go on the outside. When creating labels:
    - Try to group items into categories. These should be as specific as you can without creating a label that is too long.
    - Make sure that every item inside falls under at least 1 of the categories
    - Try to avoid creating labels that are overly broad, like “Miscellaneous,” or “Personal Items”
    - Typically, you do not need to name every tool uniquely, or list ID numbers. It may be permissible, however, if people often look for a very specific tool, or if an ID number is its most defining trait.
    - Go with your gut. Write down labels that make sense, or ones that a person might need to find their way around.

- Place Labels
    - Once you have a list of labels you want to make, work with your ATL to get them printed.
    - Try to make sure that the labels you make are easy to read and match the styling of other labels in your area.
    - If you are concerned that a label might fall off or get worn down, use more adhesive and/or cover it with clear tape or clear plastic.

- Shadow Boards / Foam
    - Now that you have labeled your containers, it is time to organize what is in them. It will probably be a good idea for you to create a foam insert for your tools to lie in, a board that shows the shape of every tool hung on it, or some other object that keeps tools organized. Having one of these systems can help make sure that your tools stay Set In Order, and will allow you to easily see if a tool is missing.

Figure 9: Shadow Boards & Foam Block

- ◇ First, lay out your tools the way you would like them to appear.
- ◇ Take a picture.
- ◇ Print out your picture.
- ◇ Obtain a foam or board you would like to use. The foam should be sturdy enough to be cut into shapes without tearing.
- ◇ Cut out shapes in your foam or paint outlines on your board in the shape of the tools that you want to place there. Use your picture as a reference.
- ◇ Perform a test fit and make adjustments if necessary.
- ◇ Label tools or groups of tools as necessary.
- ◇ Ask your ATL for help if you encounter difficulties.

○ Floor / Wall Markings

- ◇ Certain items in your area may occupy floor space, or may be placed on a surface. In these cases, it is important to have them clearly marked- both to remain organized and to stay safe. If during Set In Order, you have assigned an item to a particular floor-space, that space should clearly marked. Any pathways, or areas that need to be kept free of objects, should also be marked.
- ◇ Saint Gobain has established a color scheme for painting and taping surfaces to indicate a specific use. For specifics on how this should be done, refer to the Visual Management Standard Specifications, under Appendix C for this document.
- ◇ If you need an area painted, tape applied, or a graphic installed, consult your ATL and file a ticket with maintenance. In some cases, you may be able to tape it yourself.

 Test Your Implementation

- Take a picture and compare it with the one you took at the end of sort, what changes have you made?
- Ask yourself:
  - Does every item have a home?
  - How much time do you spend finding a specific tool?
  - Are things easy to find? Could a person find all the tools they need in 15 minutes?
  - How far do you have to go to get the items you need?
  - If a tool went missing could you easily tell?
  - Are you experiencing back pain regularly?
  - Does your space feel too camped? Too empty?
- Make Setting things In Order a daily habit. If you can find a better place for an item, make the change.

③ SHINE

- Understand Shine
  - Ensure that you have read the appropriate section of the 5S Education and Training Guide, and that you have a basic understanding of Shine.
  - Ask your supervisor or other coworkers for advice in following any of the steps below

- Set Visual Standards
  - To keep a workplace clean, we will first need to define what “clean” means specifically for each zone in your workplace, and then put it into writing. In this section, you will be creating a Visual Standard for every major zone in your workplace.
  - First, select a zone to create a visual standard for; such as a workbench, or a machine that needs regular cleaning and its immediate surroundings.
    - A good place to start would be any zones that pose a safety risk, need to be cleaned very frequently, are cleaned inconsistently, or are complicated or difficult to clean correctly.
  - Clean that zone. Use the following criteria to decide what “clean” means to you:
    - Imagine how your place would look when it was new.
    - Identify any dirt, dust, or oil in the zone that need to be controlled.
    - Think about how clean various surfaces need to be to prevent contamination or defects from occurring.
    - Ask yourself how you deal with hazardous waste.
    - Talk with your supervisor about what expectations they may have.
  - After you are happy with your cleaning, take pictures up, down, around, your zone- as well as inside and outside any machines. Be sure to include the floor and any other surfaces that you need to keep clean.

- Create Visual Standard Documentation
  - Obtain an electronic copy of Saint Gobain's Visual Standard Template Excel file.
  - Start filling out the template with the:
    - Name of the zone (or the machine, operation, or location)
    - Name of your team or workplace
    - Name of the person creating it
    - Current date
  - Decide on an image or set of images to use for your visual standard. Make sure that your picture is not blurry or too small. For a complex area, you may need to create multiple sheets.
  - Create a short list of steps to follow
    - Find out what the most important steps are for cleaning that zone or machine. Be sure to include all the different parts of the machine, and what requirements exist for that zone.
    - Create short sentences that summarize these steps.
      - Your Visual Standard will act as a quick reference to remind yourself and others how the area should be cleaned. You will be creating more detailed instructions when you create your Cleaning Standard later on.
    - Type your short instructions below the image(s) you have selected
  - Assign different numbers and colors to these cleaning requirements in a similar fashion as shown in the picture below. Match each instruction to its relevant part of the zone or machine
  - Print out your new Visual Standard and post it in a visible location next to or inside your zone.
  - Repeat this process until every zone that requires regular cleaning has a visual standard associated with it.

