MES Production Confirmation POC - Demo Data Reference

This document provides a complete reference of all seed/demo data in the MES Production Confirmation POC application. It is intended for portal users who do not have direct database access and need to understand what data is available, how entities relate to one another, and what scenarios are pre-configured for demonstration purposes.

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1. Overview

The demo data represents a realistic steel manufacturing environment with complete production workflows spanning melting, casting, rolling, pickling, annealing, and finishing operations. The data covers:

- **12 customers** across 9 countries (11 active, 1 inactive)
- **7 products** spanning hot rolled coils, cold rolled sheets, rebar, and billets
- **31 materials** organized by type: raw materials (15), intermediates (9), and finished goods (7)
- **6 production processes** with 4 active routings containing 22 routing steps
- **8 hierarchical BOM trees** (88 total BOM nodes) covering all products
- **16 equipment items** across 11 categories (melting, refining, casting, rolling, etc.)
- **12 operators** across 6 departments on shifts A and B
- **45 orders** (15 original + 30 additional with multi-stage production)
- **82 order line items** with full operation chains
- **70 batches** across all material types and statuses
- **70 inventory records** across all states
- **4 batch number configuration rules**
- Hold records and production confirmations are not pre-loaded (created during demo sessions)

All demo data is timestamped in January-February 2026 and reflects various stages of production: orders that are completed, in-progress, on hold, blocked, and cancelled.

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2. User Accounts

The application ships with a single administrator account for demonstration purposes.

Field	Value
Email	`admin@mes.com`
Password	`admin123`
Name	Admin User
Employee ID	EMP-001
Status	ACTIVE
Role	System Administrator

This account has full access to all modules: Dashboard, Orders, Production, Inventory, Batches, Holds, Equipment, Quality, and all Admin/Manage pages.

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3. Customers

There are 12 customers in the system. Eleven are active and available for order creation; one (CUST-012) has been deactivated.

ID	Code	Name	Contact Person	Email	Phone	City	Country	Status
1	CUST-001	ABC Steel Corporation	John Smith	john.smith@abcsteel.com	+1-555-0101	Pittsburgh	USA	ACTIVE
2	CUST-002	Global Manufacturing Inc	Sarah Johnson	sarah@globalmfg.com	+1-555-0102	Detroit	USA	ACTIVE
3	CUST-003	Pacific Metal Works	Michael Chen	m.chen@pacificmetal.com	+1-555-0103	Seattle	USA	ACTIVE
4	CUST-004	European Auto Parts GmbH	Hans Mueller	h.mueller@euroauto.de	+49-555-0104	Munich	Germany	ACTIVE
5	CUST-005	Asian Electronics Ltd	Yuki Tanaka	y.tanaka@asianelec.jp	+81-555-0105	Tokyo	Japan	ACTIVE
6	CUST-006	BuildRight Construction	Robert Brown	r.brown@buildright.com	+1-555-0106	Chicago	USA	ACTIVE
7	CUST-007	Nordic Steel AS	Erik Larsson	e.larsson@nordicsteel.no	+47-555-0107	Oslo	Norway	ACTIVE
8	CUST-008	Middle East Metals LLC	Ahmed Hassan	a.hassan@memetals.ae	+971-555-0108	Dubai	UAE	ACTIVE
9	CUST-009	South American Mining Co	Carlos Rodriguez	c.rodriguez@samining.br	+55-555-0109	São Paulo	Brazil	ACTIVE
10	CUST-010	Indian Steel Works Pvt	Rajesh Sharma	r.sharma@indiansteel.in	+91-555-0110	Mumbai	India	ACTIVE
11	CUST-011	Oceanic Metals Ltd	Bruce Wilson	bruce@oceanicmetals.au	+61-2-55520	Sydney	Australia	ACTIVE
12	CUST-012	Canadian Steel Works	Pierre Dubois	pierre@cansteelworks.ca	+1-514-5553	Montreal	Canada	**INACTIVE**

Customer Distribution by Country

Country	Count	Customer Codes
USA	4	CUST-001, CUST-002, CUST-003, CUST-006
Germany	1	CUST-004
Japan	1	CUST-005
Norway	1	CUST-007
UAE	1	CUST-008
Brazil	1	CUST-009
India	1	CUST-010
Australia	1	CUST-011
Canada	1	CUST-012 (inactive)

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4. Products

Seven products are configured in the system, spanning three product categories. All products are ACTIVE.

SKU	Product Name	Category	Unit	Price (USD)	Status
PROD-HR-COIL-2MM	Hot Rolled Coil 2.0mm	Flat Products	T	750.00	ACTIVE
PROD-HR-COIL-3MM	Hot Rolled Coil 3.0mm	Flat Products	T	740.00	ACTIVE
PROD-CR-SHEET-1MM	Cold Rolled Sheet 1.0mm	Flat Products	T	850.00	ACTIVE
PROD-CR-SHEET-2MM	Cold Rolled Sheet 2.0mm	Flat Products	T	830.00	ACTIVE
PROD-REBAR-10	Rebar 10mm Grade 60	Long Products	T	650.00	ACTIVE
PROD-REBAR-16	Rebar 16mm Grade 60	Long Products	T	640.00	ACTIVE
PROD-BILLET-100	Steel Billet 100mm	Semi-Finished	T	600.00	ACTIVE

Product-to-Process Mapping

Each product is manufactured through a specific production process. The SKUs below are the simplified codes used in order line items:

Product SKU (Order Ref)	Process	Operations Count	Description
HR-COIL-2MM	Process 1: Hot Rolled Coil Production	8	Charge, Melt, Refine, Slab Cast, Reheat, Rough Roll, Finish Roll, Cool/Coil
HR-COIL-3MM	Process 1: Hot Rolled Coil Production	8	Same as HR-COIL-2MM
HR-COIL-4MM	Process 1: Hot Rolled Coil Production	8	Same as HR-COIL-2MM
CR-SHEET-1MM	Process 2: Cold Rolled Sheet Production	3	Pickling, Cold Rolling, Batch Annealing
CR-SHEET-2MM	Process 2: Cold Rolled Sheet Production	3	Same as CR-SHEET-1MM

REBAR-10MM	Process 3: Rebar Production	7	Charge, Melt, Refine, Billet Cast, Reheat, Bar Roll, Quench/Temper
REBAR-12MM	Process 3: Rebar Production	7	Same as REBAR-10MM
STEEL-BILLET-100	Process 4: Billet Production	4	Charge, Melt, Refine, Billet Cast

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5. Materials

There are 31 materials organized into three types reflecting the steel production value chain.

5.1 Raw Materials (RM) - 15 materials

These are purchased inputs consumed during production.

Code	Name	Description	Unit	Std. Cost (USD)	Min Stock	Reorder Point
RM-SCRAP-A	Steel Scrap Grade A	High quality steel scrap for EAF	T	350.00	100	200
RM-SCRAP-B	Steel Scrap Grade B	Standard steel scrap for EAF	T	280.00	150	300
RM-SCRAP-C	Steel Scrap Grade C	Shredded steel scrap	T	150.00	30	60
RM-IRON-ORE	Iron Ore Pellets	Iron ore pellets 65% Fe	T	150.00	500	1,000
RM-LIMESTONE	Limestone	Limestone for flux	T	45.00	200	400
RM-FESI	Ferrosilicon 75%	Ferrosilicon alloy 75%	KG	1.80	5,000	10,000
RM-FEMN	Ferromanganese HC	High carbon ferromanganese	KG	1.50	5,000	10,000
RM-FEV	Ferrovanadium 80%	Ferrovanadium for high-strength steel	KG	25.00	100	200
RM-COAL	Anthracite Coal	Anthracite coal for carburizing	T	200.00	100	200
RM-GRAPHITE	Graphite Electrodes	Graphite electrodes for EAF	PC	2,500.00	10	20
RM-ALWIRE	Aluminum Wire	Aluminum wire for deoxidation	KG	2.50	2,000	4,000
RM-MOLD-POWDER	Mold Powder	Casting mold powder	KG	1.20	3,000	6,000
RM-LUBRICANT	Rolling Lubricant	Rolling mill lubricant	L	3.50	2,000	4,000
RM-HCL	Hydrochloric Acid	HCl for pickling	L	0.50	5,000	10,000
RM-COATING	Coating Oil	Anti-rust coating oil	L	4.00	1,000	2,000

5.2 Intermediate Materials (IM) - 9 materials

These are produced and consumed within the production chain, not sold to customers.

Code	Name	Description	Unit	Std. Cost (USD)
IM-LIQUID-STEEL	Liquid Steel	Molten steel from EAF	T	500.00
IM-SLAB-CS	Carbon Steel Slab	Carbon steel slab 200mm	T	550.00
IM-BILLET	Steel Billet 100mm	Steel billet 100x100mm	T	520.00
IM-HR-COIL	Hot Rolled Coil	Hot rolled coil 3-6mm	T	620.00

IM-PICKLED	Pickled Strip	Pickled and oiled strip	T	650.00
IM-CR-STRIP	Cold Rolled Strip	Cold rolled strip 0.5-2mm	T	700.00
IM-ANNEALED	Annealed Strip	Batch annealed strip	T	720.00
IM-WIRE-ROD	Wire Rod	Wire rod 5.5-12mm	T	580.00
IM-BAR	Rolled Bar	Rolled bar 10-40mm	T	560.00

5.3 Work In Progress (WIP) - Not in Materials Master

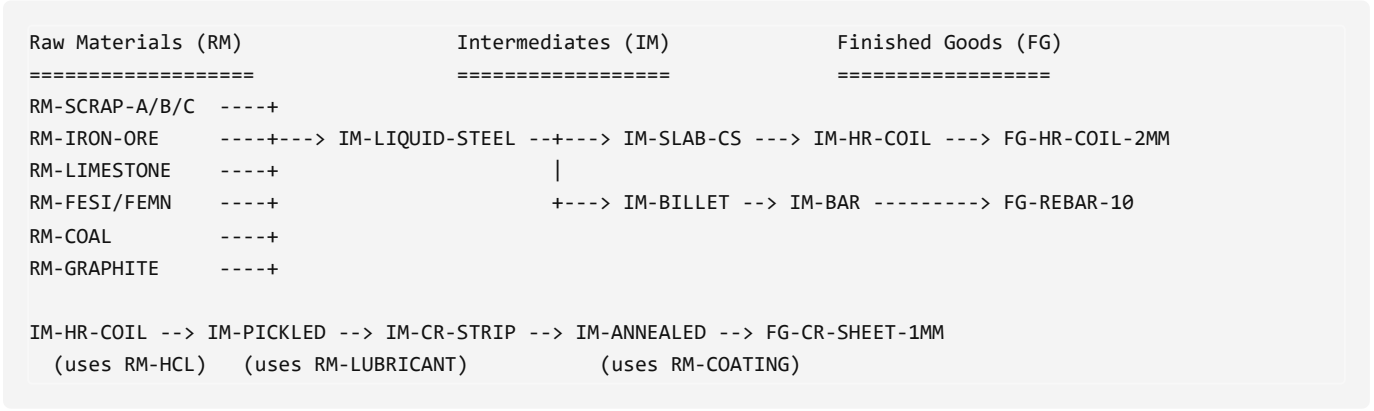
There are no WIP materials defined in the materials master data table. However, WIP material codes (WIP-MELT, WIP-CAST, WIP-ROLL, WIP-PICKLE) are used in batch and inventory records to represent material actively being processed on equipment. These codes exist only as references in operational data, not as entries in the materials table.

