

Pace Timers

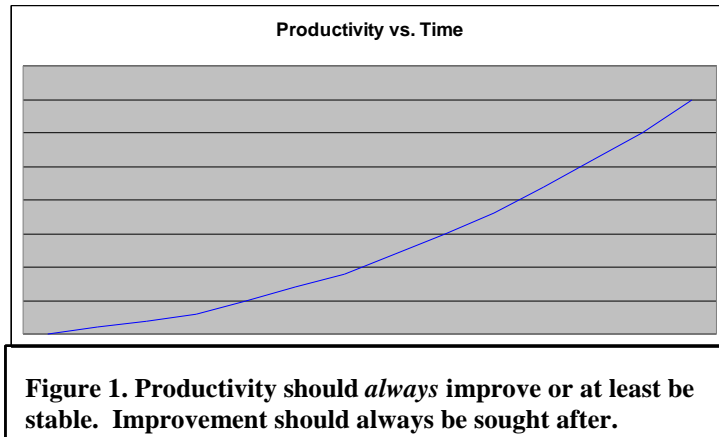
In a Lean Manufacturing Setting

1.0 Purpose:

This report is filed with the intent to assist in the understanding of how American LED-gible's Production Pace Timer product line can be integrated into, and improve within, a Lean Manufacturing production environment.

2.0 What is Lean Manufacturing?

Lean Manufacturing is a method of determining which individual steps of an assembly process are wasteful, and then correspondingly eliminating the waste through process of deductive reasoning. In effect, Lean Production is a popular and extremely beneficial method of improving productivity in the work environment. With this in mind, one must understand the 'wastes,' and properly identify them within the particular assembly processes.



3.0 What is a Production Pace Timer?



Figure 2. Model # AF-2720-101 which is American LED-gible's most popular form of Pace Timer.

A Production Pace Timer (or PPT) is a broad generalization of a variety of products offered by American LED-gible incorporated. The two most common versions include the AF-2720 Series (figure 2) and the AF-2723 Series which displays more information such as percentile values of efficiency.

These product lines are designed to display a running Pace (the 'Goal' line in figure 2) which counts up according to an expected pace value predefined. For example, if 1 part was expected every minute of operation, the pace setting programmed in should be set to 60 seconds in order to fulfill the expectations of the process. The 'Actual' field is essentially a counter actuated by a switched contact via photo-eye, manual pushbutton, limit switch, etc. This in turn counts the 'Actual' value up in order to give a visual comparison between the running expected 'Goal,' and the current, true value, 'Actual.'

4.0 What are the Production Wastes?

The production wastes are known as a generalization of production wastes that are categorized and simplified so that industrial environs can appropriately classify their individual processes accordingly.

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4.1 Waste #1, Rework

Rework is essentially waste to eliminate quality defected products and thereby keep them from reaching the consumer. When an inferior/defective product gets to the consumer, it requires capital and time to reclaim some of the value lost by the poor product. This results in loss of replacement and potentially, loss of a client.

4.1A PPTs and Rework

Production Pace Timers are commonly designed to maintain an appropriate count of the assembly line, but what happens when defective parts are on the line as well? PPTs are provided with multiple counting inputs, UP and DOWN, to differentiate between good and bad parts.

For example, the assembly line runs and the PPT is setup to increment the 'Actual' field via limit switch. When a defective component is separated from the proper components (such as down another line), the 'Actual' field could decrement to remove the inappropriate count thereby maintaining an accurate value of the quality products. This in turn maintains the true accuracy of the count of quality products down the line.

4.2 Waste #2, Overproduction

Overproduction is a common problem and often overlooked. Utilizing more resources than required to produce the product frequently performs this overproduction issue. Overproduction is an issue that wastes resources and generates inventory that is required to be stored.

4.2A PPTs and Overproduction

Production Pace Timers maintain an accurate and thorough count thereby allowing management and personnel to monitor and maintain pace settings. If the production line is excessively ahead of schedule (such as in figure 3), management could step in to re-administer personnel appropriately thereby reducing inventory storage requirements and utilizing personnel in a more efficient manor.



4.3 Waste #3, Transportation

Transportation is a waste due to risks involved in moving the product. Each time a product is moved, there is a risk of damage or loss along with a movement delay. This produces nothing but negative potential capabilities upon the quality of the product. Travel should not have any effect on the product other than spatial movement.

Figure 3. The Production line is ahead of schedule with a known appropriate count.

4.3A PPTs and Transportation

Production Pace Timers are utilized to reduce the delay involved in travel by shortening the movement delay involved. Many PPTs come with alarm outputs that can be set off as batch value alarms to actuate things such as optional tower lights and/or buzzers. In doing so, this may notify personnel that batches are

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ready for transportation/shipment therefore lowering the downtime of the shipment process.

4.4 Waste #4, Inventory

Inventory of any sort requires space to store, time to sort and organize, and has no productive qualities for the producer or the consumer. As many realize, space costs capital whether in the form of land, rent (lease), movement, tracking (logging), etc. This is a common waste in the industrial market.

4.4A PPTs and Inventory

As mentioned earlier, proper inventory values can be better maintained by paying strict attention to quantities produced. As seen in figure 4, when the 'Deviation' quantity is too large, management knows to shift personnel from production. Alternatively, once the 'Goal' value is reached, an alarm could be triggered to end the shift and start the next thereby creating only what is required.



Figure 4. Production is shown to be ahead by 206 parts (deviation).

4.5 Waste #5, Motion

As compared to Transportation, Motion is referring to equipment and movement inside the facility. This can include lines down due to maintenance of equipment, damaged product batches that must be removed, etc.

4.5A PPTs and Motion

Some Production Pace Timers can include 'Downtime' fields which begin timing when an input is actuated (such as when the conveyor stops, timers should time showing that the line is down). This notifies the onlookers that the line is down and informs management of the importance of certain line requirements. PPTs may also assist in the elimination of Motion waste due to reduction of damaged goods because the products on an assembly line are unlikely to be damaged for counting purposes (pieces can be counted without contact with external devices, such as utilization of photo-eye kits).



Figure 5. Unit with Downtime field indicating time wasted.

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5.0 Summary

Lean manufacturing is a means of eliminating waste in a production environment that is popular due to its beneficial means of improving efficiency. That being the case, some tools that could assist in the continuous improvement process include Production Pace Timer displays.

These displays improve Lean capabilities by maintaining an accurate count despite damaged 'waste' pieces on the assembly line, lower overproduction issues along with the wasted resources involved, indicates to personnel of required attention when batches are complete, assists in the appropriate control of inventory levels, and indicates the downtime of assembly lines indicating to personnel of essential requirements.

6.0 Contact Information

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Thank you for your interest!



American LED-gible Inc.

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<u>Figure #</u>	<u>Description</u>
1	Productivity on a continual rise
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5	AF-2723 Series Production Pace Timer, 4 line