

Production is decided before it begins

From automated MPS and MRP through E-MPS and CRP, and on to APS

To answer an order with “We can deliver by when?”, schedules, materials, people, and equipment must be viewed within a single plan. CMC TECH explains the structure of its proprietary production readiness solution and the sequence in which it expands.



“This order—by when can we deliver it?”

The reason it is difficult to answer this customer question immediately is not the ability of the person in charge, but where the information is located.

**Sales asks production,
production asks
materials,
and materials asks
suppliers.**

While the answer is making its way back, another order arrives and the conditions change again. As a result, delivery-date responses are delayed, and promises made in haste come back as adjustments on the day of production.

CAPACITY

Capacity

How much capacity is available on the lines and in the processes during that period?

MATERIAL

Materials

Will the required parts arrive before the input date?

WORKFORCE

People

Are the personnel and shifts needed to handle the process secured?

EQUIPMENT

Equipment

Can it operate after excluding repair and calibration schedules?

The four answers are in different places. Excel, the person in charge's memory, the warehouse, and the equipment register. This proposal covers the sequence for bringing all four together into a single plan.

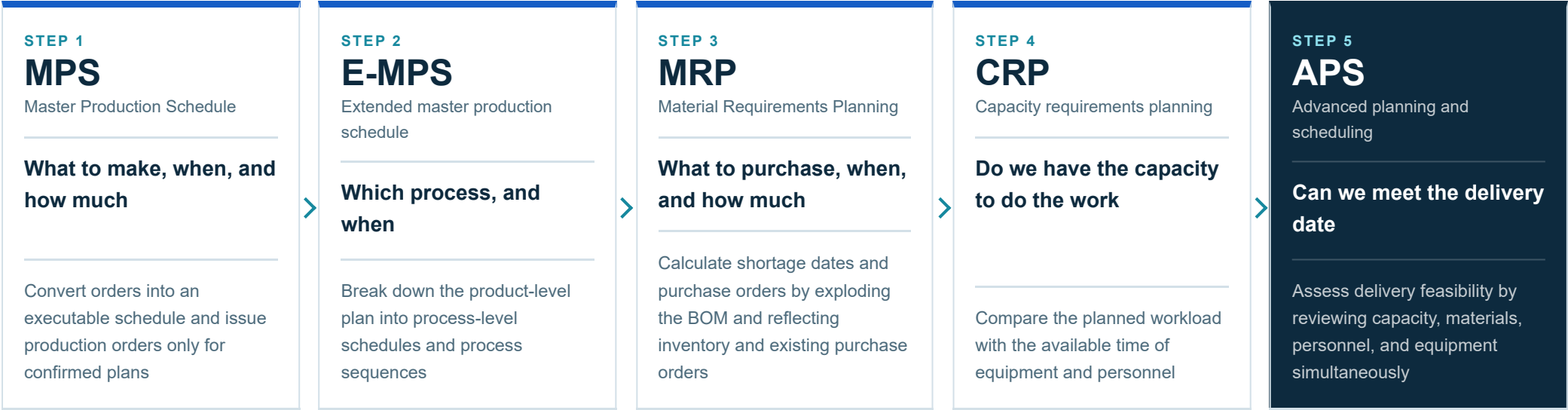
The problem becomes visible on the day of production, but the cause lies in the preparation stage.

Even when MES records actual results accurately, the burden on the shop floor remains if preparation is insufficient. Here are eight recurring shop-floor symptoms and their causes.

	Symptoms visible on the shop floor	Causes in the preparation stage	Relevant functions
Schedule	The schedule slips on the day, even though production started as planned	A schedule that does not reflect the line's daily capacity and working days	MPS capacity-based allocation
	The same semi-finished product is made over several days	Orders are issued separately for each finished product, so common demand cannot be consolidated	MPS hierarchical planning
	It is risky to change the conditions and recalculate	The calculation results are immediately reflected in actual production orders	Separation of planning and ordering
	It is impossible to tell which process is causing the bottleneck	There is only a product-level plan, with no process-level schedule	E-MPS process-level planning
Materials	The shortage is discovered only after the line stops	The point at which a shortage will occur is not calculated in advance	MRP time-phased planning
	Materials are purchased again even though they are already in stock	On-hand inventory and purchase orders already placed cannot be included in the calculation	MRP net requirements calculation
	Recalculation removes purchase orders that have already been organized	There is no distinction between confirmed purchase orders and purchase orders under review	Confirmed boundary · Fixed purchase orders
	The materials are ready, but there are no people or equipment	Only materials are prepared, without reviewing capacity	CRP · APS

Five questions, One plan

CMC-EIMS expands production preparation across five stages. Start with the stages you need and expand to the next stage using the same master data.



