

# Calculating OEE Worksheet

Give it a try! Using the table below, fill in the highlighted areas with your production data for a single shift. Use the key letters to help guide you. In some cases, you may have to convert units to simplify the calculation. For example, 3600 PPH (Pieces per Hour) is 60 PPM (Pieces per Minute).

First let's get the data:

| Production Data |   | Calculated Data         |   |                |                 |
|-----------------|---|-------------------------|---|----------------|-----------------|
| Shift Length    |   | Hours =                 | A | Minutes        |                 |
| Short Breaks    |   | Breaks @                |   | Minutes Each = | B Minutes Total |
| Meal Break      |   | Breaks @                |   | Minutes Each = | C Minutes Total |
| Down Time       | D | Minutes                 |   |                |                 |
| Ideal Run Rate  | E | PPM (Pieces Per Minute) |   |                |                 |
| Total Pieces    | F | Pieces                  |   |                |                 |
| Reject Pieces   | G | Pieces                  |   |                |                 |

Now let's calculate the support variables using the above information:

| Support Variable        | Calculation                       | Calculated Data |   |       |   |           |
|-------------------------|-----------------------------------|-----------------|---|-------|---|-----------|
| Planned Production Time | Shift Length-Breaks               | A               | - | (B+C) | = | H Minutes |
| Operating Time          | Planned Production Time-Down Time | H               | - | D     | = | I Minutes |
| Good Pieces             | Total Pieces-Reject Pieces        | F               | - | G     | = | J Pieces  |

The final step is to calculate your OEE percentage.

| OEE Factor   | Calculation                                      | Calculated Data |   |   |   |   | OEE %     |
|--------------|--------------------------------------------------|-----------------|---|---|---|---|-----------|
| Availability | Operating Time / Planned Production Time         | I               | / | H | = | K | K x 100 % |
| Performance  | (Total Pieces / Operating Time) / Ideal Run Rate | F               | / | I | / | E | L x 100 % |
| Quality      | Good Pieces / Total Pieces                       | J               | / | F | = | M | M x 100 % |
| Overall OEE  | Availability x Performance x Quality             | K               | x | L | x | M | N x 100 % |

# OEE Example

Here's how it looks. The following example is an 8-hour shift with two scheduled 15 minute breaks and a 30 minute meal period running hypothetical production:

| Production Data       |                          |
|-----------------------|--------------------------|
| <b>Shift Length</b>   | 8 Hours = 480 minutes    |
| <b>Short Breaks</b>   | 2 @ 15 min. = 30 minutes |
| <b>Meal Break</b>     | 1 @ 30 min. = 30 minutes |
| <b>Down Time</b>      | 47 minutes               |
| <b>Ideal Run Rate</b> | 60 pieces per minute     |
| <b>Total Pieces</b>   | 19,271 pieces            |
| <b>Reject Pieces</b>  | 423 pieces               |

Support variables are calculated using the above information:

| Support Variable               | Calculation                       | Calculated Data   | Result        |
|--------------------------------|-----------------------------------|-------------------|---------------|
| <b>Planned Production Time</b> | Shift Length-Breaks               | 480-60 minutes    | 420 minutes   |
| <b>Operating Time</b>          | Planned Production Time-Down Time | 420-47 minutes    | 373 minutes   |
| <b>Good Pieces</b>             | Total Pieces-Reject Pieces        | 19,271-423 pieces | 18,848 pieces |

The next table shows how the OEE percentage is calculated using the collected production data and calculated support variables:

| OEE Factor          | Calculation                                      | Calculated Data                                      | OEE %           |
|---------------------|--------------------------------------------------|------------------------------------------------------|-----------------|
| <b>Availability</b> | Operating Time / Planned Production Time         | 373 / 420 minutes                                    | 0.8881 (88.81%) |
| <b>Performance</b>  | (Total Pieces / Operating Time) / Ideal Run Rate | (19,271 pieces / 373 minutes) / 60 pieces per minute | 0.8611 (86.11%) |
| <b>Quality</b>      | Good Pieces / Total Pieces                       | 18,848 / 19,271 pieces                               | 0.9780 (97.80%) |
| <b>Overall OEE</b>  | Availability x Performance x Quality             | 0.8881 x 0.8611 x 0.9780                             | 0.7479 (74.79%) |

The final calculated OEE percentage is a respectable 74.8%, however, World Class OEE is considered to be 85% or better! Clearly this process could use some improvement, how about yours?

| OEE Factor          | World Class |
|---------------------|-------------|
| <b>Availability</b> | 90.0%       |
| <b>Performance</b>  | 95.0%       |
| <b>Quality</b>      | 99.9%       |
| <b>Overall OEE</b>  | 85.0%       |