ShopFloor Planning & Execution

1 — Last update: Oct 24, 2022

NAVEKSA A/S

Table of Contents

1. Before you begin

Before you begin

You operate this manual by:

- Using the TOC – Table of content
- Expand / Collapse topics in table of content
- Using the Next / Previous at the end of each topic
- Using the subject direct links for further information
- When you hoover over a picture and see the + sign or a hand, clicking will enlarge the picture
- Using the Print subject function
- Using the Print manual function
- Using the seach bar
- Click on NAVEKSA A/S on the blue top line to switch to another manual
- Sending your feedback to NAVEKSA if you think something should be improved

Recommended background materials to explore:

- Microsoft Dynamics NAV manufacturing manuals available on Microsoft customer/partner source
- Scott Hamilton: Managing your supply chain using Dynamics NAV
- Peik Bech-Andersen: Manufacturing with Dynamics NAV

NAVEKSA solutions are all Microsoft certified applications (CfMD) working on top of Dynamics NAV version 2016 and newer, and 365 Business Central Cloud and On-Premise versions; both C/AL and AL/ Extension versions.

Throughout this document, the following abbreviation will be used.

BC = Dynamic 365 Business Central
NAV = Dynamic NAV

BC/NAV

BC – Screenshots
BC – Functions, might not be available in NAV

1.1. Background – Process flow planning in BC/NAV

Background – Process flow planning in BC/NAV

If you want the Dynamics 365 Business Central / Dynamics NAV to do a true and accurate production planning job for you, there are a number of different parameters you can use.

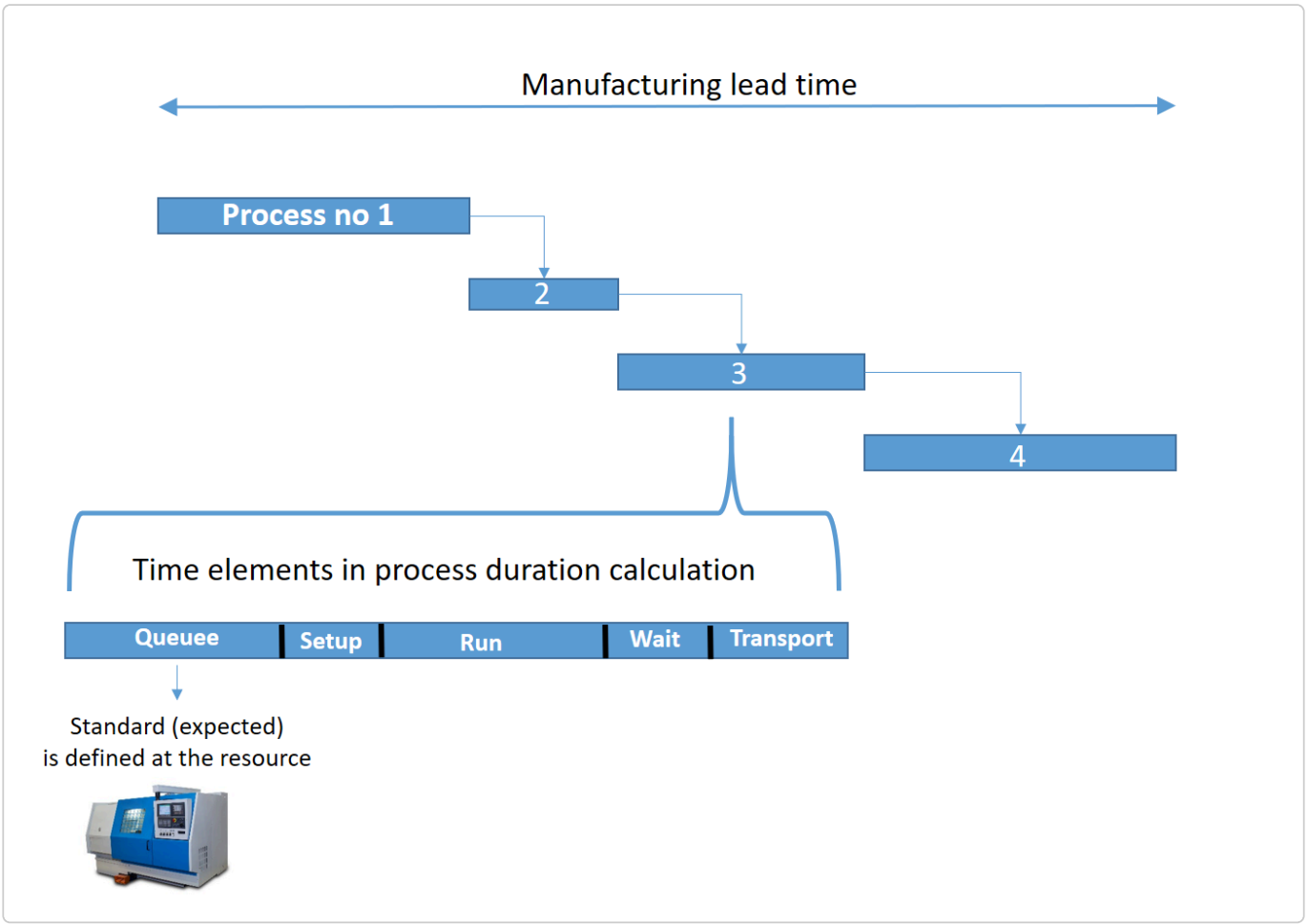
First you must decide if you want to plan production orders with forwards or backwards planning direction based on a wanted start date or a wanted end date.

In Dynamics 365 Business Central / Dynamics NAV a production order's start and end dates are calculated based on routing and resource data and definitions as described below.

1. Here are some routing line data to think of:

- Setup time
- Operator or machine time
- Waiting time
- Transportation time

Routing time elements illustrated:



2. Resource data are machine center, work center, work center group definitions.

Here are some resource data to think of:

- Queuing time
- Number of capacities
- Efficiency %

Resource time elements illustrated:

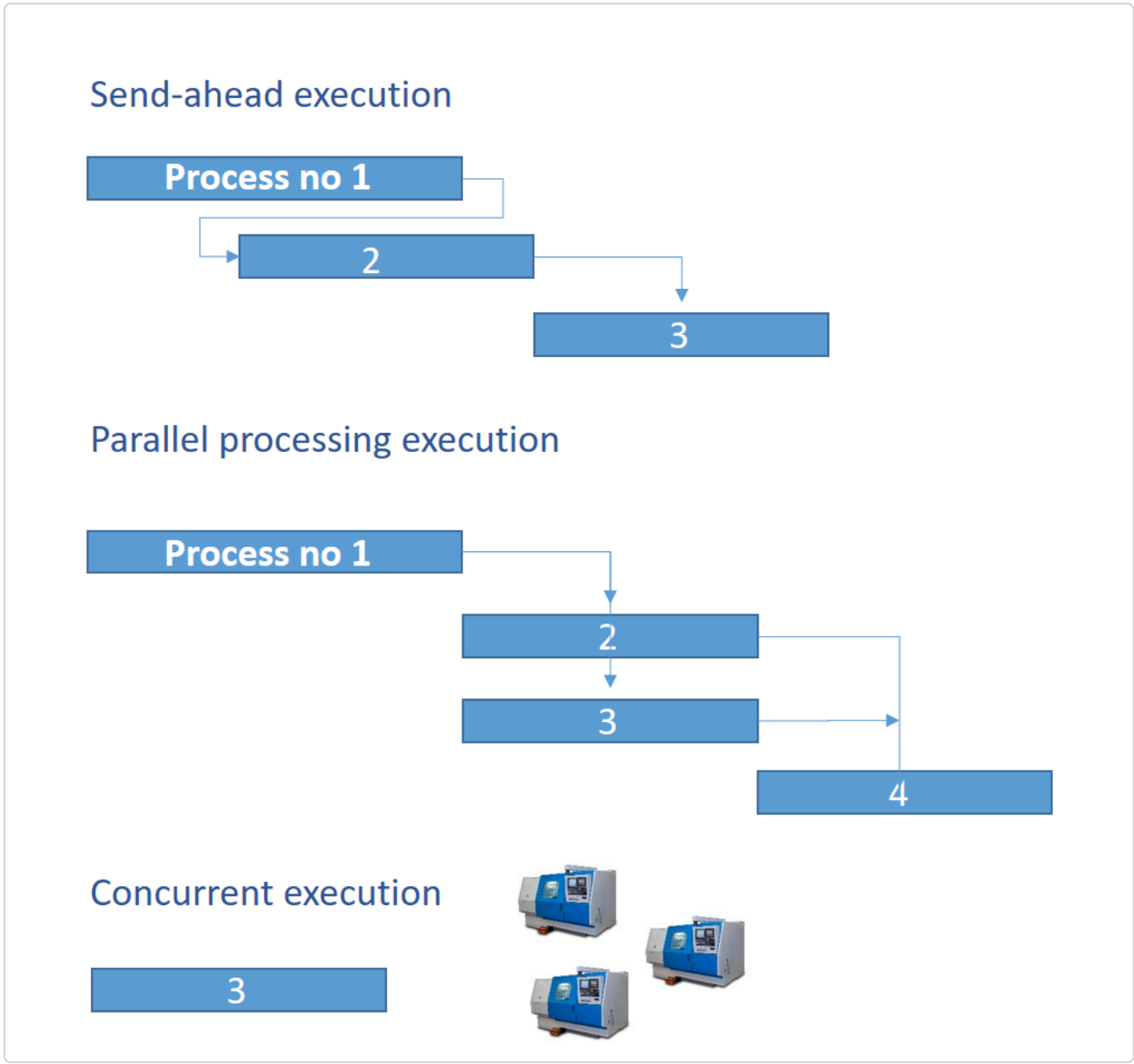
3. NAV operates with additional lead-time reducing planning elements.

Here are some resource data to think of:

- Send ahead (a routing line element)

- Parallel process execution (a routing line element)
- Concurrent capacity (a routing line element)

Additional lead-time reduction time elements illustrated:



1.2. Why ShopFloor Planning & Execution

Why ShopFloor Planning & Execution

NAVEKSA ShopFloor is a system for planning and real-time paperless execution and data collection of Dynamics 365 Business Central / Dynamics NAV production orders.%

Also known as MES – a Manufacturing Execution System solution.%

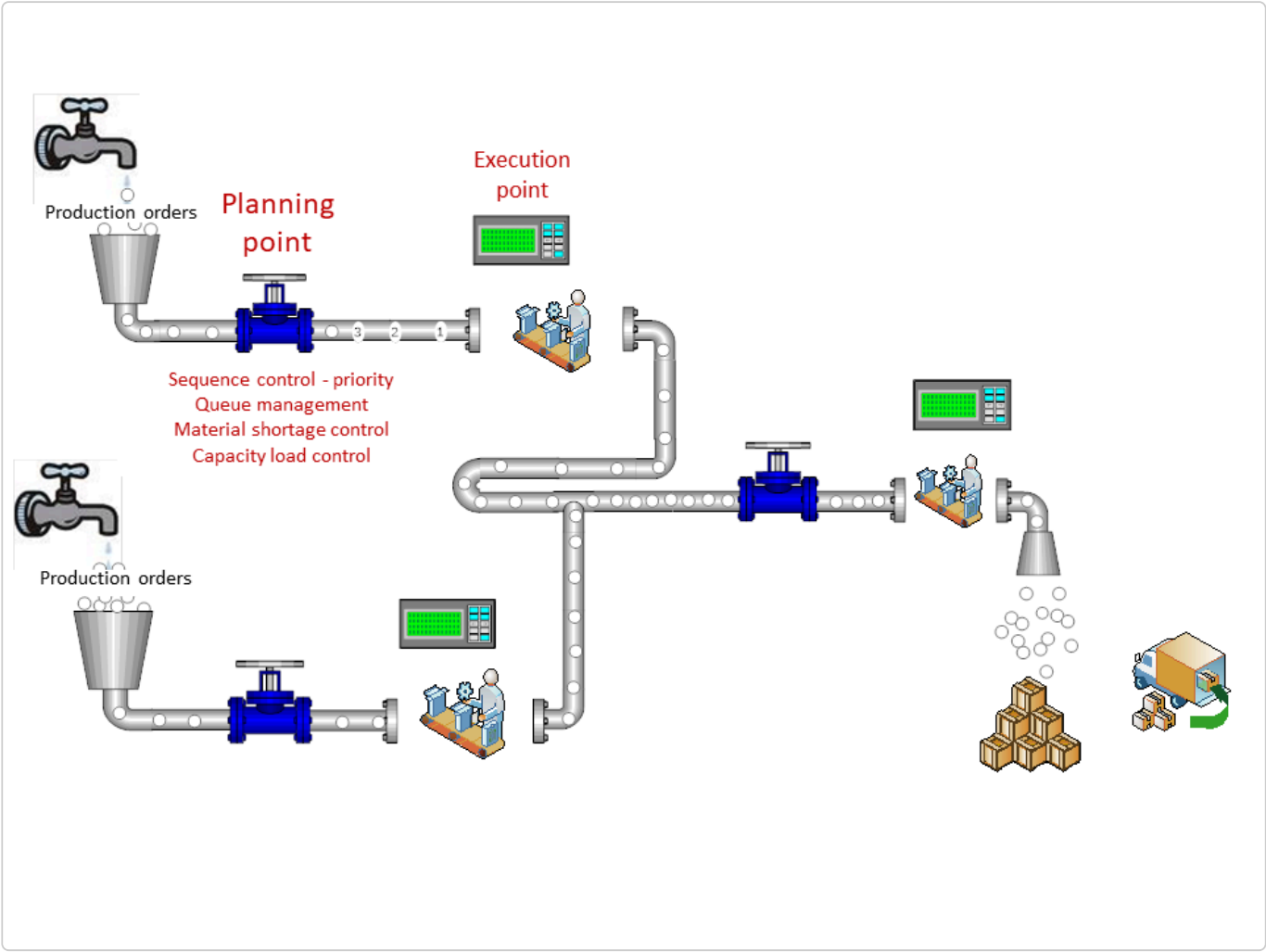
The solution consists of 2 parts:%

A planning used by the production planner which deals with material shortages, sequence of orders, re-scheduling resources and capacity load and queue control.%

An execution part used by the shop floor operator which deals with time and attendance, starting and completing jobs, qc reporting etc.%

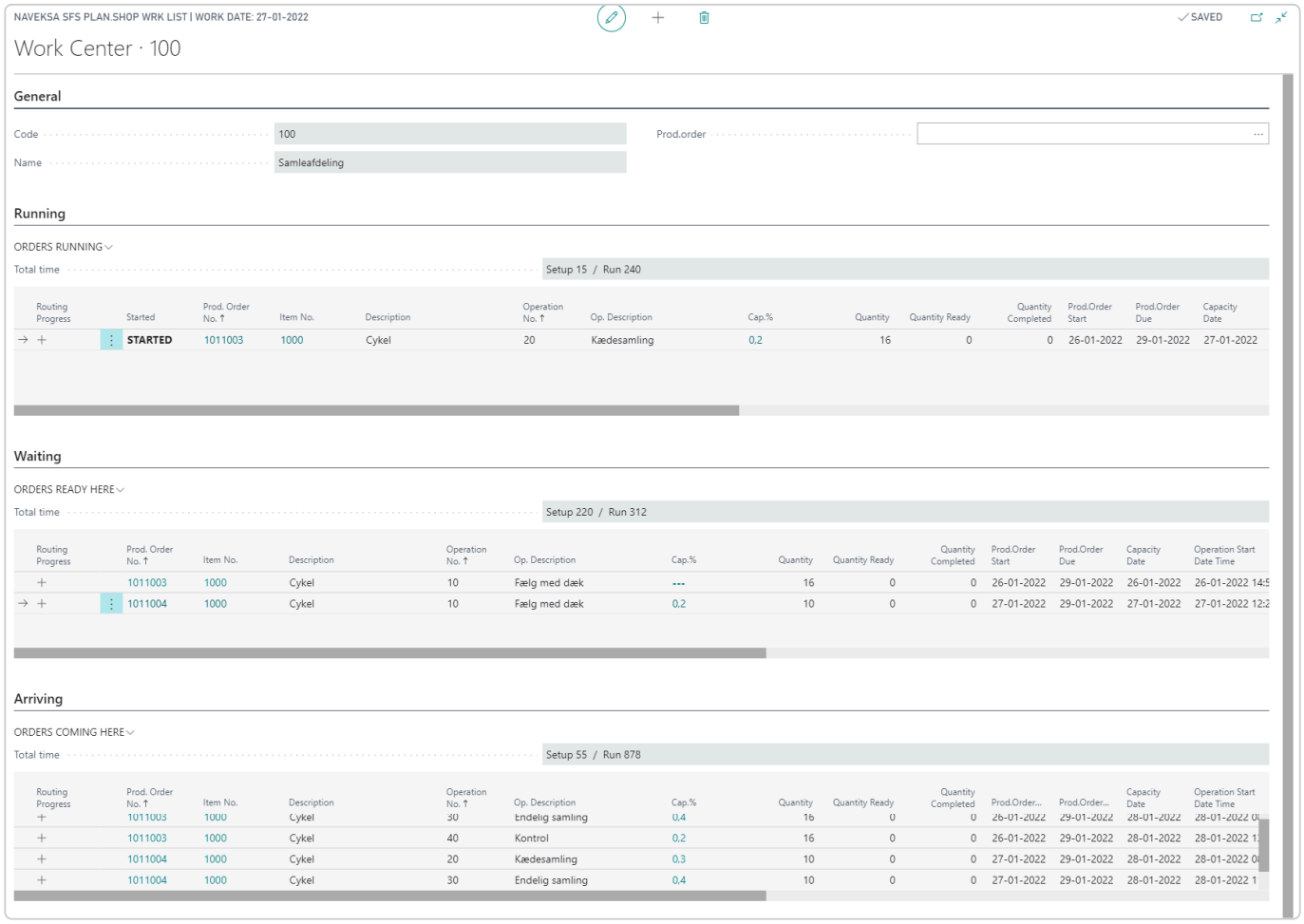
Here you see an overview of the work with planning the shop floor per resource (sequencing, assign priority to the rush order, queuee control) and operator execution and reporting:%

Click on the picture to enlarge

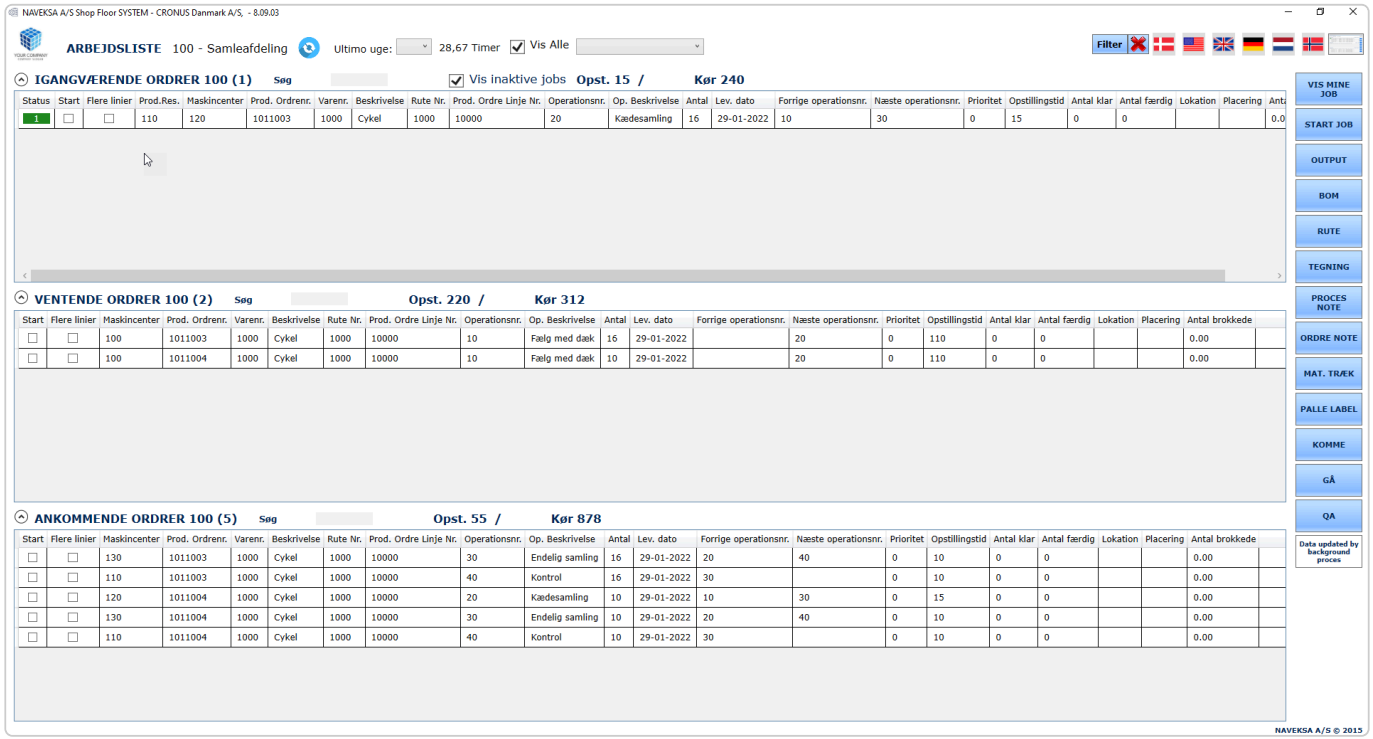


The system consist of 2 main screens. A PLANNER cockpit to be used by the production planner, and an OPERATOR cockpit to be used by the shop floor operator.

The PLANNER cockpit:



The OPERATOR cockpit:



> The ShopFloor system is based on simple principles – a prioritirized sequence of the production orders process steps presented in 3 different logical sections: ORDERS RUNNING, ORDERS QUEING, and FUTURE ORDERS. The 3 sections can be shown per resource, work center, or even factory total.

> The meaning of each section is:

- **ORDERS RUNNING (Processing)** are being worked on at the moment.
- **QUEING ORDERS (Waiting)** has been completed by the previous jobstep and is now ready to be processed at the next jobstep.
- **FUTURE ORDERS (Arriving)** are orders which are being worked on somewhere in the factory and will show up at this workplace later.

> You can compare our solution logic with many different daily day situations where a waiting line is involved.

One example is some people checking in at the desk at the airport, others are queing up to check in, and others are on their way to the airport heading for the same flight.

1.3. VIDEOS – Functional views – ShopFloor

VIDEOS – Functional views – ShopFloor

VIDEOS – Functional views – ShopFloor

4 videoes with America, English, German and Danish speak and subtitles.

https://player.vimeo.com/video/640268170

https://player.vimeo.com/video/640268131

https://player.vimeo.com/video/640268096

https://player.vimeo.com/video/640268056

1.4. Setting up ShopFloor

Setting up ShopFloor

ShopFloor setup can be quite a task.

Please read more about it here. ShopFloor setup

1.4.1. Adding/deleting BC/NAV machine/ work centers and resources in ShopFloor

Adding/deleting BC/NAV machine/work centers in ShopFloor

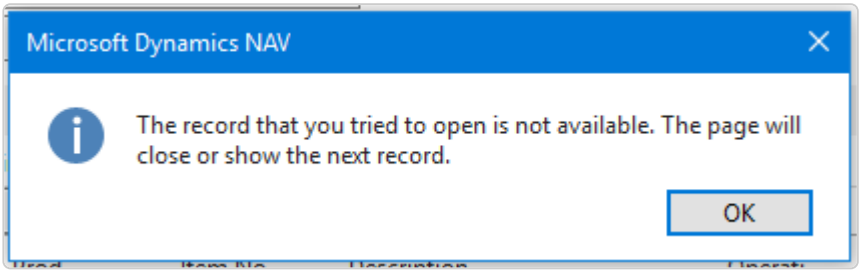
When a new work center / machine center is created, ShopFloor will automatically update the list when you enter Enter ShopFloor again.

Similarly, when you delete in BC/NAV, ShopFloor will also be automatically updated by removing the deleted work center / Machine center..

When you create a new BC/NAV resource and open ShopFloor Planning, the new resource will not appear in the list. You must open the new existing resource in NAV and quit the program again to update it.

When you delete a BC/NAV resource and open SFS Planning, the deleted resource still exists (same reason as above).

If you try to open the currently deleted resource, you will receive the following message, which is actually very reasonable.



2. How to run ShopFloor – PLANNING part

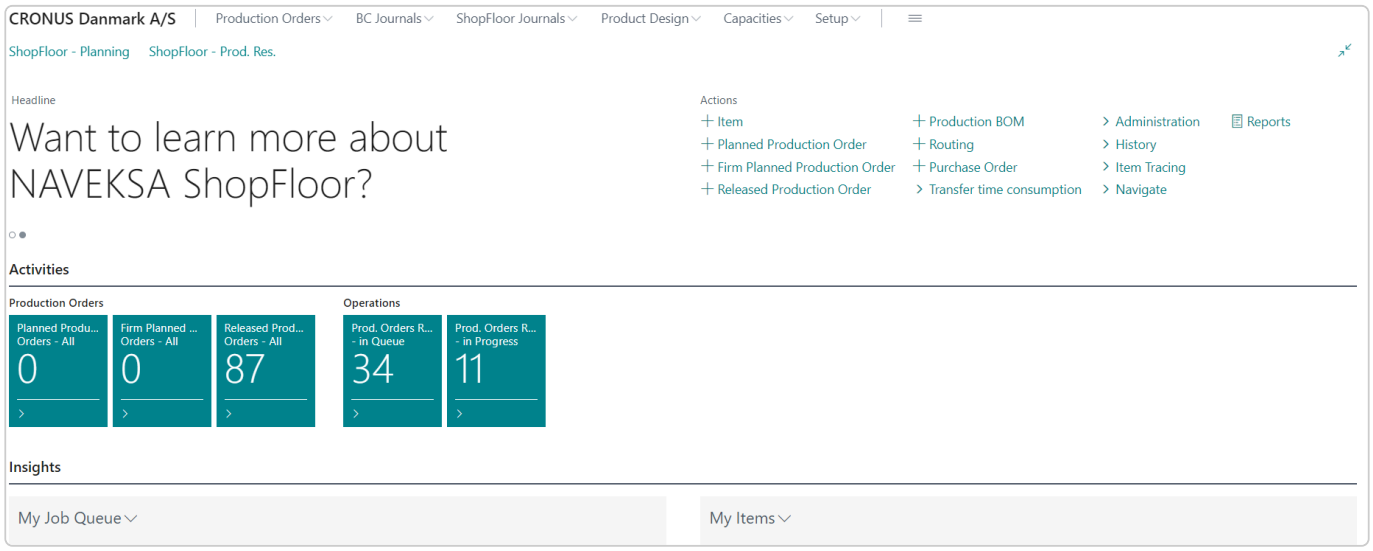
2.1. ShopFloor Planning menus

ShopFloor Planning menus

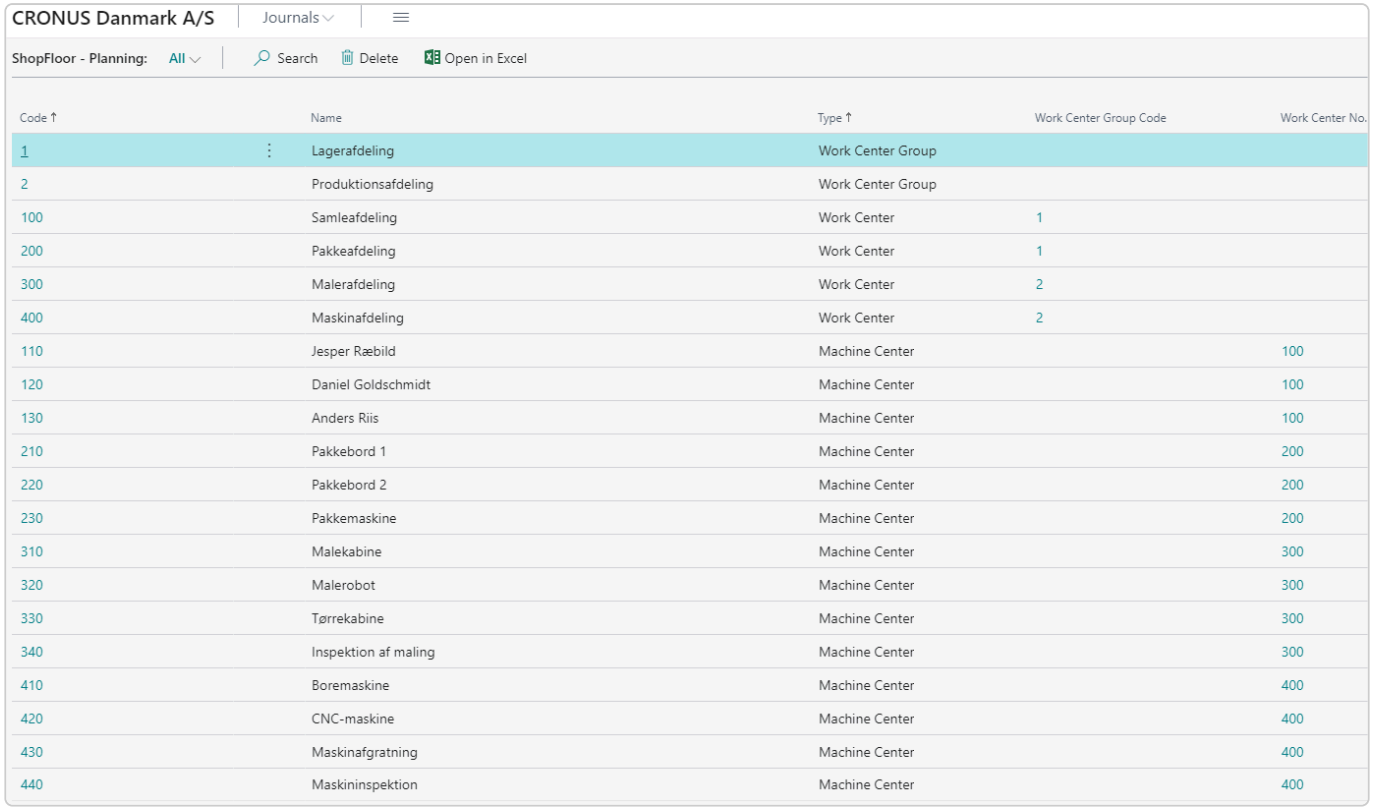
The following menu items will describe the menu content for ShopFloor application.

2.1.1. ShopFloor Planning

ShopFloor Planning

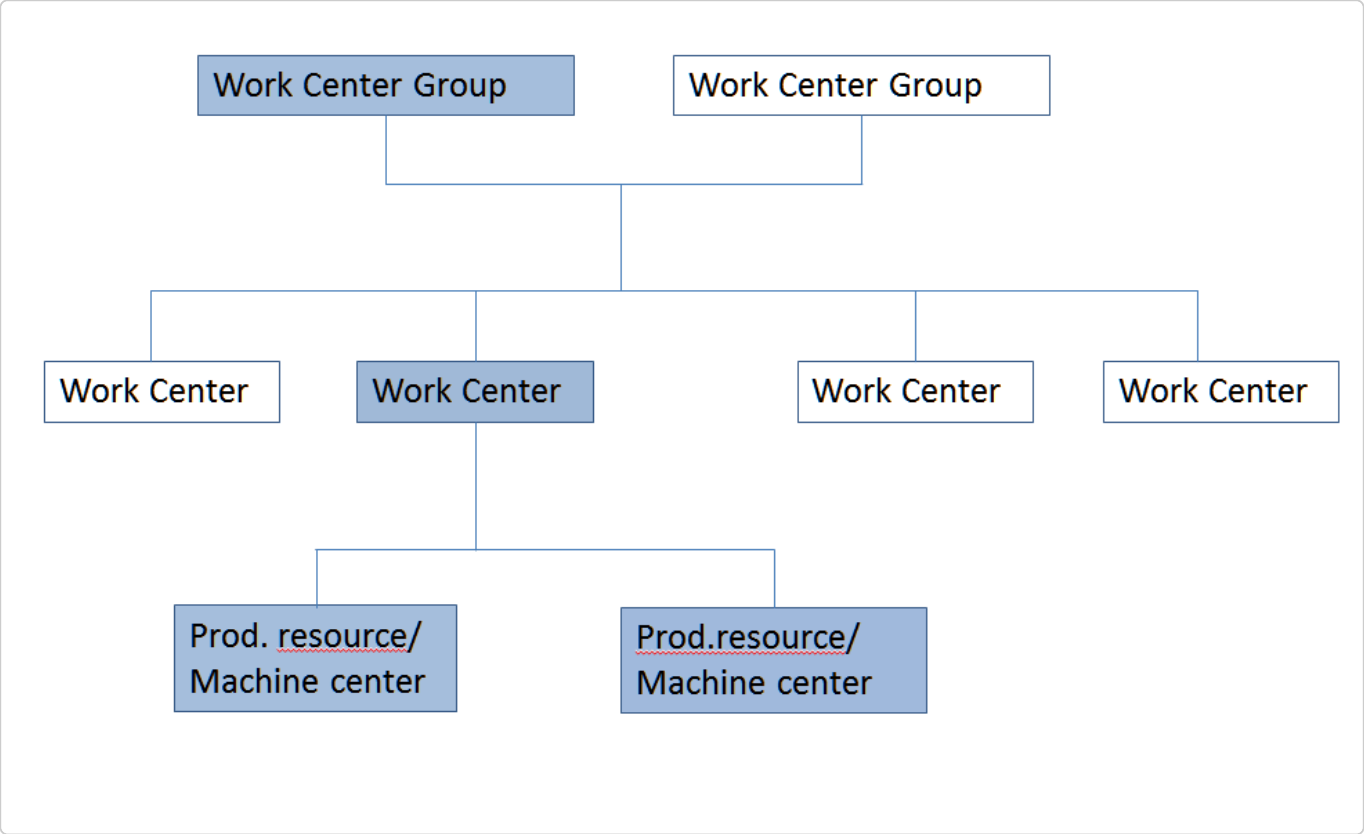


You start the ShopFloor Planning by selecting the menu item. You will be presented to a list to choose what to work with.



Code	Name	Type	Work Center Group Code	Work Center No.
1	Lagerafdeling	Work Center Group		
2	Produktionsafdeling	Work Center Group		
100	Samleafdeling	Work Center	1	
200	Pakkeafdeling	Work Center	1	
300	Malerafdeling	Work Center	2	
400	Maskinafdeling	Work Center	2	
110	Jesper Ræbild	Machine Center		100
120	Daniel Goldschmidt	Machine Center		100
130	Anders Riis	Machine Center		100
210	Pakkebord 1	Machine Center		200
220	Pakkebord 2	Machine Center		200
230	Pakkemaskine	Machine Center		200
310	Malekabine	Machine Center		300
320	Malerobot	Machine Center		300
330	Tørrekabine	Machine Center		300
340	Inspektion af maling	Machine Center		300
410	Boremaskine	Machine Center		400
420	CNC-maskine	Machine Center		400
430	Maskinafgratning	Machine Center		400
440	Maskininspektion	Machine Center		400

The entry point is a list of work center groups, work centers and resources according to the setup in standard NAV: A resource/machine center belongs to a work center, and a work center belongs to a work center group.

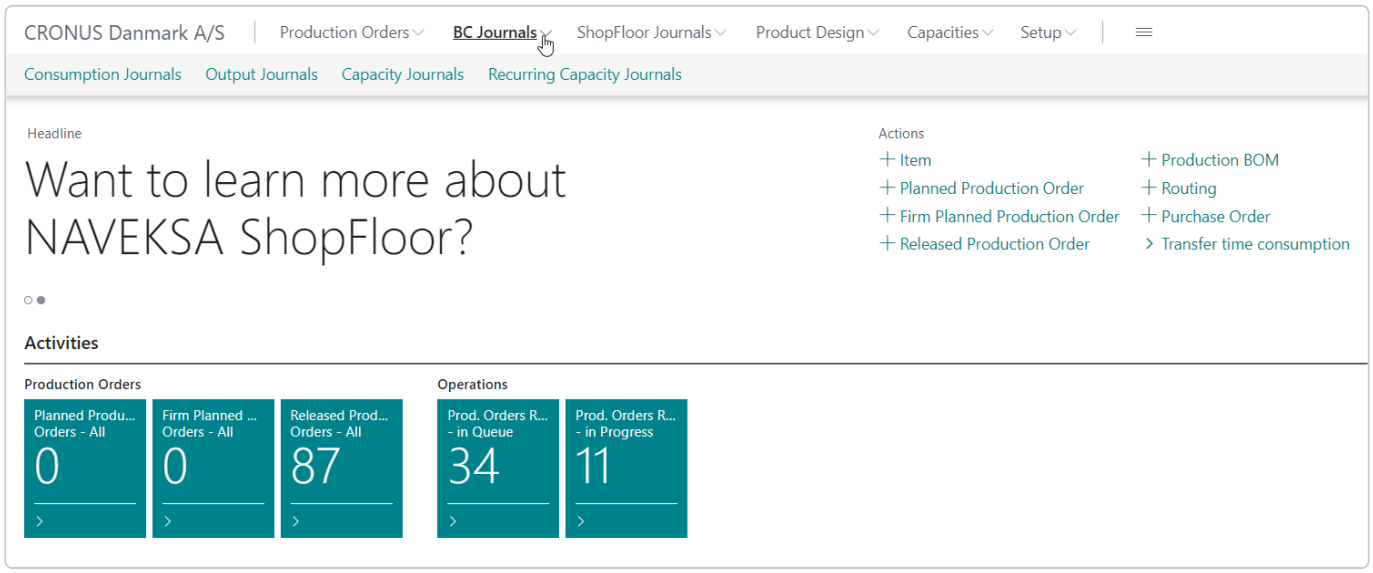


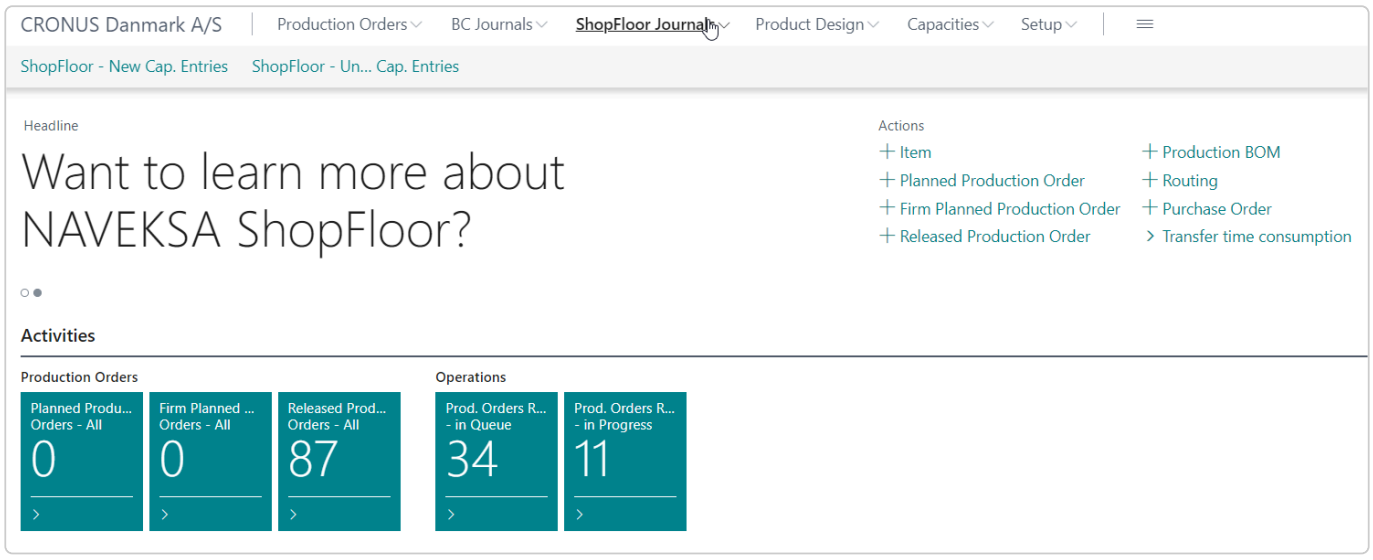
SHOPFLOOR – Production resources

A list of the available production resources – people, machines, work centers etc. as defined per setup.

2.1.2. ShopFloor Entry Transfer

ShopFloor Entry Transfer menu





SHOPFLOOR – New Cap. Entries

This menu item handles editing and or transferring entries to the NAV Output Journal, and putting error transactions in the “ShopFloor – Unfinished Cap. Entries” journal for manual editing.

SHOPFLOOR – Unfinished Cap. Entries

This menu item is for editing error transactions in the “Unfinished Cap. Entries” journal.

SHOPFLOOR – Transfer time consumption

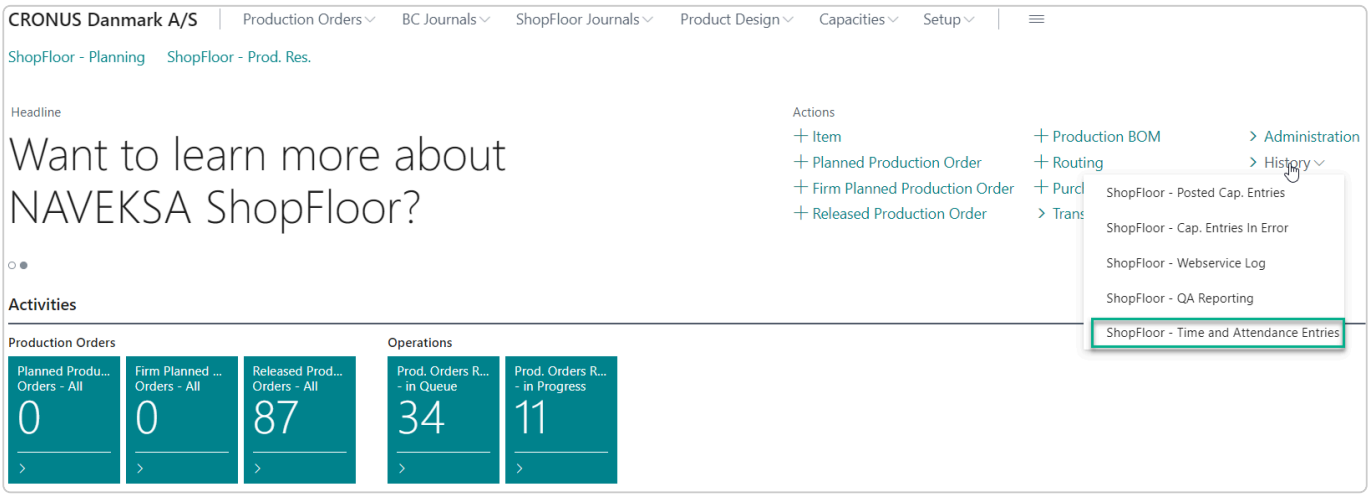
This function is used to transfer the daily spend working hours on a long-running job.

