

# MES Production Confirmation - POC Demo Document

**Document Version:** 1.0 **Delivery Date:** 08-02-2026 **Prepared By:** Sumeet Gupta **Client:** BLUEMINGO TECH PRIVATE LIMITED

## Executive Summary

This POC delivers a functional MES application demonstrating:

Deliverable	Description	Status
<b>Core Production Engine</b>	Multi-level BOMs, Batch Parent-Child (Split/Merge)	Complete
<b>Execution UI</b>	4 screens: Login, Order Dashboard, Production Confirmation, Traceability	Complete
<b>Business Logic</b>	Consumption validation, scrap tracking, equipment/operator assignment	Complete
<b>Data Foundation</b>	Pre-seeded PostgreSQL database ready for demo	Complete

### Demo Access:

- URL: `http://localhost:4200`
- Email: `admin@mes.com`
- Password: `admin123`

## Screen 1: Login

**Route:** `/#/login`

**MES Production**

Sign in to your account

Email

Password

**Sign In**

Demo credentials: admin@mes.com / admin123

**MES Production**

Sign in to your account

Email

Password

**Sign In**

Demo credentials: admin@mes.com / admin123

## Login Flow

User enters credentials → System validates → JWT token issued → Redirect to Dashboard

## Actions

Action	Result
Enter valid credentials + Login	JWT token stored, redirect to Dashboard
Enter invalid credentials + Login	Error message displayed
Access protected page without token	Redirect to Login

## Screen 2: Order Dashboard

### Dashboard

Route: /#/dashboard

The screenshot displays the MES Production Order Dashboard with the following key sections:

- Header:** Shows the title "MES Production", navigation links for Dashboard, Orders, Manufacturing, Inventory, Quality, and Manage, and a user profile for "AU Admin User".
- Section 1: Inventory Flow** (blue background):
  - RM (Raw Materials): 18 available
  - WIP (Work in Progress): 6 available
  - IM (Intermediates): 8 available
  - FG (Finished Goods): 5 available
- Section 2: Operations Status** (grey background):
  - Partially confirmed: 1
  - Not started: 15
  - Ready: 7
  - In progress: 1
  - Confirmed: 33
  - On hold: 1
  - Blocked: 2
- Section 3: Needs Attention** (yellow background):
  - Active Holds: 8
  - Batches Pending Approval: 3
  - Blocked Inventory: 2
- Section 4: Currently Running** (light blue background):
  - PICKLING: In Progress (# Pickling)
- Section 5: Key Metrics** (white cards):
  - Orders: 15 (7 ready to start, 9 in progress)
  - Today's Production: 0 (0 confirmations today)
  - Inventory Items: 56 (37 available, 5 consumed)
  - Active Batches: 46 (5 created recently)
- Section 6: Analytics** (light grey cards):
  - Inventory Distribution
  - Order Status
  - Batch Status

## Dashboard Flow

Dashboard loads → Fetch statistics → Display metrics → Show quick actions

## Dashboard Actions

Action	Result
Click "Confirm Production"	Navigate to Production Confirmation
Click "View Orders"	Navigate to Orders list
Click "Batch Traceability"	Navigate to Batches list
Click inventory type (RM/IM/FG)	Navigate to Inventory filtered by type

