

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.

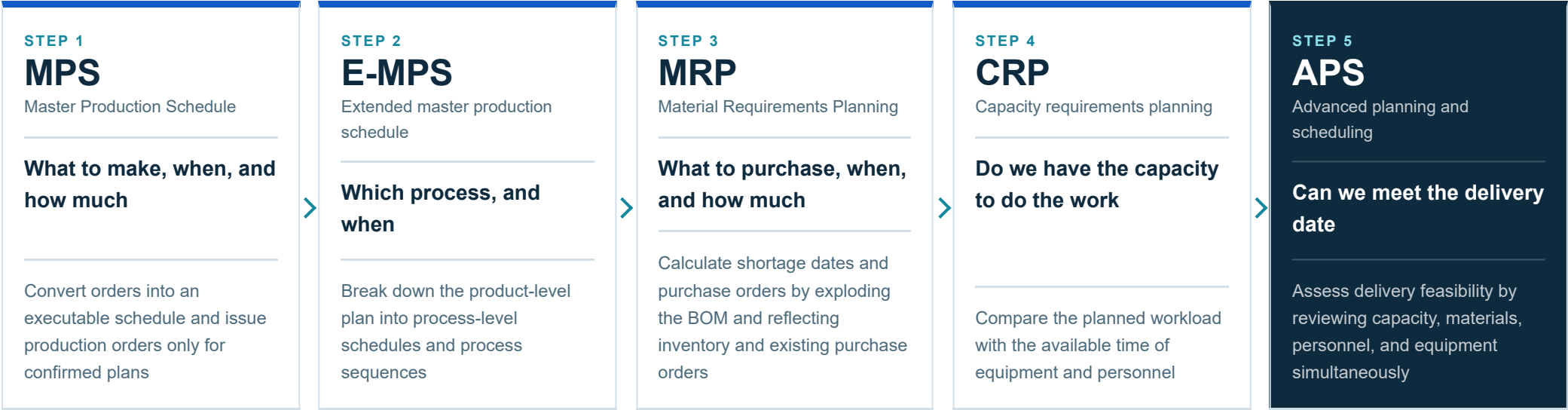
The problem becomes visible on the day of production, but the cause lies in the preparation stage.

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.



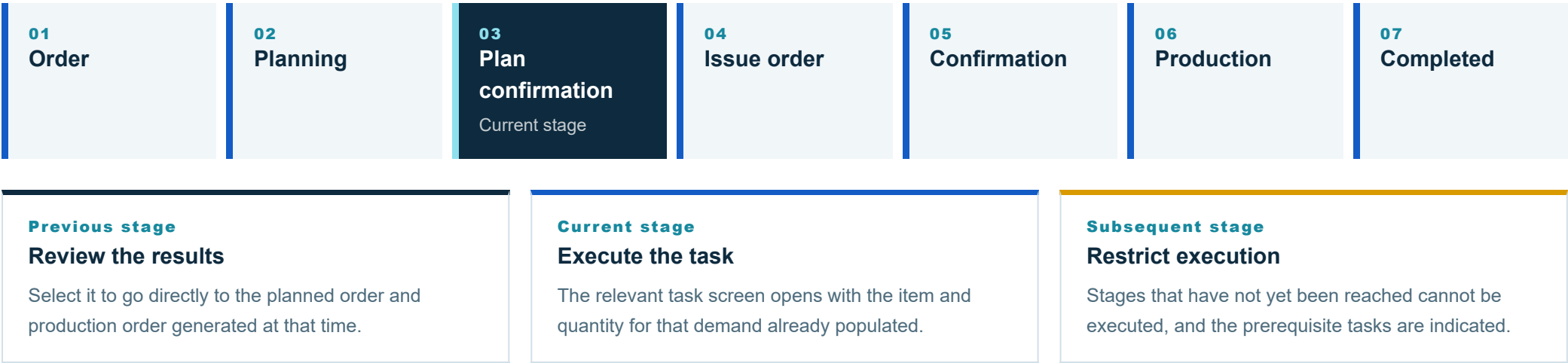
Common master data Items · BOMs · processes (routings) · resource capacity · factory calendars · lead times · lot policies — all five stages use the same master data.

