



TIME, WASTE, AND QUALITY MANAGEMENT IN HEAT GUN PROCESS: INTRODUCTION TO ASWC MACHINE

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Abstract : This study examines how automation can have a favorable impact on all of these parameters, including decreased time requirements, decreased waste production, and improved quality of shrink wrap finishing. Two different manufacturing SMMEs and their employees were subjected to structured interviews, operational procedures, and sample methods. Our investigation demonstrates how automations might impact the heat gun process in terms of time usage, waste production, and finish quality. Therefore, we draw the conclusion that time-consuming waste generation and heat gun process finishing quality can be regulated in a positive way by automating the shrink wrap cutting process.

INTRODUCTION

Packaging

Packaging, Food packaging, cosmetics packaging, electronics packaging, or garment packaging all have a reason for being.

What unites various common items is that they all inevitably arrive in some form of packaging. The functions of packaging are numerous. To name a few of these, there are protection, safety, improved usage, appealing appearance, ideal design, and unique customer requirements. However, single-use purposes are what are frequently associated with packaging. Packaging only has one chance to accomplish its goal. It is either ripped off to begin using the thing it contains, or it is discarded as soon as the product within runs out of packing. The outcome is identical. It is only passingly present.

Five reasons why packaging is important.

Protection

The main objective of packaging is to safeguard its contents from any harm that might occur during handling, storage, and transportation. Throughout the whole logistical chain, from the manufacturer to the final user, packaging keeps the goods in perfect condition. It shields the goods from moisture, light, heat, and other outside elements. The main objective of packing is this. As a result, it is common for there to be far more packaging than real goods. particularly when purchasing things from internet retailers. The product might leave behind an incredible amount of packing waste. Overall, packaging serves to protect, but there is a distinction between packaging that is intelligently and skillfully made vs packaging that lacks a design that is appropriate for its intended use.

Safety

Above all, packaging is crucial to the security of both its contents and its intended audience. Important details about the product and its safety should be included on the packaging. For food goods, for instance, the packaging must make the packing date, best before date, and ingredient list readily apparent. Whether food is made from virgin material or recycled material, packing materials shouldn't leach any toxic chemicals, odors, or tastes onto the food. Additionally, the packaging must make it obvious if product includes dangerous materials. For the consumer, the product safety is enhanced by all of these pieces of information. Always prefer having too much information to having none at all.

Attractiveness

A significant component of the product brand and marketing is the packaging. A distinctive package can make a product more alluring and influence consumers' inclination to purchase it. As crucial as the product itself is the packaging. Its goals are to differentiate itself

from competing products on the shelf or website, increase sales, offer pertinent product information, and pique attention. According to two thirds of individuals, packaging influences their purchasing decisions. A product's packaging can also reveal a great deal about the company that created it as well as the economic, social, and environmental effects of the product. It serves as a vehicle for expressing the company's ideals and the many advantages the product offers to customers.

Usability

Customers want packaging that is appropriate for their needs. They expect highly practical, "life-saving," and user-friendly packaging. The only people who can evaluate a package's usability are its consumers. Some of the consumer demands will be met by packaging that is easy to open and close, fold and sort after use, and that can be recycled or reused. Additionally, good design improves usability. The utility of today's packaging has been observed to shift away from the single-use culture and toward bulk purchases, reusable packaging, and personal containers like in the 1960s. Consumers that care about the environment already carry their own empty jars, bags, and containers when they shop for groceries. Usability of packing thus remains a significant concern.

Sustainability

Before making a purchase, more and more customers are considering the carbon footprint, reusability, and recyclability of the packing materials. In fact, the more positively it affects sales figures, the more sustainable packaging is deemed to be. The packaging design has a key part in determining how simple it is to separate the materials from one another and, consequently, how simple it is to reuse and recycle the packaging. Making more out of less not only conserves resources, but also reduces the amount of product that consumers must manage correctly.