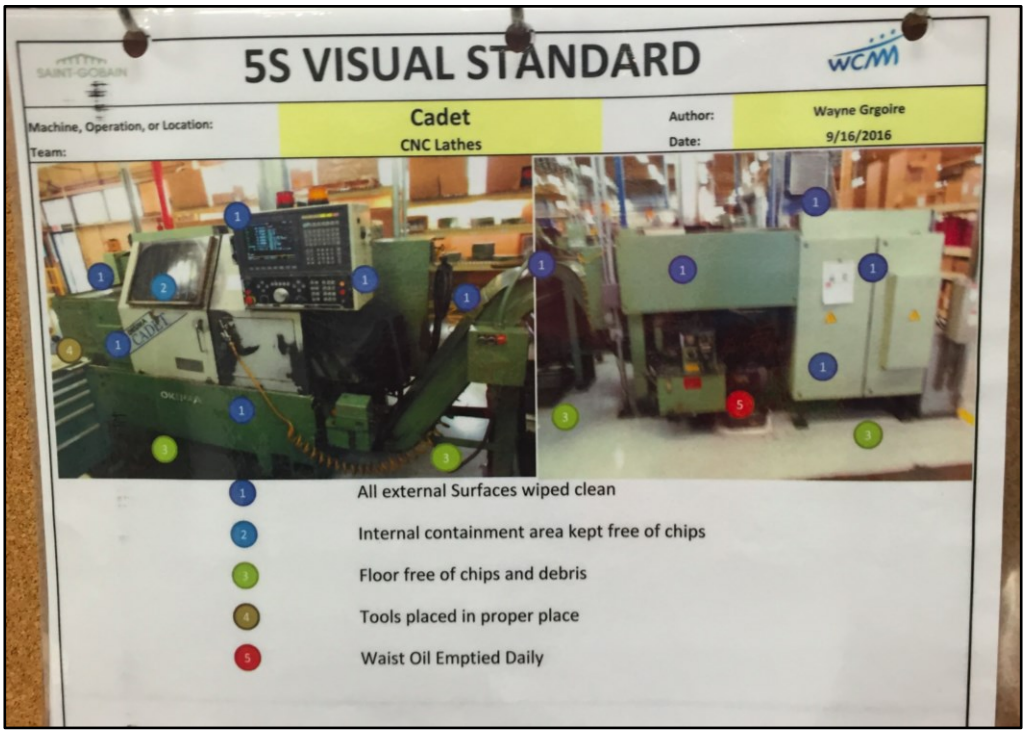


Figure 10: Completed Visual Standard

- Make a Cleaning Standard
  - Next, you will be creating a Cleaning Standard, this will act as a central document that helps make Shine routine, and gives you and other employees the information they need to clean effectively. As with your Visual Standards, this will be largely putting what you know into writing.
  - Your first step will be to obtain an electronic copy of Saint Gobain's Cleaning Standard Template as an Excel file.
  - Next, you will paste in a picture for every zone in your area and fill out all of the required information as prescribed by the vertical columns in the template.
    - Most likely, this will require you to develop, or re-asses the cleaning schedule in your workplace, who is responsible for doing each task, and what a person should know about that task.
    - If you are unsure about what information to enter, meet with your coworkers and supervisors to develop a concrete plan for cleaning.

N	Area	Component	Cleaning Standard	Cleaning Tools	Operation	Machine Status	(Exp. Time)	Frequenc	Who	When	OP n
1	Material transport	Rear Roller		1" paint brush, vacuum, 1/4" screwdriver	Clean by hand and vacuum debris	Stopped	2016/11/14	After every shift	Operators using saw	End of shift	
2	Material transport	Rear Vise and table					3 min				
3	Material transport	Front Vise table		Air hose	Clean by hand	Stopped	1 min	Between every set up	Operator using saw	Between each use	
4	Saw body	Front pan		Vacuum, 1" paint brush, shop rag	Clean by hand	Stopped	2 min	After every shift	Operators using saw	End of shift	
6	Saw body	Guide area & Piston		1" paint brush	Clean by hand	Stopped	1 min	Weekly	Operators using saw	Friday at shift change	
5	Chip Conveyor	Chip conveyor cover		Shop rag	Clean by hand	Stopped	1 min	After every shift	Operators using saw	End of shift	

Figure 11: Example of Cleaning Standard

- Now, fill in the columns, they include:
  - A basic **ID Number**
  - The **Area** the item can be found
  - The Name (or **Component**) of the item being described
  - A **Visual Standard** or picture of the item as it should appear
  - The **Cleaning Tools** needed for the job
    - Be sure to include a detailed description (ex: 1'' paint brush vacuum, ¼'' screwdriver)
  - Under **Operation**, how the cleaning of a particular section should be carried out
  - The **Machine Status**, or, whether the machine needs to be stopped down or running while cleaning
  - The **Expected Time** necessary to do the cleaning
  - How often machine/component needs to be cleaned- in other words its **Frequency**
  - **Who** is responsible to keeping the area clean
  - And the right time to do the cleaning, under **When**

- Once you have completed your Cleaning Standard and it is to everyone's satisfaction, print it out and paste it in a visible, common area that everyone can easily reference.
- Be sure to update it with any changes that you make, and schedule a regular time to talk about Shine and make sure that all of your goals are being met.

- Create other Documentation
  - Creating a Dirt Map
    - When it comes time to clean a complicated machine, it can sometimes be difficult to know exactly what parts need to be cleaned, or it can be difficult to remember if one has checked and cleaned everything. Here

we will help you build your own Dirt Map to act as a quick and useful guide for anyone cleaning up.

- ◇ First, obtain an electronic Saint Gobain's Dirt Map Template Excel file to help you build your Dirt Map.
- ◇ Now, fill in some of the fields at the top- like the area this item could be found, the department this item belongs to, the name of the item (under Equipment), and the name of the purpose making this document (under Prepared By).

Figure 12: Sample Dirt Map

- ◇ Next, take a wide angle picture of the whole machine.
- ◇ Then, zoom in on areas of the machine that are major sources of dirt, need special attention, or are easy to miss, and take pictures.
- ◇ Add all of your pictures to the template.
- ◇ If you can, draw an arrow between your zoomed in pictures, and their respective locations on the wide angle picture. This can help indicate to people where they should look.
- ◇ Print and paste the Dirt Map on the board

- Ensure follow through
  - Make sure that you work to continuously improve the cleanliness and quality of your area. Meet regularly to make sure that you and your fellow employees adhere to 5S and keep it clean.
  - Make sure that you maintain your commitment to Shine and to 5S, as 5S, and Shine in particular. It will allow to better see what is going on in your workplace and how you can best control it to prevent errors, wasted time, and safety issues.
  - Try to make it so that your area automatically tackles problems before they become serious- such as slipping hazards, leaking hazardous waste containers, or any other issue.