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**

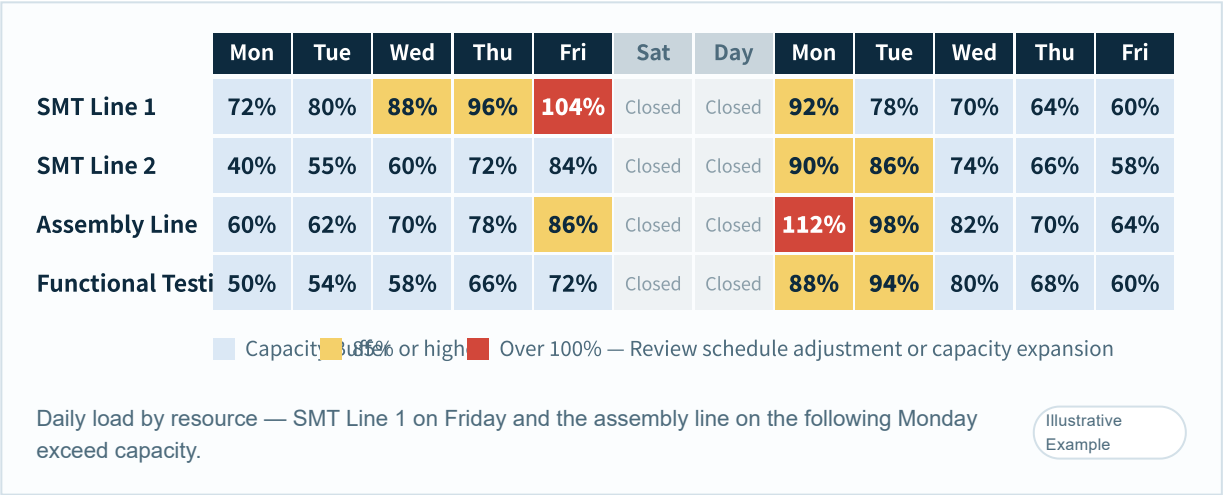
Distinguish utilization of 85% or more from utilization exceeding 100% by resource and date.

■ **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.

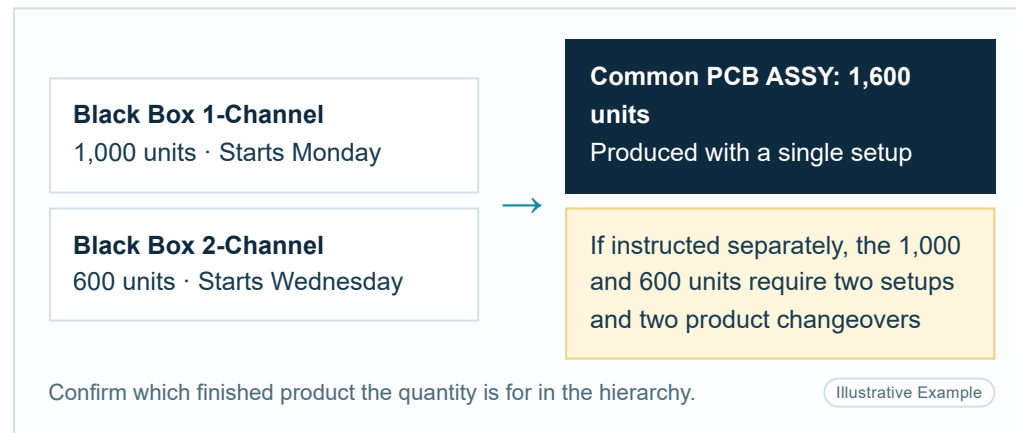


Even when calculations reflect capacity, any indication of overload or delay requires checking the cause and input conditions. This does not mean that delivery dates are guaranteed under any circumstances.

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.

