Prelude 7 ERP

Introductory Exercise: The Trucks Case

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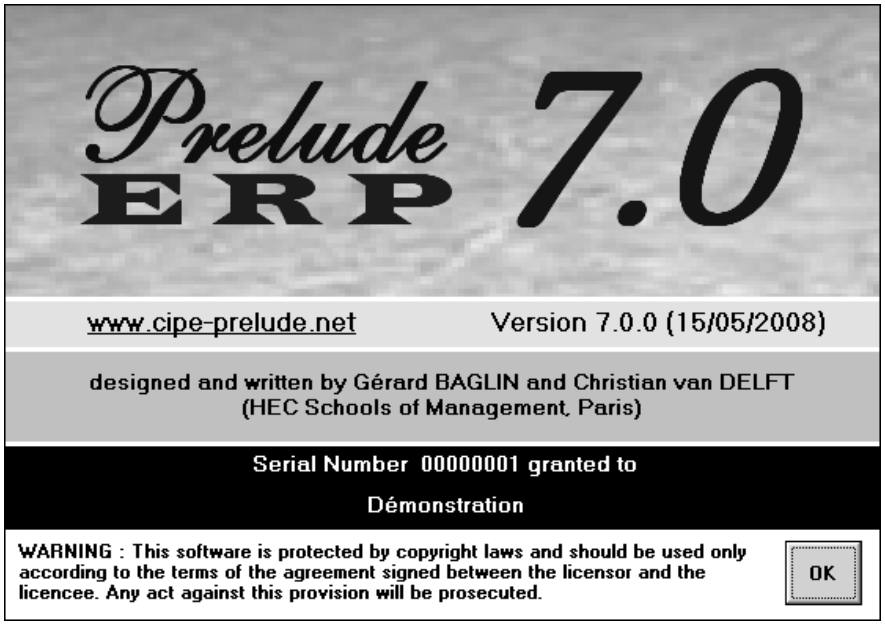


Objective of this exercise

This exercise presents the main functions of **Prelude 7 ERP**, in a very simple and global perspective.

The technical data (items, bills of materials, work centers, routings, etc.) have already been entered in the folders and therefore additional data entry is kept to a minimum.

Assumptions and notations

Entering data

During the whole length of the exercise, the data will be examined in the different windows of **Prelude 7 ERP**. When certain information is not specified in the text, it means that the default values proposed by **Prelude 7 ERP** must be used.

Notations

The following conventions are used:

1. **Command Names**. The command names are printed in bold type, for example “You can reach the table maintenance window from the **Technical Data** menu, **Table Maintenance** option”.

2. **BUTTON NAMES**. The button names appear in small capitals, for example “Click on the **OK** button”.

3. *Data to enter*. The words or characters to enter appear in italics. For example “Enter *10 10 2006*”[1].

[1] Date format depends on windows settings. Dates are entered without any delimiter.

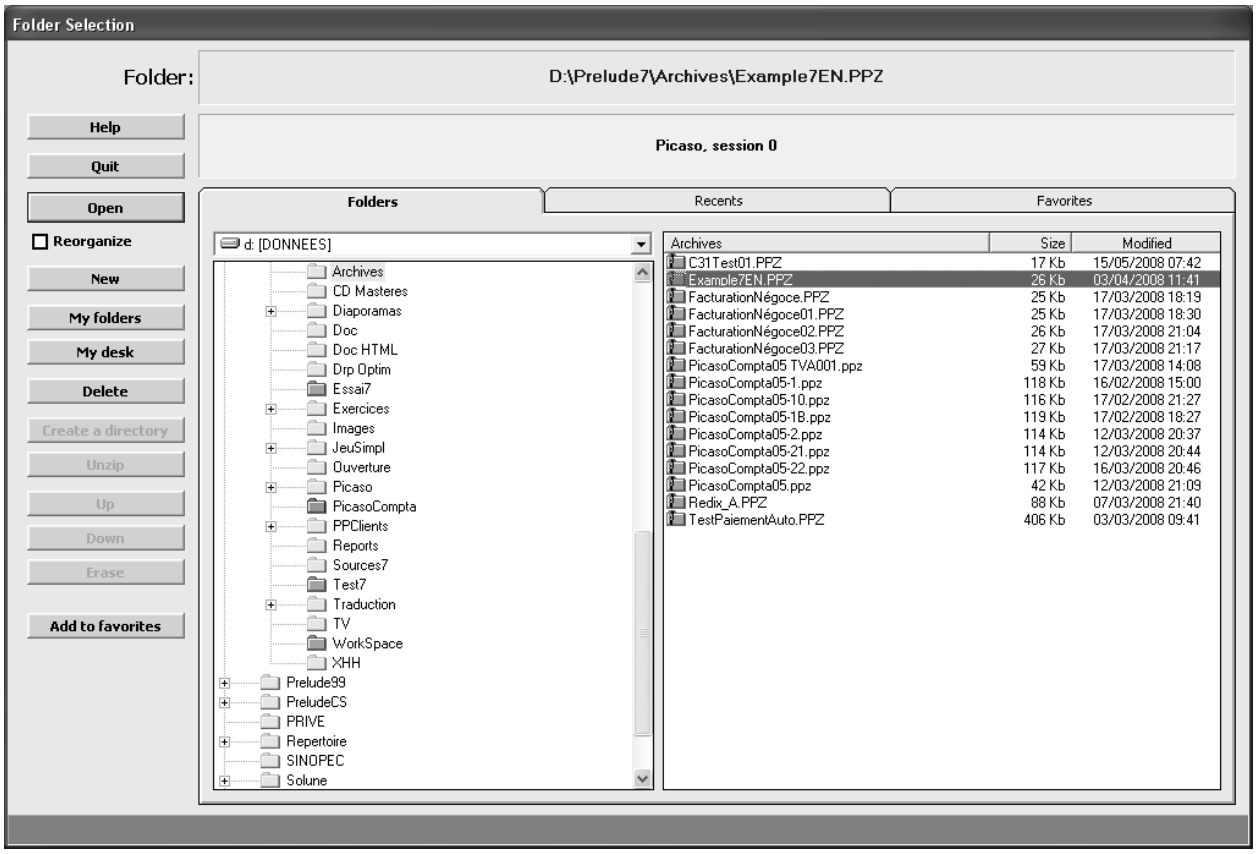
Getting started with Prelude 7 ERP

To run the program, click on the **Prelude 7 ERP** icon.

Click on the **OK** button in the introductory window.

The file selection window lets you select the folder you will work on.

Select the *Example.ppz* archive file:



Confirm with the **Open** button. Now you can access all the functions of **Prelude 7 ERP**.

Note that in the demonstration version of the software you are restricted to the *Example* folder.

The production management problem under study

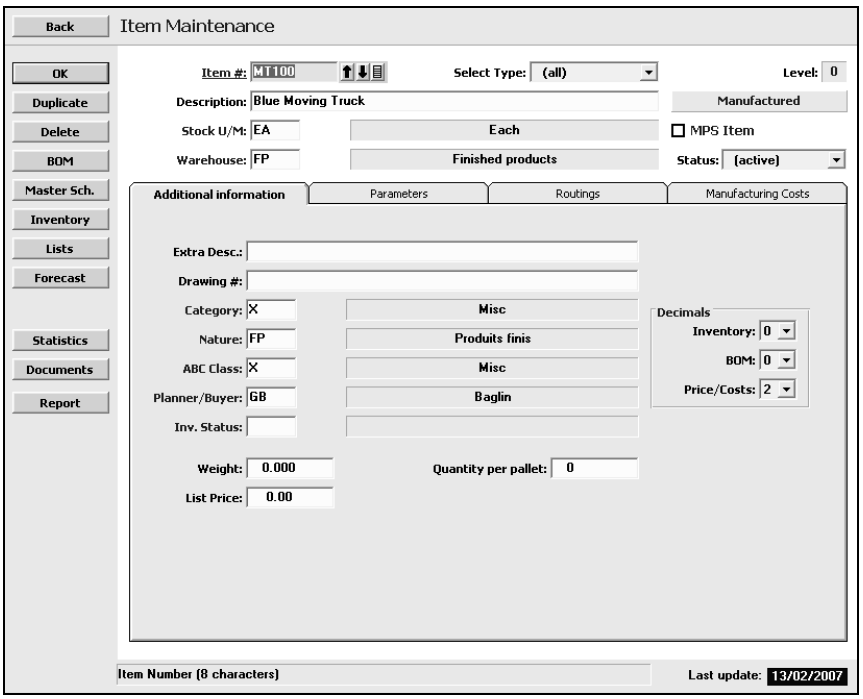
The **Trucks Inc.** factory is organized as a production-to-stock system and manufactures toys and more particularly flatbed truck, removal truck and tank truck miniatures. The challenge here is to plan and organize the production over 2006.