- Test Your Implementation
  - Communicate with your supervisors and make sure that your implementation meets their standards.
  - Try to take pride in making your workplace clean, you have spent a great deal of time there and will likely need to the future.
  - Ask yourself:
    - Is this given area clean?
    - When was this item last cleaned?
    - Does everybody do at least some of the cleaning?
    - If someone notices something too dirty, is immediate action taken?

④ STANDARDIZE

- Obtain a good understanding of Standardize.
  - Locate and read the appropriate section of the 5S Education & Training Guide, test your understanding and know why Standardize is important.
  - Ask your supervisor or other coworkers for advice in following any of the steps below

- Define Current Work Processes - Employees
  - Your next goal, as an employee, will be to ensure that the work you do is well defined, and that there are clear standards for accomplishing it.
    - First, locate work instructions relevant to you (See Appendix D for sample work instruction)
    - Examine your work instructions, answer the following:
      - Is there a set of work instructions for each task I perform?
      - Are the work instructions accurate and up to date?
      - Do the work instructions provide you with the best possible working technique?

- ➢ Do the instructions provide enough accurate details for the person to do the job well on their own?
- ➢ Are the directions efficient? Do they make sense?

◇ If you have answered "No" to any of these questions, you and your supervisor may need to refine these instructions. Ideally, every process or action should have a standard by which it is supposed to be done- against which, good work is measured.

◇ During the revision process, try to introduce as many measurements and controls that are feasible. Eliminating guesswork where possible helps improve communication and prevents errors from occurring. Modifying tools and applying other unique solutions may be useful here.

◇ Once you are finished, be sure to check back regularly to make sure that your work and the work prescribed by the work instructions are in sync- and that there are no changes that need to be made to the work instructions.

 Set Standards for 5S - Management

○ Our goal for the next section will be to ensure that 5S is a process of continuous improvement, and that factory does not go to back to pre-5S state. To do this, we will need to set standards for doing 5S, and ensure that 5S a routine process.

○ First, we will need to write down standards for doing 5S. This will be much like creating a cleaning standard during Shine– except that we will be focusing on regular 5S, instead of regular cleaning. To make up your new 5S Standard you will need to:

◇ Create schedules for conducting 5S

◇ Define who is responsible for doing what

◇ Provide directions for doing 5S

◇ Provide a standard of what good 5S looks like

◇ And ensure that the 5S program is refined regularly. When you do so:

- ➢ Identify problems and develop solutions together
- ➢ Seek continuous improvement
- ➢ Be transparent

 Communicate 5S Information Effectively

○ Designing Visual Tools

◇ Whenever you create visual tools to communicate 5S information, be sure to check your work and ensure that it:

- ➢ Is Well Defined, Meaning that it is:
  - ■ Content Rich
  - ■ Comprehensive
  - ■ Has a Specific Goal
  - ■ Effective in Accomplishing that Goal
  - ■ And it Provides All Necessary Information
- ➢ Easy to Understand

        - ➢ Visual
        - ➢ Styled and Formatted Consistently
    - ○ Post your Visual Tools
        - ◇ Once you have created a visual tool, make sure that when you move to display it, it is:
            - ➢ In a highly visible public place, so that people can access it
            - ➢ Posted where it is most relevant
                - ■ For Example: Place a PPE sign on a machine that requires that particular PPE.
    - ○ Maintain your tools and update them as necessary

- ☐ Test Your Implementation
    - ○ Ask Yourself:
        - ◇ Have any zones dropped into their pre-5S states?
        - ◇ Is every process documented?
        - ◇ Does every process have a metric or standard?
        - ◇ Is it clear to an outside observer how everything should appear? Would they be able to tell if anything was out of place?
        - ◇ Is 5S consistent across the zone? Across the plant?
        - ◇ Is prompting required to carry out 5s?
        - ◇ Do all employees have the information they need?

5 SUSTAIN

- ☐ Ensure that you have a good understanding of Sustain.
    - ○ Locate and read the appropriate section of the 5S Education & Training Guide, test your understanding and know why Sustain is important.
    - ○ Ask your supervisor or other coworkers for advice in following any of the steps below.

- ☐ Verify Implementation - Employees
    - ○ To make sure that 5S is implemented well, we will need to check our work throughout and make sure that your area is the best that it can be.

    - ○ To do this, you will need to review the following questions. If you find yourself answering yes to any of them, or are not sure, consider checking your work or asking for assistance.
        - ◇ Sort
            - ➢ Can you find any clutter in your area?
            - ➢ Are you short on space?
            - ➢ Do you have any redundant items in your area? Any items that you did not use yesterday or today?
            - ➢ Are there items in the Red-Tag area? Have they been there for more than a few days?
            - ➢ Have you received a lower score than you would like in this area?

- ◇ Set in Order
  - ➢ Are any of your tools, equipment, and documents not in their correct locations?
  - ➢ Have you felt confused or frustrated when trying to find something?
  - ➢ Is your inventory list not up to date?
  - ➢ Are you the only one who knows where everything is?
  - ➢ Do you find yourself rearranging items frequently?
  - ➢ Are there any floor markings or signs missing that should be there?
  - ➢ Have you received a lower score than you would like in this area?

- ◇ Shine
  - ➢ Are there areas that don't look like your visual standard right now?
  - ➢ Are there any areas that should be clean, but aren't?
  - ➢ Is the amount of cleaning you are doing unreasonable?
  - ➢ Would you be comfortable walking through your area in socks alone?
  - ➢ Has anyone slipped recently?
  - ➢ Are you unhappy with the way your area looks?
  - ➢ Have you received a lower score than you would like in this area?

