



Batch Management & Analytics for Process Plants

Digital-maturity and Challenges in Batch Management

In Control?

Out of Control?

SOPs

Control System

Recipe Management

Long cycle times

Quality off-specs /
give aways

Sample workflow
delays

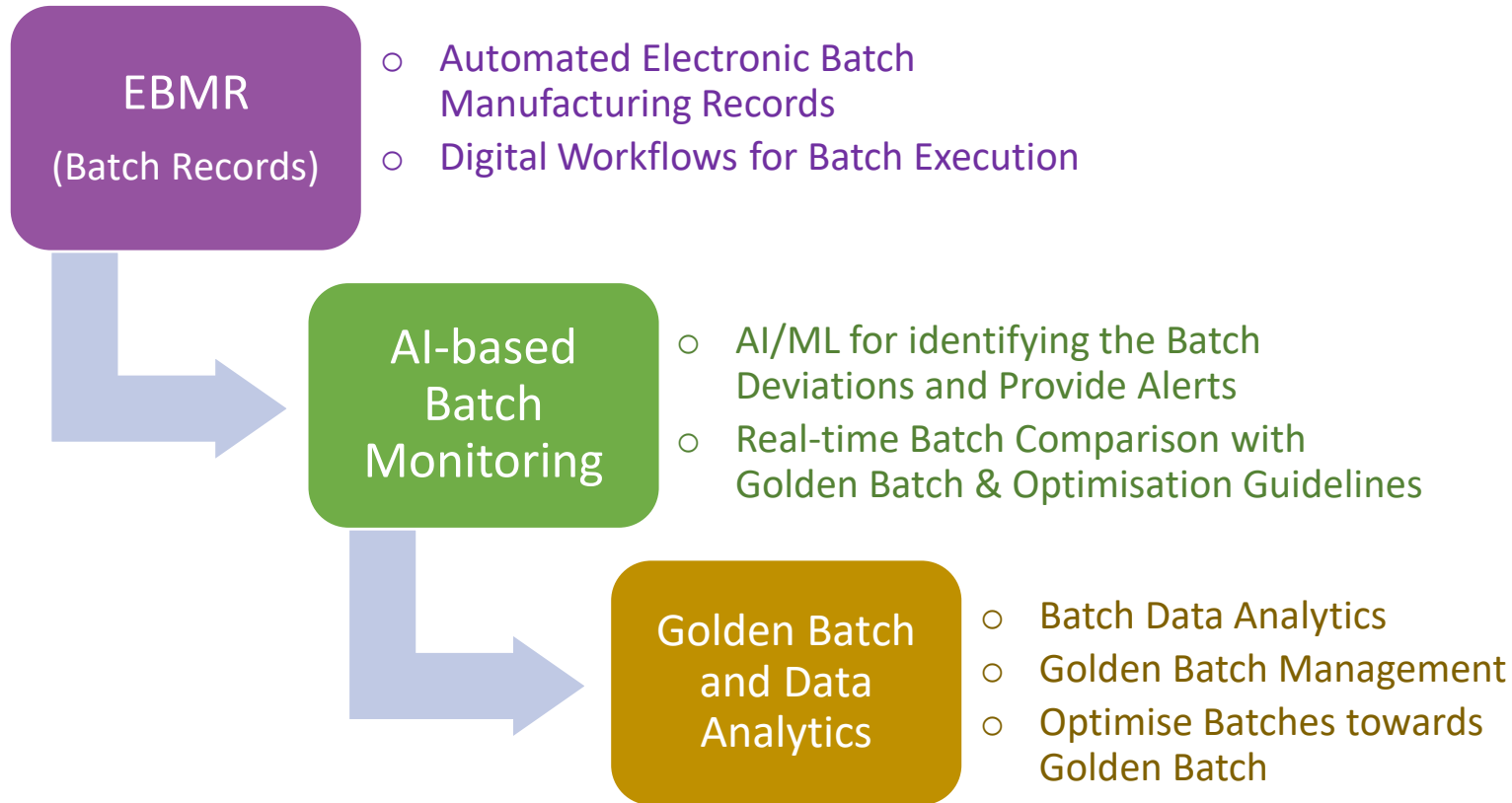
Batch deviations

Is the **Batch Execution** streamlined using digital workflows? Are the **Batch Data Records** automated and digitized and are used for Predictive Analytics?



Batch Management & Analytics

Reduce Batch anomalies and optimize batch performance using AI-powered Batch Management Solutions



inSis Batch helps in Streamlining Batch Execution, Batch Data Management, Real-time Batch Monitoring & Optimization and Batch Data Analytics for Golden Batch



Streamlines the **Operating Procedures (SOPs)**



Manage **Recipes** and Synchronize with ERP/MES



Connects the workforce using an **Unified App** in various steps



Provides **Batch Data Analytics** for Golden Batch



AI-based Batch deviation monitoring in Real-time & RCA



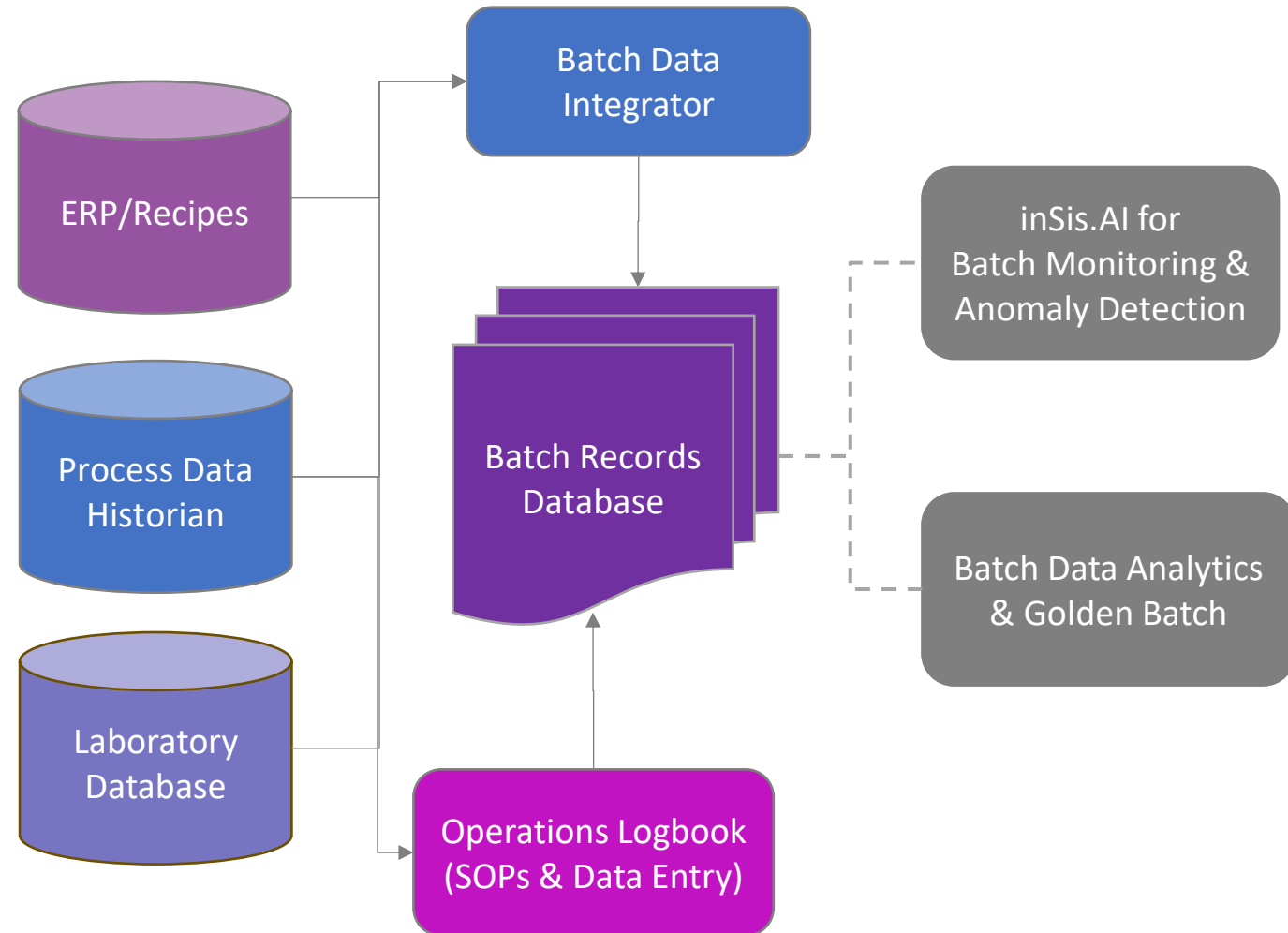
Automatic data collection from **multiple data sources**