The Items

Trucks Inc. produces finished products, but the manufacturing process needs subassemblies and parts end raw materials and components supplied by other factories.

The Item Maintenance Windows

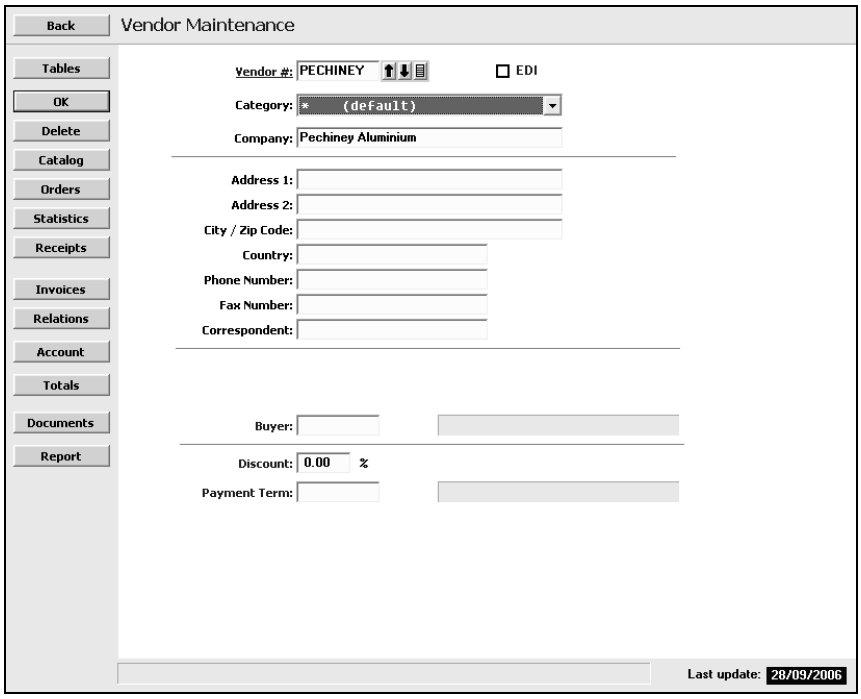
Access the Item Maintenance windows via the **Items** function (**Technical Data** menu). As an example consider item *MT100*. The following window is displayed on your screen:



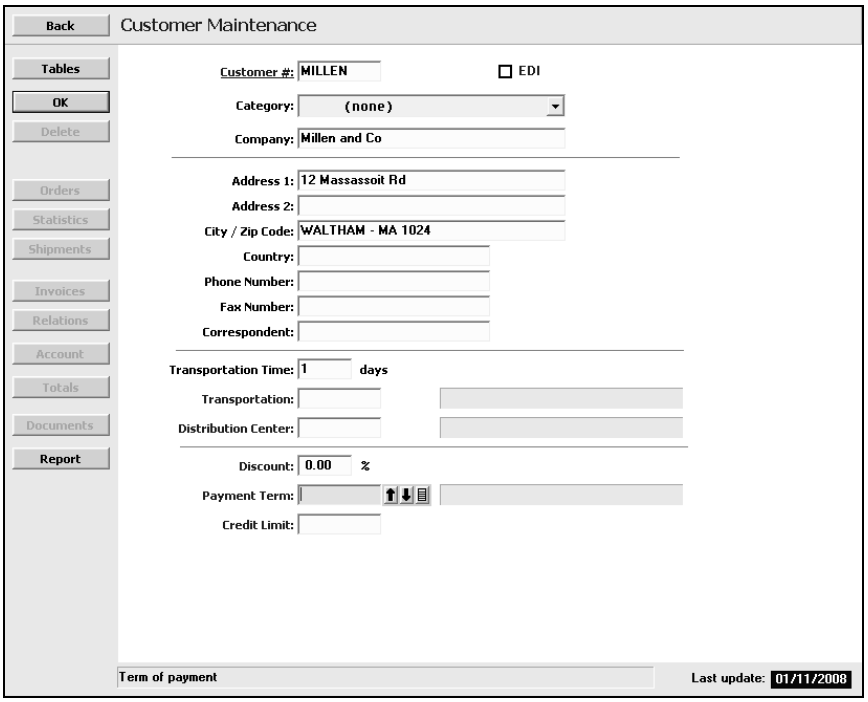
You can access the list of the items that have been entered, by clicking on the buttons on the right of the Item # field. You can also access the items by clicking on an item code on the **List** tab of the left panel.

Commercial information for the Items

You access information about the suppliers of the purchased items by using the **Vendor maintenance** function (**Purchasing** menu). The following window is displayed on your screen



You access information about the customers by using the **Customer maintenance** function (**Sales** menu). The following window is displayed on your screen

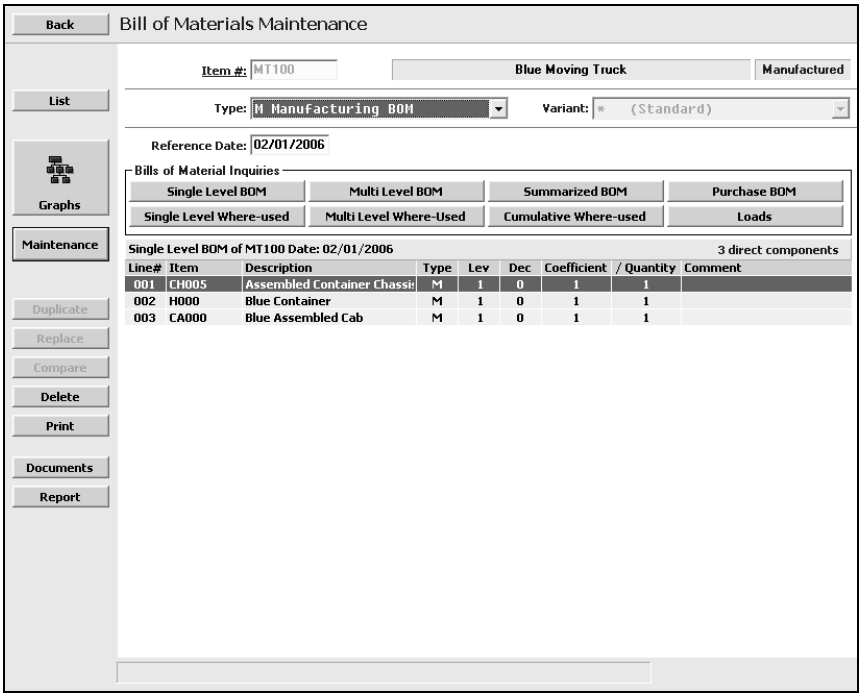


Bills of Materials

In **Prelude 7 ERP**, the bills of materials can be accessed via the **Bills of materials** function (**Technical Data** menu). In order to access a structure record, you have to carry out the following steps:

Select the item *MT100* by entering its code the **Item #** field in the BOM sheet.

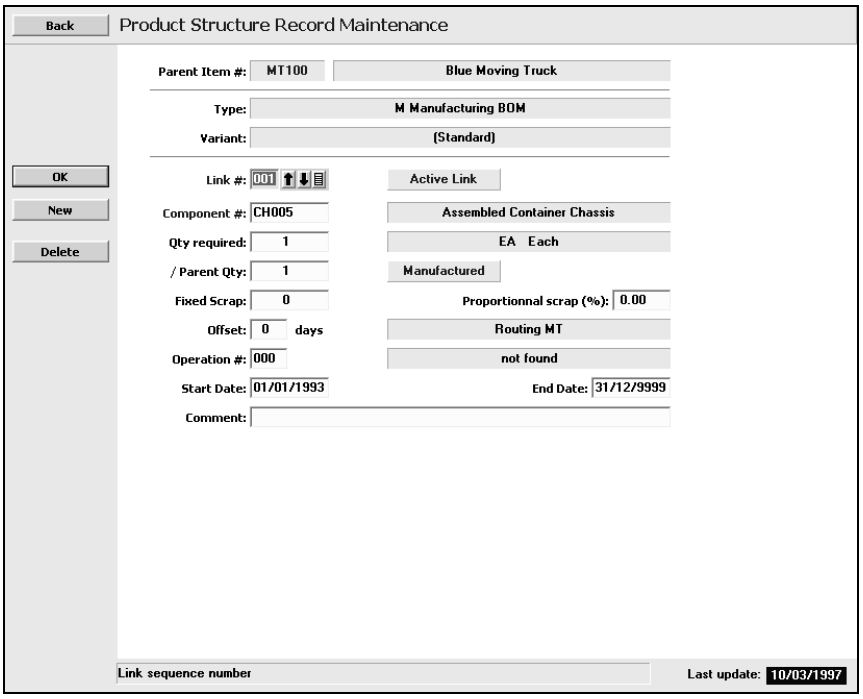
For item *MT100*, the following windows are displayed on your screen:



In order to examine the different item manufacturing BOMs available for item *MT100*, display the following options (by clicking once on the relevant button):
- Single level BOM,
- Multi Level BOM,
- Summarized BOM,
- Purchase BOM,
- Single Level Where-Used,
- Multi Level Where-Used.