## Orders List

Route: /#/orders

Order Number	Customer	Product	Quantity	Status	Order Date	Actions
ORD-2026-015	Nordic Steel Trading AB	Steel Billet 100mm	250	BLOCKED	Feb 5, 2026	<button>View</button> <button>Edit</button>
ORD-2026-014	Pacific Metal Works	Cold Rolled Sheet 1mm	90	CANCELLED	Feb 4, 2026	<button>View</button> <button>Edit</button>
ORD-2026-013	Global Manufacturing Ltd	Hot Rolled Coil 4mm	180	COMPLETED	Feb 3, 2026	<button>View</button> <button>Edit</button>
ORD-2026-012	ABC Steel Corporation	Reinforcement Bar 12mm	180	COMPLETED	Feb 2, 2026	<button>View</button> <button>Edit</button>
ORD-2026-011	Oceanic Metals Ltd	Cold Rolled Sheet 2mm	260	IN PROGRESS	Feb 1, 2026	<button>View</button> <button>Edit</button>
ORD-2026-010	African Mining Corp	Steel Billet 100mm	600	CREATED	Jan 31, 2026	<button>View</button> <button>Edit</button>
ORD-2026-009	South American Steel SA	Hot Rolled Coil 3mm	350	CREATED	Jan 30, 2026	<button>View</button> <button>Edit</button>
ORD-2026-008	Asian Electronics Inc	Hot Rolled Coil 2mm	60	ON HOLD	Jan 28, 2026	<button>View</button> <button>Edit</button>
ORD-2026-007	Middle East Metals FZE	Cold Rolled Sheet 1mm	120	CREATED	Jan 25, 2026	<button>View</button> <button>Edit</button>
ORD-2026-006	Nordic Steel Trading AB	Reinforcement Bar 10mm	450	CREATED	Jan 22, 2026	<button>View</button> <button>Edit</button>
ORD-2026-005	European Auto Parts GmbH	Hot Rolled Coil 2mm	75	COMPLETED	Jan 20, 2026	<button>View</button> <button>Edit</button>
ORD-2026-004	Pacific Metal Works	Hot Rolled Coil 2mm	230	CREATED	Jan 18, 2026	<button>View</button> <button>Edit</button>
ORD-2026-003	BuildRight Construction	Reinforcement Bar 10mm	300	IN PROGRESS	Jan 15, 2026	<button>View</button> <button>Edit</button>
ORD-2026-002	Global Manufacturing Ltd	Cold Rolled Sheet 1mm	120	IN PROGRESS	Jan 12, 2026	<button>View</button> <button>Edit</button>
ORD-2026-001	ABC Steel Corporation	Hot Rolled Coil 2mm	200	IN PROGRESS	Jan 10, 2026	<button>View</button> <button>Edit</button>

## Orders List Flow

Page loads → Fetch orders → Display in table → User can filter/search

## Orders List Actions

Action	Result
Select status filter	Table filtered by selected status
Enter search text	Table filtered by order number/customer
Click order row	Navigate to Order Detail
Click pagination	Load next/previous page

## Order Detail

Route: /#/orders/:id

The screenshot shows the 'MES Production' application interface. At the top, there's a navigation bar with links for Dashboard, Orders (selected), Manufacturing, Inventory, Quality, and Manage. A user profile 'AU Admin User' is also visible.

The main content area displays Order #1, identified by the ID 'ORD-2026-001' and the customer 'ABC Steel Corporation'. The status is marked as 'IN PROGRESS'.

The 'Order Summary' section provides key details:
 

- Order Date: Jan 10, 2026
- Line Items: 2
- Total Operations: 8
- Progress: 5/8 operations completed (63%)

A progress bar at the bottom of this section indicates the completion status across different operation types: 5 Completed, 0 In Progress, 1 Ready, and 2 Pending.

The 'Process Flow Visualization' section shows a flowchart of the production steps:
 

```

graph LR
    Start([Start Hot Rolled Coil Production]) --> ScrapCharging[Scrap Charging CONFIRMED]
    ScrapCharging --> EAFMetting[EAF Metting CONFIRMED]
    EAFMetting --> LadleRefining[Ladle Refining CONFIRMED]
    LadleRefining --> SlabCasting[Slab Casting CONFIRMED]
    SlabCasting --> SlabReheating[Slab Reheating CONFIRMED]
    SlabReheating --> RoughRolling[Rough Rolling READY]
    RoughRolling --> FinishRolling[Finish Rolling NOT_STARTED]
    FinishRolling --> Cooling[Cooling & Coiling NOT_STARTED]
    Cooling --> End([End])
    
```

The 'Line Items' section lists the specific item: 'Hot Rolled Coil 2mm' with SKU 'HR-COIL-2MM'.

## Order Detail Flow

Page loads → Fetch order with line items → Fetch operations → Display process flow chart → Start production

## Order Detail Actions

Action	Result
Click "Start Production" on READY operation	Navigate to Production Confirmation for that operation
Click line item	Expand/collapse operations
Click operation	View operation details
Click "Back"	Return to Orders list

## Operation Status Logic

Current Status	Can Confirm?	Next Status After Confirm
NOT_STARTED	No	-
READY	Yes	IN_PROGRESS or CONFIRMED
IN_PROGRESS	Yes	CONFIRMED (if complete)
CONFIRMED	No	-
ON_HOLD	No	-

## Status Transition Flow

Order created:

- └ All operations → NOT\_STARTED
- └ First operation → READY

After confirming operation:

- └ Current operation → CONFIRMED (if complete) or IN\_PROGRESS (if partial)
- └ Next operation → READY (if previous confirmed)

All operations confirmed:

- └ Order status → COMPLETED

# Screen 3: Production Confirmation

**Route:** /#/production/confirm or /#/production/confirm/:operationId

## Empty Form

The screenshot shows the MES Production Dashboard with the following key sections and data points:

- Inventory Flow:** A horizontal flowchart showing the progression from Raw Materials (RM) to Work in Progress (WIP), then to Intermediates (IM), and finally to Finished Goods (FG).
  - RM: 18 available
  - WIP: 6 available
  - IM: 8 available
  - FG: 5 available
- Operations Status:** A grid of status boxes.
 