Example: A routing operation runs for more weeks, and you want to depreciate the daily spend hours

every day. Using this function or setting up an automatic job queue job, this function will transfer the previous days (00:00:00 – 23:59:59) hours to the NAVEKSA capacity entries.

2.1.3. ShopFloor Time & Attendance

ShopFloor Time & Attendance menu



SHOPFLOOR – Time & Attendance

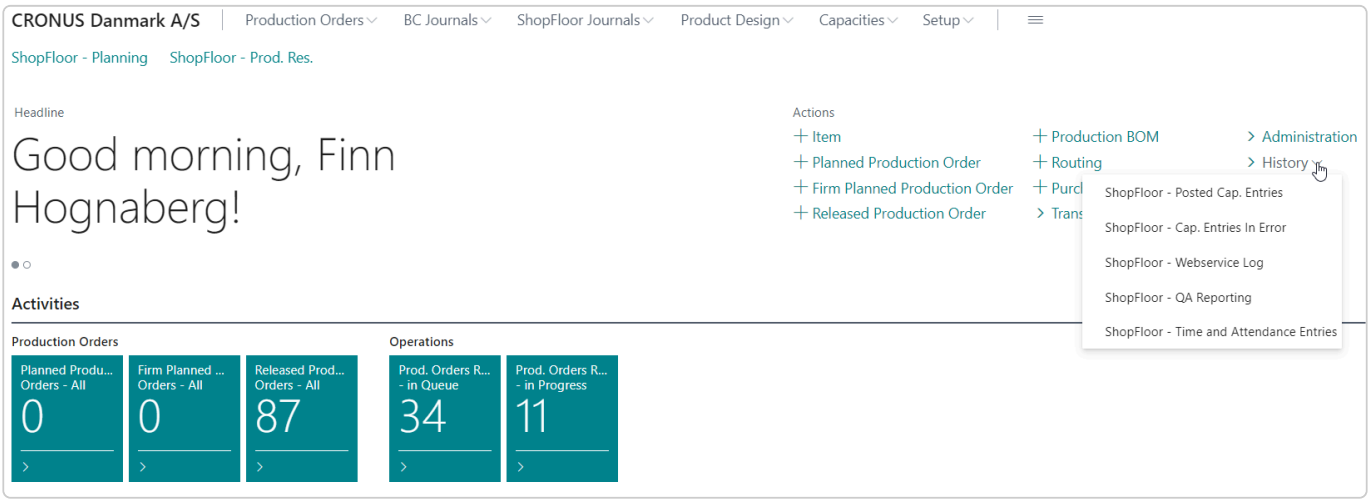
This menu item makes it possible to perform time and attandance registration without using the ShopFloor execution client.

Please read the NAVEKSA TA user guide for explanation at:

Time & Attendance user guide

2.1.4. ShopFloor History

ShopFloor History menu



SHOPFLOOR – Posted Capacity entries

This is a history option for the overview of all posted capacity entries.

SHOPFLOOR – Unfinished capacity entries

This is a history option for the overview of all unfinished capacity entries. Transactions can be maintained via this option.

SHOPFLOOR Time & Attendance entries

Please read the NAVEKSA TA user guide for explanation.

SHOPFLOOR WEB service log

If problems in running the SHOPFLOOR Client operator application you will be able to find an answer I this log file on what has caused the problem.

SHOPFLOOR QA reporting

Use this option to extract quality control data to excel for operator keyed recordings.

2.1.5. The ShopFloor Planning screen

The ShopFloor Planning screen

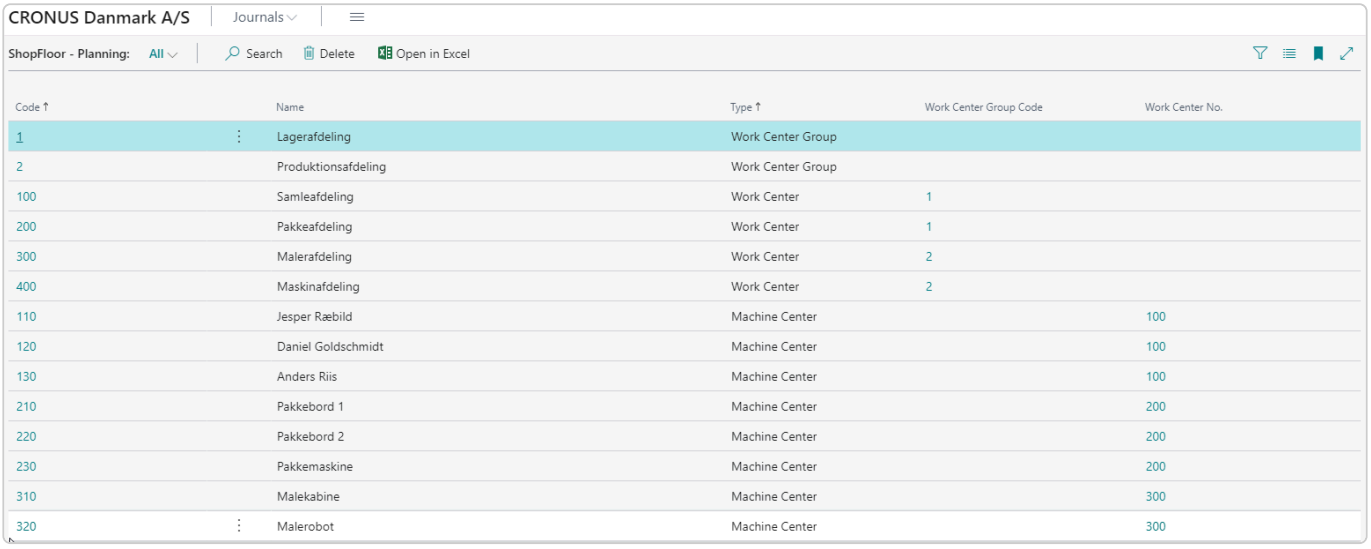
This section contains all you need to know about the ShopFloor planning screen.
Please move on.

2.1.5.1. Using the ShopFloor planning screen

Using the ShopFloor planning screen

How it works

Start the ShopFloor planning menu and choose a Resource



Code	Name	Type	Work Center Group Code	Work Center No.
1	Lagerafdeling	Work Center Group		
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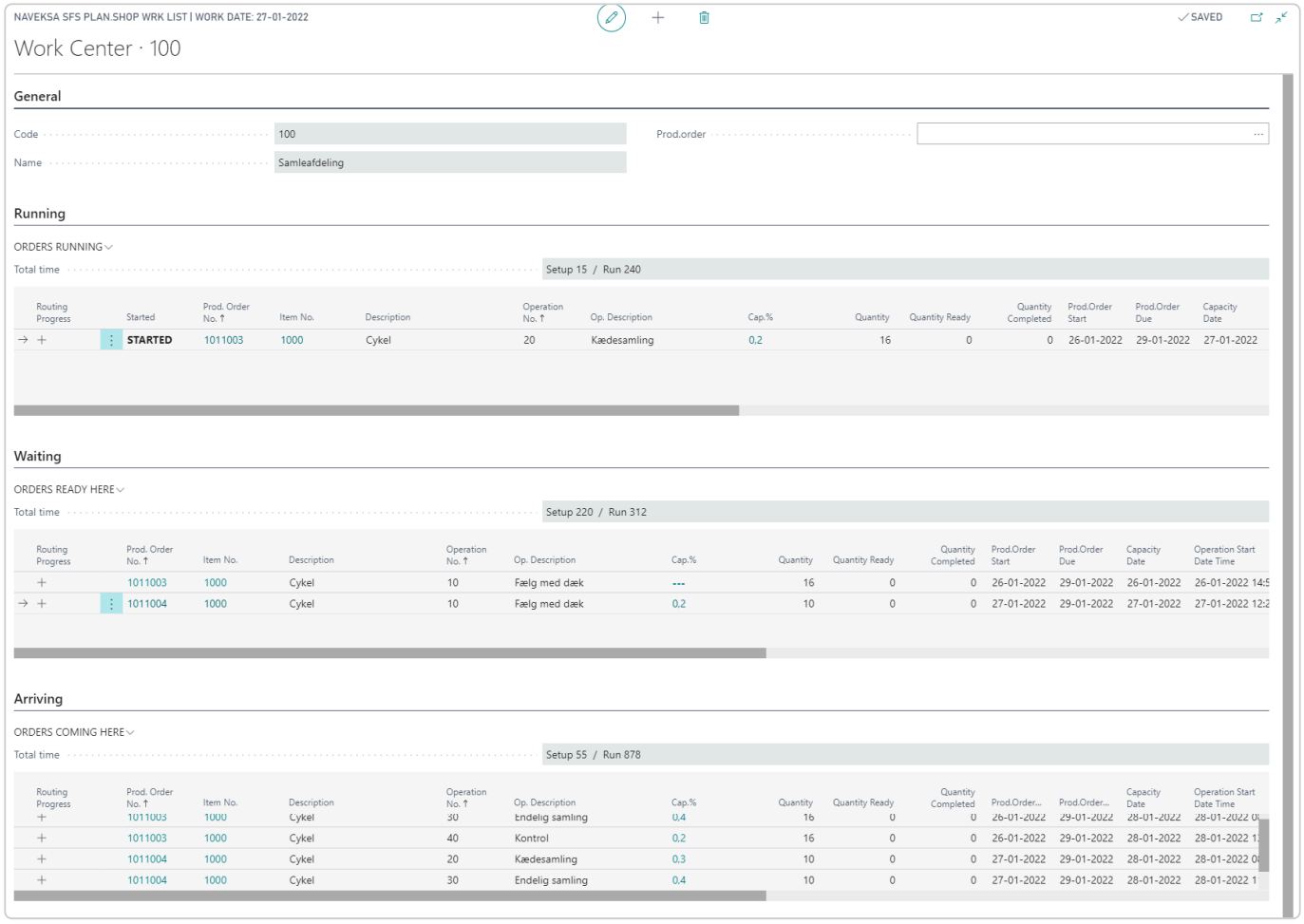
100	Samleafdeling	Work Center	1	
200	Pakkeafdeling	Work Center	1	
300	Malerafdeling	Work Center	2	
400	Maskinafdeling	Work Center	2	
110	Jesper Ræbild	Machine Center		100
120	Daniel Goldschmidt	Machine Center		100
130	Anders Riis	Machine Center		100
210	Pakkebord 1	Machine Center		200
220	Pakkebord 2	Machine Center		200
230	Pakkemaskine	Machine Center		200
310	Malekabine	Machine Center		300
320	Malerobot	Machine Center		300

The Planning screen will show up:



For a resource, work center, or work center group, the screen shows the total workload at different status – Running (In process), Queuing (Waiting) or Future (Arriving) orders.

Orders processing are orders were start activity has been reported..

Queuing orders are orders waiting to be processed at this resource. Queuing orders means that all previous operation steps have been finished..

Future orders are orders that may currently be in process elsewhere in the factory, but at a time they will arrive at this resource.

Click here for a description and use of column fields

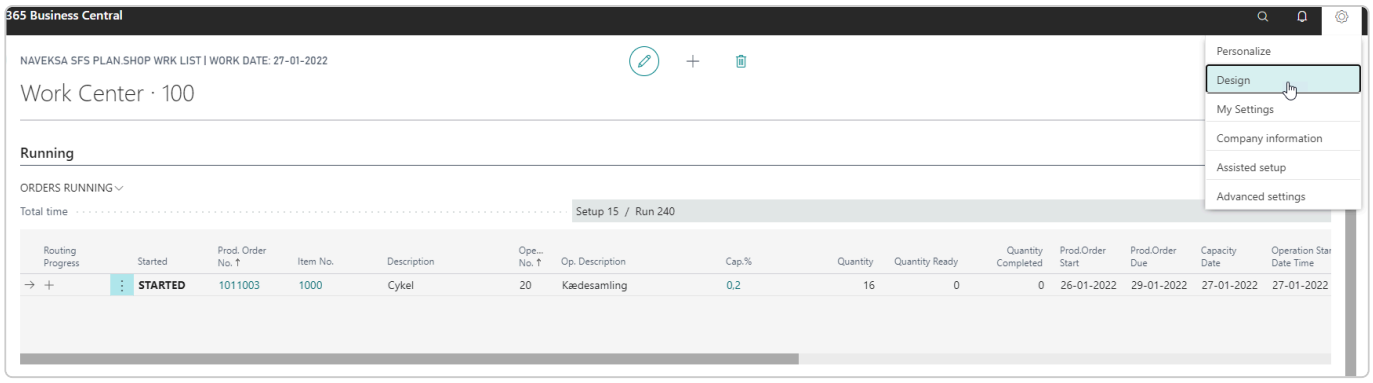
Click here for a description of using the tooltip line and menues

2.1.5.2. Customizing the ShopFloor planning screen

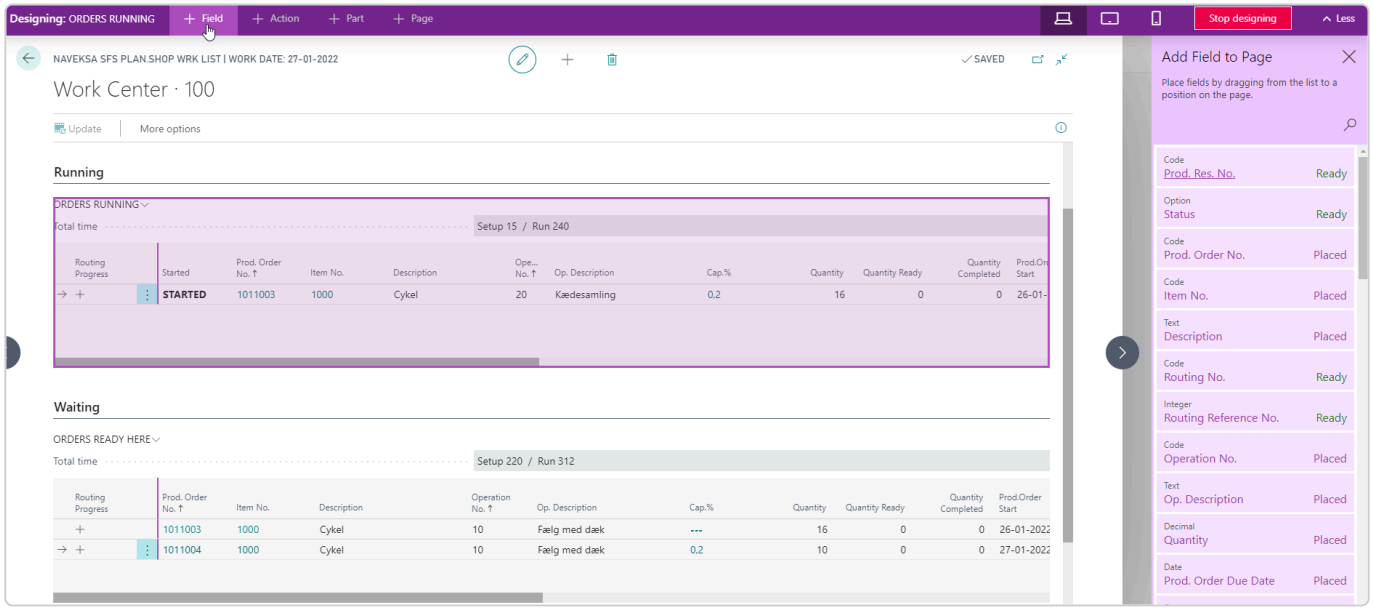
Customizing the ShopFloor Planning display

The ShopFloor planning display can be adopted to your specific needs. Using standard BC / NAV functions “Design” will open up a display for selecting columns and sequence.

You can adjust each individual planning section to your needs.



Then you are given the option to add remove and change.



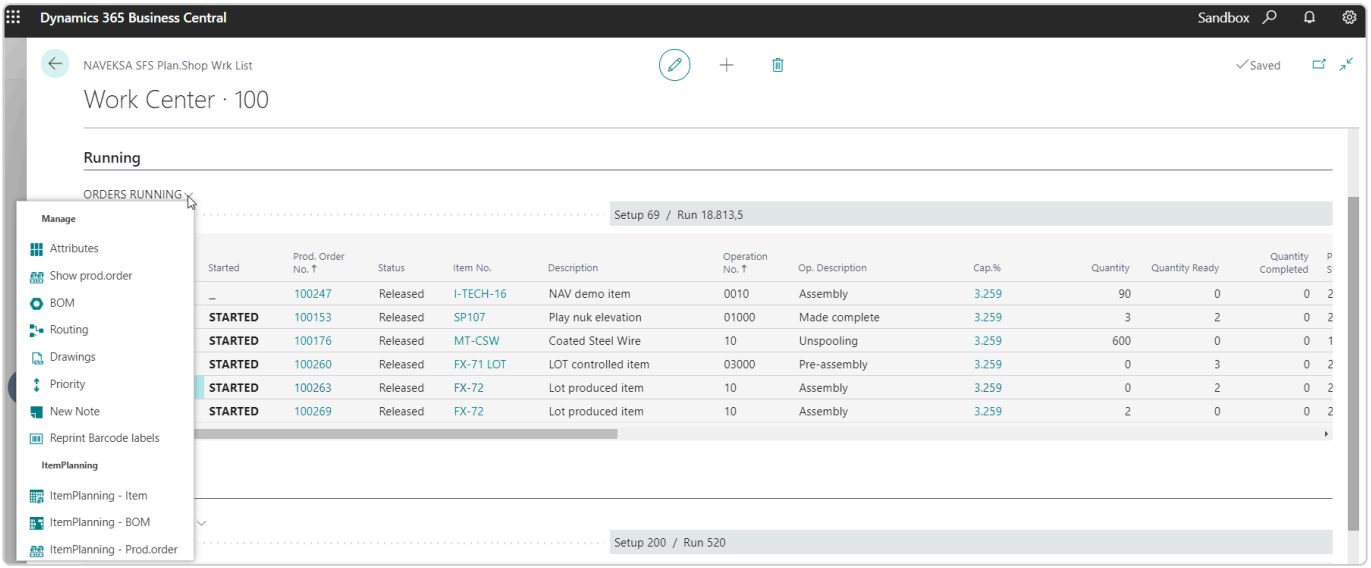
2.1.5.3. Using tooltips functions

Tooltips

When you click on a line the tooltip menu will vary depending upon various attached information to the order/operation line you click at.

The are tooltips for the following information.

- Attributes = Clicking on this will give the option to view or edit the operations attributes
- Show prod.order = Clicking this will show Production order for selected line
- BOM = Clicking on this opens up the standard BC / NAV Production BOM editable bill of material display
- Routing = Clicking on this opens up the standard BC / NAV Routing editable display
- Drawings = Clicking on this will show the first drawing (only) attached to this production order
- Priority = Opens up the display for changing execution sequence for the production order
- New Note = Opens the main card for the Prod.order and you can write new comments
- Repring Barcode labels = Print labels for the Prod.order
- ItemPlanning = Clicking on this opens 3 possibilities looking at the inventory profile for the item, Production order or the bill of material.



2.1.5.4. How to use ShopFloor planning – Columns and content

How to use ShopFloor planning – Columns and content

In this section you will find a description and explanation to all the possible fields and columns for ShopFloor planning.
Please move on.

2.1.5.4.1. Production order number

Production order number

The production order number.

Click on the look up button to access the BC / NAV production order.

2.1.5.4.2. Production resource number

Production resource number

Production resource number is the work center/resource number where the work takes place.

2.1.5.4.3. Description

Description

Production order item description

2.1.5.4.4. Item number

Item number

Production order item number

2.1.5.4.5. Operation number

Operation number

Production order routing operation number

2.1.5.4.6. Operation description

Operation description

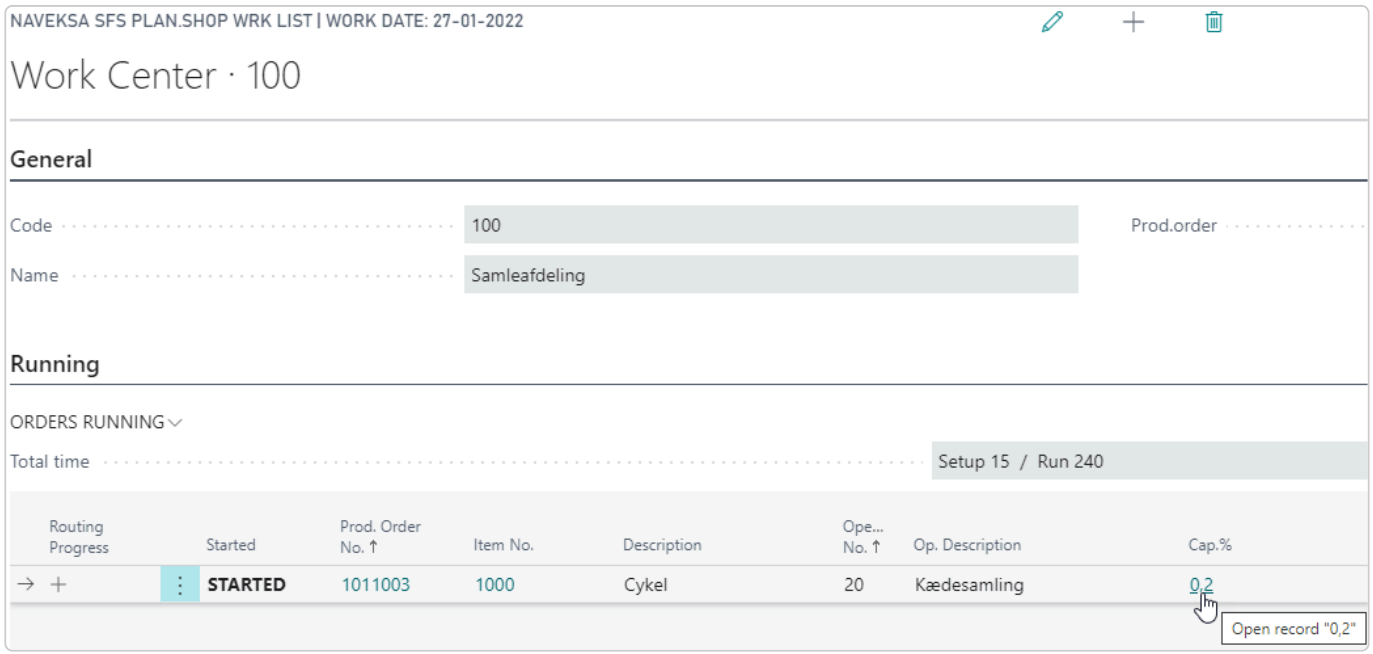
Production order operation description

2.1.5.4.7. Capacity %

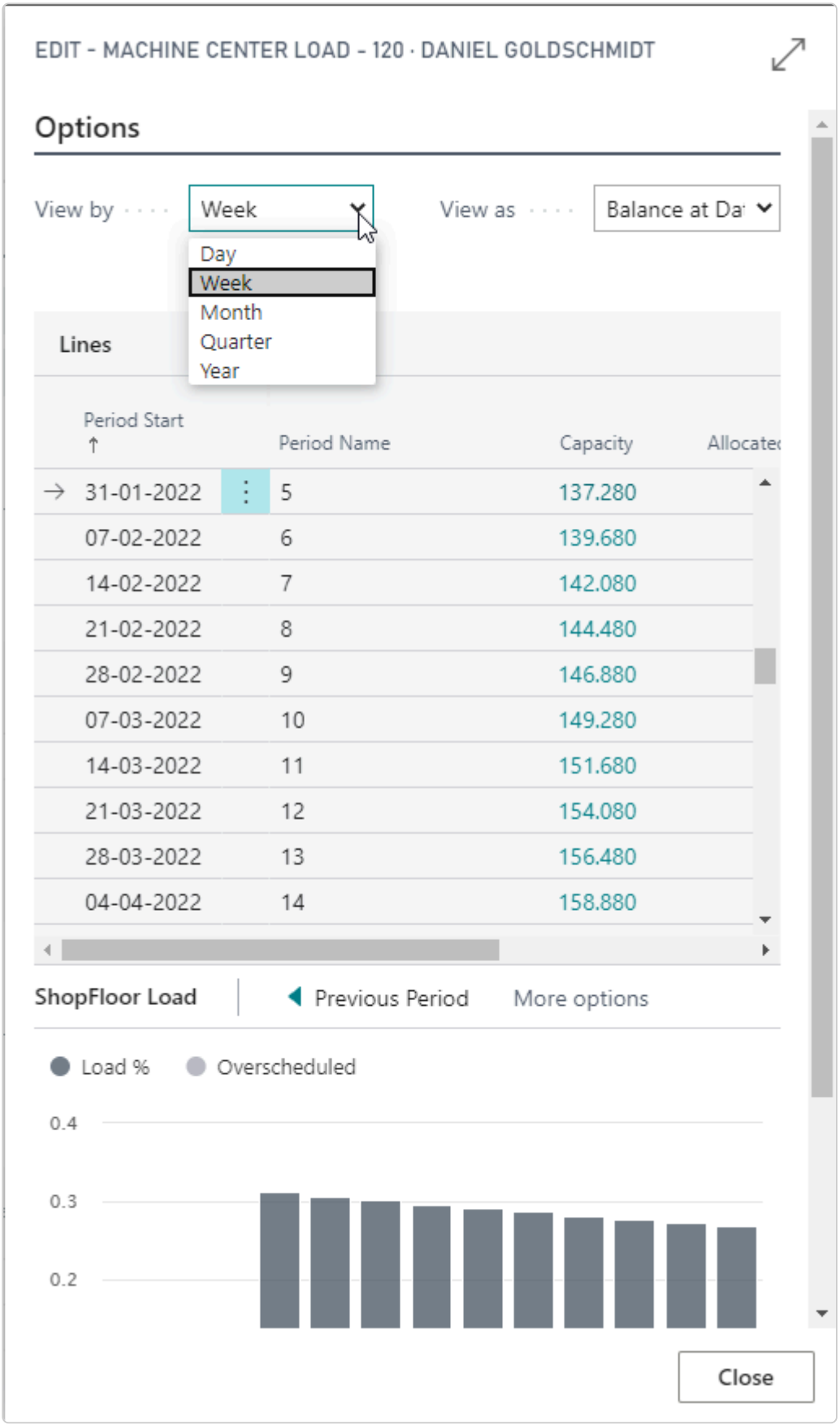
Capacity %

This figure represents the accumulated capacity load on the operation start date.

You can click on a figure in the column “Cap%” to see additional details.



displays a new detail screen with more information.



You can choose to se the load per day, week, month, 3 months etc

You can choose to see the load accumulated or per period.

The ShopFloor load bar graphics reflects your chosen options and you can shift period forwards or

backwards.

> ! Please notice that the Naveksa accumulated capacity load calculation differs from what you find in standard NAV. Available capacity is from this very moment in time only, and does NOT include available capacity in the past. This is opposite to standard NAV. See the example below:

		Capacity	Capacity	Load	Load%	Load%
		NAV wise	Naveksa		The NAV way	**The Naveksa way**
	Day1	800	0	400	50	**0**
	Day2	800	0	400	50	**0**
	Day3	800	0	100	26,7	**0**
Today	Day4	800	800	800	53,1	**212,5**
	Day5	800	800	400	52,5	**131,5**
	Day6	800	800	200	47,9	**95,8**

2.1.5.4.8. Expected capacity need

Expected capacity need

The expected capacity need column represents the remaning standard setup and run time left for this production order routing operation.

Remaning time is time remaining when completed quantity setup and run standard times has been deducted.

2.1.5.4.9. Expected capacity unit of measure

Expected capacity unit of measure

This is unit of measure for the expected capacity units.

2.1.5.4.10. Quantity

Quantity

This is the production order original order qunatity

2.1.5.4.11. Finished

Finished

This is the completed quantity at this production order operation step.

2.1.5.4.12. Due date

Due date

This is production order due date.

2.1.5.4.13. Capacity date

Capacity date

This is the capacity date from where the load is applied for this order/operation.

2.1.5.4.14. Previous operation number

Previous operation number

This is previous operation number for the production order operation line you are looking at.

2.1.5.4.15. Next operation number

Next operation number

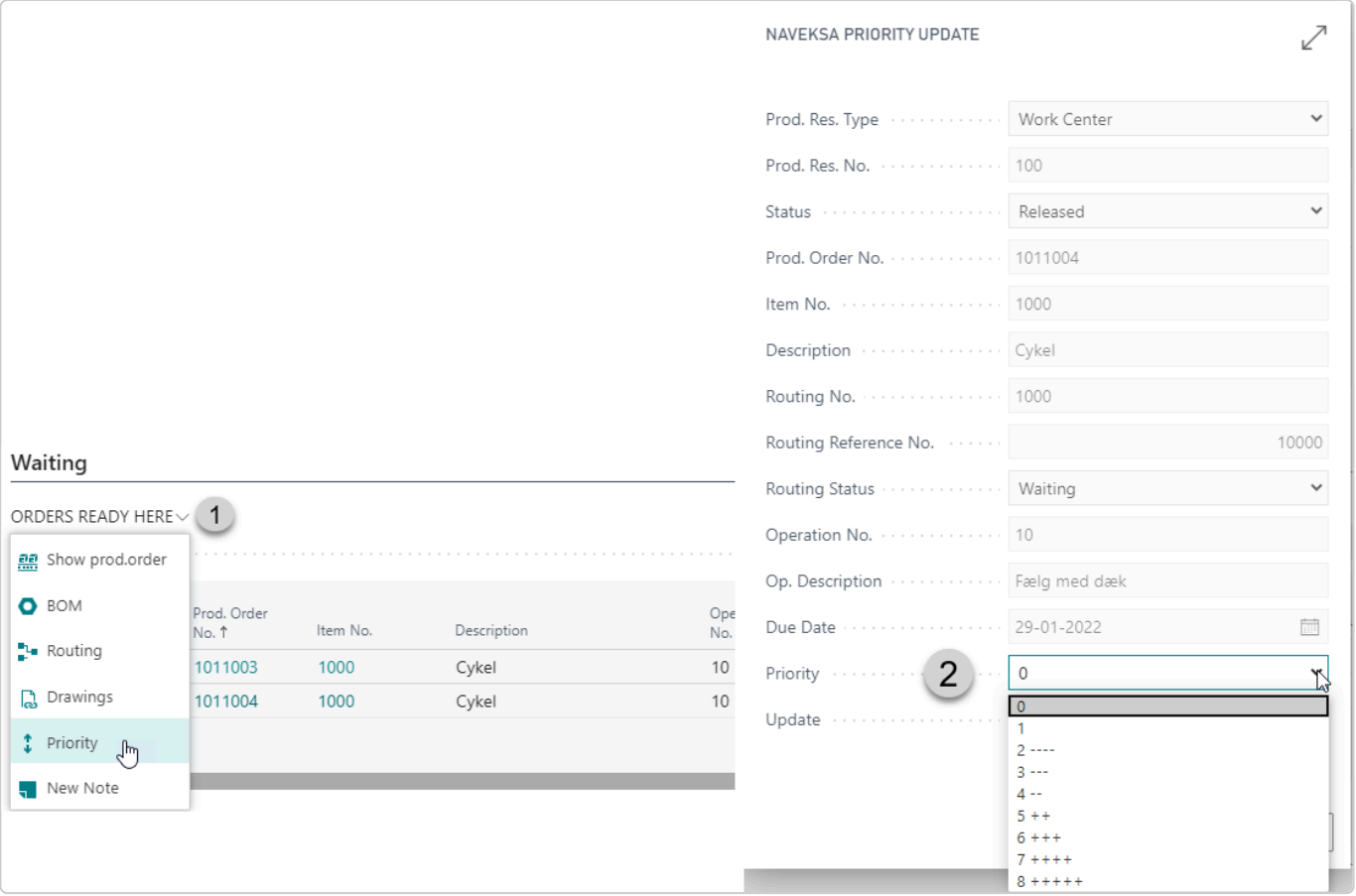
This is next operation number for the production order operation line you are looking at.

2.1.5.4.16. Priority

Priority

Assigning priority to a production order routing line, involves the assigning of priority to all, uncompleted operations of this production order.

The workload categories are displayed in date order, which is determined by the system setup paramater:



- Start date of the order
- Start date of the order routing operation
- Delivery date of the operation
- Due date (delivery date) of the order

By using the priority facility, it is possible to change the sorting so that the orders sequence are modified in the total workload.

It is possible to use different codes that appear when pressing the “Modify priority” key on a certain line at the bottom of the screen.

Important

• **The codes 5–8 prioritize the order FORWARDS through the total workload order stack, with 8 being the highest priority of expediting**. When selecting the priority 5 – 8, the delivery date of the order will be secondary, so that the orders are sorted in relation to the delivery date within each priority code.

• **The codes 2-4 prioritize the order BACKWARDS through the workload with 2 as the most powerful figure lowering the priority of deferring**. When choosing priority 2-4, the delivery date of the order will be primary, so that the orders are sorted related to the delivery date and within each priority code.

• **The codes 0 and 1 can be used to determine if orders shall be shown at the planner screen only, or on the planner screen and the operator screen.**

A planner can, if an order should be held, or the like, at any time remove an order from the operator screen. (Or remove remaining operations), by changing the priority code from 0 to 1. (This only applies, if “Automatic release” has been selected).

• Please observe that the priority change is done on all non-finished routing operations for the order. In a multi order line environment on the same production order you determine yourself if the priority update shall be made for the single order line or all order lines.

2.1.5.4.17. Setup time

Setup time

Setup time for this production order routing operation.

2.1.5.4.18. Setup time unit of measure

Setup time unit of measure

Code for setup time – minutes, hours and days, etc.

2.1.5.4.19. Run time

Run time

Routing operation time for this operation.

2.1.5.4.20. Run time unit of measure

Run time unit of measure

Code for routing operation time – minutes, hours, days, etc.

2.1.5.4.21. Customer user fields 1-10

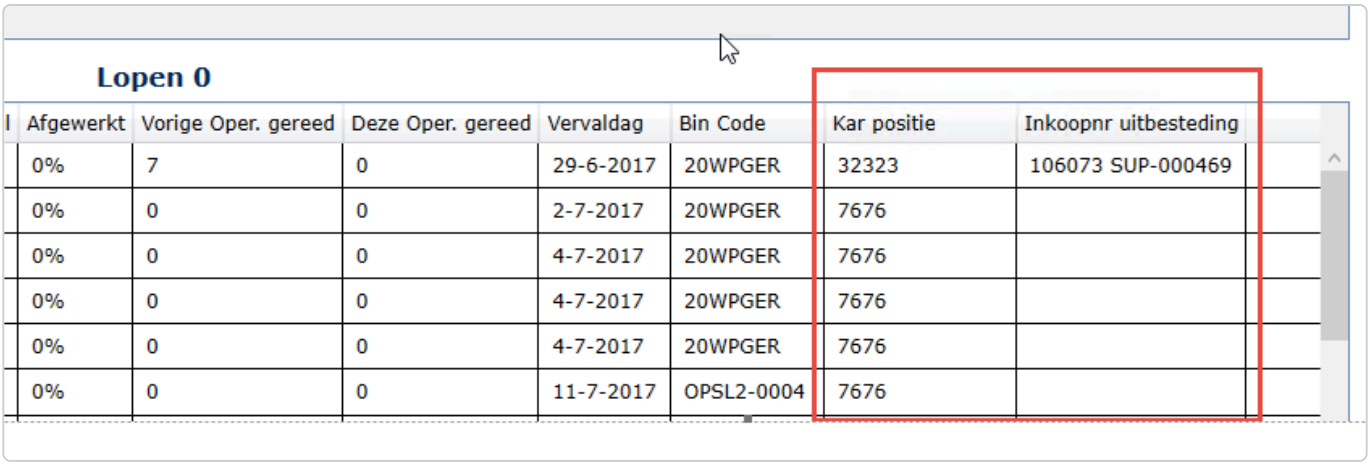
Customer User fields 1-10

Customer fields are fields which can be added in an easy way to both the ShopFloor planning and execution screens.

There is 10 additional customer fields available to choose from. Definition is each 50 characters.

Example:

Here a customer has added some order information for outsourced components.



Lopen 0

Afgewerkt	Vorige Oper. gereed	Deze Oper. gereed	Vervaldag	Bin Code	Kar positie	Inkoopnr uitbesteding
0%	7	0	29-6-2017	20WPGER	32323	106073 SUP-000469
0%	0	0	2-7-2017	20WPGER	7676	
0%	0	0	4-7-2017	20WPGER	7676	
0%	0	0	4-7-2017	20WPGER	7676	
0%	0	0	4-7-2017	20WPGER	7676	
0%	0	0	11-7-2017	OPSL2-0004	7676	

Customer fields are also used when sorting and selecting data with a kind of similar characteristics for combined production execution:

Plate thickness
Colour
Same raw material
etc.

Click here to read about how to add and setup your own fields

2.2. Functions in ShopFloor planning

Using ShopFloor planning – Advanced functions

In this section you will find how to operate various advanced topics.

Please move on.

2.2.1. Capacity levelling in ShopFloor planning

Capacity levelling in ShopFloor planning

The usual procedure when you create a production order in Business Central / Navision is to create a production order in good time, based on the concerned routing. Here, the quantity that has to be manufactured, has to be defined, as well as when it has to be finished.

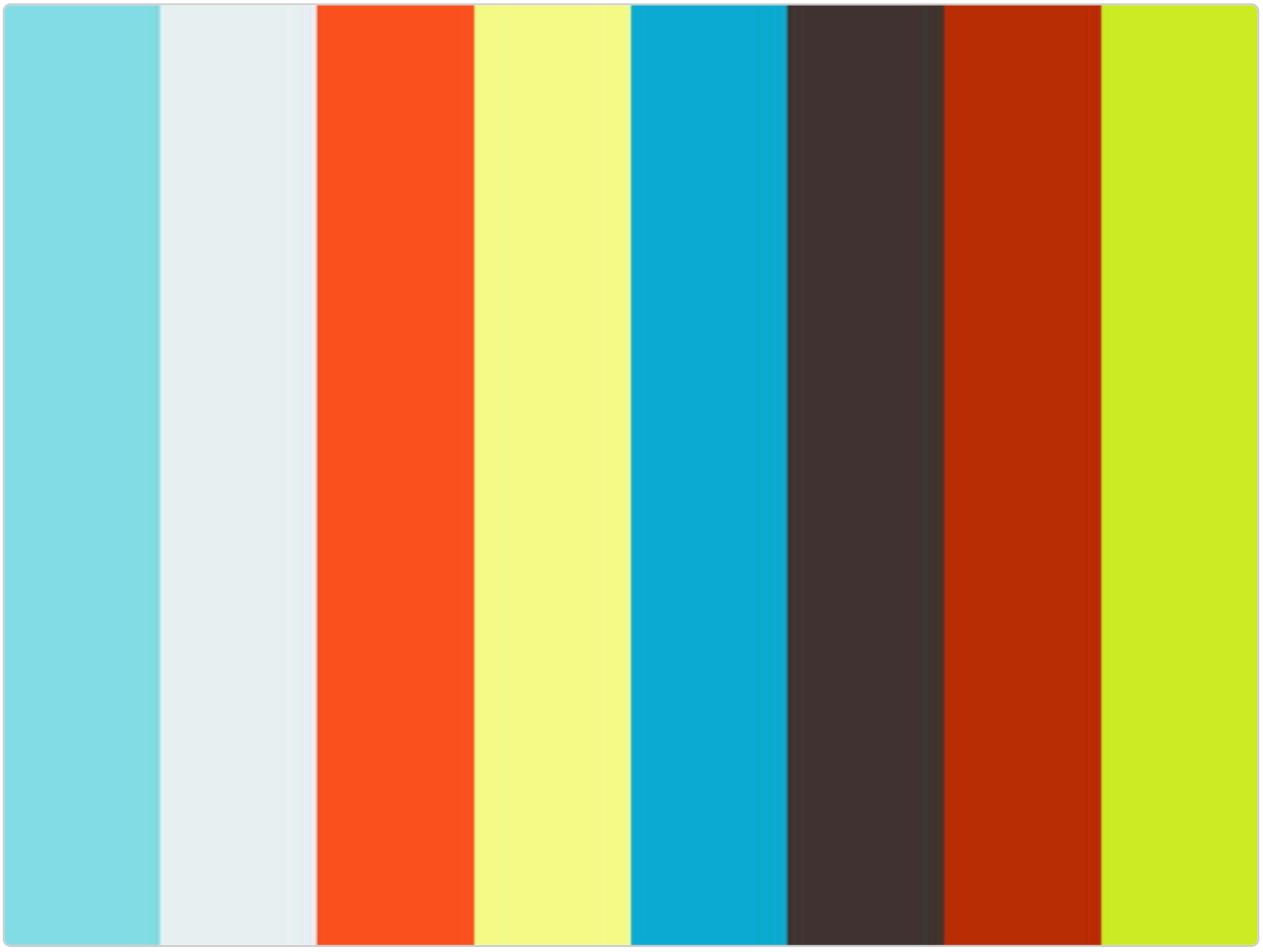
The routings usually consist of work centers, since it is not possible to appoint the employee or machine in advance, regarding who has to perform the job. In this context, the employees and machines are considered as production resources.

It is not necessary either, to consider this in the rough planning, as we are just interested in knowing, whether we have got the necessary capacity available at the work center.

Shortly before the production has to be started, you have to consider, which employee or machine has to perform the job in question, and this has to be communicated to the shopFloor operators.
For this purpose, the standard BC / NAV manufacturing is not very helpful, as there is no planning picture available, where you can carry out this job scheduling.

However, NAVEKSA SHOPFLOOR has got the necessary tools for this purpose, partly through NAVEKSA Planning Shop Work, where the planning can be made, and partly using the NAVEKSA ShopFloor client, which gives information to the operators.