Digital Batch Data Records Management

A unified digital framework for collection, storage & reporting of batch manufacturing records in electronic format

Several Data-sets from various Data Sources

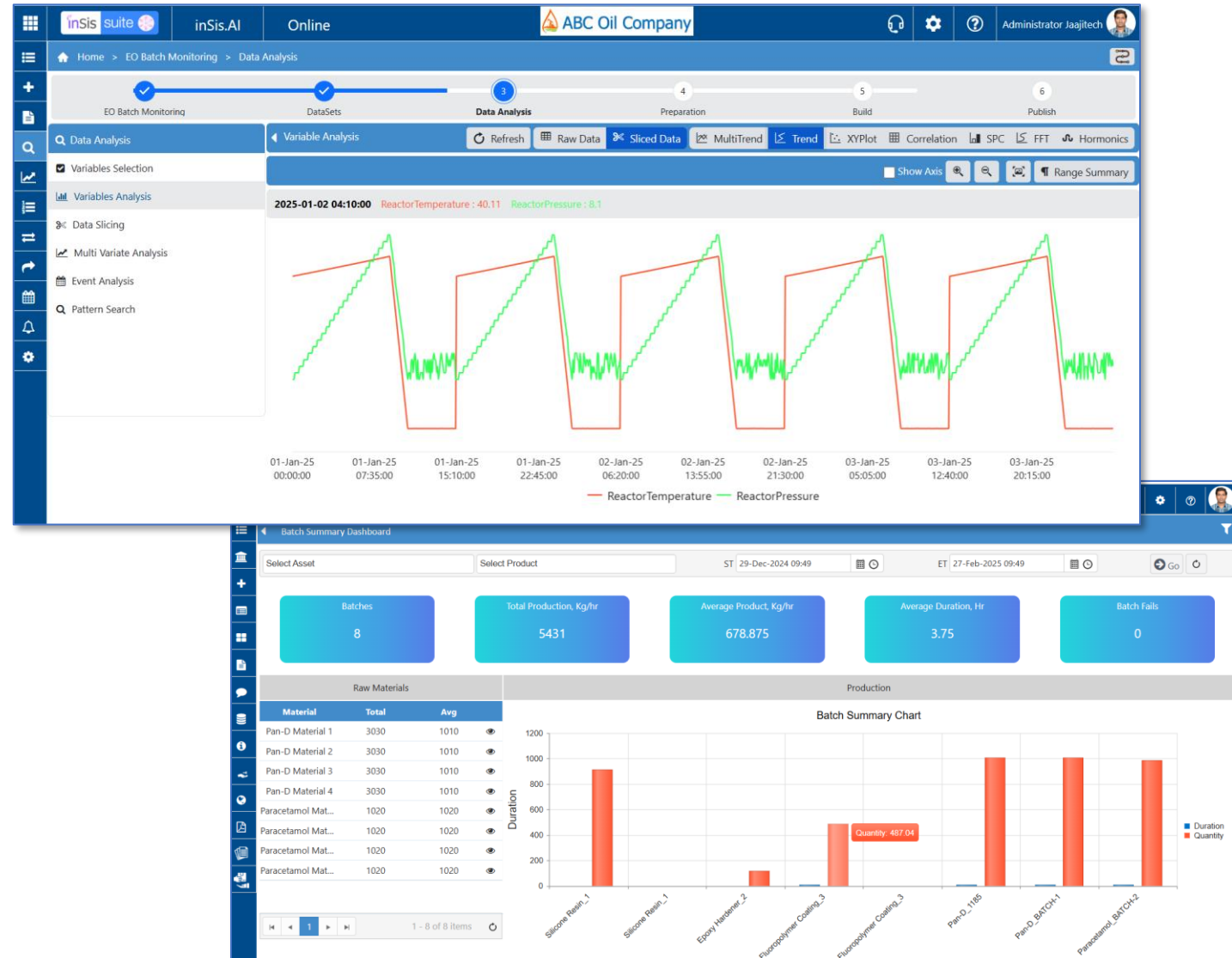
1. **Batch Information** (From ERP)
2. **Recipe/Raw Materials/Catalysts/Utilities** (From ERP & Manual Entry)
3. **Process Steps and Conformations** (SOP)
4. **Process Data** (DCS/Manual)
5. **Lab Data** (LIMS Modules)
6. **Products/Byproducts** (From ERP & Manual Entry)
7. **Batch Interruptions Information** (Manual Entry)
8. **Comments** (Manual Entry)
9. **Shift Handovers** (Workflow Info)



AI-based Batch Deviation Monitoring

Using the power of AI models, the deviations and quality off-specs are predicted well in advance

- Using AI/ML modelling methods, the Batch Health Vector is build
- Identifies and Aggregates the Batch Patterns using the historical Batch data
- Uses Real-time data of the batch equipment, the Batch process parameters and health vector are monitored for deviations
- An email and in-app notifications are provided for deviations in the Batch Execution



Batch Management at a Leading Specialty Chemical Manufacturer



OBJECTIVE



To digitize and streamline Batch Manufacturing Records (BMR) by integrating operational, quality, and ERP systems—enabling real-time tracking, accuracy, and compliance.

OFFERED SOLUTION



inSis Laboratory Information & Management System (LIMS)

CONCLUSION



enabled a fully paperless, standardized, and traceable manufacturing process. It improved efficiency, ensured regulatory compliance.