1 Partially_confirmed	15 Not_started	7 Ready	1 In_progress	33 Confirmed	1 On_hold	2 Blocked
-----------------------	----------------	---------	---------------	--------------	-----------	-----------
- Needs Attention:** A section showing pending actions.
  - 8 Active Holds
  - 3 Batches Pending Approval
  - 2 Blocked Inventory
- Currently Running:** A section showing active processes.
  - PICKLING: # Pickling (In Progress)
- Key Metrics:** A row of summary metrics.
 

Orders: 15 (7 ready to start, 9 in progress)	Today's Production: 0 (0 confirmations today)	Inventory Items: 56 (37 available, 5 consumed)	Active Batches: 46 (5 created recently)
--	---	--	---
- Analytics:** A section with three tabs: Inventory Distribution, Order Status, and Batch Status.

## With Operation Selected

**Operation Details**

OPERATION Rough Rolling (ROLL-RGH)	TYPE ROLLING	STATUS READY
PRODUCT Hot Rolled Coil 2mm (HR-COIL-2MM)	ORDER QUANTITY 150	STAGE Hot Rolled Coil Production

**Production Time**

Start Time * 08-02-2026 23:28	End Time * 08-02-2026 23:28
----------------------------------	--------------------------------

End time must be after start time

**Production Quantities**

Quantity Produced * 150	Quantity Scrapped 0
----------------------------	------------------------

Total Production: 150 Yield: 100%

Good (>=95%) Warning (80-95%) Critical (<80%)

**Material Consumption**

BOM Suggested Consumption

Target Quantity: 150 T Total Required: 791.1825 T

Apply Suggestions

Material	Required Qty	Available	Yield Ratio	Stock Status
Finished HR Coil 2mm (FG-HR-2MM)	147 T	195 T	0.98	Sufficient

## Production Confirmation Flow

### PRODUCTION CONFIRMATION FLOW

1. SELECT ORDER & OPERATION
  - └ Only orders with READY operations shown
  - └ Only READY operations available for selection
2. VIEW OPERATION DETAILS
  - └ Process name, operation type, target quantity
3. SELECT INPUT MATERIALS
  - └ Available batches shown (status = AVAILABLE)
  - └ Enter quantity to consume from each batch
  - └ Validation: qty ≤ available qty
4. ENTER PRODUCTION TIMES
  - └ Start time, End time
  - └ Validation: end time ≥ start time
5. ENTER QUANTITIES
  - └ Produced quantity (good output)
  - └ Scrap quantity (waste)
6. SELECT EQUIPMENT & OPERATORS
  - └ Equipment dropdown (only AVAILABLE equipment)
  - └ Operators dropdown (only ACTIVE operators)
7. ENTER PROCESS PARAMETERS
  - └ Dynamic fields based on operation type
  - └ Validation: values within min/max limits
8. CLICK CONFIRM
  - └ Validation passes → Execute confirmation
  - └ Validation fails → Show errors

## Form Sections

### 1. Material Consumption

[Home](#) > [Production](#) > [Confirm](#)