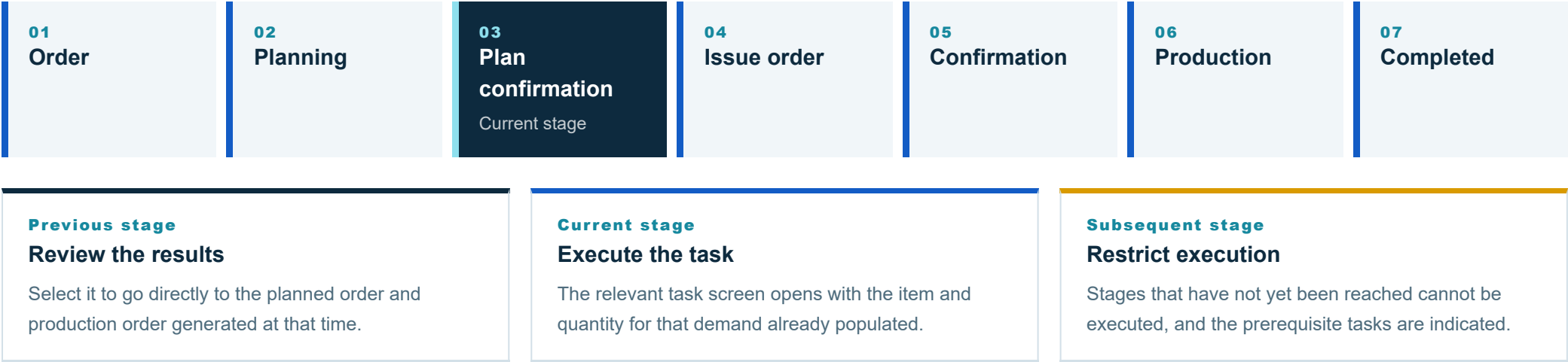
Common master data Items · BOMs · processes (routings) · resource capacity · factory calendars · lead times · lot policies — all five stages use the same master data.

MES actuals · work in process · losses Return to this plan to refine the next plan. Planning and execution are not completed in a single pass; they are repeatedly aligned.

The status of a single order

Seven stages are managed

You do not need to open multiple screens to check whether an order has been planned, an order has been issued, or a confirmation has been recorded. The workflow menu always displays the current stage.



- **No need to enter the same values again**
The order's item number, quantity, and due date carry over to the plan creation screen.
- **Production not included in orders, within the same plan**
Register inventory replenishment, trial production, rework, and urgent orders through the five-stage entry process.

This is not a menu for skipping stages. If the plan has not been confirmed, complete the prerequisite tasks first. During implementation, the approval procedures for plan changes and shop-floor changes are configured to match your operating standards.

Not a schedule on paper

An executable schedule is calculated

Simply distributing production quantities across dates does not show whether the schedule is feasible on the shop floor. Resource capacity and the factory calendar provide the basis for the schedule.

■ **Allocate within capacity limits**

Allocate work while observing the daily capacity and working days of lines and equipment. No work is scheduled on non-working days.

■ **Highlight overloaded periods with color**

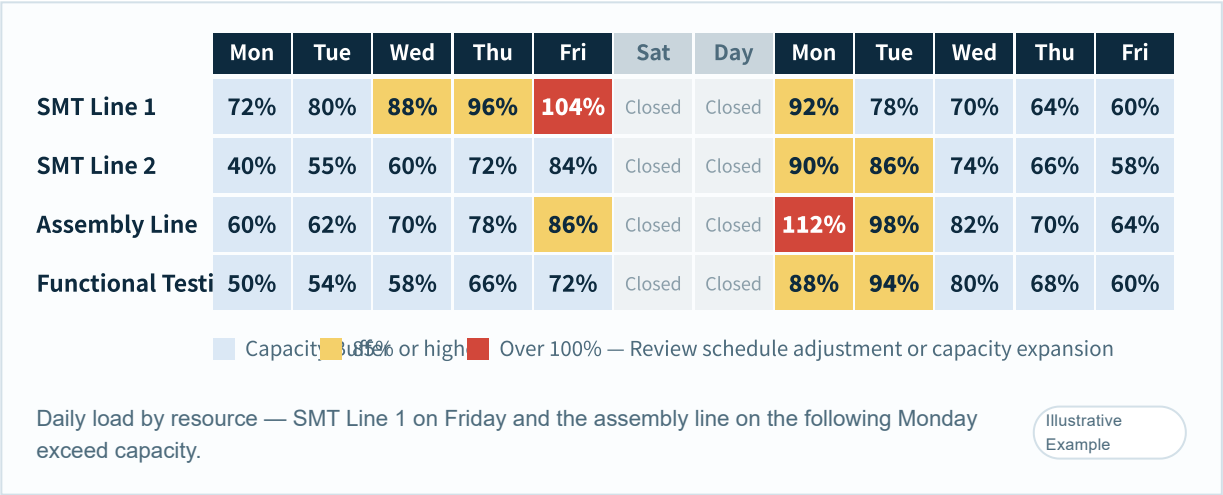
Distinguish utilization of 85% or more from utilization exceeding 100% by resource and date.