5.4 Finished Goods (FG) - 7 materials

These correspond to the final products shipped to customers.

Code	Name	Description	Unit	Std. Cost (USD)
FG-HR-COIL-2MM	HR Coil 2.0mm	Hot rolled coil 2.0mm finished	T	680.00
FG-HR-COIL-3MM	HR Coil 3.0mm	Hot rolled coil 3.0mm finished	T	670.00
FG-CR-SHEET-1MM	CR Sheet 1.0mm	Cold rolled sheet 1.0mm	T	780.00
FG-CR-SHEET-2MM	CR Sheet 2.0mm	Cold rolled sheet 2.0mm	T	760.00
FG-REBAR-10	Rebar 10mm	Reinforcing bar 10mm	T	590.00
FG-REBAR-16	Rebar 16mm	Reinforcing bar 16mm	T	585.00
FG-BILLET-100	Steel Billet 100mm	Finished steel billet 100x100mm	T	560.00

Material Flow Diagram



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6. Processes, Routing, and Operations

6.1 Processes

Six production processes are defined. Four are active with routing configurations; one is in draft and one is inactive.

ID	Process Name	Status	Has Routing	Description

1	Hot Rolled Coil Production	**ACTIVE**	Yes	Full steelmaking + hot rolling (8 operations)
2	Cold Rolled Sheet Production	**ACTIVE**	Yes	Downstream cold processing (3 operations)
3	Rebar Production	**ACTIVE**	Yes	Full steelmaking + bar rolling (7 operations)
4	Billet Production	**ACTIVE**	Yes	Steelmaking + billet casting (4 operations)
5	Wire Rod Production	**DRAFT**	No	Future capability, not yet configured
6	Galvanized Sheet Production	**INACTIVE**	No	Deactivated process

6.2 Routing and Steps

Each active process has one sequential routing. Routing steps link to operation templates and define which steps produce output batches.

Process 1: HR Coil Standard Route (8 steps)

Seq	Operation	Code	Type	Produces Batch	Equipment Type
1	Scrap Charging	MELT-CHRG	FURNACE	No	EAF
2	EAF Melting	MELT-EAF	FURNACE	No	EAF
3	Ladle Refining	MELT-LF	FURNACE	Yes (Liquid Steel)	LF
4	Slab Casting	CAST-SLAB	CASTER	Yes (Steel Slab)	CCM
5	Slab Reheating	ROLL-RHT	FURNACE	No	RHF
6	Rough Rolling	ROLL-RGH	ROLLING	No	HSM
7	Finish Rolling	ROLL-FIN	ROLLING	No	HSM
8	Cooling & Coiling	ROLL-COOL	COOLING	Yes (HR Coil)	HSM

Process 2: CR Sheet Standard Route (3 steps)

Seq	Operation	Code	Type	Produces Batch	Equipment Type
1	Pickling	PKL	PICKLING	Yes (Pickled Strip)	PKL
2	Cold Rolling	CRM	ROLLING	Yes (CR Strip)	CRM
3	Batch Annealing	ANN	HEAT_TREATMENT	Yes (CR Sheet)	BAF

Process 3: Rebar Standard Route (7 steps)

Seq	Operation	Code	Type	Produces Batch	Equipment Type
1	Scrap Charging	MELT-CHRG	FURNACE	No	EAF
2	EAF Melting	MELT-EAF	FURNACE	No	EAF
3	Ladle Refining	MELT-LF	FURNACE	Yes (Liquid Steel)	LF
4	Billet Casting	CAST-BILL	CASTER	Yes (Billet)	CCM
5	Billet Reheating	BAR-RHT	FURNACE	No	RHF
6	Bar Rolling	BAR-ROLL	ROLLING	No	BRM
7	Quenching & Tempering	BAR-QT	HEAT_TREATMENT	Yes (Rebar)	QT

Process 4: Billet Standard Route (4 steps)

Seq	Operation	Code	Type	Produces Batch	Equipment Type
1	Scrap Charging	MELT-CHRG	FURNACE	No	EAF
2	EAF Melting	MELT-EAF	FURNACE	No	EAF
3	Ladle Refining	MELT-LF	FURNACE	Yes (Liquid Steel)	LF
4	Billet Casting	CAST-BILL	CASTER	Yes (Billet)	CCM

6.3 Operation Templates (18 total)

These are the reusable templates from which runtime operations are created:

ID	Name	Code	Type	Qty Type	Duration (min)	Status
1	Scrap Charging	MELT-CHRG	FURNACE	BATCH	60	ACTIVE
2	EAF Melting	MELT-EAF	FURNACE	BATCH	180	ACTIVE
3	Ladle Refining	MELT-LF	FURNACE	BATCH	90	ACTIVE
4	Slab Casting	CAST-SLAB	CASTER	CONTINUOUS	240	ACTIVE
5	Billet Casting	CAST-BILL	CASTER	CONTINUOUS	180	ACTIVE
6	Slab Reheating	ROLL-RHT	FURNACE	BATCH	120	ACTIVE
7	Rough Rolling	ROLL-RGH	ROLLING	CONTINUOUS	60	ACTIVE
8	Finish Rolling	ROLL-FIN	ROLLING	CONTINUOUS	45	ACTIVE
9	Cooling & Coiling	ROLL-COOL	COOLING	CONTINUOUS	30	ACTIVE
10	Pickling	PKL	PICKLING	CONTINUOUS	90	ACTIVE
11	Cold Rolling	CRM	ROLLING	CONTINUOUS	120	ACTIVE
12	Batch Annealing	ANN	HEAT_TREATMENT	BATCH	480	ACTIVE
13	Billet Reheating	BAR-RHT	FURNACE	BATCH	90	ACTIVE
14	Bar Rolling	BAR-ROLL	ROLLING	CONTINUOUS	60	ACTIVE
15	Quenching & Tempering	BAR-QT	HEAT_TREATMENT	CONTINUOUS	30	ACTIVE
16	Quality Inspection	QC	INSPECTION	DISCRETE	60	ACTIVE
17	Packaging	PACK	FINISHING	DISCRETE	45	ACTIVE
18	Galvanizing	GALV	COATING	CONTINUOUS	120	INACTIVE

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7. Bill of Materials (BOM)

Eight BOM trees define the complete material hierarchy for each product. The BOM is hierarchical: the root node is the output product, and child nodes are the inputs required at each production stage. Each node specifies a quantity required per unit of parent output and a yield loss ratio (where 1.00 = no loss).

7.1 HR-COIL-2MM BOM (5 levels, 14 nodes)

```
FG-HR-2MM (1.0000 T, yield 0.98)          <- Finished HR Coil 2mm
+-- IM-HR-ROUGH (1.0500 T, yield 0.95)     <- Hot Rolled Strip
|   +-- IM-SLAB (1.1200 T, yield 0.93)     <- Steel Slab 200mm
|   |   +-- IM-LIQUID (1.1800 T, yield 0.88)    <- Liquid Steel
```

```
|   |   |   +-- RM-SCRAP-A (0.7000 T, yield 0.95)
|   |   |   +-- RM-SCRAP-B (0.2000 T, yield 0.92)
|   |   |   +-- RM-IRON-ORE (0.1500 T, yield 0.97)
|   |   |   +-- RM-LIMESTONE (0.0800 T, yield 1.00)
|   |   |   +-- RM-FESI (0.0050 KG, yield 1.00)
|   |   |   +-- RM-COAL (0.1000 T, yield 1.00)
|   |   |   +-- RM-GRAPHITE (0.0030 EA, yield 0.85)
|   |   +-- RM-MOLD-PWD (0.0050 KG, yield 1.00)
|   +-- RM-ROLL-LUB (0.0100 L, yield 1.00)
+-- RM-COATING (0.0200 L, yield 1.00)
```

7.2 CR-SHEET-1MM BOM (6 levels, 14 nodes)

This is the deepest BOM tree, reflecting that cold rolled sheet requires hot rolled coil as an input.

```
FG-CR-1MM (1.0000 T, yield 0.97)          <- Finished CR Sheet 1mm
+-- IM-ANNEALED (1.0300 T, yield 0.97)     <- Annealed CR Strip
|   +-- IM-CR-STRIP (1.0800 T, yield 0.94)    <- Cold Rolled Strip
|       +-- IM-PICKLED (1.1200 T, yield 0.96)     <- Pickled HR Strip
|       |   +-- IM-HR-ROUGH (1.1500 T, yield 0.93)    <- HR Coil Base
|       |   |   +-- RM-SCRAP-A (0.7500 T, yield 0.95)
|       |   |   +-- RM-IRON-ORE (0.2000 T, yield 0.97)
|       |   |   +-- RM-FESI (0.0050 KG, yield 1.00)
|       |   |   +-- RM-LIMESTONE (0.0600 T, yield 1.00)
|       |   |   +-- RM-COAL (0.0800 T, yield 1.00)
|       |   |   +-- RM-AL-WIRE (0.0030 KG, yield 1.00)
|       |   +-- RM-HCL (0.0500 L, yield 1.00)
|       +-- RM-ROLL-LUB (0.0200 L, yield 1.00)
+-- RM-COATING (0.0150 L, yield 1.00)
```