- ◇ Standardize
  - ➢ Can you find a place where your work and the instructions for doing it don't match up?
  - ➢ Do you have to eyeball measurements?
  - ➢ Have you felt unsure whether or not what you're doing is correct?
  - ➢ Has it been a while since you've done any 5S?
  - ➢ Would it be hard for another person to cover for you?
  - ➢ Have you received a lower score than you would like in this area?

- ○ Don't dread the 5S Audit
  - ◇ The audit is merely a tool to help management see how things are going and identify changes that need to be made.
  - ◇ Take the opportunity to ask questions and figure out what to keep an eye on

- ○ Practice Continuous Improvement
  - ◇ If you notice a problem 5S, take the initiative and fix it.
  - ◇ Try to provide good feedback and look for ways to make work easier, more efficient, or error-proof.

- ◇ Do Quick Kaizens:
  - ➢ Do a Quick Kaizen to help you solve problems in your area. When you encounter an issue, make a copy of the Quick Kaizen Template and set to work. You can find the template under Appendix E.
  - ➢ List possible sources of problems and suggest how you would address them.
  - ➢ Make sure to follow-up after you have prescribed possible solutions.
  - ➢ Refer to the Educational Guide for more information on how to practice Kaizen.

- Verify Implementation - Supervisors
  - ○ Assess this document
    - ◇ Your first step should be to see how far along people are in following this S.O.P. Determine whether or not they need any help, motivation, or resources to complete their tasks.
  - ○ Assess visual control of areas
    - ◇ Another way to examine 5S implementation is to test an area's visual management. When you look at an area, ask yourself:
      - ➢ Am I able to tell if an area is in or out of control?
      - ➢ Does the area look like it's being cared for?
      - ➢ Does anything appear confusing?
      - ➢ Is it clean or dirty?
      - ➢ Do people seem to believe in 5S, or are they going through the motions?

- Conduct 5S Audits - Supervisors
  - ○ Conducting 5S Audits are an important part of Sustain, as they help quantify 5S implementation, spur communication and improvement, and help manage expectations.
  - ○ Instructions for Building an Audit
    - ◇ Saint Gobain utilizes a standardized audit; its most current electronic version is maintained by management. When making changes to an audit, keep the following objectives in mind:
      - ➢ The audit must be broad and flexible enough to be used for every area of the plant.
      - ➢ It must be specific and comprehensive enough to address every major concern or factor of 5S
      - ➢ The audit should have built in metrics that are well defined; quantifiable data must have a solid foundation to be collected on.
      - ➢ The method of scoring should maintain a function and appearance of fairness, impartiality, and repeatable consistency

        - The auditing process should be largely transparent to avoid miscommunication and confusion

    - Instructions for Conducting an Audit
        - When conducting audits, be sure to:
            - Look up down and around
            - Provide detailed feedback
            - Be prepared to discuss your result
            - Use the opportunity to communicate vision, expectations, and strategies for self-policing
            - Schedule regular times for doing future audits

- Shape Workplace Culture - Supervisors
    - Promote 5S
        - To implement a culture of sustain, you will most likely need to begin with promoting the core concepts of 5S and selling them as a better way to work.
        - Helpful strategies may include:
            - Setting a good example
            - Promoting 5S as “a way of life”
            - Stressing the importance of information and communication in the organization (the importance of visual management)
            - Emphasizing that it will improve efficiency
            - Saying that it will improve safety and quality of life in the long run
            - Reminding people that this is a new requirement for everyone at Saint Gobain

    - Promote Continuous Improvement
        - Next, you will need to create a climate of continuous improvement.
        - Several strategies include:
            - Focusing efforts on eliminating waste and delivering value
            - Improving communication at and between all levels
            - Making sure that meetings are regular and accomplish what they set out to do
            - Support and streamline efforts to implement change
            - Promote the concept of employees owning and taking responsibility for their spaces
        - Finally, when there are competing visions for improvement, if there is conflict, or if improvement is somehow constrained, seek to make distinctions between opinion, rules and guidelines, budgetary constraints, and interpersonal conflict. Differences of opinion should not be allowed to inhibit communication.

- Improve the 5S Program - Supervisors

- Look for problems in your training and execution of 5S
  - Have meetings with you colleagues to discuss difficulties and develop improvements together.
- Tailor 5S to your organization
  - Update this S.O.P. and 5S Education and Training Guide as necessary
  - Change the level of emphasis placed on each S to suit your needs
  - Develop new tools and strategies that work for you
  - Seek out additional tools, methodologies, and techniques from other organizations
- Ensure that 5S is your best solution
  - Assess the role 5S plays in your organization and determine what value it delivers to you.
  - Examine the philosophies and programs of other organizations and determine if they might offer you better solutions.

- Test Your Implementation
  - Examine your work on 5S. Look back at the pictures you have taken. How far have you come?
  - Ask yourself:
    - Have there been any preventable accidents or defects?
    - Are people happy with the 5S implementation?
    - Do people seek continuous improvement?
    - Can the status of a workspace be determined without asking anyone?
    - Do people see the value of 5S?
    - Is 5S a habit?
    - Is all of this easy to see?

5S Education & Training Guide (ET&G)

SAINT-GOBAIN

5S Education and Training Guide

The WPI Team

What is 5S ?

A lean manufacturing system technique that reduces waste, standardizes the work area and increases workers productivity

Why is 5S Important ?

- 5S makes the workplace safer
- 5S helps workers better to communicate with one and another and management
- 5S improves workers productivity and efficiency
- 5S creates a cleaner, more well organized workplace

5S Application and Implementation

- 5S is applicable to any workplace or office in Saint Gobain
- First read this ***5S Education and Training Guide*** to get a general understanding of 5S, then follow the 5S S.O.P. for steps on how to implement 5S in Saint Gobain

Figure 1

- *5S is a continuous improvement process*
- *A good understanding of 5S and proper implementation of the **S.O.P.** will help improve the 5S score in your area*

Frequently Asked Questions about 5S:

Who is responsible for 5S?