ORDER

Production Order

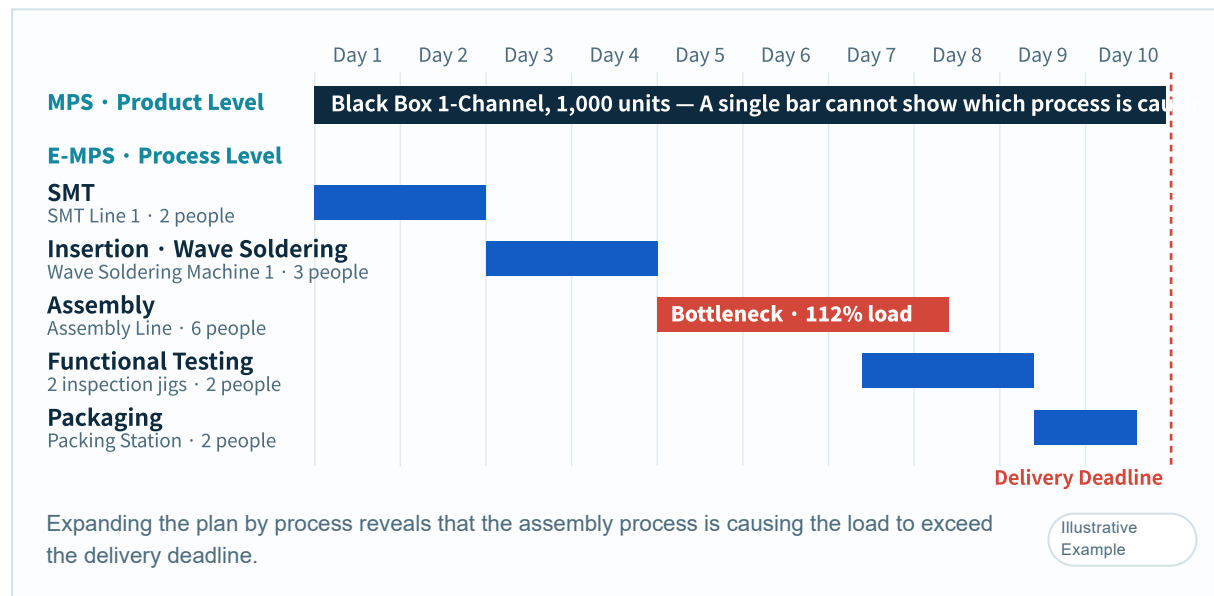
An order number is assigned only when the order is confirmed. After that, manage confirmation, completed quantities, and change-request status.

Confirmed

- **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

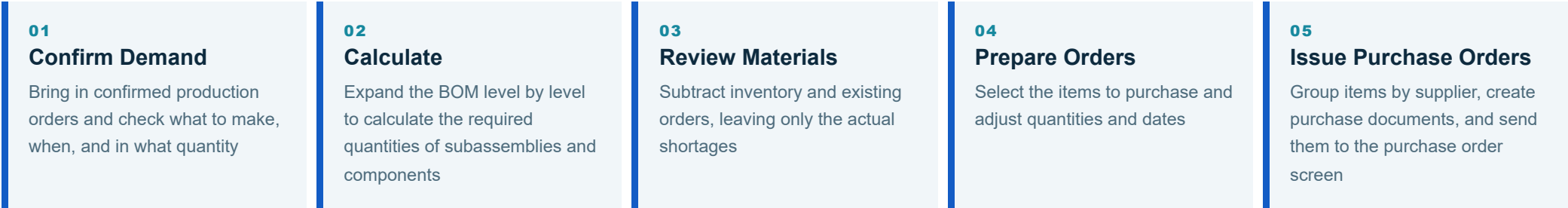
- **Schedules and dependencies by process**
Completion of the preceding process becomes the condition for starting the next process.
- **Equipment Availability Conditions**
Reflect the available operating hours of the equipment assigned to each process.
- **Workforce**
Review the personnel required for 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.

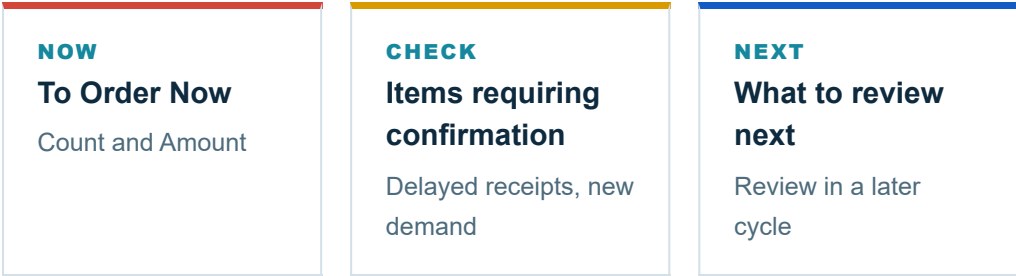
From Production Planning to Purchase Orders

