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

Support variables are calculated using the above information:

Support Variable	Calculation	Calculated Data	Result
Planned Production Time	Shift Length-Breaks	480-60 minutes	420 minutes
Operating Time	Planned Production Time-Down Time	420-47 minutes	373 minutes
Good Pieces	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 %
Availability	Operating Time / Planned Production Time	373 / 420 minutes	0.8881 (88.81%)
Performance	(Total Pieces / Operating Time) / Ideal Run Rate	(19,271 pieces / 373 minutes) / 60 pieces per minute	0.8611 (86.11%)
Quality	Good Pieces / Total Pieces	18,848 / 19,271 pieces	0.9780 (97.80%)
Overall OEE	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
Availability	90.0%
Performance	95.0%
Quality	99.9%
Overall OEE	85.0%