SAP MES for the Plastic Injection Molding Industry

QUICK FACTS!

Company:

- Industry:
  - Plastics

- Products & Services:
  - Consumer

- Implementation Partner:
  - **RTS Consulting Automation (RTS)**
  - 12-year SAP MES Services Partner
  - An ISO 9001:2015 Certified Company

RTS
Manufacturing Business Intelligence
Delivering Operational Excellence
CONSULTING - AUTOMATION

Implementation Highlights:

- Very close collaboration between client and RTS
- Overall equipment performance real time visibility via Andon system
- Visual production work order MES Scheduler
- Web based HMI Screens, integrated with PLC and SAP S4-Hana
- Ad hoc uniform reporting with an option to export csv or send as email
- Scalable solution – Configure additional Injection Molding Presses/equipment on the fly

Challenges and Opportunities:

- Visibility and dynamic work order sequencing at equipment level
- Real time visibility to lost production time and scrap
- Optimize internal plant material logistics via Automated Guided Vehicles (AGV's)
- Visibility to the production data from S4-Hana and PLCs
- Web based HMI Screens at work stations
- How to present operators with relevant workflow machine instructions and specific part drawings

Why SAP:

- Seamless integration with SAP ERP/S4-Hana.
- Interactive & uniform user-interface
- Secured role-based functionality
- Real-time, bidirectional communication with plant equipment and ERP/S4-Hana
- Web based dashboards, availability on smart mobile devices

Objectives:

- Real-time insight and control of production operations at various levels: Plant, Line, Equipment.
- Increase production assets (equipment) utilization via OEE
- Automatic production reporting back to SAP S4-Hana
- Provide operators, planners and managers with accurate role based, real-time information using common interactive dashboards.
- Create a data repository for Injection Molding Machines' configuration, Mold maintenance management, operator user clock ID and other details, as well machine history.

Benefits:

- More accurate planning and production order management
- Quick control over operational data
- Real time Plant level KPI's
- Real time monitoring of equipment and production parameters, streamlined maintenance response
- Easy to manage production Label printing
- Mold maintenance with validations during assignments
- A single web enabled HMI Screen showing real time data from PLC and master data from SAP S4-Hana.

Existing Environment:

- SAP S4-Hana

Overview

SAP MII solves the disconnect between the plant floor and the enterprise business system; enabling manufacturers to become adaptive, profitably replenishing their supply networks while dynamically responding to unpredictable change.

By leveraging the capabilities of SAP MII, RTS delivered specific Manufacturing Execution System (MES) functionality for the plastics industry. This MES system can effectively regulate the production process, increase equipment/production resource tool (PRT) utilization, improve production efficiency, provide important shop floor KPI's, all while being flexible enough to add new machines/equipment on the fly.

It also solves the following major problems for the plastics industry:

- Mold Maintenance
- Traceability
- Real time visibility to the plant floor
- Poor visibility to the production data
- Product Quality

The SAP MES application increases company flexibility and makes them more agile to adjust to market requirements quickly as it not only provides up to the minute production status but also provides various means to control and adjust production.

The application is integrated with SAP ERP/S4 Hana and with shop floor PLCs which are connected to the Injection Molding machines. This extended connectivity allows the users to see important contextual data from both, the local dedicated dashboard or mobile devices.

Machine Availability & KPI's

Based on when the machine is scheduled to run, the Andon dashboard indicates each work center status with its actual current cycle time. This enables the supervisors/plant managers to keep an eye on the overall status of the plant from a single dashboard, with a drill down to equipment allowing quick corrective action when needed.


Visual Order Schedule Planner

Orders with specific details are downloaded from SAP S4-Hana in the background and are displayed in a searchable table which allows the operator to search with any keyword from the order details. The orders can be assigned to any of the work centers based on the health of the Mold (which is highlighted in red, if there is an issue).