The importance of productive packaging processes

It's critical for companies in the manufacturing sector to have effective production procedures in place. To guarantee that business operations continue without interruption and that the manufacturing line is not disrupted, this includes collaborating with a packaging provider who can satisfy the requirements of these procedures. Managing the timing and quality of packing is another objective if the company does the packaging itself.

Numerous manufacturing companies have various production processes that call for various requirements as discussed above.

However, in my field of business, whether the product is a statue or home décor, the focus is more on how it appears when it is displayed and how safe it is to deliver. The goods must be delivered on time while maintaining the highest possible level of quality for both the product and its packaging.

When handling products for packaging, damage occurs frequently. This causes a delivery timeline to be delayed and disturbed. Therefore, in my profession, managing correct packaging processes and deadlines is crucial.

The most crucial component, along with quality, is time management. There are many tasks that people currently perform that are not only time-consuming but also degrade quality. Such processes can be made automated using machines already on the market or by building a new one. which, by using less labor and producing goods of higher quality, saves you money in addition to saving you time. The ability to execute two or more operations simultaneously is an additional advantage. This makes managing time and quality very simple.

Requirement of automation

Nowadays, automation in the industry becomes the global trend in manufacturing and with the success of the Japanese and European industries in terms of production; more and more companies are switching to automation. Automation is certainly the watchword as today's manufacturers face razor-thin profit margins, Just-In-Time (JIT) manufacturing and the ISO-9002 quality standards. Companies must automate in order to deliver what today's customer is demanding when he wants it and at the price, he wants to pay (Baroro, J. M. M., Alipio, M. I., Huang, M. L. T., Ricamara, T. M., & Beltran Jr, A. A. (2014).) The main advantage obtained with the automated task is that productivity could be significantly increased. (Pérez-Vidal, C., Gracia, L., de Paco, J. M., Wirkus, M., Azorín, J. M., & de Gea, J. (2018).) General process of automation control software design is introduced. And the results show current machines are potential to work automatically and efficiently and produce goods with low lost and high quality. (Xi, X. (2015).) The importance of automation in the process industries has increased dramatically in recent years. In the highly industrialized countries, process automation serves to enhance product quality, master the whole range of products, improve process safety and plant availability, efficiently utilize resources and lower emissions. In the rapidly developing countries, mass production is the main motivation for applying process automation. (Jämsä-Jounela, S. L. (2007).) Automation is the future. Sometime in the future, warehouses will be fully automated. Already today, many warehouses around the world have reached a high degree of automation. The packaging process currently relies primarily on manual labor, and the focus is to investigate methods to improve this process through automation. (Hulgaard, J. (2020).)

During an observation, it was found that sorting and packaging was time consuming and requires lots of human efforts and has possibility of more error. (Kunwar Jr, P. J. (2019).) Additionally, I learned through experience running my own business how time-consuming, rife with human error, and less productive and efficient the work done by humans is in comparison to automation.

Every sector that uses heat gun packaging typically has to deal with an issue that takes time and is concerned with efficiency if it doesn't use more packaging material, which costs more money. Which is cutting the plastic to fit the product's size perfectly before using a heat gun to wrap it.

The process is wrapping the product in plastic with the use of a heat gun; the plastic is provided in the form of a tube, so the worker must cut it to the ideal size so that it completely encloses the product without creating waste and at the same time wouldn't slip off for the product. As a result, the worker must measure each time they cut the plastic to fit the product. Furthermore, it can be challenging to count and recall the number each time after measuring the product numerous times. It frequently happens that if a worker cuts more pieces than necessary or because many cuttings were rejected due to size issues, resulting in waste.

Aswc machine

The Automatic Shrink Wrap Cutter, or ASWC for short, was created to address the problems of waste, time, and perfect size cuts. As implied by the name, the shrink wrap tube is cut in line with the size and quantity offered. By simply entering the variables, such as the size and quantity, it automatically creates the process of cutting tube. Additionally, it will result in a decrease in waste generation during the entire heat gun operation.

Currently, the machine is being designed. It is being designed in such a manner that it will have the lowest possible cost, be simple to change tools on, and be simple to use so that any worker, regardless of education level, can use it without difficulty.