■ **Show the basis for the calculation**

Show setup and processing times, whether there is a delay, and the demand fulfilled by this order.

■ **Recalculate immediately when moved**

When a bar is moved, the planned order and resource load are recalculated, and other orders that should be reviewed together are indicated.

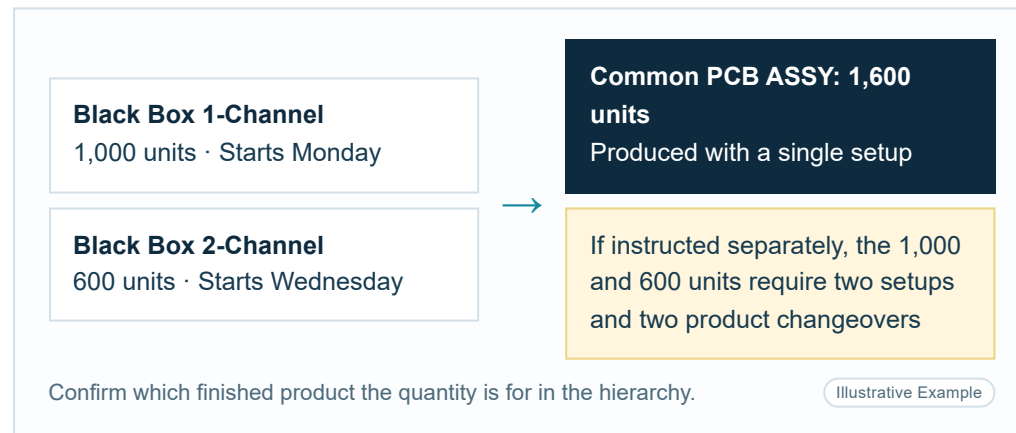


Even when calculations reflect capacity, any indication of overload or delay requires checking the cause and input conditions. This does not mean that delivery dates are guaranteed under any circumstances.

Common subassemblies are in one batch, recalculated safely

Electronic products often have multiple models sharing the same PCB ASSY. Both consolidating demand and repeating calculations must be possible without adding unnecessary burden.

Plan finished goods and subassemblies separately, then consolidate demand



Plans and instructions are separated

PLAN

Planning

Run calculations multiple times with different conditions. The preview does not create a planning version, so no data remains after you close it, even after reviewing it.