Solution Overview

- Eliminate paper-based logs and manual processes
- Real-time tracking of operational & quality data
- SOP-based, step-wise workflow execution and guidance
- Improve traceability, standardization & collaboration
- Recipe Management Module including
 - Structured recipe catalogue & governance
 - Role-based access control
 - BOM sync with DCS & Oracle

Scope of Work

- Data Integration with ABB and Yokogawa DCS via OPC DA
- Oracle-based ERP & Trace Ready system
- Techtronic Sampler – Manual data entry interface
- Interface from Weighing scales or manual entry
- E-BMR for 700 Recipes
- 150 standardized templates

Benefits Achieved



- 100% Paperless Batch Logging
- Automated Data Fetch & Workflow Generation
- Secure Data Access & Storage



Real-Time Monitoring & Analytics



Reduced Man-Hours, Faster Audits



Plant-wide Data Visibility Across Devices



Metrics-Driven Decision Making

eBMR – Batch Records Management

Centralized Digital Platform – Create, track, and manage batch records efficiently.

Compliance & Traceability – Ensures regulatory adherence and complete batch visibility.

Dashboard Views – Card or list view with status indicators (Issued, Completed, Approved, Cancelled).

Detailed Batch Table – Captures date, batch number, product name, responsible personnel, manager, and approval details.

Real-Time Monitoring – Instant updates on batch progress and status.

Digital Approvals – Streamlined authorization process with audit trails.

Error Reduction – Minimizes manual effort and data entry mistakes.

Improved Efficiency – Enhances operational control and manufacturing productivity.

The screenshot displays the eBMR interface. The top navigation bar includes 'insis suite' and 'Electronic Batch Manufacturing Record'. Below this, there are tabs for 'BMR's', 'Batch Record', 'Notes', 'Instructions', 'Shift Handover', and 'BMR Report'. The main area shows a dashboard with cards for various batch records, each with a status indicator (Issued, Completed, etc.). Below the dashboard is a table titled 'Plant 3 PX-3822 - Batch Record' showing details for several batches, including Date, Batch No, Product Name, Approving Person, Preparation Person, Manager, Status, and Approval Status.

Date	Batch No	Product Name	Approving Person	Preparation Person	Manager	Status	Approval Status
28-May-2025 16:00:00	3370073022	PX-3822	Any Authorized Person	Chavdaliten Karsanbhai	Vinod Jorvar	Completed	Pending
24-May-2025 04:42:00	3370072841	PX-3822	Any Authorized Person	Vijay Kotian	-	Completed	Pending
22-May-2025 08:15:00	3370072810	PX-3822	Any Authorized Person	Vikash Kumar	-	Completed	Pending
09-Apr-2025 01:23:00	3370070686	PX-3822	Any Authorized Person	Panel Operator	-	Completed	Pending
08-Apr-2025 17:24:00	3370070522	PX-3822	Any Authorized Person	Panel Operator	Administrator Jaajitech	Completed	Pending
18-Mar-2025 11:27:00	3370070038	PX-3822	BMR Approver	Panel Operator	-	Completed	Pending

Batch Records management

Create Batch Record

The *Create Batch Record* screen allows users to initiate a new batch by entering key details such as date, panel operator, shift in-charge, equipment, and dependency batches. Users can either select an existing batch (fetched from Oracle or other data source) or manually enter details like batch identifier, ERP reference, batch number, grade, material, and target quantity. This ensures accurate and consistent recording of batch data right from the start.

Batch Identifier	Product Name	ERPRef	BatchNo	Grade	BatchMaterial	BatchTargetQty
PX-3822	PX-3822	3370073212	3370073212		PX-3822	17600
PX-3822	PX-3822	3370073062	3370073062		Polysobutylene-High Reactive	16224.30661
PX-3822	PX-3822	3370073022	3370073022		Maleic Anhydride	1525

Edit Batch Record

The *Edit Batch Record* screen helps in updating or modifying an existing batch. Users can change panel operators, equipment, shift in-charge, and other related details. Batch information such as product name, ERP reference, material, scheduled time, target quantity, yield, and status can be updated to keep the record aligned with actual production activities.

BatchIdentifier	Product Name	BatchNo	Grade	BatchMaterial	BatchTargetQty	BatchYield	BatchRecordCreatedTime	BatchStatus
PX-3822	PX-3822	3370072890		Maleic Anhydride	0.00	0.00	23-May-2025 12:03	None

Batch Execution & Automatic Data Collection

The Batch Card Viewer provides a comprehensive view of batch details, enabling users to monitor progress in real time and seamlessly perform key actions such as approving, rejecting, or updating records.”

The Input and output quantities can be fetched from oracle other sources.

Built-in support is provided for LIMS in Batch Cards for streamlining the sample requests & data collection

Plant 3 PX-3822					
Batch No: 3370073022			Batch Identifier: PX-3822		
Start Time: 28-05-2025 16:01:36			End Time: 30-May-25 01:19		
Input					
S.No	Raw Materials	Formulation	Required kgs	Actual kgs	
1	Polystyrene -High Reactive	0	16224.30661	16226	
2	Maleic Anhydride	0	1525	1525	
3	Silicon Fluid M-60000	0	1.06005	1.065	
		0	17750.37166	17752.065	
Output					
S.No	Product and by products	Wt. %	Net wt. in kgs	Actual Qty in kgs	
1	PX-3822	0	17600	17670	
		0	17600	17670	
Check list prior to charging the batch					
Description	Remarks	Comments			
Check Reactor R 712 with its receiver is Clean & Dry as standard cleaning procedure	Continuous_Campaign	continue same batch			
Agitator speed of R 712 is at Maximum.	Yes				
Close all manual valves on R 712 and all other pipelines going to other units to be isolated.	Yes				
Check all control valves operational by mock testing	Yes				
Check all instruments are operational by mock testing	Yes				
Reactor vent to be kept open to process scrubber throughout the reaction phase Confirm	Yes				
Take trial for blank vacuum in reactor whenever any joint on reactor is opened. It should be minimum 40 mm Hg abs, it is applicable for first batch, after cleaning/changeover	Yes				
Check the Thermic Oil temperature for heating can be max 280 Deg C	Yes				
Manufacturing Process					
InProgress					
MUN_P3_PX3822 PX-3822					
Manufacturing Procedure					
Inspect Reactor for any impurities inside the reactor (must be clean & dry). Must be cleaned & Pressure test taken as per SOP and check list for first batch. Note: If production is continuous, do not required to check above step during every batch. Continue the next batch.	Qty	Act Time	Temp	Pressure	Remarks
	Start Time	28-May-2025 15:53	190.05	734.60	
	End Time	28-May-2025 15:53	190.05	734.60	
Keep Storage tank and transfer line for heating before material transfer.	Start Time	28-May-2025 15:53	190.05	734.60	OK
Start HRPB circulation through MFM to storage tank after getting steady flow. Then reset the set point & charge in reactor	End Time	28-May-2025 15:53	190.05	734.60	
Charge 100 kgs of fresh soft water in decanter D-712 and V-712A before starting batch.	Start Time	28-May-2025 15:53	190.05	734.60	OK
Vapour line XV-HE-712A/2 : Close and open two times and keep open continuously	End Time	28-May-2025 15:53	190.05	734.60	
Charge HRPB-950 in reactor through MFM. Start stirring On receiving approx. ~2000 kg HRPB. Give sample (IP-O) for Moisture content.	Start Time	28-May-2025 15:53	218	190.05	734.60
	End Time	28-May-2025 19:31	91.41	739.18	
On receiving approx. ~4000 kg HRPB. Start charging of Maleic Anhydride in parallel	Start Time	28-May-2025 17:06	37	104.19	742.08
	End Time	28-May-2025 17:43	87.68	735.33	
Note : Required PPEs for this activity.					
1. PVC Hand gloves					
2. Leather Apron					
3. Safety Helmet					
4. Safety shoes					
Instructions for batch charging activity. PPEs required. First aid measures given by:					
SIC/PO Name Sign		Select User	Company Operator Name & Sign		Select User
Instructions on batch charging activity. PPEs required. First aid measures given to Contractor workmen.					
Contractor workmen 1			Contractor workmen 2		

Digital SOPs in eBMR

Integrate SOP as Execution Guidance

Guides operator to execute a process or operation step-by-step while documenting the various execution details like Start Time, End Time, Operating Parameters etc. for each of the step automatically or manually.

