

## Calculating OEE

### Who this guide is for..



Anyone who needs to calculate OEE.  
You will need basic arithmetic skills  
Some knowledge of basic spreadsheet creation will be useful

### Calculation Tip



A quick way to work out OEE is to use the ratio of actual good product to total potential output. Here's how I would do it for this example.

*Actual good output = 1 present*

*Potential output = 4 (ideal output rate) x 2 (planned hours) = 8 presents*

*Actual output / Potential output = 1/8 = 12.5%*

It is a handy double check for the full method opposite.

### Who came up with OEE?



OEE was developed by Seiichi Nakajima in the 1960s and was first described in in Seiichi Nakajima's book 'TPM tenkai' (1982, JIPM Tokyo)

### Feedback?



Contact Bernie Smith  
bernie.smith@madetomeasureKPIs.co.uk  
Visit madetomeasureKPIs.com for more tips

### Plain English Description



OEE stands for 'Overall Equipment Effectiveness'. It is a commonly used efficiency measure.

What do we mean by efficiency? Put simply, it is "How much did we make, compared with how much we could have made."

### Core Calculation



To work out OEE we multiply together the three numbers..

- Availability
- Quality
- Rate

See 'Core Concepts' opposite for how to calculate each value.

### Calculation Method - Worked Example

I am wrapping Christmas presents. I know that I should be able to wrap 4 presents an hour. I settle down having planned a 2 hour wrapping session.

For the first hour I struggle, only wrapping 2 presents. One of these presents is so badly wrapped that I can't send it out. For the second hour I get distracted and end doing other things for the entire hour.

What is my OEE?

*Availability: I work for 1 hour out of the 2 I planned = 1/2 = 50%*

*Performance rate: When running (i.e. available) I wrapped at a "2 presents an hour" against my known best of "4 presents an hour". My performance rate is 2/4 = 50%*

*Quality rate: My output is 2, but I scrapped 1, so my quality rate is (2-1)/2 = 50%*

**OEE = Availability x Performance x Quality = 50%x50%x50% = 12.5%**

### Core Concepts



#### Availability

How much of the available time were we running for?  
If we planned to run a machine for 10 hours, but it was only working for 5 hours, then our Availability would be 50%. This measure might show stoppages caused by problems, lack of materials or process problems.

#### Quality Rate

We may manage to make some product that is not good enough to sell. The ratio of bad to good produce is called the "quality rate". If we make 350 widgets, but only 280 of them are good enough to sell then our quality rate would be 80%

*Quality Rate = (Quantity of product - scrapped product) / Quantity of product*

#### Performance Rate

You can "lose" output by machines or lines running slower than they should. So a machine set to make 100 widgets a minutes that was set to only run at 70 widgets per minute would be running at 70% speed/rate/performance (sorry, all these names are used - it's a bit confusing). This measure would show us problems that caused lost output but were not serious enough to completely stop production.

*Performance Rate = (Actual bottleneck speed / Ideal bottleneck speed)*

### About this guide

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