Click on start at the video screen to see how it works (2:40 minutes):

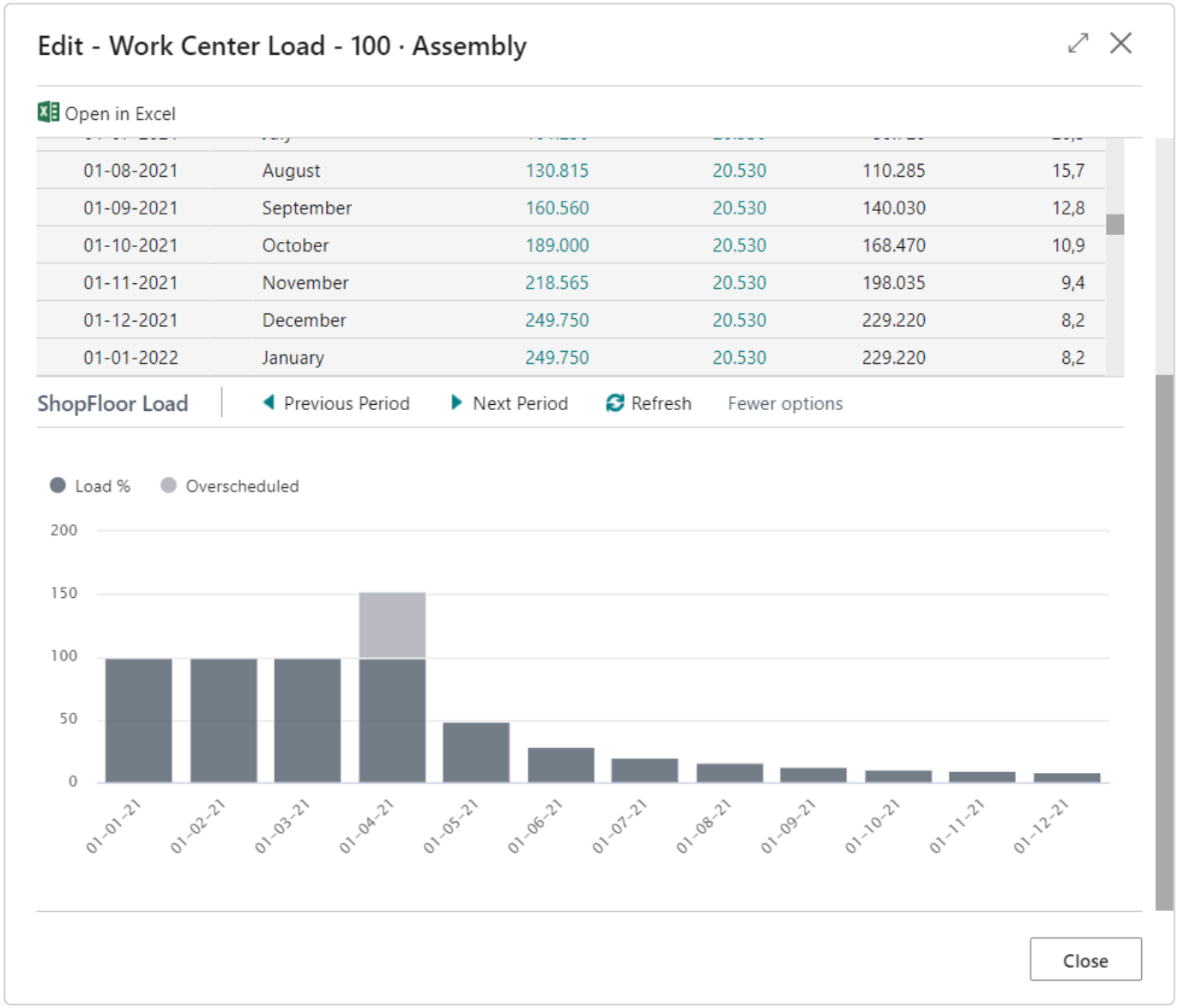


https://player.vimeo.com/video/204163288

How it works

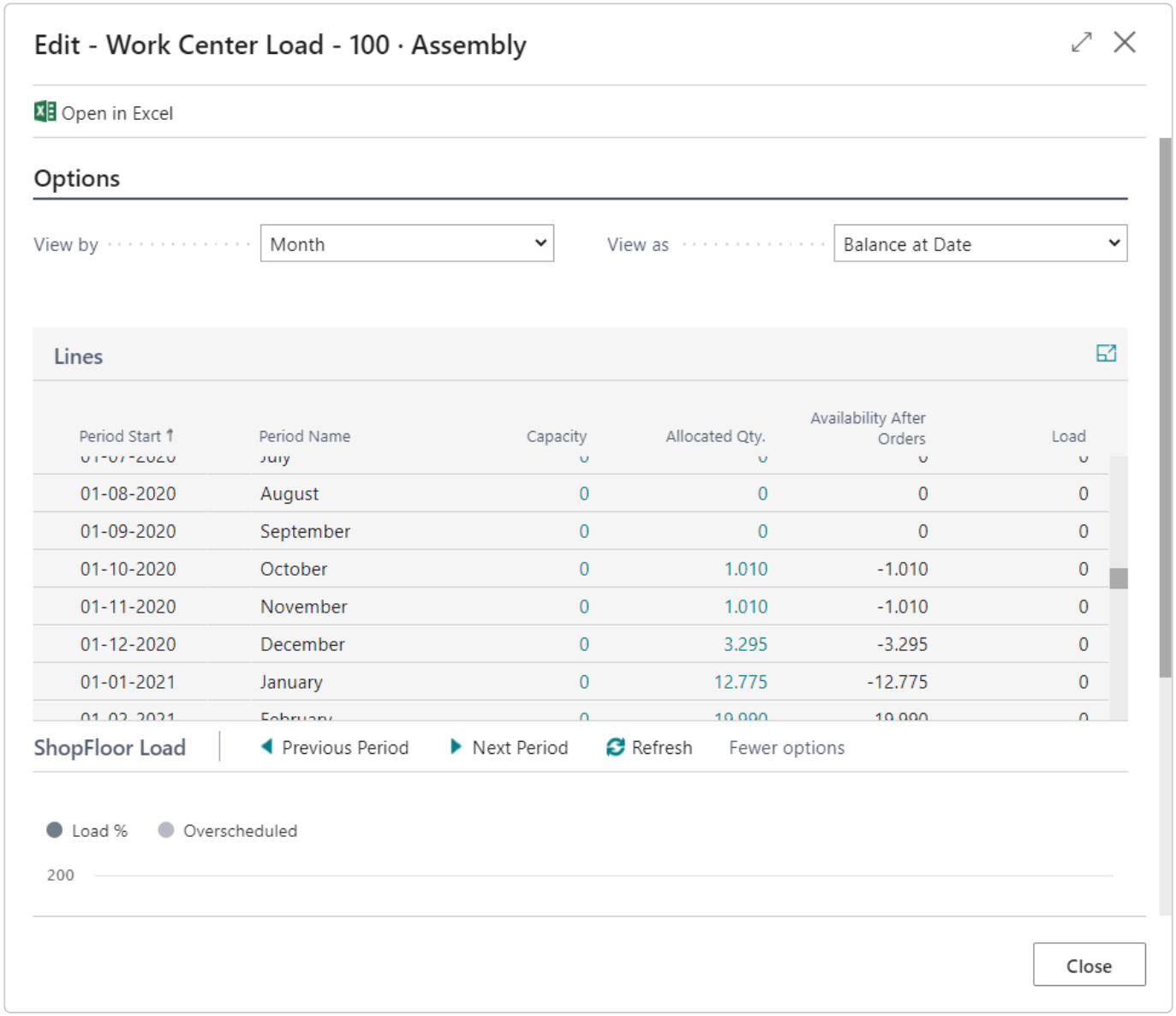
Here are a number of orders under “Orders Queing” that have to be manufactured during the next days. The orders are only allocated to work center 100, and it has not been considered yet, which employees shall work on the production.

Under Cap%, the accumulated capacity of the work center is shown. If you want to see the capacity each day, you might look it up in Cap % in order to see the capacity load for each day. Under SHOPFLOOR capacity load, the length of the period is selected, which has been set to 1 Month on the picture below:



If you switch among the periods (Previous period/Next period) you can have an overview, showing, whether there are any problems concerning the capacities of the period.

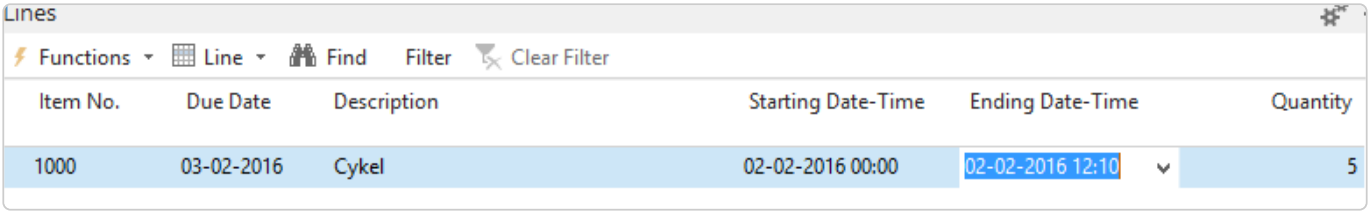
By looking up on the top screen, you can see, which productions are scheduled to be performed this date (necessary columns have to be added):



This overview can be obtained by sorting in the Capacity Date order.

We can see that both production 101006 and 101007 start on the same date, and it might be appropriate to move the start time to a date in the future for one of them, if it does not conflict with a sales order.

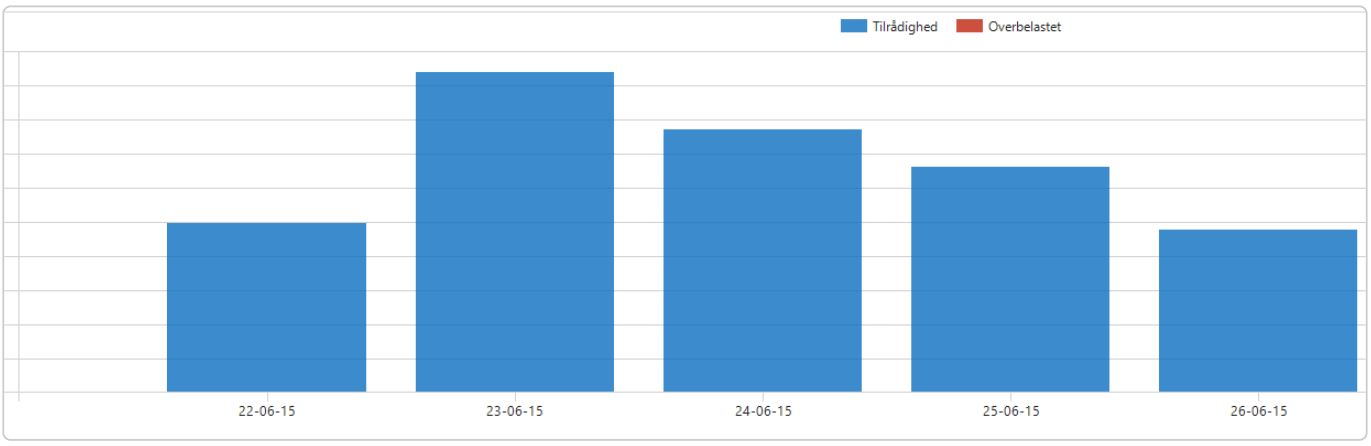
It is possible directly to look up to the concerned production order from this window, and change the start date on the production order line:



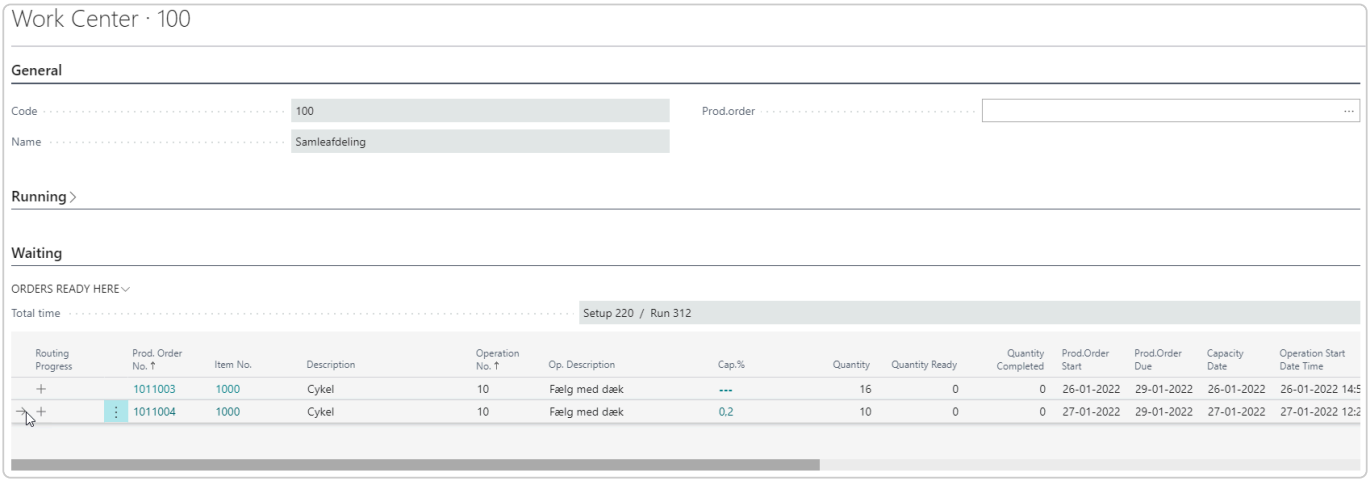
The date has been moved one day forward to the 02-02-16.

By going back to the screen showing the work center capacity load, and by making an ”Update” of the SHOPFLOOR in the SHOPFLOOR capacity load, the capacity load will be updated and it is now possible

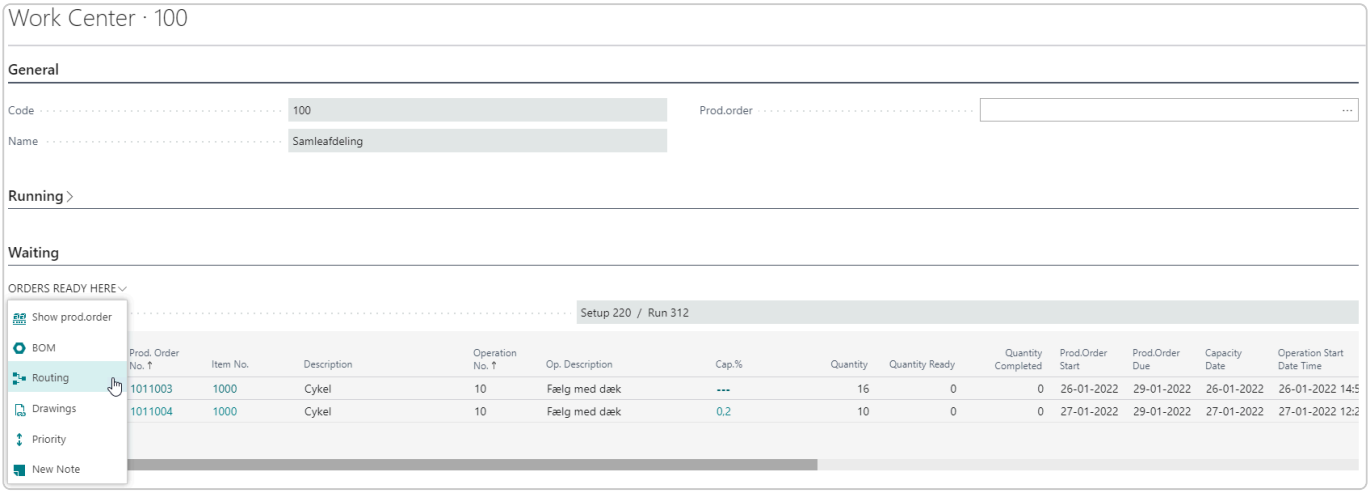
to see that the under capacity on the 24/6 has disappeared:



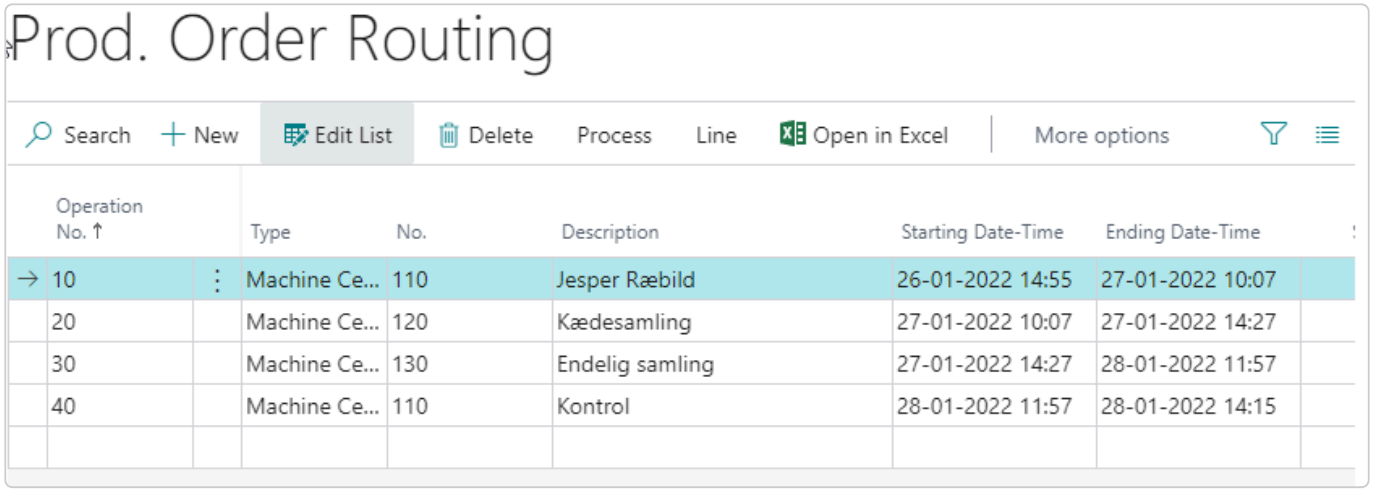
The next step of the job scheduling is to allocate the concerned productions to the employees. The overview of the workload is closed down in order to get back to the picture with the overview of the orders that are ready. Possibly sort on the capacity date, in order to have the jobs shown in ascending date order with regards to the start date:



Delegation of tasks take place through routings and therefore we look up on ”Show Routing on the first line:

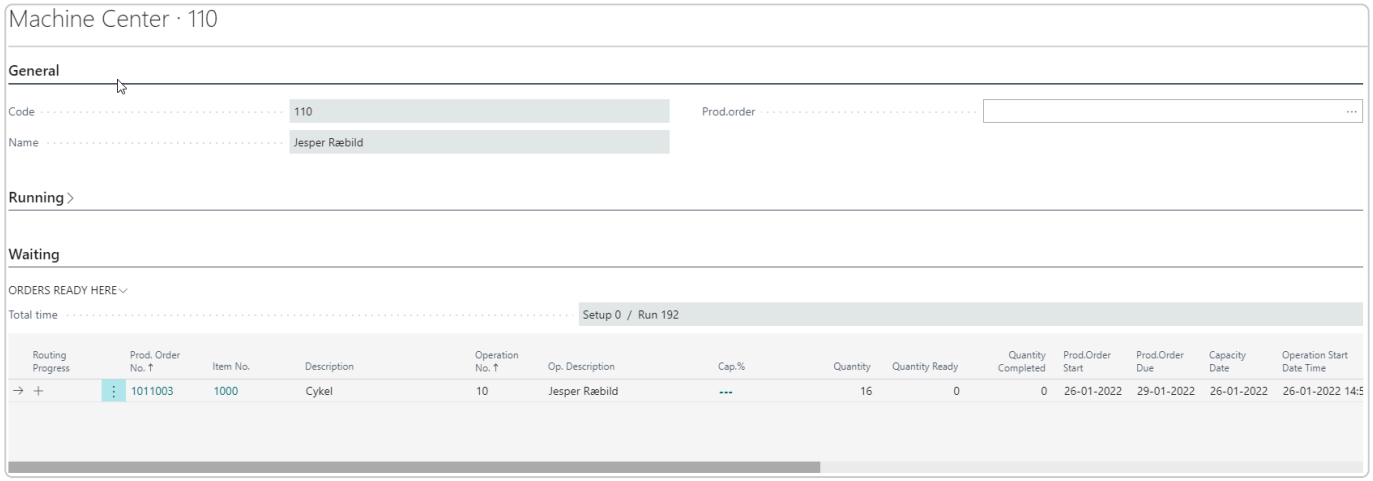


We only want to schedule work center 100. We alter the type into Production resource and select no. 110 for this task:



Please note that even if we change to a production resource, the operation time will not be changed.

However, the setup will be reset, that means it has to be set back to default (look up is made to a Navision page and table). As it is our policy not to change in the Navision standard, this cannot be changed by NAVEKSA. We continue through the lines and allocate the different jobs to the different employees:



The different jobs have now been allocated to the employees.

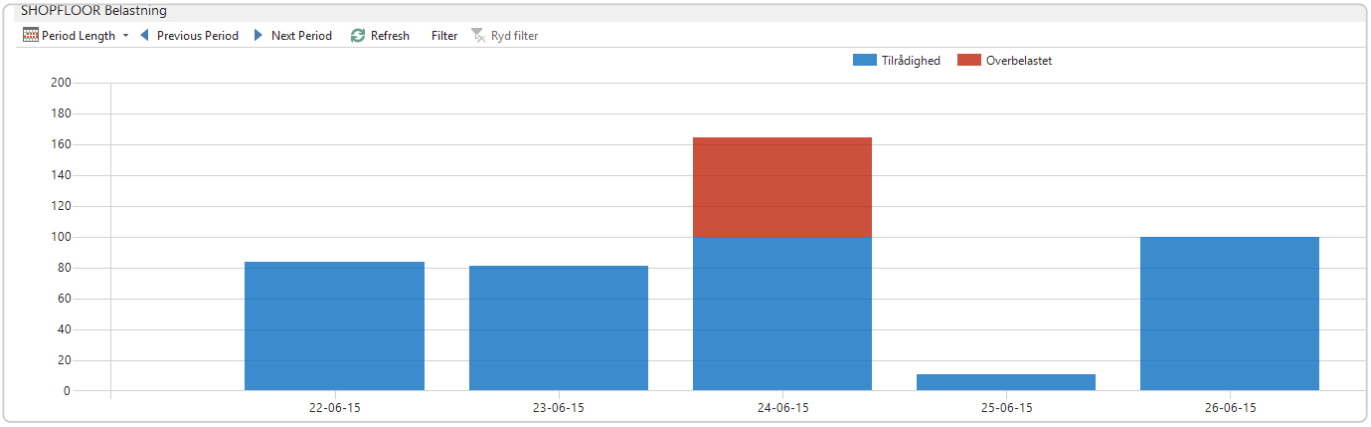
The above is a simplified example, where all jobs have the same lead time. In the real world there may be big differences in lead times. Consequently, the next task is to make sure, that the production resources have no under capacity. However, it will often be the case that certain employees carry out certain tasks, as in the above example.

In order to see the load of the production recourses, you have to go back to the list of work centers and select each production resource:

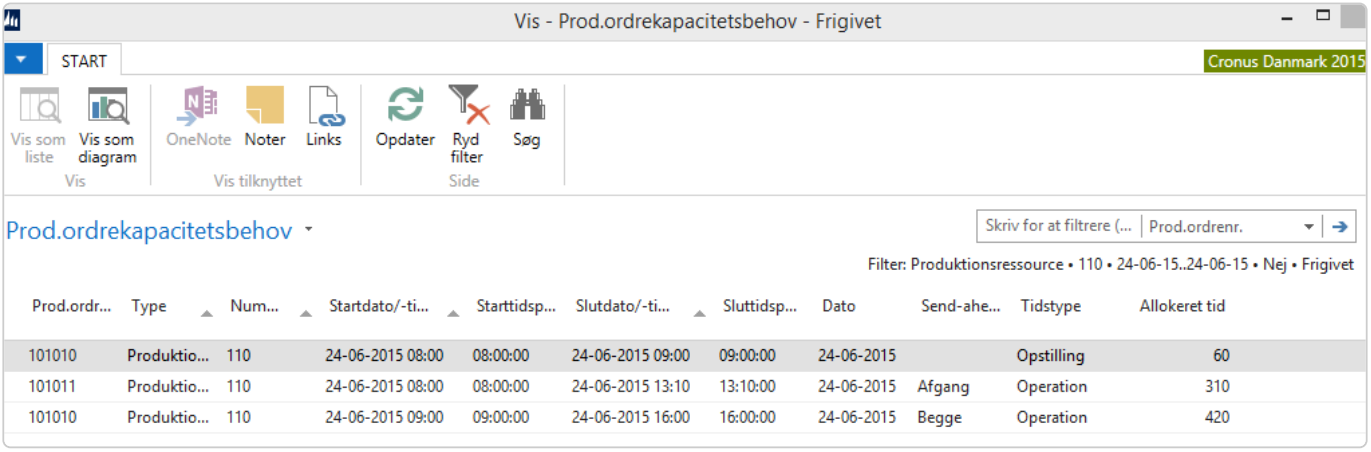
Setup time	Operation time	Op. Number
10	20	10
5	10	15
20	15	20

We start to select no. 110 and can see that the jobs he has got assigned are shown here:

In order to see, if there is under capacity, we look up in Cap%.

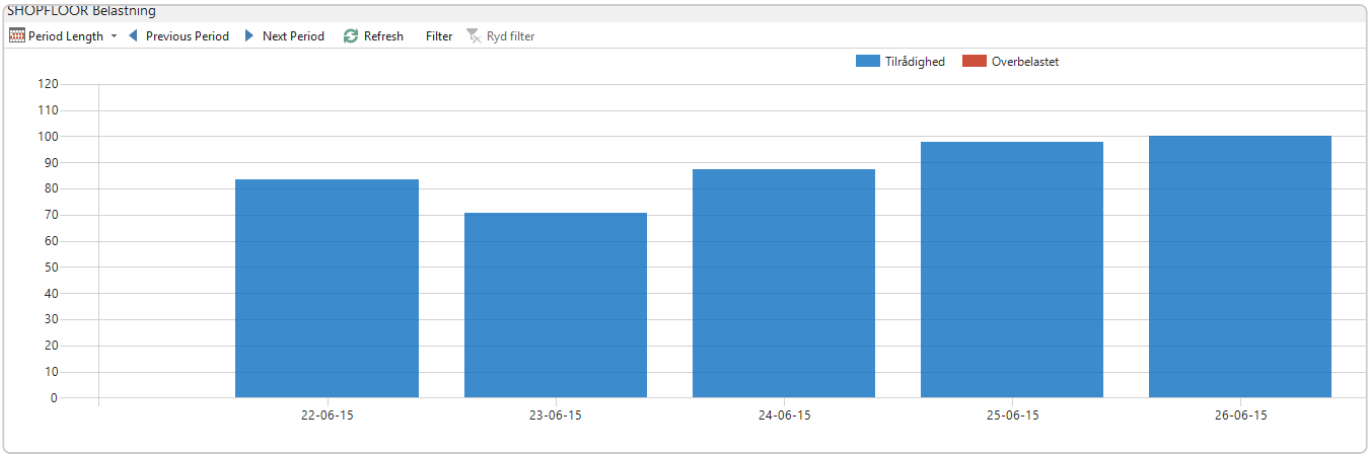


We can see that his capacity is heavily overloaded on the 24/6 2015, however he has lots of free capacity the day after. Therefore, we check this date in order to find out, if any productions can be postponed:



Prod.ordr...	Type	Num...	Startdato/-ti...	Starttidsp...	Slutdato/-ti...	Sluttidsp...	Dato	Send-ahe...	Tidstype	Allokeret tid
101010	Produktio...	110	24-06-2015 08:00	08:00:00	24-06-2015 09:00	09:00:00	24-06-2015		Opstilling	60
101011	Produktio...	110	24-06-2015 08:00	08:00:00	24-06-2015 13:10	13:10:00	24-06-2015	Afgang	Operation	310
101010	Produktio...	110	24-06-2015 09:00	09:00:00	24-06-2015 16:00	16:00:00	24-06-2015	Begge	Operation	420

Here we select to postpone the start date of production 101010 to the 24/6 at 14.10 pm and now we have the following capacity load.



In the same way you have to continue with the remaining production resources, until the job scheduling

has been made for all productions in the assembly department.

This information is now available via the SHOPFLOOR client.

NAVEKSA SHOPFLOOR Planning can also be used to carry out necessary adjustments of job, if either an employee has become ill, or a machine has broken down, and all tasks have to be moved to other production resources.

Let us assume that we have received a message this morning that Daniel Goldschmidt is long-term sick. To begin with, we look up in the SHOPFLOOR planning, Daniel Goldschmidt, for an overview of which jobs have been assigned to him:

We have to move these tasks to other employees, as we cannot wait for his recovery. We look up under Show routing and put some filters in, so we only see his job for a certain period.

We chose to allocate the jobs to Jesper Petersen and Anders Riis, and we can see that this means that we have to notify overtime for Jesper Petersen:

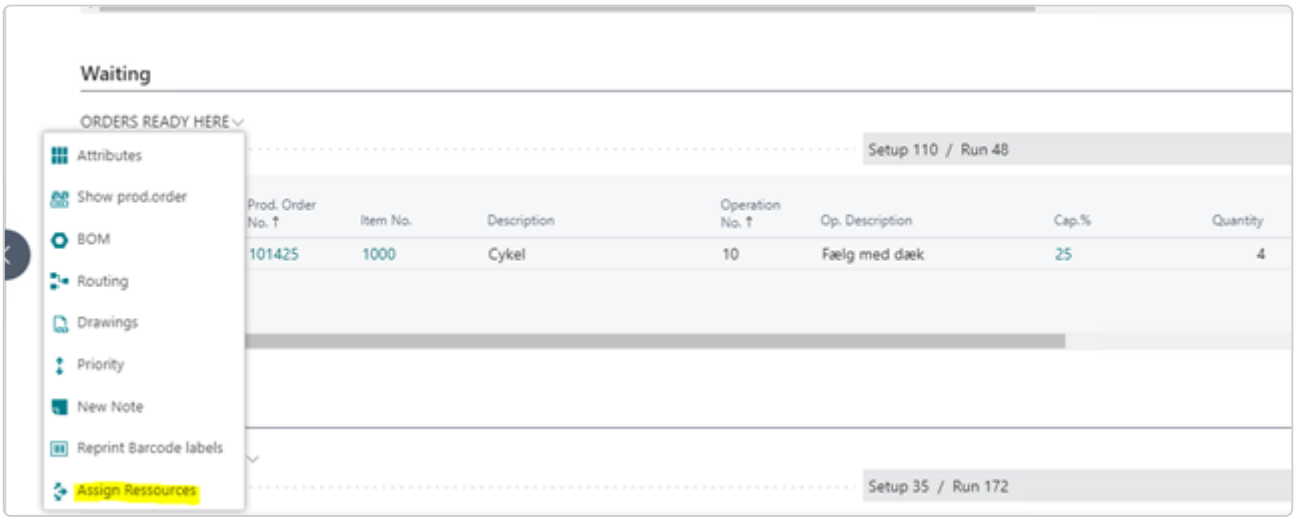
Alternatively, we have to start re-scheduling the jobs, postpone delivery, or hire a temporary worker. The scheduling of this is made as described above.

It is possible to schedule everything from the NAVEKSA SHOPFLOOR Planning, and it will immediately be visible via the SHOPFLOOR client in the SHOPFLOOR.

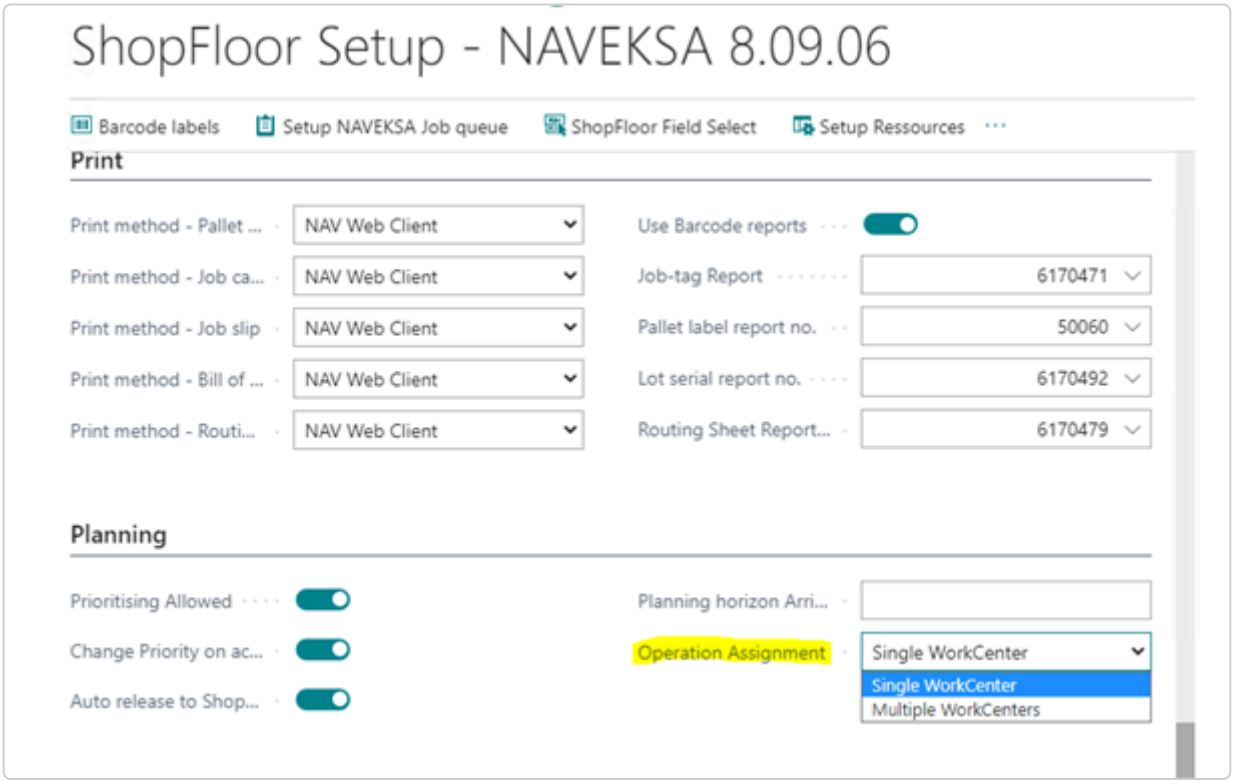
2.2.2. Re-assign routing operation from a planned work center into one or more machine centers

Re-assign routing operation from a planned work center into one or more machine centers

On the ShopFloor Planning page for Waiting and Arriving Order there is a Line Action for re-assigning operations from a planned WorkCenter to one or multiple MachineCenters.



This re-assignment has two modes of action dependent on a new Setup parameter.

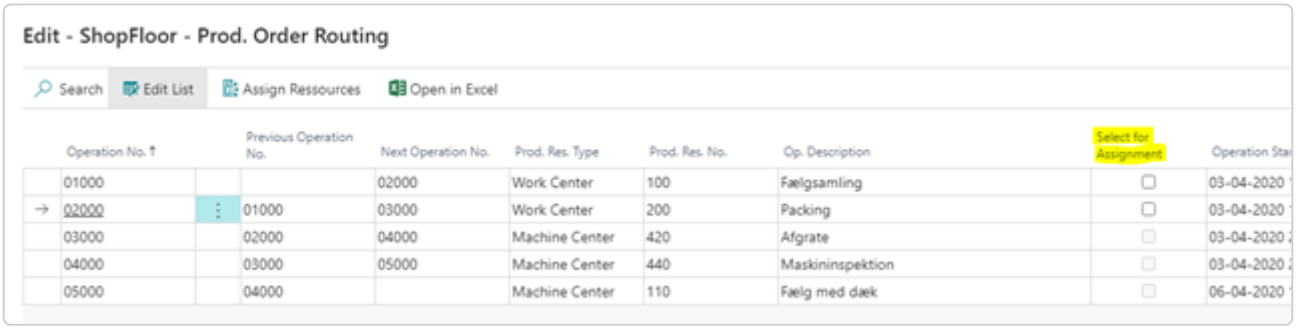


If setup to “Single WorkCenter” the function acts to handle the situation where the planner is controlling

an individual WorkCenter, and operations on that WorkCenter only.

If setup to “Multiple WorkCenters” the function acts to handle the situation where the planner is controlling all WorkCenters and is planning for all operations on a specific production order.

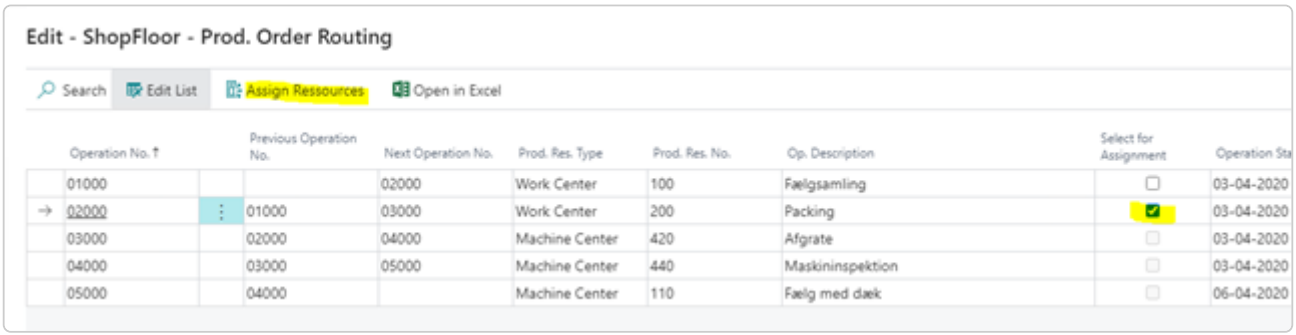
If setup to “Multiple WorkCenters”, selecting the “Assign Resources” function will open a page showing all operations on the production order.



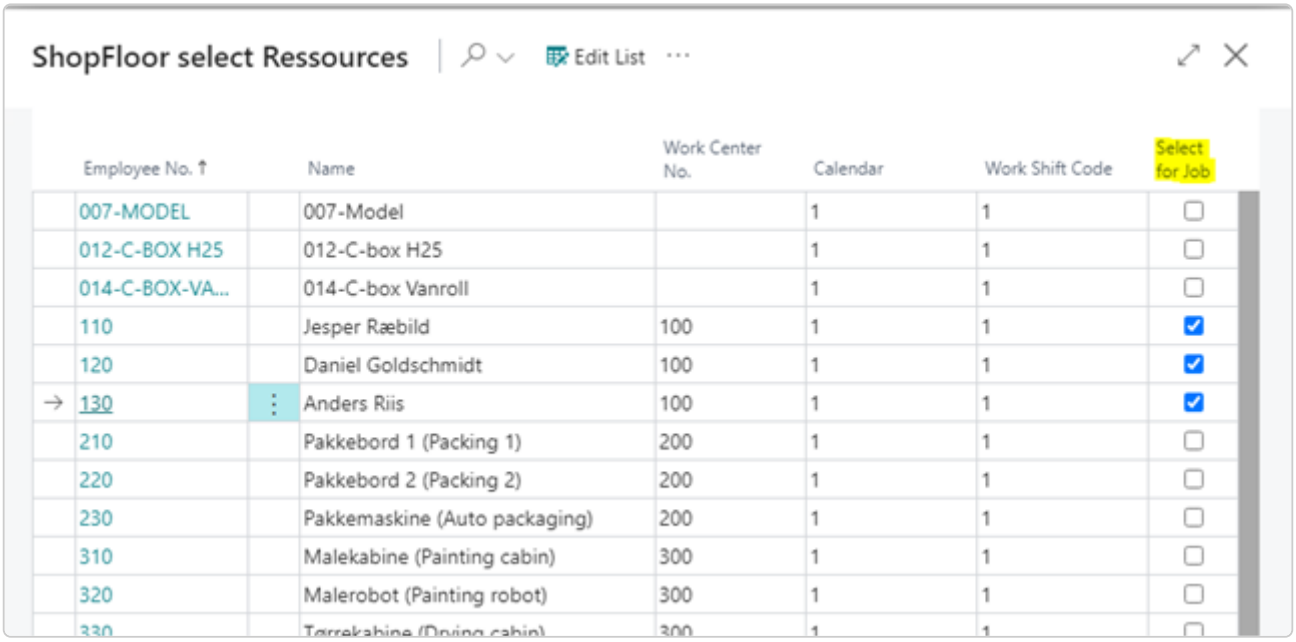
You will have a column where you select which operation to assign to MachineCenters.

Please note:
1. You can not assign first and last operation to more then one Resource due to standard BC Rules.
2. You can only assign operations from a WorkCenter to MachinCenter(s)
3. You are limited on the number of MachineCenters according to a BC restriction on the length of the routing line fields “Previous operations” and “Next operations”.

When you have selected which WorkCenter operation you want to assign to MachineCenters, you click the Action button “Assign Resources”.

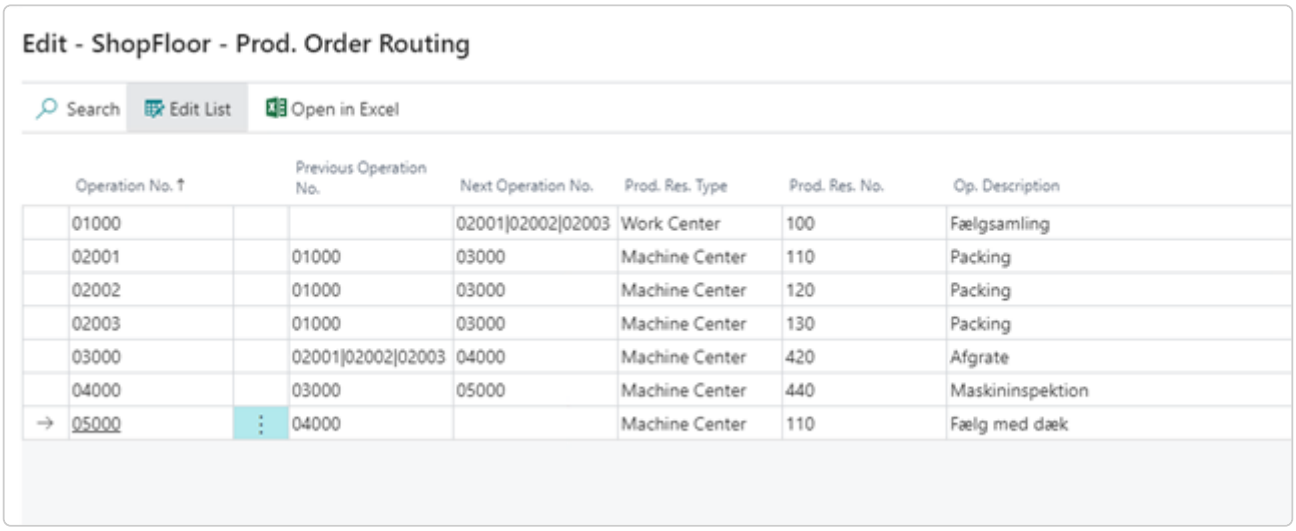


This opens a new page where you select the actual MachineCenters for this operation.
This is the same page, and therefore the starting point, when setup to “Single WorkCenter”.
On this page, you start with selecting “Edit List”. (If you have entered this page by accident, you can leave without changing anything)
Next you mark the “Select for Job” field on the Resources you want to assign the operation to.