When SOP execution is completed, a detailed record of execution is available as a document for future references and comparisons.

✓ **When EnableStepExecution is ON:** Buttons like Play, Pause, Cancel, Reload, Complete, and Skip are visible depending on the step status.

✗ **When EnableStepExecution is OFF:** Only the  Refresh button will be displayed. If step data (HTML content) isn't configured, no button will appear.

Any deviation from standard parameters must be documented. Immediate corrective action should be taken under supervisor guidance.

Procedure	
	PARAMETERS
♦ Raw Material Inspection Ensure raw materials meet quality standards before processing.	Start Time
	End Time
	P-Aminophenol Purity
	Acetic Anhydride Purity
	Moisture Content
	Solvent Purity
♦ Acetylation Reaction Convert P-Aminophenol to Paracetamol through acetylation.	Start Time
	End Time
	Reaction Temperature
	Catalyst Type
	Stirring Speed
♦ Crystallization Purify Paracetamol through controlled cooling.	Start Time
	End Time
	Cooling Rate
	Final Crystallization Temperature
	Crystal Size Range
♦ Filtration and Washing Remove impurities and excess reactants.	Start Time
	End Time
	Filtration Pressure
	Washing Solvent
	Washing Cycles



Digital SOPs in eBMR – Mobile App

SOP as Reference

ABC Pharma - Paracetamol

Specific Process Considerations

Paracetamol_Specific Process Considerations
Specific Process Considerations

1

Occupational, Health, Environmental & Safety considerations:

1. Use helmet, goggles, PVC hand gloves, safety shoes & organic cartridge mask, while charging of raw materials.
2. Hot sampling kit to be used. Use of PPEs such as face shield, PVC hand gloves, safety shoes, helmet and PVC suit/Apron. Ensure proper earthing is done to drums while charging of raw materials.
3. Ensure leak test of the reactor is done at 2.0 kg/cm2.

2

Quality considerations:

1. Ensure RPM of reactor is at Max.
2. Cooling & Chilling connections are ready and tested

SOP for guided Execution

ABC Pharma - Paracetamol

Initialized

Deviations and Corrective Actions

·Any deviation from standard parameters must be documented.
·Immediate corrective action should be taken under supervisor guidance.

Procedure

Completed

Raw Material Inspection

Ensure raw materials meet quality standards before processing.

PARAMETERS	Value
Start Time	02-06-2025 22:30:00
End Time	02-06-2025 23:32:55
P-Aminophenol Purity	0.30
Acetic Anhydride Purity	23.56
Moisture Content	99.30
Solvent Purity	56.23

ABC Pharma - Paracetamol

InProgress

Filtration and Washing

Remove impurities and excess reactants.

Start Time 02-06-2025 23:38:00

End Time

Filtration Pressure

Washing Solvent

Washing Cycles

Initialized

Drying

Achieve the desired moisture content in Paracetamol.

Start Time

End Time

Drying Temperature

Final Moisture Content

Initialized

Milling and Sieving

Seamless Integration with Laboratory

Built-in support is provided for LIMS in Operations Logbooks for streamlining the sample requests & data collection

Reduces time delays for sample results by eliminating communication gaps between Operations & Quality Control,

- Users can initiate lab test requests based on predefined triggers or manual selection within the log sheet.
- The integrated LIMS widget allows users to select test parameters, sample types etc., without leaving the logbook interface.
- Once the request is submitted, it is automatically transmitted to the LIMS system and alerts lab personnel.
- Operators can view the status of Sample Analysis in the Laboratory from the Logbook. And, the results are automatically updated into Logbook without any need to manually collect and enter
- Provides labels for printing on Sample Bottle for requested Samples
- Optionally, the locally measured sample results are easily updated into Logbook through this LIMS widget

Request Sample from Logbook

Lab Samples				Register	Requests	↺
SampleStatus	SampleName	SampleResults	Description			

Sample Measurement

CollectedBy

Select user...

CollectedTime

02-Jun-2025 11:06

📅🕒

ReceivedTime

02-Jun-2025 11:06

📅🕒

SampleTime

02-Jun-2025 11:06

📅🕒

SampleBatchId

3370070158

CustomSampleIdentifier

IC-01

SampleName

Ethylene Oxide

✕

Sample Registration Success

Product Name	
Batch No	3370070158
Sample Name	Ethylene Oxide
Date	02 Jun 2025 11:07:17

🖨️📄

Seamless Integration with Laboratory

- Each request is linked back to the originating log entry, enabling traceability and audit readiness.
- The request is notified to Laboratory team and is quickly accessible from Notifications and Activities Feed.
- Once the request is accepted, the sample is automatically registered, and sample workflow is started.

Sample Request Notification in LIMS

The screenshot displays the 'InSis suite' Quality Management interface for 'ABC Oil Company'. A 'Registration Request' modal is open, showing details for a sample registration. The modal includes fields for Sample BatchIdentifier, Sample BatchID, Sample Time, Collected By, Collected Time, Requested By, and Requested Time. Below the fields are 'Accept Request' and 'Cancel Request' buttons. In the background, a 'Sample Requests' notification is visible, stating: 'Admin has requested a sample registration for Ethylene Oxide from the logbook.' with a timestamp of '2025-06-02 11:07:16'.

Field	Value
Sample BatchIdentifier	
Sample BatchID	3370070158
Sample Time	2025-06-02 11:06:00
Collected By	Admin
Collected Time	2025-06-02 11:06:00
Requested By	Admin
Requested Time	2025-06-02 11:07:16

Sample measurement in LIMS

The screenshot displays the 'Sample Measurement' form in the LIMS interface. The form shows 'Measure Status: Completed' and 'Sample Expired Status: InValid'. The 'Measured By' field is set to 'Admin'. The 'Start Time' and 'End Time' are both set to '02-Jun-25 11:08 AM'. Below the form is a table titled 'Sample Measure Results' with columns for Property Name, Units, DesignValue, and Results. The table contains five rows of data.