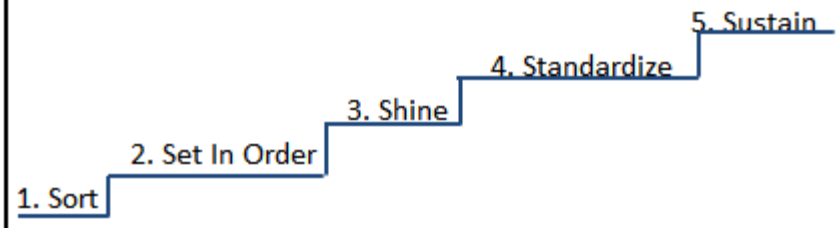
- In short, everyone.
- ATLs should guide the workers when learning 5S and ensure that workers properly follow the S.O.P.
- Operators and Leads are responsible for executing 5S in their zones/areas

Is implementing 5S an individual work or a team effort?

- 5S can be implemented individually but at Saint Gobain, 5S implemented as a team

The Order of 5S

5S in Saint Gobain should be implemented in the following order:



This is the most logical and time efficient order

For Example: *It is inefficient and pointless to shine an area that has not been sorted out for clutter, and everything in the area does not have an assigned location*

SORT

Introduction to Sort

What is Sort ?

- Sort is the first step in 5S
- It involves removing unnecessary items from the workplace
- Places an emphasis on controlling clutter and space
- It identifies the frequency of use of different items in the workplace

Why is Sort Important?

- Sort helps to make space for the rest of 5S to occur
- It controls the removal of items and promotes thought about what is important in any given space

Example of Good Sorting

Figure 2

How do we Sort?

- Scan your area for unnecessary items and clutter
- Divide items into 3 categories: **Frequently Used**, **Infrequently Used** and **Never Used**.
- **Red-Tag** unnecessary, "Never Used", broken, or obsolete items
- Check/Update inventory lists for items required in a specific area
- Regularly remove items that do not belong in the specific zones/areas

TIP:
Refer to the Sort section of the SOP for more detailed information on the Sorting Procedure

Figure 3

Inventory List

What is an ***Inventory list***?

- An Inventory List is document that lists all of the tools, supplies, and other resources that you use.
- Includes details like how old the tool is, how many of the same do you have, and where a person can find it.

Why is it Important ?

- It will help you to keep track of your tools
- Frequency section of the inventory list help determine how frequently the items are used, which can then help us in making decisions about red-tagging items

Note: This tool will also be used when we perform Set in Order

Example of an Inventory List

Date	11/30/2016	INVENTORY LIST				
Manufacutring Zone	Mixing					
Compiled by	Leif					
Inventory ID	NAME	Description	Location	Quantity	Condition	Frequency of Use (Daily, Monthly, Annually, Never used)
1	Hammer	Stainless Steel - Model A	Shelf	2	New	frequently

Red Tag Area

Figure 5

What is a Red Tag Area?

- An area set aside to document and to remove unnecessary items from the factory

- It is the last stop before items goes to trash

Why is Red Tagging important?

Figure 6

- It keeps the factory free from clutter
- It is an important part of Sort and 5S as a whole
- It helps organize the workspace
- Red Tagging promotes thinking about what is needed and what is not needed in a workspace
- Allows the removal of unneeded items to be monitored

What items go in the Red Tag Area?

- Items that have never been used
- Items that have no use in the future
- Items that are defective
- Items that are obsolete
- Items that do not belong in a particular zone


Figure 7

What happens to Red-Tagged items

- Items that are Red-Tagged are documented:
  - **Person** who Red-Tagged items
  - **Location** at which items were Red-Tagged
  - **Date** on which the items were Red-Tagged
  - **Name** of the items
  - **Reason** for Red-Tagging items

Figure 8

- Items are either discarded (trashed) or moved to a Red Tag Holding area for 1 day.
- Items in the Holding area are there to give you last chance to reclaim them before they are discarded for good.

Test Your Implementation

- ❑ Is this item required to complete the upcoming tasks?
- ❑ How often is this item used?
- ❑ When was this item last used?
- ❑ Do newer versions of these items exist?
- ❑ What items or documents are kept on a desk space? Why?
- ❑ Can you justify keeping this item?
- ❑ Could the same job be accomplished by a more multifunctional item?

Figure 4

SET IN ORDER

Introduction to SET IN ORDER

What is Set in Order?

- Set in order is the second step in 5S
- Uses Inventory Lists **(from Sort)** to determine frequency of use
- Makes items easily accessible by using various organization tools such as: **Mapping and Labeling**

Why is Set in Order Important?

It is important because:

- Tools should be easily found, easily retrieved, and easily returned
- Reduces the chance of losing items
- Makes work more efficient and effective
- It helps people understand the layout of the workplace and where items can be found
- Helps people to be aware of hazards

How do we SET IN ORDER?

- Identify the best location for each item
- Place each item in its assigned location
- After use immediately return each item to its assigned location
- Regularly check that each item is in its assigned location

Please refer to the Set In Order section of the SOP guideline for a more detailed information on the Set in Order Procedure

Figure 9 *2. SET IN ORDER*

Figure 10

MAPPING

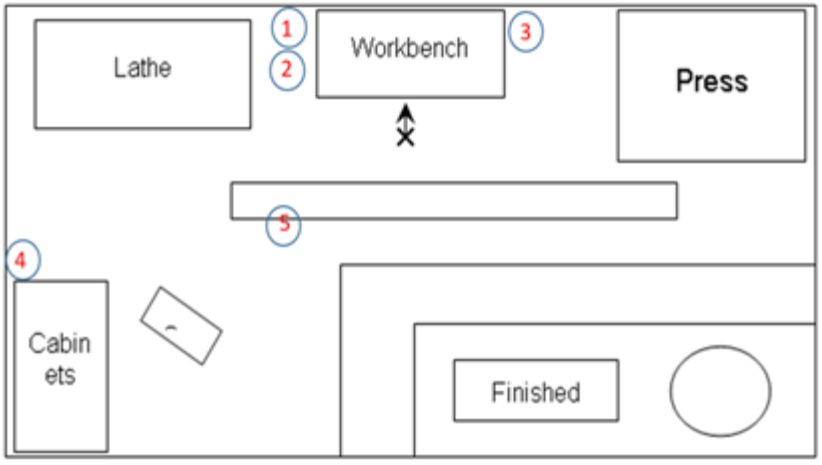
What is Mapping?

