

## 5S – TOOL OF ELIMINATING WASTE IN COMPANY PROCESSES

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### **Abstract:**

*The article deals with the use of method 5S to increase the efficiency of company processes. The steps of implementation are described in detail along with the benefits they bring. The potential benefits in the areas of waste are expressed in percentages. The article also warns against errors and risks associated with 5S.*

**Key words:** 5S, seiri, seiton, seiso, seiketsu, shitsuke, wasting, company process

## 1 INTRODUCTION

The companies in a globalized economy have faced to challenges relating to the effort to reduce waste in the production process. To identify activities that cause wastage in production and their gradual reduction can mean the creation of significant competitive advantage and potential profits for the company. The companies that have been applying philosophy of kaizen (continuous small improvements) tend replaced waste by its Japanese equivalent of the wider significance muda. Almost every organization has found these seven kinds of muda, activities that do not add value - overproduction, waiting, unnecessary handling, unnecessary movements, poorly chosen work procedure, stocks, errors of the workers and their subsequent removal. [3] Bauer and all. complement the creativity of unused human potential and poor communication to the the aforementioned types of muda. [2] Despite revelations muda will be never completely removed. Frequently used and effective methods to counter the effects of certain muda is method 5S or its modification 3S (implemented only the first three steps of the 5S method) and 7S (original five steps supplemented by safety and spirit). [4] Method 5S is an essential input for the implementation of other methods such as kaizen, flow respectively total productive maintenance.[4] 5S helps to analyze processes at the workplace, to understand them and show possible directions for improvement. The origin of 5S goes back to Japan, the name is derived from the initials of five successive steps constituting this method.

**Tab. 1 5S**

<b>Steps</b>	<b>Japanese language</b>	<b>English language</b>	<b>Slovak Language</b>
1.step	Seiri	Sort	Selekcia
2.step	Seiton	Set in order	Systematicky rozdeliť
3.step	Seiso	Shine	Stále čistiť
4.step	Seiketsu	Standardize	Štandardizovať
5.step	Shitsuke	Sustain	Sebadisciplinovanosť

*Source: By author*

## **2 THE PROCEDURE OF IMPLEMENTATION OF 5S**

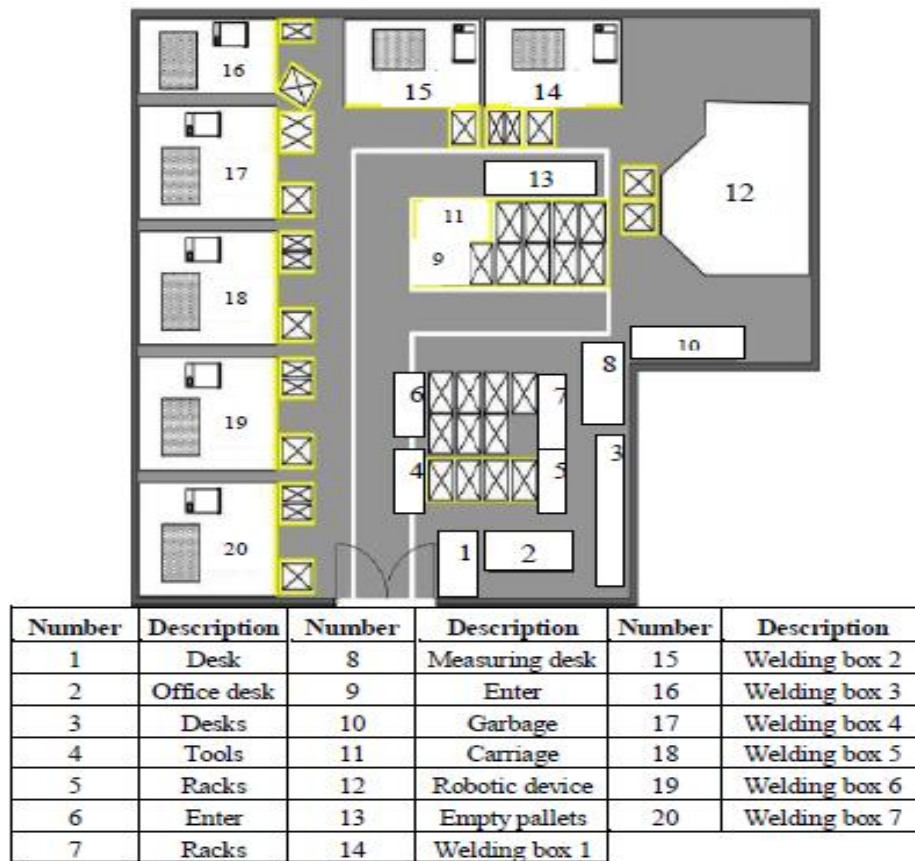
Before the implementation of the method 5S is important to plan all steps. In the planning phase are set the terms of the steps and the reasons, consequences and tasks in implementing 5S are explained to the personnel concerned. The company may implement 5S itself or may have recourse to an external consultant.

