

Overall Equipment Effectiveness Simplified

Analyzing OEE to find the Improvement
Opportunities

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**OVERALL EQUIPMENT EFFECTIVENESS
SIMPLIFIED: ANALYZING OEE TO FIND
THE
IMPROVEMENT OPPORTUNITIES**

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Introduction

How OEE is related to productivity and capacity?

OEE measures the ratio (%) of what product is actually made which is defect less and sellable, to what could be made according to the design. One hundred percent of OEE is the design or maximum capacity a process or a machine is designed to make with zero defects.

Real Defectless Output / Design Output

Why use OEE & what is the intention behind the measure?

The intention is to find why this process is not working as what have been expected, and why the real output is low. Then, some actions should be taken to maximize the current process capabilities, fix problems, and improve productivity.

Example to Present Different Types of Improvement

OEE Overall Equipment Effectiveness Calculation

Basically, any machine has a capacity. It should be able to deliver specific number of units in a given time. If it can produce 20 units in an hour. In 8-hour day, it should have the ability to produce 160 units. Over 5 days, the capacity is 800 units. This is the rated capacity when everything is perfect. If the machine has to be slowed to half speed due to poor maintenance, it would make only 400 units.

$$\text{Performance \%} = \frac{\text{Number of units manufactured}}{\text{Possible number of units}} \times 100$$

Performance would be $(800-400)/800*100=50\%=0.5$

Considering the break-times. So, over five days, the equipment was not available for use for a five-hour period.

Availability%=

$$\frac{(Total\ time\ available - Total\ downtime)}{Total\ time\ available} \times 100$$

In a 40-hour week, the availability is $(40-5)/40 \times 100 = 87.5\% = 0.875$

With a lost time, we can only make 0.875 times 100= 350 units in a week. Availability tracks any time the machine isn't available for use.

Assuming 10 defected parts,

Quality %=

$$\frac{Total\ no\ of\ units\ produced - Total\ no\ of\ defects}{Total\ no\ of\ units\ produced} \times 100$$

Quality ratio is $(350-10)/350 \times 100 = 97.14\% = 0.9714$

OEE=Performance x Availability x Quality= $0.5 \times 0.875 \times 0.9714 = 42.5\%$.