Click on the **Maintenance** button to open the **Product Structure Record Maintenance** window.

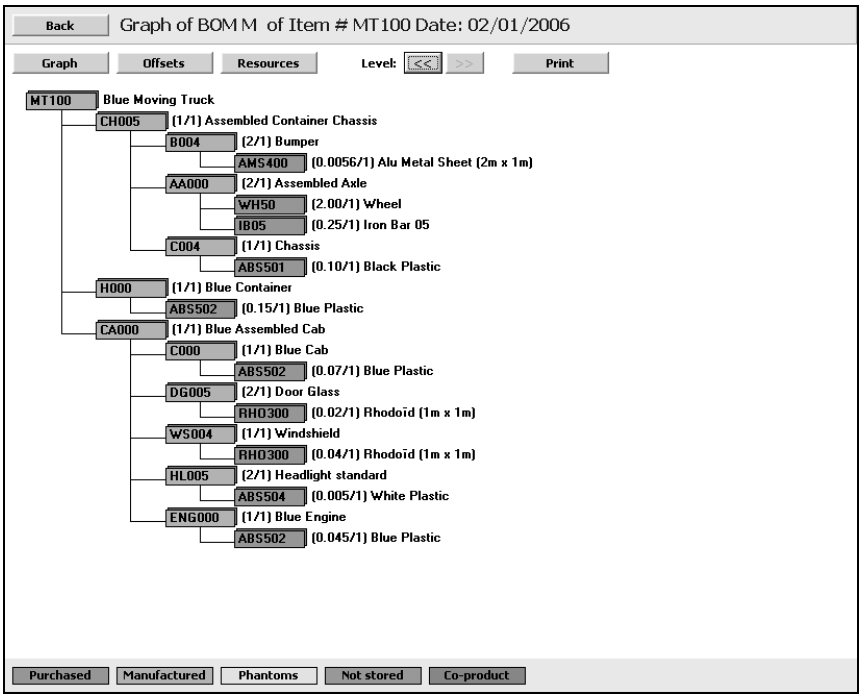
Enter the sequence (link) number.



Return to the previous window by clicking on the **BACK** button.

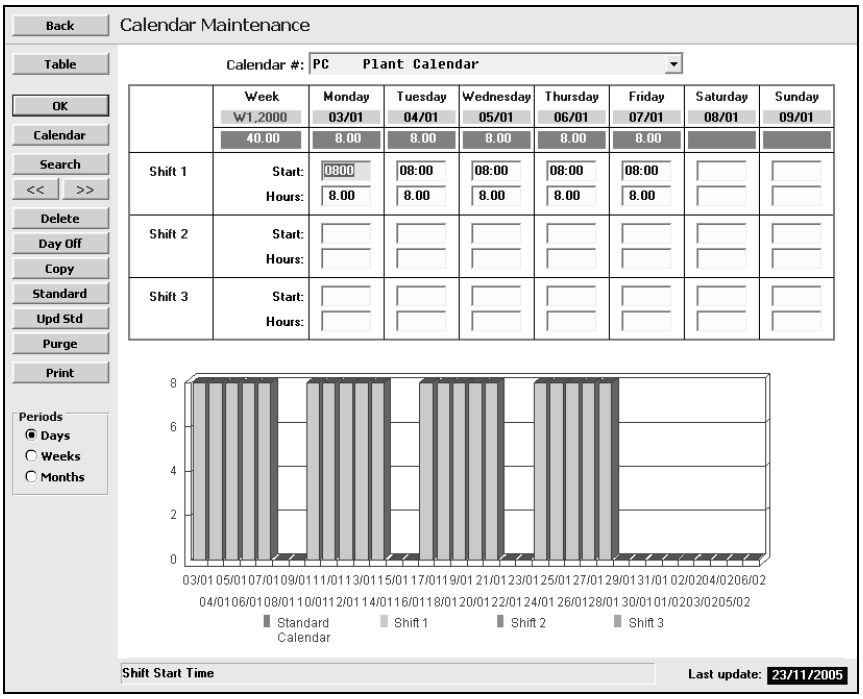
On the BOM window, click on the **GRAPHS** button.

Graphs of BOMs are also available via the **BOM GRAPH, OFFSETS GRAPH** and **Resources Graph** buttons. For item *MT100*, the corresponding windows are as follows:



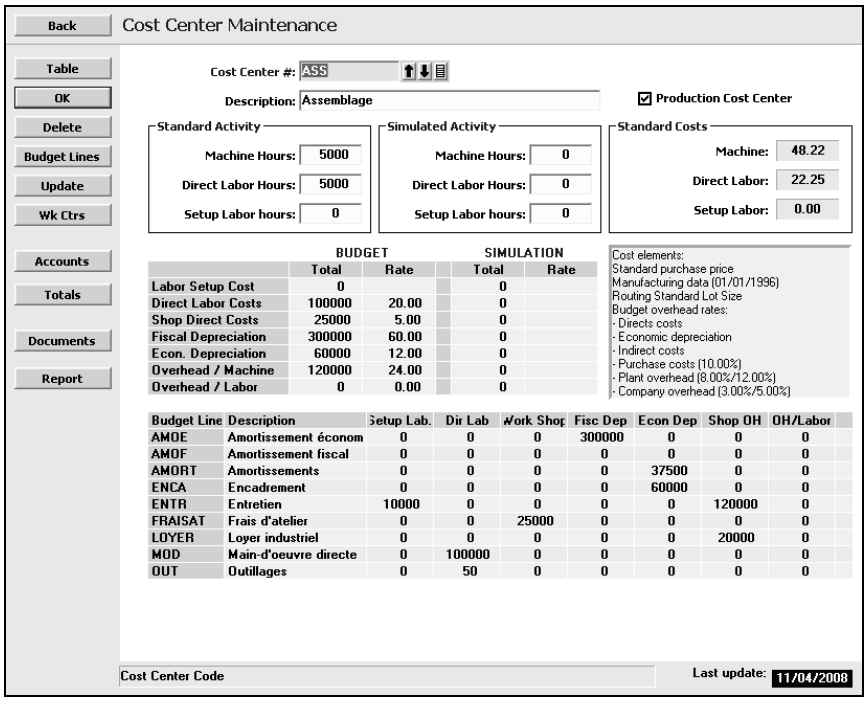
Plant Calendar

Use the **Calendars** function (**Planning** menu) to show the calendar considered for this exercise:



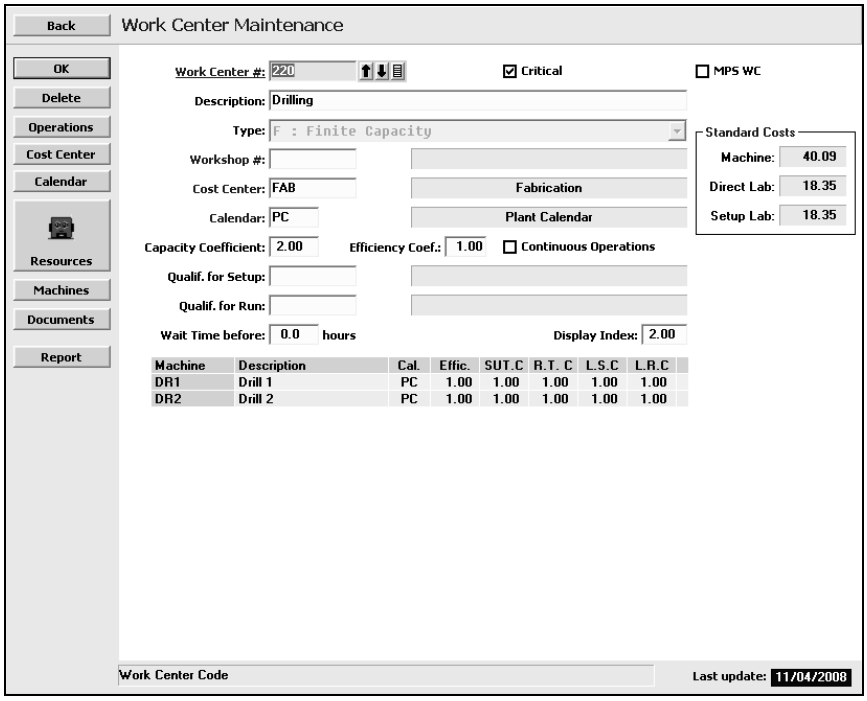
Cost Centers

A department consists of work centers, grouped together for accounting purposes. Each department has specific hourly rates. As an example, access the following **Cost Center Maintenance** window, via the **Cost Center Maintenance** function (**Costing** menu):