Property Name	Units	DesignValue	Results
Purity	%	>= 99.5%	99.3
Moisture content	ppm	<= 100 ppm	96
Inhibitor Content	ppm	<=10	5.6
EO Peroxide & Aldehyde Content	ppm	<= 5	3.5
Odor & Color	APHA	<=10	9.8

Seamless Integration with Laboratory

- Confirmation or status updates—such as “Accepted”, “Registered”, or “Measured”, or “Approved” — can also be displayed within the logbook via widget synchronization.

Sample results updated in Logbook automatically

Lab Samples			
		Register	Requests
SampleName	Description	SampleStatus	SampleResults
Ethylene Oxide	C ₂ H ₄ O	Cancelled	Purity Moisture content Inhibitor Content EO Peroxide & Aldehyde Content Odor & Color
Ethylene Oxide	C ₂ H ₄ O	Assigned	Purity Moisture content Inhibitor Content EO Peroxide & Aldehyde Content Odor & Color
Ethylene Oxide	C ₂ H ₄ O	Approved	Purity 99.3 Moisture content 96 Inhibitor Content 5.6 EO Peroxide & Aldehyde Content 3.5 Odor & Color 9.8

View status on Sample Analysis from Logbook

Registered Samples										
SampleName	Sample Time	Collected By	Collected Time	Requested by	Requested Time	Status	Batch Identifier	Batch NO	Comment	
Ethylene Oxide	02-Jun-25 11:06	Admin	02-Jun-25 11:06	Admin	02-Jun-25 11:07	Created		3370070158		
Ethylene Oxide	02-Jun-25 11:09	Admin	02-Jun-25 11:09	Admin	02-Jun-25 11:10	Created				
1 - 2 of 2 items										

Integration with Data Sources

- inSis seamlessly integrates with various data sources, like PCS/Historian, allowing data to be fetched directly and automatically into logbooks.
- Typically, this option is used for Panel Operator Logbooks
- Values that exceed defined limits are automatically highlighted with color, making it easy for users to spot abnormalities at a glance.
- These data can be tended in detail views



ABC INDUSTRIES LIMITED
(Chemical Division, Renukoot)
IMS OPERATIONAL MANUAL
LOGSHEET FOR PRIMARY BRINE SECTION

COPY NO.
DOC. NO. QR-1/1/C-10
SHIFT A (06:00 To 14:00)
02-Jun-2025

Reactor - Pump Outlet					
Parameter	02-Jun-25 06:00	02-Jun-25 08:00	02-Jun-25 10:00	02-Jun-25 12:00	02-Jun-25 14:00
Reactor Outlet Excess NaOH	44.06	168.15	58.30	172.57	265.67
Reactor Outlet Excess Na2Co3	487.42	332.18	512.66	352.29	462.22
Reactor Outlet Dosing Rate NaOH	14.43	3.26	13.76	4.62	6.33
Reactor Outlet Dosing Rate Na2CO3	8.01	5.52	10.94	5.60	6.31
Reactor Outlet pH	1.18	1.14	12.25	6.16	2.01

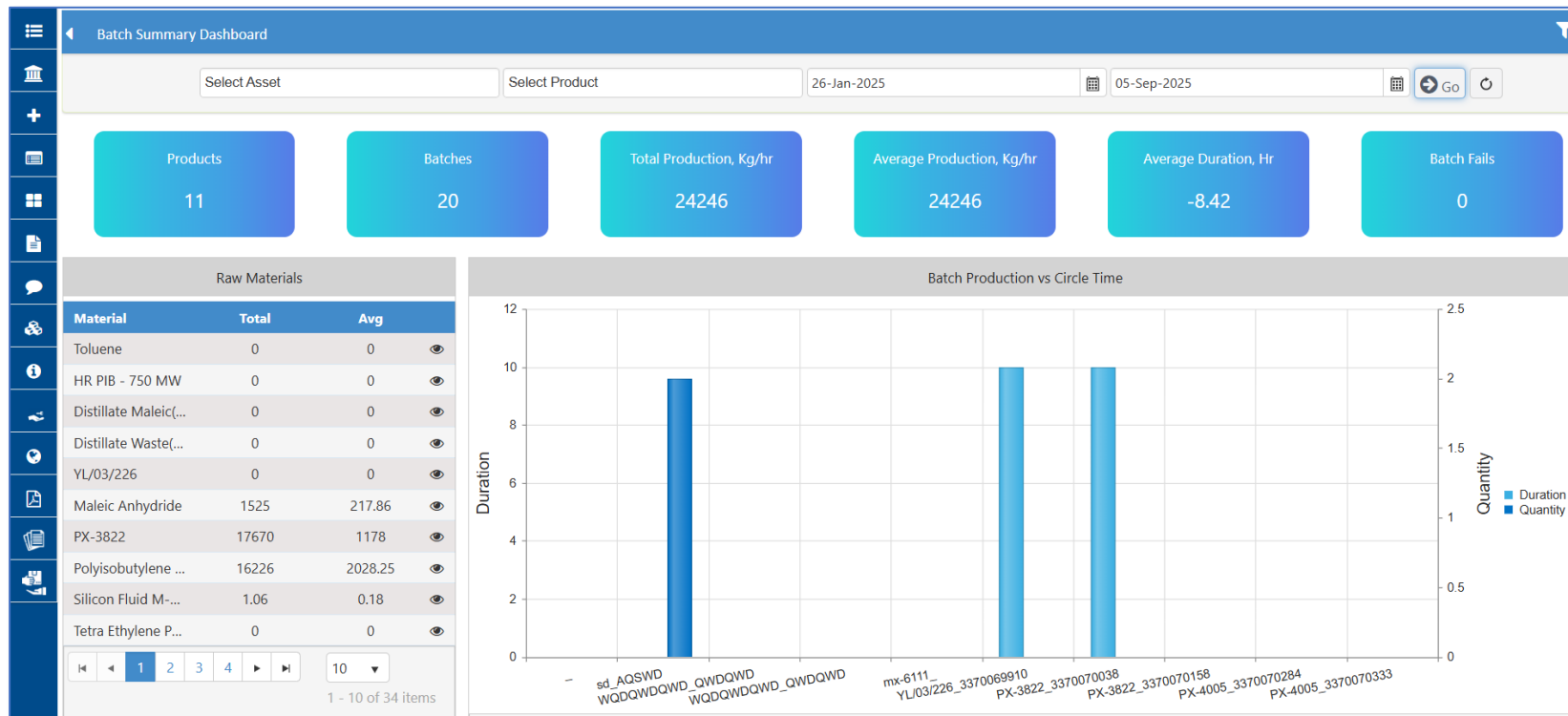
Clarifier - Pump Outlet					
Parameter	02-Jun-25 06:00	02-Jun-25 08:00	02-Jun-25 10:00	02-Jun-25 12:00	02-Jun-25 14:00
Clarifier Outlet Excess NaOH	63.36	89.80	0.72	45.70	118.57
Clarifier Outlet Excess Na2Co3	501.62	415.59	393.55	262.31	149.64
Clarifier Outlet Hardness Ca	-0.14	-3.01	-2.21	-3.35	-2.20
Clarifier Outlet Hardness Mg	0.98	-2.68	-2.20	2.87	-0.45
Clarifier Outlet CBT Level	53.81	84.58	113.07	40.74	112.47
Clarifier Outlet Colony Well Water Flow	90.45	23.97	142.55	43.44	55.16
Clarifier Outlet Sludge Temp	167.09	180.46	101.03	224.66	177.77

