Did you Know?

OEE – A performance figure that helps you to monitor your production

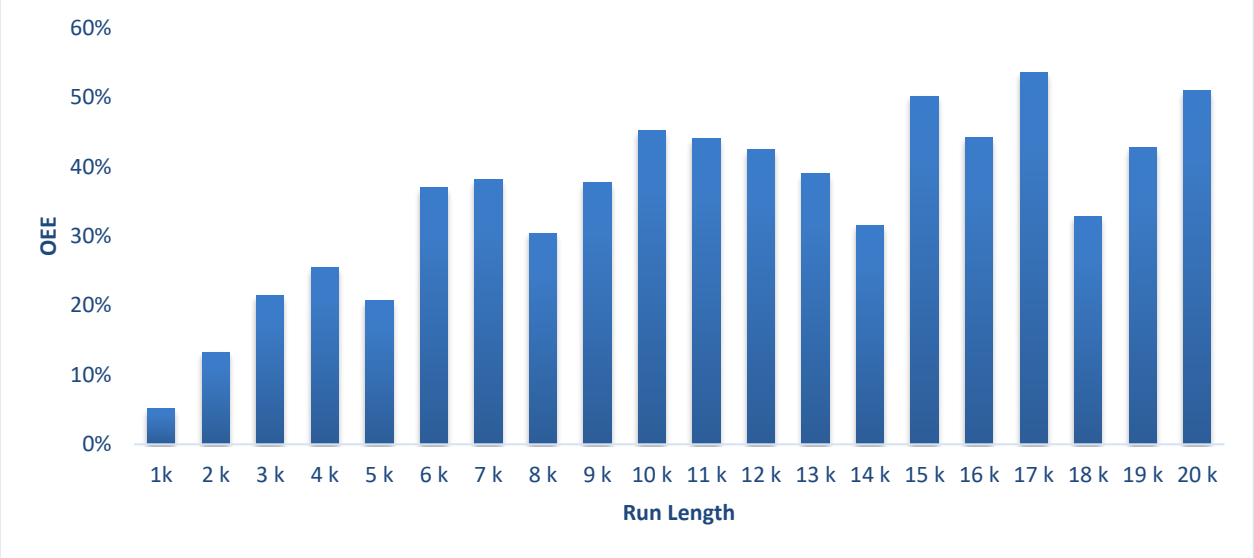
Explanation

When optimizing your production, Overall Equipment Effectiveness (OEE) provides a valuable independent measure of how well a piece of equipment performs over time. It also helps gauge the impact of changes to workflow and production methods.

The OEE breaks the performance of a manufacturing unit into three separate but measurable components: **Availability**, **Performance** and **Quality**. Each component points to an aspect of the process that can be targeted for improvement.

The OEE is an individual number and strongly depends on the job structure a customer has. Customers with a lot of short runs also have a high number of make ready's which means that automatically the time for good production will be reduced which also reduces the OEE. On the other hand side, a print shop that prints a lot of long runs doesn't have that much make ready's and therefor have more time for good production, which has a positive effect on the OEE.

Basically, the higher the OEE the better, but the highest value you can reach is defined by the job structure you have. This is also the reason why you cannot always compare the OEE of your presses with presses of other customers. If you want to compare the OEE, you always must ensure that you compare your press with presses that are printing the same jobs.



A typical OEE chart from the printing industry is shown in the figure above. This figure illustrates the relationship between OEE and run length. Since there is typically a larger percentage of time spent on make ready, OEE will change as the run length reduces.

The OEE is a very complex number but it provides you a perfect value to get a general overview about your production and even helps to improve your overall performance.

Calculation

The calculation of the OEE looks very simple but there are a lot of different important KPI's involved. In the following we will show you the different calculations and explain the influencing KPI's in detail. Understanding these important KPI's is crucial if you want to improve the performance of your press.

OEE Index = *QualityIndex * TimeIndex * SpeedIndex*

QualitiyIndex

The QualityIndex represents the number of good impressions compared to all printed impressions in percentage.

*QualityIndex = Net Impressions / Gross Impressions * 100%*

SpeedIndex

The SpeedIndex shows the utilization of the maximum printing speed in percentage.

*SpeedIndex = Average Running Speed / Max Speed * 100%*

TimeIndex

The TimeIndex shows the share of production time within the operation time in percentage.

*TimeIndex = (**eff. Fine-Tuning Time** + **eff. Production Time**) / Operating Time * 100%*

The **Effective Production Time** is the time period between the first good sheet and the last printed sheet without any production interruptions.

The **Effective Fine-Tuning Time** is the time period between the first printed make ready sheet to the first printed good sheet without any interruptions.

The **Operating time** displays the total time the machine is switched on in a month.

Influencing Parameters

As already explained the OEE is influenced by a lot of different parameters. Basically everything that influences the time, the quality or the speed of the press plays a major role in the calculation of the OEE. In the following we want to focus on the most common parameters which reduce the OEE the most and which can be adjusted by yourself.

Make-ready time / Make-ready waste

The make ready process is one of the most important processes that influences the performance of your whole print shop. The higher the number of make ready's you have the more important this process is.

The make-ready time and make-ready waste are two main parameters that effect the OEE. The higher the make ready time, the less time you have for good production and with that the lower your OEE will be. This is especially important if you have a lot of make ready's per day as the total time for make readies will add up over the days. Reviewing the make-ready process and trying to improve will help you to increase the output of your press and help you to strongly increase the efficiency of your press and gain additional business or safe costs.

The same is true for the make-ready waste. The make ready waste will influence the QualityIndex. The higher your make-ready waste, the lower the QualityIndex will be. Reducing the make-ready waste is therefor very important and safes you not only costly waste sheets but also effects your overall performance.

Other time

The Other time includes all the actions which are necessary to prepare the press for the next job. It is the time span between the last printed sheet and the following plate change of the new job. The other time together with the make-ready time are the most time-consuming processes in a print shop.

The other time is most likely even more important than the make-ready time. Study's showed that the time for preparing the press, e.g. providing plates, ink, paper, etc. is the part of the process where our customers spend the most time beside the production itself.

Just like the make-ready time, the other time will increase with the number of jobs printed. With a smart internal supply chain and a good job planning in prepress along with well-trained employees, the other time can be reduced dramatically which also influences the OEE.

Average Printing Speed

This parameter should be clear but is often not exhausted as printer prefer to print slower in order to have everything under control. The printing obviously influences the output of the press. The higher the printing speed, the higher your output and with that the higher the OEE will be.

It makes sense to have a look at the average printing speed on your press. Always try to produce with the highest printing speed possible. If you have any issues with paper run or anything else, it might make sense to evaluate the problems and perhaps train the operators so that a higher printing speed can be achieved.

Maintenance

Maintenance does not directly influence the performance of your press but it ensures that your press is always up and running. A machine that is not producing is always a waste of time and money. The target should always be to minimize press downtimes to maximum.

Customer Benefit

Understanding the OEE means understanding the whole print process. If you know what the OEE means, which parameters are going into this KPI and what you can do to improve it, will help you to dramatically improve the performance of your press.

Priority

High

Ideal Direction

up