Problems that the ASWC aims to address are:

Time management

Each time a worker uses a heat gun, they must first cut the shrink wrap tube to the appropriate length for the product. Therefore, the worker will need to measure the tube each time before cutting it. So, if there are more products, it will take longer to measure and then cut the tube. The more time it consumes for this process, more the further timeline gets delayed. Resulting the delay in time and so other consequences of it.

What ASWC would do is automate the entire procedure. It is programmed such that by just entering factors like size, it will continue to cut until your desired amount is reached. Once you enter the desired size, the tube will automatically be cut to that size; there is no need to measure it again, saving time and manpower that can be put to better use elsewhere.

Control on waste

Human mistake is always a risk while cutting the tube with the use of human power. If there is too much or too little of anything, the entire task will fail to be cut, generating waste. Errors like these happen when the size is different from the needed one.

Simply said, ASWC is configured to cut the exact size that has been entered for cutting. Therefore, after you select the desired size, the entire amount will be sliced into that size only. Consequently, no more or less tubes are cut owing to human mistake or for any other cause. leading in the development of zero or almost zero waste.

Control on quality

As the entire heat gun procedure is for security, decorative, and showcasing purposes, quality control is a crucial component. perhaps you might say that the heat gun process's final product reflects its quality. Generally, the size of the tube has an impact on the quality. because too much plastic during the heating process might generate an uncomfortable wrap, while too little plastic could not provide a material to wrap the entire thing in.

While using ASWC, we gain from perfect sizing as well as quality from the tube cutting end. because the tube's size directly affects the wrap's quality.

Economical & Productive

In general, we must choose a worker to do the task. Consequently, you are investing both time and manpower.

So, you can use your time and people more effectively simply by automating the entire cutting process. Additionally, the entire machine will be more efficient than any worker's monthly salary.

These is how ASWC makes change. With the aid of ASWC, it will be possible to address not only mechanical issues but also managerial ones including time management and its effects, waste management and its effects, quality control, economic advantages, and productive benefits.

REVIEW OF LITERATURE

Automation

The boom in manufacturing is led by the new technologies available today as well as low wages, customization, mass production, flexibility, & most importantly, the information. A study on computer aided design (CAD) makes it possible to transmit designs directly to machines that will follow them perfectly. It provides the classical advantages of automation: time and accuracy. Standards for CAD transmissions have been developed such as IGES and STEP. Another study in automation is supported by the new technology hierarchy which is a concept of utilizing a chip on top of a part to be processed. The chip acts as a negotiator for the part communicating with the machines in behalf of the part. It eventually finds a suitable machine to process the part. (Baroro, J. M. M., Alipio, M. I., Huang, M. L. T., Ricamara, T. M., & Beltran Jr, A. A. (2014).) This work presents a robotic-based solution devised to automate the product packaging in industrial environments. Although the proposed approach is illustrated for the case of the shoe industry, it applies to many other products requiring similar packaging processes. The main advantage obtained with the automated task is that productivity could be significantly increased. The key algorithms for the developed robot system are: object detection using a computer vision system; object grasping; trajectory planning with collision avoidance; and operator interaction using a force/torque sensor. All these algorithms have been experimentally tested in the laboratory to show the effectiveness and applicability of the proposed approach. (Pérez-Vidal, C., Gracia, L., de Paco, J. M., Wirkus, M., Azorín, J. M., & de Gea, J. (2018).) Mechanical automation in advanced countries develops to set of equipment instead of single machine. In set of equipment, the stability and speed of produce improves, and the automation control is better. It is more flexible in produce, structure, providing with the set of equipment. After computer technology getting in especially, there is less error in produce proceed and pollution to the environment. (Xi, X. (2015).)