### Material Consumption

BOM Suggested Consumption

Material	Required Qty	Available	Yield Ratio	Stock Status
Finished HR Coil 2mm (FG-HR-2MM)	147 T	195 T	0.98	Sufficient
Hot Rolled Strip (IM-HR-ROUGH)	149.625 T	95 T	0.95	Insufficient
Surface Coating Oil (RM-COATING)	3 L	2000 L	1	Sufficient
Steel Slab 200mm (IM-SLAB)	156.24 T	155 T	0.93	Insufficient
Rolling Lubricant (RM-ROLL-LUB)	1.5 L	3000 L	1	Sufficient
Liquid Steel (IM-LIQUID)	155.76 T	100 T	0.88	Insufficient
Mold Powder (RM-MOLD-PWD)	0.75 KG	1000 KG	1	Sufficient
Steel Scrap Grade A (RM-SCRAP-A)	99.75 T	1130 T	0.95	Sufficient
Steel Scrap Grade B (RM-SCRAP-B)	27.6 T	320 T	0.92	Sufficient
Iron Ore Pellets (RM-IRON-ORE)	21.825 T	400 T	0.97	Sufficient
Limestone (RM-LIMESTONE)	12 T	150 T	1	Sufficient
Ferroalloy FeSi (RM-FESI)	0.75 KG	2000 KG	1	Sufficient
Coal / Coke (RM-COAL)	15 T	300 T	1	Sufficient

[Apply Suggestions](#)

## 2. Process Parameters

[Home](#) > [Production](#) > [Confirm](#)

### Process Parameters

Entry Temperature \*<sup>(°C)</sup> [100 - 1280]  
1200

Finish Temperature \*<sup>(°C)</sup> [850 - 950]  
900

Coiling Temperature \*<sup>(°C)</sup> [550 - 700]  
620

Thickness \*<sup>(mm)</sup> [1.5 - 3]  
2

Speed \*<sup>(m/s)</sup> [5 - 15]  
10

### Notes

Add any notes about this production confirmation...

## 3. Equipment & Operators

[Home](#) > [Production](#) > [Confirm](#)

### Equipment & Operator

Equipment \* (0 selected)

- (EAF-001)
- (LF-001)
- (LF-002)
- (CCM-001)
- (HSM-001)

Operator \* (0 selected)

- (OP-001)
- (OP-002)
- (OP-003)
- (OP-004)
- (OP-005)

### Delay Tracking

Delay Duration (minutes)  
0

Delay Reason  
- Select Reason -

## 4. Output

**Production Time**

Start Time *	End Time *
08-02-2026 23:28	08-02-2026 23:28

End time must be after start time

**Production Quantities**

Quantity Produced *	Quantity Scrapped
150	0

Total Production: 150   Yield: **100%**

(● Good (>=95%)   ● Warning (80-95%)   ● Critical (<80%)

## 5. Confirm Button

**MES Production**

Dashboard   Orders   Manufacturing   Inventory   Quality   Manage   AU Admin User

[Back to Order](#)   **Production Confirmation**   [Apply Hold](#)

**Operation Details**

OPERATION	TYPE	STATUS
Rough Rolling (ROLL-RGH)	ROLLING	READY
PRODUCT	ORDER QUANTITY	STAGE
Hot Rolled Coil 2mm (HR-COIL-2MM)	150	Hot Rolled Coil Production

**Production Time**

Start Time *	End Time *
08-02-2026 23:28	08-02-2026 23:28

End time must be after start time

**Production Quantities**

Quantity Produced *	Quantity Scrapped
150	0

Total Production: 150   Yield: **100%**

(● Good (>=95%)   ● Warning (80-95%)   ● Critical (<80%)

**Material Consumption**

BOM Suggested Consumption					<a href="#">Apply Suggestions</a>
Target Quantity: 150 T   Total Required: 791.1825 T					
Material	Required Qty	Available	Yield Ratio	Stock Status	
Finished HR Coil 2mm (FG-HR-2MM)	147 T	195 T	0.98	Sufficient	

## On Confirmation - System Actions

### SYSTEM ACTIONS ON CONFIRMATION

1. VALIDATE ALL INPUTS
  - └ Check required fields
  - └ Check quantity validations
  - └ Check parameter limits
2. CREATE PRODUCTION CONFIRMATION RECORD
  - └ Store all entered data
  - └ Link to operation, equipment, operators
  - └ Record process parameters
3. CONSUME INPUT MATERIALS
  - └ For each selected batch:
    - └ Create ConsumedMaterial record
    - └ Update inventory state → CONSUMED
    - └ Record consumed quantity
4. CREATE OUTPUT BATCH
  - └ Generate batch number
  - └ Status = QUALITY\_PENDING
  - └ Create BatchRelation (parent → child genealogy)
5. CREATE OUTPUT INVENTORY
  - └ State = PRODUCED
  - └ Link to output batch
6. UPDATE OPERATION STATUS
  - └ If produced qty = target qty → CONFIRMED
  - └ If produced qty < target qty → IN\_PROGRESS (partial)
7. ADVANCE NEXT OPERATION
  - └ If operation CONFIRMED and has next:
    - └ Next operation → READY
8. UPDATE ORDER STATUS
  - └ If all operations CONFIRMED → Order status = COMPLETED
9. LOG AUDIT TRAIL
  - └ Record all changes with timestamps
  - └ User attribution