### **2.1 STEP SEIRI**

The aim of the first step of method 5S is to distinguish the important from the unimportant at the workplace. This step used to take a lot of time. In its implementation it is necessary to go through the whole workplace and at each thing, which is currently located at inspected department, to ask whether it is necessary to work or not. If the answer is affirmative, the next question is whether the reviewed matter is needed to work each day respectively only in certain cases. Items used on a daily frequency are kept at the workplace things with exceptional frequency of use are marked with a green card that symbolizes their relocation away from workplace, to the store possibly at the places designed for them. [2] At every workplace there are also things that are not necessary for the work or we cannot determine their importance in the work process. In case that the checked thing is not necessary to perform the production, it is labeled with red card. Things marked with red cards are subsequently separated into waste and there is much more place in the work area. Besides red and green cards are yellow cards too. The yellow color indicates the need of repair. The results of all made operations are better usability of workplace, orderliness and flexibility.

### **2.2 STEP SEITON**

The aim of the second step of 5S is a systematic arrangement of things to find them takes minimal time. Workers decide on optimal distribution of tools and machines in the workplace on the base of previous experience. The arrangement is temporary, it happens definitive after discussion and approval by workers that things are on the best possible location. The layouts of workplaces will be created and they are supported visualization.



*Fig. 1 The example of layout of workplace*

*Source: [4, 33]*

Except optimization of distribution of things it is very important to determine the optimal amount of materials at the workplace as not to overflow the working space and thus to the elimination of the effect of the previous step. Step seiton can be considered as successfully completed where everything in the workplace has its address and there is no unnecessary searching and waiting. [1]

### 2.3 STEP SEISO

The primary objective of the third step of 5S is to keep clean everything. It should be kept clean not only the workplace but also all the things associated with the production process (machinery, equipment, tools). Cleaning refers the removal of impurities and also the possible sources of pollution. Good motivation and an example of positive change at the workplace are taking photos before and after step seiso. Workers clean their workplace themselves, it means that every worker is responsible for the appearance of his/her workplace. Ultimately, step seiso manages to achieve cleanliness at the workplace.

### 2.4 STEP SEIKETSU

After successfully mastering of 3S comes the step associated with standardization. Standardization regards elimination return of the original state. It will be developed, approved and issued standard of the appearance of workplace and the location of things. The standards

serve to the workers to facilitate their work. The standards are developed in cooperation with the operators concerned and reflect their needs and experiences of the performed process. Without the cooperation with the workers in developing standards, there is a presumption that the standards would not contain sufficient depth of procedural issue. Main features of standard:

- a) easy,
- b) understandable,
- c) graphic (photos with short texts),
- d) respecting of the requirements of workplace safety and harmlessness of work environmental.

In the standards there are captured the instructions and intervals of cleaning. One of the functions of the standard is a control function, that is, the actual condition of the workplace corresponds to the state specified in the standard. The result is a standardized workplace created following the recommendations of workers and where all work the same way.