Five Steps

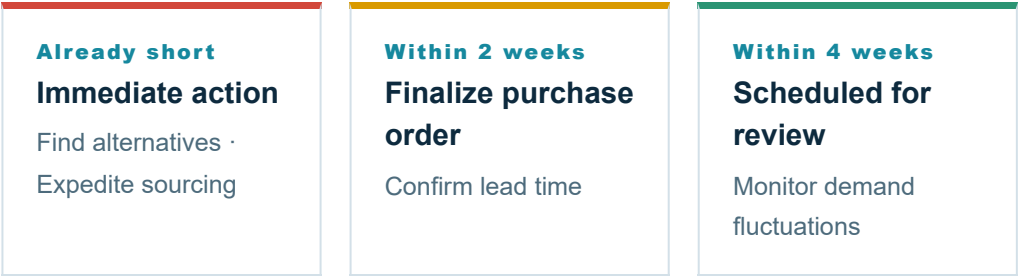
Once MPS determines what to make and when, MRP calculates the materials required for production and when they are needed. The starting point is a confirmed production order.



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

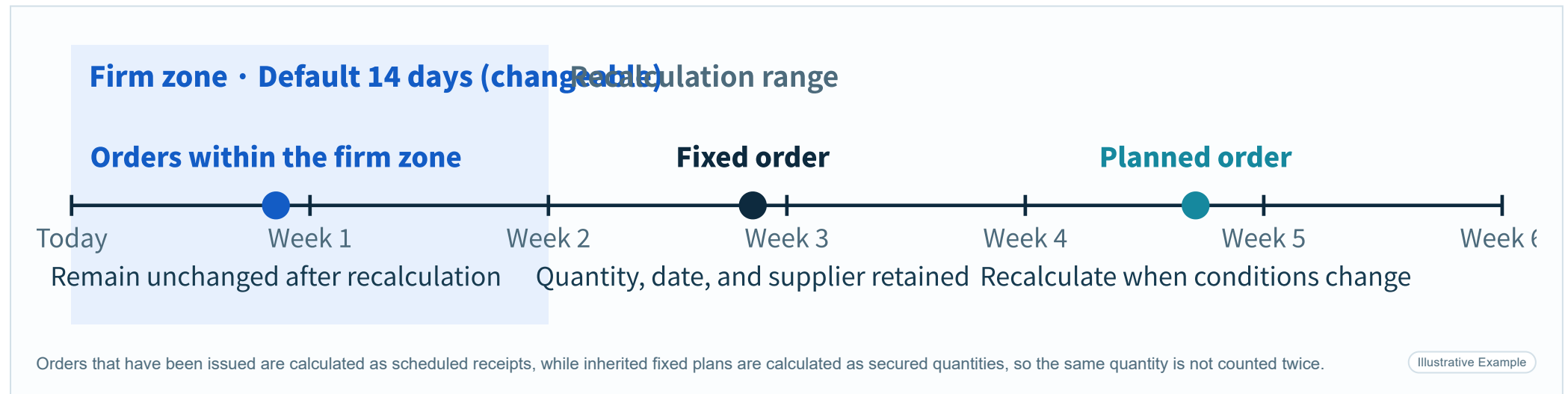


Black box, 2-channel · 600 units
Production orders and sales orders

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