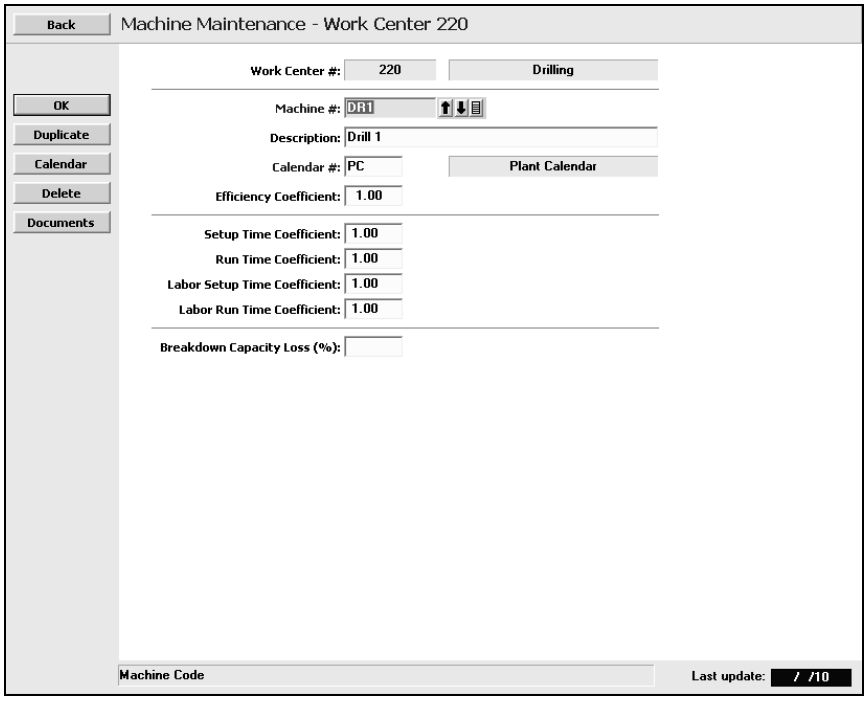


Work centers and machines

The work centers in the **Trucks Inc.** factory can be viewed via the **Work Centers** function (**Technical Data** menu). The corresponding description windows are as follows:

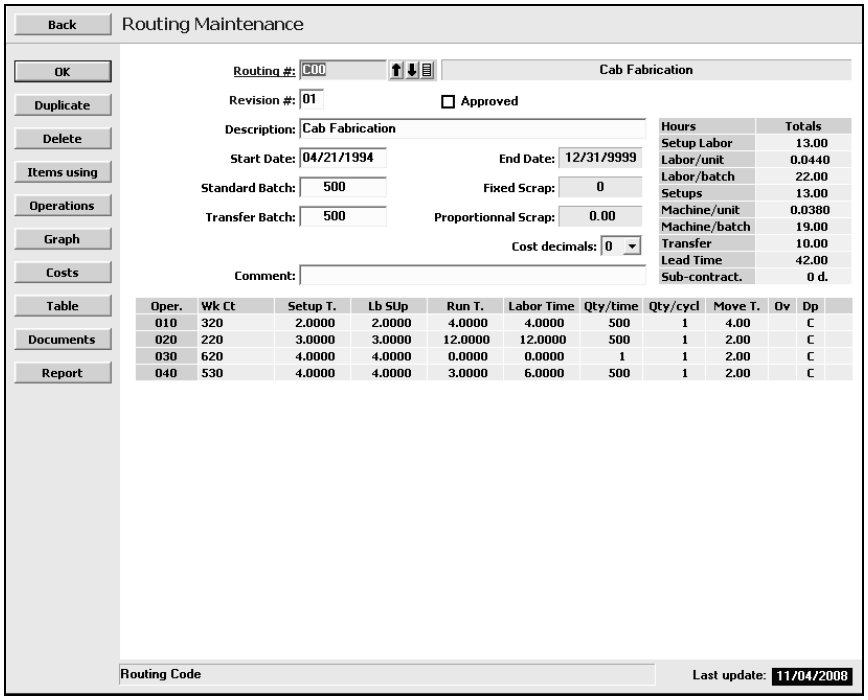


By clicking on the **MACHINES** button, you access the following **Machine Maintenance** window:

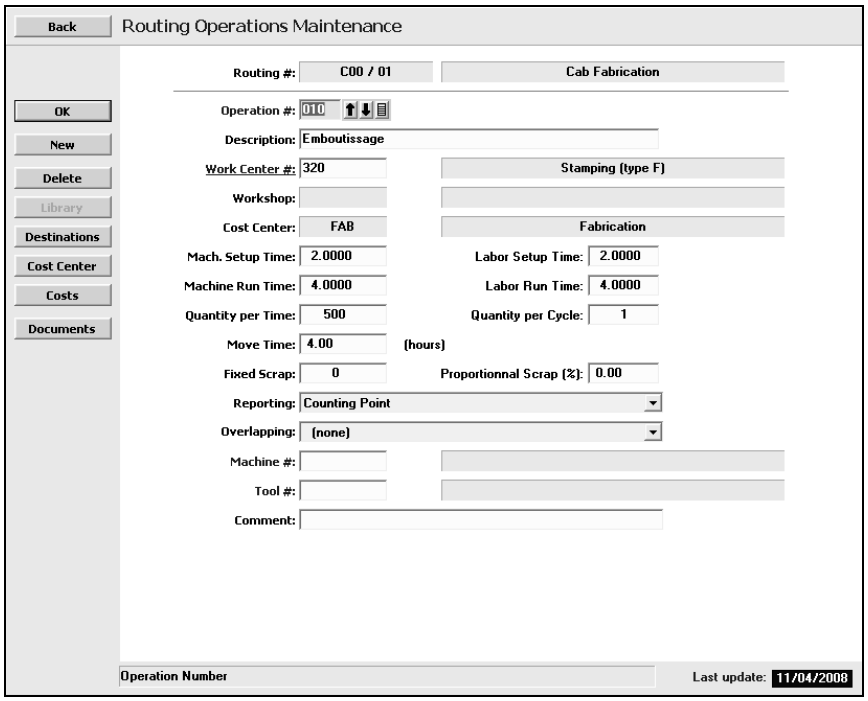


Work centers and routings

Now, as the production resources are known, the operation times and the routings can be defined. These data are to be found in the **Routing Maintenance** window (accessed via the **Data** menu, **Routings** function),

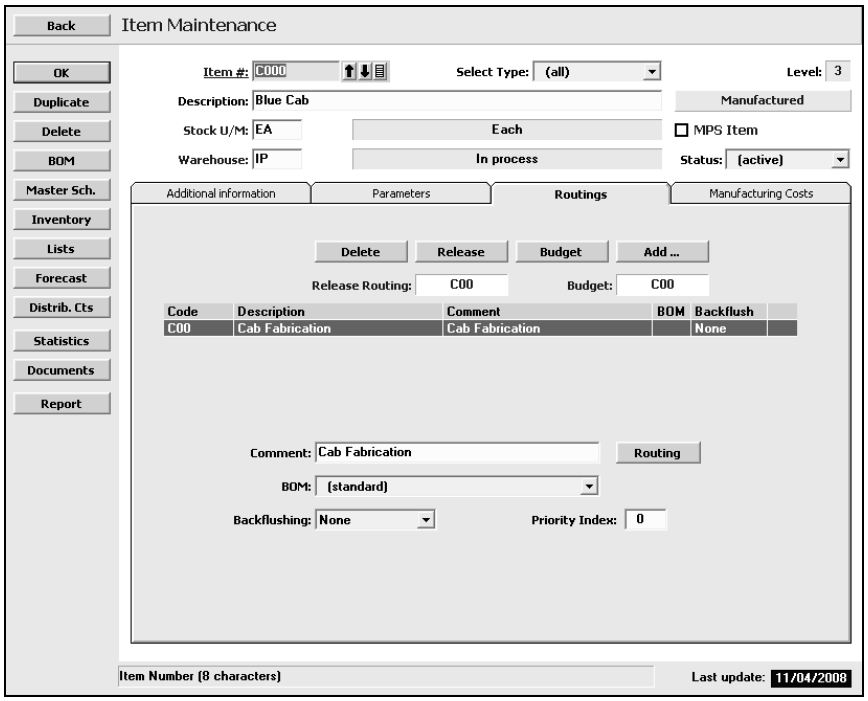


By clicking on the **OPERATIONS** button you get more details, as shown below:



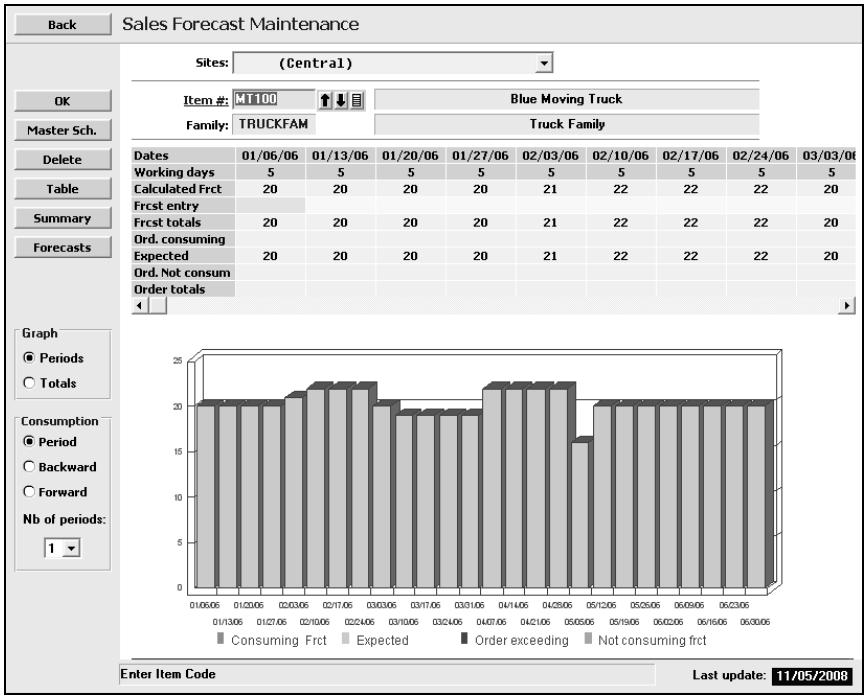
Items and routings

For each item, the routings to use are defined in the **Routings** panel in the **Item Maintenance** window (accessed by the **Items** function, **Technical Data** menu), as shown below:



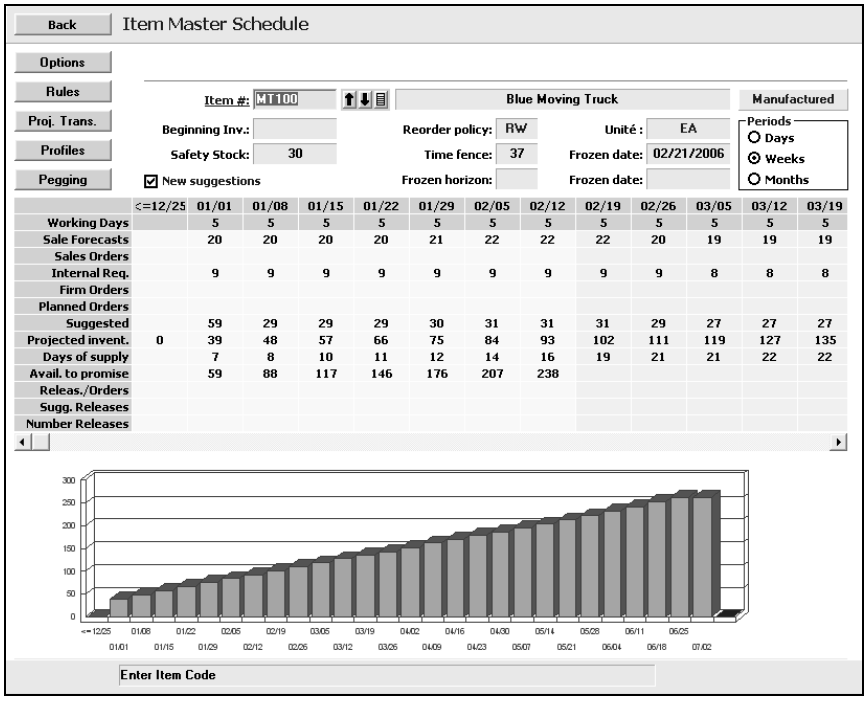
Detailed forecasts and backlog of orders

As **Trucks Inc.** is organized as a production-to-stock system, the master schedule is computed on the basis of sales forecasts (and not on the basis of firm orders). These forecasts can be found using the **Sales Forecast Maintenance** and **Sales Forecast Table** functions (**Sales** menu):



Dates	01/06/06	01/13/06	01/20/06	01/27/06	02/03/06	02/10/06	02/17/06	02/24/06	03/03/06
Working days	5	5	5	5	5	5	5	5	5
Calculated Frct	20	20	20	20	21	22	22	22	20
Frcst entry									
Frcst totals	20	20	20	20	21	22	22	22	20
Ord. consuming									
Expected	20	20	20	20	21	22	22	22	20
Ord. Not consum									
Order totals									

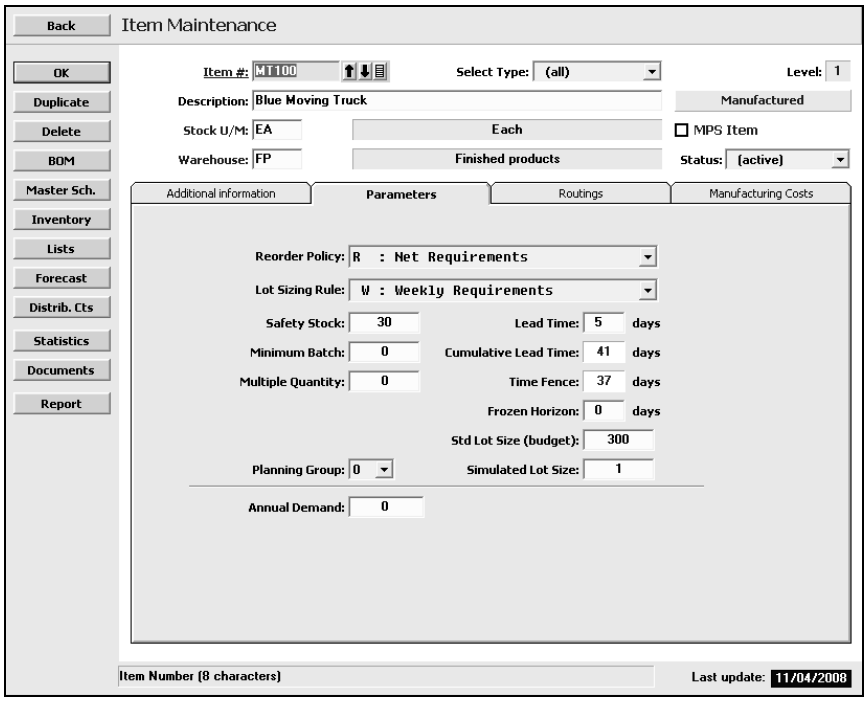
By clicking on the **Master Schedules** function (**Planning** menu), you access the following **Master Schedule** windows, which include the forecast values:



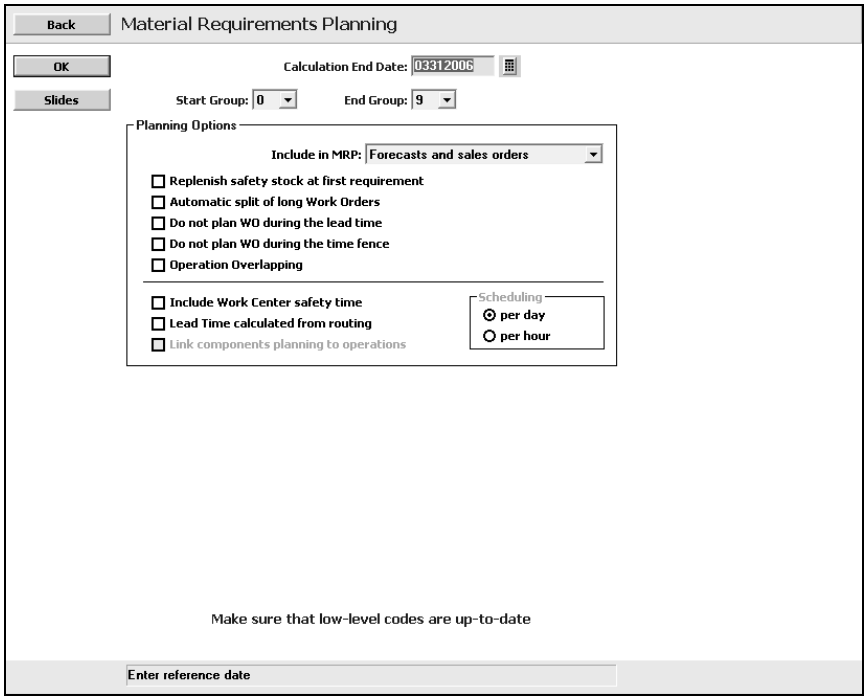
	<=12/25	01/01	01/08	01/15	01/22	01/29	02/05	02/12	02/19	02/26	03/05	03/12	03/19
Working Days		5	5	5	5	5	5	5	5	5	5	5	5
Sale Forecasts		20	20	20	20	21	22	22	22	20	19	19	19
Sales Orders													
Internal Req.		9	9	9	9	9	9	9	9	9	8	8	8
Firm Orders													
Planned Orders													
Suggested		59	29	29	29	30	31	31	31	29	27	27	27
Projected invent.	0	39	48	57	66	75	84	93	102	111	119	127	135
Days of supply		7	8	10	11	12	14	16	19	21	21	22	22
Avail. to promise		59	88	117	146	176	207	238					
Releas./Orders													
Sugg. Releases													
Number Releases													