## Validation Rules

Field	Validation	Error Message
Order	Required	Please select an order
Operation	Required	Please select an operation
Start Time	Required	Start time is required
End Time	Required, $\geq$ Start Time	End time must be after start time
Produced Qty	Required, $> 0$	Produced quantity must be greater than 0
Scrap Qty	$\geq 0$	Scrap quantity cannot be negative
Material Qty	$\leq$ Available	Cannot consume more than available
Parameters	Within min/max	Value must be between X and Y

## Multi-Level BOM Logic

Example: Producing HR Coil

STEP 1: MELTING (consumes raw materials)

Input: B-RM-SCRAP-001 (Steel Scrap)  
B-RM-ORE-001 (Iron Ore)  
Output: B-WIP-LS-001 (Liquid Steel)

STEP 2: CASTING (consumes WIP from previous step)

Input: B-WIP-LS-001 (Liquid Steel)  
Output: B-IM-SLAB-001 (Steel Slab)

STEP 3: ROLLING (consumes IM from previous step)

Input: B-IM-SLAB-001 (Steel Slab)  
Output: B-FG-COIL-001 (HR Coil)

Each step creates genealogy links:

B-RM-SCRAP-001  
B-RM-ORE-001 → B-WIP-LS-001 → B-IM-SLAB-001 → B-FG-COIL-001

# Screen 4: Traceability View

Route: /#/batches

## Batch List

Batch Number	Material ID	Quantity	UoM	Status	Created	Actions
B-IM-011	IM-PICKLED	85	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-IM-012	IM-CR-STRIP	80	T	PRODUCED		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-IM-013	IM-ANNEALED	75	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-IM-018	IM-BILLET	60	T	QUALITY PENDING		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-IM-015	IM-LIQUID	130	T	PRODUCED		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-IM-016	IM-SLAB	125	T	PRODUCED		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-FG-001	FG-HR-2MM	75	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-FG-002	FG-CR-1MM	70	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-FG-003	FG-REBAR-10	180	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-FG-004	FG-HR-2MM	120	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-FG-005	FG-REBAR-10	175	T	PRODUCED		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-FG-006	FG-CR-1MM	55	T	PRODUCED		<button>View</button> <button>Approve</button> <button>Reject</button> <button>Edit</button> <button>Delete</button>
B-RM-019	RM-SCRAP-A	100	T	BLOCKED		<button>View</button> <button>Edit</button> <button>Delete</button>
B-IM-017	IM-SLAB	45	T	BLOCKED		<button>View</button> <button>Edit</button> <button>Delete</button>
B-FG-008	FG-REBAR-10	150	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>
B-WIP-001	WIP-MELT	85	T	AVAILABLE		<button>View</button> <button>Edit</button> <button>Delete</button>

## Batch List Flow

Page loads → Fetch batches → Display in table → User can filter by status

## Batch List Actions

Action	Result
Select status filter	Table filtered by batch status
Enter search text	Table filtered by batch number/material
Click batch row	Navigate to Batch Detail
Click "Approve" (if QUALITY_PENDING)	Batch status → AVAILABLE
Click "Reject" (if QUALITY_PENDING)	Batch status → BLOCKED

## Batch Detail with Genealogy

Route: /#/batches/:id

MES Production

Batches > Batch #1

← Back to Batches

**Batch Information**

BATCH NUMBER: B-RM-001  
MATERIAL ID: RM-SCRAP-A  
STATUS: AVAILABLE  
CREATED  
QUANTITY: 500 T

**Batch Genealogy (Traceability)**

**Visual Genealogy**

```

graph TD
    B_RM_001[B-RM-001  
RM-SCRAP-A  
Qty: 500 T] --> B_RM_001_1[B-RM-001  
Qty: 165 T]
    B_RM_001 --> B_RM_002[B-RM-002  
Qty: 85 T]
    B_RM_001 --> B_RM_003[B-RM-003  
Qty: 90 T]
  
```

B-RM-001  
Material: RM-SCRAP-A  
Quantity: 500 T

Derived Products / Child Batches

MES Production

Dashboard Orders Manufacturing Inventory Quality Manage AU Admin User

Batches Batch #10

[← Back to Batches](#)