7.3 REBAR-10MM BOM (5 levels, 10 nodes)

```
FG-REBAR-10 (1.0000 T, yield 0.99)        <- Finished Rebar 10mm
+-- IM-ROLLED-BAR (1.0400 T, yield 0.96)   <- Rolled Bar
    +-- IM-BILLET (1.1000 T, yield 0.93)    <- Steel Billet 100mm
    |   +-- IM-LIQUID (1.1500 T, yield 0.90)    <- Liquid Steel
    |   |   +-- RM-SCRAP-A (0.8000 T, yield 0.94)
    |   |   +-- RM-SCRAP-B (0.1800 T, yield 0.92)
    |   |   +-- RM-FEMN (0.0080 KG, yield 1.00)
    |   |   +-- RM-COAL (0.0900 T, yield 1.00)
    |   +-- RM-LIMESTONE (0.0400 T, yield 1.00)
    +-- RM-ROLL-LUB (0.0050 L, yield 1.00)
```

7.4 HR-COIL-3MM BOM (5 levels, 11 nodes)

Similar structure to HR-COIL-2MM with slightly different quantities for the 3mm thickness.

```
FG-HR-2MM (1.0000 T, yield 0.98)          <- Finished HR Coil 3mm
+-- IM-HR-ROUGH (1.0600 T, yield 0.94)
|   +-- IM-SLAB (1.1400 T, yield 0.92)
|   |   +-- IM-LIQUID (1.2000 T, yield 0.87)
|   |   |   +-- RM-SCRAP-A (0.7200 T, yield 0.95)
|   |   |   +-- RM-SCRAP-B (0.1800 T, yield 0.92)
|   |   |   +-- RM-IRON-ORE (0.1600 T, yield 0.97)
|   |   |   +-- RM-COAL (0.1100 T, yield 1.00)
```

```
|   |   +-- RM-MOLD-PWD (0.0055 KG, yield 1.00)
|   +-- RM-ROLL-LUB (0.0120 L, yield 1.00)
+-- RM-COATING (0.0180 L, yield 1.00)
```

7.5 HR-COIL-4MM BOM (5 levels, 10 nodes)

```
FG-HR-2MM (1.0000 T, yield 0.98)          <- Finished HR Coil 4mm
+-- IM-HR-ROUGH (1.0700 T, yield 0.93)
|   +-- IM-SLAB (1.1600 T, yield 0.91)
|   |   +-- IM-LIQUID (1.2200 T, yield 0.86)
|   |   |   +-- RM-SCRAP-A (0.7500 T, yield 0.94)
|   |   |   +-- RM-SCRAP-B (0.1500 T, yield 0.92)
|   |   |   +-- RM-IRON-ORE (0.1700 T, yield 0.97)
|   |   |   +-- RM-COAL (0.1200 T, yield 1.00)
|   +-- RM-ROLL-LUB (0.0140 L, yield 1.00)
+-- RM-COATING (0.0160 L, yield 1.00)
```

7.6 CR-SHEET-2MM BOM (6 levels, 11 nodes)

Similar to CR-SHEET-1MM with quantities adjusted for 2mm thickness.

```
FG-CR-1MM (1.0000 T, yield 0.97)          <- Finished CR Sheet 2mm
+-- IM-ANNEALED (1.0400 T, yield 0.96)
|   +-- IM-CR-STRIP (1.0900 T, yield 0.93)
|       +-- IM-PICKLED (1.1300 T, yield 0.95)
|       |   +-- IM-HR-ROUGH (1.1600 T, yield 0.92)
|       |   |   +-- RM-SCRAP-A (0.7800 T, yield 0.95)
|       |   |   +-- RM-IRON-ORE (0.1800 T, yield 0.97)
|       |   |   +-- RM-COAL (0.0900 T, yield 1.00)
|       |   +-- RM-HCL (0.0450 L, yield 1.00)
|       +-- RM-ROLL-LUB (0.0180 L, yield 1.00)
+-- RM-COATING (0.0140 L, yield 1.00)
```

7.7 REBAR-12MM BOM (5 levels, 10 nodes)

Similar to REBAR-10MM with quantities adjusted for 12mm diameter.

```
FG-REBAR-10 (1.0000 T, yield 0.99)        <- Finished Rebar 12mm
+-- IM-ROLLED-BAR (1.0500 T, yield 0.95)
    +-- IM-BILLET (1.1100 T, yield 0.92)
    |   +-- IM-LIQUID (1.1600 T, yield 0.89)
    |   |   +-- RM-SCRAP-A (0.8200 T, yield 0.94)
    |   |   +-- RM-SCRAP-B (0.1600 T, yield 0.92)
    |   |   +-- RM-FEMN (0.0090 KG, yield 1.00)
    |   |   +-- RM-COAL (0.0950 T, yield 1.00)
    |   +-- RM-LIMESTONE (0.0450 T, yield 1.00)
    +-- RM-ROLL-LUB (0.0060 L, yield 1.00)
```

7.8 STEEL-BILLET-100 BOM (3 levels, 8 nodes)

The simplest BOM tree for the semi-finished billet product.

```
IM-BILLET (1.0000 T, yield 0.98)          <- Steel Billet 100mm
+-- IM-LIQUID (1.0800 T, yield 0.92)      <- Liquid Steel
|   +-- RM-SCRAP-A (0.7000 T, yield 0.95)
|   +-- RM-SCRAP-B (0.2500 T, yield 0.93)
|   +-- RM-IRON-ORE (0.1200 T, yield 0.97)
|   +-- RM-LIMESTONE (0.0500 T, yield 1.00)
|   +-- RM-COAL (0.0800 T, yield 1.00)
+-- RM-MOLD-PWD (0.0040 KG, yield 1.00)
```

BOM Summary Table

Product SKU	BOM Version	Levels	Total Nodes	Key Raw Materials
HR-COIL-2MM	V1	5	14	Scrap A/B, Iron Ore, Limestone, FeSi, Coal, Graphite
HR-COIL-3MM	V1	5	11	Scrap A/B, Iron Ore, Coal
HR-COIL-4MM	V1	5	10	Scrap A/B, Iron Ore, Coal
CR-SHEET-1MM	V1	6	14	Scrap A, Iron Ore, FeSi, Limestone, Coal, Al Wire, HCl
CR-SHEET-2MM	V1	6	11	Scrap A, Iron Ore, Coal, HCl
REBAR-10MM	V1	5	10	Scrap A/B, FeMn, Coal, Limestone
REBAR-12MM	V1	5	10	Scrap A/B, FeMn, Coal, Limestone
STEEL-BILLET-100	V1	3	8	Scrap A/B, Iron Ore, Limestone, Coal

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8. Equipment

Sixteen pieces of equipment are configured across the production facility.

ID	Code	Name	Type	Category	Capacity	Unit	Location	Status
1	EAF-001	Electric Arc Furnace #1	BATCH	MELTING	120	T	Melt Shop Bay 1	**AVAILABLE**
2	EAF-002	Electric Arc Furnace #2	BATCH	MELTING	120	T	Melt Shop Bay 2	**IN_USE**
3	EAF-003	Electric Arc Furnace #3	BATCH	MELTING	150	T	Melt Shop Bay 3	**MAINTENANCE**
4	LF-001	Ladle Furnace #1	BATCH	REFINING	120	T	Secondary Metallurgy	**AVAILABLE**
5	LF-002	Ladle Furnace #2	BATCH	REFINING	150	T	Secondary Metallurgy	**AVAILABLE**
6	CCM-001	Continuous Caster #1	CONTINUOUS	CASTING	200	T/H	Casting Bay 1	**AVAILABLE**
7	CCM-002	Continuous Caster #2	CONTINUOUS	CASTING	100	T/H	Casting Bay 2	**IN_USE**
8	HSM-001	Hot Strip Mill #1	CONTINUOUS	HOT_ROLLING	400	T/H	Hot Rolling Bay 1	**AVAILABLE**
9	HSM-002	Hot Strip Mill #2	CONTINUOUS	HOT_ROLLING	350	T/H	Hot Rolling Bay 2	**AVAILABLE**

10	CRM-001	Cold Rolling Mill	CONTINUOUS	COLD_ROLLING	150	T/H	Cold Rolling Bay	**AVAILABLE**
11	BAF-001	Batch Annealing Furnace	BATCH	HEAT_TREATMENT	80	T	Annealing Bay	**AVAILABLE**
12	PKL-001	Pickling Line	CONTINUOUS	PICKLING	200	T/H	Finishing Bay	**ON_HOLD**
13	BRM-001	Bar Rolling Mill	CONTINUOUS	BAR_ROLLING	100	T/H	Long Products Bay	**AVAILABLE**
14	GALV-001	Galvanizing Line	CONTINUOUS	COATING	100	T/H	Coating Bay	**AVAILABLE**
15	WRM-001	Wire Rod Mill	CONTINUOUS	WIRE_DRAWING	80	T/H	Wire Products Bay	**AVAILABLE**
16	PACK-001	Packaging Line #1	BATCH	PACKAGING	50	T	Shipping	**AVAILABLE**

Equipment Status Summary

Status	Count	Equipment
AVAILABLE	12	EAF-001, LF-001, LF-002, CCM-001, HSM-001, HSM-002, CRM-001, BAF-001, BRM-001, GALV-001, WRM-001, PACK-001
IN_USE	2	EAF-002, CCM-002
MAINTENANCE	1	EAF-003
ON_HOLD	1	PKL-001

Equipment by Location

Location	Equipment
Melt Shop Bay 1/2/3	EAF-001, EAF-002, EAF-003
Secondary Metallurgy	LF-001, LF-002
Casting Bay 1/2	CCM-001, CCM-002
Hot Rolling Bay 1/2	HSM-001, HSM-002
Cold Rolling Bay	CRM-001
Annealing Bay	BAF-001
Finishing Bay	PKL-001
Long Products Bay	BRM-001
Coating Bay	GALV-001
Wire Products Bay	WRM-001
Shipping	PACK-001

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9. Operators

Twelve operators are configured across six departments. Eleven are active; one (OP-012) is inactive.