- It is a simple tool that helps with planning Set In Order
- Using a simple map of your workspace, draw locations of where items will go and how much space they take up.
- Items that are frequently used are placed closer to the operator

Why is Mapping Important?

- It helps people visualize items and the space they take up
- Can be used to test various setups without moving items unnecessarily

Example of Mapping



**Each number represents the location of a set of tools or some other object necessary for work*

LABELING

What is Labeling?

- Labeling is a method to define items specific locations by putting the items name in and beside their home locations.

Why is labeling important?

- Labeling helps to quickly identify, retrieve and store items in their locations.
- Makes it easy to identify if some parts have gone missing

Labeling

Where is labeling used?

- Used for items in shelves, drawers and storage cabinets in manufacturing zones
- To identify Items and tools in the workstations
- In setting cleaning supplies and items in a supply closet
- On small carts that carry finished items to the next zone
- On large machines and work zones for easy identification

Examples of Labeled items in their home locations

Shadow Board

Name Tags

Floor Markings

What are Floor Markings?

- Lines and symbols on the floor that make people aware of important workplace boundaries. An example is of hazardous areas are marked so that workers in the factory can avoid them

Why are Floor marking important?

- Relays important information about the location
- Creates a safer working environment
- Creates an efficient environment
- Required by Occupational Safety and Health Administration (OSHA)
- Makes the different factory spaces easier to understand by

Floor Markings

Where are Floor Markings used?

- Near known potential hazards such as toxic chemicals and moving parts, and tripping hazards
- Staging areas of finished products from different zones
- Locations for long term storage of raw materials
- Raw materials or finished products stored
- Locations of large equipment storage such as forklifts
- Traffic routes such as Emergency exits and vehicle pathways

Examples of Floor Markings

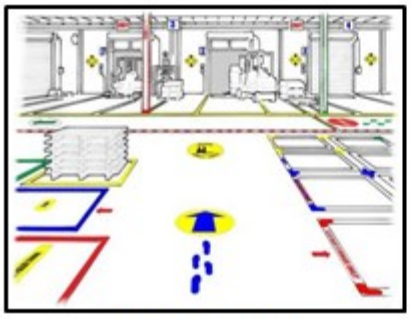
Tiger Marks

Walkways

Divider Lines

Material Storage Areas

More Examples of Floor Markings



Vehicle Pathways

Range Lines

Example of Set In Order

Figure 11

Test Your Implementation

- ❑ Are frequently used items placed in convenient locations?
- ❑ Are required items easily located?
- ❑ Are the locations for items clearly marked?
- ❑ Are there max. or min. indicators noted for supplies?
- ❑ Do all items have a home location?
- ❑ Are items returned after use?
- ❑ Are working / draft copies of documents maintained separately from final/ master copies?

Figure 4

SHINE

Introduction to Shine

What is Shine?

- Shine is the third step of 5S
- Helps in keeping everything clean, functional, and ready for use
- Uses ***Cleaning Standards*** to define and communicate cleaning requirements for a certain area
- Uses ***Visual Standards*** to define what level of cleanliness is acceptable

Why it is important?

- Shine keeps factory clean and aesthetically pleasing
- Helps to control contaminants and make maintenance issues obvious
- Helps to prevent or mitigate accidents caused by as slips and falls, airborne particles, toxic chemicals, and other hazards
- Ensures that cleaning is consistent and fair

How Do We Clean?

- Take "before" pictures of every machine, work table, inventory racks etc.
- Select an area to be cleaned.
- Clean that area thoroughly. Ensure the work area is neat, clean and tidy
- Take "after" pictures and compare to your standard

Figure 12

Figure 13

3. SHINE

Please refer to the Shine section of the SOP guideline for a more detailed information on the Shine Procedure

Cleaning Standards

What are Cleaning Standards?

- A Cleaning Standard is a document that describes in detail how and when all the equipment in a particular zone should be cleaned, and who is responsible for doing so

Why are Cleaning Standards important?

- Cleaning Standards helps ensure that a schedule for Shine is created and maintained
- Cleaning Standards remove ambiguity and helps ensure accountability
- They also help ensure that machines are cleaned to the same standard every time and make sure that people have all the information they need to do the job properly

Example of a Cleaning Standard

#	Area	Component	Cleaning Standard	Cleaning Tool	Operation	Machine Status	(Est.) Time	Frequency	Who	When	OK
1	Material transport	Rear Roller		1" paint brush, vacuum, 1/4" screwdriver	Clean by hand and vacuum debris	Stopped	3 min	After every shift	Operators using saw	End of shift	
2	Material transport	Rear Vise and table					3 min				
3	Material transport	Front Vise table		Air hose	Clean by hand	Stopped	1 min	Between every set up	Operator using saw	Between each use	
4	Saw body	Front pan		Vacuum, 1" paint brush, shop rag	Clean by hand	Stopped	2 min	After every shift	Operators using saw	End of shift	
6	Saw body	Guide area & Piston		1" paint brush	Clean by hand	Stopped	1 min	Weekly	Operators using saw	Friday at shift change	
5	Chip Conveyor	Chip conveyor cover		Shop rag	Clean by hand	Stopped	1 min	After every shift	Operators using saw	End of shift	

Visual Standards

What are Visual Standards?

Each machine in a manufacturing zone needs to have a Visual Standard associated with it. A Visual Standard is a quick reference that shows:

- The name of a machine and its description
- How clean a machine should appear
- What areas of a machine need specific attention

Why do we need Visual Standards?

