OEEsystems
Operational Excellence Solutions

OEE POCKET GUIDE

THE **OEE** MODEL

Unscheduled Time				
Scheduled Production Time	Planned Downtime			
	Unplanned Downtime	Speed Loss		
	Uptime	Net Operating Time	Quality Loss	
			Fully Productive Time	OEE Time

Scheduled Time	Availability	Performance	Quality	OEE
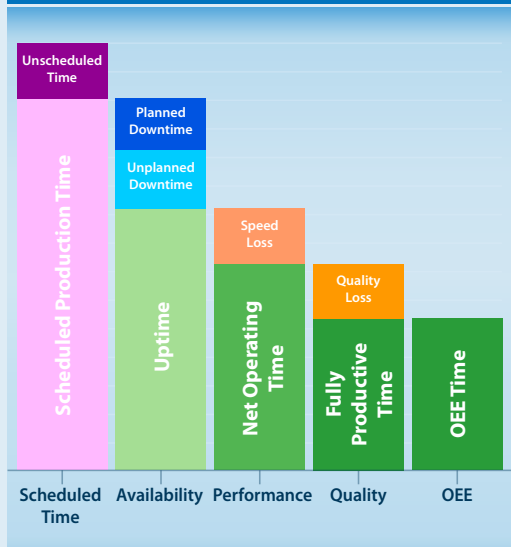
OEE CALCULATION

OEE can simply be calculated as:

$$\text{OEE\%} = \frac{\text{Good Parts} \times \text{Ideal Cycle Time}}{\text{Scheduled Production Time}}$$

or as:

$$\text{OEE\%} = \text{Availability} \times \text{Performance} \times \text{Quality}$$

AVAILABILITY

Availability takes into account Downtime Losses, (both Planned Downtime and Unplanned Downtime), which include all events that stop the scheduled production time for any length of time. Examples include equipment failures, material shortages, Line Setup and Changeovers.

Changeover time is included in the OEE analysis since it is a form of downtime. Availability is the ratio of Uptime (which is simply Scheduled Production Time less all Downtime) to Scheduled Production Time, and accounts for Downtime Losses.

It is calculated as:

$$\text{Availability\%} = \frac{\text{Uptime}}{\text{Scheduled Production Time}}$$

PERFORMANCE

Performance takes into account Speed Loss, Idle Time and any minor stoppages that are not included in Downtime. These losses include all factors that cause the process to operate at speeds less than the ideal optimum speed when running.

Examples include slow running, micro stoppages or slow product feed (gaps). The remaining time is called Net Operating Time. Performance is the ratio of Net Operating Time to Uptime and accounts for Speed Losses.

It is calculated as:

$$\text{Performance \%} = \frac{\text{Total Parts} \times \text{Ideal Cycle Time}}{\text{Uptime}}$$

Ideal Cycle Time is the best cycle time that the process can achieve.

QUALITY

Quality takes into account Quality Losses, which accounts for produced pieces that do not meet the quality standards, including pieces that require rework. The remaining time is called Fully Productive Time. Quality is the ratio of Fully Productive Time to Net Operating Time.
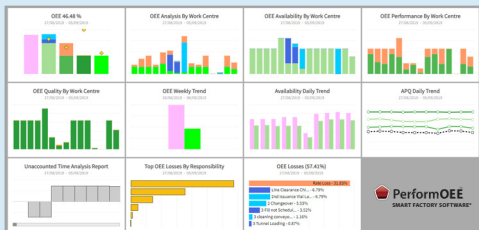
It is calculated as:

$$\text{Quality \%} = \frac{\text{Good Parts} \times \text{Ideal Cycle Time}}{\text{Total Parts} \times \text{Ideal Cycle Time}}$$
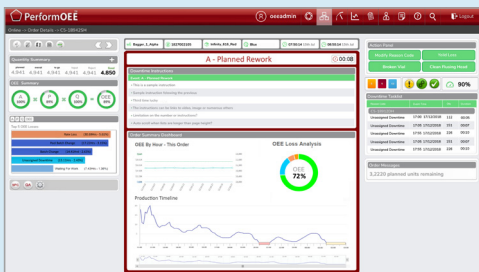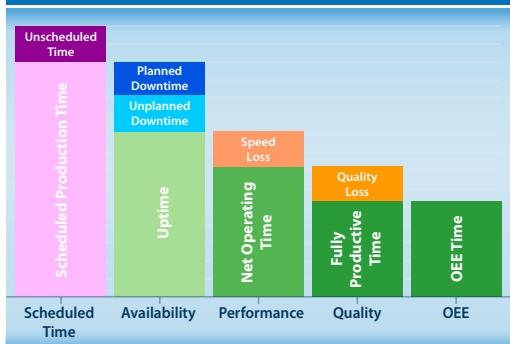
LIVE STATUS

DASHBOARD

OPERATOR UI

PerformOEE™

SMART FACTORY SOFTWARE®

THE OEE MODEL

Unscheduled Time				
Scheduled Production Time	Planned Downtime / Unplanned Downtime	Speed Loss	Quality Loss	
	Uptime	Net Operating Time	Fully Productive Time	OEE Time
Scheduled Time	Availability	Performance	Quality	OEE

AVAILABILITY LOSSES

Changeover
Line Setup
Equipment Breakdown
Breaks
Material Shortage
Running Adjustments

PERFORMANCE LOSSES

Minor Stoppages
Slow Running

YIELD LOSSES

Scrap
Rework

6 BIG LOSSES	OEE Loss Category	Loss Examples
UPTIME	Downtime Loss	✖ General Breakdowns ✖ Equipment Failure ✖ Unplanned Maintenance ✖ Tooling Failures
SETUP ADJUSTMENTS	Downtime Loss	✖ Setup / Changeover ✖ Cleaning ✖ Warm-up Time ✖ Start-up Delays
SHORT STOPS	Downtime Loss	✖ Component Jams ✖ Upstream Starved ✖ Downstream Blocked ✖ Line Checking
REDUCED SPEED	Speed Loss	✖ Slow Running / Idling ✖ Equipment Wear ✖ Ramp-up / Ramp down ✖ Line Balance Slowdown
START-UP REJECTS	Quality Loss	✖ Start-up Scrap ✖ Adjustment Scrap ✖ Line Cleaning Scrap ✖ Line Purging Scrap
PRODUCTION REJECTS	Quality Loss	✖ Scrap ✖ Rework ✖ Visual Rejects ✖ Functional Rejects

PerformOEE™

SMART FACTORY SOFTWARE®

OEEsystems International are **THE OEE PEOPLE.** We work with the world's most progressive manufacturing companies to increase capacity, reduce costs and drive continuous improvement.

Our unique record of combining our Smart Factory Software, **PerformOEE™**, with our Science of Manufacturing Methodology delivers real-time visibility, analysis and control of your manufacturing performance.

That makes us **THE OEE PEOPLE!**

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