Employee No.	Name	Work Center No.	Calendar	Work Shift Code	Select for Job
007-MODEL	007-Model		1	1	☐
012-C-BOX H25	012-C-box H25		1	1	☐
014-C-BOX-VA...	014-C-box Vanroll		1	1	☐
110	Jesper Ræbild	100	1	1	☑
120	Daniel Goldschmidt	100	1	1	☑
→ 130	Anders Riis	100	1	1	☑
210	Pakkebord 1 (Packing 1)	200	1	1	☐
220	Pakkebord 2 (Packing 2)	200	1	1	☐
230	Pakkemaskine (Auto packaging)	200	1	1	☐
310	Malekabine (Painting cabin)	300	1	1	☐
320	Malerobot (Painting robot)	300	1	1	☐
330	Tørrekabine (Drying cabin)	300	1	1	☐

Pressing OK-button will change the Routing lines on the production order to reflect these new Resource assignments and return to the previous page, showing the new production order routing lines where the newly assigned MachineCenters are added as parallel operations.



Operation No.	Previous Operation No.	Next Operation No.	Prod. Res. Type	Prod. Res. No.	Op. Description
01000		02001|02002|02003	Work Center	100	Fælgsamling
02001	01000	03000	Machine Center	110	Packing
02002	01000	03000	Machine Center	120	Packing
02003	01000	03000	Machine Center	130	Packing
03000	02001|02002|02003	04000	Machine Center	420	Afgrate
04000	03000	05000	Machine Center	440	Maskininspektion
→ 05000	04000		Machine Center	110	Fælg med dæk

If you have more WorkCenter operations, you want to assign to MachineCenters, you can now select the next and repeat the process.

2.2.3. Using different resource unit cost rates for costing purposes

Using different resource unit cost rates for costing purposes

Naveksa ShopFloor supports the feature that the specific unit cost of a given production resource can be transferred to the output journal.

On the other hand, the unit cost of a resource cannot be used, as resources are not related to capacity entries.

The unit cost of a resource cannot be used either, as resources are not connected to capacity entries. The unit price of an employee cannot be used either, for that reason alone that an employee has no unit price in the system.

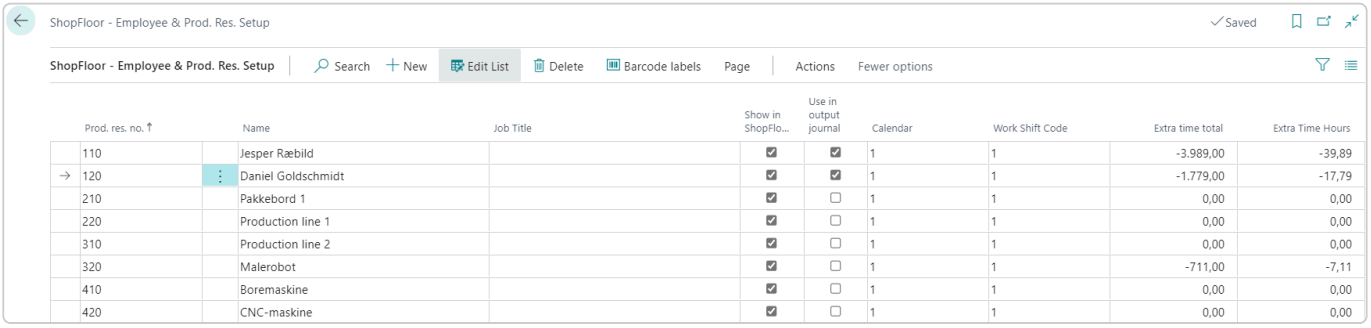
This means that if you want to register a resource or the unit price of an employee as a capacity cost, the resource or the employee has to be created in the system as a production resource as well.

In order to keep an overview of the capacity costs relation to resources or to an employee, it is recommended to create the production resource with the same number as the resource or the employee.

Regardless if there are several types of operators having the same number, this number will just be displayed once, with the production resource having the highest priority. Utilizing TA (Time Attendance) clock on / clock off, the number of the employee will have the highest priority.

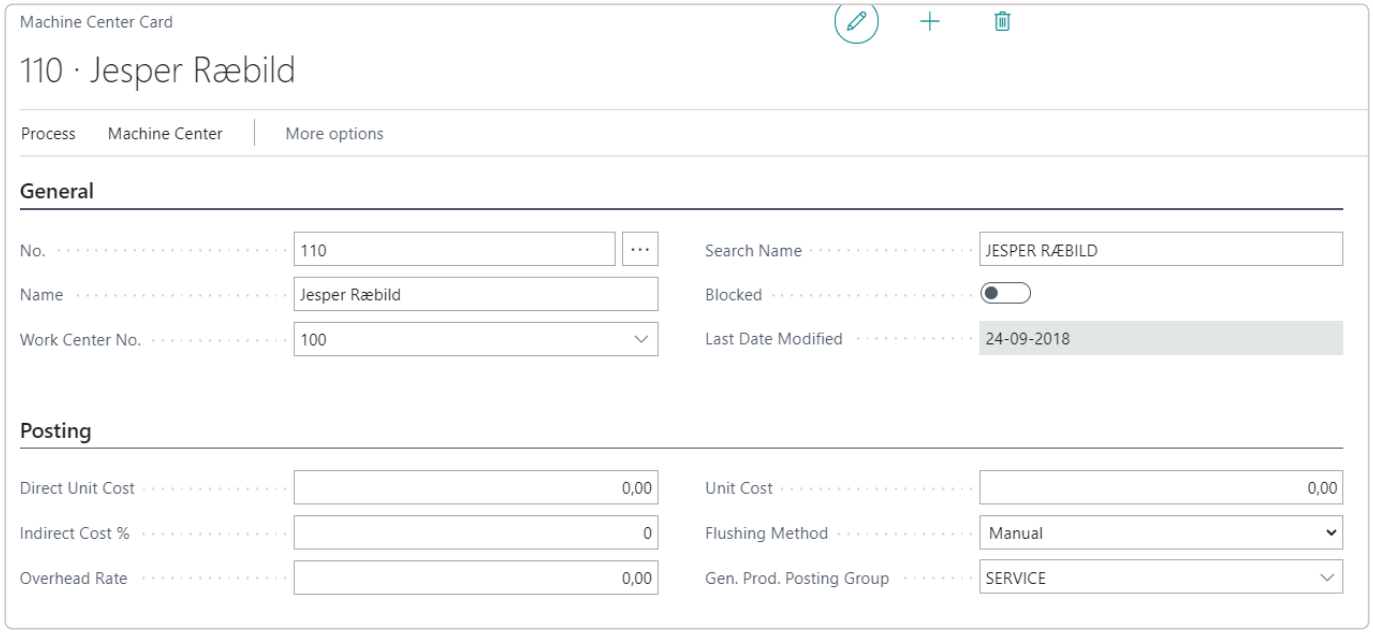
Transfer of the Production Resource Unit Price to the Output Journal

In the ShopFloor page ”Employee & Production Resource Setup”, there is a column referred to as “Use in the Output Journal”:



Prod. res. no.	Name	Job Title	Show in ShopFlo...	Use in output journal	Calendar	Work Shift Code	Extra time total	Extra Time Hours
110	Jesper Ræbild		☑	☑	1	1	-3.989,00	-39,89
120	Daniel Goldschmidt		☑	☑	1	1	-1.779,00	-17,79
210	Pakkebord 1		☑	☐	1	1	0,00	0,00
220	Production line 1		☑	☐	1	1	0,00	0,00
310	Production line 2		☑	☐	1	1	0,00	0,00
320	Malerobot		☑	☐	1	1	-711,00	-7,11
410	Boremaskine		☑	☐	1	1	0,00	0,00
420	CNC-maskine		☑	☐	1	1	0,00	0,00

If this field has been check marked, the relevant cost of production resources will be transferred to the output journal:



If this field has not been marked, the unit price of the work center will be used. That means it is only necessary to checkmark the field of the operators having a unit price that differs from the standard unit price of the work center.

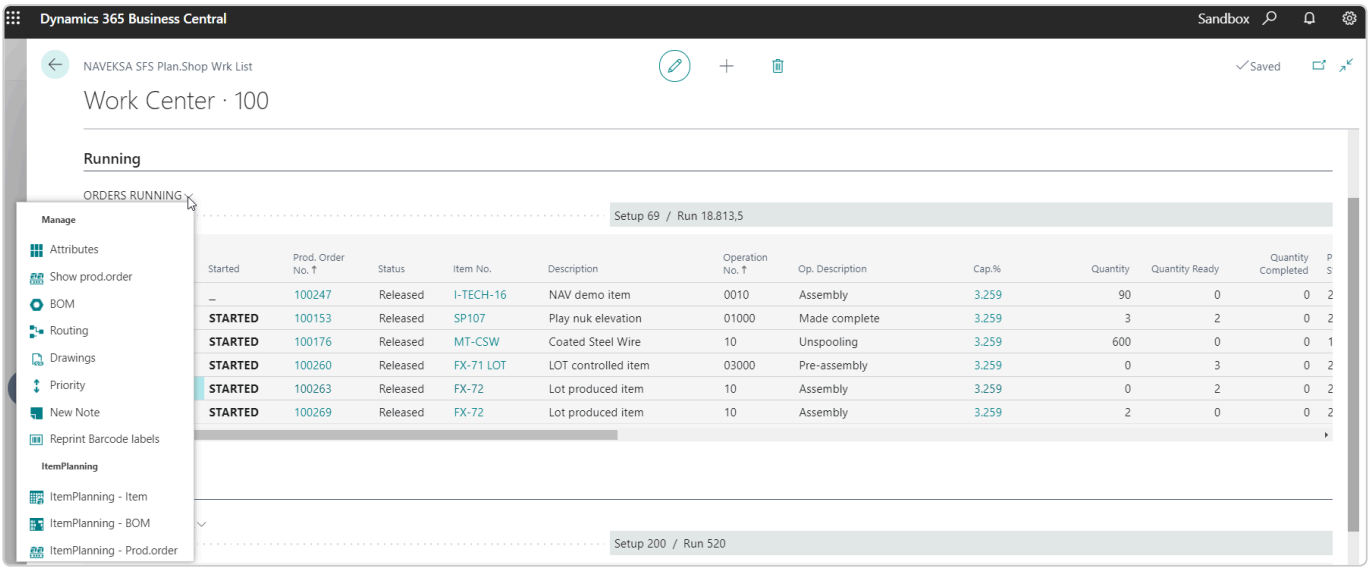
2.2.4. NAVEKSA ItemPlanning integration

NAVEKSA ItemPlanning integration

As a convienience the NAVEKSA ItemPlanning (when installed) is added as a tooltip to the ShopFloor planning screen for the control of inventory availability and potential shortages when working with a production order.

Using this you can work with **item availability** for

- The production order item
- The standard production bill of material for the production order item
- The production order component inventory availability



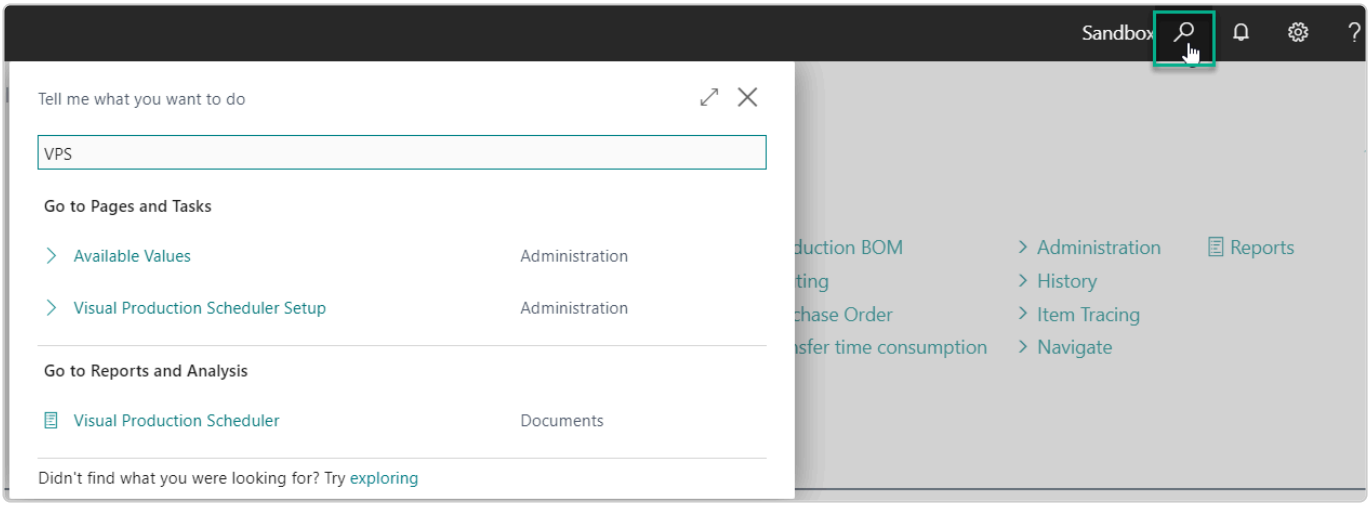
Click here to read more on ItemPlanning

2.2.5. Netronic VPS – Visual Production Scheduler integration

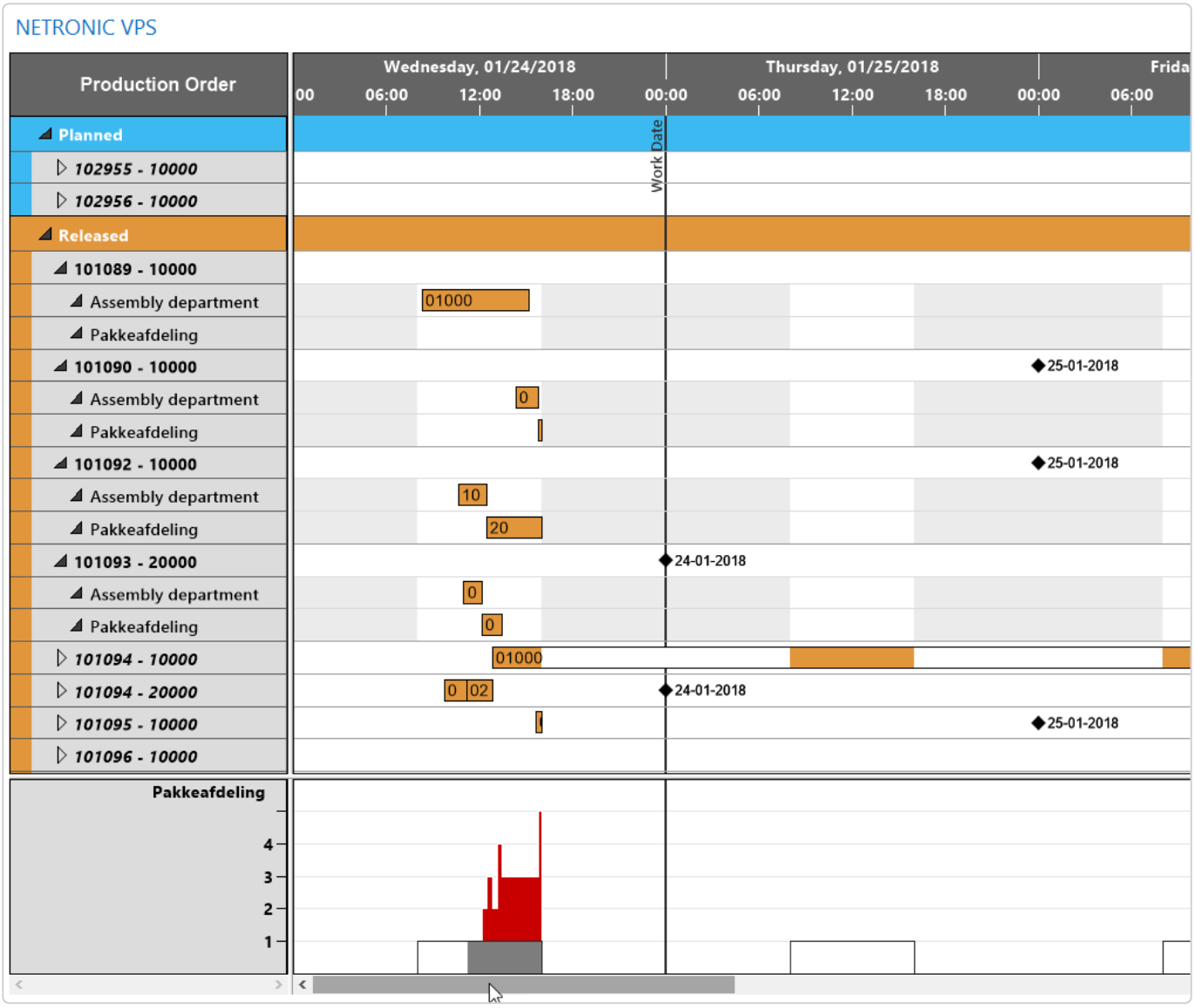
Netronic VPS – Visual Production Scheduler integration

The Netronic VPS – Visual Production Scgeduler can run as an integrated part of the ShopFloor planning if you prefer to do your scheduling in a graphical tool.

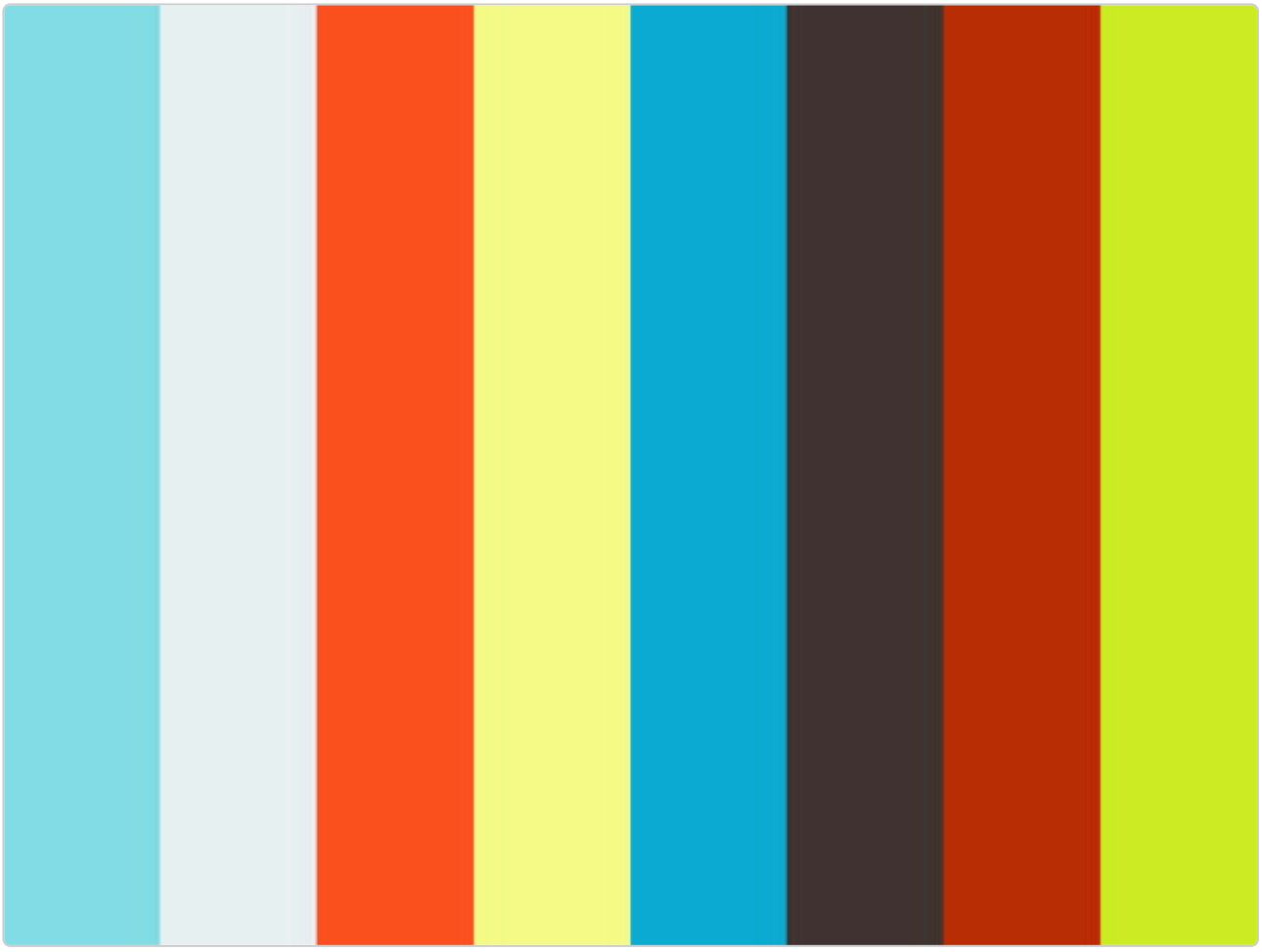
When working with ShopFloor planning please use the lup and search for “VPS”



This will launch the Visual Production Scheduler application:



Click the start button in the video screen to see the 2 minutes video presentation:



https://player.vimeo.com/video/205032536

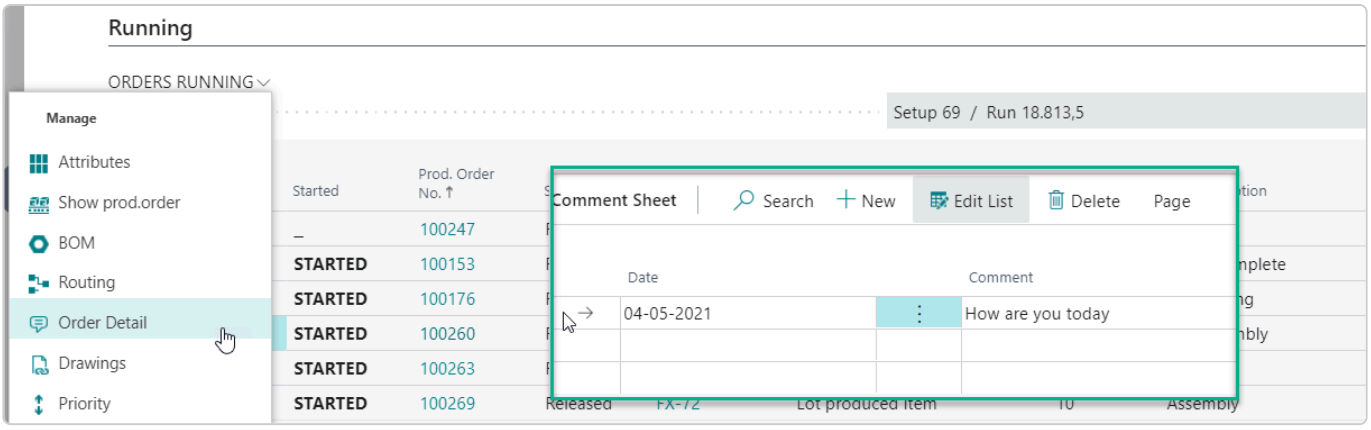
Click here to read more about the Netronic VPS solution at their web-site

2.2.6. Comments/Notes between planning and execution

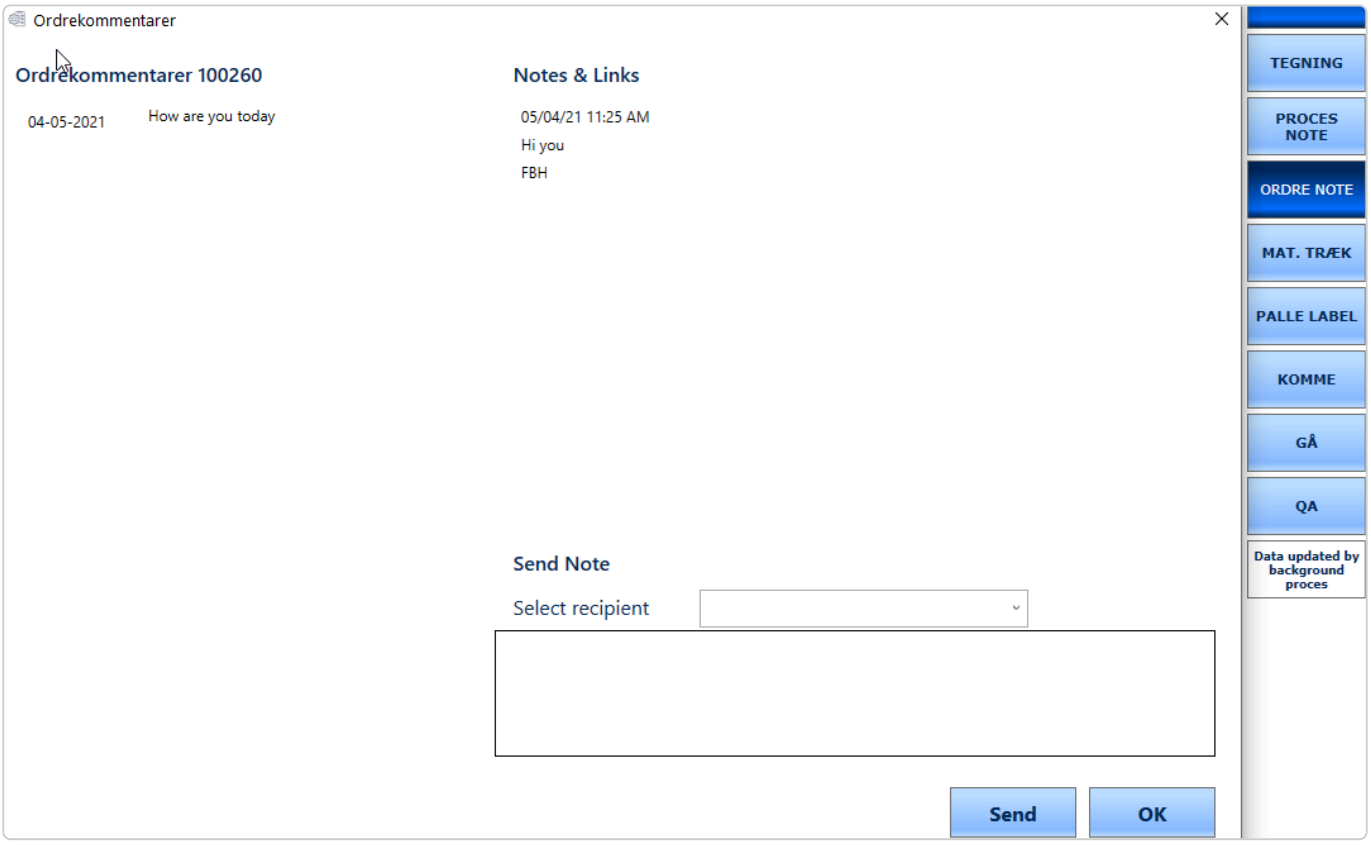
Comments/Notes between planning and execution

Adding order comments to a production order in ShopFloor planning can be shown to the operator, and the operator in return can add and send a message attached to the production order.

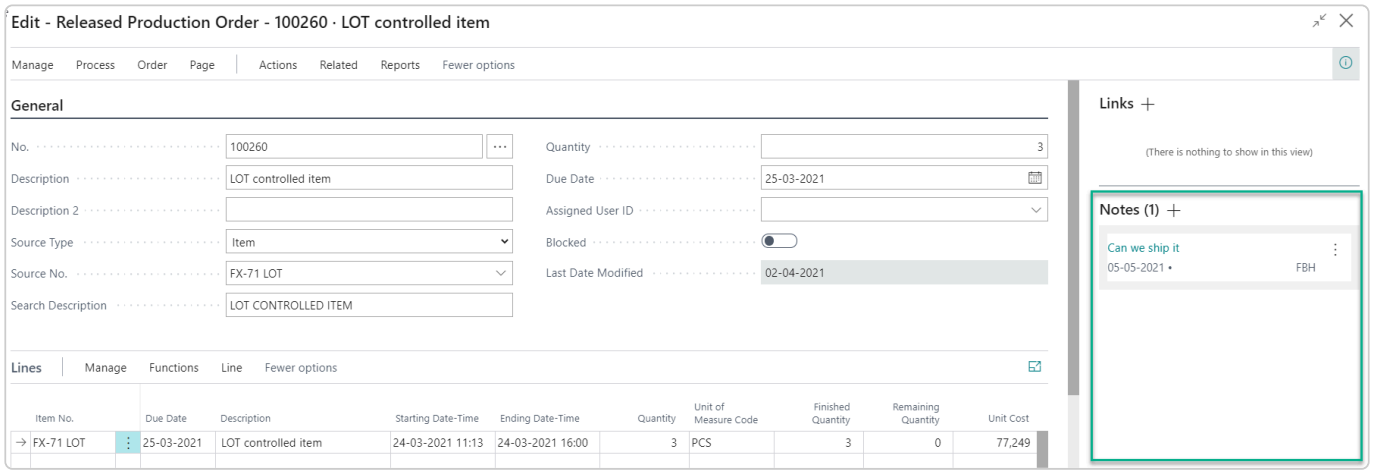
Order comments attached to the production order made by the planner can be shown clicking the “Order detail” tooltip.



Order comments attached to the production order can be shown clicking the “Order note” button in the operator client. The operator can enter a answer or a new note and send it back attached to the production order.



When the operator press Send, the message will pop-up at the Notes section next to production order card:



All messaging will be kept at the order for future reference, – also at the finished order.

2.2.7. Bundled production – Methods in distribution of job time methods

Bundled production and redistribution of job time

When a bundled production run is finished, The spend time needs to be distributed back to the originating (different) production order routing lines.

2 different principles apply you can read about below.

Where can the different Allocation Methods be used advantageously

Actual time in relation to the expected standard operating time

You can benefit from using this method, in case that several productions are processing at the same time as a family, and where productions are processing simultaneously. In case of reporting partial completion, the total time will not be allocated to the product that has been reported as partial completed, until the end of the production. Typically reporting partial completion will result from an urgent order.

Actual time in relation to the number of items reported as finished

You can benefit from using this method, when several orders are started at the same time as a family, but where there is only one order/item processing at a time, thereafter partial reporting as completed is made regularly. Typically start of the orders at the same time, will have more the nature of a reservation of the particular order to a certain employee/production resource.

Action	Allocation in Relation to expected Time	Allocation in Relation to the Number/Quantity that is reported as completed
Pausing all orders	Time will be allocated in relation to the total estimated job time excl. setup of individual productions. In case there is no expected time, time will be allocated equally.	Time will be allocated in relation to the total estimated job time excl. setup of individual productions. In case there is no expected time, time will be allocated equally.
Pausing only one of the orders of the family	Time will be allocated in relation to the total expected operating time, excl. setup of the individual productions. The order(s) that have not been paused, are started again with a new sequence number and a new start time. If there is no expected time, time will be allocated equally.	Time will be allocated in relation to the total expected operating time, excl. setup of the individual productions. The order(s) that have not been paused, are started again with a new sequence number and a new start time. If there is no expected time, time will be allocated equally.
Reporting partial completion of one or more orders	All orders will be stopped and the time will be allocated in relation to the expected operating time. If there is no expected time, time is allocated equally, regardless of the number. The orders are started again with a new sequence number and a new start time.	All orders will be stopped and the time will be allocated, *in relation to the expected time, on the number that has been reported as completed.* If there is no expected time, time is allocated equally, regardless of the number. The orders are started again with a new sequence number and a new start time.
Reporting productions as completed	Time will be allocated in proportion to *the planned operating time,* regardless the number having been reported as completed.	Time will be allocated in proportion to the expected operating time of the number having been reported as completed.

2.2.8. Bundled productions – Calculations in redistributing actual job time back to individual orders

*Distribution of actual job time across family order lines *

Examples of Calculations

3 order operations which are running as a family order. Automatic completion is used (clock in /clock off). The following hours and quantity exist:

Setup time	Operation time	Op. Number
10	20	10
5	10	15
20	15	20

1. Calculation of the total estimated time (running hours x planned number) x number of orders (650). If the total time cannot be calculated because the total time is 0, the spent time is allocated evenly.

2. Finding of total time spent (e.g. 400).

3. The allocated, spent time of the operation: (Running hours x planned number / total planned time) * total time spent.

3.1 ((20 ×10) / 650) × 400 = 123
3.2 ((10 × 15) / 650) × 400 = 92
3.3 ((15 × 20) / 650) × 400 = 185

If the planned running hours are 0 (zero) or the planned numberis 0, the time spent is set to 0.

4. When calculating the number at partial reporting without number/quantity, the quantity is set to 0 (zero).

Real time spent per operation / running hours.

4.1 123/20 = 6
4.2 92 / 10 = 9
4.3 185 / 15 = 12

If the number is bigger than an order quantity, the number is set to the order quantity.

The setup is allocated in the same way. Partial reported time without quantity: Spent time is allocated in the same way as automatic completion (clock in/clock off).

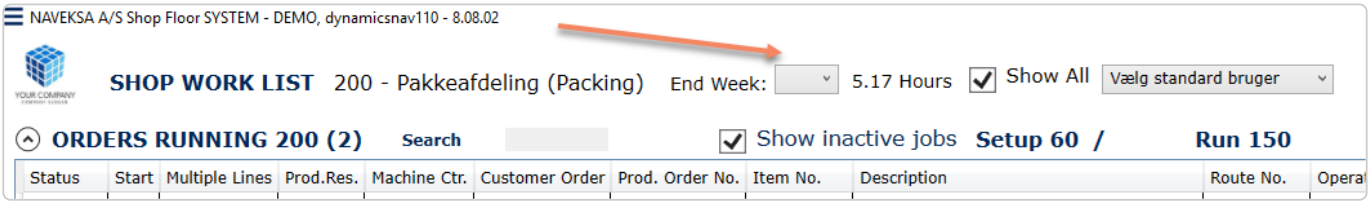
Partially reported time without quantity: Time spent is allocated in the same way as the automatic

reporting as completed (clocking in / clocking off).

Partial reported time with quantity (number): Calculation is made in the same way as the automatic completion reporting, just using the reported number, instead of the estimated quantity. The same is valid for the reporting of the final completion.

2.2.9. End week load

End week load



This field calculates the remaining hours of work for the week selected for all categories – running, waiting and arriving..
Please notice it is a 52 week forward calculation.
So, if you for instance select select week 7, and the current week is 10, then you look at the load in week 7 next year.

2.2.10. Using barcodes in ShopFloor

General usage

The NAVEKSA ShopFloor operator terminal has traditionally been operated using a mouse, manual keying or tapping the soft touch screen.

Now the option of running all transaction processing using barcode scanning has been added. This means the display reacts and updates itself based on reading a barcode for the wanted function.
This bar code scanning option is ideal in a standard operating environment.

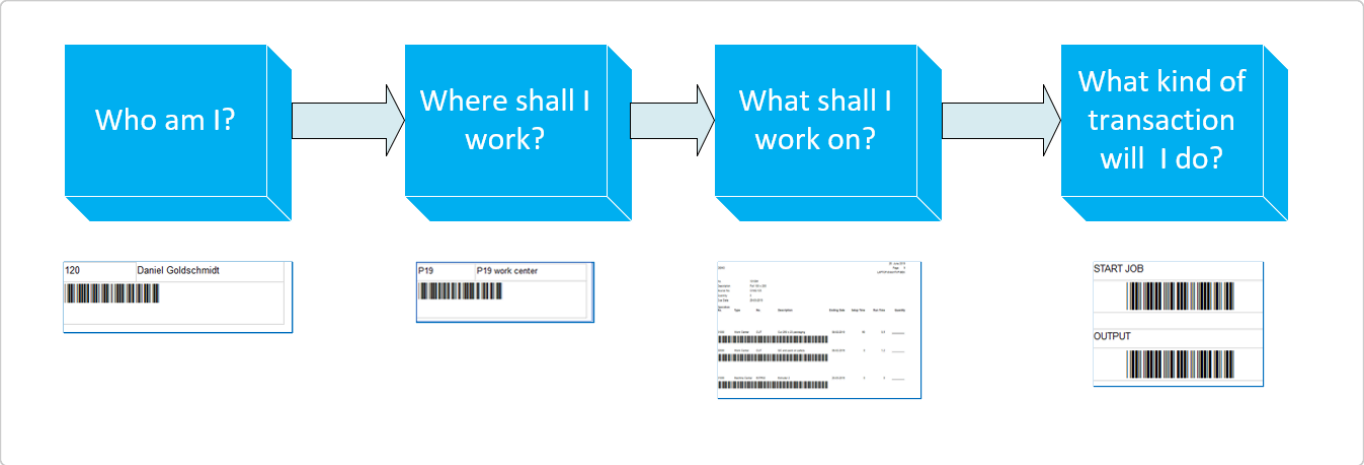
When we say standard, we mean manufacturing execution with basic start and end of jobs, and not too many other things which extend the needed transaction processing– f.ex. variable material issue, operator assignment of lot/serial numbers, scrap reporting and other.

Of course, everything can be run in mixed mode – using a combination of mouse, keying, scanning or tapping the screen. But incorporating many functions can become complex, and probably no good in terms of operator usability.

So, the overall message is: **Keep the transaction flow simple when using bar coded transactions**.

2.2.10.1. General description on how it works

Description of the overall bar code reading principle:

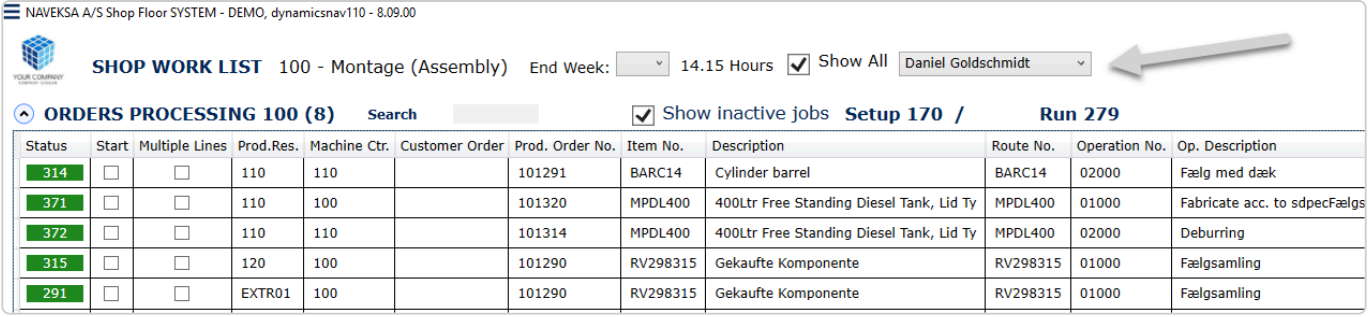


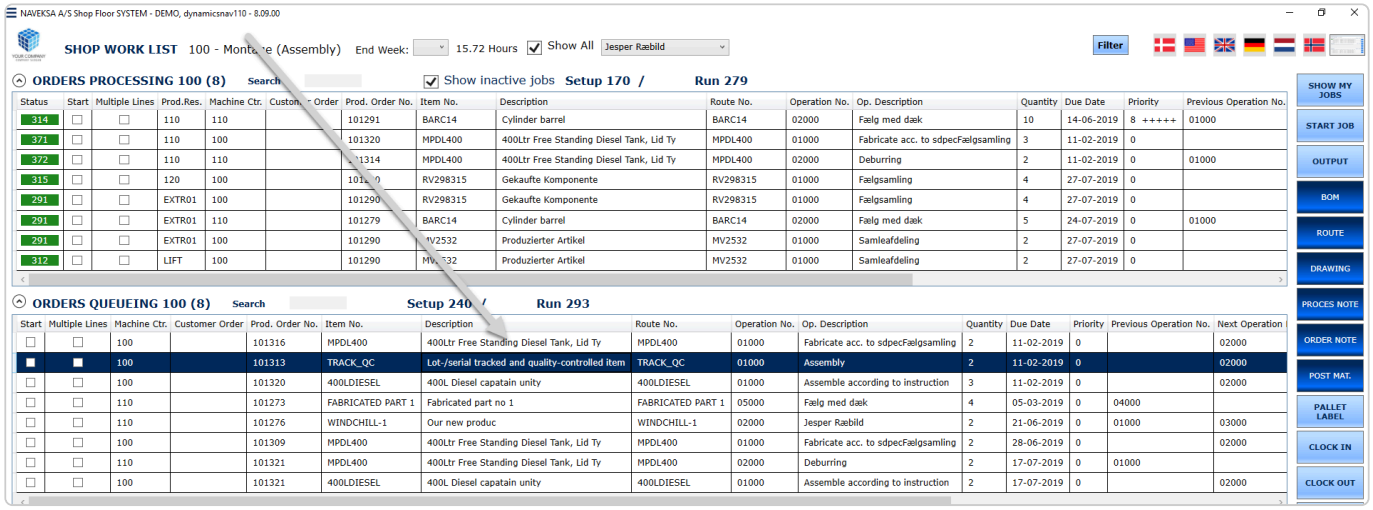
Bar code labels/papers used

1. Employee badges
For every active employee/resource a label can be printed. This label is meant to be kept by the operator.
The employee/resource label is the first step to operate job execution- “I’m Daniel……”

Example:

Scanning the employee badge at the terminal positions the terminal display to the employee:





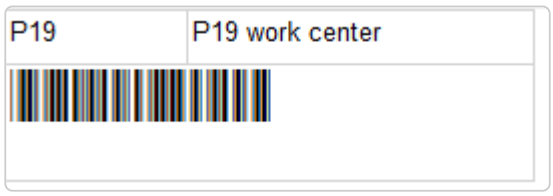
Note: Employee badges together with absence codes bar codes can be used in the Naveksa Time/ Attendance module also.

2. Work center / Machine center / Resource badges

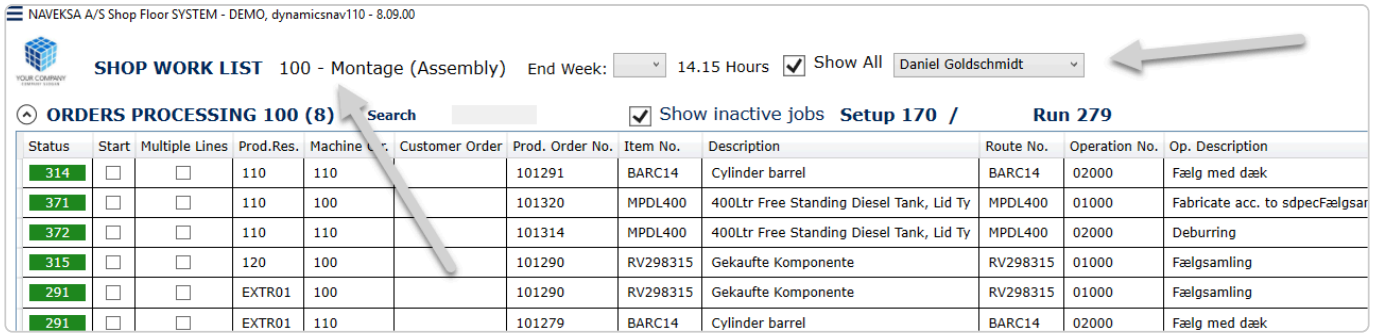
For every active work center/machine center/resource a label can be printed. This label – one or more, is meant to be placed in convenient places in the work center, machine center or at the resource.