By developing technologies, it is possible to find solutions to the basic needs of society and the industry. The development of technology helps to maintain all of the current competitive advantages and to create new ones in many new fields, thus further improving prosperity and well-being. The development of high technology applications further boosts the introduction of new cooperation models: networking among business companies, universities and research institutes, as well as decision-makers in the public sector. A trans-disciplinary approach e.g., in materials development requires expertise in physics, chemistry, biomaterials, electronics, communications, programming and automation. (Jämsä-Jounela, S. L. (2007).) The packaging process currently relies primarily on manual labor, and the focus is to investigate methods to improve this process through automation. The process of packing goods on a pallet consists of the following steps; transport to the packing area, label the products, move the products to a new pallet, measure, apply protection, wrap, label the pallet, and transport to temporary storage. In order to automate a process, some degree of standardization is needed, but many parameters constrain this development. An important parameter is variation in terms of material and packaging, both interior and exterior, such as pallet type. The packaging process can be divided into a number of subfunctions by Function Analysis. Together with Process Activity Mapping, the study suggests that the relevant part of automating is the last part of the packing process, from the step wrap mentioned earlier. The project has developed five different concepts. All of the concepts include a fully-automatic wrapping machine. The five concepts have different methods of transporting finished pallets to storage at the other end of the warehouse. The investigated transport methods are various lengths of conveyor belts, an automated guided forklift (AGV), a combined conveyor belt-AGV solution, and human-operated forklifts. (Hulgaard, J. (2020).) Research-based study for checking the possibility of automating the sorting and packaging process by providing reasonable solutions was assigned by JR-Tools Oy and approved by the head of the department Tommi Fransila. The thesis client is a maker of unique cutting tools for a metal business located in Tikka Koski. During an observation, it was found that sorting and packaging was time consuming and requires lots

of human efforts and has possibility of more error. So, major goal of the thesis was to analyze sorting and packaging process and check the possibility of automation for those processes which is followed by a minor goal to improve inbound and outbound process of the company. Qualitative research methodology was used to collect quantitative data and evaluation method was carried out by analyzing those collected data for intrinsic solutions for the company. (Kunwar Jr, P. J. (2019).)

Mechanism

A bistable mechanism has two stable equilibrium positions within its range of motion. This behavior is desirable for a variety of applications. However, bistable mechanism design presents a number of challenges, particularly since the mechanisms' motion and energy storage characteristics are strongly coupled. This is especially true for bistable compliant mechanisms, in which the motion and energy storage generally both take place within the same flexible segments. (Hegmans, A., Berners-Price, S. J., Davies, M. S., Thomas, D. S., Humphreys, A. S., & Farrell, N. (2004).) The slider-crank mechanism is considered as one of the most used systems in the mechanical field [1]. It is found in pumps, compressors, steam engines, feeders, crushers, punches and injectors. Furthermore, the slider-crank mechanism is central to diesel and gasoline internal combustion engines, which play an indispensable role in modern living. It mainly consists of crank shaft, slider block and connecting rod. It works on the principle of converting the rotational motion of crank shaft to the translational motion of slider block. (Anis, A. (2012).) A new fully compliant linear-motion mechanism, called the XBob, is presented. The mechanism is based on the pseudo rigid-body model (PRBM) of a system of Roberts approximate straight-line mechanisms combined in series and parallel. It can be fabricated in a single plane and has a linear force displacement relationship. (Hubbard, N. B., Wittwer, J. W., Kennedy, J. A., Wilcox, D. L., & Howell, L. L. (2004, January).) A fully compliant constant-force mechanism that uses an initially angled parallel guiding mechanism is proposed. A pseudo-rigid-body model (PRBM) of the mechanism is developed and validated using both finite element models and experimental prototype testing. The PRBM is used as a preliminary design tool to identify parameters that result in a constant-force mechanism. An adjustable version of the mechanism is also proposed and is used to assess the range of validity of the PRBM and highlights how the system response can be varied by changing the flexible beams inclination. (Tolman, K. A., Merriam, E. G., & Howell, L. L. (2016).) a robotic-arm exoskeleton that uses a parallel mechanism inspired by the human forearm to allow naturalistic shoulder movements. The mechanism can produce large forces through a substantial portion of the range of motion (RoM) of the human arm while remaining lightweight. This paper describes the optimization of the exoskeleton's torque capabilities by the modification of the key geometric design parameters. (Klein, J., Spencer, S., Allington, J., Bobrow, J. E., & Reinkensmeyer, D. J. (2010).)

