



## PRODUCT DATASHEET

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# MES Operations

## Real-time Manufacturing Execution Management

Efficiently and reliably manage and document the transformation of materials into finished products. Increase plant productivity and secure quality through the digital transformation of work order and job execution processes. Empower operators with the right information anytime and anywhere, and enforce process and product specifications and capture all manufacturing execution and material flow information for detailed product genealogy and material traceability.

## Summary

MES Operations offers a complete set of Manufacturing Execution System (MES) software functions to efficiently manage production and inventory related operational activities in industrial manufacturing plants. The software allows for a full electronic information and workflow management for manual job execution, as well as data download and execution on automated plant equipment.

Integration with enterprise resource planning (ERP) the manufacturing execution system enables short term production management and provides schedule flexibility for the plant. Enforcement of product specifications such as bill of materials (BOM), setup parameters, rules of material flow and job execution sequence ensures consistent quality. Automatic electronic record keeping provides detailed product genealogy and end to end material traceability. Business applications can be updated with work in process (WIP) and inventory status information in real time. Execution history data offers drill down analyses of operational performance and identification of best practices, facilitating the continuous improvement process.

## Business Value

Digital transformation and automation of operational processes can raise efficiencies, reduce errors and improve quality, ultimately increasing yields dramatically. Inventory turns faster, production lead times shrink and the business becomes more agile and responsive.

## Benefits

- Elimination of error prone paperwork
- Automation of data collection tasks
- Improved inventory velocity and reduced production order lead time
- Lower variance in production results, less scrap and rework
- Reduced risk of managing product recalls or production emergencies
- Enhanced supply chain visibility and decision support
- Reduced regulatory compliance cost and risks
- Visibility into plant performance for continuous improvement

## Production Management

MES Operations helps manufacturing companies to eliminate paperwork for managing and documenting production and inventory logistics processes and material flow. The software provides a configurable information model to enforce business and data collection rules, and to assist with job-related specification data and digital instruction documents in real time.

Work order execution is managed by scheduling instances of the product-related master process, scaled to the requested product quantity. Instances of the process are then broken into jobs and scheduled to equipment for execution on the plant floor.

Detailed records of product genealogy and material traceability allow for fast and effective responses to unforeseen events and help reduce the cost of compliance to consumer and product safety regulations.

## Specification Management

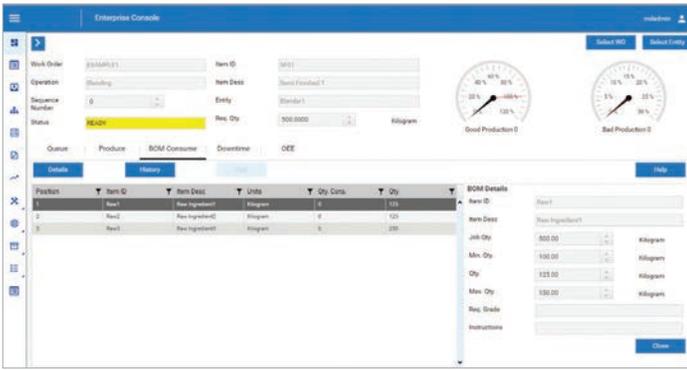
The MES Process model defines the business rules and product specification information to provide and enforce work instructions, BOM, and setup information to both people and automated equipment. Material consumption can be verified against BOM specifications using barcode or RFID readers.

## Inventory and Storage Management

MES Operations includes functionality for managing inventory operations and to enable end to end traceability across storage locations, mobile storage units or production equipment for raw materials, semi-finished and finished products.

Material quantities are updated automatically in production inventory as materials are consumed and products are made.

You can additionally manage and track work order independent inventory operations such as material receiving, transfer related to pre- or post-production logistics or managing Kanban inventory.

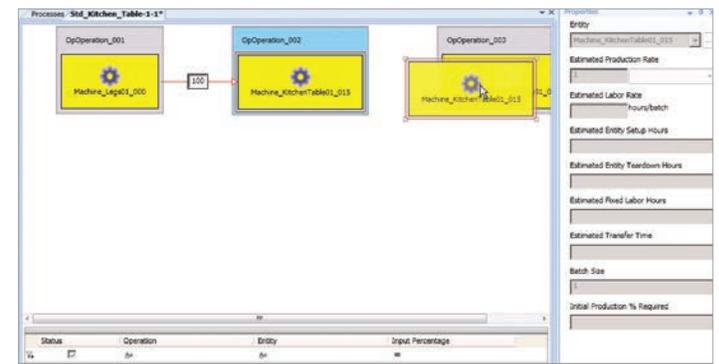


## Labor Tracking and Certification Management

The software tracks operators logged into jobs and captures time and duration on machines, which allows accounting of labor costs attached to work order execution by an operator or groups of operators. Jobs can be restricted to operators with valid certificates of necessary qualifications to run the job.