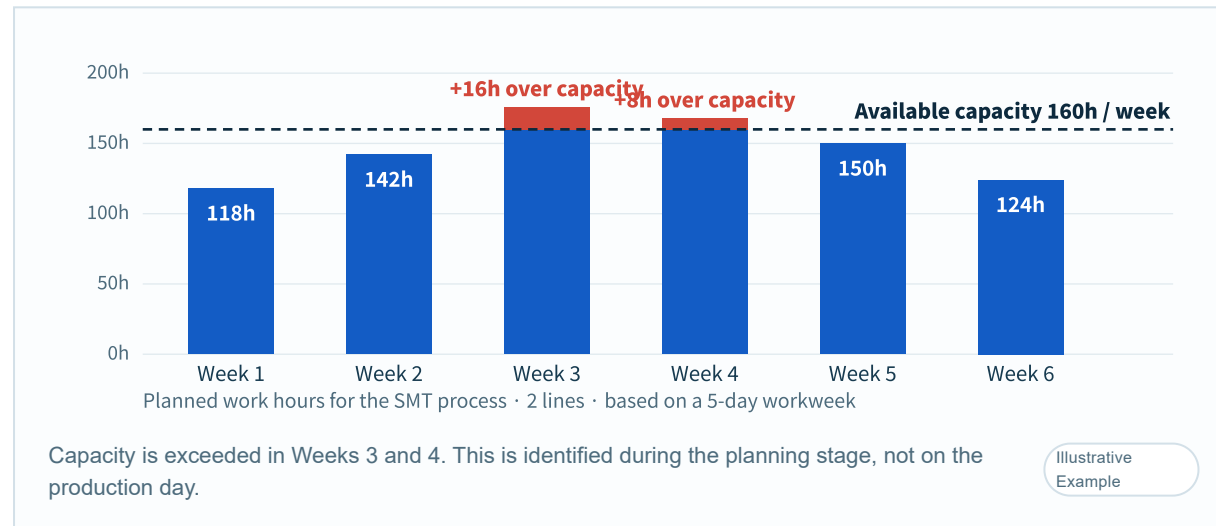
Compare only what has changed

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

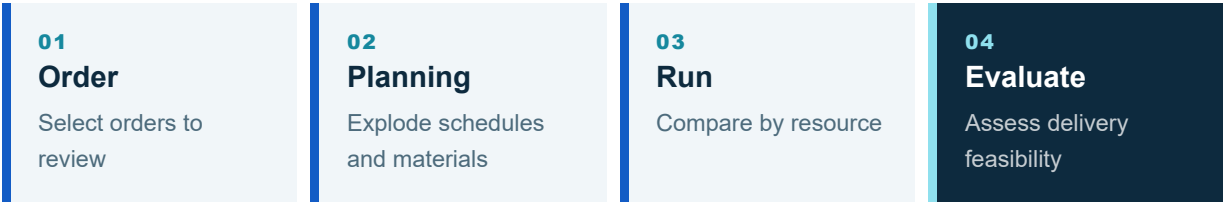
Outsource by process

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.



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.

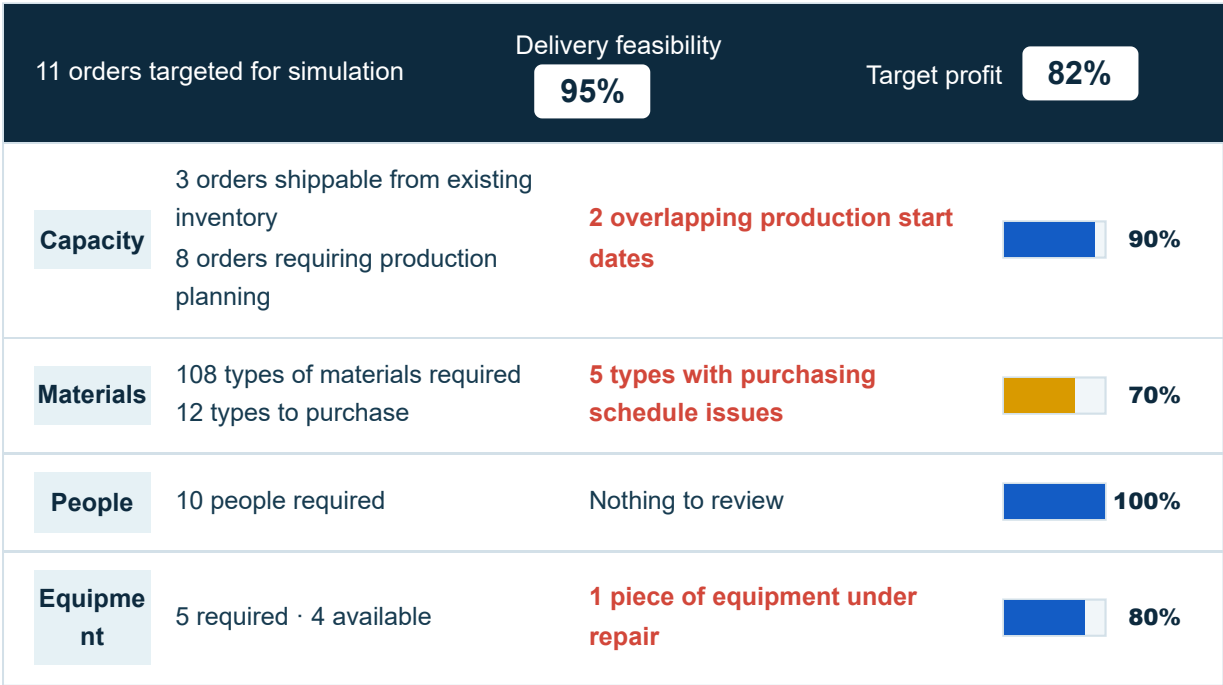
■ That is why the order matters

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.