Filter - Pump Outlet					
Parameter	02-Jun-25 06:00	02-Jun-25 08:00	02-Jun-25 10:00	02-Jun-25 12:00	02-Jun-25 14:00
Filter Outlet RBT Flow	65.97	96.99	65.76	82.28	126.63
Filter Outlet Common Filter Outlet	4.32	9.82	5.71	14.09	4.79
Filter Outlet Ca	-4.57	2.69	2.61	0.39	-2.66
Filter Outlet Mg	-0.76	-0.32	-0.48	-3.19	-4.43
CBT Pump DIS.PR	3.47	8.92	11.06	5.97	1.09

Page No.	Issued By (HOD)	Approved By (MR/MA)	Issue/Revision No.	Issue/Revision Date
1			2/1	2/6/2025

Batch Data Analytics – Summary

The **Batch Summary Dashboard** offers a quick overview of production performance, showing key insights such as total products, batches executed, production output, average production rate, and batch failures. It also tracks raw material consumption with totals and averages, helping monitor resource usage. The visual chart of **Batch Production vs. Cycle Time** provides a clear view of efficiency across different batches, enabling better analysis and decision-making.



Batch Data Analytics – Golden Batch Identification

The **Golden Batch Identification** helps in determining the most optimal batch by comparing key parameters such as product yield, cycle time, and process metrics. Users can set criteria, assign weights, and define directions (maximum/minimum) to evaluate and rank batches. The system then identifies the best-performing batch as the **Golden Batch**, which can be used as a benchmark for process consistency, quality improvement, and future production optimization

Golden Batch Identification

PX-3822 x30-Mar-202505-Sep-2025Go

Batch Parameter

Raw Materials

Product

☐ PX-3822

Metric

☐ CycleTime

☐ Yield

Parameters

☐ MUN_P3_PX-3822_IP0_WAT_CONT.ME

Direction

☐ Maximum

☐ Minimum

Criteria

Batch Parameter	Direction	Cost/Weight
PX-3822	1(Maximum)	2
CycleTime	1(Maximum)	2
Yield	1(Maximum)	2
MUN_P3_PX-3822_IP0_WAT_CONT.ME	1(Maximum)	2

Find Golden Batch

Golden Batches

Batch No	Objective Value	Rank	Set As Golden
3370070522	0	1	Set As Golden
3370072946	0	2	Set As Golden

Batch Data Analytics –Batches Comparison

The **Batch Comparison Dashboard** in the Electronic Batch Manufacturing Record (EBMR) enables users to analyze multiple batches side by side for better process evaluation.

The screenshot displays the 'Batch Comparison' dashboard within the 'inSis suite' Electronic Batch Manufacturing Record (EBMR). The interface includes a top navigation bar with the 'inSis suite' logo and 'Electronic Batch Manufacturing Record' title. Below this, a 'Batch Comparison' header bar contains a search filter 'PX-3822', date ranges '26-Jan-2025' to '05-Sep-2025', and a 'Go' button. The main data table lists four batches with columns for 'Batch No', 'Golden', 'Batch StartTime', 'Batch EndTime', 'Cycle Time', and 'Yield'. The first batch, '3370070522', is marked as 'Golden' with a checkmark. Below the table, there are pagination controls showing '1' of 10 items and a '1 - 4 of 4 items' status. A 'Compare BMR' button is visible. The dashboard is split into two panels: 'Sheet 1 Logbook : Plant 3 PX-3822 - 21-Mar-2025 02:54:00 PM' and 'Sheet 2 Logbook : Plant 3 PX-3822 - 18-Mar-2025 11:27:00 AM'. Both panels show a 'Rejected Comment : reject' message. The left panel displays a table for 'Plant 3 PX-3822' with columns for 'Batch No', 'Batch Identifier', 'Start Time', and 'End Time'. The right panel displays a table for 'Plant 3 PX-3822' with columns for 'Batch No', 'Batch Identifier', 'Start Time', and 'End Time'. Both panels also show an 'Input' table with columns for 'S.No', 'Raw Materials', 'Formulation', 'Required kgs', and 'Actual kgs'.

Batch No	Golden	Batch StartTime	Batch EndTime	Cycle Time	Yield
3370070522	✓	06-Apr-25 00:51	31-Dec-99 23:51	0	0
3370070158		21-Mar-25 14:55	21-Mar-25 14:55	0	0
3370070038		18-Mar-25 11:27	18-Mar-25 22:19	10	0
3370072946		24-May-25 05:34	31-Dec-99 23:51	-5	0

Plant 3 PX-3822			
Batch No	Batch Identifier	Start Time	End Time
3370070158	PX-3822	21-03-2025 14:55:41	21-Mar-25 15:01

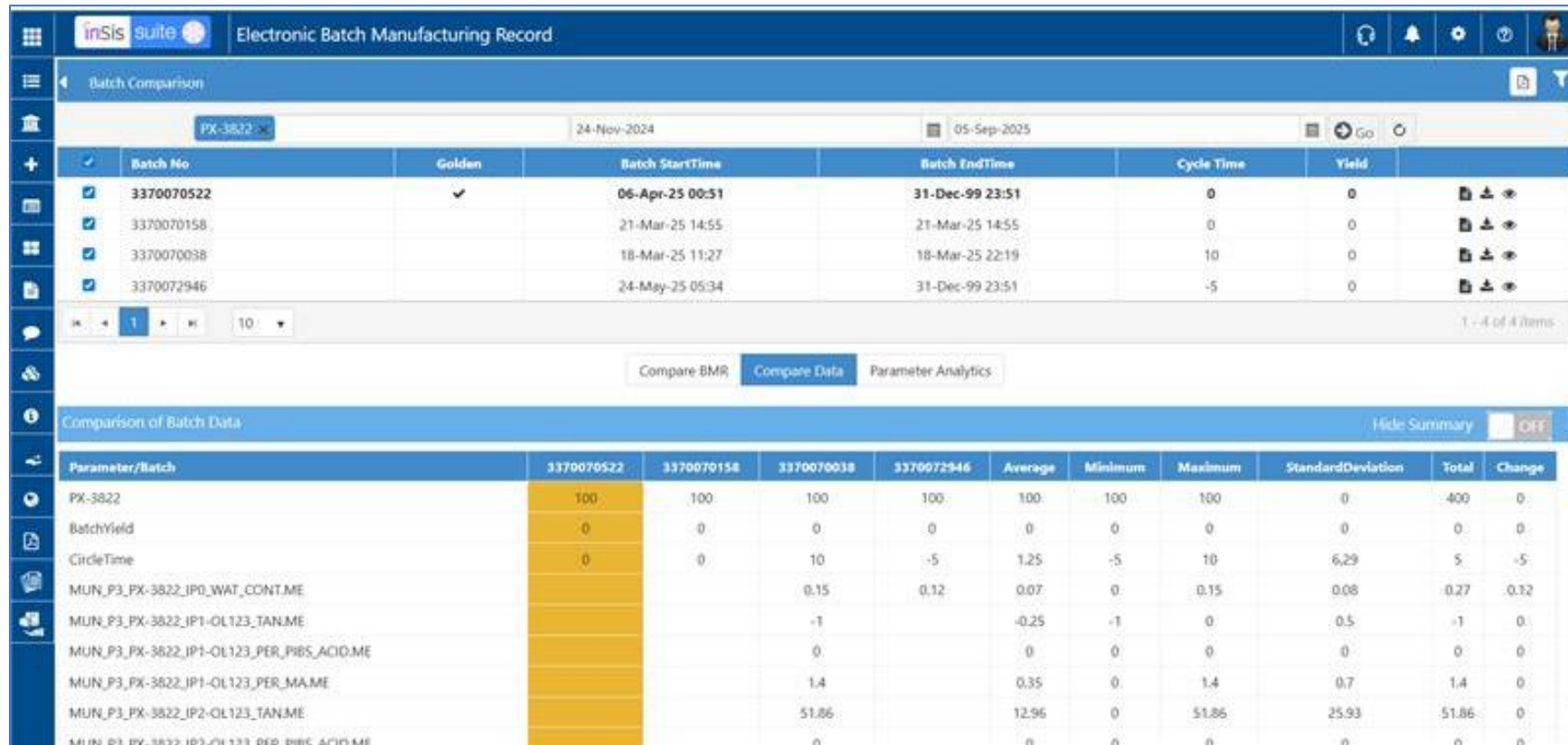
Plant 3 PX-3822				
Batch No	Batch Identifier	Start Time	End Time	
3370070038	PX-3822	18-03-2025 22:19:14	20-Mar-25 12:53	

