



FACT SHEET



# Clever Manufacturing Plus

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## Benefits

- Improves compliance, traceability, and change management efficiency with a full audit trail.
- Enhances tool management efficiency, reducing downtime and supporting precise tool maintenance scheduling.
- Reduces waste, adds potential revenue, and improves traceability of by-products.
- Enhances resource allocation, visibility of production orders, and prevents bottlenecks.
- Quickly highlights potential issues, component shortages, and capacity bottlenecks.
- Ensures accuracy in production processes, component usage, and costs through comprehensive manufacturing analysis.

## Requirements

Dynamics 365 Business Central

**Do you struggle with managing engineering changes, tracking tools, reducing waste, optimising resources, and ensuring efficient production processes?**

Clever Manufacturing Plus complements the standard Dynamics 365 Business Central Manufacturing module by offering additional functionalities such as Engineering Change Control, Tooling, By-Product Management, Enhanced Visualizations, Enquiries, and Enhanced Analysis. These features improve compliance, traceability, change management efficiency, tool management, resource allocation, and overall production accuracy. This helps businesses mitigate potential problems, enhance efficiency, and maintain smoother operational workflows.

## Engineering Change Requests (ECRs):

Streamline manufacturing changes with a comprehensive audit trail. ECRs can be initiated from various sources including production orders (for instance, due to part shortages or machine breakdowns), production BOMs and versions, routings and versions, by-products and versions, items, and stockkeeping units. The system allows users to quickly view cost implications of the changes and visually track modifications to the bill of materials and routing. Users can also record free-form notes to justify changes. There is an approval process for completed ECRs to ensure all modifications are properly vetted.

## Engineering Change Orders (ECOs):

ECOs are generated when an Engineering Change Request (ECR) is actioned, updating the initiating master record with changes and recording approved modifications, creating a permanent audit trail. ECOs enhance compliance, traceability, and change management efficiency with their full audit trail. They also ensure a structured approval process for all manufacturing adjustments, promoting thorough and organised change implementation.

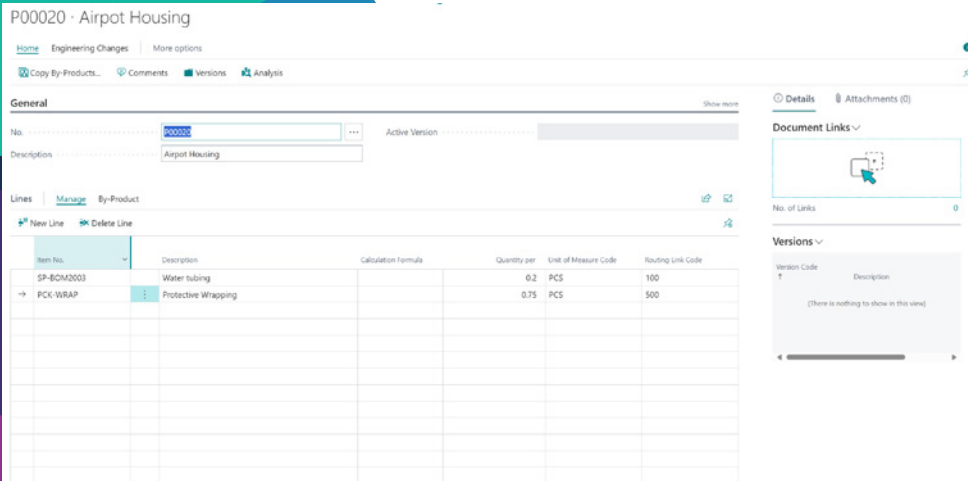
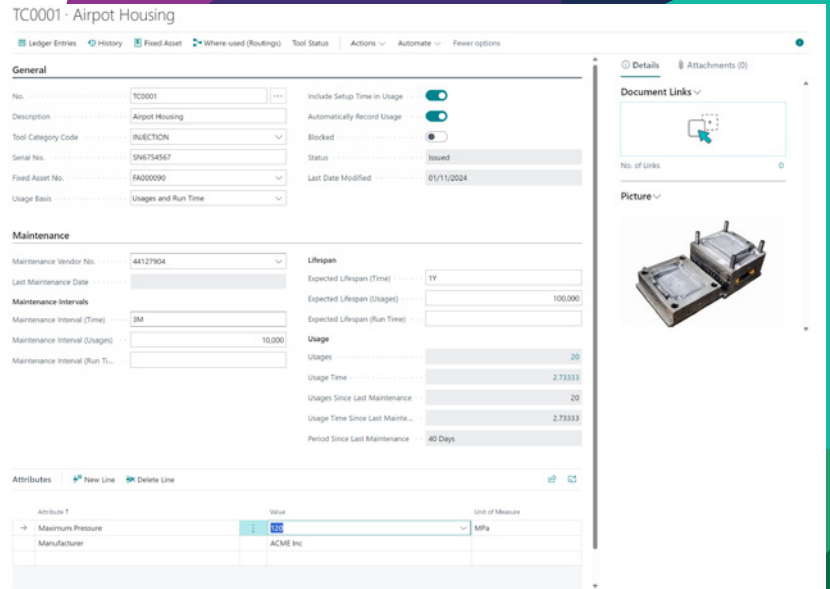
Request - ECR-0004