Confirmed

ORDER

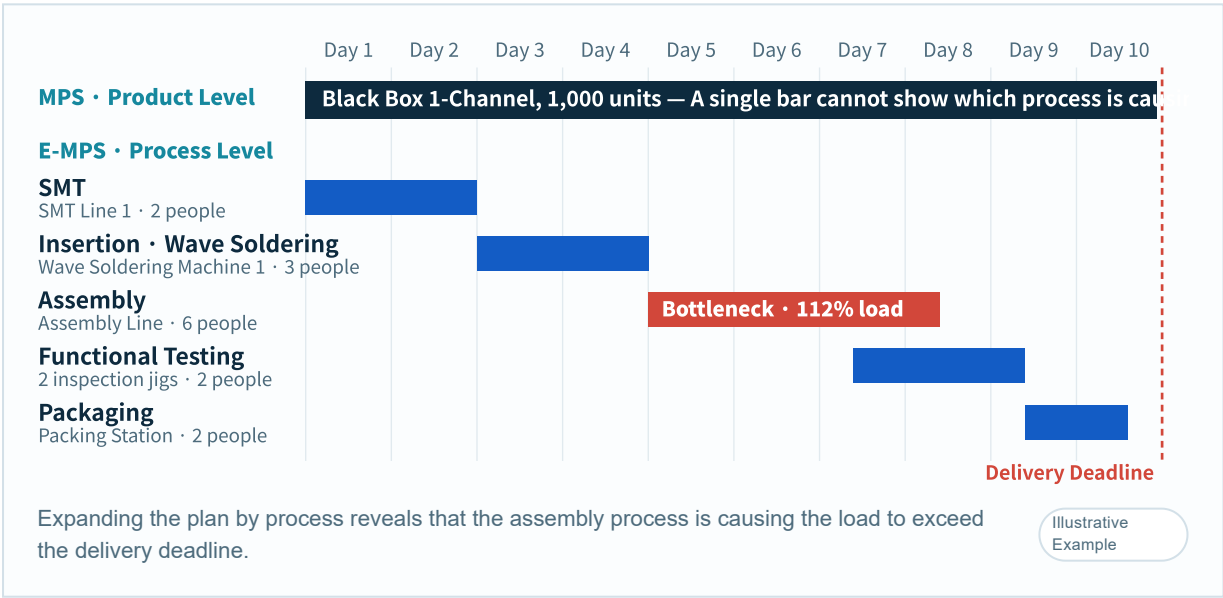
Production Order

An order number is assigned only when the order is confirmed. After that, manage confirmation, completed quantities, and change-request status.

- **Show the reason when requested and planned quantities differ**
Indicate which policy was applied: yield, minimum lot size, or multiples.
- **Count items requiring action**
Capacity overload, start-date overrun, or unscheduled items.

E-MPS — Extends product planning process planning into

Extended MPS goes beyond finished-good quantities and completion dates to plan schedules for each process, along with the equipment and personnel required for those processes.



Four Things E-MPS Adds

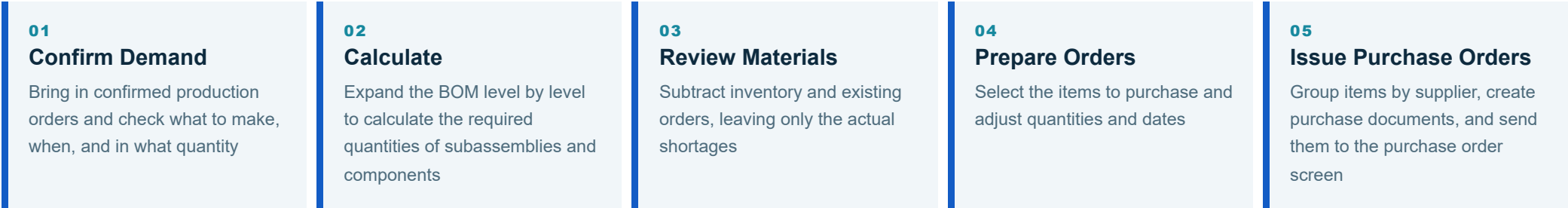
- **Schedules and dependencies by process**
Completion of the preceding process becomes the condition for starting the next process.
- **Equipment Availability Conditions**
Reflect the available operating hours of the equipment assigned to each process.
- **Workforce**
Review the personnel required for each process together with shift conditions.
- **Interprocess Waiting and Work in Process**
Check not only processing time but also the lead time that accumulates between processes.

The longer and more equipment-dependent the processes are, as in SMT, the harder it is to identify bottlenecks through product-level planning alone. The scope of connections among processes, equipment, and personnel is confirmed for each customer before finalization.

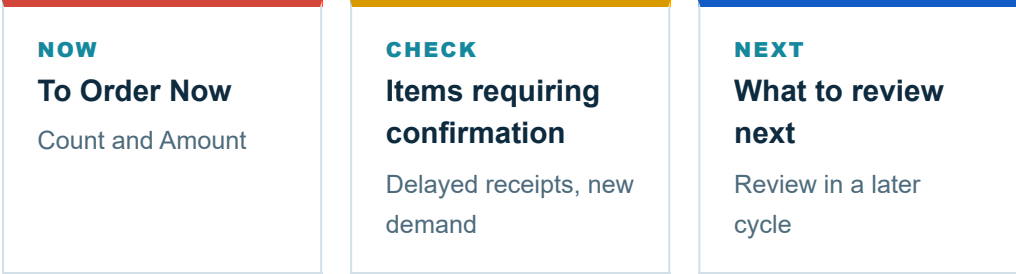
From Production Planning to Purchase Orders