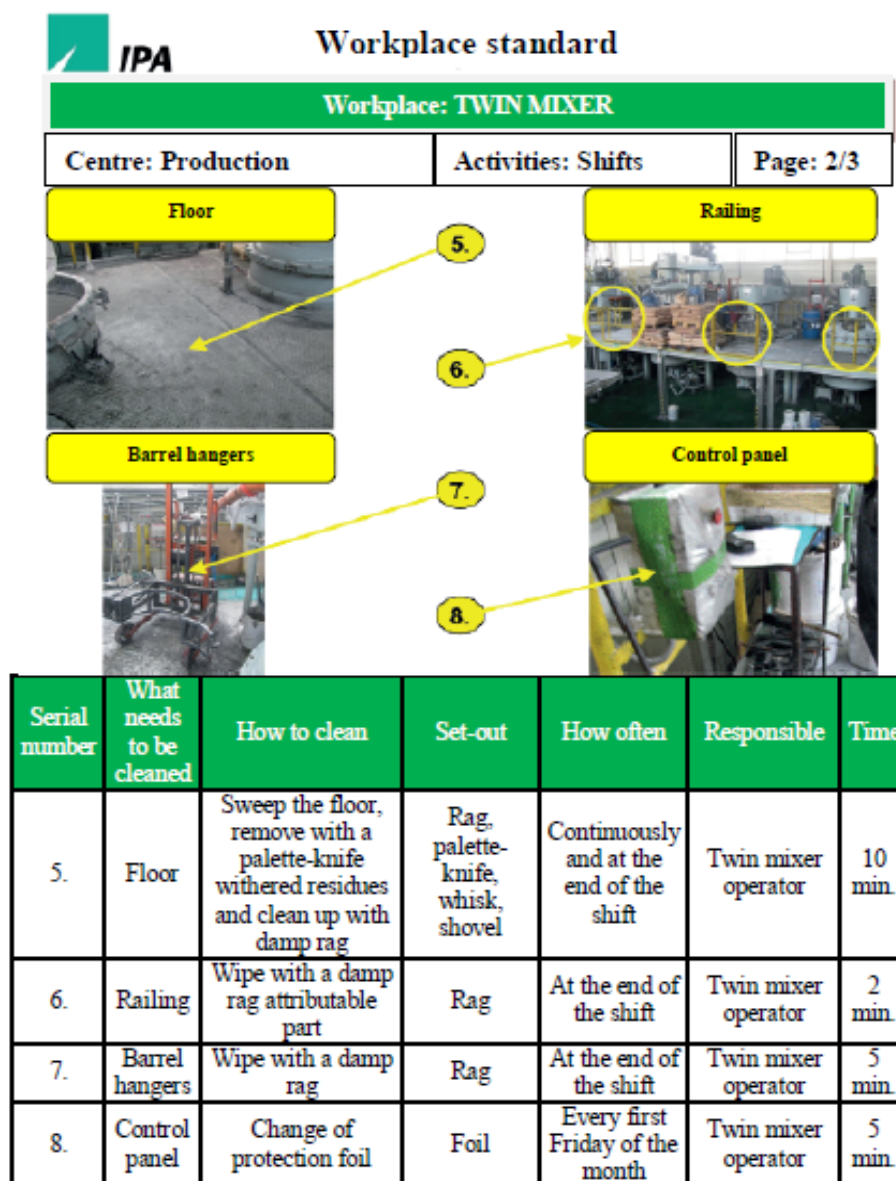


Fig. 2 The example of standard of workplace  
Source: [4, 38]

## 2.5 STEP SHITSUKE

The aim of the final step of method 5S is to build and to respect a culture of 5S and use self-discipline to maintain and continuously improve the condition of the workplace. The essence of this step consists in carrying out the inspections. The inspectors assess compliance with the set standards. The inspection has a support function too, that workers adopt new values and discipline. The checks may be carried out by workers each other or may be carried out between changes. The control card is an excellent tool to complement the control. In specific case of check is audit which is carried out by an independent professional.

Date	Change	Name	Notes	Signature of workers	Signature of supervisor

*Fig. 3 The example of the control card*

*Source: [4, 40]*

Optimal condition after the implementation of the method 5S is, if workers settled in their new conditions and after short time they come with their own ideas for ongoing improvements in the workplace.[1] It symbolizes that the main motive of 5S - open to any improvements (initiated by anyone, anytime) was reached.