Change Type	Line Type	Type	No.	Description	Operation No.	Calculation Formula	Quantity per	Unit of Measure Code	Fixed Temp Quantity	Scrap %	Routing Line Code	Setup Time	Run Time
	Component	Item	PL-0001	Plastic Resin Pellets (Polypregyle)			0.9	KG			5	400	
	Component	Item	PNT-001	Paint Maroon			0.2	LITRE			0	600	
	Component	Item	PNT-LAQUER	Laquer			0.2	LITRE			0	600	
	Component	Item	AIRPOT-DECAL	Airpot Decal			1	PCS			0	700	
	Component	Item	PCK-WRAP	Protective Wrapping			1	PCS			0	500	
	Component	Item	SC-002	Screw 16 Stainless Steel			8	PCS			0	200	
	Component	Item	SC-001	Screw 16 Stainless Steel			8	PCS			0	700	
	Operation	Machine C.	500	Injection Moulding			10				0	400	10
	Operation	Machine C.	510	Finishing			20				0	700	15
	Operation	Machine C.	310	Painting and Coating			30				0	600	20
	Operation	Machine C.	450	Assembly			40				0	100	10
	Operation	Machine C.	520	Quality Control			50				0	300	10
	Operation	Machine C.	230	Apply Packaging			60				0	500	5



# Tool Tracking and Maintenance

Tooling enables users to set up and monitor the usage and history of tools in production. The new tool card allows detailed setup including descriptions, maintenance intervals, and categories. Users can record tool attributes to find suitable tools for routing operations and associate tools with fixed assets. Tools can be checked out to production orders and their usage tracked, scheduling maintenance based on this usage. Integration with Clever MES allows viewing required tools for routing operations and managing check-outs directly from the MES screen. Benefits include improved tool management efficiency, reduced downtime, precise tool maintenance scheduling, accurate tool location tracking, and the ability to identify tools used in specific production orders if issues arise.

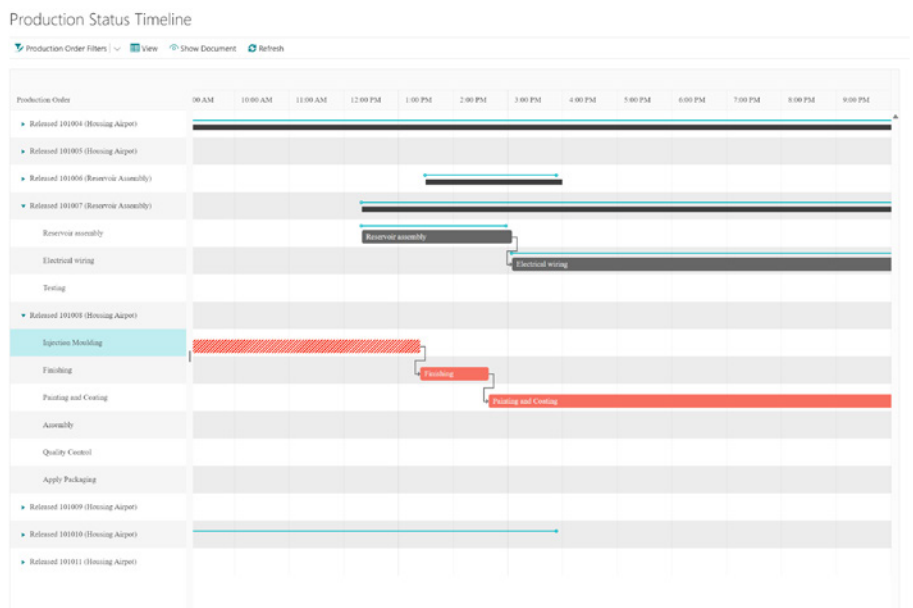


## By-Products

By-Products are used when there are usable by-products, like off-cuts, that can be reused in other processes or for disassembly scenarios. Similar to a production bill of materials, a by-products list can be defined and applied to an item or stockkeeping unit, with version control. By-products are integrated into production orders and can be amended, recorded as additional output. Benefits include reduced waste, potential revenue from by-products, and improved traceability of products generated from manufacturing other items.