Five Steps

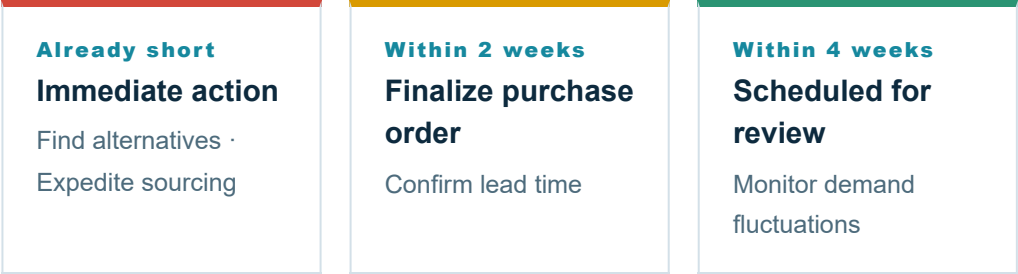
Once MPS determines what to make and when, MRP calculates the materials required for production and when they are needed. The starting point is a confirmed production order.



Your tasks are divided into three cards



Prioritize urgent items by when shortages will occur



Do not place an order based on color alone. Confirm the supporting evidence—whether an existing receipt was delayed or new demand has arisen—before making a decision.

How much rather than when it will be short is calculated

A large gross requirement does not mean purchasing the entire quantity. We reflect the quantity already secured and distinguish the week when a shortage will occur from the week when an order must be placed.

Connector C-100	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Gross requirement	300	400	0	600	300	400
Scheduled receipt (already ordered)	0	500	0	0	0	0
Net requirement	0	0	0	500	300	200
Planned receipt	0	0	0	500	500	500
Planned order	0	500	500	500	0	0
Projected inventory	200	300	300	200	400	500

On-hand inventory 500 · Safety stock 200 · Lead time 2 weeks · Order multiple 500

Illustrative Example

The gross requirement is 2,000 units, and the quantity to be newly ordered is 1,500 units. And the first order must be placed not in Week 4, when the shortage occurs, but in Week 2.

Trace back why this quantity is needed

Connector C-100 · 600 units
Needed in Week 4



PCB ASSY · 600 units
Subassembly plan

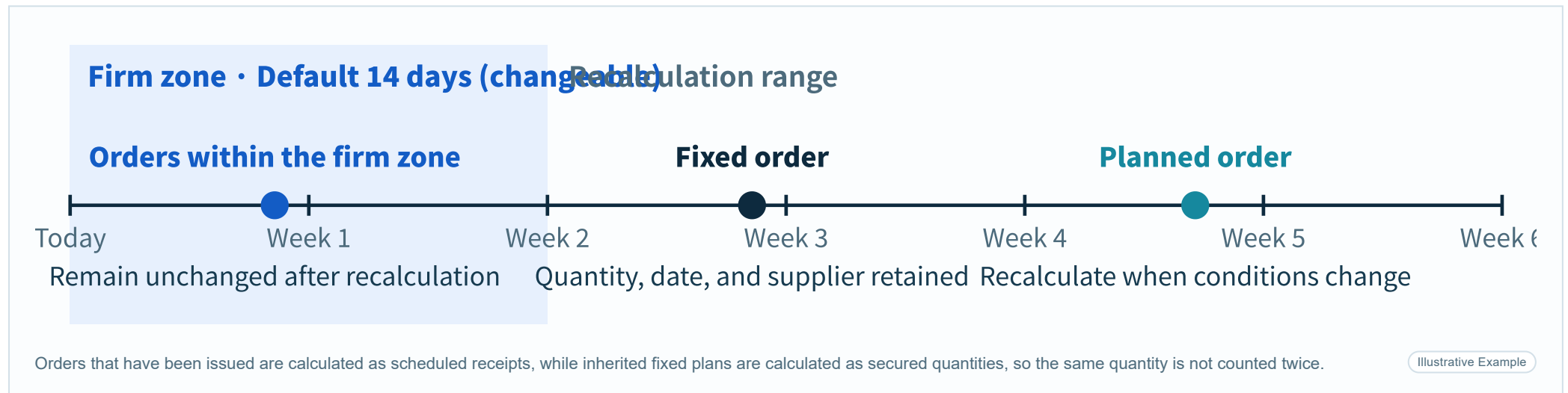


Black box, 2-channel · 600 units
Production orders and sales orders

Tracing the basis of requirements (pegging) provides the rationale for quantities in purchase approvals and is the starting point for identifying materials affected when demand changes.