S.No	Raw Materials	Formulation	Required kgs	Actual kgs
1	Polyisobutylene -High Reactive	0	16270.39839	0
2	Silicon Fluid M-60000	0	1.06808	0
3	Maleic Anhydride	0	1529.13263	0

S.No	Raw Materials	Formulation	Required kgs	Actual kgs
1	Maleic Anhydride	0	1525	0
2	PX-3822	0	17600	0
3	Polyisobutylene -High Reactive	0	16224.30661	0
4	Silicon Fluid M-60000	0	0	0

Batch Data Analytics - Batches Comparison

The **Batch Data Comparison** table provides a detailed parameter-wise analysis across multiple batches. It highlights values such as averages, minimums, maximums, standard deviation, totals, and changes, enabling users to assess process consistency and deviations. With side-by-side batch data visibility, it helps in identifying performance trends, monitoring yield and cycle times, and spotting variations in critical process parameters. This ensures better control, quick troubleshooting, and continuous process improvement.



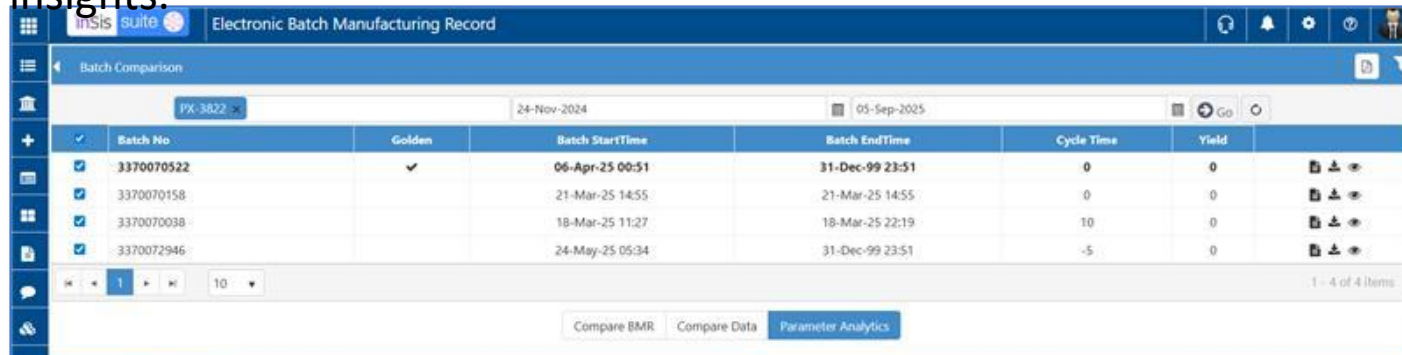
The screenshot displays the 'inSis suite' Electronic Batch Manufacturing Record (BMR) interface. The top section shows a 'Batch Comparison' view with filters for 'PX-3822' and dates '24-Nov-2024' to '05-Sep-2025'. Below this is a table listing four batches with their respective start/end times, cycle times, and yields. The bottom section, titled 'Comparison of Batch Data', provides a detailed parameter-wise analysis for the selected batches, including average, minimum, maximum, standard deviation, total, and change values for various parameters like PX-3822, BatchYield, CircleTime, and various MUN_P3 parameters.

Batch Mo	Golden	Batch StartTime	Batch EndTime	Cycle Time	Yield
3370070522	✓	06-Apr-25 00:51	31-Dec-99 23:51	0	0
3370070158		21-Mar-25 14:55	21-Mar-25 14:55	0	0
3370070038		18-Mar-25 11:27	18-Mar-25 22:19	10	0
3370072946		24-May-25 05:34	31-Dec-99 23:51	-5	0

Parameter/Batch	3370070522	3370070158	3370070038	3370072946	Average	Minimum	Maximum	StandardDeviation	Total	Change
PX-3822	100	100	100	100	100	100	100	0	400	0
BatchYield	0	0	0	0	0	0	0	0	0	0
CircleTime	0	0	10	-5	1.25	-5	10	6.29	5	-5
MUN_P3_PX-3822_IP0_WAT_CONT.ME			0.15	0.12	0.07	0	0.15	0.08	0.27	0.12
MUN_P3_PX-3822_IP1_OL123_TAN.ME			-1		-0.25	-1	0	0.5	-1	0
MUN_P3_PX-3822_IP1_OL123_PER_PHS_ACID.ME			0		0	0	0	0	0	0
MUN_P3_PX-3822_IP1_OL123_PER_MAME			1.4		0.35	0	1.4	0.7	1.4	0
MUN_P3_PX-3822_IP2_OL123_TAN.ME			51.86		12.96	0	51.86	25.93	51.86	0
MUN_P3_PX-3822_IP2_OL123_PER_PHS_ACID.ME			0		0	0	0	0	0	0