- We need them to determine which machines need cleaning
- To explain how and where a machine should be cleaned
- To have a visual check on what a machine should look like after cleaning

Example of Visual Standard

Shine: Before and After

Figure 14

Test your implementation

- ❑ Is your area clean?
- ❑ Do you know what your cleaning responsibilities are?
- ❑ Do you have all the instructions you need to complete the task?
- ❑ How much time has elapsed since you cleaned last
- ❑ Are machines being properly maintained (e.g. paper jams cleared)?
- ❑ Has contamination caused any defects recently?
- ❑ Could an outside observer find out determine if your equipment and workspaces are adequately clean?

STANDARDIZE

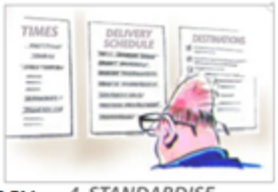
Introduction to Standardize

What is Standardize?

- Standardize is the fourth step in 5S
- It adds prevention and consistency to 5S
- Focuses on creating and maintaining standards of doing regular work and doing 5S

Why is it important?

- Helps ensure that the first three steps are well implemented and maintained
- It improves communication and transparency
- Makes sure that the workplace does not return to its original (non-5S) state



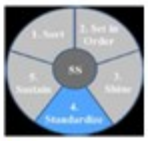
4. STANDARDISE

Figure 15

How do we Standardize?

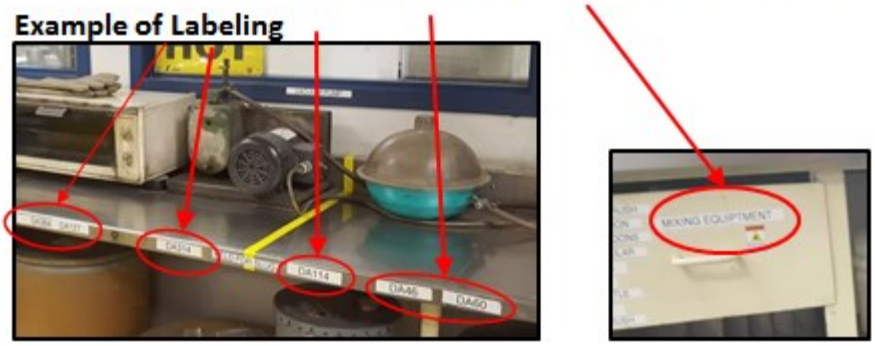
- Place various ***Visual Tools*** such as ***Cleaning Standards*** that you created in the previous steps in visible locations
- Make sure the **language**, **color-coding**, **labeling**, and **checklists** are consistent for all documents all across the factory
- All processes should be defined and everyone should be held to that standard for effective running of the plant
- Make changes to processes that are not following their respective standards

Standardized Labeling



- Review labeling from ***Set in Order*** and make sure it follows Saint Gobain's labelling standards
- Make sure that the labeling style is consistent across all areas

Example of Labeling



Creating Visual Tools

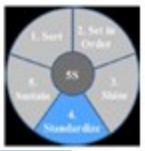
What are Visual Tools?

- They are procedures, checklists, standards and other visual posters created to make everyone's responsibilities clear
- They help in better communication between workers and management

What makes good Visual Tools?

- They need to be in a highly visible location
- They need to be easy to read and understand
- They need to be in durable format (resist getting dirty or damaged) - ***lamination*** is a good technique

Example of Visual Tool



Before and After Standardization

Test your implementation

- Do workstations have files organized in a similar fashion?
- Are individuals able to quickly locate another individual's/ team's materials/ files?
- Does a standard naming convention for files exist?
- Do procedures/ job aids on the proper way to organize and maintain materials/ files exist?
- Do team members understand their role and responsibility in adhering to the first 3S's?

SUSTAIN

Introduction to SUSTAIN

What is Sustain?

- Sustain is the final step in 5S
- It involves continuously training workers to establish and maintain 5S standards
- Uses **Auditing** to perform regular checkups
- Improves **communication** across the organization
- And develops a 5S culture

Why is it Important ?

- Having a culture of responsibility, transparency, and continuous improvement is key
- Sustain makes the implementation of 5S easier, more consistent, and more comprehensive
- Sustain makes sure that 5S is flexible and effective

Figure 18

How Do We Sustain?

- Introduce the ***5S Education and Training Guide*** to employees to train them on 5S skills
- Improve **communication** within and outside a department to better convey information and to increase work efficiency
- Perform Kaizen in your area
- **Audit** and record daily outcomes
- Test 5S knowledge periodically
- Incorporate 5S into employee's routine to create a 5S culture

Communication Methods

What are Communication Methods?

- Periodic checkups on the conditions of that workplace
  - **Regular Meetings:** interdepartmental meetups to communicate goals and tasks for everyone on the floor
  - **Daily Performance Boards:** boards that document the daily progress of specific areas by using indicators such as Safety

Why are they important?

- Communication Methods help team members check their goal progress on achieving their goals
- They document observable impacts of the team's actions
- They avoid confusion and conflicts between team members

Example of a Communication Method

Auditing

What is Auditing?

- Auditing is a visual inspection of the implementation of all the previous steps in 5S
- Every zone/area receives a score out of 5 based on their performance

Why is it important?

- It helps keep a safe working environment by promoting constant awareness of potential hazards
- Ensures that the area remains well maintained
- Promotes a high sense of ownership of one's area

What Makes a Good Audit?