Even when recalculated the plans already made do not disappear

If even purchase orders agreed upon through consultation fluctuate with every recalculation, the person in charge has to repeat the same work. Fixed orders and the firm zone define that boundary.



When a receipt arrives

we only reread the inventory

Only projected inventory and the timing of shortages are updated. Planned orders and fixed orders remain unchanged.

Each time it is calculated

stored as a cycle

The conditions and results at that point are retained, allowing you to review why a previous plan was made.

Two cycles side by side

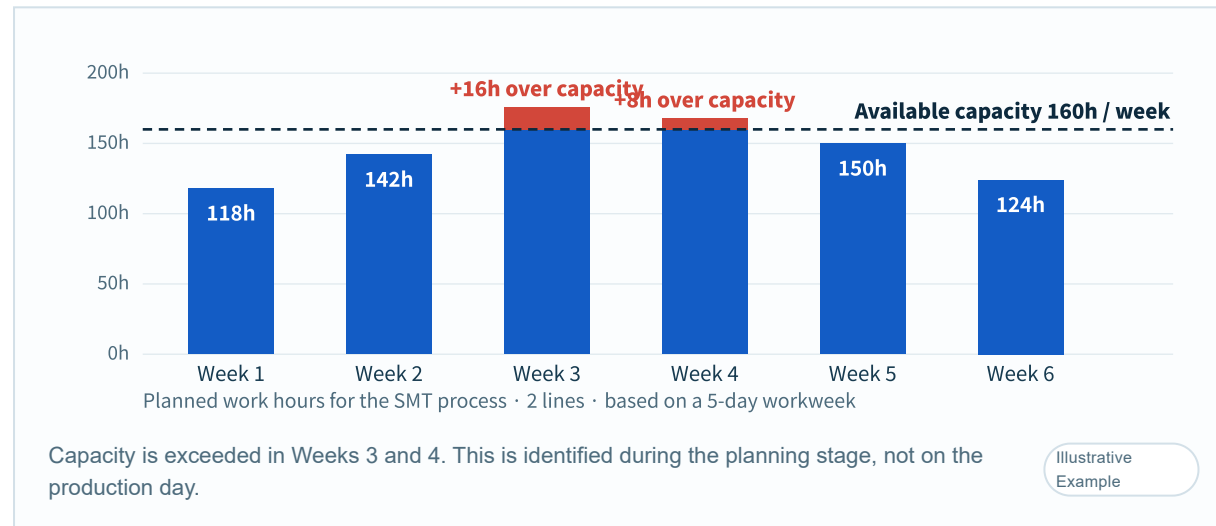
Compare only what has changed

Classify changes as newly added, increased, decreased, or rescheduled.

If demand or the BOM itself has changed, you must check whether an inventory update alone is sufficient. Preserve the cycle that served as the basis for the order and review the new conditions as a new cycle.

CRP — Even when materials are ready the capacity to execute is still required

Capacity requirements planning compares planned workloads with available capacity using the same time unit. Knowing in advance which weeks are over capacity gives you more options for responding.



Three components of capacity

- **Equipment**
Available operating hours, repair and calibration schedules
- **People**
Work rules, shifts, actual attendance, and available personnel
- **Processes**
Standard time, setup time, and yield