## 3 THE RISKS AND THE ERRORS OF IMPLEMENTATION OF 5S

During the implementation of 5S also certain risks may occur. The main risks are related to the field of the staff. Unwillingness of employees to agree to the changes may be on the one hand associated with personality traits (the prejudices) and on the other due to cultural and social environments.

If 5S has become only a formal project, it is a sign of faulty implementation of 5S. Standards hangs on designated sites, workplaces is regularly cleaned, but workers perceive 5S just as regular cleaning, but not as a tool to improve workflow. There has been no change in the corporate spirit. In these cases, the target of 5S has been missed, the method is just blindly followed without understanding of the other connections and thus the power and effectiveness of the implementation of 5S for other related methods of lean company have lost.

## 4 THE BENEFITS OF 5S

Successful implementation of 5S brings to company many advantages. In describing of the specific steps were mentioned benefits associated with the given step. Based on the experience of Burieta are benefits supported by the percentage results:

- a) reducing of the work area of 20 - 40%,
- b) reducing of stocks in the workplace by 80%
- c) improving of the quality of 10 - 20%,
- d) shortening of the search time by 50%,
- e) shortening of the rise time about 10 - 15%,
- f) reducing of assembly operations by 30%. [3]

## 5 CONCLUSION

Implementation of the method 5S makes it possible to eliminate waste in areas such as unnecessary handling, waiting, unnecessary movement, poorly chosen workflow or errors of the workers. Significant after the implementation of this method is its continuous observance and renewal. An essential part of the successful operation of 5S is that the workers concerned were with 5S identified and have considered it for tool that facilitates and accelerates workflow. The successful implementation of the 5S has created an excellent basis for the application of other optimization methods related to company processes.

### References

- [1] Anderson, S.: To 5S or Not to 5S. [on line]. (2012) Quality digest. [cit. 2015-25-11] <<http://www.qualitydigest.com/inside/quality-insider-column/5s-or-not-5s.html#>>
- [2] Bauer, M., Haburaiová, I., Vlček, K., Kadavý, P., Skaláková, E., Kovács, J., Žižka, J.: KAIZEN. Cesta ke štíhlé a flexibilní firmě. (2012) Brno, BizBooks, 200p. ISBN 978-80-265-0029-2.
- [3] Burieta, J.: 5S [on line]. (2007) Ipa Slovakia. [cit. 2015-24-11] <<http://www.ipaslovakia.sk/sk/ipa-slovnik/5s>>
- [4] Burieta, J.: Metóda 5S. Základy štíhleho podniku. 60p. ISBN 978-80-89667-04-8.
- [5] Ceniga, P., Šukalová, V.: Logistics Aspects in the Process of Globalization. (2015) 3rd International Conference on Economics and Social Science, Advances in Education Research, Vol. 86, pp. 100 – 105, ISSN 2160-1070.
- [6] , J., Boledovič, L., Krišťak, J., Marek, M.: KAIZEN. Osvědčená praxe českých a slovenských podniků. (2010) Brno, Computer Press, 234p. ISBN 978-80-251-2349-2.
- [7] Mateides, A.: Manažérstvo kvality. História, koncepty, metódy. (2006) Bratislava, Epos, 751 p. ISBN 80-8057-656-4.
- [8] Michalska, J., Szewieck, D.: The 5S methodology as a tool for improving the organisation. Journal of Achievements in Materials and Manufacturing Engineering. (2007) Volume 24, Issue 2, 211-214p. [cit. 2015-24-11] <[http://www.journalamme.org/papers\\_vol24\\_2/24247.pdf](http://www.journalamme.org/papers_vol24_2/24247.pdf)>
- [9] Sorooshian, S., Salimi, M., Bavani, S., Aminattaheri, H.: Case report: Experience of 5S implementation. Journal of Applied Sciences Research. (2012). 3855-3859p. ISSN 1819-544X.