ID	Code	Name	Department	Shift	Status
1	OP-001	John Martinez	Melt Shop	A	**ACTIVE**
2	OP-002	Sarah Wilson	Melt Shop	B	**ACTIVE**
3	OP-003	Michael Brown	Casting	A	**ACTIVE**
4	OP-004	Emily Davis	Casting	B	**ACTIVE**
5	OP-005	David Garcia	Hot Rolling	A	**ACTIVE**
6	OP-006	Jennifer Lee	Hot Rolling	B	**ACTIVE**
7	OP-007	Robert Taylor	Cold Rolling	A	**ACTIVE**
8	OP-008	Lisa Anderson	Cold Rolling	B	**ACTIVE**
9	OP-009	James Thomas	Finishing	A	**ACTIVE**
10	OP-010	Patricia Jackson	Finishing	B	**ACTIVE**
11	OP-011	Christopher White	Quality	A	**ACTIVE**
12	OP-012	Amanda Harris	Quality	B	**INACTIVE**

Operators by Department

Department	Shift A	Shift B
Melt Shop	OP-001 (John Martinez)	OP-002 (Sarah Wilson)
Casting	OP-003 (Michael Brown)	OP-004 (Emily Davis)
Hot Rolling	OP-005 (David Garcia)	OP-006 (Jennifer Lee)
Cold Rolling	OP-007 (Robert Taylor)	OP-008 (Lisa Anderson)
Finishing	OP-009 (James Thomas)	OP-010 (Patricia Jackson)
Quality	OP-011 (Christopher White)	OP-012 (Amanda Harris - inactive)

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10. Orders

There are 45 orders in the system, organized into two groups: the original 15 orders and 30 additional orders that include multi-stage production scenarios.

10.1 Original Orders (1-15)

ID	Order Number	Customer	Product(s)	Qty	Status	Date
1	ORD-2026-001	ABC Steel Corporation	HR-COIL-2MM (150T), HR-COIL-3MM (50T)	200T	IN_PROGRESS	2026-01-10
2	ORD-2026-002	Global Manufacturing Ltd	CR-SHEET-1MM (80T), CR-SHEET-2MM (40T)	120T	IN_PROGRESS	2026-01-12
3	ORD-2026-003	BuildRight Construction	REBAR-10MM (200T), REBAR-12MM (100T)	300T	IN_PROGRESS	2026-01-15
4	ORD-2026-004	Pacific Metal Works	HR-COIL-2MM (100T), CR-SHEET-1MM (50T), REBAR-10MM (80T)	230T	CREATED	2026-01-18

5	ORD-2026-005	European Auto Parts GmbH	HR-COIL-2MM (75T)	75T	COMPLETED	2026-01-20
6	ORD-2026-006	Nordic Steel Trading AB	REBAR-10MM (300T), REBAR-12MM (150T)	450T	CREATED	2026-01-22
7	ORD-2026-007	Middle East Metals FZE	CR-SHEET-1MM (120T)	120T	CREATED	2026-01-25
8	ORD-2026-008	Asian Electronics Inc	HR-COIL-2MM (60T)	60T	ON_HOLD	2026-01-28
9	ORD-2026-009	South American Steel SA	HR-COIL-3MM (250T), HR-COIL-4MM (100T)	350T	CREATED	2026-01-30
10	ORD-2026-010	African Mining Corp	STEEL-BILLET-100 (400T), REBAR-10MM (200T)	600T	CREATED	2026-01-31
11	ORD-2026-011	Oceanic Metals Ltd	CR-SHEET-2MM (180T), HR-COIL-2MM (80T)	260T	IN_PROGRESS	2026-02-01
12	ORD-2026-012	ABC Steel Corporation	REBAR-12MM (180T)	180T	COMPLETED	2026-02-02
13	ORD-2026-013	Global Manufacturing Ltd	HR-COIL-4MM (120T), CR-SHEET-2MM (60T)	180T	COMPLETED	2026-02-03
14	ORD-2026-014	Pacific Metal Works	CR-SHEET-1MM (90T)	90T	CANCELLED	2026-02-04
15	ORD-2026-015	Nordic Steel Trading AB	STEEL-BILLET-100 (250T)	250T	BLOCKED	2026-02-05

10.2 Additional Orders (16-45)

These orders include multi-stage production types where one product feeds into another.

ID	Order Number	Customer	Type	Product Line Items	Status	Date
16	ORD-2026-016	Asian Electronics Inc	Single	HR-COIL-2MM (110T)	IN_PROGRESS	2026-02-06
17	ORD-2026-017	Oceanic Metals Ltd	Single	HR-COIL-3MM (170T)	IN_PROGRESS	2026-02-06
18	ORD-2026-018	South American Steel SA	Single	HR-COIL-4MM (190T)	COMPLETED	2026-02-06
19	ORD-2026-019	Asian Electronics Inc	Single	CR-SHEET-1MM (60T)	IN_PROGRESS	2026-02-07
20	ORD-2026-020	Asian Electronics Inc	Single	CR-SHEET-2MM (60T)	CREATED	2026-02-07
21	ORD-2026-021	Global Manufacturing Ltd	Single	REBAR-10MM (190T)	IN_PROGRESS	2026-02-07
22	ORD-2026-022	ABC Steel Corporation	Single	REBAR-12MM (250T)	BLOCKED	2026-02-08
23	ORD-2026-023	ABC Steel Corporation	Single	STEEL-BILLET-100 (500T)	ON_HOLD	2026-02-08
24	ORD-2026-024	Middle East Metals FZE	Single	REBAR-10MM (190T)	IN_PROGRESS	2026-02-08

25	ORD-2026-025	Pacific Metal Works	Single	HR-COIL-2MM (240T)	CANCELLED	2026-02-09
26	ORD-2026-026	Asian Electronics Inc	**HR->CR**	HR-COIL-2MM (140T) + CR-SHEET-1MM (110T)	CREATED	2026-02-09
27	ORD-2026-027	Global Manufacturing Ltd	**HR->CR**	HR-COIL-3MM (100T) + CR-SHEET-2MM (120T)	CREATED	2026-02-09
28	ORD-2026-028	Pacific Metal Works	**HR->CR**	HR-COIL-4MM (170T) + CR-SHEET-1MM (110T)	ON_HOLD	2026-02-10
29	ORD-2026-029	European Auto Parts GmbH	**HR->CR**	HR-COIL-2MM (120T) + CR-SHEET-2MM (80T)	COMPLETED	2026-02-10
30	ORD-2026-030	BuildRight Construction	**Billet->Rebar**	STEEL-BILLET-100 (220T) + REBAR-10MM (180T)	COMPLETED	2026-02-10
31	ORD-2026-031	European Auto Parts GmbH	**Billet->Rebar**	STEEL-BILLET-100 (360T) + REBAR-12MM (310T)	CREATED	2026-02-11
32	ORD-2026-032	African Mining Corp	**Billet->Rebar**	STEEL-BILLET-100 (180T) + REBAR-10MM (120T)	ON_HOLD	2026-02-11
33	ORD-2026-033	Asian Electronics Inc	**Full Pipeline**	HR-COIL-2MM (160T) + CR-SHEET-1MM (110T) + REBAR-10MM (260T)	IN_PROGRESS	2026-02-11
34	ORD-2026-034	Oceanic Metals Ltd	**Full Pipeline**	HR-COIL-3MM (90T) + CR-SHEET-2MM (80T) + REBAR-12MM (140T)	CANCELLED	2026-02-12
35	ORD-2026-035	Middle East Metals FZE	**Triple Process**	STEEL-BILLET-100 (340T) + HR-COIL-4MM (150T) + CR-SHEET-2MM (120T)	CREATED	2026-02-12
36	ORD-2026-036	Asian Electronics Inc	**Mixed HR**	HR-COIL-2MM (70T) + HR-COIL-3MM (110T)	CREATED	2026-02-12
37	ORD-2026-037	Nordic Steel Trading AB	**Mixed Rebar**	REBAR-10MM (130T) + REBAR-12MM (170T)	COMPLETED	2026-02-13
38	ORD-2026-038	Nordic Steel Trading AB	**Mixed CR**	CR-SHEET-1MM (50T) + CR-SHEET-2MM (70T)	IN_PROGRESS	2026-02-13
39	ORD-2026-039	South American Steel SA	**Heavy HR->CR**	HR-COIL-2MM (220T) + HR-COIL-4MM (180T) + CR-SHEET-1MM (170T)	COMPLETED	2026-02-13
40	ORD-2026-040	Middle East Metals FZE	**HR->CR**	HR-COIL-3MM (120T) + CR-SHEET-1MM (90T)	CREATED	2026-02-14
41	ORD-2026-041	European Auto Parts GmbH	**Billet->Rebar**	STEEL-BILLET-100 (380T) + REBAR-12MM (340T)	CREATED	2026-02-14
42	ORD-2026-042	European Auto Parts GmbH	**4-Stage Pipeline**	STEEL-BILLET-100 (110T) + HR-COIL-2MM (110T) + CR-SHEET-2MM (80T) + REBAR-10MM (120T)	CREATED	2026-02-14
43	ORD-2026-043	Oceanic Metals Ltd	**Mixed HR**	HR-COIL-2MM (100T) + HR-COIL-3MM (70T) + HR-COIL-4MM (80T)	COMPLETED	2026-02-15
44	ORD-2026-044	South American Steel SA	**Billet+Rebar+CR**	STEEL-BILLET-100 (250T) + REBAR-12MM (170T) + CR-SHEET-1MM (80T)	IN_PROGRESS	2026-02-15
45	ORD-2026-045	Global Manufacturing Ltd	Single	STEEL-BILLET-100 (470T)	CREATED	2026-02-15

Order Status Summary (All 45)

Status	Count	Order IDs

CREATED	15	4, 6, 7, 9, 10, 20, 26, 27, 31, 35, 36, 40, 41, 42, 45
IN_PROGRESS	12	1, 2, 3, 11, 16, 17, 19, 21, 24, 33, 38, 44
COMPLETED	9	5, 12, 13, 18, 29, 30, 37, 39, 43
ON_HOLD	4	8, 23, 28, 32
BLOCKED	2	15, 22
CANCELLED	3	14, 25, 34

Multi-Stage Order Types Explained

Type	Description	Processes Involved	Total Ops
HR->CR	Hot Rolled Coil feeds into Cold Rolled Sheet	Process 1 (8 ops) + Process 2 (3 ops)	11
Billet->Rebar	Billets are cast, then rolled into rebar	Process 4 (4 ops) + Process 3 (7 ops)	11
Full Pipeline	HR Coil + CR Sheet + Rebar in one order	Process 1 + Process 2 + Process 3	18
Triple Process	Billet + HR Coil + CR Sheet	Process 4 + Process 1 + Process 2	15
4-Stage Pipeline	All four processes in one order	Process 4 + Process 1 + Process 2 + Process 3	22
Heavy HR->CR	Multiple HR Coil variants feeding CR Sheet	Process 1 (x2) + Process 2	19
Mixed	Multiple variants of the same product type	Same process, different SKUs	Varies

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11. Batches

There are 70 batches in the system representing material at various production stages and statuses.