### Batch Information

BATCH NUMBER	MATERIAL ID	QUANTITY
<b>B-RM-001</b>	RM-SCRAP-A	500 T
STATUS	CREATED	
AVAILABLE		

[Split Batch](#) [Merge Batches](#)

### Batch Genealogy (Traceability)

#### Visual Genealogy

```

graph TD
    Root[B-RM-001  
RM-SCRAP-A  
Qty: 500 T] --> Child1[B-IM-001  
Qty: 165 T]
    Root --> Child2[B-IM-002  
Qty: 65 T]
    Root --> Child3[B-IM-003  
Qty: 90 T]
  
```

[Derived Products \(Child Batches\)](#)

## Batch Detail Flow

Page loads → Fetch batch → Fetch genealogy (parents + children) → Display batch info and gene

## Genealogy Logic



## Batch Actions

Action	Available When	Result
Approve	Status = QUALITY_PENDING	Status → AVAILABLE
Reject	Status = QUALITY_PENDING	Status → BLOCKED
Split	Status = AVAILABLE	Creates child batches, original quantity reduced
Click parent batch	Has parents	Navigate to parent batch
Click child batch	Has children	Navigate to child batch

## Split Operation Flow

BEFORE SPLIT:

B-IM-SLAB-001 (Quantity: 100T, Status: AVAILABLE)

SPLIT ACTION:

Split into: 60T, 40T

AFTER SPLIT:

B-IM-SLAB-001 (Quantity: 0T, Status: SPLIT)

  ↳ B-IM-SLAB-001-A (Quantity: 60T, Status: AVAILABLE)  
  ↳ B-IM-SLAB-001-B (Quantity: 40T, Status: AVAILABLE)

Genealogy: B-IM-SLAB-001 is PARENT of both child batches

## Merge Operation Flow

BEFORE MERGE:

B-IM-SLAB-001 (Quantity: 30T, Status: AVAILABLE)

B-IM-SLAB-002 (Quantity: 40T, Status: AVAILABLE)

B-IM-SLAB-003 (Quantity: 30T, Status: AVAILABLE)

MERGE ACTION:

Merge all three batches

AFTER MERGE:

B-IM-SLAB-001 (Status: MERGED)

B-IM-SLAB-002 (Status: MERGED)

B-IM-SLAB-003 (Status: MERGED)

  ↳ B-IM-SLAB-MERGED-001 (Quantity: 100T, Status: AVAILABLE)

Genealogy: All three original batches are PARENTS of merged batch

## Batch Status Flow

NEW BATCH CREATED:

- └ From Production Confirmation → QUALITY\_PENDING
- └ From Material Receipt → QUALITY\_PENDING

QUALITY DECISION:

- └ Approve → AVAILABLE
- └ Reject → BLOCKED

AVAILABLE BATCH:

- └ Used in production → CONSUMED
- └ Split → SPLIT (original), children = AVAILABLE
- └ Put on hold → ON\_HOLD

ON\_HOLD BATCH:

- └ Release hold → AVAILABLE

BLOCKED BATCH:

- └ Scrap decision → SCRAPPED

## Demo Scenarios

### Scenario 1: Complete Production Confirmation

1. Login as [admin@mes.com](mailto:admin@mes.com)
2. Go to Orders list
3. Click on order ORD-2026-001 (IN\_PROGRESS)
4. Find READY operation, click "Start Production"
5. Select input materials, enter quantities
6. Enter start/end times
7. Enter produced quantity, scrap quantity
8. Select equipment and operators
9. Enter process parameters
10. Click "Confirm Production"
11. **Verify:**

- Success message with new batch number
- Operation status → CONFIRMED

- Next operation → READY
- Navigate to batch, verify genealogy shows parent batches

## Scenario 2: Batch Traceability

1. Go to Batches list
  2. Click on a batch (e.g., B-FG-COIL-001)
  3. View genealogy section
  4. **Backward trace:** Click parent batches to see inputs
  5. **Forward trace:** Click child batches to see outputs
  6. Navigate complete chain: FG → IM → WIP → RM
- 

## Technical Summary

---

### Technology Stack:

- Frontend: Angular 17
- Backend: Spring Boot 3.2
- Database: PostgreSQL 14+
- Authentication: JWT

### Demo Data:

Entity	Count
Orders	8
Products	6
Materials	24
Equipment	12
Operators	8
Batches	27

---

*End of Document*