This label is the used as the next step to identify the resource to be worked at. So “I’m Daniel – I want to work at the 100 Assembly work center”

Example:



Scanning the resource will position the terminal display to this value:



3. Production Order Routing sheet

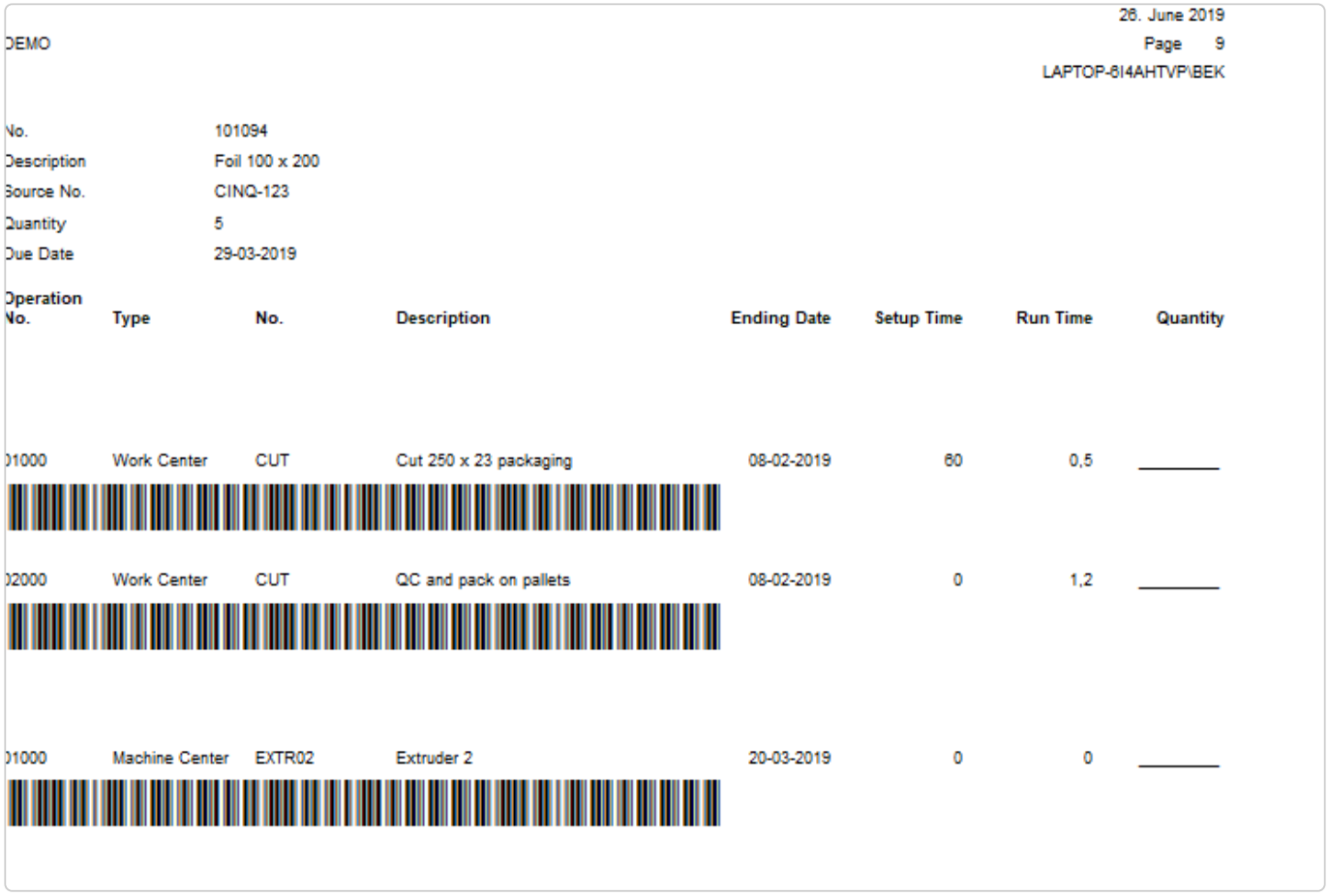
When releasing a production order in standard NAV/365 BC a routing sheet is automatically printed for each production line order if the order contains more than one line.

The routing sheet is meant to follow the order.

If needed, the production order routing sheet can be re-printed using the ShopFloor planning function.

The operator scans the desired production order routing line which will position the terminal display to this value on the display and high-light the line.

Example:



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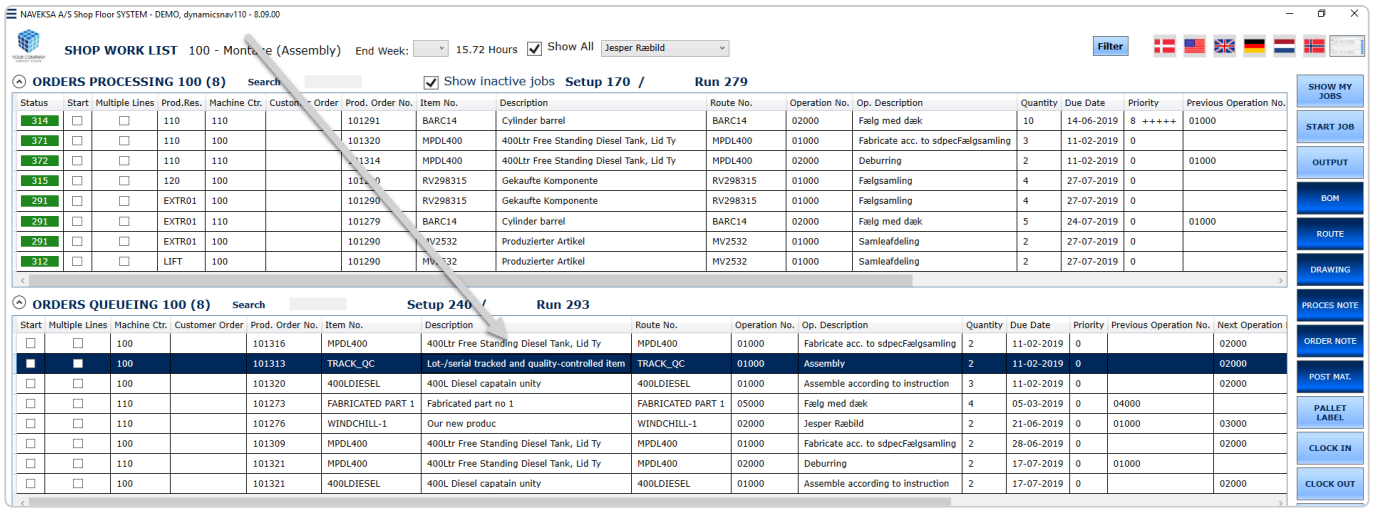
No. 101094
Description Foil 100 x 200
Source No. CINQ-123
Quantity 5
Due Date 29-03-2019

Operation No.	Type	No.	Description	Ending Date	Setup Time	Run Time	Quantity
01000	Work Center	CUT	Cut 250 x 23 packaging	08-02-2019	60	0,5	_____
02000	Work Center	CUT	QC and pack on pallets	08-02-2019	0	1,2	_____
01000	Machine Center	EXTR02	Extruder 2	20-03-2019	0	0	_____



4. Transaction codes

Transaction codes are all the possible transactions that can be scanned and applied on a production order, and replaces the use of the terminal function buttons.
Standard display functions buttons:

The sheet with transaction bar codes can be printed from the ShopFloor setup.
This transaction codes sheet is meant to be placed close to the individual shop floor terminals, and replaces the need for display screen interactions.

Example:

The transaction list (17 individual transactions) triggers the wanted when scanned:
• Start job, (Triggers the starts of a job for the selected resource)
• Output reporting, (Triggers the standard output display for detailed reporting)
• Output – Setup, (Triggers end of job for a setup operation)
• Output – Part quantity, (Triggers the completion of 1 unit)
• Output – Pause, (Triggers pausing an operation)
• Output – End operation, (Triggers completion/end of job)
• Show BOM, (Triggers the display of the production order bill of material)
• Show Routing, (Triggers the display of the production order routing)
• Show Material shortage, (Triggers the display of current component shortages)
• Show drawing, (Triggers the display of drawings and other documents)
• Show process note, (Triggers the display of routing step process notes, if not automatic)
• Show order note, (Triggers the display of the order comments)
• Material issue, (Triggers production order total component issue)
• Print pallet label, (Triggers the printing of a production order pallet label)
• Print material requisition, (Triggers the printing of a material picking list)
• Print routing sheet, (Triggers the printing of a routing sheet)
• Print job card. (Triggers the printing of the production order routing step job card)

2.2.10.2. Barcoding equipment

NAVEKSA does not recommend specific barcode reader equipment. But look at “2D – standard and QR formats with facilities for high through-put and aiming functions.

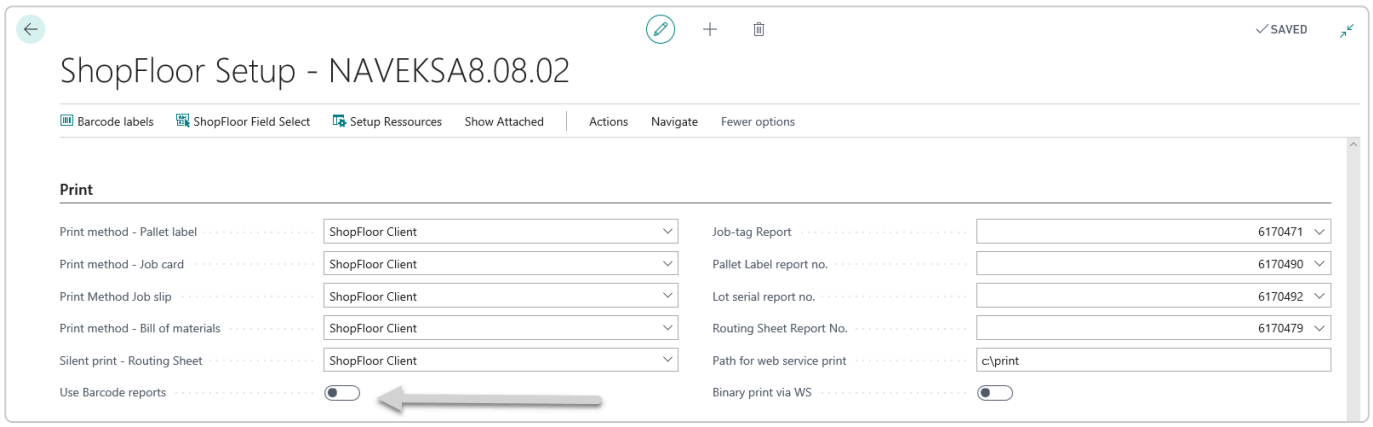
Please notice that NAVEKSA barcodes are all generated as industrial code 39 bar codes.

The reader should ideally be attached to the computer as a serial USB COM port.

Example:

2.2.10.3. Activating Barcoding in ShopFloor

To activate the use of reading barcoded transactions, you must enable this in the ShopFloor setup by putting a tick mark in the field “Use barcode reports”



For compliance reasons with various rules, we will soon introduce a new setup parameter which prevents an operator from selecting any employee/operator except himself. The new function will be a barcoded transaction as the only way to identify an employee/operator. (Available in version 8.09.02 due late august 2019)

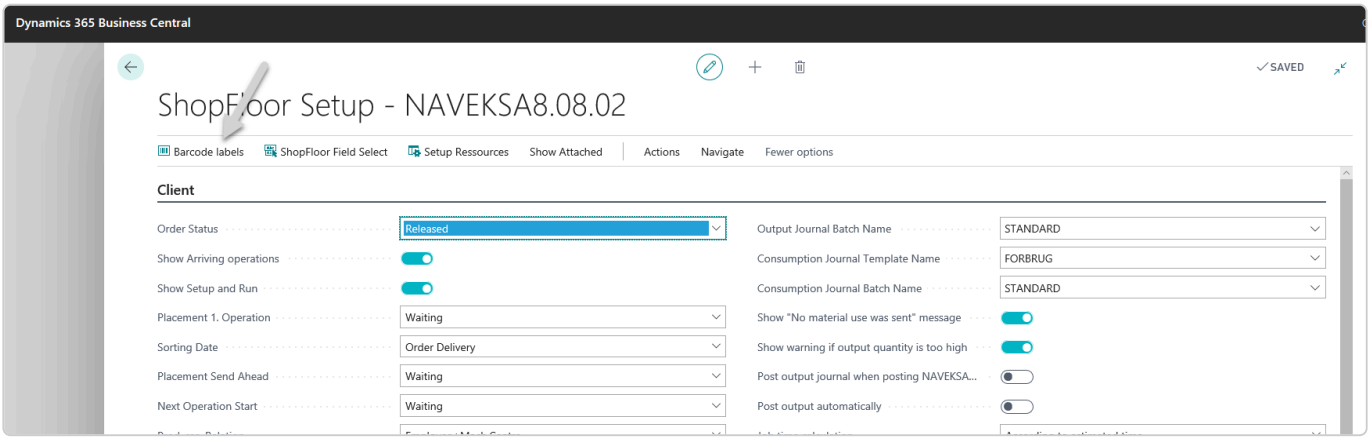
2.2.10.4. Printing static and dynamic information for bar coded reading

Printing static and dynamic information for bar coded reading comprises the following.

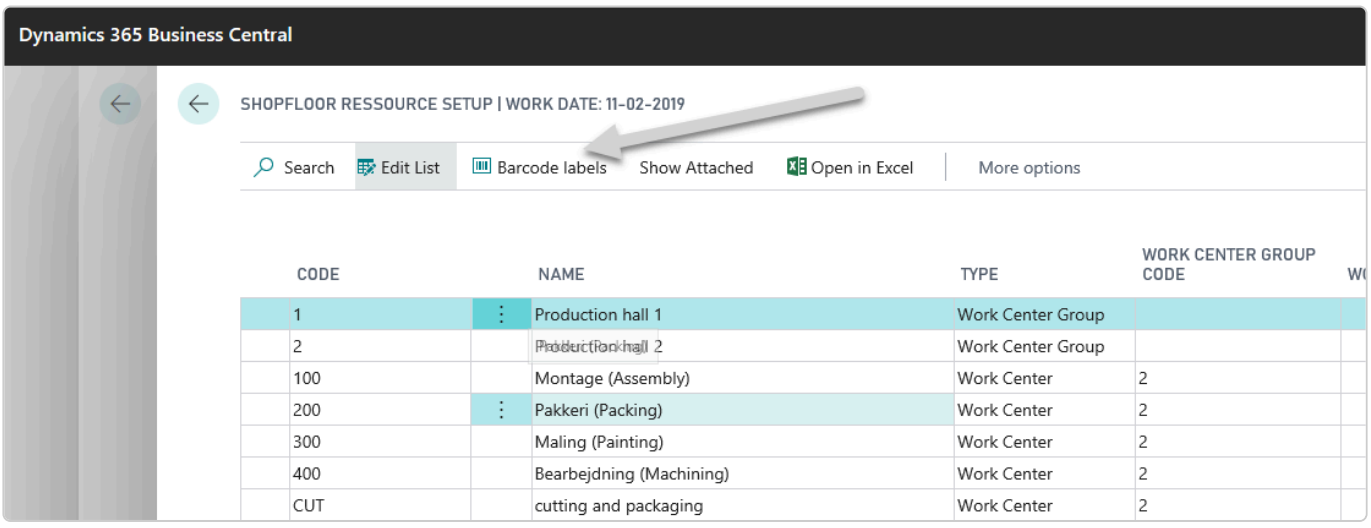
A pair of scissors, re-arranging, glue, laminating equipment etc. may be needed to fit the labels to your exact needs.

> The printing option buttons on the displays are not visible if the bar coding setup question is not tick marked.

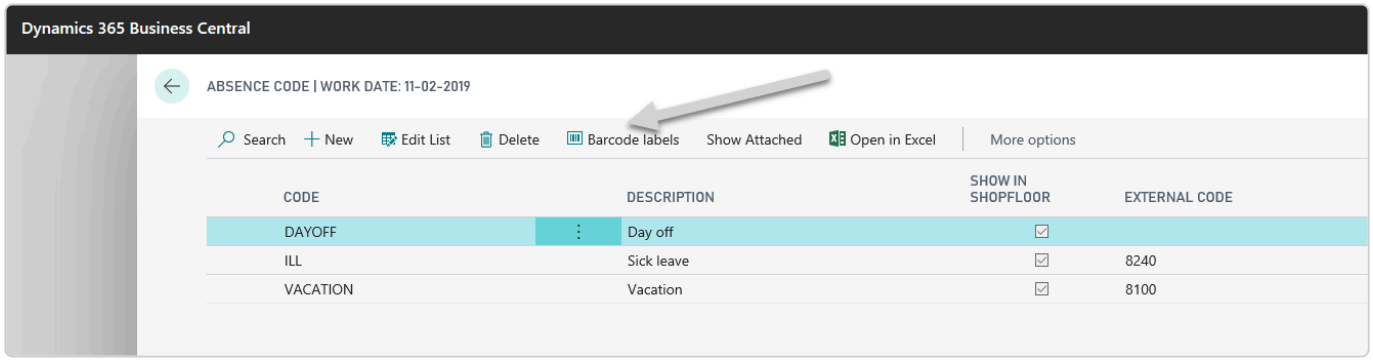
- Printing transaction code labels can be done from the “ShopFloor Setup” display:



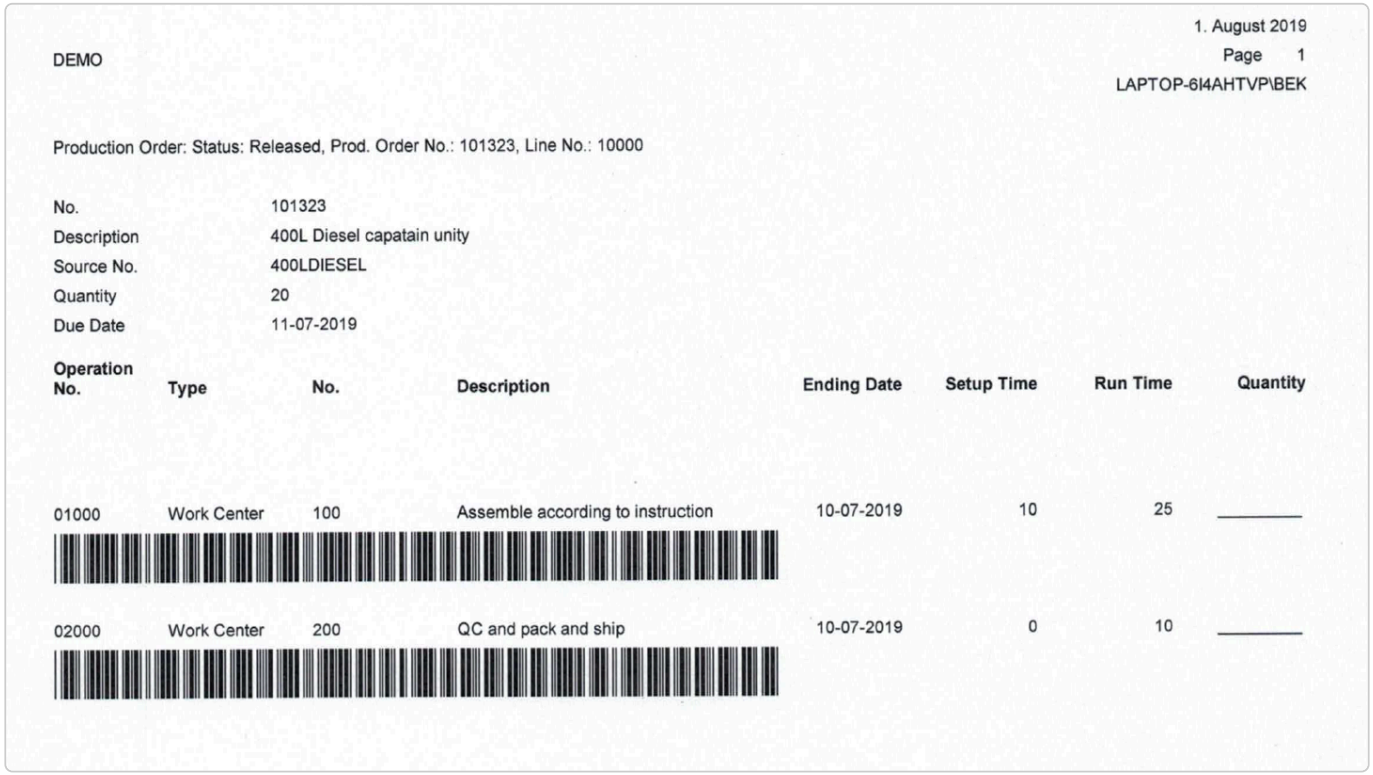
- Printing Employee and resource labels can be done from the “ShopFloor resource setup” display:



If you intend to use Time & Attendance with ShopFloor, bar coded absense code labels can be printed also. This can be done from the Absense code display:



- The next thing you need is a production order routing sheet printed with bar codes for each routing step. Printing of this is done automatically when you refresh a production order.



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Production Order: Status: Released, Prod. Order No.: 101323, Line No.: 10000

No.	101323
Description	400L Diesel capatain unity
Source No.	400LDIESEL
Quantity	20
Due Date	11-07-2019

Operation No.	Type	No.	Description	Ending Date	Setup Time	Run Time	Quantity
01000	Work Center	100	Assemble according to instruction	10-07-2019	10	25	_____
02000	Work Center	200	QC and pack and ship	10-07-2019	0	10	_____

2.2.10.5. Executing jobs with the use of barcoded labels/papers.

As described in the General section the way to process transactions is the following:

You stand close to a ShopFloor operator terminal, and now you want to start a new job.

You do the following:

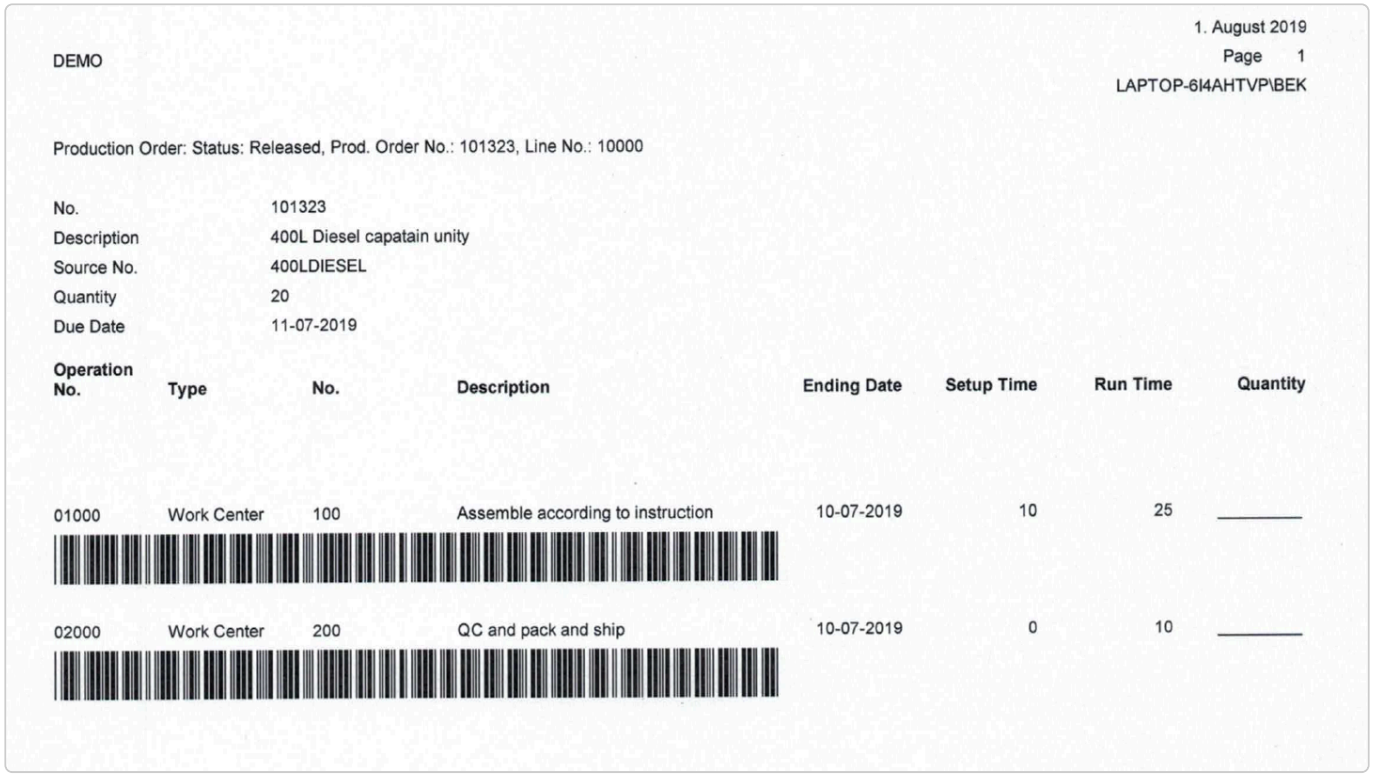
- Tell the system who you are (Read the employee badge/label you wear in your pocket)

The display now shows that you are the operator on this display until changed by reading a new employee barcode or the terminal is restarted.

- Tell the system where you want to work (Read the resource badge/label probably glued to the machine)

The display normally starts by displaying the 1st resource defined. When reading the machine/work center barcode the display shifts to this place.

- Tell the system what you want to work on (Read the proper production order routing step) The order is of course present and stands in the Waiting status. The order is identified via the production order bar coded routing sheet.



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Production Order: Status: Released, Prod. Order No.: 101323, Line No.: 10000

No.	101323
Description	400L Diesel capatain unity
Source No.	400LDIESEL
Quantity	20
Due Date	11-07-2019

Operation No.	Type	No.	Description	Ending Date	Setup Time	Run Time	Quantity
01000	Work Center	100	Assemble according to instruction	10-07-2019	10	25	_____
02000	Work Center	200	QC and pack and ship	10-07-2019	0	10	_____

Reading the routing barcode step, the display positions itself to the right order and makes this line dark blue.

Now you have the choice of reading various transaction codes to display the underlying information. I.e. the transaction codes correspond to the dark blue function buttons on the screen.

Reading the ESCape barcode normally takes you back to the previous display.

There are a few rules to obey when using bar codes and transaction bar codes:

If you leave the ShopFloor terminal program for example to look at a drawing, coming back you must read the order barcode again. This is the way Windows operates in closing/restarting the application.

Reporting output:
Reading the “Output reporting” triggers the display of the output display for manual reporting.
Reading the “Setup” triggers end of job for a setup operation.
Reading Output – Part quantity triggers the completion of 1 (one) unit.
Reading Output – Pause triggers pausing an operation (green indicator light goes out)
Reading Output – End operation triggers completion/end of job for this order/routing

step.

A word of caution
The bar code scanning option is ideal in a standard operating environment.

When we say standard, we mean manufacturing execution with basic start and end of jobs, and not too many other things which extend the needed transaction processing– f.ex. variable material issue, operator assignment of lot/serial numbers, scrap reporting and other.

Of course, everything can be run in mixed mode – using a combination of mouse, keying, scanning or tapping the screen. But incorporating many functions can become complex, and probably no good in terms of operator usability.

So, the overall message is: Keep the transaction flow simple when using bar coded transactions.

2.2.10.6. Using barcodes with time & attendance

Time and attendance recording can be barcode enabled:

We start by reading the transaction code – In or out:

Example:

Then the employee badge is read:

Example:

Then if the operator is prompted for an absense code, this must be read also:

Example:

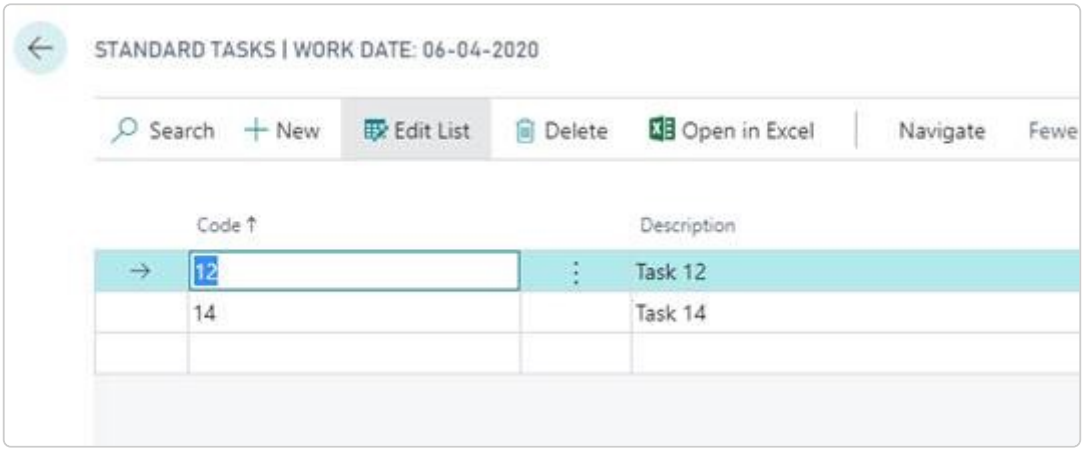
2.2.11. Creating standard tools and tool sets in routings and production orders.

Adding tools to routing operations using standard tasks

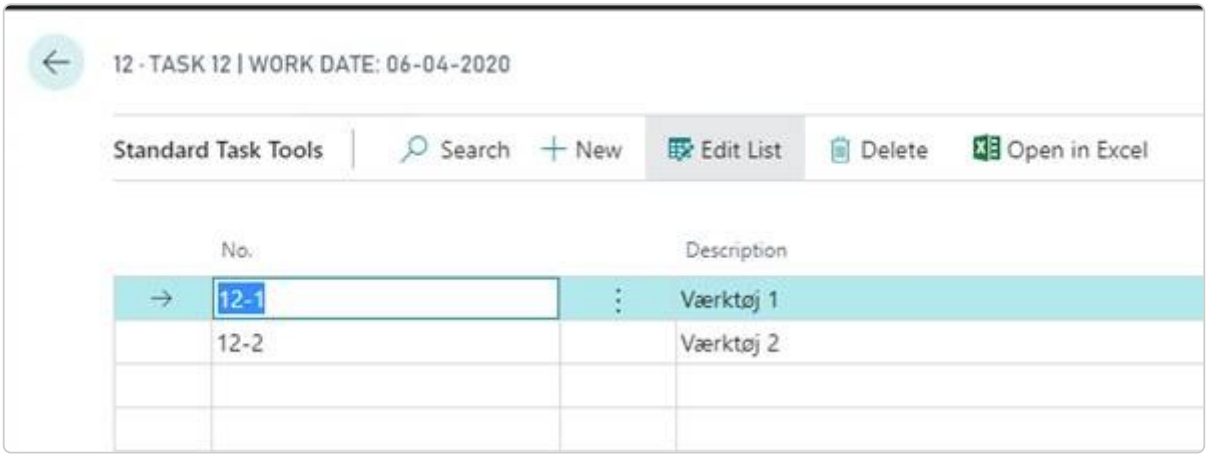
In ShopFloor we have added a function which enables you to define standard tooling sets which then can be applied to the individual routing lines.
All tooling will then be available to see from the ShopFloor operator client.

How it works

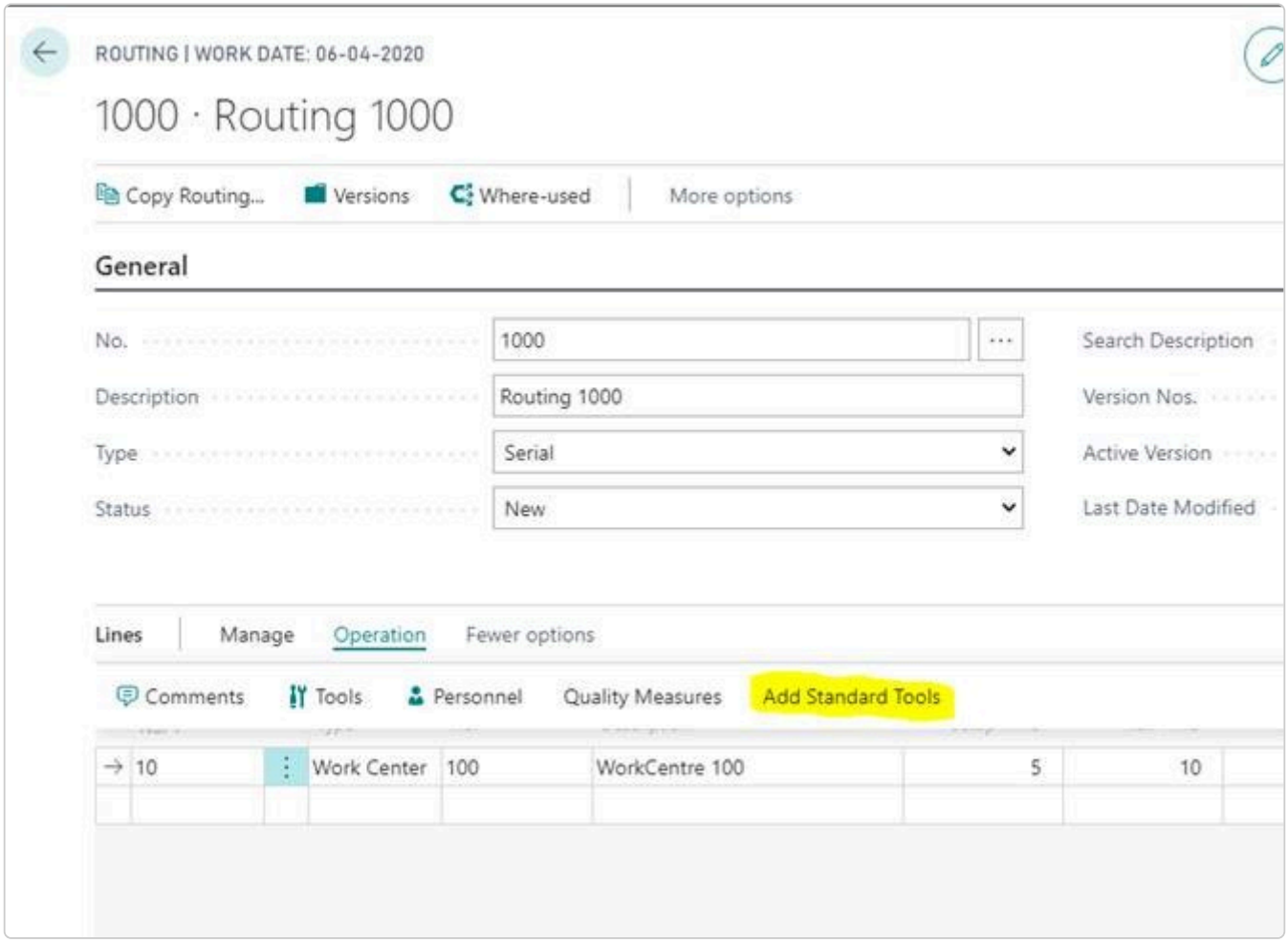
1. At first you define your standard tasks; f.eks numbewr 12 with a description Task 12.



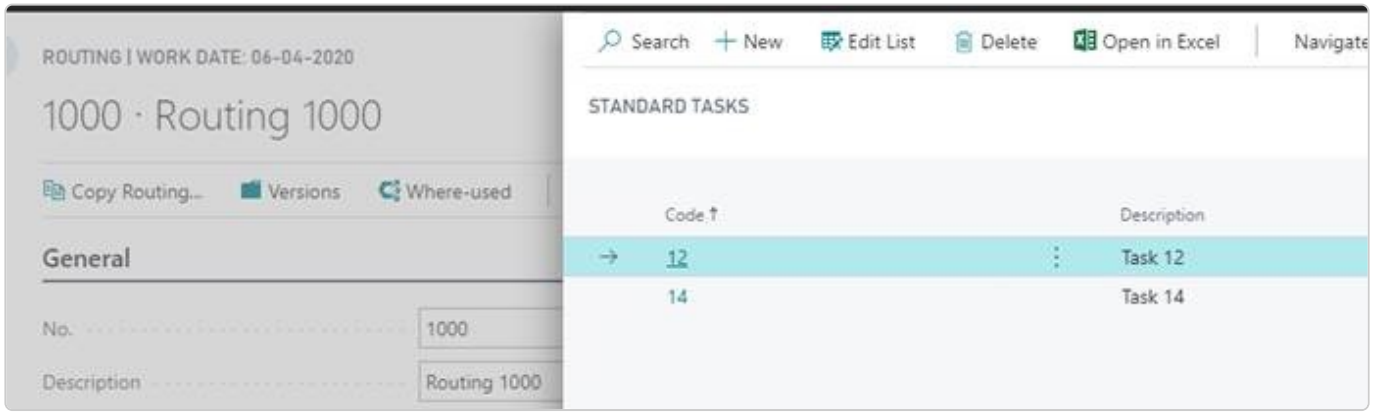
2.- Then you define the standard tooling set.

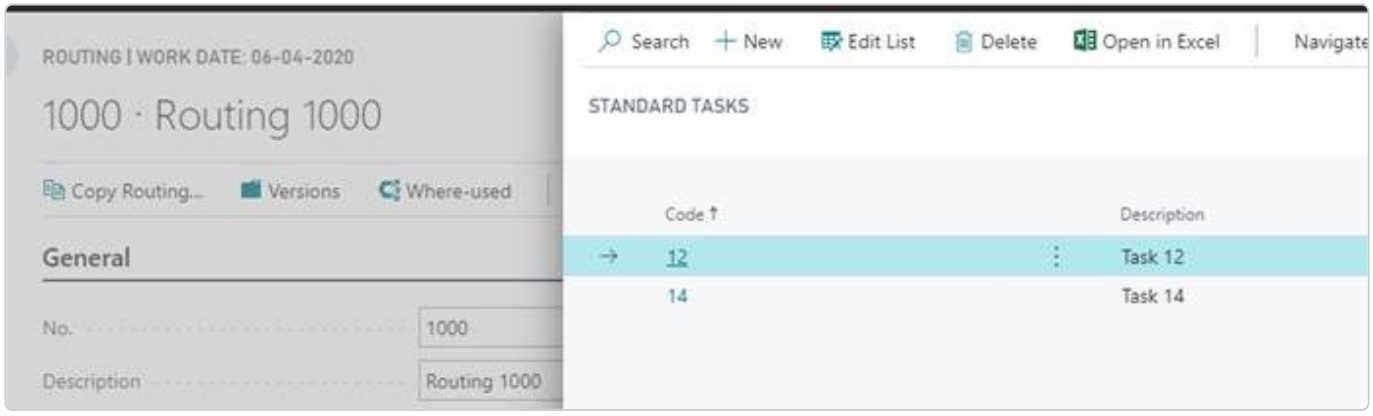


3. Next you go to the stanard routing maintenence card to add the stanard tools to the operations.



4. Now you select the appropriate tool sets





Your toolsets are now ready to be used on production orders, as they will be copied to the production order routing lines when you create a production order.

3. How to run ShopFloor – EXECUTION part

How to run ShopFloor – EXECUTION part

3.1. The Operator execution screen

The Operator execution screen

The ShopFloor execution screen is very intuitive and the instructions to the operator can be very short and simple.
Please read on.

3.1.1. Using the ShopFloor Operator screen

Using the ShopFloor operator display

The ShopFloor execution screen presents per chosen resource 3 sections with production order operations: Orders processing (running), Orders queing (Waiting) and Future (Arriving) orders.

This is an excellent way to get an overview on what is going on a machine, a group of machines, a person or other resources.

Initially the ShopFloor operator only needs to deal with a few actions:

Choose a resource for execution

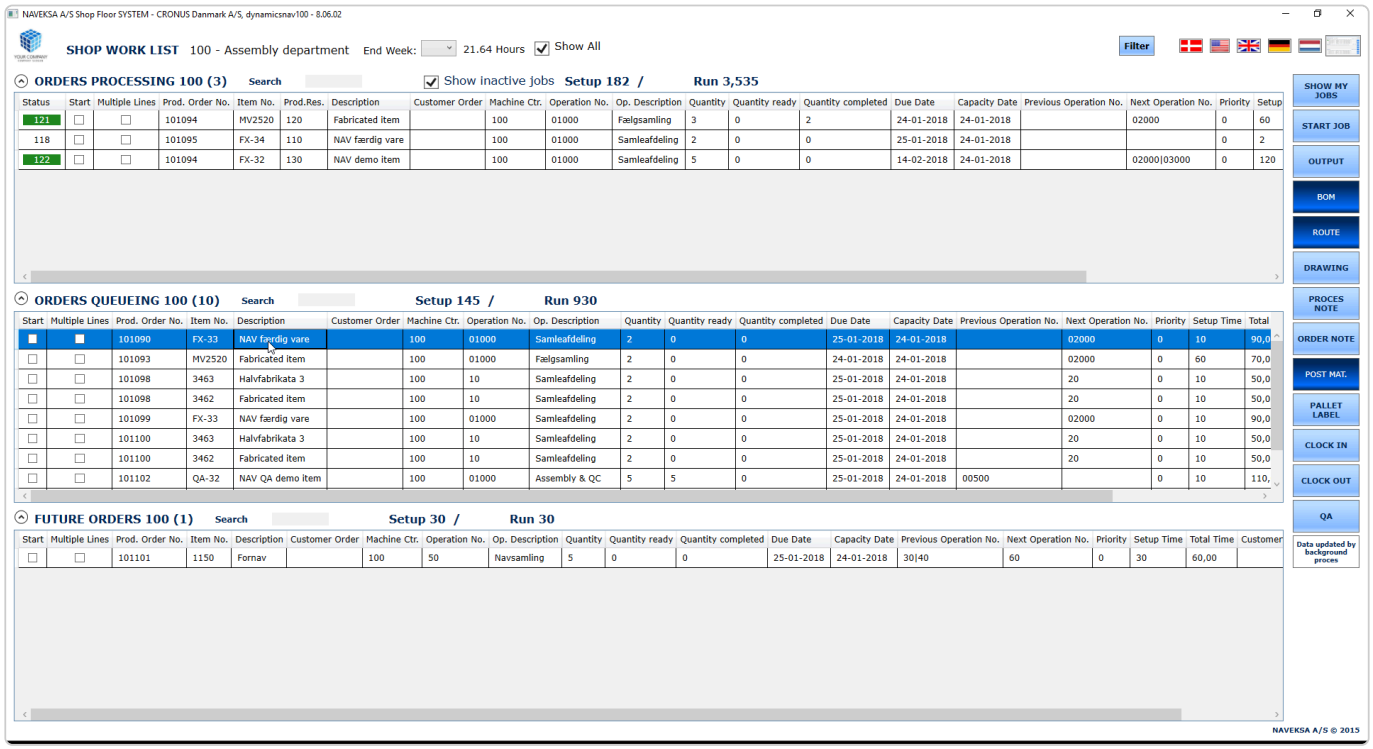
Select this

What am I supposed to work on next?

Click on the top line in the Orders queing section.

When clicking on a line, some of the buttons to the right becomes dark blue.