A good Audit should:

- Be clear easy to use
- Cover all the S's comprehensively
- Result in consistent outcomes
- Provide prompts that ensure a thorough examination
- Be Transparent

Example of an Audit

5th S: Sustain

			INITIAL SITUATION	FIRST IMPROVEMENT	DEVELOPMENT		INTEGRATED SYSTEM	EXCELLENCE
	Sustain improvements and make further company wide improvements		NO REGULAR 5S ACTIVITY	REGULAR 5S ACTIVITIES ARE STARTING	CONTINUOUS IMPROVEMENT ACTIVITIES ARE BEING DEPLOYED		A CONSTANT IMPROVEMENT CULTURE IS ESTABLISHED	INTENSIVE CONTINUOUS IMPROVEMENT ACTIVITIES ALL
	Check item	Question	No Team Activity	Team Activity Started	Regular Team Activity	Regular Team Activity and reporting	Audit by the Team	Audit and Action
5.1	5S project with management commitment and a Steering Committee	Is there a formal 5S program with management commitment? Is the 5S vision shared in the plant? Are targets clearly communicated? Are there an audit system and a reporting system in place?	0	1	2	3	4	5
5.2	5S training and team activities. Audits and follow-up	Have all operators been trained to the 5S and is there a continuous 5S team activity all over the plant, with a regular audit plan clearly defined for all the teams?	0	1	2	3	4	5
5.3	Ideas for 5S improvement and action projects	Have improvement suggestions, projects and action plans been structured and visually displayed, and are they visible to everyone?	0	1	2	3	4	5
5.4	Performance indicators	Is everyone informed of the workplace past and present achievements?	0	1	2	3	4	5
5.5	5S standard	Are the 5S standards applicated and updated ?	0	1	2	3	4	5

Kaizen

What is Kaizen:

- Is a way to practice continuous improvement in the workplace
- Figuring out what processes are not followed correctly
- Correcting the flaws in the current state of the process

Why is it important?

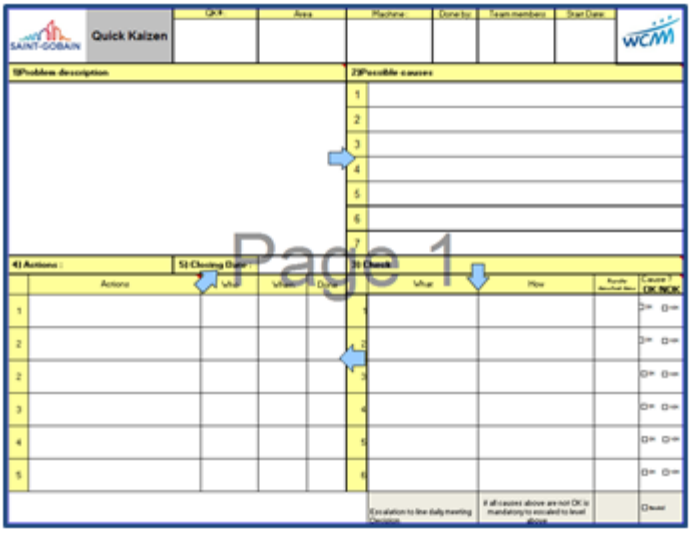
- Enables you to find root cause of the problems
- Helps in eliminating waste
- Small improvements overtime can achieve big results
- Saves a lot of money

Kaizen

How do we do Kaizen?

- List down a problem that you have in your area
- Write out all the possible causes of the problem
- Check for how what is causing the problem and how it is affecting the correct state
- Come up with action items/what you are going to do to correct what is wrong
- Keep a track of who is responsible for action items
- Make sure the problems in your areas are addressed

Example of a Kaizen Template



5S Responsibilities

Operators:
Implement 5S in their zones

ATLs:
Make sure supplies are available and boards are updated

VSCs:
Coach operators on 5S

Management:
Audit the implementation of 5S and set goals

Developing a 5S culture

- In order to make 5S work, an organization needs to adopt a "5S Culture," or one of continuous improvement.
- The more that people believe in and practice 5S, the easier implementation will occur.
- Employees need to:
  - take ownership of a space
  - feel that they can contribute
- The best teams operate this way.

Figure 19

Benefits of a 5S culture

- People have the ability for continuous improvement
- It engages employees at every level and encourage a sense of ownership, involvement & responsibility
- Improves quality, productivity and workplace flow
- Improves safety, organization and standardization
- Increases efficiencies, quality and productivity

Test your implementation

- How regularly are audits performed?
- How do you recognize or reward staff for thinking about, or adhering to 5S?
- Do employees offer suggestions on how to improve their workplace or the 5S program?
- Is there confusion about what 5S means or why it is being implemented?
- Do people go through the motions or do they believe in 5S?
- Is non-adoption understood and addressed?

Additional Resources

- Online resources
- Standard Operation Procedure
- Saint Gobain Materials and Templates
- Saint Gobain Audit
- Ask supervisors for guidance

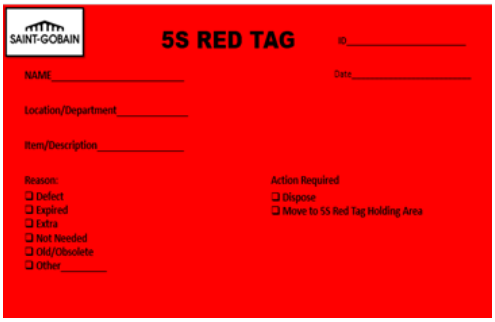
Red Tag Area - One Point Lesson (O.P.L.)

ONE POINT LESSON **Pillar:**

[x]	Basic Knowledge	[ ]	Problem	[x] Improvement	OPL No.
Title:	Red Tag Area			Filled by:	
Team				Department:	Date:

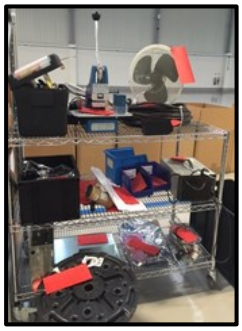
1. How to Red Tag Parts?

- Fill the following Red-Tag Card and move item to the nearest Red Tag Area.
- Call maintenance as soon as you do this.



2. What makes a good Red Tag Area?

- Every item is Red-Tagged
- Red-Tagged item only stays in the area for more than a day
- Items in the area are discarded daily
- Maintenance has a record of all Red-Tagged items



Training Date:													
Trainer:													
Trainee:													