Arduino Programming

Arduino interface boards provide a low-cost, easy-to-use technology to create microcontroller-based projects. With little electronics, you can make your Arduino do all sorts of things, from controlling lights in an art installation to managing the power on a solar energy system. There are many project-based books that show you how to connect things to your Arduino, including 30 Arduino Projects for the Evil Genius by this author. However, the focus of this book is on programming the Arduino.

Arduino is a small microcontroller board with a universal serial bus (USB) plug to connect to your computer and a number of connection sockets that can be wired to external electronics such as motors, relays, light sensors, laser diodes, loudspeakers, microphones, and more. They can be powered either through the USB connection from the computer, from a 9V battery, or from a power supply. They can be controlled from the computer or programmed by the computer and then disconnected and allowed to work independently. The board design is open source. This means that anyone is allowed to make Arduino-compatible boards. This competition has led to low costs for the boards and all sorts of variations on the "standard" boards. The basic boards are supplemented by accessory shield boards that can be plugged on top of the Arduino board. Introduction The software for programming your Arduino is easy to use and also freely available for Windows, Mac, and Linux computers. (Monk, S. (2016).)

RESEARCH METHODOLOGY

Logic of Inquiry

Here the data obtained from first-hand observation, interviews, questionnaires (on which participants write descriptively), focus groups, participant-observation, recordings made in natural settings, documents, case studies, and artifacts. So the type of research is Qualitative type.

Qualitative researchers use different sources of data to understand the topic they are studying. So here the data is obtained mostly by the research papers and case study done for the particular operations to observe, experience and study the various factors like a time waste generation and quality work.

Research Setting and participants

The MICRO MSME is the research setting's targeted population since it is the group that the study will benefit from the most. The micro MSME is best suited since they cannot afford large equipment due to their financial inability or slow expansion ability. Instead, they want a less expensive, more user-friendly, and flexible solution.

Methods and Procedure of Data Collection

Most of data here is collected by 2 methods

1. Research paper
2. Observations
3. Practices
4. Survey

Methods and Procedure of Data Analysis

Here, the information is primarily drawn from the two sources that were stated before.

Therefore, information regarding and connected to the issue is deduced from the study article. data that is relevant to the issue, has knowledge about it, or has some connection to it.

According to the observation, data are repeatedly directly seen during operations.

Research objective

Objectives of the research are

1. Data collection from study article

2. Data collection from the observation
3. Implantation and validation of data on other MICRO MSMEs.
4. Market research
5. Analyse & study the verified data
6. Learn programming language
7. Create possible design according the data collected.
8. Improvise the design

DATA COLLECTION, INTERPRETATION

Data collection

The systematic process of obtaining observations or measurements is known as data collection. We need a strong back in this case because we are constructing something new, which will increase the machine's accuracy and productivity. Thus, gathering data in the proper direction is the most crucial and important task to complete.

Hence, we are going through 4 phases, which are

1. Defining aim of research
2. Method of data collection
3. Procedure of data collection
4. Collection of data

- *Defining aim of research*

to develop an automatic shrink wrap tube cutter to control packing time, waste production, and quality.

We have created a questionnaire to conduct research utilizing a mixed methods approach in order to accomplish our goal (combination of both qualitative and quantitative methods).

Questions:

1. How long have you worked using a heat gun machine?
2. What was the purpose of your use of the hit gun machine?
3. How did you cut the shrink wrap tube when using the heat gun machine setup?
4. If there are any additional ways to cut shrink wrap tubes, please describe them.
5. Do you think automation might change how shrink wrap tubing is cut in any way? how?
6. What do you think about the time-saving benefits of automating the shrink wrap tube process?
7. What do you think of the advantages of automating the shrink wrap tube process in terms of waste reduction?
8. What do you think of the advantages of automating the shrink wrap tube process for quality maximisation?