11.1 Raw Material Batches (28 batches)

Batch #	Material	Quantity	Unit	Status	Notes
B-RM-001	RM-SCRAP-A (Steel Scrap Grade A)	500	T	AVAILABLE	Primary scrap supply
B-RM-002	RM-SCRAP-A (Steel Scrap Grade A)	350	T	AVAILABLE	
B-RM-003	RM-SCRAP-B (Steel Scrap Grade B)	200	T	AVAILABLE	
B-RM-004	RM-IRON-ORE (Iron Ore Pellets)	400	T	AVAILABLE	
B-RM-005	RM-LIMESTONE (Limestone)	150	T	AVAILABLE	
B-RM-006	RM-FESI (Ferroalloy FeSi)	2,000	KG	AVAILABLE	
B-RM-007	RM-FEMN (Ferroalloy FeMn)	1,500	KG	AVAILABLE	
B-RM-008	RM-COAL (Coal / Coke)	300	T	AVAILABLE	
B-RM-009	RM-GRAPHITE (Graphite Electrodes)	50	EA	AVAILABLE	
B-RM-010	RM-SCRAP-A (Steel Scrap Grade A)	180	T	**ON_HOLD**	Quality investigation
B-RM-011	RM-SCRAP-B (Steel Scrap Grade B)	120	T	AVAILABLE	
B-RM-012	RM-HCL (Hydrochloric Acid)	5,000	L	AVAILABLE	
B-RM-013	RM-COATING (Surface Coating Oil)	2,000	L	AVAILABLE	
B-RM-014	RM-ROLL-LUB (Rolling Lubricant)	3,000	L	AVAILABLE	

B-RM-015	RM-MOLD-PWD (Mold Powder)	1,000	KG	AVAILABLE	
B-RM-016	RM-AL-WIRE (Aluminum Wire)	500	KG	AVAILABLE	
B-RM-017	RM-SCRAP-C (Steel Scrap Grade C)	250	T	AVAILABLE	
B-RM-018	RM-FEV (Ferroalloy FeV)	100	KG	AVAILABLE	
B-RM-019	RM-SCRAP-A (Steel Scrap Grade A)	100	T	**BLOCKED**	High sulfur content
B-RM-020	RM-COAL (Coal / Coke)	25	T	**SCRAPPED**	Contaminated
B-RM-021	RM-SCRAP-A (Steel Scrap Grade A)	280	T	AVAILABLE	
B-RM-022	RM-SCRAP-B (Steel Scrap Grade B)	150	T	AVAILABLE	
B-RM-023	RM-SCRAP-A (Steel Scrap Grade A)	400	T	AVAILABLE	
B-RM-024	RM-SCRAP-B (Steel Scrap Grade B)	300	T	AVAILABLE	
B-RM-025	RM-IRON-ORE (Iron Ore Pellets)	250	T	AVAILABLE	
B-RM-026	RM-LIMESTONE (Limestone)	200	T	AVAILABLE	
B-RM-027	RM-FEMN (Ferroalloy FeMn)	2,000	KG	AVAILABLE	
B-RM-028	RM-FESI (Ferroalloy FeSi)	1,500	KG	AVAILABLE	

11.2 Intermediate Batches (28 batches)

Batch #	Material	Quantity	Unit	Status	Notes
B-IM-001	IM-LIQUID (Liquid Steel)	165	T	CONSUMED	Used in slab casting
B-IM-002	IM-SLAB (Steel Slab 200mm)	155	T	AVAILABLE	
B-IM-003	IM-LIQUID (Liquid Steel)	90	T	CONSUMED	
B-IM-004	IM-LIQUID (Liquid Steel)	220	T	CONSUMED	Used for rebar billet
B-IM-005	IM-BILLET (Steel Billet 100mm)	210	T	AVAILABLE	
B-IM-006	IM-LIQUID (Liquid Steel)	85	T	CONSUMED	
B-IM-007	IM-SLAB (Steel Slab 200mm)	82	T	CONSUMED	
B-IM-008	IM-HR-ROUGH (HR Coil Rough)	78	T	CONSUMED	
B-IM-009	IM-SLAB (Steel Slab 200mm)	30	T	QUALITY_PENDING	Surface cracks detected
B-IM-010	IM-BILLET (Steel Billet 100mm)	195	T	AVAILABLE	
B-IM-011	IM-PICKLED (Pickled HR Strip)	85	T	AVAILABLE	
B-IM-012	IM-CR-STRIP (Cold Rolled Strip)	80	T	PRODUCED	
B-IM-013	IM-ANNEALED (Annealed CR Strip)	75	T	AVAILABLE	
B-IM-014	IM-ROLLED-BAR (Rolled Bar)	190	T	AVAILABLE	
B-IM-015	IM-LIQUID (Liquid Steel)	130	T	PRODUCED	
B-IM-016	IM-SLAB (Steel Slab 200mm)	125	T	PRODUCED	
B-IM-017	IM-SLAB (Steel Slab 200mm)	45	T	**BLOCKED**	Thickness out of spec
B-IM-018	IM-BILLET (Steel Billet 100mm)	60	T	QUALITY_PENDING	
B-IM-019	IM-HR-ROUGH (HR Coil Rough)	95	T	AVAILABLE	
B-IM-020	IM-LIQUID (Liquid Steel)	100	T	AVAILABLE	

B-IM-021	IM-BLOOM (Steel Bloom 200mm)	160	T	AVAILABLE	
B-IM-022	IM-BLOOM (Steel Bloom 200mm)	140	T	AVAILABLE	
B-IM-023	IM-WIRE-ROD (Wire Rod)	120	T	AVAILABLE	
B-IM-024	IM-WIRE-ROD (Wire Rod)	95	T	AVAILABLE	
B-IM-025	IM-LIQUID (Liquid Steel)	200	T	AVAILABLE	
B-IM-026	IM-LIQUID (Liquid Steel)	180	T	AVAILABLE	
B-IM-027	IM-SLAB (Steel Slab 200mm)	200	T	AVAILABLE	
B-IM-028	IM-HR-ROUGH (HR Coil Rough)	110	T	AVAILABLE	

11.3 Work In Progress Batches (6 batches)

These batches represent material actively being processed on equipment.

Batch #	Material	Quantity	Unit	Status	Equipment Location
B-WIP-001	WIP-MELT (Molten Steel)	85	T	AVAILABLE	EAF #1
B-WIP-002	WIP-MELT (Molten Steel)	92	T	AVAILABLE	EAF #2
B-WIP-003	WIP-CAST (Steel Being Cast)	78	T	AVAILABLE	Caster #1
B-WIP-004	WIP-ROLL (Strip on Hot Mill)	65	T	AVAILABLE	Hot Mill #1
B-WIP-005	WIP-PICKLE (Strip in Pickle Line)	45	T	AVAILABLE	Pickle Line #1
B-WIP-006	WIP-ROLL (Strip on Cold Mill)	55	T	AVAILABLE	Cold Mill #1

11.4 Finished Goods Batches (8 batches)

Batch #	Material	Quantity	Unit	Status	Notes
B-FG-001	FG-HR-2MM (HR Coil 2mm)	75	T	AVAILABLE	Order 5 completed
B-FG-002	FG-CR-1MM (CR Sheet 1mm)	70	T	AVAILABLE	
B-FG-003	FG-REBAR-10 (Rebar 10mm)	180	T	AVAILABLE	
B-FG-004	FG-HR-2MM (HR Coil 2mm)	120	T	AVAILABLE	
B-FG-005	FG-REBAR-10 (Rebar 10mm)	175	T	PRODUCED	
B-FG-006	FG-CR-1MM (CR Sheet 1mm)	55	T	PRODUCED	
B-FG-007	FG-HR-2MM (HR Coil 2mm)	25	T	QUALITY_PENDING	QC inspection pending
B-FG-008	FG-REBAR-10 (Rebar 10mm)	150	T	AVAILABLE	

Batch Status Summary

Status	Count	Description
AVAILABLE	50	Ready for use in production or shipment
CONSUMED	5	Used up in production (historical)
PRODUCED	4	Recently produced, awaiting quality release
QUALITY_PENDING	3	Awaiting quality inspection or approval

BLOCKED	2	Blocked due to quality issues
ON_HOLD	1	Temporarily held pending investigation
SCRAPPED	1	Disposed of due to contamination

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12. Inventory

There are 70 inventory records tracking material at specific locations. Each inventory record is linked to a batch.

Inventory by Type and State

Type	AVAILABLE	CONSUMED	PRODUCED	RESERVED	BLOCKED	ON_HOLD	SCRAPPED	**Total**
RM (Raw Material)	24	0	0	2	1	1	1	**29**
IM (Intermediate)	16	5	3	0	1	2	0	**27**
WIP (Work In Progress)	6	0	0	0	0	0	0	**6**
FG (Finished Goods)	5	0	2	0	0	1	0	**8**
Total	**51**	**5**	**5**	**2**	**2**	**4**	**1**	**70**

Key Inventory Locations

Location	Material Types	Count
Scrap Yard A/B/C/D	RM-SCRAP-A, RM-SCRAP-B, RM-SCRAP-C	10
Alloy Store / Alloy Store B	RM-FESI, RM-FEMN, RM-FEV	5
Ore Storage / Ore Storage B	RM-IRON-ORE	2
Flux Store / Flux Store B	RM-LIMESTONE	2
Coal Yard	RM-COAL	1
Chemical Store	RM-HCL	1
Electrode Store	RM-GRAPHITE	1
Casting Store	RM-MOLD-PWD	1
Oil Store	RM-COATING, RM-ROLL-LUB	2
Slab Yard / Slab Yard B	IM-SLAB	4
Billet Yard	IM-BILLET	2
Ladle / Ladle #2 / Ladle #3	IM-LIQUID	4
Hot Mill	IM-HR-ROUGH	2
Pickling Bay	IM-PICKLED	1
Cold Mill	IM-CR-STRIP	1
Annealing Bay	IM-ANNEALED	1
Bar Mill	IM-ROLLED-BAR	1
Bloom Yard	IM-BLOOM	2
Wire Rod Bay	IM-WIRE-ROD	2