You must click on each of them to see various attached execution informatio*



The screen has the following intuitive features when using it:

- All fields includes “Mouse over” full text capability
- All colums can be sorted in ascending or descending order

- The 3 sections can be expanded/collapsed as wanted
- A search bar is available for each section searching a specific order number.
- A general data filter function can be applied to the full screen
- Clicking on a flag changes the language on the screen
- A customer logo can be inserted in upper left corner
- A “Show all” button expands or collapses combined orders
- Button for showing active jobs only
- Moving the function buttons – right, top or bottom

3.1.2. The ShopFloor Operator screen fields

The ShopFloor screen fields

The ShopFloor Operator screen columns can be made up of the below fields list.

What colums you want to see is determinded by the setup you can read about in the installation and setup.

You can read the installation and setup manual clicking here

There is no explanation to the field content in this section exceot a field list as every field has been described in detail in the planning section.

You can read the field definitions by clicking here

List of ShopFloor Operator screen field names:

- Prod. Res. No.
- Status
- Prod. Order No.
- Item No.
- Description
- Routing No.
- Routing Reference No.
- Operation No.
- Op. Description
- Quantity
- Due Date
- Next Operation No.
- Previous Operation No.
- Priority
- Setup Time
- Run Time
- Finished
- Prod. Res. Type
- Setup Time Unit of Meas. Code
- Run Time Unit of Meas. Code
- Unit of Measure Code
- Capacity Date
- Starting Date-Time
- Customer Order No.
- Send-Ahead Quantity
- Quantity Ready
- Quantity Completed
- Location Code
- Bin Code

- Total Scrap Qty
- Variant Code
- Total Time
- Total Time Unit of Meas. Code
- Expected capacity need
- Expected capacity need unit of maesure
- Sequence number
- CustomerField1
- CustomerField2
- CustomerField3
- CustomerField4
- CustomerField5
- CustomerField6
- CustomerField7
- CustomerField8
- CustomerField9
- CustomerField10

3.1.3. Customize the ShopFloor Operator screen

Customize the ShopFloor Execution screen

It is limited what can be changed on the Operator screen.

This is because this screen needs to be more or less the same, regardless of which terminal the operator uses.

So the screen appearance is a result of doing the initial setup.

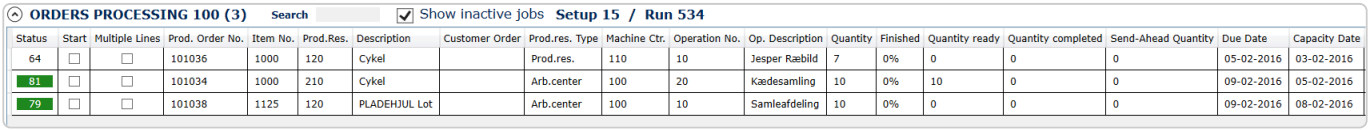
Click here to read more about the Operator screen setup

3.2. Using the ShopFloor execution functions

3.2.1. Starting a single job

Starting a single line production order operation

On the top of the window, you have to choose which work center / production resource's jobs, you would like to see.

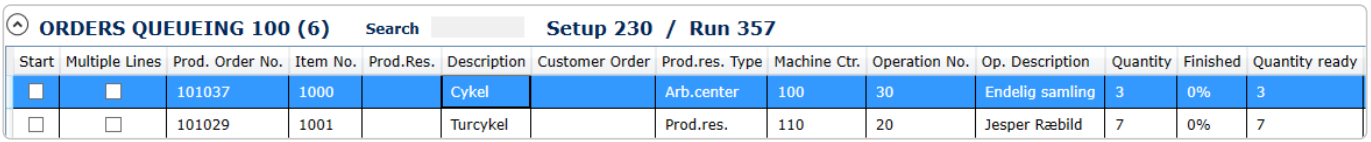


ORDERS PROCESSING 100 (3) Search Show inactive jobs Setup 15 / Run 534

Status	Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Customer Order	Prod.res. Type	Machine Ctr.	Operation No.	Op. Description	Quantity	Finished	Quantity ready	Quantity completed	Send-Ahead Quantity	Due Date	Capacity Date
64	☐	☐	101036	1000	120	Cykel		Prod.res.	110	10	Jesper Ræbild	7	0%	0	0	0	05-02-2016	03-02-2016
81	☐	☐	101034	1000	210	Cykel		Arb.center	100	20	Kædesamling	10	0%	10	0	0	09-02-2016	05-02-2016
79	☐	☐	101038	1125	120	PLADEHJUL Lot		Arb.center	100	10	Samleafdeling	10	0%	0	0	0	09-02-2016	08-02-2016

In the window showing "Orders queing", the orders that are going to be processed on the particular work center, are displayed.

Jobs can be started, either by placing the cursor on the particular line, Please observe if any function buttons become dark blue. Click on each of them to see additional execution information

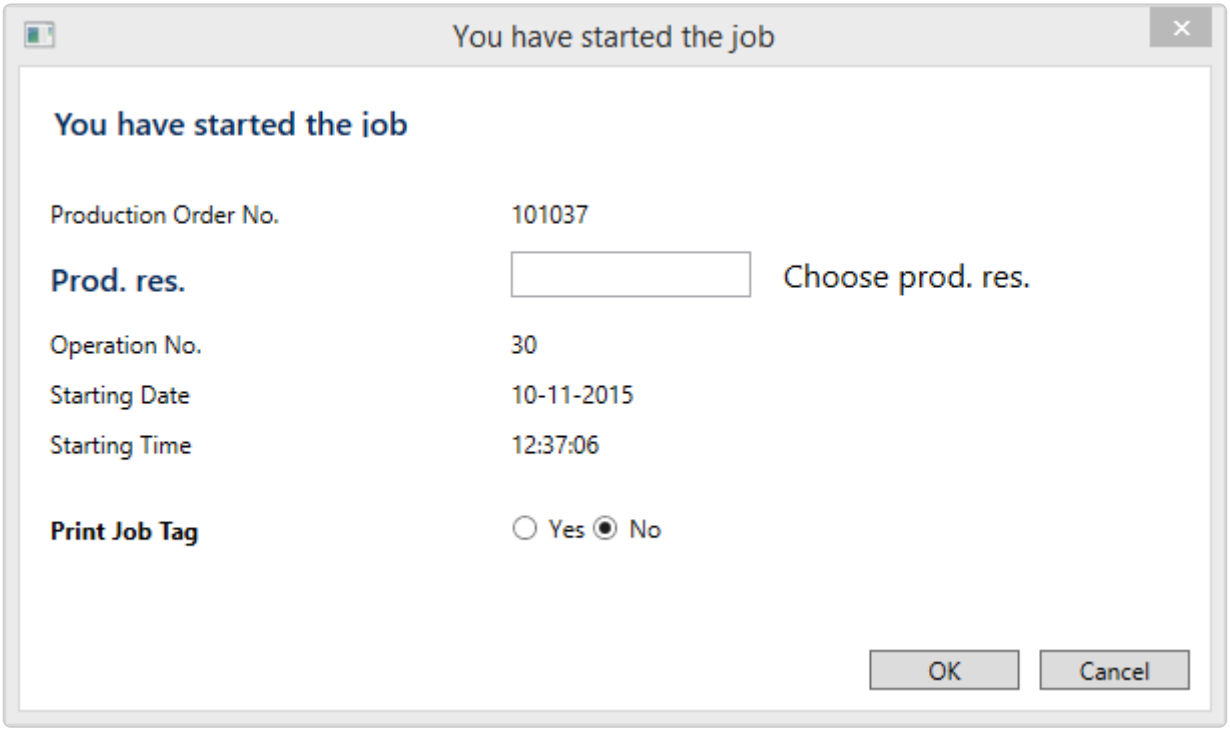


ORDERS QUEUEING 100 (6) Search Setup 230 / Run 357

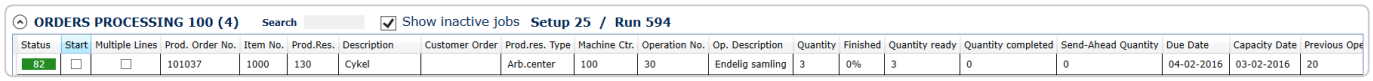
Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Customer Order	Prod.res. Type	Machine Ctr.	Operation No.	Op. Description	Quantity	Finished	Quantity ready
☐	☐	101037	1000		Cykel		Arb.center	100	30	Endelig samling	3	0%	3
☐	☐	101029	1001		Turcykel		Prod.res.	110	20	Jesper Ræbild	7	0%	7

and then chosing "Start job", (depending of the set up, you may be asked to issue material, or you may receive a message that the job can not be started due to material shortage – please see below.

Now you have to select, key or wand from a barcode device which employee/machine center has to perform the particular job, and press OK.



The job will now be moved to Orders processing, having assigned a sequence number, that is highlighted in green:


ORDERS PROCESSING 100 (4) Search Show inactive jobs Setup 25 / Run 594

Status	Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Customer Order	Prod.res. Type	Machine Ctr.	Operation No.	Op. Description	Quantity	Finished	Quantity ready	Quantity completed	Send-Ahead Quantity	Due Date	Capacity Date	Previous Ope
82	☐	☐	101037	1000	130	Cykel		Arb.center	100	30	Endelig samling	3	0%	3	0	0	04-02-2016	03-02-2016	20

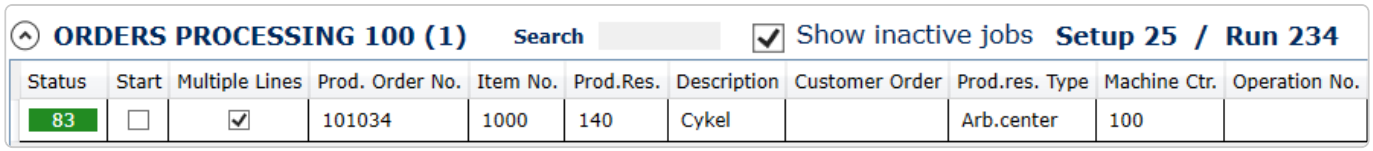
Once the job has been completed, it has to be reported as completed. (Dependend of the set up, you might be asked to issue material, before the job can be completed – if no material has been issued, the key “Issue material” is highlighted dark blue).

3.2.2. Starting a combined (family) job

Starting a combined (family) job

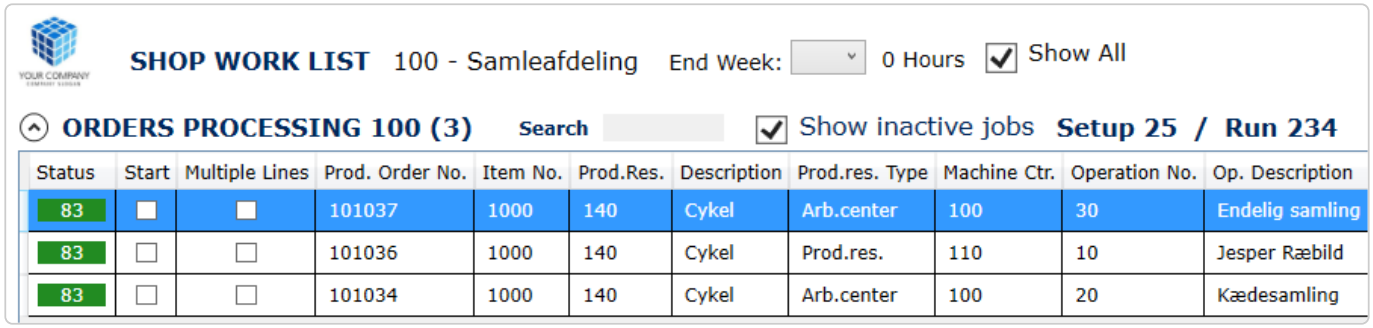
The system allows to start several order lines at once by marking “Start” next to the particular lines you want to start at the same time, and subsequently commom completion reporting.

In case of a production order, created either through a project order, or as a family order, and if “Show all” has not been marked, all lines on the order will be started, when the particular line is selected.



ORDERS PROCESSING 100 (1) Search Show inactive jobs Setup 25 / Run 234

Status	Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Customer Order	Prod.res. Type	Machine Ctr.	Operation No.
83	☐	☑	101034	1000	140	Cykel		Arb.center	100	



SHOP WORK LIST 100 - Samleafdeling End Week: 0 Hours Show All

ORDERS PROCESSING 100 (3) Search Show inactive jobs Setup 25 / Run 234

Status	Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Prod.res. Type	Machine Ctr.	Operation No.	Op. Description
83	☐	☐	101037	1000	140	Cykel	Arb.center	100	30	Endelig samling
83	☐	☐	101036	1000	140	Cykel	Prod.res.	110	10	Jesper Ræbild
83	☐	☐	101034	1000	140	Cykel	Arb.center	100	20	Kædesamling

Depending on the specific task, it is now possible to combine orders within each section (ORDERS PROCESSING, ORDERS QUEING, FUTURE ORDERS). By putting a checkmark in “Show All”, you put a “X” in the orders that you want to start together. This can be carried out accros the order numbers.

Please note that orders belonging to ”FUTURE ORDERS” have not yet been completed on the prior operations, and therefore probably will not be ready to be started on the operation concerned. The option of starting an order line from “FUTURE ORDERS” therefore should only be used, if you know for sure that the order is ready, but has just not been reported as completed on the previous operations.

The system now controls, which lines are manufactured together, and all lines are visible by putting a checkmark on “Show” all, or as a single family order line, by NOT having checkmarked “Show all”. When reporting as completed, you have to accept or fill in the correct number, the number of discarded items, or probably the “Reason code” for each production line of the family order, in “END JOB”.

Upon completion of the lines, all family order bindings are repealed and a new family combination can be created as project orders or as family productions. However, this does not apply for production orders that have been created as project orders or family productions. Here, only still one line will be displayed, if “Show all” has not been checkmarked.

The example below only shows one family order for a single product, but it could also have been different products, which should simply undergo the same function. An example could be a steel plate containing differerent components, but which are cut on a laser cutter from the same plate.

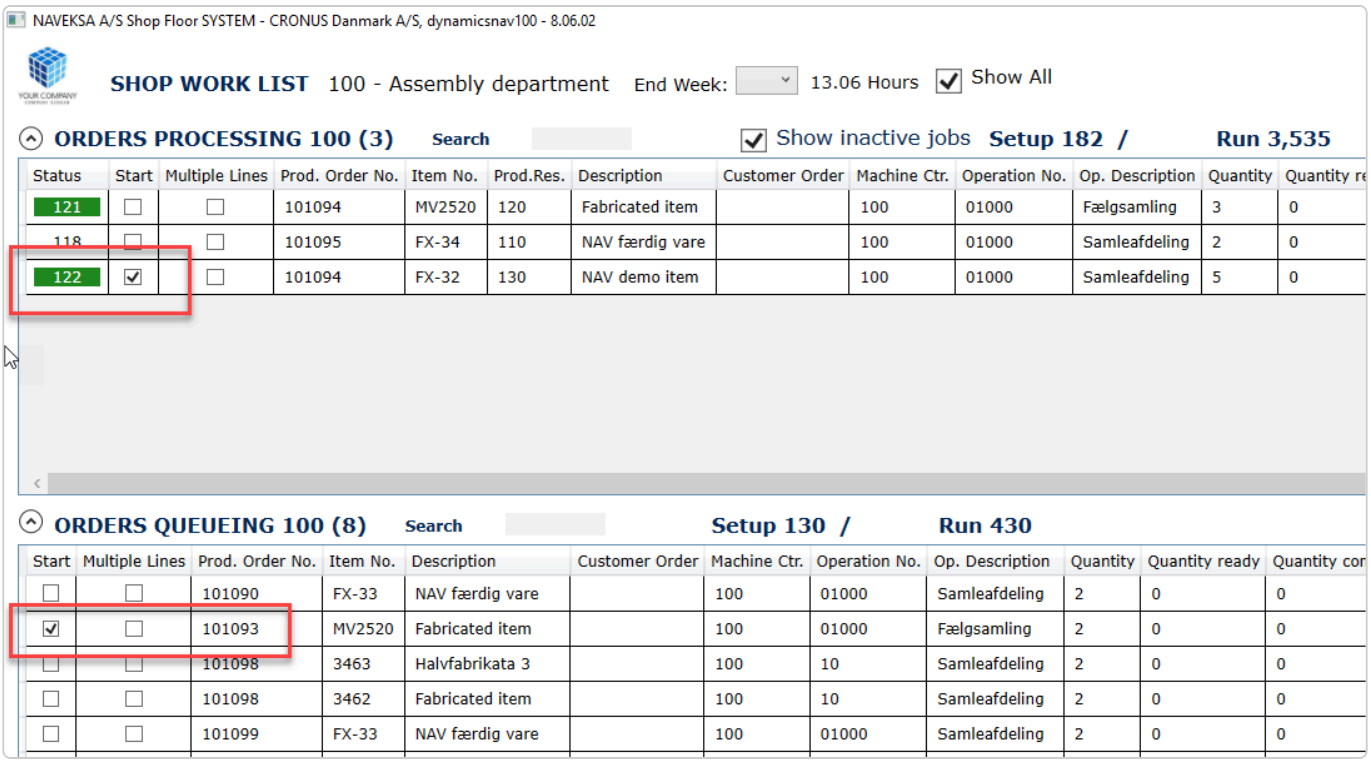
You can add/remove lines to an existing combination of orders running (identified with a run number)

3.2.3. Starting and adding a job to a pool of running jobs

Starting and adding a job to a already running job

The system offers the opportunity to start a new order line and connect it to an allready processing job.

Simply check mark the new order line to be started, and also check mark the order line, it shall be attached to.

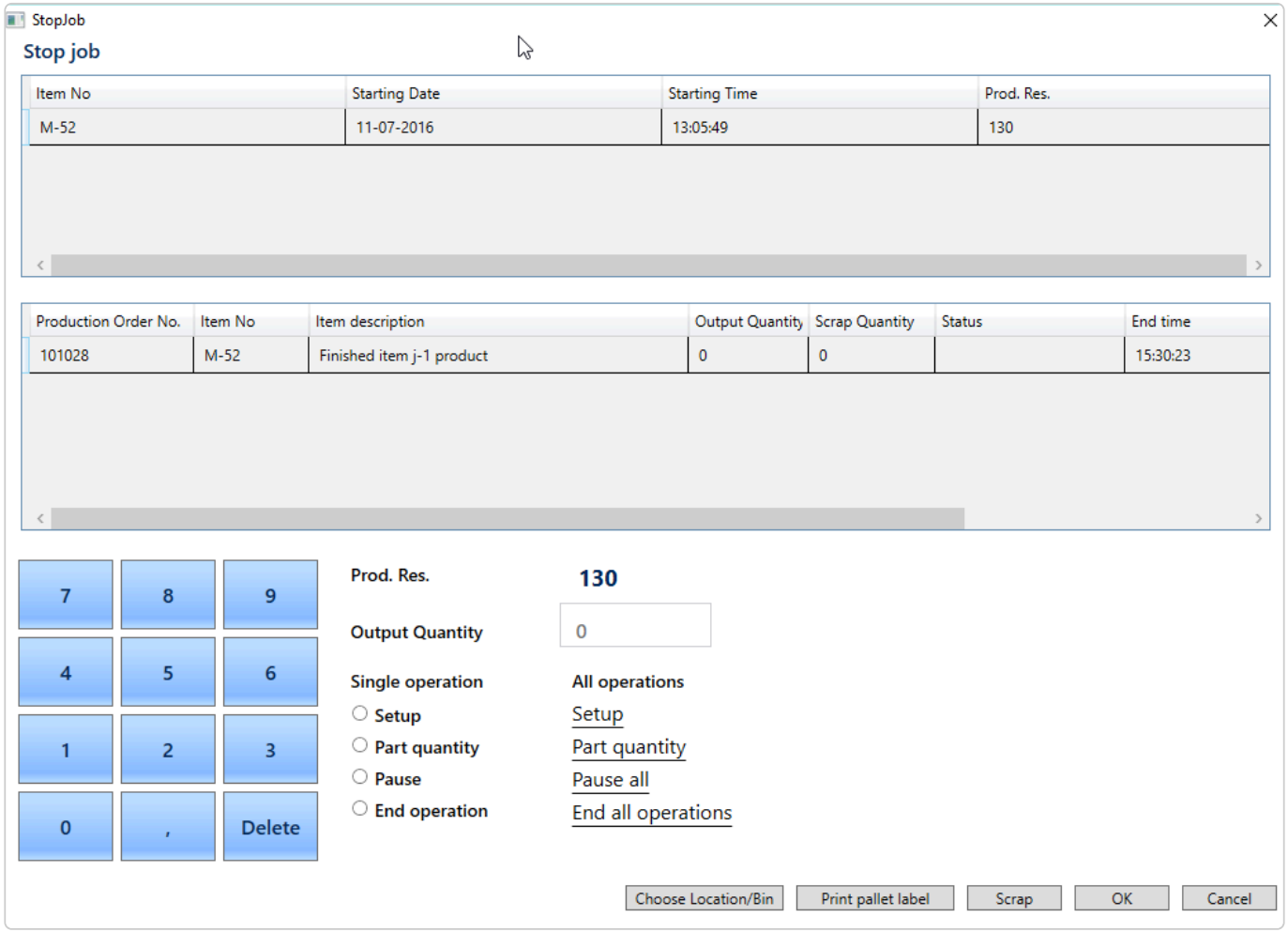


The figure illustrates that I (the operator) wants to start order 101093 and connect it to an already running job 101094. If this job is operated by myself, I will now be running 2 jobs.
If the order I connect to, is operated by someone else, the situation is that 2 people are now working on order 101094, but I am also working on order 101093 myself.

3.2.4. Outputting a single job

Outputting a single job

Mark the concerned line and select “Output” on the main screen. Subsequently the following window will pop up:



There is now an opportunity to carry out individual reporting as completed on the single lines, or, during all operations to mark, that the following reportings have to be made:

- Set up
- Partial output
- Pause
- End operation

If you select ”End of operation” and fill in the expected number and press OK. If you have selected in the setup that start of the next operation has to be displayed as “Orders queing”, the order line will disappear from the overwiev, showing “ orders processing” and will appear on the next operation under “Orders queing”.

If you have selected in the setup that the next operation will be displayed under “Orders processing”, the line in question will still be visible under “Orders processing”, if several operations on the job in the

particular work center have to be performed, or it will appear as “orders processing” under “next operation/work center”.

It is recommened in the setup to select that the next operation has to appear as queuing, then the operator always knows that new orders are started from “queuing”.

Various printing of pallet labels, product id tickets can be printed as part of the reporting.

This one is just an example: with item number, batch number, serial number etc.

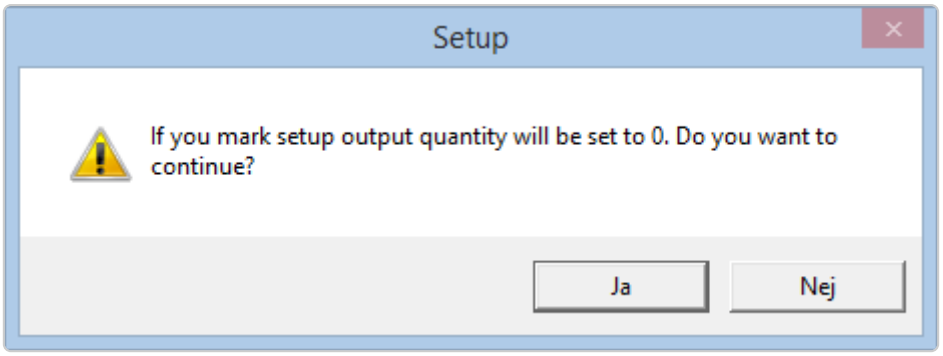
3.2.5. Outputting a combined (Family) job

Outputting a combined (Family) job

There is now an opportunity to carry out individual reporting as completed on the single lines, or, during all operations to mark, that the following reportings have to be made:

• Set up
• Partial reporting
• Interrupt (pause) all
• End all operations

1. If you select to report “setup”, the following message appears:



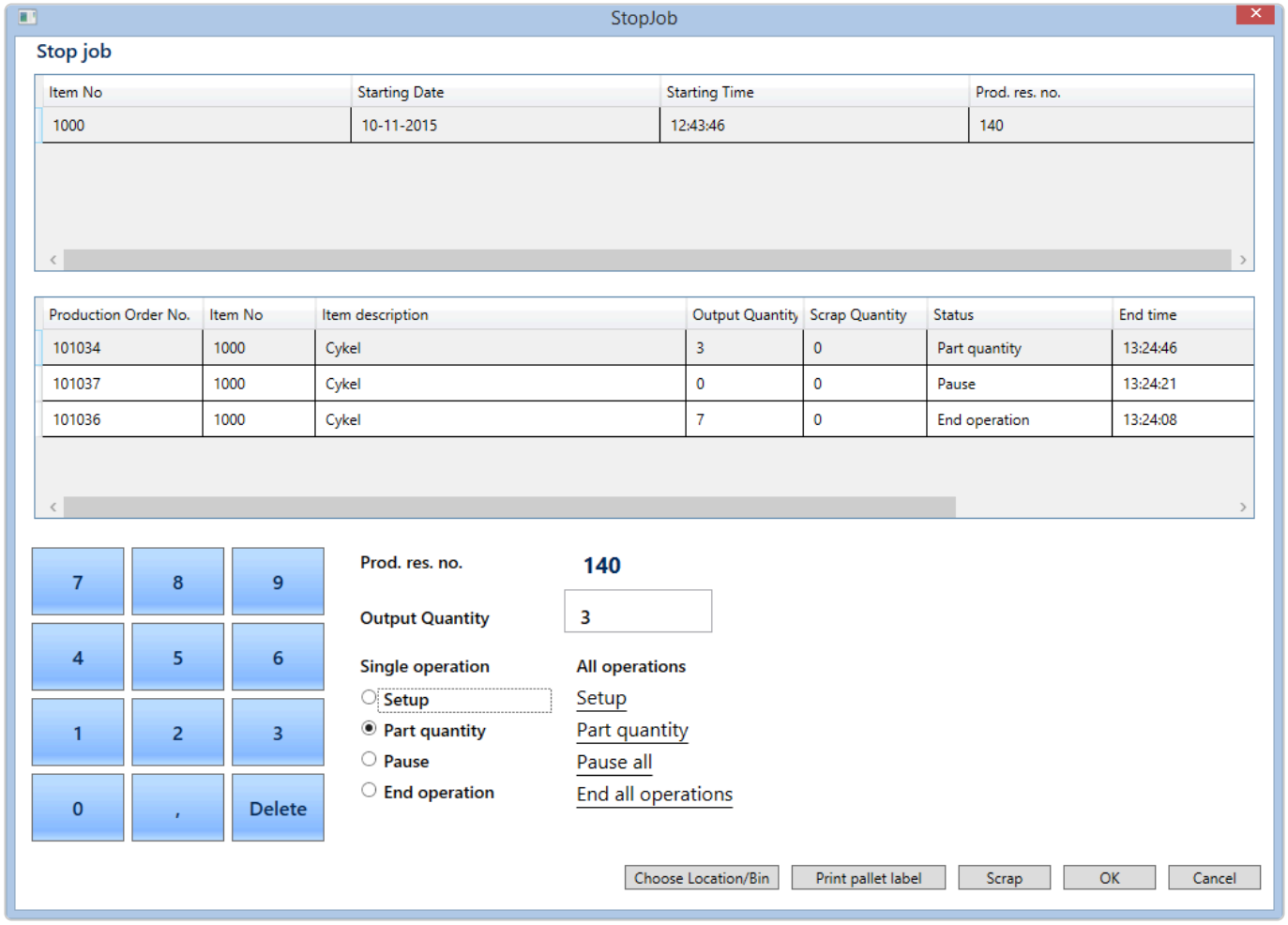
This should be answered with ”Yes”, in order to record the setup time.

1. 2. If you select partial reporting for all lines, you have to report the number individuallly for each line. If you select partial reporting, the number is reported, and the order lines are restarted with a new sequence number.

1. 3 If you select to interrupt (pause) all, the productions are stopped temporarely. If it has been selected in the setup, that the productions have to be stopped, when the employee concerned is clocking out, this corresponds to interrupt (pause) all of them.

1. 4 If you choose “End all operations” the expected number is filled in automatically. For each line this number can be changed, and the number of discared items/scrap, as well as the reason can be reported.

As mentioned the above can be combined individually, according to be picture below and be reported as completed in one step:



Finally you have to press OK in order to carry out the selected functions.

There is also the opportunity to choose a function for one or several lines and let them be executed. If so, the lines concerned will be restarted automatically with a new sequence number.

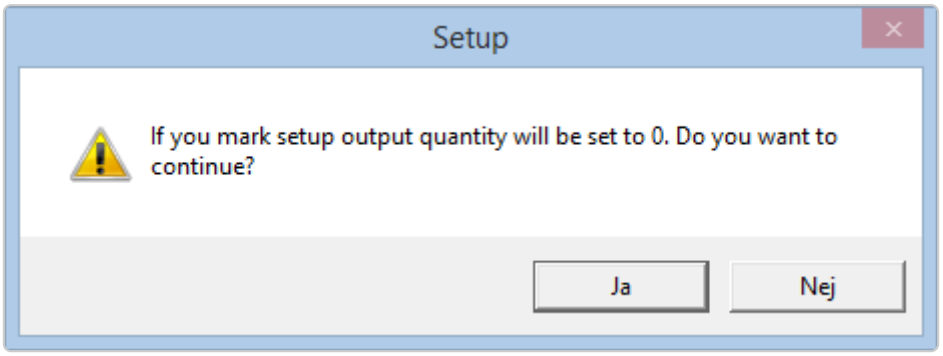
3.2.6. Outputting a job from a pool of running jobs

Outputting a job from a pool of running jobs

There is now an opportunity to carry out individual reporting as completed on the single lines, or, during all operations to mark, that the following reportings have to be made:

• Set up
• Partial reporting
• Interrupt (pause) all
• End all operations

If you select to report “setup”, the following message appears:

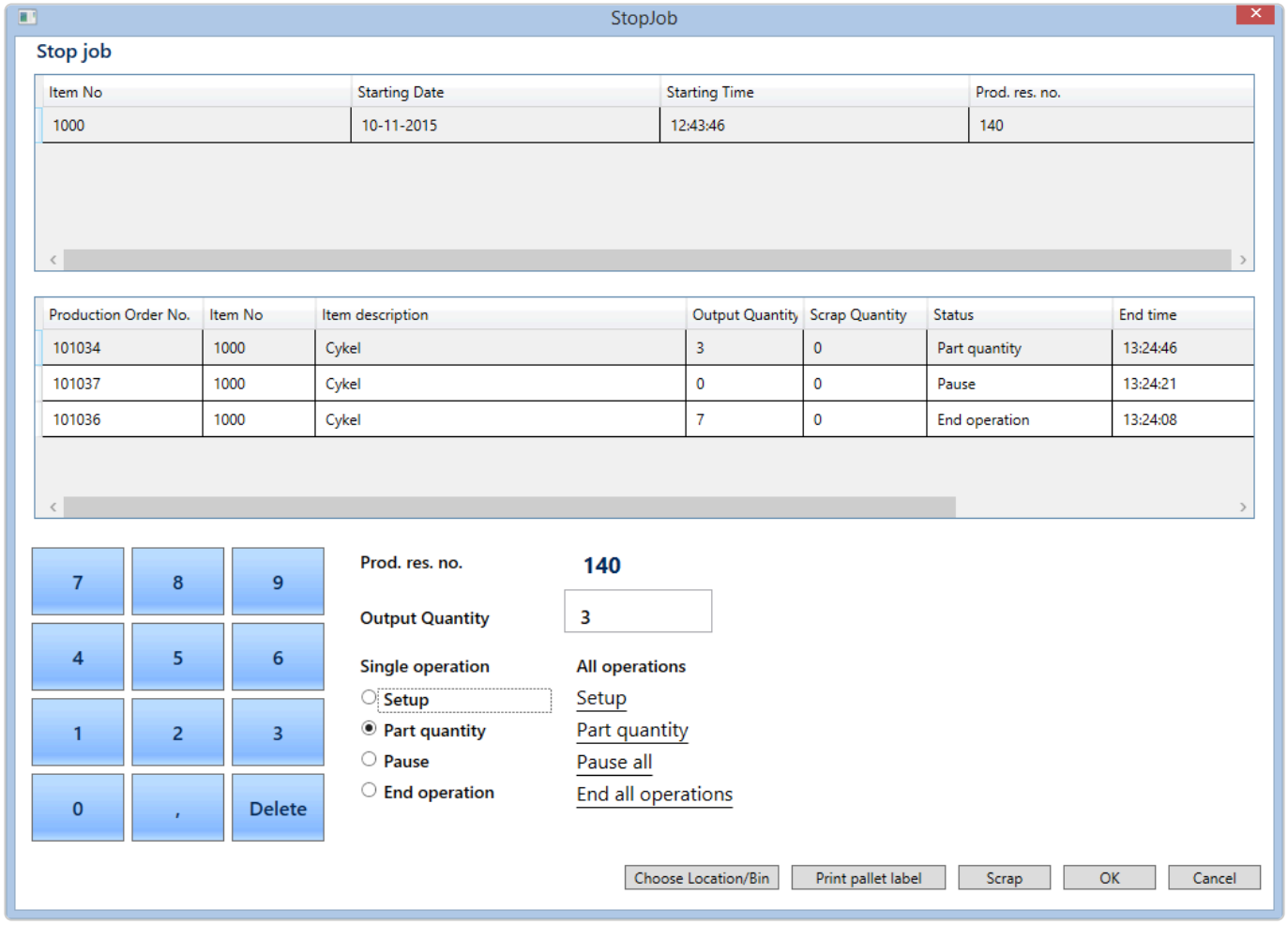


This should be answered with ”Yes”, in order to record the setup time.

Re 2.
If you select partial reporting for all lines, you have to report the number individuallly for each line. If you select partial reporting, the number is reported, and the order lines are restarted with a new sequence number.
Re 3.
If you select to interrupt (pause) all, the productions are stopped temporarely. If it has been selected in the setup, that the productions have to be stopped, when the employee concerned is clocking out, this corresponds to interrupt (pause) all of them.

Re 4.
If you choose “End all operations” the expected number is filled in automatically. For each line this number can be changed, and the number of discared items/scrap, as well as the reason can be reported.

As mentioned the above can be combined individually, according to be picture below and be reported as completed in one step:



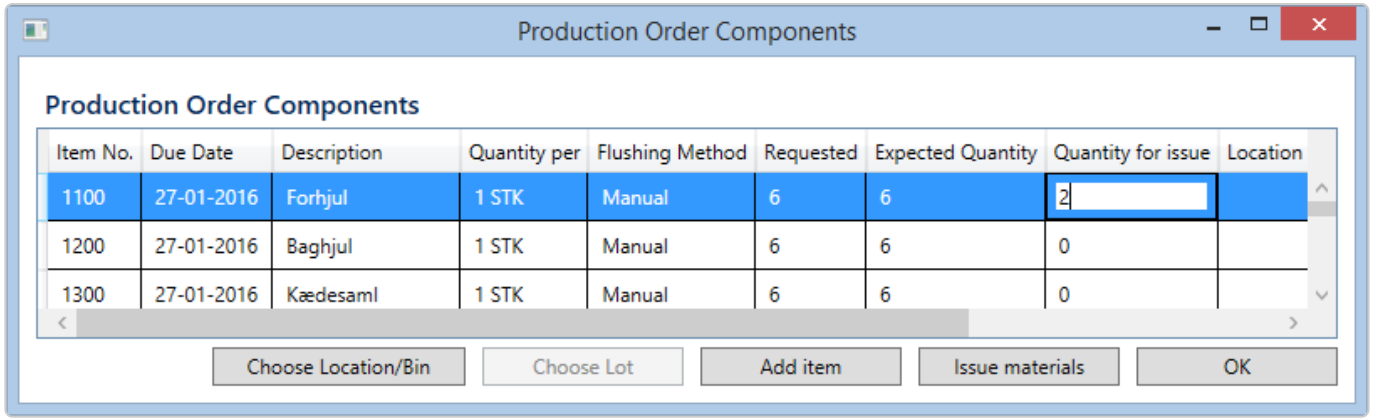
Finally you have to press OK in order to carry out the selected functions.

3.2.7. Using variable material issue

Work with variable material issue

In certain manufacturing processes, it may be necessary to manually enter the material consumption, because there is no mathematical relationship between material consumption and the final product. This can also be the case in process production, where you have to to add material continually.

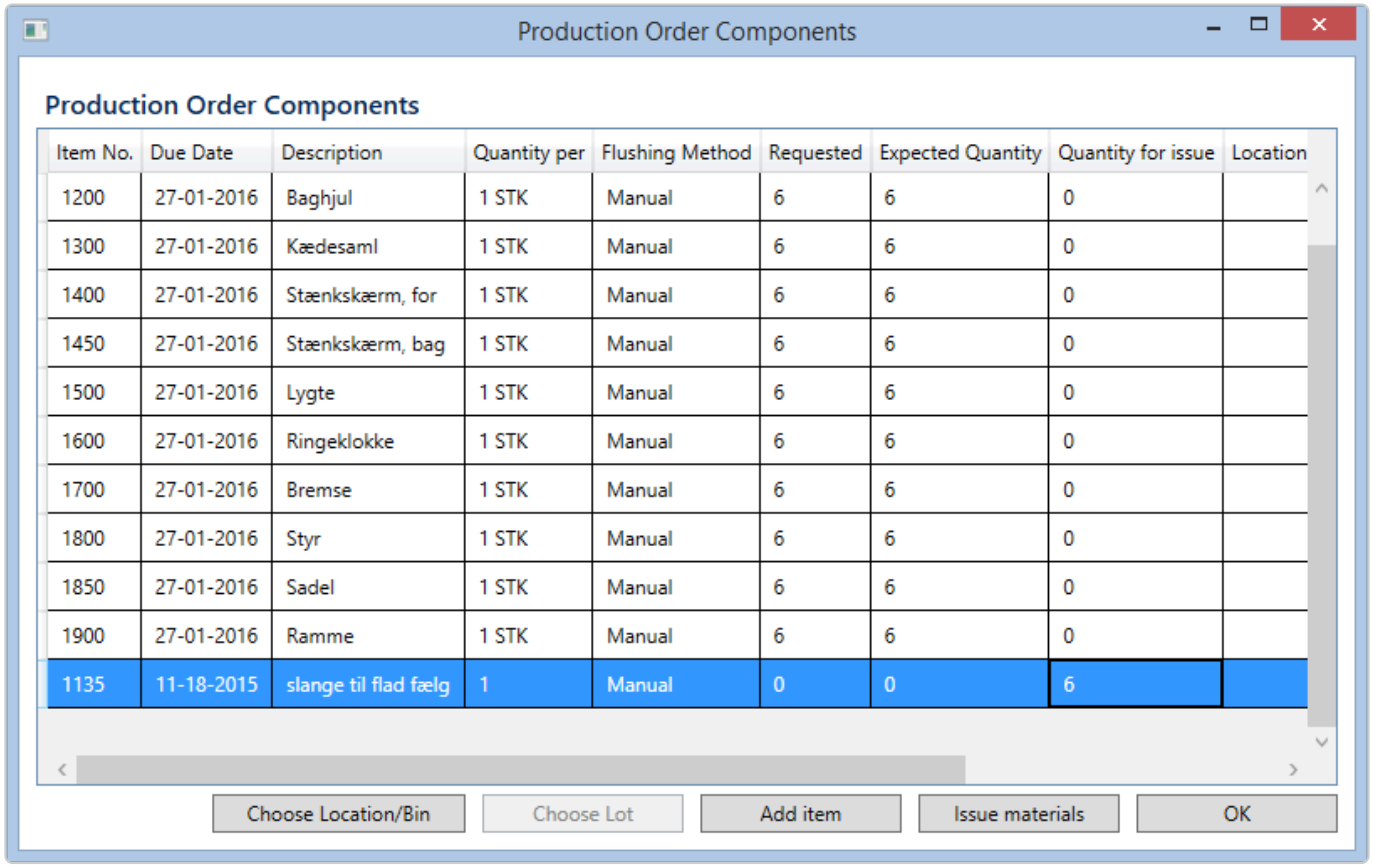
Therefore it is possible to manually enter the number / quantity of each product on the certain line, in the window “Material issue”.



The field ”Issued” is automatically updated, when material is issued via the function ”Issue material”. There is also the oppurtunity to add a component, which is not a part of the standard of the BOM, via the function “Add component”.

The list of the items is displayed and the component in question can be selected. It is possible to sort the list in ascending or descending order, or in alphabetical order. Futheron you can search the number.