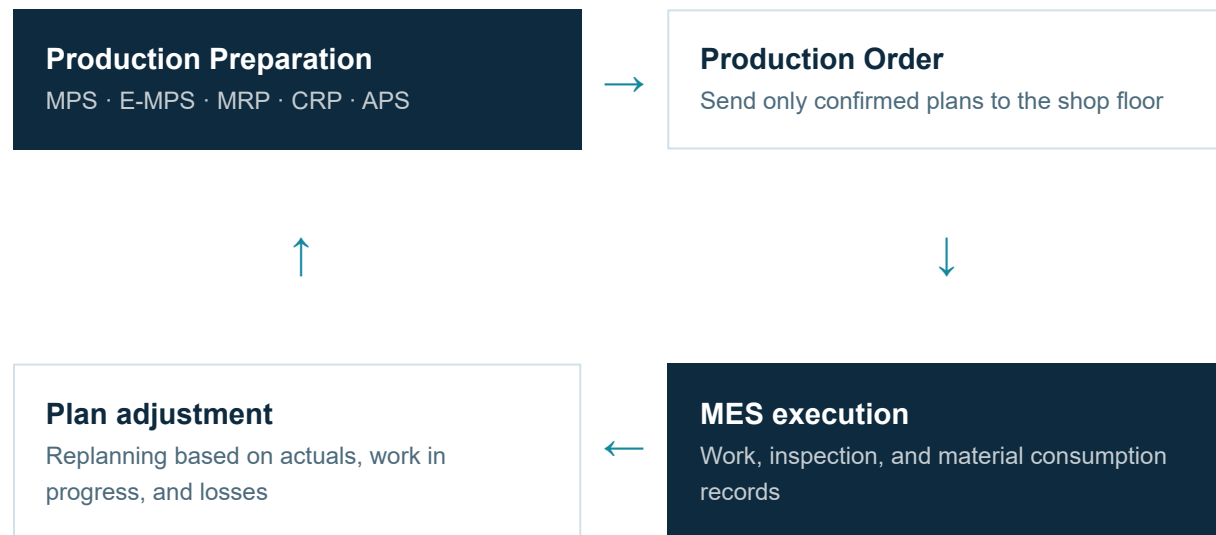


From the evaluation items, go directly to the production plan, material details, time and attendance data, and equipment schedule.

Illustrative Example

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.

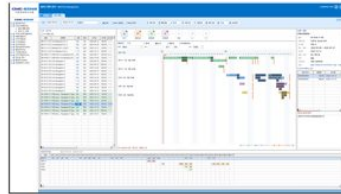
Actual Program Screens

These are the MPS and MRP screens of CMC-EIMS. This material has been scaled down for public viewing, and the screens and scope to be implemented will be finalized after reviewing the business requirements.

병목 자원을 즉시 식별합니다

자음별 점유 현황을 시간 축으로 확인합니다

- **자원별 정규 현황을 표시합니다**
매는 라면에 작업이 집중되고 매는 라면에 비어 있는 잔을 놓아도 됩니다.
- **드레고로 즉시 조정합니다**
매대를 옮기거나 매 줄을 조정하면 개회소와 자원 부족이 즉시 재개산합니다. 별도 저장 절차가 없습니다.
- **남기 기준선을 함께 표시합니다**
표구절을 세로선으로 표시하여 남기를 초과한 도어를 즉시 식별합니다.