FG Warehouse 1/2/3	FG-HR-2MM, FG-CR-1MM, FG-REBAR-10	6
Quarantine Area / QC Area	Blocked/On Hold items	4
Historical	Consumed records	5
Disposal	Scrapped items	1

Notable Inventory Items

Description	Location	State	Reason
180T Steel Scrap Grade A	Scrap Yard C	ON_HOLD	Quality investigation pending
100T Steel Scrap (Blocked)	Quarantine Area	BLOCKED	High sulfur content
45T Steel Slab (Blocked)	QC Area	BLOCKED	Thickness out of spec
30T Steel Slab (QC Pending)	QC Area	ON_HOLD	Surface defects
60T Steel Billet (QC)	QC Area	ON_HOLD	Quality review
25T HR Coil (QC Pending)	QC Area	ON_HOLD	Pending inspection
200T Scrap A (Reserved)	Scrap Yard A	RESERVED	Reserved for Order ORD-2026-009
100T Scrap B (Reserved)	Scrap Yard B	RESERVED	Reserved for Order ORD-2026-009
25T Coal (Contaminated)	Disposal	SCRAPPED	Contaminated, disposed

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13. Hold Records

The following 12 hold records are consistent with the pre-loaded entity statuses:

13.1 Active Holds (8)

Hold ID	Entity Type	Entity	Reason	Comments	Applied By	Applied Date
1	BATCH	B-RM-010 (Scrap A, 180T)	QUALITY_HOLD	Suspected contamination in scrap shipment - pending lab report	OP-006 (Jennifer Lee)	2026-01-25
2	INVENTORY	Inv #39 (Scrap A, 100T)	QUALITY_HOLD	Chemical analysis failed - high sulfur content detected	OP-006 (Jennifer Lee)	2026-01-26
3	INVENTORY	Inv #41 (Steel Slab, 30T)	QUALITY_HOLD	Surface defects found during slab inspection	OP-007 (Robert Taylor)	2026-01-27
4	OPERATION	Op #27 (Scrap Charging, Ord 8)	MATERIAL_DEFECT	Waiting for scrap availability	OP-004 (Emily Davis)	2026-01-28
5	BATCH	B-IM-009 (Steel Slab, 30T)	SAFETY_CONCERN	Slab surface cracks detected - requires ultrasonic testing	OP-006 (Jennifer Lee)	2026-01-29
6	EQUIPMENT	PKL-001 (Pickling Line #1)	SAFETY_CONCERN	Acid leak detected in pickling line - safety inspection required	OP-008 (Lisa Anderson)	2026-01-28
7	ORDER	ORD-2026-008 (60T HR Coil 2mm)	CUSTOMER_REQUEST	Customer requested hold pending design review	Admin	2026-01-29
8	BATCH	B-IM-017 (Steel Slab, 45T)	SPEC_DEVIATION	Slab thickness out of specification - requires disposition	OP-006 (Jennifer Lee)	2026-02-01

13.2 Released Holds (4)

Hold ID	Entity Type	Entity	Reason	Released By	Release Date	Release Comment
9	BATCH	B-RM-003 (Scrap B, 200T)	QUALITY_HOLD	OP-007 (Robert Taylor)	2026-01-21	Lab results clear - release approved
10	INVENTORY	Inv #5 (Limestone, 150T)	CONTAMINATION	OP-006 (Jennifer Lee)	2026-01-23	Moisture test passed - OK to use
11	OPERATION	Op #16 (Billet Reheating)	EQUIPMENT_ISSUE	OP-008 (Lisa Anderson)	2026-01-25	Maintenance completed - equipment OK
12	EQUIPMENT	EAF-003 (Arc Furnace #3)	SAFETY_CONCERN	OP-008 (Lisa Anderson)	2026-01-26	Inspection passed - cleared for use

Hold Distribution by Entity Type

Entity Type	Active	Released	Total
BATCH	3	1	4
INVENTORY	2	1	3
OPERATION	1	1	2
EQUIPMENT	1	1	2
ORDER	1	0	1
Total	**8**	**4**	**12**

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14. Batch Number Configuration

Four batch numbering rules control how batch numbers are automatically generated during production confirmation.

Config Name	Operation Type	Product SKU	Prefix	Separator	Date Format	Seq Length	Seq Reset	Priority
Melting Batch	MELTING	(any)	MLT	-	yyMMdd	4	DAILY	10
Casting Batch	CASTING	(any)	CST	-	yyMMdd	4	DAILY	10
Rolling Batch	HOT_ROLLING	(any)	HRL	-	yyMMdd	4	DAILY	10
Receipt Batch	RECEIPT	(any)	RCV	-	yyMMdd	4	DAILY	5

How Batch Numbers Are Generated

The system selects the matching rule based on operation type. Each rule generates a batch number with the configured prefix, date in `yyMMdd` format, and a 4-digit daily sequence.

Example batch numbers:

- Melting operation: `MLT-260215-0001`
- Casting operation: `CST-260215-0001`
- Hot rolling operation: `HRL-260215-0001`
- Material receipt: `RCV-260215-0001`

Sequences reset daily, so the first batch each day starts at 0001.

15. Production Confirmations

The following 35 production confirmations correspond to the pre-loaded operation statuses:

Confirmations by Order

Order 1 (ORD-2026-001): HR Coil 2mm - IN_PROGRESS

Conf ID	Operation	Produced	Scrap	Duration	Operator	Equipment	Notes
1	Scrap Charging	160 T	3 T	4h	OP-001 (John Martinez)	EAF-001	Scrap charging complete, 160T loaded
2	EAF Melting	155 T	5 T	5.5h	OP-001	EAF-001	Electrode change, 20min delay
3	Ladle Refining	152 T	3 T	2.5h	OP-001	LF-001	Chemistry adjusted
4	Slab Casting	148 T	4 T	6h	OP-003 (Michael Brown)	CCM-001	Minor mold issue, 15min delay
5	Slab Reheating	148 T	0 T	3h	OP-004 (Emily Davis)	HSM-001	Slabs reheated to 1250C

Operations 6-8 (Rough Roll, Finish Roll, Cool/Coil) are pending. Operation 6 is READY.

Order 3 (ORD-2026-003): Rebar 10mm - IN_PROGRESS

Conf ID	Operation	Produced	Scrap	Duration	Operator	Equipment	Notes
6	Scrap Charging	210 T	5 T	4h	OP-001	EAF-002	Rebar order scrap charge
7	EAF Melting	205 T	5 T	6.5h	OP-001	EAF-002	Temp correction, 30min quality delay
8	Ladle Refining	200 T	5 T	3h	OP-001	LF-001	
9	Billet Casting	195 T	5 T	8h	OP-003	CCM-002	Billet casting 100mm square

Operations 16-18 (Billet Reheat, Bar Roll, Quench/Temper) are pending. Operation 16 is READY.

Order 5 (ORD-2026-005): HR Coil 2mm - COMPLETED (all 8 operations)

Conf ID	Operation	Produced	Scrap	Operator	Equipment
10	Scrap Charging	82 T	1 T	OP-001	EAF-001
11	EAF Melting	80 T	2 T	OP-001	EAF-001
12	Ladle Refining	79 T	1 T	OP-001	LF-001
13	Slab Casting	77 T	2 T	OP-003	CCM-001
14	Slab Reheating	77 T	0 T	OP-004	HSM-001
15	Rough Rolling	76 T	1 T	OP-004	HSM-001
16	Finish Rolling	75.5 T	0.5 T	OP-004	HSM-001
17	Cooling & Coiling	75 T	0.5 T	OP-004	HSM-001

This is the only fully completed order in the original 15 that has all confirmations. Final output: 75T HR Coil 2mm (batch B-FG-001).

Order 12 (ORD-2026-012): Rebar 12mm - COMPLETED (all 7 operations)

Conf ID	Operation	Produced	Scrap	Operator	Equipment
18	Scrap Charging	190 T	5 T	OP-002 (Sarah Wilson)	EAF-002
19	EAF Melting	185 T	5 T	OP-002	EAF-002
20	Ladle Refining	182 T	3 T	OP-002	LF-002
21	Billet Casting	178 T	4 T	OP-003	CCM-002
22	Billet Reheating	178 T	0 T	OP-004	HSM-001
23	Bar Rolling	175 T	3 T	OP-004	BRM-001
24	Quenching & Tempering	175 T	0 T	OP-004	BRM-001

Final output: 175T Rebar 12mm (batch B-FG-005).

Order 13 (ORD-2026-013): HR Coil 4mm - COMPLETED (all 8 operations)

Conf ID	Operation	Produced	Scrap	Operator	Equipment
25	Scrap Charging	130 T	2 T	OP-001	EAF-001
26	EAF Melting	127 T	3 T	OP-001	EAF-001
27	Ladle Refining	125 T	2 T	OP-001	LF-001
28	Slab Casting	122 T	3 T	OP-003	CCM-001
29	Slab Reheating	122 T	0 T	OP-004	HSM-001
30	Rough Rolling	120 T	2 T	OP-004	HSM-001
31	Finish Rolling	118 T	2 T	OP-004	HSM-001
32	Cooling & Coiling	118 T	0 T	OP-004	HSM-001

Final output: 118T HR Coil 4mm (batch B-FG-004).

Additional In-Progress Confirmations

Conf ID	Order	Operation	Produced	Scrap	Operator	Notes
33	Ord 11 (Oceanic)	Scrap Charging	85 T	2 T	OP-011 (Christopher White)	HR Coil production
34	Ord 9 (S. American)	Scrap Charging	125 T	5 T	OP-001	Partial: 125T of 250T target
35	Ord 11 (Oceanic)	Pickling	90 T	2 T	OP-005 (David Garcia)	Most recent confirmation

Confirmation Summary Statistics

Metric	Value
Total Confirmations	35
Total Produced (gross)	~5,070 T
Total Scrap	~88 T
Avg. Scrap Rate	~1.7%
Confirmations with Delays	2 (Conf #2: Maintenance, Conf #7: Quality Issue)
Operators Used	7 (OP-001 through OP-005, OP-011)
Equipment Used	7 (EAF-001/002, LF-001/002, CCM-001/002, HSM-001, BRM-001, PKL-001)

16. Product-Process-BOM Cross Reference

This section ties together products, their production processes, routing steps, BOM hierarchy, and which orders reference each product.