Responses to overcapacity

Reschedule

Distribute across weeks with spare capacity

Additional shifts · Overtime

Expand available hours

Split lots

Start with the quantities first

Review subcontracting

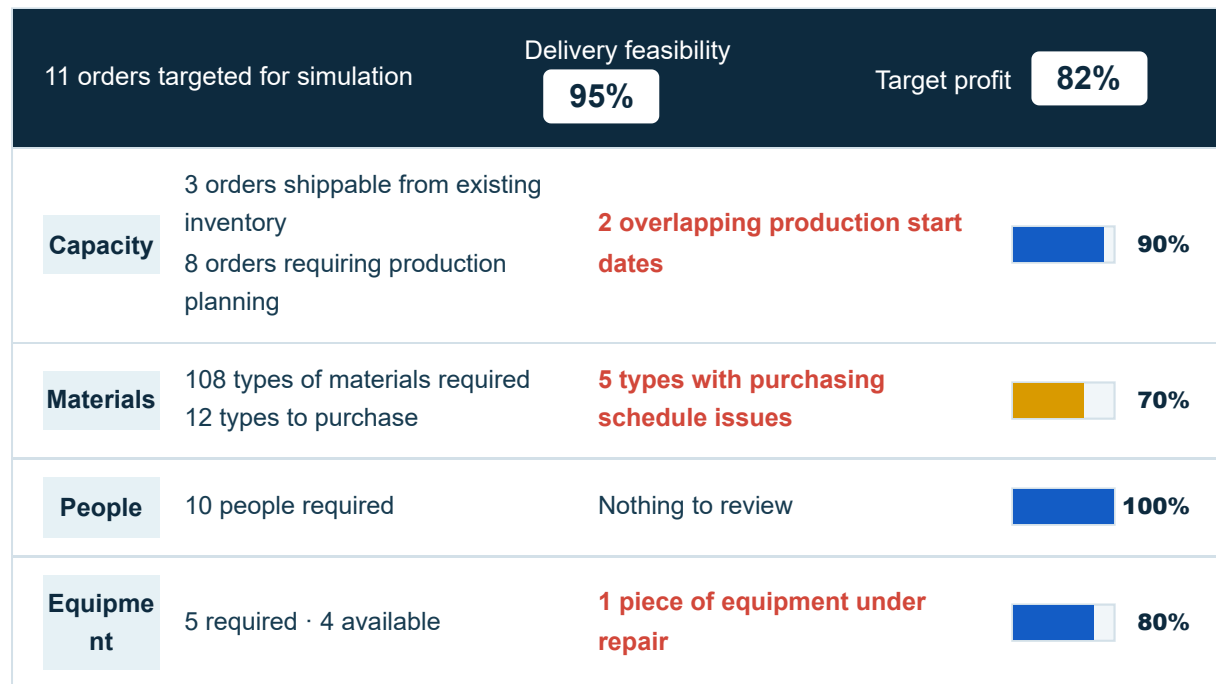
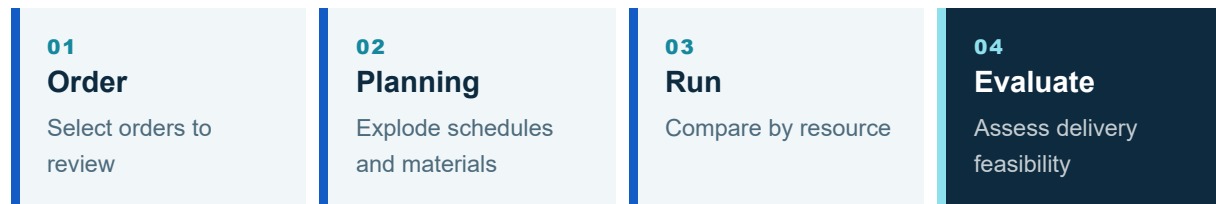
Outsource by process

People's time is also a production resource. When connecting it to work standards in HR and time and attendance, define personal data access and approval responsibilities in line with company rules.

APS — four resources **View them at once**

Assess delivery feasibility

Select an order and run a simulation to evaluate capacity, materials, people, and equipment together. Before confirming it, first identify what needs to be addressed.



From the evaluation items, go directly to the production plan, material details, time and attendance data, and equipment schedule.

Illustrative Example

APS operates on top of MPS and MRP

APS does not require new data. It makes assessments based on MPS schedules, MRP materials, CRP capacity, and time and attendance and equipment information when they are maintained on the same basis.

■ That is why the order matters

MPS and MRP automation comes first; APS is an extension that brings the results together.

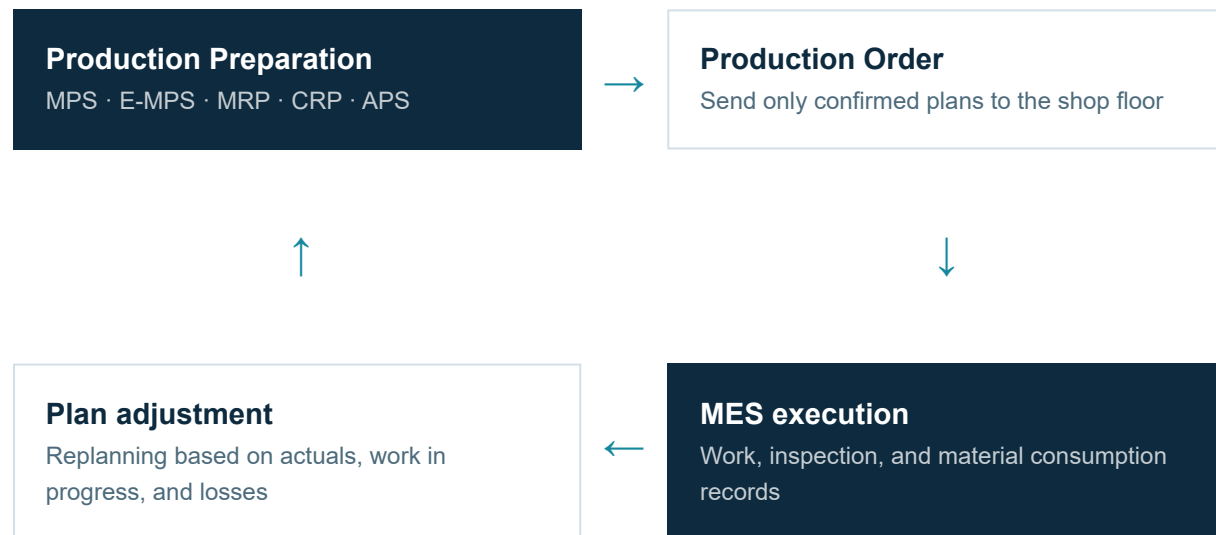
■ Evaluations provide the basis for decisions