Material Requirements Planning

Our initial assumption is that each item has specific parameters (as for example *net requirements* as reorder policy and *Daily requirements* as lot sizing rule for *MT100*), which can be checked via the **Items** function (**Technical Data** menu), by choosing the **Parameters** panel:

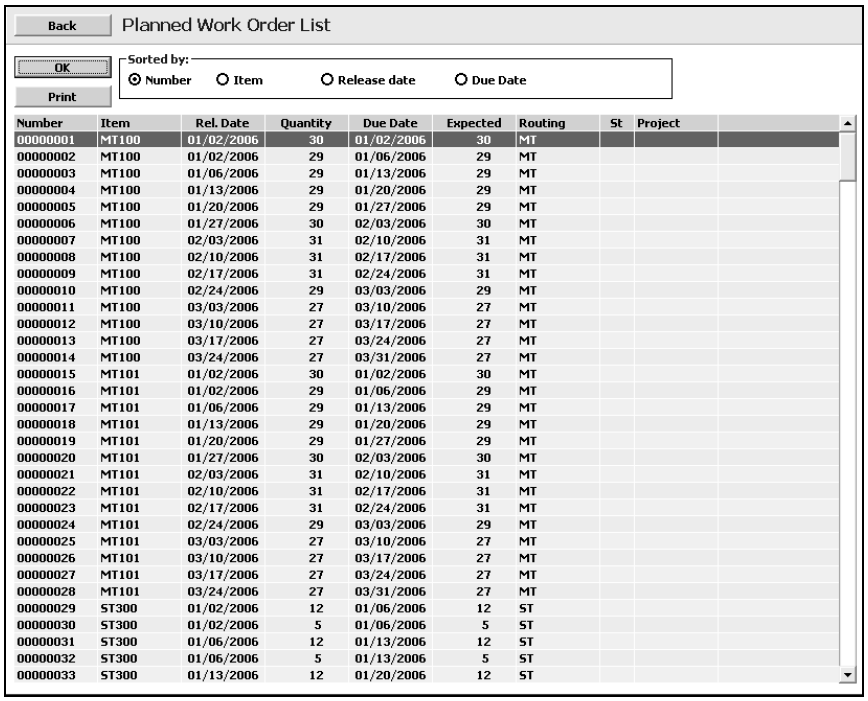


The MRP procedure can be started by clicking on the **Material Requirements Planning** function (**Planning** menu), typing the final date of the planning horizon (i.e.: *06302006*) and clicking on the **OK** button. The window shown below is displayed on your screen:



Then click on the **OK** button. The MRP procedure computes the planned work orders and the planned requisition orders for the problem.

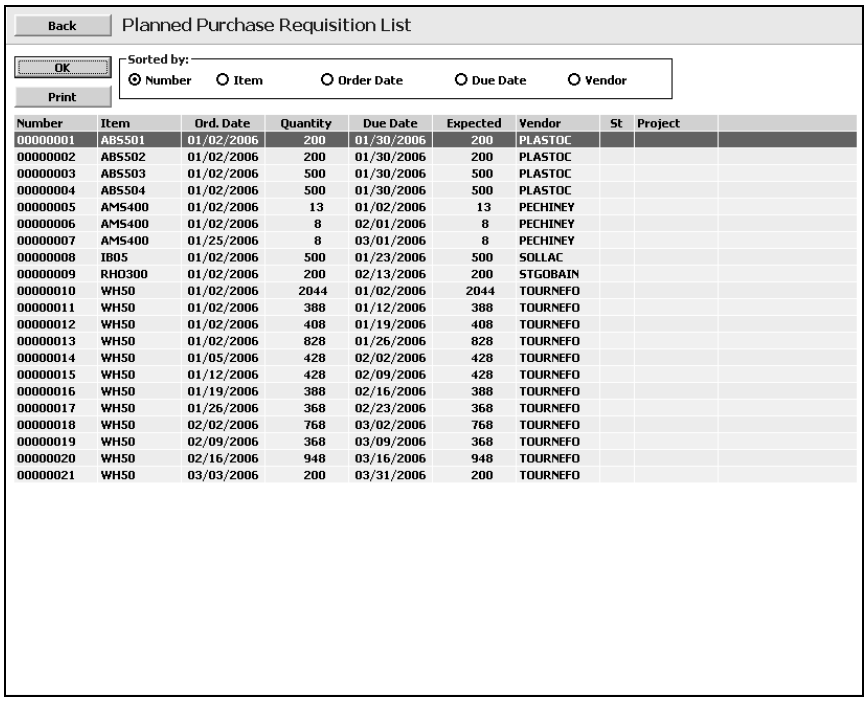
These orders are accessed by clicking on the **Planned Work Order List** function and on the **Planned Requisition Order List** function (**Planning** menu):



Back | Planned Work Order List

OK | Print | Sorted by: (•) Number ( ) Item ( ) Release date ( ) Due Date

Number	Item	Rel. Date	Quantity	Due Date	Expected	Routing	St	Project
00000001	MT100	01/02/2006	30	01/02/2006	30	MT		
00000002	MT100	01/02/2006	29	01/06/2006	29	MT		
00000003	MT100	01/06/2006	29	01/13/2006	29	MT		
00000004	MT100	01/13/2006	29	01/20/2006	29	MT		
00000005	MT100	01/20/2006	29	01/27/2006	29	MT		
00000006	MT100	01/27/2006	30	02/03/2006	30	MT		
00000007	MT100	02/03/2006	31	02/10/2006	31	MT		
00000008	MT100	02/10/2006	31	02/17/2006	31	MT		
00000009	MT100	02/17/2006	31	02/24/2006	31	MT		
00000010	MT100	02/24/2006	29	03/03/2006	29	MT		
00000011	MT100	03/03/2006	27	03/10/2006	27	MT		
00000012	MT100	03/10/2006	27	03/17/2006	27	MT		
00000013	MT100	03/17/2006	27	03/24/2006	27	MT		
00000014	MT100	03/24/2006	27	03/31/2006	27	MT		
00000015	MT101	01/02/2006	30	01/02/2006	30	MT		
00000016	MT101	01/02/2006	29	01/06/2006	29	MT		
00000017	MT101	01/06/2006	29	01/13/2006	29	MT		
00000018	MT101	01/13/2006	29	01/20/2006	29	MT		
00000019	MT101	01/20/2006	29	01/27/2006	29	MT		
00000020	MT101	01/27/2006	30	02/03/2006	30	MT		
00000021	MT101	02/03/2006	31	02/10/2006	31	MT		
00000022	MT101	02/10/2006	31	02/17/2006	31	MT		
00000023	MT101	02/17/2006	31	02/24/2006	31	MT		
00000024	MT101	02/24/2006	29	03/03/2006	29	MT		
00000025	MT101	03/03/2006	27	03/10/2006	27	MT		
00000026	MT101	03/10/2006	27	03/17/2006	27	MT		
00000027	MT101	03/17/2006	27	03/24/2006	27	MT		
00000028	MT101	03/24/2006	27	03/31/2006	27	MT		
00000029	ST300	01/02/2006	12	01/06/2006	12	ST		
00000030	ST300	01/02/2006	5	01/06/2006	5	ST		
00000031	ST300	01/06/2006	12	01/13/2006	12	ST		
00000032	ST300	01/06/2006	5	01/13/2006	5	ST		
00000033	ST300	01/13/2006	12	01/20/2006	12	ST		