Batches Comparison – Parameter Analysis

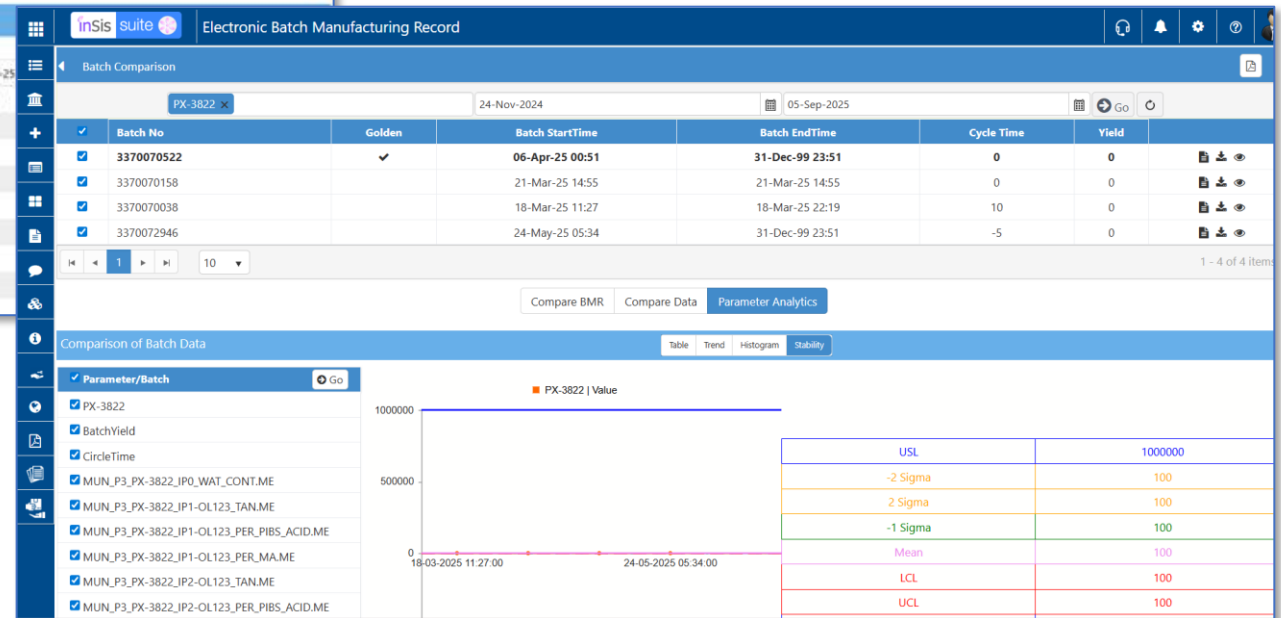
The **Parameter Analytics** feature in the Electronic Batch Manufacturing Record (EBMR) enables in-depth evaluation of batch parameters to identify trends, deviations, and stability. Users can analyze data in multiple formats including **table view, trend charts, histograms, and stability graphs**, providing both granular details and visual insights.



Batch No	Golden	Batch StartTime	Batch EndTime	Cycle Time	Yield
3370070522	✓	06-Apr-25 00:51	31-Dec-99 23:51	0	0
3370070158		21-Mar-25 14:55	21-Mar-25 14:55	0	0
3370070038		18-Mar-25 11:27	18-Mar-25 22:19	10	0
3370072946		24-May-25 05:34	31-Dec-99 23:51	-5	0

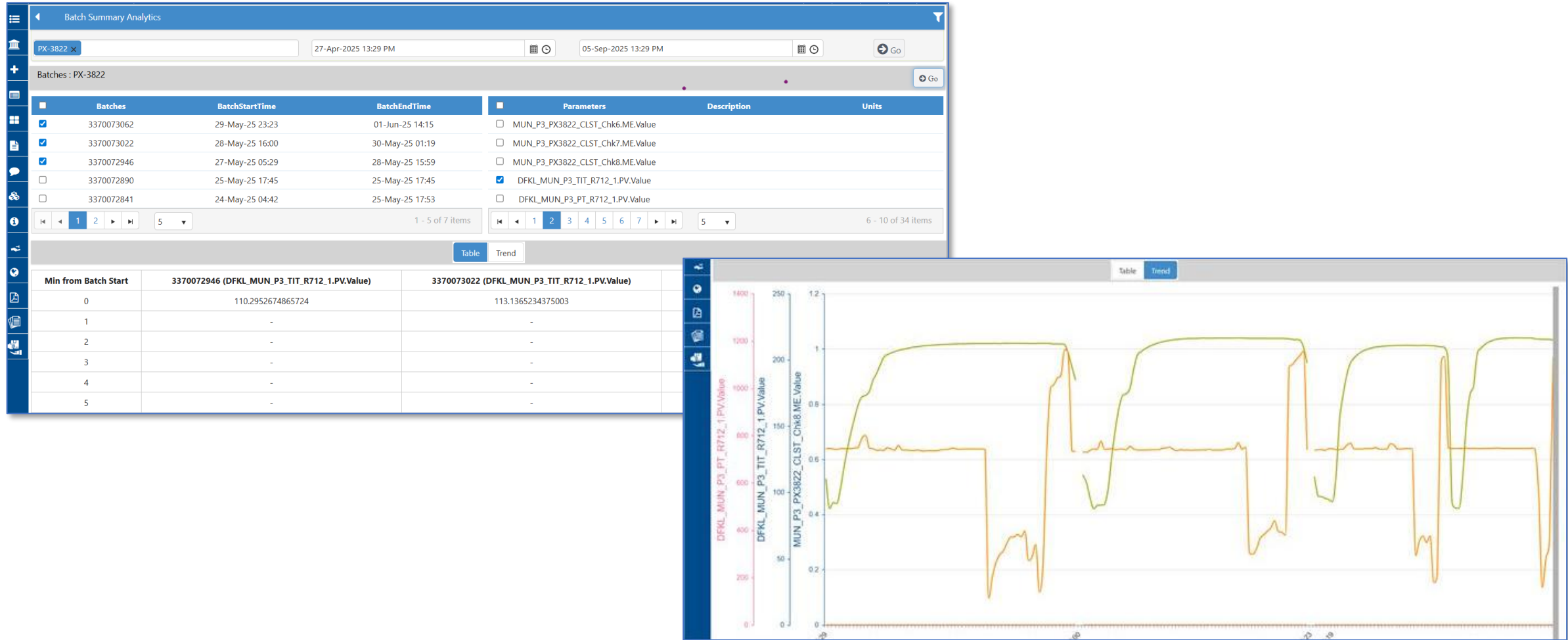


Parameter/Batch	Tags	18-Mar-25 11:27	21-Mar-25 14:55	06-Apr-25 00:51	24-May-25 05:34
PX-3822	PX-3822 Value	100.00	100.00	100.00	100.00
BatchYield	BatchYield Value	0.00	0.00	0.00	0.00
CircleTime	CircleTime Value	10.00	0.00	0.00	-5.00
MUN_P3_PX-3822_IP0_WAT_CONT.ME	MUN_P3_PX-3822_IP0_WAT_CONT Value				
MUN_P3_PX-3822_IP1-OL123_TAN.ME	MUN_P3_PX-3822_IP1-OL123_TAN Value				
MUN_P3_PX-3822_IP1-OL123_PER_PIBS_ACID.ME	MUN_P3_PX-3822_IP1-OL123_PER_PIBS_ACID Value				
MUN_P3_PX-3822_IP1-OL123_PER_MA.ME	MUN_P3_PX-3822_IP1-OL123_PER_MA Value				
MUN_P3_PX-3822_IP2-OL123_TAN.ME	MUN_P3_PX-3822_IP2-OL123_TAN Value				
MUN_P3_PX-3822_IP2-OL123_PER_PIBS_ACID.ME	MUN_P3_PX-3822_IP2-OL123_PER_PIBS_ACID Value				



Batch Analytics

Provides Batch parameter Patterns to analyze the Batch Performance in-depth.



Thank You

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