## Screen Enquiries

The additional screen enquiries offer valuable insights into the shop floor's current status. Production Status displays the current status of all production orders, grouped by production order, due date, family, item, or customer. Production Shortages identify which orders cannot be executed due to component shortages, also groupable by various criteria. Production Load provides an overview of work and machine centre loads by date. These tools help quickly highlight potential issues, component shortages, and capacity bottlenecks that could impact production processes.



Prod. Order Routing - 101004 Housing Airport AIRPOT\_CASE

Operation No. ↑	Type	No.	Description	Starting Date-Time	Ending Date-Time
10	Machine C...	500	Injection Moulding	05/11/2024 08:20	05/11/2024 09:45
20	Machine C...	510	Finishing	05/11/2024 09:45	05/11/2024 16:00
30	Machine C...	310	Painting and Coating	05/11/2024 18:30	06/11/2024 13:35
40	Machine C...	450	Assembly	06/11/2024 13:35	07/11/2024 09:45
50	Machine C...	520	Quality Control	07/11/2024 09:45	07/11/2024 13:55
60	Machine C...	230	Apply Packaging	07/11/2024 13:55	07/11/2024 16:00

Routing Diagram

## Enhanced Visualization Tools

Enhanced Visualization Tools offer clear visual representations of BOM structures and routing processes for better decision-making. The production status timeline graphically displays operations for production orders, showing scheduled versus actual production times when used with Clever MES, highlighting delays and their impacts. Load view charts provide insights into machine and work centre loads, aiding in capacity planning. These tools enhance resource allocation, improve visibility of production order status, and prevent bottlenecks.

SP-SCM1004 - AutoDrip

Home Engineering Changes More options

Copy BOM... Matrix per Version Comments Versions Where-used Analysis

**General** Show more

No. SP-SCM1004 Status Certified

Description AutoDrip Active Version

Unit of Measure Code PCS Last Date Modified 24/09/2024

**Lines** Manage Component

New Line Delete Line

Type	No.	Description	Quantity per	Unit of Measure Code	Scrap %	Routing Link Code
Item	SP-BOM1301	Housing AutoDrip	1	PCS	0	
Item	SP-BOM2000	Reservoir Assembly	1	PCS	0	
Item	SP-BOM1305	Screw Hex M3, Zinc	12	PCS	0	
Item	SP-BOM1102	Coffee Filter basket	1	PCS	0	
Item	SP-BOM1103	Front adjustable rubber	1	PCS	0	
Item	SP-BOM1302	Control panel display	1	PCS	0	100
Item	SP-BOM1303	Button	1	PCS	0	100
Item	SP-BOM1107	Circuit board	1	PCS	0	
Item	SP-BOM1104	Blower cover	1	PCS	0	

Diagram Single Level Multiple Levels Refresh

Production BOM Analysis SP-SCM2000

Filters

Item Filter: Date Filter:

Variant Code Filter:

Item No.	Variant Code	Description	No. of Prod. Orders	Unit of Measure Code	Scrap %	Quantity per	Expected Quantity	Actual Average Quantity	Quantity Difference	Quantity Difference (%)	Actual Quantity Std. Deviation
PS-0001		Plastic Resin Pellets (Polypropylene)	4	KG	5	0.9	1	26.21	25.21	2.52160	20.55604
PMT-001		Paint Maroon	1	LITRE	0	0.2	1	5	4	400.00	0
PMT-LAUQUER		Lauquer	1	LITRE	0	0.2	1	5	4	400.00	0
AIRPOT_DECAL		Airpot Decal	1	PCS	0	1	1	25	24	2,400.00	0
SC-001		Screw 1x Stainless Steel	0	PCS	0	8	8	0	0	0.00	0
PCC-WRAP		Protective Wrapping	0	PCS	0	1	1	0	0	0.00	0

Chart

Quantity per Expected Quantity Actual Average Quantity

## Manufacturing Analysis

Manufacturing Analysis provides detailed insights into production processes by tracking material usage against expected amounts (Production BOM Analysis), comparing planned versus actual times for setup and runtime (Routing Analysis), and analyzing by-product output versus expectations (By-Product Analysis). These analyses enable users to ensure that shop floor processes align with defined production BOMs, routings, and by-products, thereby ensuring accuracy in timings, component usage, and costs.





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