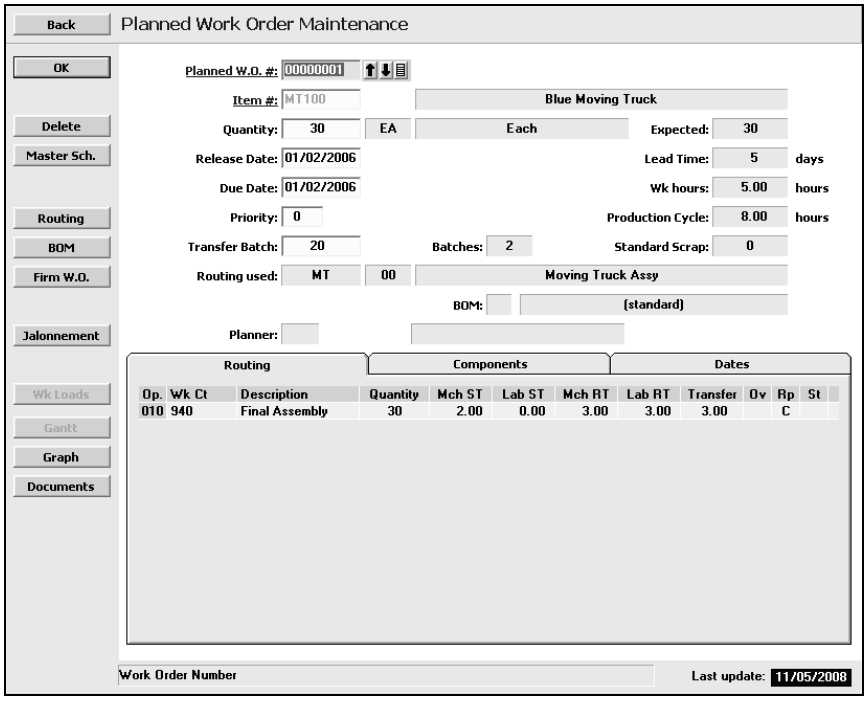


Back | Planned Purchase Requisition List

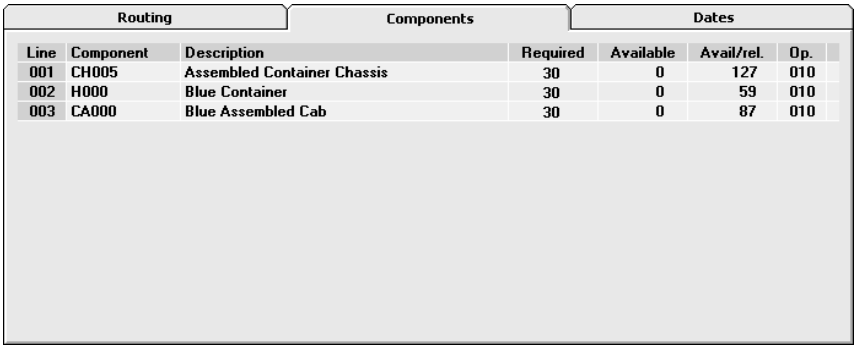
OK | Print | Sorted by: (•) Number ( ) Item ( ) Order Date ( ) Due Date ( ) Vendor

Number	Item	Ord. Date	Quantity	Due Date	Expected	Vendor	St	Project
00000001	ABS501	01/02/2006	200	01/30/2006	200	PLASTOC		
00000002	ABS502	01/02/2006	200	01/30/2006	200	PLASTOC		
00000003	ABS503	01/02/2006	500	01/30/2006	500	PLASTOC		
00000004	ABS504	01/02/2006	500	01/30/2006	500	PLASTOC		
00000005	AMS400	01/02/2006	13	01/02/2006	13	PECHINEY		
00000006	AMS400	01/02/2006	8	02/01/2006	8	PECHINEY		
00000007	AMS400	01/25/2006	8	03/01/2006	8	PECHINEY		
00000008	IB05	01/02/2006	500	01/23/2006	500	SOLLAC		
00000009	RHO300	01/02/2006	200	02/13/2006	200	STGOBAIN		
00000010	WH50	01/02/2006	2044	01/02/2006	2044	TOURNEFO		
00000011	WH50	01/02/2006	388	01/12/2006	388	TOURNEFO		
00000012	WH50	01/02/2006	408	01/19/2006	408	TOURNEFO		
00000013	WH50	01/02/2006	828	01/26/2006	828	TOURNEFO		
00000014	WH50	01/05/2006	428	02/02/2006	428	TOURNEFO		
00000015	WH50	01/12/2006	428	02/09/2006	428	TOURNEFO		
00000016	WH50	01/19/2006	388	02/16/2006	388	TOURNEFO		
00000017	WH50	01/26/2006	368	02/23/2006	368	TOURNEFO		
00000018	WH50	02/02/2006	768	03/02/2006	768	TOURNEFO		
00000019	WH50	02/09/2006	368	03/09/2006	368	TOURNEFO		
00000020	WH50	02/16/2006	948	03/16/2006	948	TOURNEFO		
00000021	WH50	03/03/2006	200	03/31/2006	200	TOURNEFO		

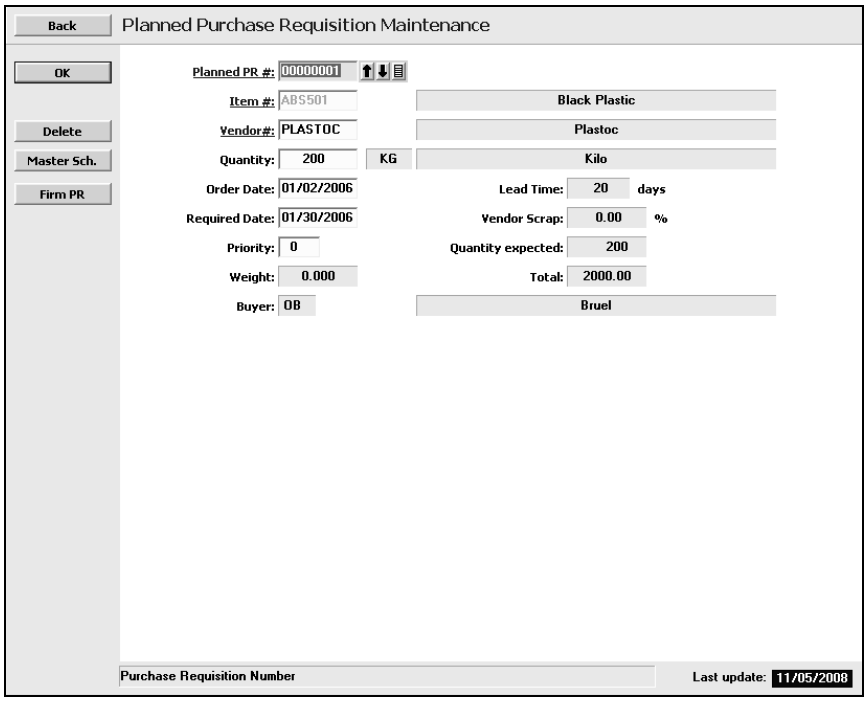
As an example, let's consider the first Planned Work Order (via the **Planned Work Orders** function, **Planning** menu):



Via the selection of the **Components** tab, you get:



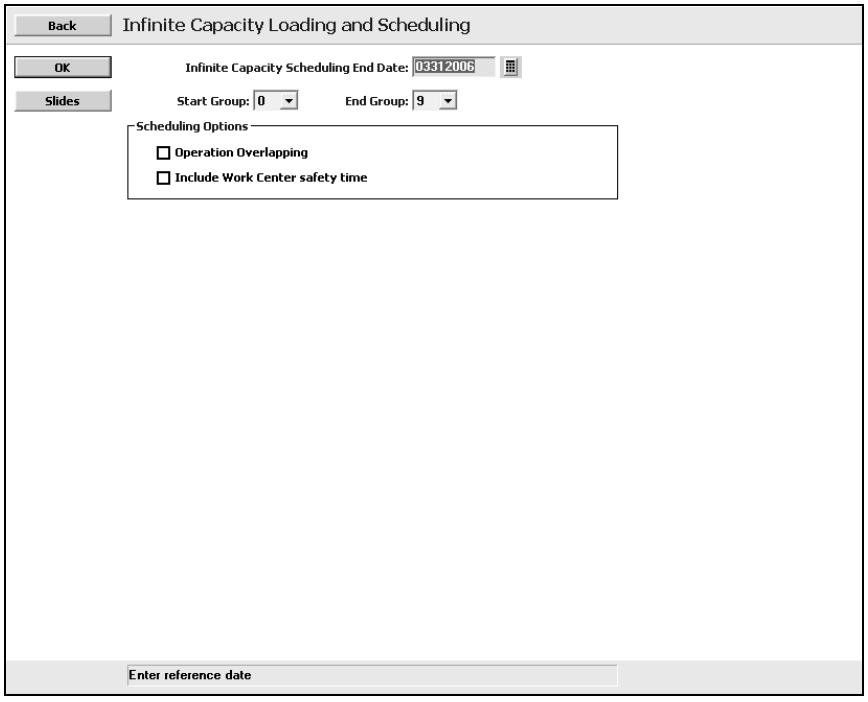
As a second example, let's consider the following Planned Purchase Requisition (via the **Planned Purchase Requisition Maintenances** function, **Planning** menu):