- *Method of data collection*

There are numerous methods for gathering data. But after closely examining the problems, we decided to use the "experiment method," "survey method," and "observation method" to gather the data more accurately and effectively. in order for us to comprehend the process on our own, in the manner of the workers, and in a natural setting.

- *Procedure of data collection*

We will collect data in three stages due to the three different methodologies we are applying.

"Operational stage" is the initial stage. We will use our first experiment method.

We'll go to the SMMEs that use shrink wrap tube cutting. As a result, we are visiting the manufacturing industry's "PR ARTS" for the experiment method.

To conduct our observation, we will use "sampling," during which we will visit the "NEWTURN NUTRITIONS" food industry.

In our third step of data collecting procedure, we will meet with experienced staff from both the industry and conduct the survey using the questions we have prepared.

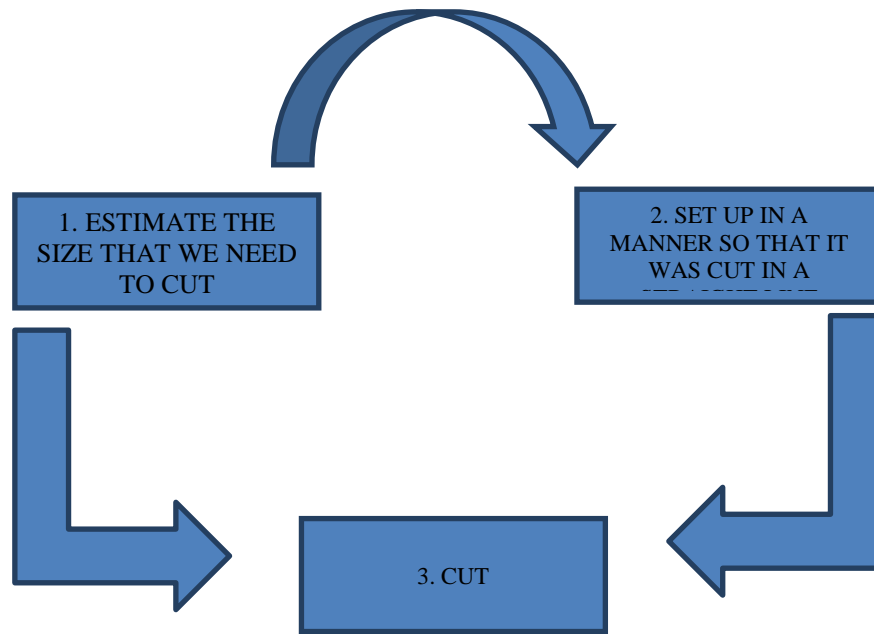
- *Collection of data*

As anticipated, all of the data were gathered using the specified techniques, and an abstract of that data is provided below.

- *Experiment method*

For experiment method we have conducted few experiments at "PR ARTS"

We learn from that experiment that we can cut approximately 80 to 100 pieces of shrink wrap tube in an hour.



Process steps of shrink wrap tube cutting

If we discuss steps 1 and 2, each step takes time by itself, and the transaction from step 1 to step 2, step 2 to step 3 and step 3 to step 1 also consumes a time as we need to change the tools.

As human is working on the operation due to human error many times wrong size is getting cut resulting into the wastage of material and poor finishing.

Now moving to the next method

- Observation method

Observational research at "NEWTURN NUTRITIONS" has produced results that are very similar to those of experimental research. Actually, all three procedures took a little bit longer here because we were more concerned with an airtight finish.

- Questionaries

(Survey conducted on 10 workers of both the industry)

1. How long have you worked using a heat gun machine?

- Average time period 3.2 years

2. What was the purpose of your use of the hit gun machine?

- Workers from both the industry have been working with heat gun in the same industry since when they joined.

So from "PR ARTS" 8 workers have answered same packaging line of their particular 'Idols and statues' for looks and to save the product from dust.

And 2 workers from "NEWTURN NUTRITIONS" are also working with heat guns ever since they have joined for the purpose of air tight packaging and premium looks.