The selected item is now inserted in the BOM and the issued number has to be added:


Production Order Components
Production Order Components
Item No. Due Date Description Quantity per Flushing Method Requested Expected Quantity Quantity for issue Location
1200 27-01-2016 Baghjul 1 STK Manual 6 6 0
1300 27-01-2016 Kædesaml 1 STK Manual 6 6 0
1400 27-01-2016 Stænkskærm, for 1 STK Manual 6 6 0
1450 27-01-2016 Stænkskærm, bag 1 STK Manual 6 6 0
1500 27-01-2016 Lygte 1 STK Manual 6 6 0
1600 27-01-2016 Ringeklokke 1 STK Manual 6 6 0
1700 27-01-2016 Bremse 1 STK Manual 6 6 0
1800 27-01-2016 Styr 1 STK Manual 6 6 0
1850 27-01-2016 Sadel 1 STK Manual 6 6 0
1900 27-01-2016 Ramme 1 STK Manual 6 6 0
1135 11-18-2015 slange til flad fælg 1 Manual 0 0 6
Choose Location/Bin
Choose Lot
Add item
Issue materials
OK

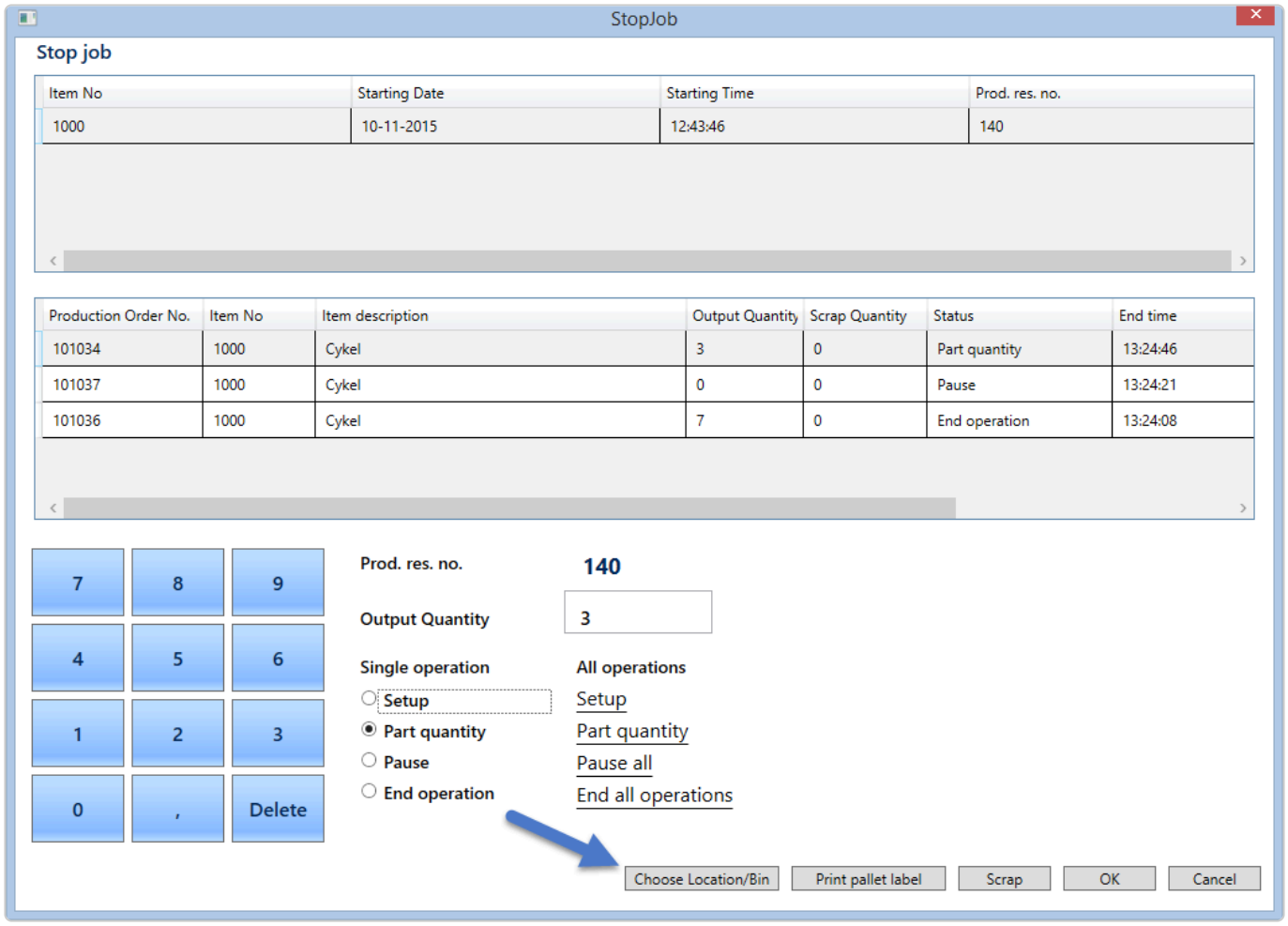
3.2.8. Using locations and bins

Using locations and bins

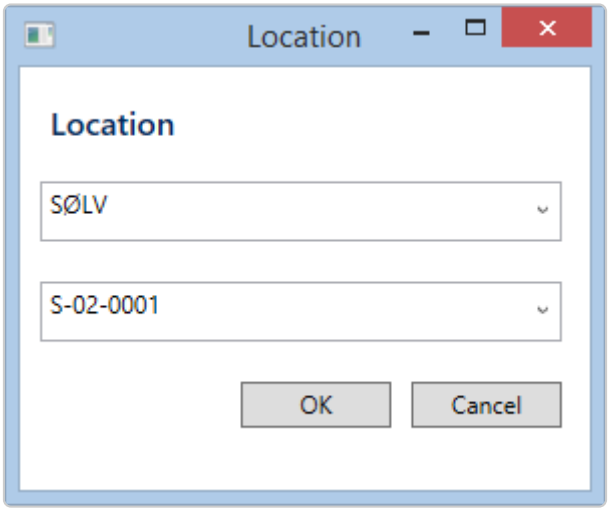
In NAV it is possible, under ”Logistics” menues to determine, that commodities and manufacutured items have have assigned a location and a bin. This facility is supported by Naveksa SHOPFLOOR, too. In Naveksa ShopFloor it is possible as well, to assign a temporary location to an item during the manufacturing process, so that the next operation receives information about, where the item in process is placed after completion of the previous operation.

Assignment of a temporary BIN

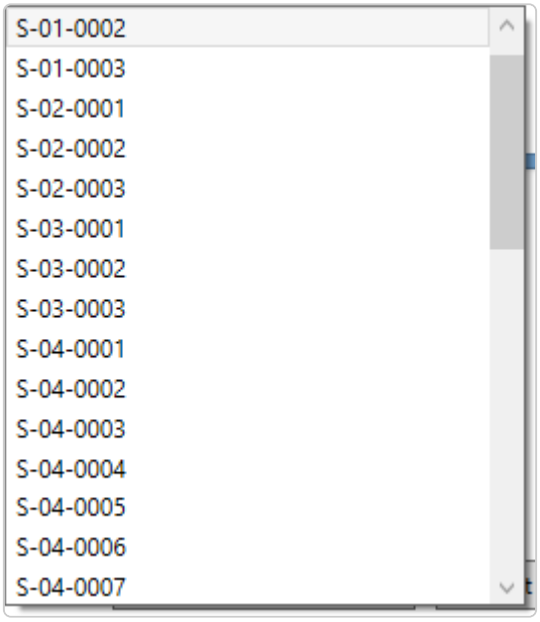
In the output picture there is a function in the bottom of the picture, where you can assign a location and a BIN:



Chose a given production order line and select Location/BIN:



You can now choose the suggested BIN, or another BIN by looking it up in the list of BIN's:

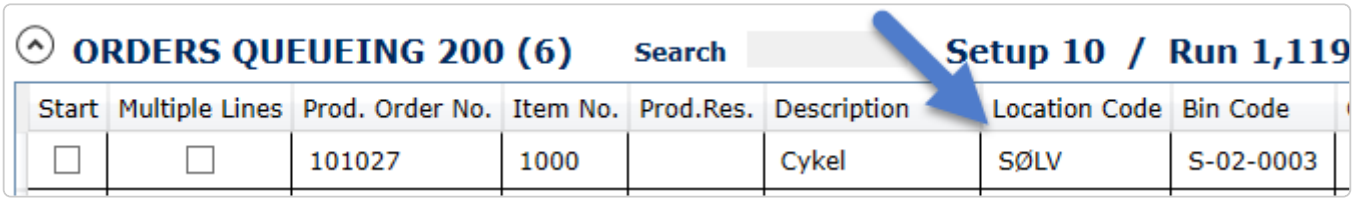


The suggested BIN is the one, that exists default on the production order line, and the one it is necessary to change during the production procress, as the temporary BIN rarely will be the final BIN:

Production Order No.	Item No	Item description	Location	Bin
101049	1000	Cykel	SØLV	S-02-0001
101050	1000	Cykel	SØLV	S-02-0002
101027	1000	Cykel	SØLV	S-02-0003

Here you can see that the first line has got another BIN, whereas the other lines do not have got a temporary BIN assigned, yet. At the final completion of the production in question, the item concerned will have a default location assigned, unless this activity is changed.

On the following operation you will then be able to see the temperary BIN of the component:



ORDERS QUEUEING 200 (6) Search Setup 10 / Run 1,119

Start	Multiple Lines	Prod. Order No.	Item No.	Prod.Res.	Description	Location Code	Bin Code
☐	☐	101027	1000		Cykel	SØLV	S-02-0003

Assignment of a new BIN at the Completion of a Production
At the completion of a production, the item has got assigned it's original BIN, and if it does not have to be changed, you can just finish the production in a normal way, without changing the BIN:

Prod. Order No.	Item No.	Prod.Res.	Description	tion Code	Bin Code
101051	1125	160	PLADEHJUL Lot	SØLV	S-01-0001
101052	1125	160	PLADEHJUL Lot	SØLV	S-01-0001
101053	1125	160	PLADEHJUL Lot	SØLV	S-01-0001

If you want to assign a new BIN to the item instead, this will be done through "Location/BIN" and by changing the default BIN:

Production Order No.	Item No	Item description	ocation	Bin
101051	1125	PLADEHJUL Lot	SØLV	S-02-0001
101052	1125	PLADEHJUL Lot	SØLV	S-02-0002
101053	1125	PLADEHJUL Lot	SØLV	S-02-0003

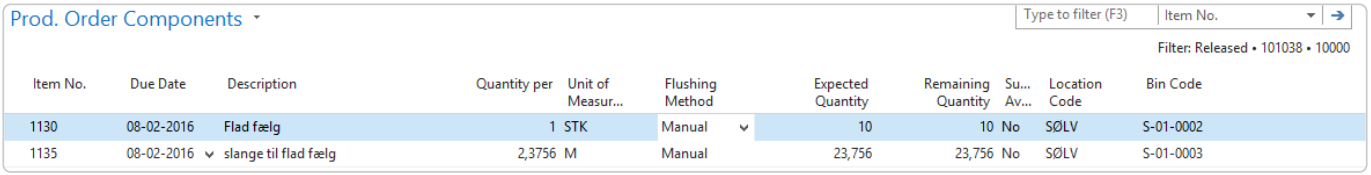
At the completion of a Production, this new BIN will be transferred to the Output Journal:

Batch Name: STANDARD

Posting Date	Order No.	Document No.	Item No.	Operation No.	Order Line No.	Type	No.	Location Code	Bin Code
02-06-2015	101004	101004	1125	10	10000	Work Center	100	SØLV	S-01-0001
17-06-2015	101004	101004	1125	10	10000	Machine Ce...	110	SØLV	S-01-0001
03-06-2015	101005	101005	1125	10	10000	Machine Ce...	120	SØLV	S-01-0002
03-06-2015	101006	101006	1125	10	10000	Machine Ce...	120	SØLV	S-01-0002
03-06-2015	101007	101007	1125	10	10000	Machine Ce...	120	SØLV	S-01-0002

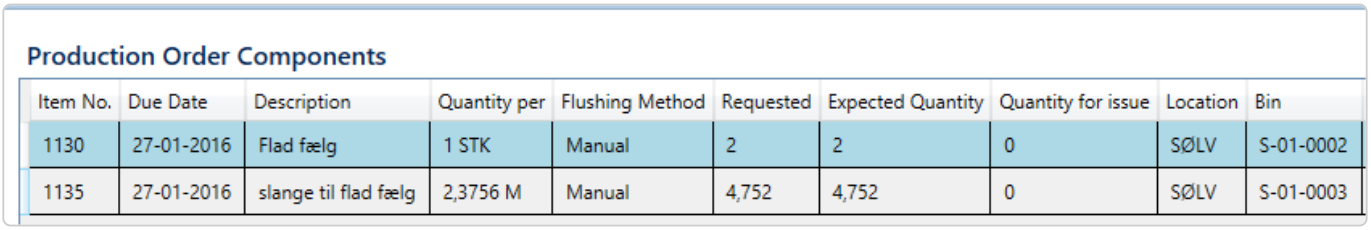
Use of location and BIN – Material Issue

Companies working with storage BINs in Navision will have this information available in the overview of the material consumption. The information will be available in the overview of the production components (BOM) as an information for the use of issue from the stock.

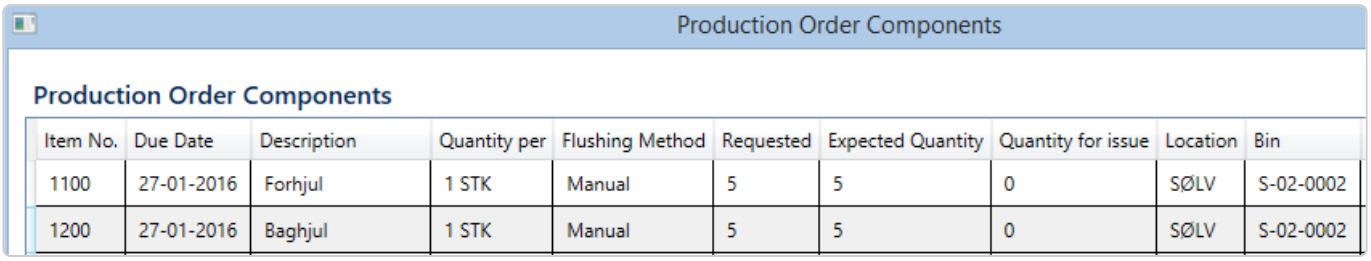


It may be nessecary to modify the printout of the material request in order to visualize information here.

If marked in the setup of the Naveksa ShopFloor, this variable material consumption is used, information regarding the BIN will be visible, too, when issuing material. In this window it is also possible to issue material from another BIN than the one that is stated by default in the component list.



If the items have been issued from a different BIN than specified, you can go to the location/BIN, and change to the BIN from which the item has been issued:

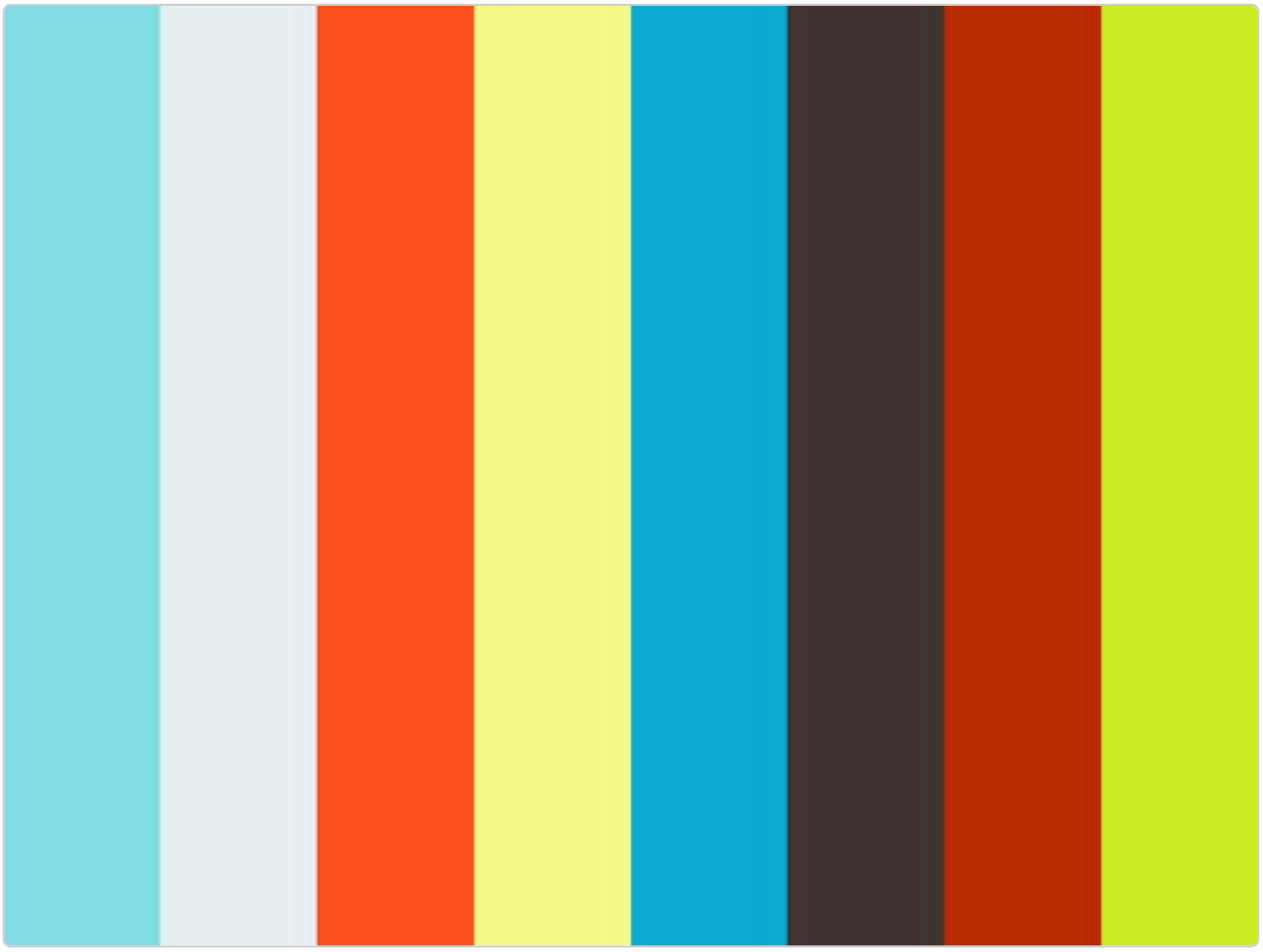


Then select ”Issue material” and press OK. The consumption has now been placed in the consumption journal with the selected BINs (the BINs will change in the window, back to default BINs, but it will be the selected ones that are posted).

3.2.9. Using batch/lot and serial number tracking

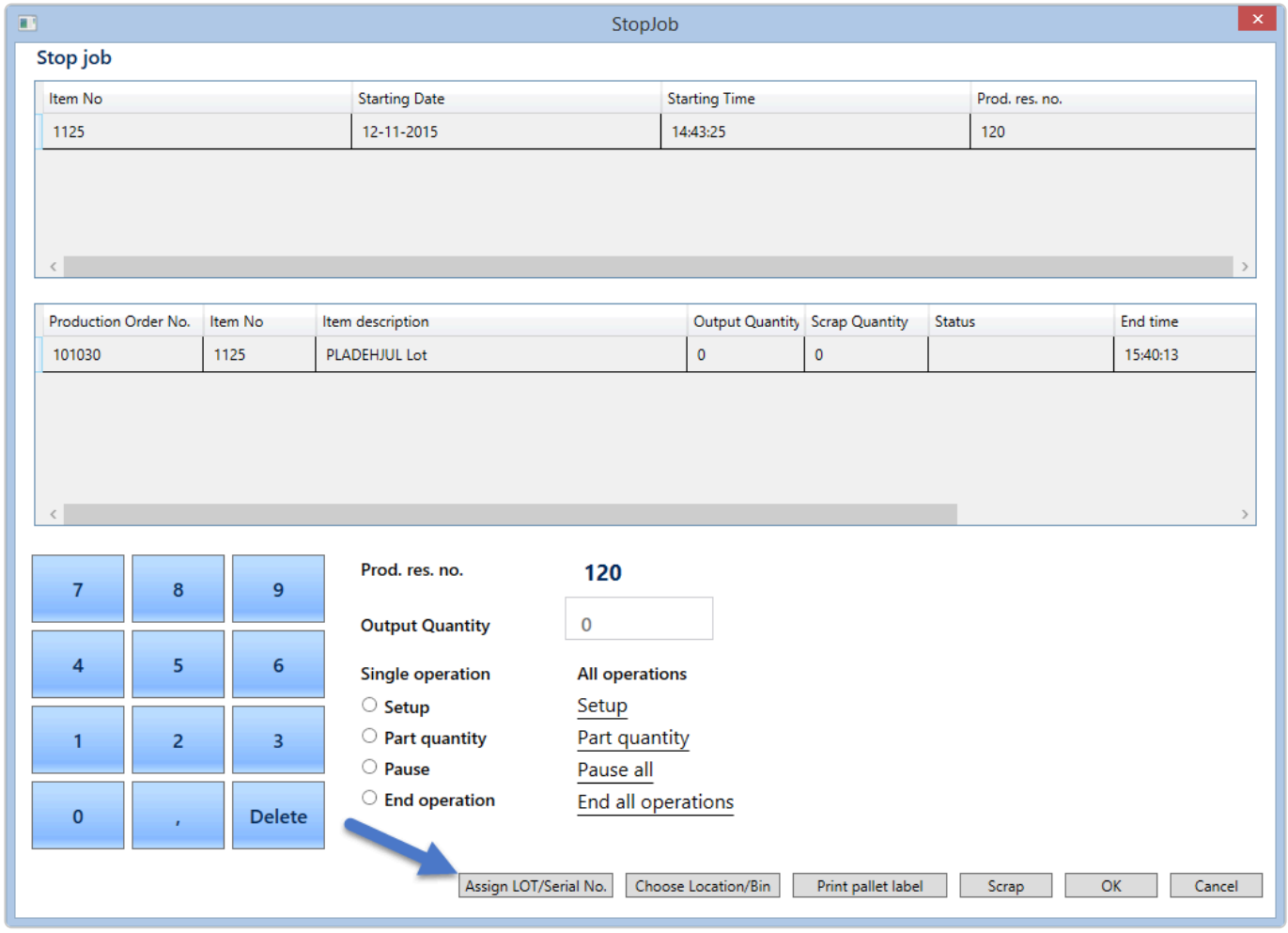
Using batch/lot and serial number tracking

See the video on batch/lot/serial number tracking here:



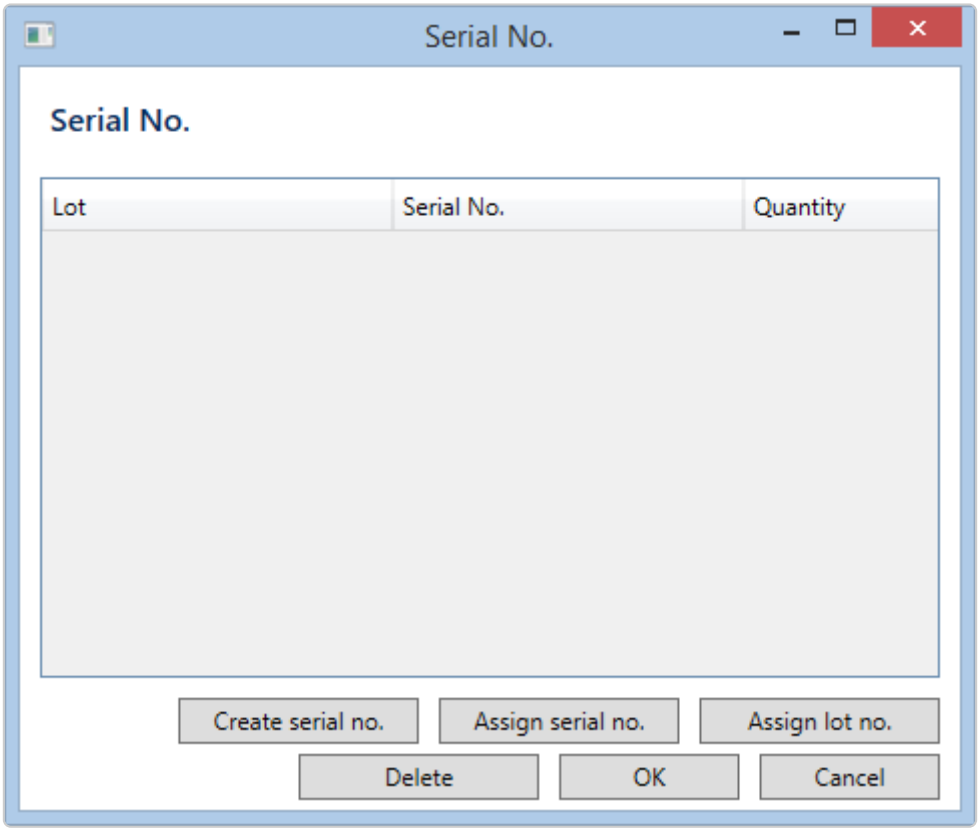
https://player.vimeo.com/video/204163514

If item tracking via Lot / serial numbers has been chosen in standard NAV for a given item, it will be possble to select them / assign them from the ShopFloor system. It is only possible to assign Lot / serial numbers on the last operation of a routing. The lot/serial number is assigned from the output-window:

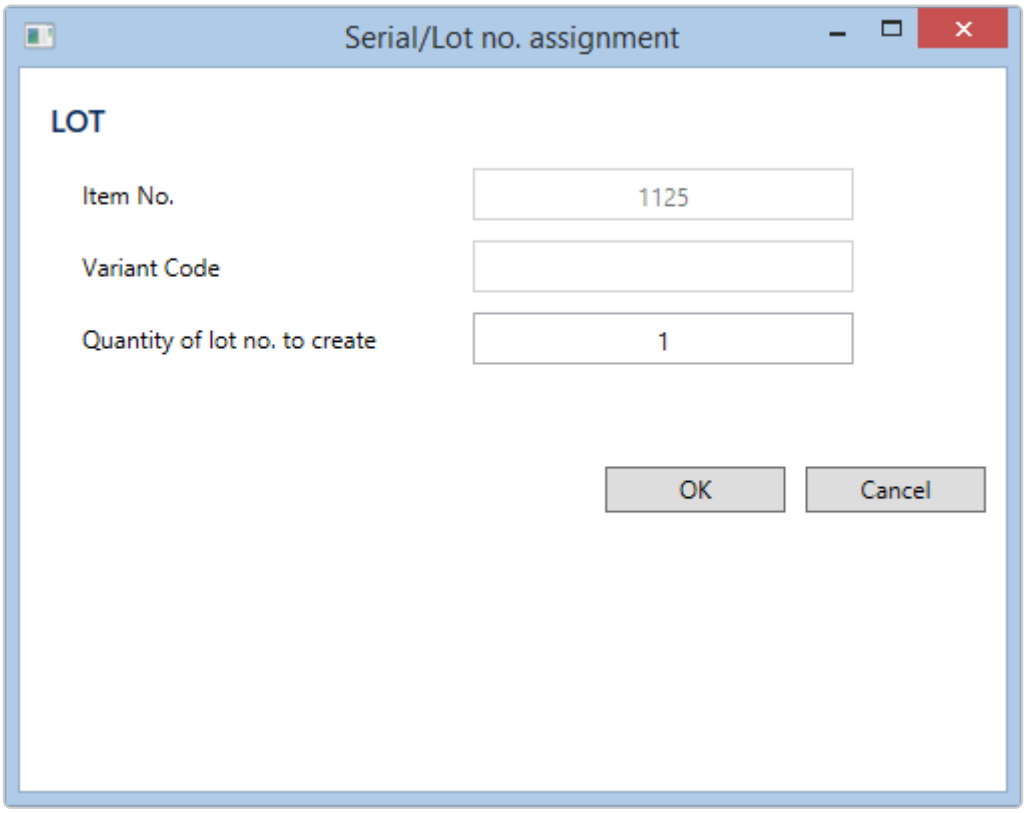


In order to assign Lot/serial numbers to the correct number, you must first select End all operations, or you have to report a certain number as partly completed:

Select Assign Lot/Serial numbers in order to see the following pop up window:



This item has to have assigned a lot number and therefore select Assign Lot No.



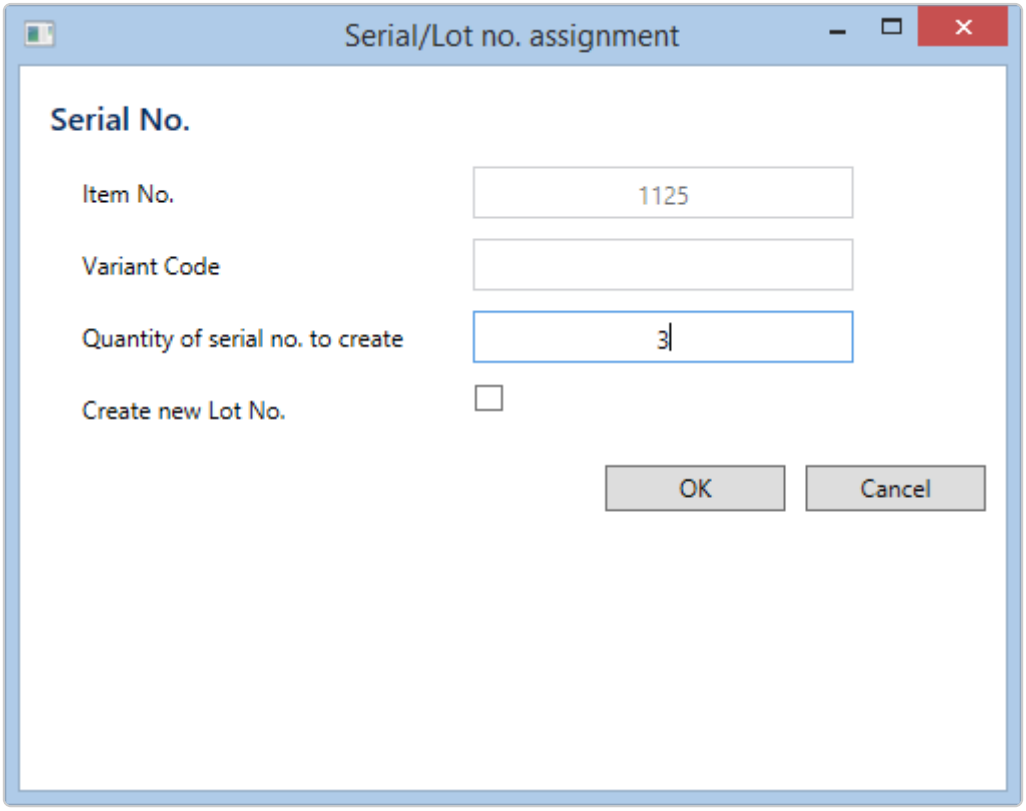
It is only possible to assign one lot number to each production. Therefore the number is set to be 1 by default. Select OK.

Now you can see that this order line, that contains 7 items, has got assigned lot no. LOT0030. Press OK

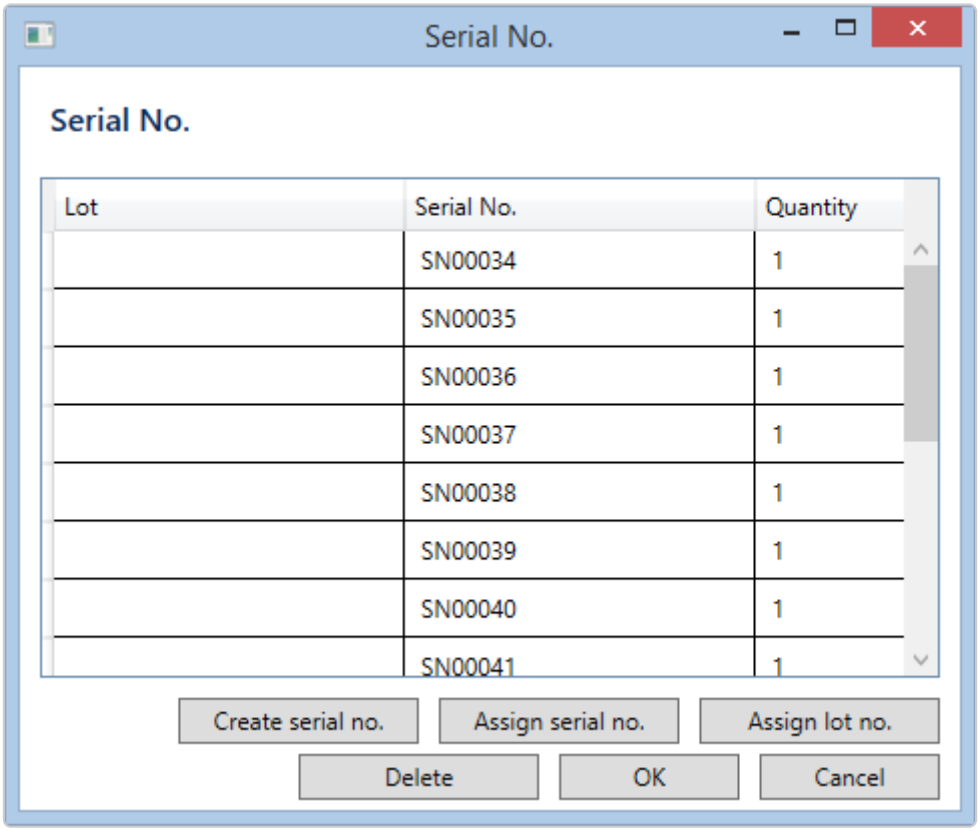
and once more OK in order to end the production.

Assigning Serial Numbers

In the same way as the assignment of lot numbers, it is possible to assign serial numbers, in case this has been selected as item tracking. Select Assign Serial Numbers:

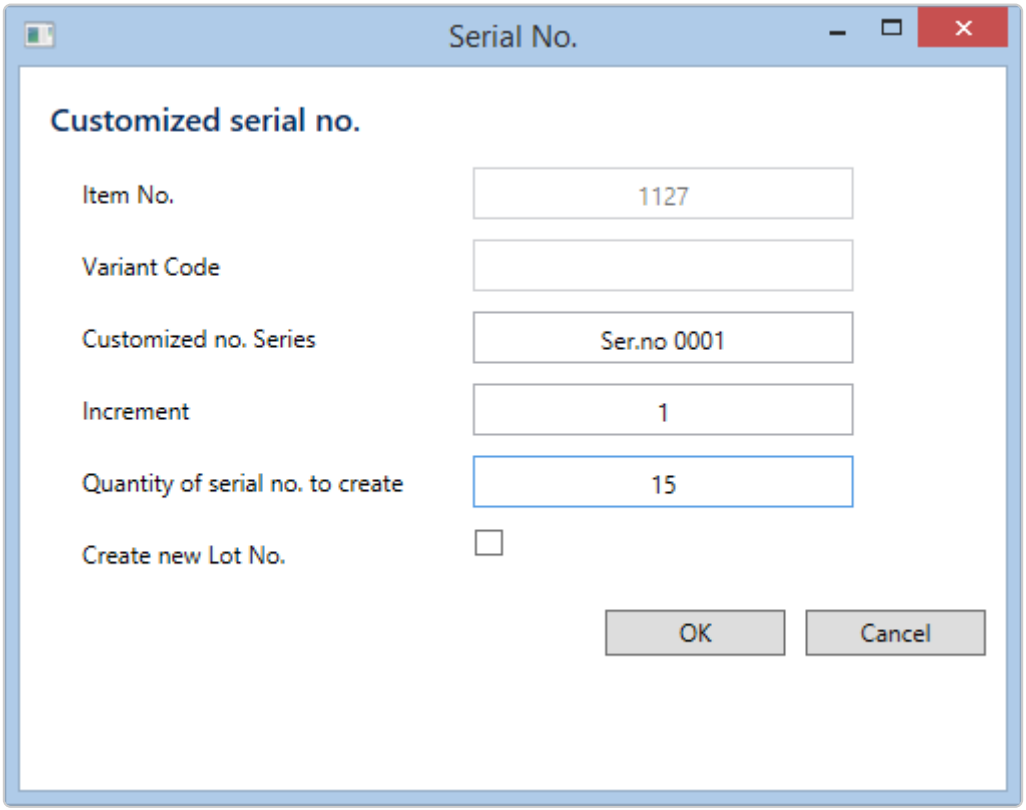


Enter the number of serial numbers that have to be created. Press OK.



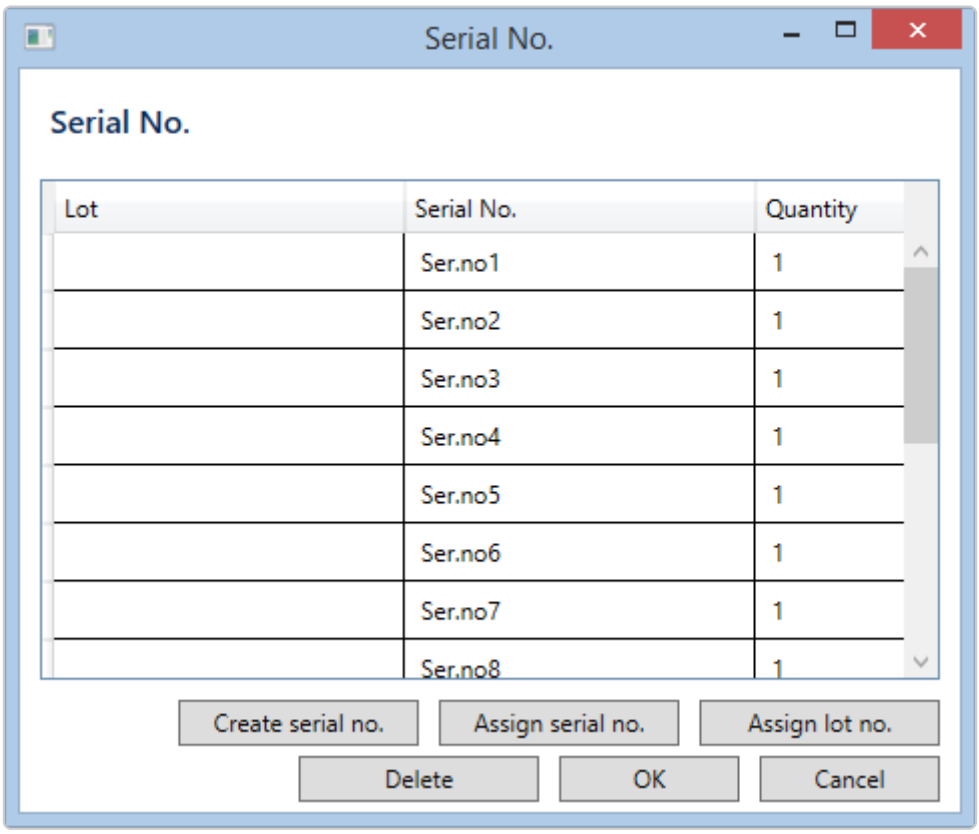
Now 3 serial numbers have been created from the number series that has been selected for the item. Press OK and finish the order.

It is also possible to create own serial numbers by selecting Create serial no.



Enter the number series, the increase and the number of serial numbers that have to be created and

press OK.

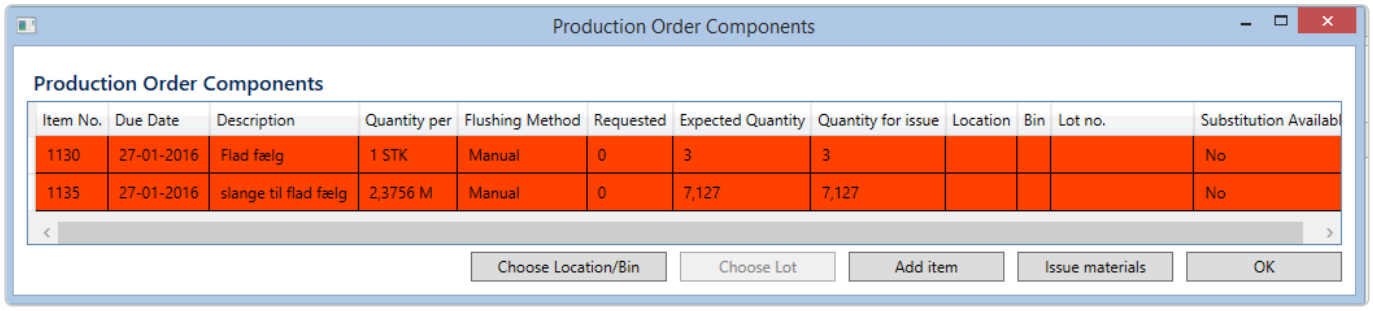


Press OK and finish the order.

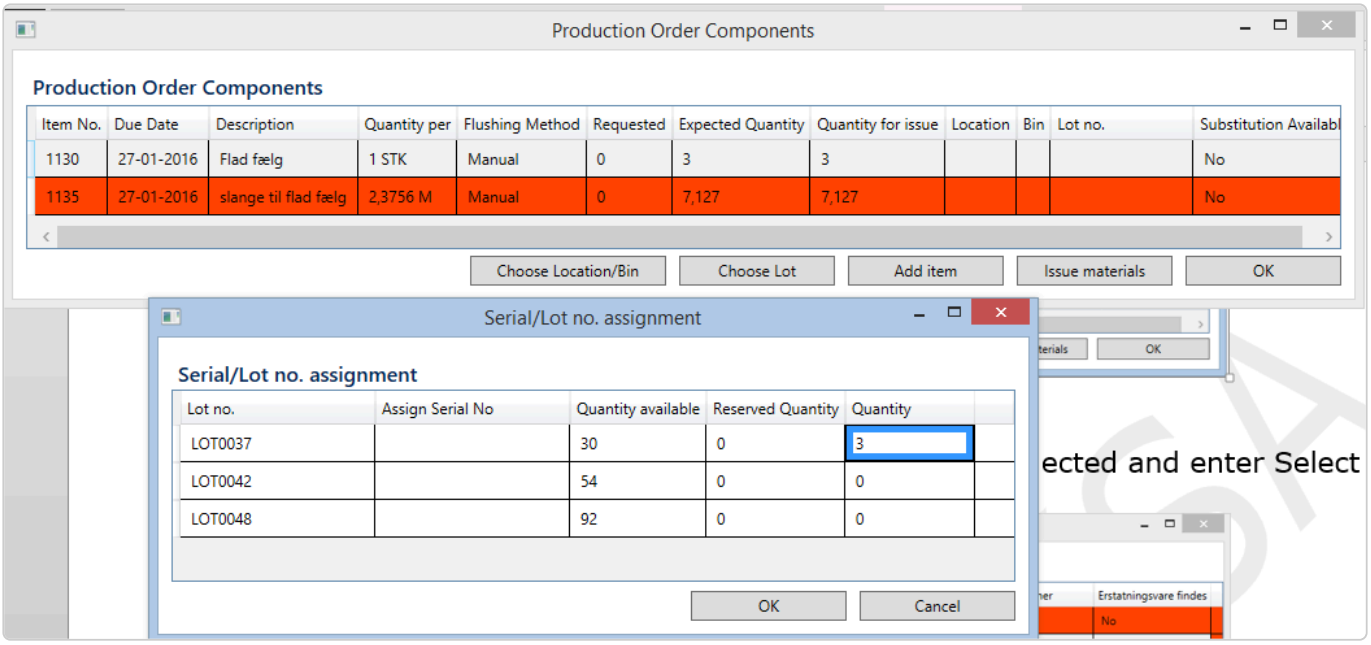
In case of a special combination of serial numbers, it is possible to correct the text directly in the field “serial numbers”.