The figures are calculated from the entered master data and plans; the final decision is made by the person in charge.

The evaluation items, calculation criteria, and scope of linked data are finalized after review with each customer.

Plans are validated on the shop floor, and the shop floor improves the plans

The prepared plan is executed in MES, and the execution results flow back into planning. The gap between schedules on paper and actual shop-floor conditions is reduced only when equipment operation and workforce allocation are considered together.



Three things MES returns to planning

■ Interaction

Instructions, actuals, and work-in-progress status are exchanged between planning and the shop floor. This determines whether the next process can actually begin.

■ Error-proofing

Verify at the time of work that materials or sequences different from the plan are not used.

■ Traceability

Record who made what, when, and under which LOT to track differences between the plan and execution.

The actual scope of data integration and level of automated control between planning and MES are confirmed during implementation.

When everyone sees the same plan

Their work changes

We do not promise implementation benefits in numbers. Instead, we explain what changes for each role. Actual results vary depending on the accuracy of master data and operating methods.

Role	Now	After implementation
Sales	Wait for the production manager's response before replying about the delivery date	Respond based on a schedule reviewed against capacity and materials
Production Planning	Split the schedule in Excel and adjust it on the day	Identify overload periods during planning and review again after changing the conditions
Purchasing · Materials	Discover shortages on the day and purchase again even when inventory is available	Know in advance which weeks will have shortages and order only the actual shortfall
Shop floor	Receive instructions but wait because materials, equipment, and personnel do not line up	Receive instructions after readiness is confirmed, with actuals reflected in the next plan
Management	It is difficult to understand why the plan changed	The plan for each run, reasons for changes, and basis for purchasing remain documented

The calculation rules remain in the system even when the person in charge changes. However, BOMs, inventory, and expected receipts must be accurate, and production demand must be up to date to produce the same results.

Not everything at once

Expand step by step does

Not every customer needs all five stages. We first review existing systems and master data, then configure the necessary stages first.

01**Master data refinement**

Align items, BOMs, processes, resource capacity, and the factory calendar with actual shop-floor conditions.

02**MPS · MRP Automation**

Connect orders to production instructions, and material requirements to purchase orders.

03**E-MPS · CRP expansion**

Add process-level scheduling and reviews of equipment and workforce capacity.

04**APS**

Expand to delivery assessment by evaluating four resources together.

What to review together before implementation

- Does the BOM match the materials actually consumed?
- Can inventory quantities be trusted as the basis for calculation?
- Are standard times and setup times managed for each process?
- Who manages holidays and overtime, and where?
- Are lead times, minimum lots, and order multiples defined for each item?
- What data should be carried over from the existing ERP and MES?

The implementation period and cost are estimated after confirming the selected stages, data migration, integration with existing systems, and the scope of shop-floor application.

Production is decided before it begins. We will prepare that decision together.

We begin by using one of your customer orders to verify together whether schedules, materials, and capacity remain connected under the same standards.

ONLINE PT

MPS · MRP Online Presentation

AI presenters Hannah and Esther explain the screens and answer questions.

INQUIRY

System Implementation Inquiry

Tell us your industry and current systems, and we will review the implementation scope.

SOLUTIONS

Other Recommended Solutions

Review proposals for product lifecycle, traceability, and the digital value chain.

CMC TECH · 43 Yeouiseo-ro, Yeongdeungpo-gu, Seoul

T 02-785-6730

E master@cmctech.co.kr