HR-COIL-2MM (Hot Rolled Coil 2mm)

Aspect	Details
Process	Process 1: Hot Rolled Coil Production (8 steps)
Routing	Charge -> Melt -> Refine -> Slab Cast -> Reheat -> Rough Roll -> Finish Roll -> Cool/Coil
BOM Depth	5 levels, 14 nodes
Key Materials	RM-SCRAP-A (0.70T), RM-SCRAP-B (0.20T), RM-IRON-ORE (0.15T), RM-COAL (0.10T) per ton
Orders	ORD-001 (150T), ORD-004 (100T), ORD-005 (75T, completed), ORD-008 (60T, on hold), ORD-011 (80T), ORD-016 (110T), ORD-025 (240T, cancelled), ORD-026 (140T), ORD-029 (120T, completed), ORD-033 (160T), ORD-036 (70T), ORD-039 (220T, completed), ORD-042 (110T), ORD-043 (100T, completed)

HR-COIL-3MM (Hot Rolled Coil 3mm)

Aspect	Details
Process	Process 1: Hot Rolled Coil Production (8 steps)
Routing	Same as HR-COIL-2MM
BOM Depth	5 levels, 11 nodes
Key Materials	RM-SCRAP-A (0.72T), RM-SCRAP-B (0.18T), RM-IRON-ORE (0.16T), RM-COAL (0.11T) per ton
Orders	ORD-001 (50T), ORD-009 (250T), ORD-017 (170T), ORD-027 (100T), ORD-034 (90T, cancelled), ORD-036 (110T), ORD-040 (120T), ORD-043 (70T, completed)

HR-COIL-4MM (Hot Rolled Coil 4mm)

Aspect	Details
Process	Process 1: Hot Rolled Coil Production (8 steps)
Routing	Same as HR-COIL-2MM
BOM Depth	5 levels, 10 nodes
Key Materials	RM-SCRAP-A (0.75T), RM-SCRAP-B (0.15T), RM-IRON-ORE (0.17T), RM-COAL (0.12T) per ton
Orders	ORD-009 (100T), ORD-013 (120T, completed), ORD-018 (190T, completed), ORD-028 (170T, on hold), ORD-035 (150T), ORD-039 (180T, completed), ORD-043 (80T, completed)

CR-SHEET-1MM (Cold Rolled Sheet 1mm)

Aspect	Details
Process	Process 2: Cold Rolled Sheet Production (3 steps)

Routing	Pickling -> Cold Rolling -> Batch Annealing
BOM Depth	6 levels, 14 nodes (deepest BOM - requires HR coil as input)
Key Materials	RM-SCRAP-A (0.75T), RM-IRON-ORE (0.20T), RM-HCL (0.05L), RM-COATING (0.015L) per ton
Orders	ORD-002 (80T), ORD-004 (50T), ORD-007 (120T), ORD-014 (90T, cancelled), ORD-019 (60T), ORD-026 (110T), ORD-028 (110T, on hold), ORD-033 (110T), ORD-039 (170T, completed), ORD-040 (90T), ORD-044 (80T)

CR-SHEET-2MM (Cold Rolled Sheet 2mm)

Aspect	Details
Process	Process 2: Cold Rolled Sheet Production (3 steps)
Routing	Same as CR-SHEET-1MM
BOM Depth	6 levels, 11 nodes
Key Materials	RM-SCRAP-A (0.78T), RM-IRON-ORE (0.18T), RM-HCL (0.045L) per ton
Orders	ORD-002 (40T), ORD-011 (180T), ORD-013 (60T, completed), ORD-020 (60T), ORD-027 (120T), ORD-029 (80T, completed), ORD-034 (80T, cancelled), ORD-035 (120T), ORD-038 (70T), ORD-042 (80T)

REBAR-10MM (Reinforcement Bar 10mm)

Aspect	Details
Process	Process 3: Rebar Production (7 steps)
Routing	Charge -> Melt -> Refine -> Billet Cast -> Reheat -> Bar Roll -> Quench/Temper
BOM Depth	5 levels, 10 nodes
Key Materials	RM-SCRAP-A (0.80T), RM-SCRAP-B (0.18T), RM-FEMN (0.008 KG), RM-COAL (0.09T) per ton
Orders	ORD-003 (200T), ORD-004 (80T), ORD-006 (300T), ORD-010 (200T), ORD-021 (190T), ORD-024 (190T), ORD-030 (180T, completed), ORD-032 (120T, on hold), ORD-033 (260T), ORD-037 (130T, completed), ORD-042 (120T)

REBAR-12MM (Reinforcement Bar 12mm)

Aspect	Details
Process	Process 3: Rebar Production (7 steps)
Routing	Same as REBAR-10MM
BOM Depth	5 levels, 10 nodes
Key Materials	RM-SCRAP-A (0.82T), RM-SCRAP-B (0.16T), RM-FEMN (0.009 KG), RM-COAL (0.095T) per ton
Orders	ORD-003 (100T), ORD-006 (150T), ORD-012 (180T, completed), ORD-022 (250T, blocked), ORD-031 (310T), ORD-034 (140T, cancelled), ORD-037 (170T, completed), ORD-041 (340T), ORD-044 (170T)

STEEL-BILLET-100 (Steel Billet 100mm)

Aspect	Details
Process	Process 4: Billet Production (4 steps)
Routing	Charge -> Melt -> Refine -> Billet Cast
BOM Depth	3 levels, 8 nodes (simplest BOM)
Key Materials	RM-SCRAP-A (0.70T), RM-SCRAP-B (0.25T), RM-IRON-ORE (0.12T), RM-COAL (0.08T) per ton
Orders	ORD-010 (400T), ORD-015 (250T, blocked), ORD-023 (500T, on hold), ORD-030 (220T, completed), ORD-031 (360T), ORD-032 (180T, on hold), ORD-035 (340T), ORD-041 (380T), ORD-042 (110T), ORD-044 (250T), ORD-045 (470T)

---

17. Lookup and Configuration Data

17.1 Hold Reasons (10)

Reason Code	Description	Applicable To
QUALITY_HOLD	Quality inspection required	BATCH, INVENTORY, OPERATION
MATERIAL_DEFECT	Material defect detected	BATCH, INVENTORY
EQUIPMENT_ISSUE	Equipment malfunction	EQUIPMENT, OPERATION
PENDING_APPROVAL	Pending management approval	ORDER, ORDER_LINE, OPERATION
SAFETY_CONCERN	Safety investigation required	BATCH, EQUIPMENT, OPERATION
CUSTOMER_REQUEST	Customer requested hold	ORDER, ORDER_LINE, BATCH
SPEC_DEVIATION	Specification deviation detected	BATCH, OPERATION
CONTAMINATION	Contamination suspected	BATCH, INVENTORY
REGULATORY_HOLD	Regulatory hold	BATCH, INVENTORY
OTHER	Other	OPERATION, ORDER_LINE, BATCH, INVENTORY, EQUIPMENT

17.2 Delay Reasons (10)

Reason Code	Description
EQUIPMENT_BREAKDOWN	Equipment breakdown or failure
MATERIAL_SHORTAGE	Raw material not available
OPERATOR_UNAVAILABLE	Operator not available
QUALITY_RETEST	Quality retest required
SCHEDULED_MAINTENANCE	Scheduled maintenance window
UTILITY_OUTAGE	Power or utility interruption
TOOLING_CHANGE	Tooling change or setup
QUALITY_ISSUE	Quality issue
SCHEDULING	Scheduling conflict
OTHER	Other

17.3 Process Parameters Configuration

Process parameters define the acceptable ranges for each operation type. These are configured per operation type (not per product).

Operation Type	Parameter	Unit	Min	Max	Default	Required
MELTING	Temperature	°C	1550	1700	1620	Yes
MELTING	Power	MW	30	80	55	Yes
CASTING	Casting Speed	m/min	0.8	2.5	1.2	Yes
CASTING	Mold Temperature	°C	200	350	280	Yes
HOT_ROLLING	Entry Temperature	°C	1100	1250	1180	Yes
HOT_ROLLING	Finish Temperature	°C	850	950	880	Yes
COLD_ROLLING	Rolling Force	kN	5000	25000	15000	Yes
ANNEALING	Soak Temperature	°C	650	750	700	Yes
ANNEALING	Soak Time	hours	8	24	16	Yes

17.4 Units of Measure Reference

These are the unit codes used across materials, products, batches, and inventory records. There is no separate `units_of_measure` database table; units are stored as VARCHAR values on each entity.

Code	Name	Type
T	Metric Ton	WEIGHT
KG	Kilogram	WEIGHT
L	Liter	VOLUME
EA	Each	COUNT
PC	Piece	COUNT

---

18. Summary Counts

Entity	Count	Details
Users	1	Admin only
Customers	12	11 active, 1 inactive
Products	7	2 HR Coils, 2 CR Sheets, 2 Rebars, 1 Billet
Materials	31	15 RM, 9 IM, 7 FG
Processes	6	4 active, 1 draft, 1 inactive
Routings	4	One per active process
Routing Steps	22	8 + 3 + 7 + 4 steps
Operation Templates	18	17 active, 1 inactive
BOM Trees	8	One per product (order SKU), 88 total nodes
Equipment	16	12 available, 2 in use, 1 maintenance, 1 on hold

Operators	12	11 active, 1 inactive
Orders	45	15 created, 12 in-progress, 9 completed, 4 on-hold, 2 blocked, 3 cancelled
Order Line Items	82	25 original + 57 additional
Operations (Runtime)	425	93 from patch 002 + 332 from patch 003
Batches	70	56 from patch 002 + 14 from patch 003
Inventory Records	70	56 from patch 002 + 14 from patch 003
Batch Relations	40	Genealogy chains for traceability
Batch Number Configs	4	Operation-type rules
Process Parameters	9	For MELTING, CASTING, HOT_ROLLING, COLD_ROLLING, ANNEALING
Hold Reasons	10	Quality, Safety, Equipment, Customer, etc.
Delay Reasons	10	Equipment, Material, Operator, Quality, etc.

---

19. Batch Genealogy (Traceability)

The system maintains parent-child relationships between batches through batch relations. This enables both forward traceability (what was this material used for?) and backward traceability (what materials went into this product?).