Assigning Lot and Serial numbers – Material Issue

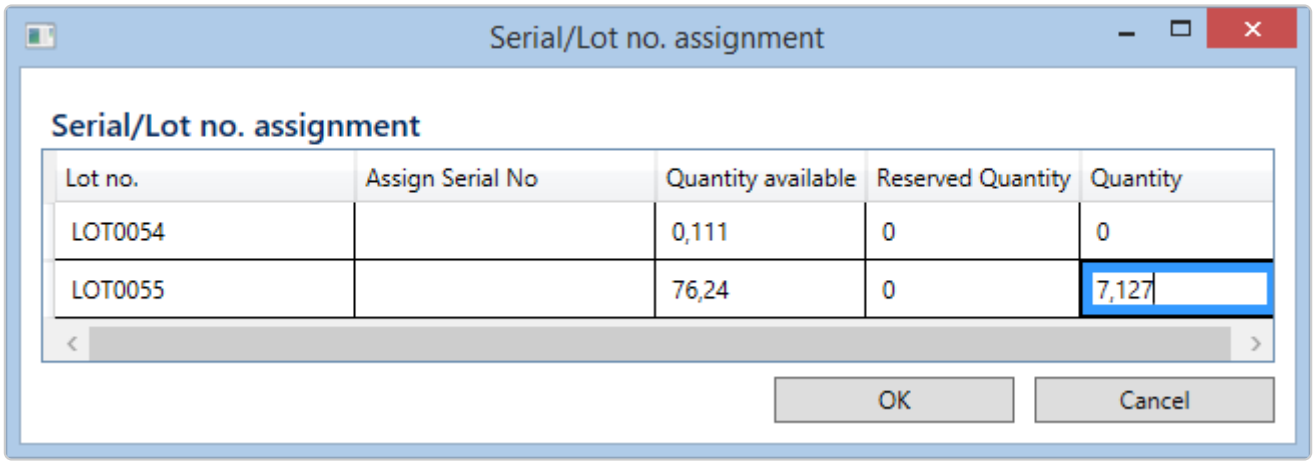
In order to support tracking of the components, that are a part of the finished product, it is possible to select components from certrain lot or serial numbers, when issuing material. If material has to be selected from a certain lot or serial number, the lines will be marked in red, when the window ”Material Issue appears:



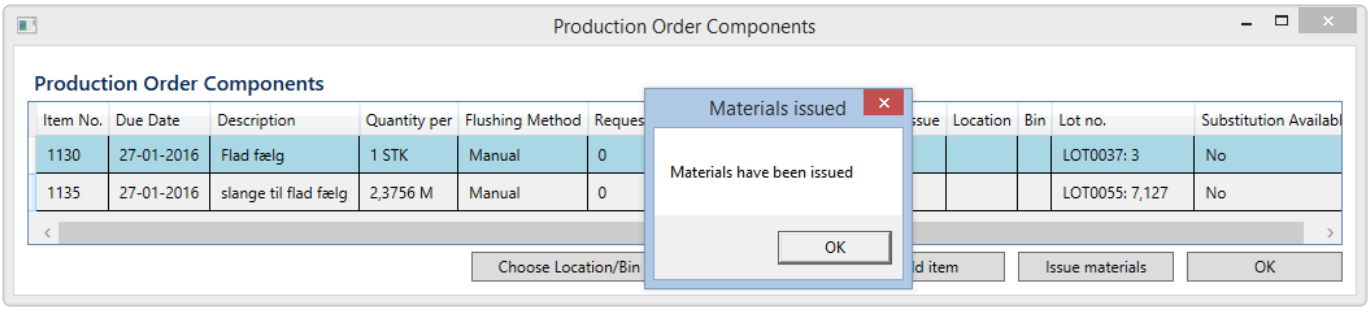
Mark the line, from which the consumption has to be selected and enter Select Lot – or alternatively enter “Select serial number”.



Next to the lot to be chosen from, enter the number:



In case of chosing from serial numbers, enter 1 next to each serial number that is included in the production.
Enter OK, complete the selection of components and then issue material.



The selected lot number and the quantity is displayed next to each single line. If requested, it is possible to enter data directly in the field “Lot number. However it is only recommended for barcode reading.

PLEASE NOTE: If a certain serial number / lot number has been booked for the concerned production,

the field “Booked number” will be filled in, and components have to be selected from this line.

However, it is possibe to chose a larger number than the booked number, if necessary.

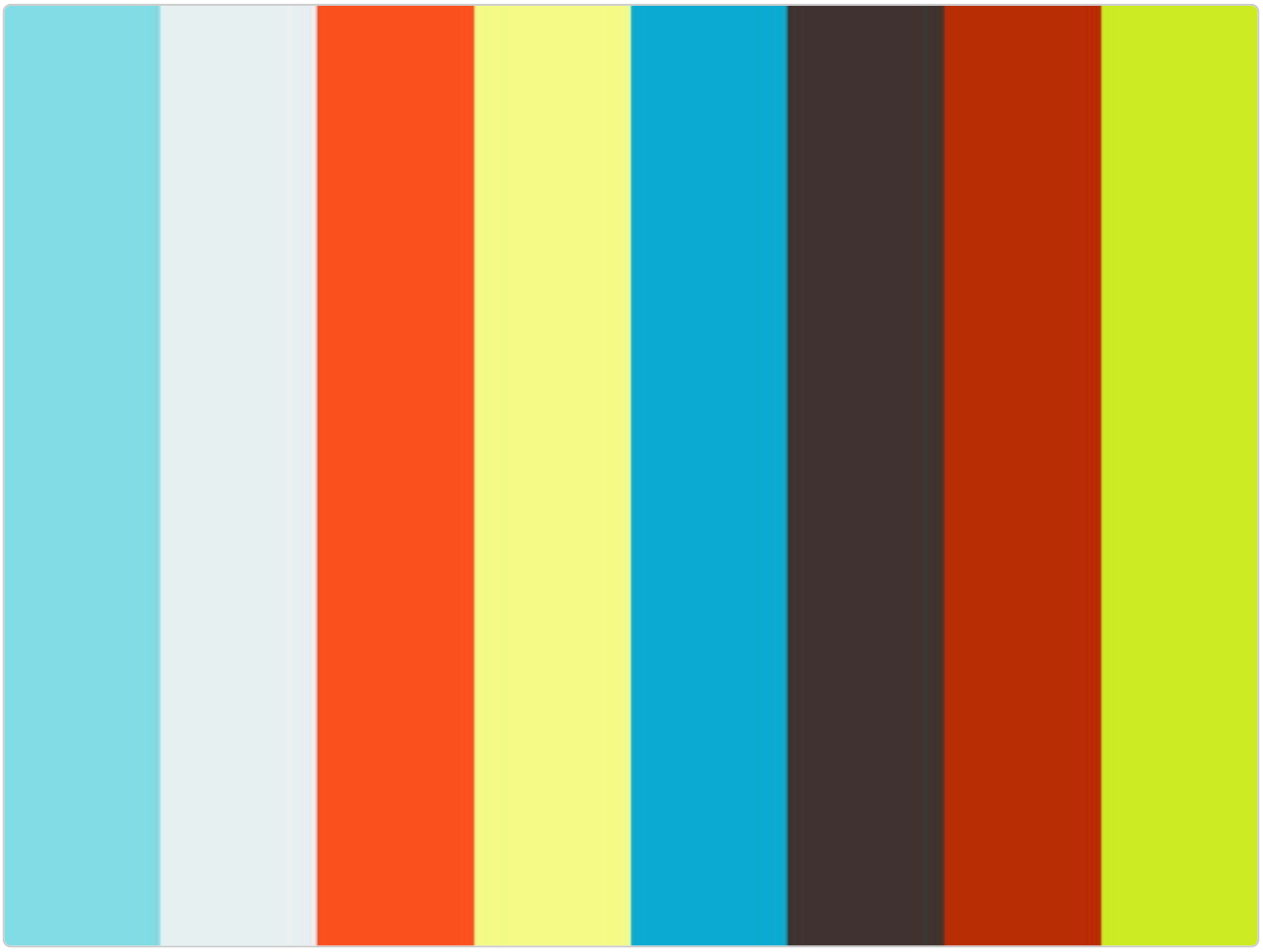
Various printing of pallet labels, product id tickets can be printed as part of the reporting.

This one is just an example: with item number, batch number, serial number etc.

3.2.10. Using quality assurance and control

Using QA/QC – Quality Assurance and control

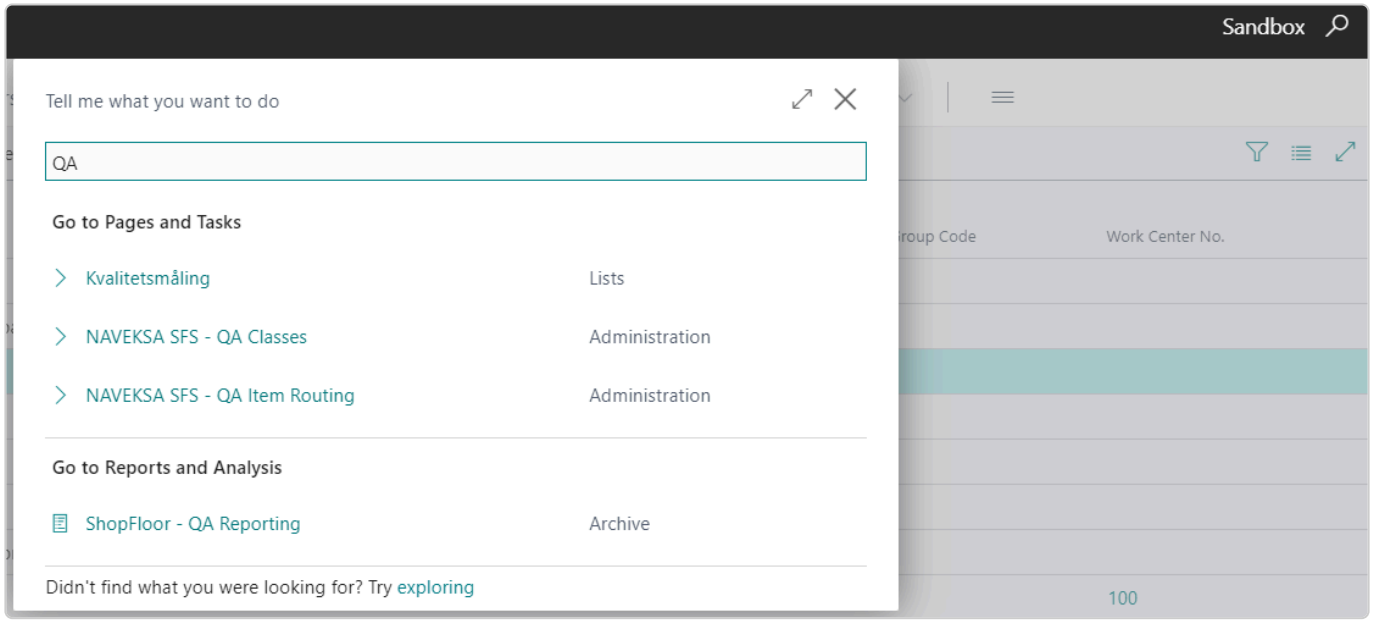
See the QA/QC video here (8 min):



https://player.vimeo.com/video/204225820

ShopFloor QA is an in-line process information and reporting tool.

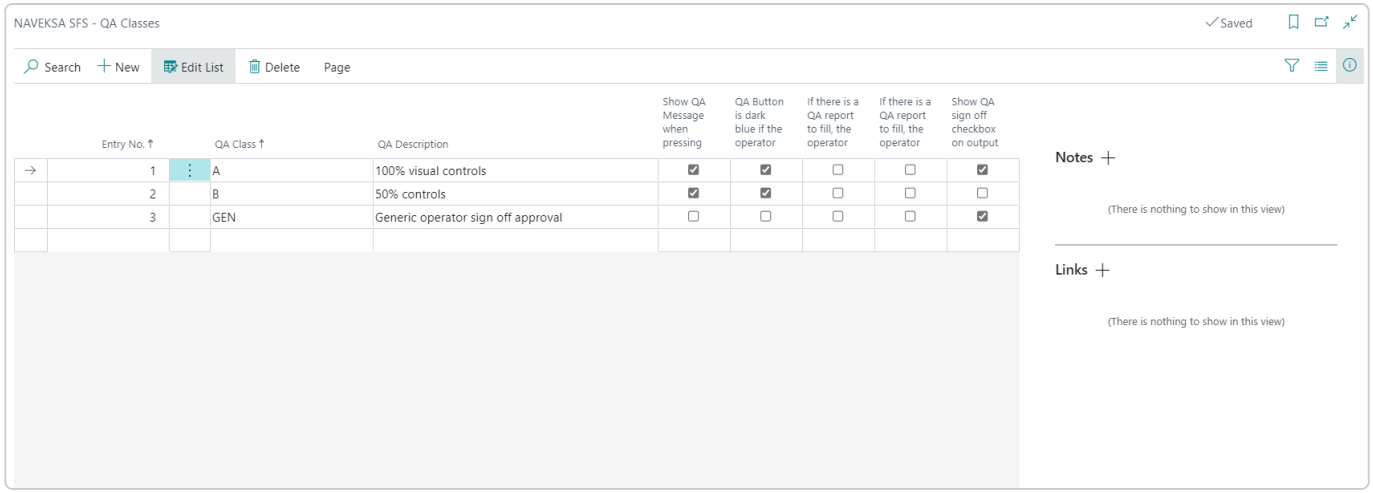
To setup the QA NAVEKSA solutions. ShopFloor QA is setup by using the lup and type in “QA”. Then you will be presented the serch results.



ShopFloor QA facilitates filling in quality control forms. Forms can be created in a BC / NAV web page application, or using Word/Excel.

The statistical part is made, so that CSV files can be extracted for forms, items or specific manufacturing orders.

Setup



On the ”SHOPFLOOR – QA Classes” page you can create the quality control classes (workflows) you want to assign to your items.

SHOPFLOOR QA classes

Here it is possible to configure 5 different workflow settings per class.

- Show QA Message when Starting a Job
  If you assign this workflow setting to your QA class, the SHOPFLOOR operator will be presented to a dialogue box when pressing “Start Job”, asking, if she wants to fill in the quality control document right now, or to start the job.

Once the quality control document has been filled in, the operator will no longer see this dialogue box for the specific operation, even if the workflow setting is enabled.

- Does the QA Button have to be Dark Blue when the Operator has not yet filled in the QA Report?
  If you assign this workflow setting to your QA class, the “QA” button will be dark blue in the SHOPFLOOR main screen, until the quality control document has been filled in.

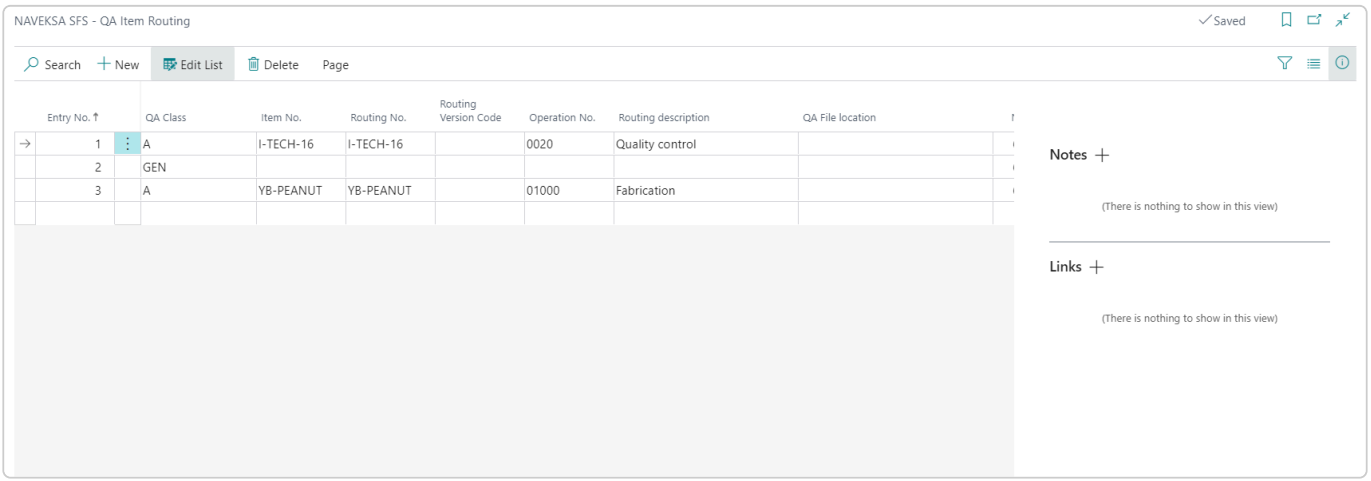
- If there is a QA Report to be filled in, the Operator cannot report Completion
  If you assign this workflow setting to your QA class, the operator cannot report the operation as completed, until he has filled in the quality control document.

- If there is a QA Report to be filled in, the Operator cannot pause
  When assigning this workflow setting to the QA class, the operator cannot pause the operation, before she has filled in the quality control sheet.

- Show ”QA Performed” Confirmation Checkbox, before the Operator can Report an Operation as Completed
  If you assign this workflow setting to your QA class, the operator has to checkmark the confirmation checkbox, before she can report the operation as completed.

SHOPFLOOR – QA Item Routing Relation

On the ”SHOPFLOOR – QA Item Routing Relation” page you can assign your QA classes to items and routings.



For each combination, you have to choose a quality control sheet.

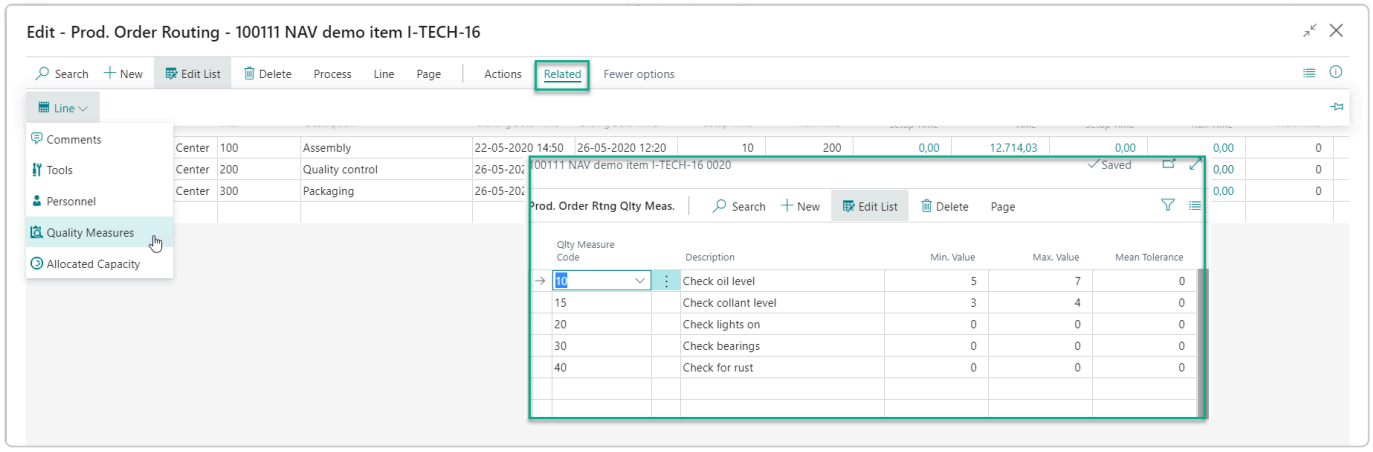
It is also possible to have several quality control workflows assigned to the same item on different operations. It is only possible to have one quality control workflow assigned to one single item on the same operation.

Setting up specific quality measures

Only to be used with the BC / NAV web page reporting solution.

The specific quality measures can be setup in standard BC / NAV using the routing maintenance function – maintain quality measures on the individual routing line.:

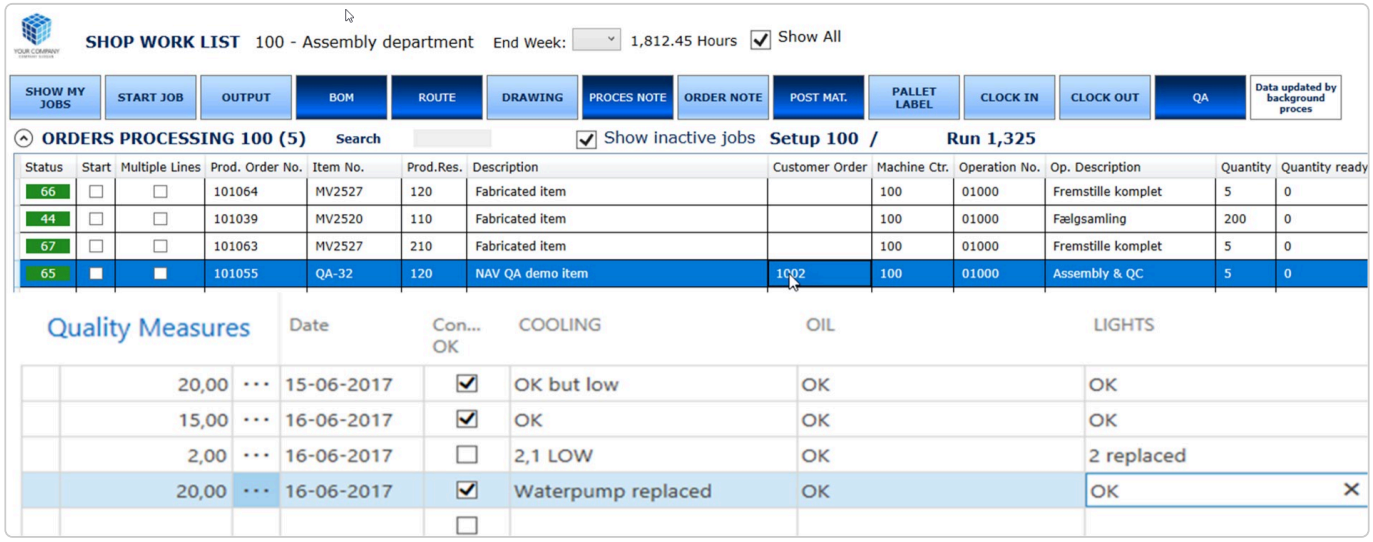
You can setup a maximum of 20 different QC measures.



Enter quality control data

ShopFloor QA is fully integrated in the ShopFloor solutions. Dependent on how the workflow settings are configured for the ShopFloor QA classes, the operator will either be reminded about filling in the quality control document at the beginning of the operation, while the operation is processing, or during output.

No matter what you have chosen, the operator is lead to the QA screen, where there is a link to the quality control sheet, which is opened by clicking on the link “Open quality assurance document”, which asks Windows to open the InfoPath form, using the related Window standard program. Consequently, it is necessary that InfoPath Filler or a similar program is installed on the client computer.



Reporting quality data

You can always let your BC / NAV partner or NAVEKSA partner develop specific reports, in case you prefer having data in Dynamics 365 Business Central / Dynamics NAV. Or it can be as simple as generating a
BC / NAV query to be run on the qualty data.

In its simpliest format it could be excel reporting from the QA detail file:

QA report - September 15th measurements

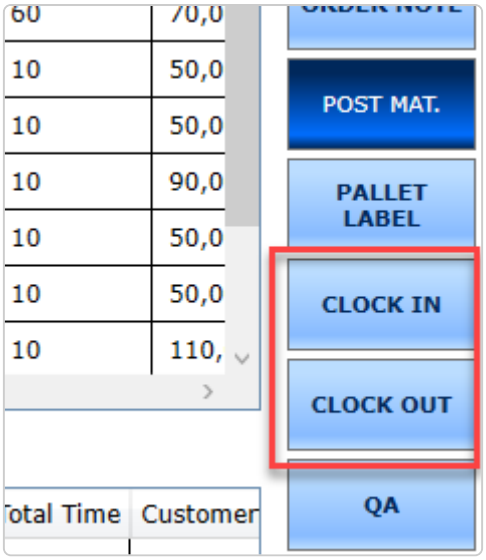
Prod_Order_No	Routing_No	Prod_Order_Line_No	Line_No	Subject_No	Measure_Date	Measure_Time	Employee_No	Control_OK	Value_1	Min_Value_1	Max_Value_1	Mean_Tolerance_1	QA_Code_1
101119	QA-321	10000	10000	123	15-09-2017	09:35:42	210	Ja		0	0	0	
101120	QA-321	10000	10000	12	15-09-2017	10:21:34	110	Ja	12	10	20	0	BRAKING
101120	QA-321	10000	20000	13	15-09-2017	10:21:41	110	Ja		10	20	0	BRAKING
101122	QA-321	10000	10000	1	15-09-2017	16:03:34	120	Ja	15	10	20	0	BRAKING
101122	QA-321	10000	20000	1	15-09-2017	16:04:08	120	Ja	12	10	20	0	BRAKING
101122	QA-321	10000	30000	1	15-09-2017	16:04:35	120	Nej	14	10	20	0	BRAKING
101122	QA-321	10000	40000	0	15-09-2017	16:04:42	120	Nej		10	20	0	BRAKING

3.2.11. Using Time and Attendance with ShopFloor execution

Using Time and Attendance with ShopFloor execution

From the ShopFloor operator screen you have the possibility to perform operator time & attendance transactions using the clock in / clock out functions.

The Time & Attendance functions can be used as stand-alone application or as an integrated part of ShopFloor.



How all this works in detail please click here to read the Time & Attendance manual

3.2.12. Integrating PLC controls and automation into the ShopFloor solution

Integrating PLC controls and automation into the ShopFloor solution

NAVEKSA offers various kinds of automation connected to the manufacturing execution of a production order.

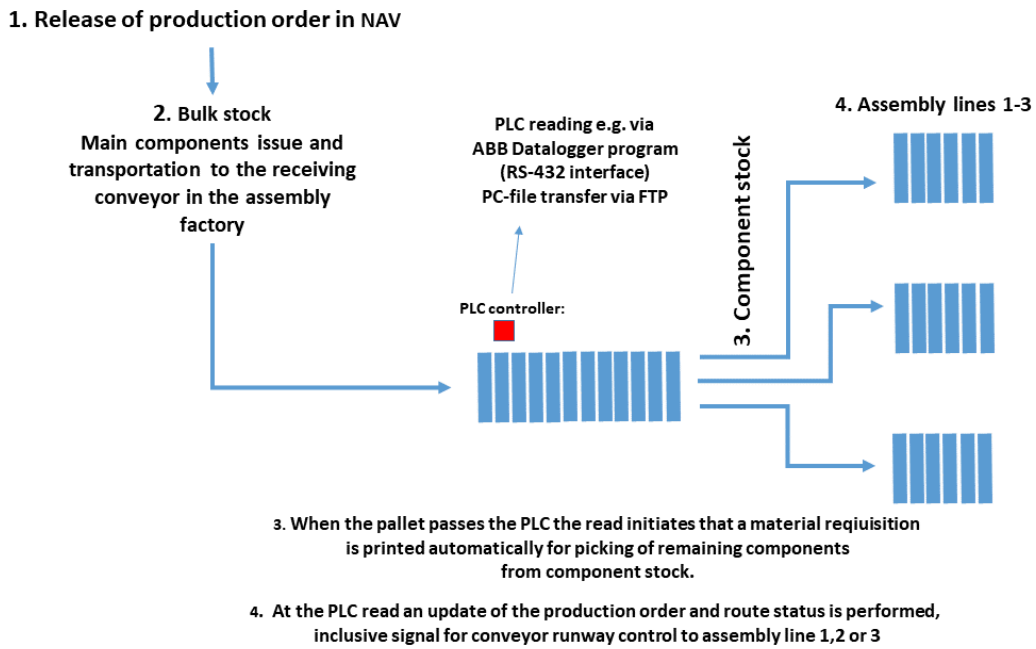
Basiccally the controls will be based on:

- Sending selected production order / order routing data and process information to a PLC from our ShopFloor solution,
- Collecting selected data from a PLC which updates the production order status / order routing data in our ShopFloor solution.

The wishes are many and different. Therefore no standard automation solutions are available.

All wishes requires a thorough analysis and proposal preparation can be seen in the thoughtful example below:

1. A customer wants to pick production order components from different physical locations,
2. As components are picked they are put on pallets, and pallets are placed on conveyor lines..
3. As pallets moves forward on the conveyor, different PLC communication controls further picking activities, and finally direct pallets to specific assembly lines.



Please contact us to discuss your opportunities.

4. Regular technical operating routines

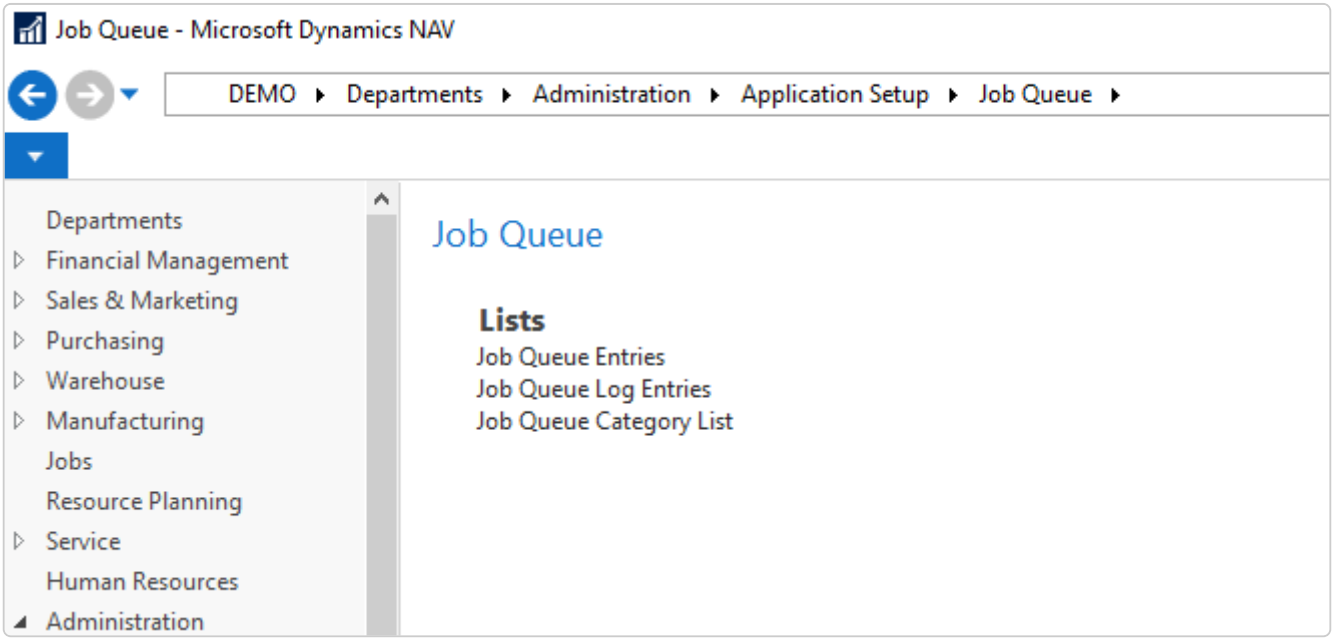
Operating routines – technical

From the NAVEKSA ShopFloor version 8.09.03 and newer a change has been implemented in the ShopFloor functionaslity.

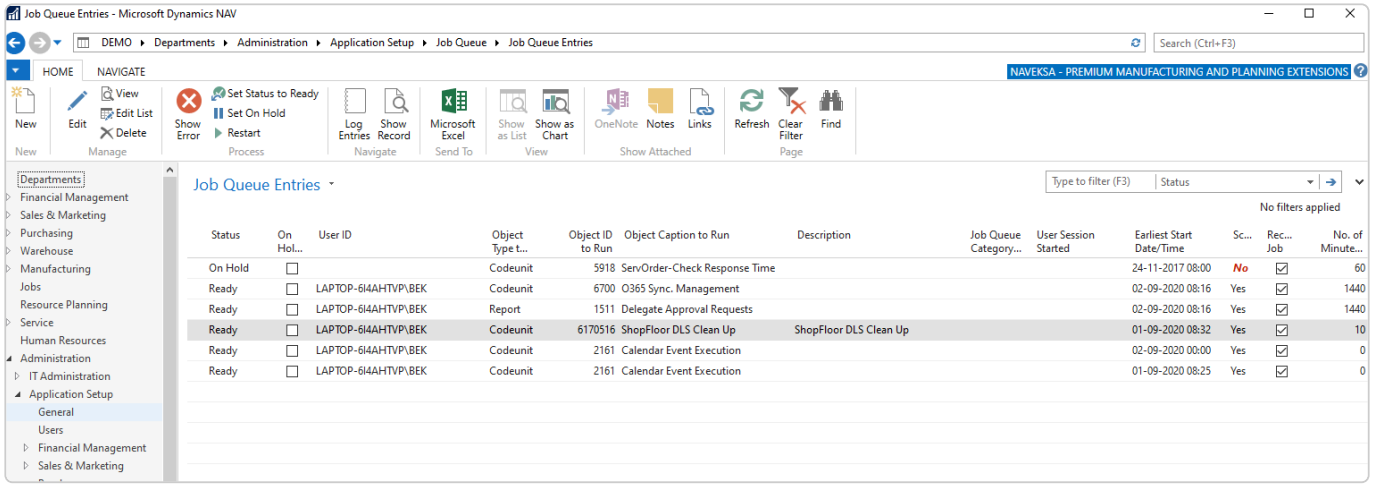
Both Dynamics NAV and 365 Business Central use special asynchrounous procedures to keep the ShopFloor system in good health.

Operating procedures for Dynamics NAV:

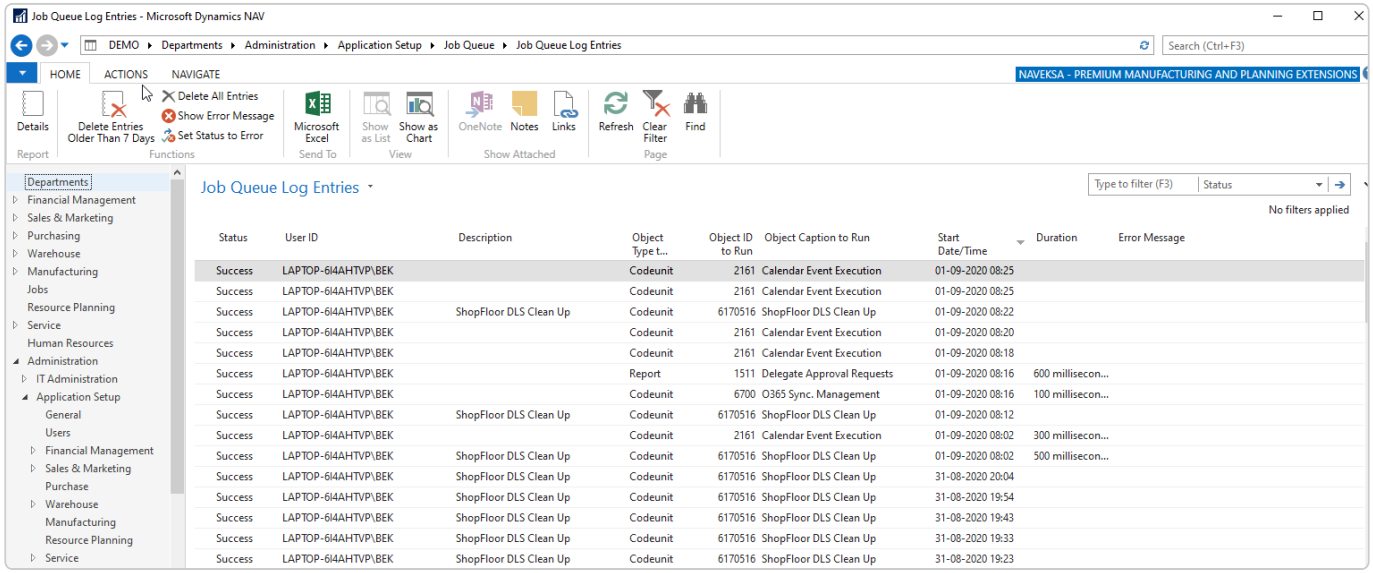
Search for the term “job q” using the search bar in Dynamics NAV.



Make sure that the job “NAVEKSA SFS – DLS clean up” is running

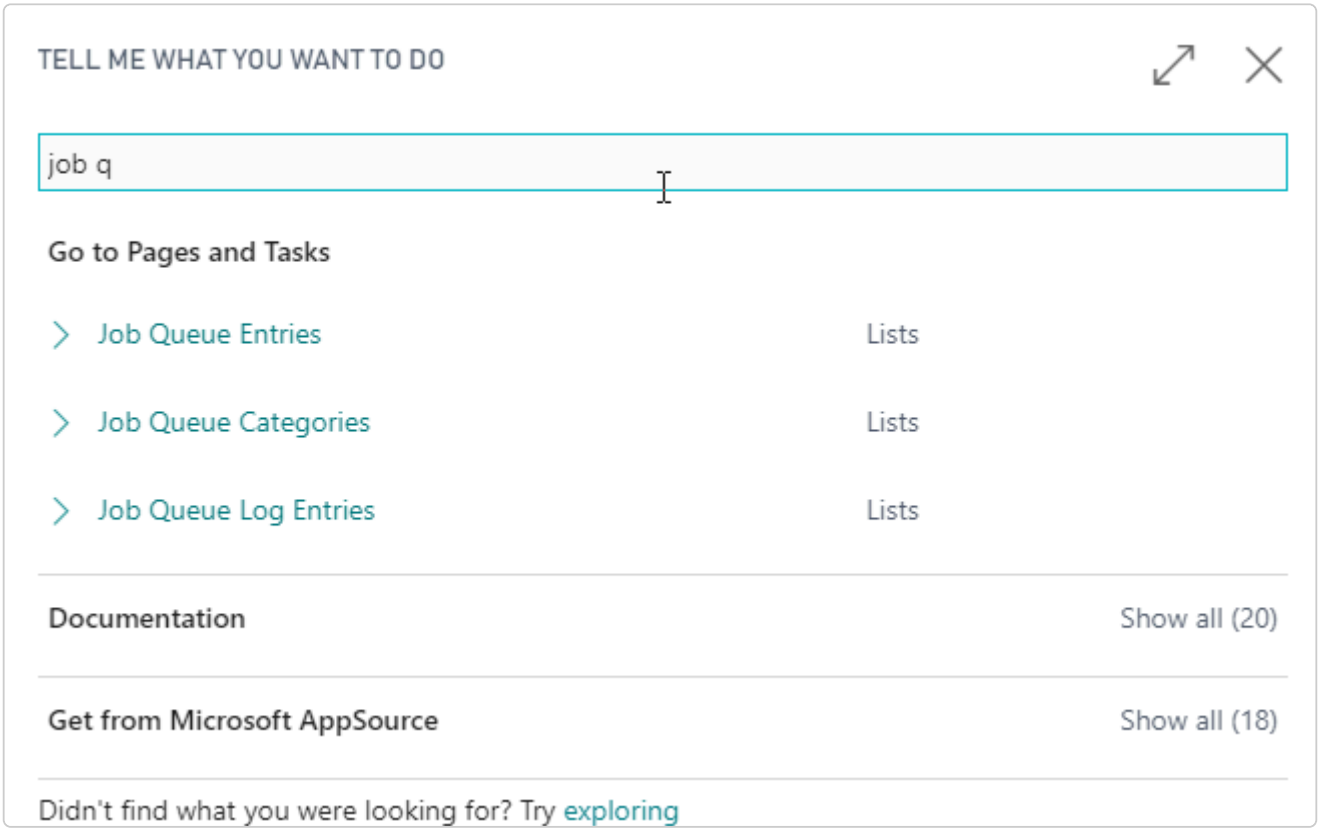


Every time the clean up job runs, a log file record is generated. This file must be cleaned manually at regular intervals.

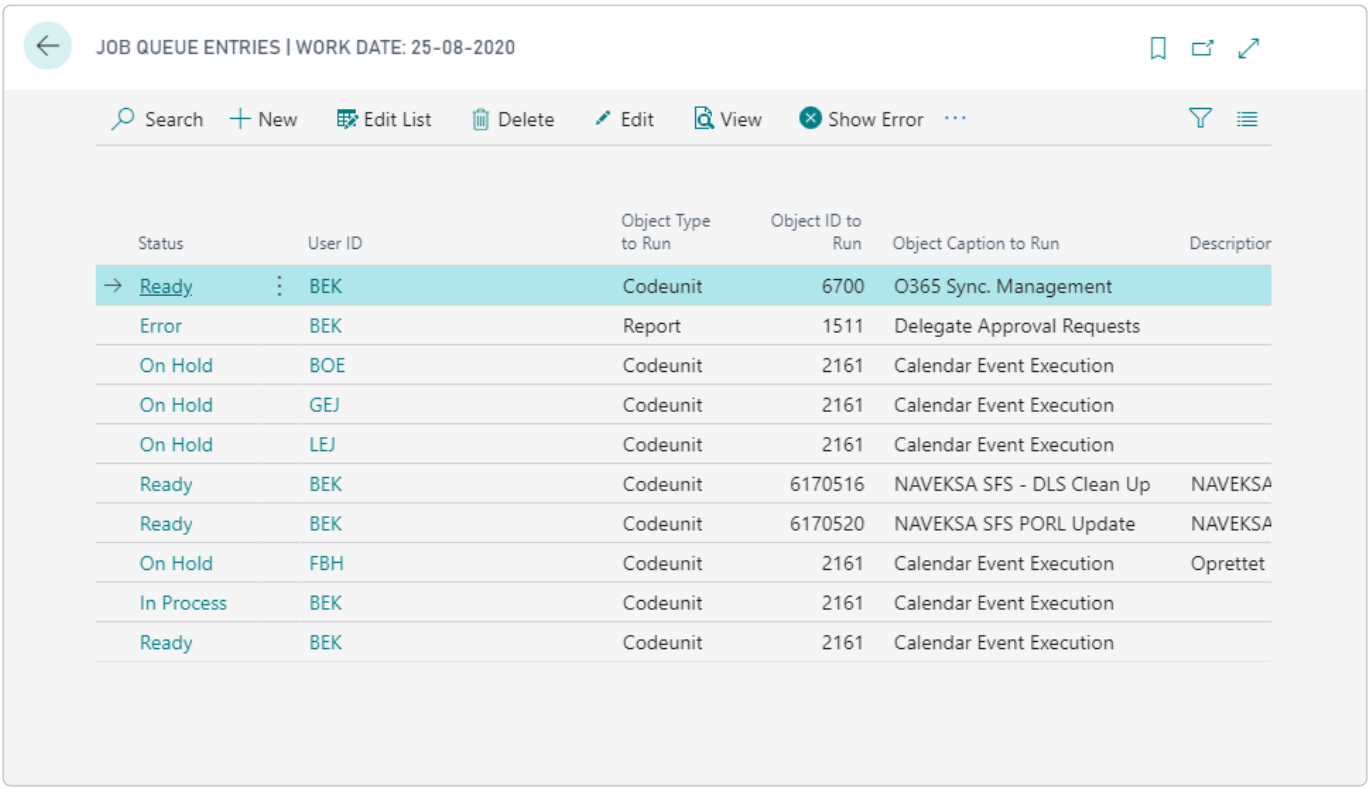


Operating procedures for 365 Business Central:

Search for the term “job q” using the search function.



Make sure that the job “NAVEKSA SFS – DLS clean up” is running.
Make sure the job “NAVEKSA SFS – PORL update” is running.



Status	User ID	Object Type to Run	Object ID to Run	Object Caption to Run	Description
Ready	BEK	Codeunit	6700	O365 Sync. Management	
Error	BEK	Report	1511	Delegate Approval Requests	
On Hold	BOE	Codeunit	2161	Calendar Event Execution	
On Hold	GEJ	Codeunit	2161	Calendar Event Execution	
On Hold	LEJ	Codeunit	2161	Calendar Event Execution	
Ready	BEK	Codeunit	6170516	NAVEKSA SFS - DLS Clean Up	NAVEKSA
Ready	BEK	Codeunit	6170520	NAVEKSA SFS PORL Update	NAVEKSA
On Hold	FBH	Codeunit	2161	Calendar Event Execution	Oprettet
In Process	BEK	Codeunit	2161	Calendar Event Execution	
Ready	BEK	Codeunit	2161	Calendar Event Execution	

Every time the clean up job runs, a log file record is generated. This file must be cleaned manually at regular intervals.