MPS · Resource Utilization Status

Lines with Concentrated Workloads and the Delivery Due-Date Baseline

능력과 대조한 일정을 확정 전에 제시합니다

수량만 입력하면 일정은 시스템이 산출합니다

- **자민 능력과 자동으로 대표합니다**
입학한 수험생은 자민별 일정한 능력과 공간 일격에 대하여는 자수일과 판도일을 지을 안습합니다. 입당자나 일정한 개산일 필요가 없습니다.
- **확정 전에 결과를 검토합니다**
확정 결과 뒤의 어떤 일정한 일격 결과 결과를 지시하는 리라모이 있습니다. 계획 버전이 완성되지 않아 확한 후 종료로 재료가 남지 않습니다.
- **조직가 필요한 지점을 제시합니다**
능력 조직, 지식 조직, 일정한 일격 조직을 간수일 집계하고, 일정한 일격과 개산 수량이 다르므로 수를 최소로 배수 수 역일 일격이 적용되었는지 확인합니다.



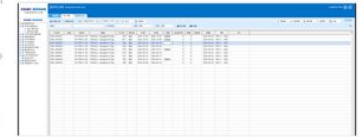
MPS · Preview Before Confirmation

Schedules Compared Against Capacity and Action Points

계획과 지시를 분리했습니다

반복 재계산에도 발현된 지시는 영향을 받지 않습니다

- **확정 시험에만 지시가 발행됩니다**
계획을 다시 계산해도 되는지 여부는 변경되지 않으며, 지시번호는 확정 시험에만 발행됩니다. 조건을 바꿔 여러 점도 맞을 수 있습니다.
- **지시는 한 화면에서 처리합니다**
기간 - 포털 - 지시번호 - 현황 상태로 조회하고, 현황과 생산관리 화면을 클릭해서 직접 수정해 저장합니다.
- **상태를 색으로 구분합니다**
매감 - 완료 - 변경요청을 색으로 구분하여 처리 현황을 즉시 확인할 수 있습니다.



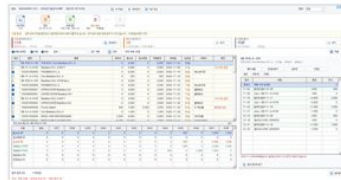
MPS · Separating Planning from Instructions

Issue Instructions Only Upon Confirmation

언제 모자라는지 봅니다

자재 하나의 앞일을 주 단위로 병합한다

- **한 표에 다 씁니다**
 풍소로, 집근처정, 순소로, 계획집고, 계획방주, 해상재고, 안전재고
 을 주자별로 사안의 씁니다.
- **목록을 가리지 씁니다**
 표는 자재 목록 아래에서 씁니다. 어느 자재를 보고 있는지 놓지
 지 씁니다.
- **그래프로도 씁니다**
 막대와 연으로 재고 흐름을 그려 아이티스로 뛰는 자질을 눈으로
 씁니다.



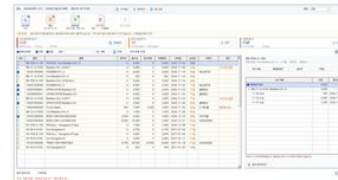
MRP - Weekly Requirements and Inventory

Identify the Weeks When Shortages Will Occur

왜 사야 하는지 답합니다

이 자료가 필요한 이유를 위로 거슬러 보아 줍니다

- **상위까지 거슬러 갑니다**
이 주제가 어느 반계로 막은 것인지, 그 반계물은 어느 생산자지 막은 것인지 단계별로 물었습니다.
- **수할 근거가 불충분하다**
각 단계마다 얼마나 필요한지, 반계까지 필요한지 함께 적었습니다.
- **결재 자리에서 답합니다**
이 수할이 왜 필요한가라는 질문에 최전선 직원도 답할 수 있습니다.



MRP - Basis for Upper-Level Requirements

Trace from Materials to Production Instructions

세운 계획이 사라지지 않습니다

다시 계산해도 창해 돈 발주는 그대로 남습니다

- **고정된 발주는 그대로 옵니다**
발주 준비해서 고정해 둔 물건 다들 회차로 수당 상황 지켜봐주시고 그대로 넘어옵니다.
- **확정 율타리를 합니다**
오늘부터 정한 일주 안에 발주해야 하는 것은 다시 계산해도 돈을 받지 않습니다. 기본 1달이내에 받을 수 있습니다.
- **두 번 사지 않습니다**
넘어온 발주는 이미 확정 물량으로 해서 소모를 합니다. 발주자가 나간 건은 절대 예정으로만 잡습니다.



MRP · Firm Orders and the Confirmation Boundary

Plans That Remain in Place After Recalculation

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.

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