19.1 Genealogy: Order 5 (HR Coil 2mm - COMPLETED)

This order demonstrates a complete traceability chain from raw materials to finished goods.

```
BACKWARD TRACE (from finished product to raw materials):

B-FG-001 (HR Coil 2mm, 75T, AVAILABLE)
  |-- consumed from B-IM-008 (HR Coil Rough, 78T)
       |-- consumed from B-IM-007 (Steel Slab, 82T)
            |-- consumed from B-IM-006 (Liquid Steel, 85T)
                 |-- consumed from B-RM-001 (Scrap A, 56T)
                 |-- consumed from B-RM-003 (Scrap B, 16T)
                 |-- consumed from B-RM-004 (Iron Ore, 12T)
                 +-- consumed from B-RM-008 (Coal, 8T)
```

19.2 Genealogy: Order 1 (HR Coil 2mm - IN_PROGRESS)

The in-progress chain shows partial traceability up to the current production stage.

```
Raw Materials --> Liquid Steel --> Steel Slab --> (pending rolling)

B-RM-001 (Scrap A, 105T) ----+
B-RM-003 (Scrap B, 30T)  ----+---> B-IM-001 (Liquid Steel, 165T, CONSUMED)
B-RM-004 (Iron Ore, 22T) ----+         |
B-RM-008 (Coal, 15T)     ----+         +--> B-IM-002 (Steel Slab, 155T, AVAILABLE)
B-RM-002 (Scrap A, 40T)  ----+              (awaiting rolling operations)
B-RM-006 (FeSi, 3 KG)    ----+
```

19.3 Genealogy: Order 3 (Rebar 10mm - IN_PROGRESS)

```
Raw Materials --> Liquid Steel --> Steel Billet --> (pending reheat/roll/quench)

B-RM-002 (Scrap A, 160T) ----+
B-RM-011 (Scrap B, 36T)  ----+---> B-IM-004 (Liquid Steel, 220T, CONSUMED)
B-RM-004 (Iron Ore, 30T) ----+         |
B-RM-008 (Coal, 18T)     ----+         +--> B-IM-005 (Steel Billet, 210T, AVAILABLE)
B-RM-006 (FeSi, 2 KG)    ----+              (awaiting billet reheating)
```

19.4 Genealogy: Order 12 (Rebar 12mm - COMPLETED)

```
Full chain: Raw Materials --> Liquid Steel --> Billet --> Rolled Bar --> Rebar

B-RM-002 (Scrap A, 140T) ----+
B-RM-017 (Scrap C, 45T)  ----+---> B-IM-015 (Liquid Steel, 130T, PRODUCED)
B-RM-007 (FeMn, 8 KG)    ----+         |
                                        +--> B-IM-010 (Billet, 180T)
                                                  |
                                                  +--> B-IM-014 (Rolled Bar, 178T)
                                                            |
                                                            +--> B-FG-005 (Rebar 10mm, 175T, PRODUCED)
```

19.5 Genealogy: Order 13 (HR Coil 4mm - COMPLETED)

```
Full chain: Raw Materials --> Liquid Steel --> Slab --> HR Rough --> HR Coil 4mm

B-RM-021 (Scrap A, 100T) ----+
B-RM-022 (Scrap B, 30T)  ----+---> B-IM-020 (Liquid Steel, 100T, AVAILABLE)
B-RM-004 (Iron Ore, 10T) ----+         |
                                        +--> B-IM-016 (Steel Slab, 125T, PRODUCED)
                                                  |
                                                  +--> B-IM-019 (HR Rough, 120T)
                                                            |
                                                            +--> B-FG-004 (HR Coil 2mm, 118T, AVAILABLE)
```

19.6 CR Sheet Production Chain (Cross-Order)

The CR Sheet traceability shows material flowing through pickling, cold rolling, and annealing.

```
B-IM-019 (HR Rough, 90T) --> B-IM-011 (Pickled Strip, 85T)
                                  |
                                  +--> B-IM-012 (CR Strip, 80T, PRODUCED)
                                            |
                                            +--> B-IM-013 (Annealed Strip, 75T)
                                                      |
                                                      +--> B-FG-002 (CR Sheet 1mm, 70T, AVAILABLE)
```

19.7 Batch Split Example

One batch split is recorded in the demo data:

```
B-IM-002 (Steel Slab 200mm, 155T, AVAILABLE)
  |
```

```
  +-- SPLIT --> B-IM-009 (Steel Slab 200mm, 30T, QUALITY_PENDING)
                [Split off 30T for quality investigation - surface cracks detected]
```

Batch Relation Types

Relation Type	Meaning	Count in Demo
MERGE	Multiple parent batches combined into one child	35
SPLIT	One parent batch divided into multiple children	1
CONSUME	Parent batch consumed during production	4

---

20. Demo Scenarios for Testing

The demo data has been designed to support several key testing and demonstration scenarios. Here is a guide to what you can demonstrate with the pre-configured data.

20.1 Production Confirmation Demo

Scenario: Confirm production for an in-progress order

Available READY operations for immediate confirmation:

- **Operation 6** (Order 1): Rough Rolling for HR-COIL-2MM, 150T
- **Operation 9** (Order 2): Pickling for CR-SHEET-1MM, 80T
- **Operation 16** (Order 3): Billet Reheating for REBAR-10MM, 200T
- **Operation 50** (Order 11): EAF Melting for HR-COIL-2MM, 80T
- **Operation 52** (Order 4): Scrap Charging for HR-COIL-2MM, 100T
- **Operation 53** (Order 6): Scrap Charging for REBAR-10MM, 300T
- **Operations 61, 69, 72, 79, 86** and many more from additional orders

20.2 Hold Management Demo

Scenario: Apply and release holds on various entity types

- **Apply hold:** Select any available batch, inventory item, or operation
- **View active holds:** 8 active holds across BATCH, INVENTORY, OPERATION, EQUIPMENT, and ORDER types
- **Release hold:** The 4 released holds demonstrate the release workflow with comments

20.3 Inventory Management Demo

Scenario: View and manage inventory across all states

- **Available inventory:** 51 records ready for production or shipment
- **Blocked inventory:** 2 records requiring disposition
- **On-hold inventory:** 4 records under investigation
- **Reserved inventory:** 2 records allocated to Order ORD-2026-009
- **Historical consumed:** 5 records showing past consumption

20.4 Batch Traceability Demo

Scenario: Trace a finished product back to its raw material sources

- **Best demo path:** Start with B-FG-001 (HR Coil 2mm, 75T from Order 5) and trace backward through 4 levels to raw materials
- **Forward trace:** Start with B-RM-001 (Scrap A) and see how it was used in multiple production runs

20.5 Multi-Stage Order Demo

Scenario: View orders that span multiple production processes

- **Order 33 (Full Pipeline):** HR-COIL-2MM + CR-SHEET-1MM + REBAR-10MM across 3 processes (18 total operations)
- **Order 42 (4-Stage):** STEEL-BILLET-100 + HR-COIL-2MM + CR-SHEET-2MM + REBAR-10MM across all 4 processes (22 total operations)
- **Order 29 (HR->CR, Completed):** Shows complete multi-stage production flow

20.6 Equipment Status Demo

Scenario: View equipment across different operational states

- **Available (12):** Ready for assignment to production operations
- **In Use (2):** EAF-002 and CCM-002 actively assigned
- **Maintenance (1):** EAF-003 undergoing maintenance
- **On Hold (1):** PKL-001 with active safety hold (Hold #6)

20.7 Order Lifecycle Demo

Scenario: View orders at every stage of their lifecycle

- **Created:** 15 orders awaiting scheduling
- **In Progress:** 12 orders with active production
- **Completed:** 9 orders fully produced and shipped
- **On Hold:** 4 orders temporarily paused
- **Blocked:** 2 orders with blocking issues
- **Cancelled:** 3 orders that were cancelled

20.8 Quality Management Demo

Scenario: Review quality-related holds and pending inspections

- **Quality holds:** Holds #1, #2, #3, #5, #8 are all quality-related
- **Quality pending batches:** B-IM-009 (slab), B-IM-018 (billet), B-FG-007 (HR coil)
- **Blocked batches:** B-RM-019 (high sulfur), B-IM-017 (thickness deviation)
- **Released quality holds:** Hold #9 (lab results clear), Hold #10 (moisture test passed)

---

21. Customer Order History

This section provides a view of orders grouped by customer for relationship management.

Customer	Orders	Total Qty (T)	Statuses
ABC Steel Corporation (CUST-001)	ORD-001, ORD-012, ORD-022, ORD-023	~1,040	1 in-progress, 1 completed, 1 blocked, 1 on-hold
Global Manufacturing Inc (CUST-002)	ORD-002, ORD-013, ORD-021, ORD-027, ORD-045	~1,000	2 in-progress, 1 completed, 2 created
Pacific Metal Works (CUST-003)	ORD-004, ORD-014, ORD-025, ORD-028	~820	1 created, 1 cancelled, 1 cancelled, 1 on-hold
European Auto Parts GmbH (CUST-004)	ORD-005, ORD-029, ORD-031, ORD-041, ORD-042	~1,945	2 completed, 3 created
Asian Electronics Ltd (CUST-005)	ORD-008, ORD-016, ORD-019, ORD-020, ORD-026, ORD-033, ORD-036	~1,130	1 on-hold, 3 in-progress, 3 created

BuildRight Construction (CUST-006)	ORD-003, ORD-030	~700	1 in-progress, 1 completed
Nordic Steel AS (CUST-007)	ORD-006, ORD-015, ORD-037, ORD-038	~870	1 created, 1 blocked, 1 completed, 1 in-progress
Middle East Metals LLC (CUST-008)	ORD-007, ORD-024, ORD-035, ORD-040	~950	3 created, 1 in-progress
South American Mining Co (CUST-009)	ORD-009, ORD-018, ORD-039, ORD-044	~1,540	1 created, 2 completed, 1 in-progress
Indian Steel Works Pvt (CUST-010)	ORD-010, ORD-032	~900	1 created, 1 on-hold
Oceanic Metals Ltd (CUST-011)	ORD-011, ORD-017, ORD-034, ORD-043	~820	2 in-progress, 1 cancelled, 1 completed
Canadian Steel Works (CUST-012)	(none)	0	Inactive customer, no orders

---

This document was generated from the SQL patch files located at:

- `backend/src/main/resources/patches/002_seed_data.sql` *(base seed data)*
- `backend/src/main/resources/patches/003_additional_data.sql` *(additional orders, operations, batches)*

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