The visual Order Schedule Planner provides a **graphical** illustration of the schedule that can help the Plant/Line manager plan, coordinate, and track specific orders easily. The orders can be stopped/started, rescheduled or assigned to any other work center by dragging and dropping it.
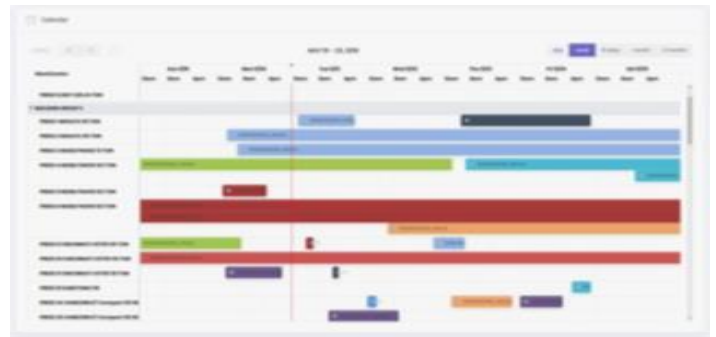
Reports

Collecting huge amounts of data is meaningless unless it provides contextualized information to help solve a problem. The ad hoc reports provided by the solution highlight problem areas. For e.g., the downtime report shows the duration of the downtime in a Pareto chart with reason codes, identifying the most notorious reasons of downtime visually. Similarly, the reject reports identify the biggest reason for scrap. Other reports provided by the solution are Color Change, Efficiency, Open orders, Production and Tooling Reports.

All the ad hoc reports provide options to export the data as csv or send it as an email.

Web Enabled HMI Dashboards

Web and touch enabled, SAP UI5 based HMI Screens connect to the injection molding machines, PLCs and SAP S4-Hana. These screens depict data from all entities on a single dashboard and allow immediate confirmations back to S4-Hana. This provides the option to select single or multiple orders for a work station based on the quantity of Molds a family mold has.

The HMI shows the actual and standard cycle times for the current execution.

While dashboards and portal technologies alone do not deliver actionable intelligence, these tools do provide a necessary base for visibility, as well as a launching point for event-based triggers and alerts. Through enabling a portal view into processes as they occur, and monitoring events or drilling down into areas of concern, employees take a proactive view of manufacturing using tools that look beyond the symptoms and provide details to enable root cause analysis. Visibility, whether gained through portals, dashboards or alerts delivered to wireless devices, easily trigger corrective or preventive actions when necessary.

Real Time Order and Quality Status

Part of the power of any automated system is the data that is exposed by accurately and efficiently monitoring and logging plant floor information. More than two million combinations of product/production parameter datasheets become valuable assets when they are correlated to manufacturing events (shift change, order change, system alarms, operator ID, etc.) and only when this correlated data is extracted and distributed to enterprise-wide personnel in the form of intelligent actionable alerts and easy to manage reports, do we see bottom line results.

The solution provides dashboards to depict current status of orders along with quality issues in real time. This enables supervisors/quality managers to contain the issues quickly, hence reducing the impact on the schedule, scrap and inventory.

Mold Maintenance

The condition of the "injection mold" affects the quality of the components produced. Performing necessary preventative maintenance improves tool longevity and part quality by stopping issues before they happen. Mold maintenance history is indispensable to identify and notify planners/operators about issues which may impact product quality. The application provides a Mold maintenance screen to capture all the minute details of a Mold and its maintenance history. In case of issues with a Mold, the planner/operator gets a notification at the time of scheduling the order, to ensure that an un-healthy mold is not used, alleviating poor quality products.

A quick search screen allows the users to search any mold from the list of molds with any keyword from the Mold details.

Summary

The SAP MII MES solution for the plastics Industry will bring transparency to the plant floor processes, help in easing the planning process, increase quality of products by helping operators choose healthy Molds, help in maintaining the Mold and overall increasing production flexibility and agility to meet market requirements.

Note:
- *References will be made available upon request*
- *To request a demo please connect with us*

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