## Process Modeling

Our Manufacturing execution system software leverages a process model to process component operations and link business rules and specification information to product manufacturing.



The process model allows defining and linking the operations, equipment, BOM and setup specifications, routings and flow of materials between operations and the data capture requirements for each operation or step within a process. An 'operation' defines a task to produce an intermediate or finished product, including the raw materials or intermediate products consumed, any by-products produced, the equipment used to complete the task, data collection, sequence of steps and labor and machine time estimates.

Dynamic routing accommodates rework by routing production to rework operations using reason codes.

## Manufacturing Execution

Integrated digital work flow management connects people into operational processes and enforces consistent execution of operating procedures. It provides an higher level of automation and team collaboration and keeps the workforce connected with mission-critical processes through a digital and mobile user experience. Preconfigured and adaptable workflows and related user interface forms for standard MES activities are offered to get MES solutions defined, deployed and running faster.



Unique execution and data collection capabilities on automated plant equipment make Manufacturing Execution System solutions the first choice for automated or fast moving goods manufacturing processes. AVEVA's System Platform is leveraged as the infrastructure for execution integrated with the plant equipment control systems. Native integration leverages the platform equipment model and facilitates transformation of control system data into consistent electronic records for storage in the MES database.

## Reporting

MES Operations includes standard reports which are published for flexible and collaborative information access via a web browser.

- Genealogy by Work Order
- Production by Equipment

Production Request(s)			
Production Request	Start Time	End Time	Duration
DemoW010	10/19/2014 11:21:00 PM	10/19/2014 11:22:58 PM	00:01:58

Material(s) Produced			
Material	Quantity	Lot	Location
BFG-000001	3,360.00 Units	FL_101914112110	Filling_002

Material(s) Consumed			
Material	Quantity	Lot	Location
B-000001	1,344.00 Units	BoLot-101914230804	Raw Materials
BL-000001	1,680.00 Gallons	BL_101914111500	CranberryPomTank
B-000001	2,016.00 Units	BoLot-101914232007	Raw Materials

Equipment Utilized			
Equipment	Start Time	End Time	Duration
Filling_002	10/19/2014 11:21:00 PM	10/19/2014 11:22:58 PM	00:01:58

Equipment Performance				
Equipment	Utilization	Performance	Quality	OEE
Filling_002	100	107.14	100	107.14

Energy Utilized		
Energy Type	Total Consumption	Energy Intensity
Electricity	9,999.5 kW h	2,976 kW h / Units

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AVEVA's Manufacturing Execution System functionality can be incrementally deployed in a plant and allows to capture best practices for reuse and standardisation across multi site operations.

## Multi-site Operations Management

The key in multi-site operations applications is to standardise KPIs, share best practices, and elevate plant performance consistently across your business. Our "model driven" methodology is based on reusable templates and a low code configuration environment which allows to digital capture best practices in work and data collection processes for reuse, sustainable standardisation, and for adopting change across multi-site manufacturing operations.

## Manufacturing Execution System Technical Specifications:

### Operating Systems

- Windows 8.1 Professional or Enterprise Edition (32-Bit and 64-Bit)
- Windows 10 Professional or Enterprise Edition (32-Bit and 64-Bit)
- Windows Server 2012 and 2012R2 or newer in Standard or Data Center Edition (64-Bit)
- Windows Server 2016 Standard or Data Center Edition (64-Bit)
- Windows Server 2019 Standard or Data Center Edition (64-Bit)

### Database Technology

- Microsoft SQL Server 2012 in Express, Standard or Enterprise Edition
- Microsoft SQL Server 2014 in Express, Standard or Enterprise Edition
- Microsoft SQL Server 2016 in Express, Standard or Enterprise Edition
- Microsoft SQL Server 2017 in Express, Standard or Enterprise Edition

### Language Support

Manufacturing Execution System includes support for the following languages:

- English
- French
- German
- Japanese
- Russian
- Simplified Chinese
- Spanish

For more information on AVEVA's Manufacturing Execution System and Manufacturing Operations Management solutions, please visit:

[sw.aveva.com/operate-and-optimize](http://sw.aveva.com/operate-and-optimize)