3. How did you cut the shrink wrap tube when using the heat gun machine setup?

- Manually by cutter (Most Common suggestion from all the participants).

4. If there are any additional ways to cut shrink wrap tubes, please describe them.

- None (Common answer from all the participants)
- Scissors are useful but more time consuming (2 of them have given the option)

5. Do you think automation might change how shrink wrap tubing is cut in any way? how?

- 7 workers replied in positive stating that it would make the hectic process easy, may save time and men power & may decrease the waste generation.
- whereas 3 of them answered negatively stating that the automation would be hard to use and learn.

6. What do you think about the time-saving benefits of automating the shrink wrap tube process?

- The same 7 people finds it beneficial
- 1 answered negative
- 2 of them didn't knew

7. What do you think of the advantages of automating the shrink wrap tube process in terms of waste reduction?

- 9 workers believed waste may reduce due to automation
- 1 didn't knew

8. What do you think of the advantages of automating the shrink wrap tube process for quality maximisation?

- The same 9 thinks that it may maximise the quality
- 1 didn't know

So, this was the result of survey conducted from 19th January 2023 to 24th January 2023.

ANALYSIS

MSMEs require cost-effective automation for packaging purpose.

All MSMEs require cost-effective automation in order to utilize human resources efficiently, cut down on time and waste, and improve the quality of finished products packaging.

The use of a heating gun requires extra attention, which makes the operation time-consuming and potentially dangerous. A minor mistake could result in material waste or even product harm. You will need a neatly cut shrink wrap tube for perfect packaging. And because we require a precise size cut for excellent package finishing and to avoid waste generation, cutting shrink wrap tubes takes a little time and can be a little attention-seeking. In order to save time, reduce waste, and increase quality, this operation should be conducted by an automated machine. Also, you are conserving a human resource for a specific operational period, resulting in overall time savings and efficient utilization of human resources.

When utilizing a heating gun, extra care must be used because even a little extra heated air can cause harm to the shrink wrap tube and occasionally even to the product itself, especially if you work in the food industry.

Hence, if you are currently using a shrink wrap tube that is the wrong size, the entire cut would be wasted. A precise size is therefore of utmost importance. Also, if we cut the shrink wrap tube a little bit larger than necessary when cutting it, it won't just look terrible; it will also utilize excess material, which will be wasted. We require a specific cut size for our shrink wrap tube in order to finish the packaging and generate less waste.

As you need a precise cut size, you will need to measure it repeatedly each time you are cutting fresh wrap, which adds time to the process of cutting shrink wrap tubes. So, the procedure is as follows: measure, cut in a straight line, measure again, and so on.

The ASWC enters the picture because it determines the cut size and automatically cuts in a straight line. This entire process moves more quickly than a human worker would, saving time. Also, because it cuts to precisely specified specifications, waste generation is reduced to almost nothing, improving the quality of the finished packing. Also, since this machine runs without any human interaction, you are conserving a man's power and can put it to better use elsewhere.

The ASWC machine measures and cuts the shrink wrap tube to your specifications, saving you time and producing up to zero waste while also improving the overall finishing quality of the packing.

CONCLUSION & FINDINGS

By automating the shrink wrap cutting process, time-consumption waste generation and finishing quality in the heat gun process can be managed in positive note.

Shrink wrap tubes should be cut in a way that reduces waste generation in addition to time savings. Also, in terms of the final finishing, we must cut in a method that produces precise measurements and a straight line.

The ASWC cuts in a straight line after entering the just premeasured cut size. Time is saved since the entire process proceeds more swiftly than a human worker would. Moreover, waste generation is reduced to nearly nothing since it is cut to the exact specifications provided, which raises the caliber of the finished packaging conserving a man's power and may use it more effectively.

If we automate this procedure, the manpower it saves can be applied elsewhere to boost small SMMEs' production. A SMME can greatly benefit from additional time-saving and waste-generation benefits. Increasing the quality of the packaging may enhance the perception of the products, leading to a developing graph of sales. Process is more efficient and easier to use.

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