Infinite Capacity Scheduling and Capacity Requirements Planning

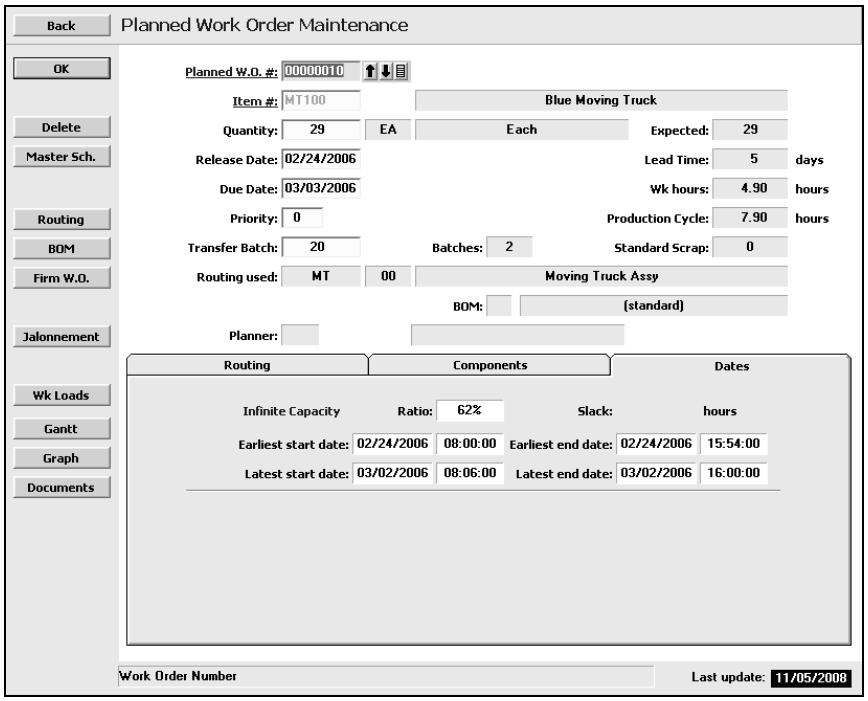
The workloads associated with the production orders can be computed by the function **Infinite Capacity Scheduling** (**Planning** menu). This analysis enables you to quickly check from a global point of view that no significant imbalances between workloads and capacities will affect the scheduling process.

Type the final date of the planning horizon (i.e.: *06/30/2006*). The window shown below is displayed on your screen:

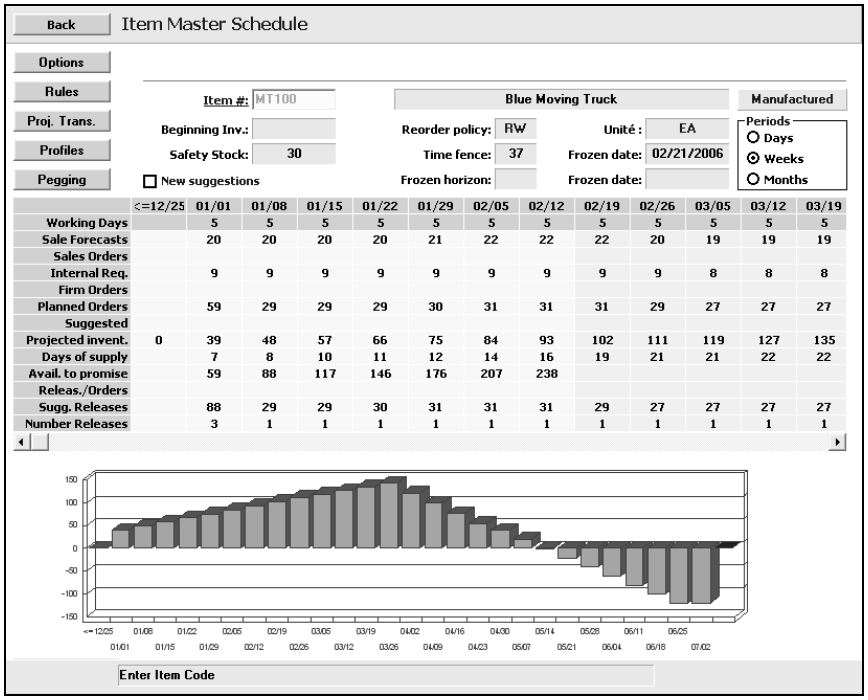


Then click on the **OK** button.

As a first example, let's consider the information in Planned Work Order # 00000001(via the **Planned Work Orders** function, **Planning** menu). Via the selection of the **Dates** tab, the window below is displayed on your screen,

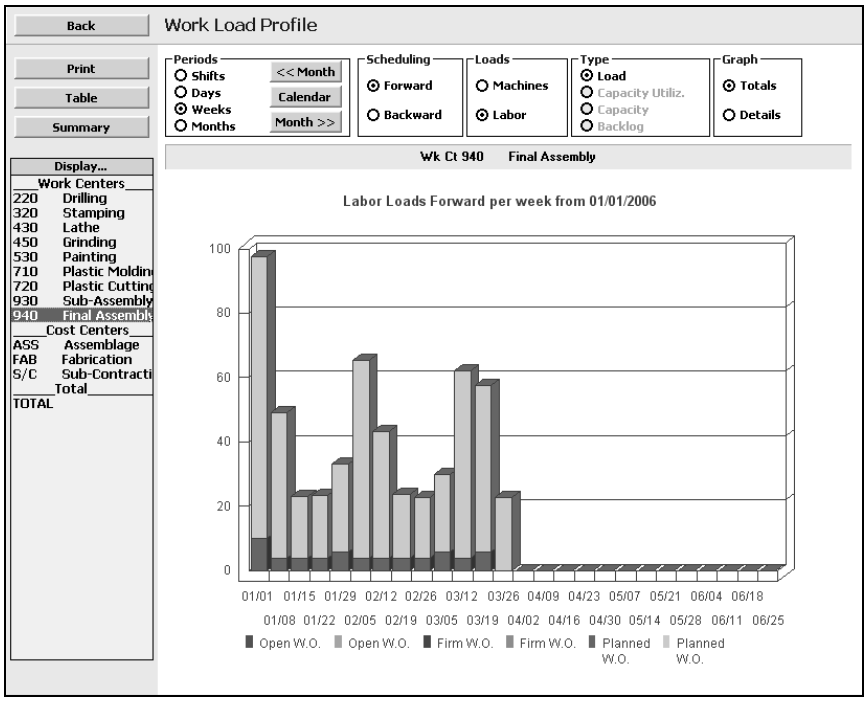


Click then on the **MASTER SCHED.** button. The following window is displayed on your screen:

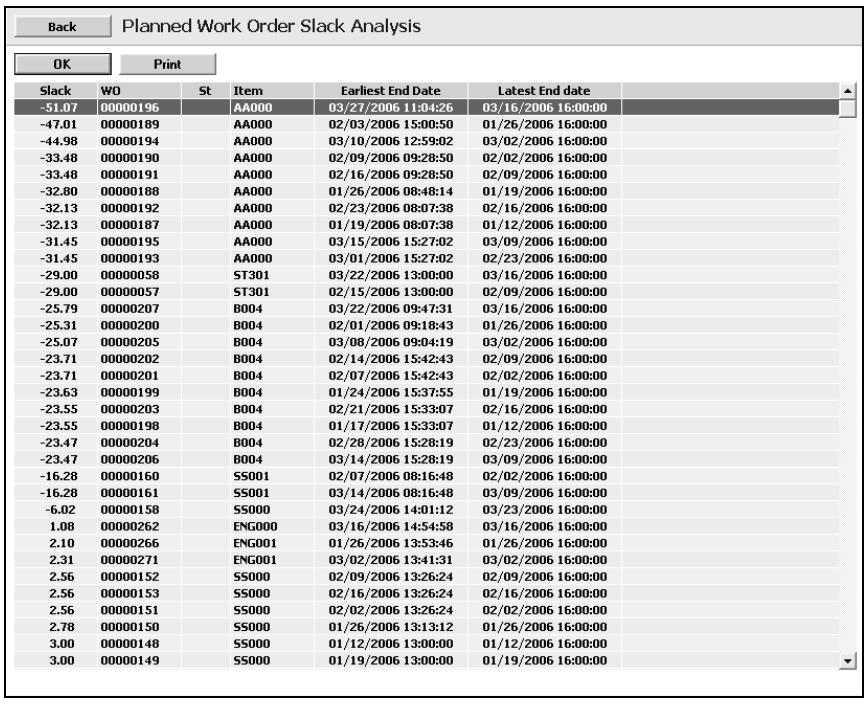


	<=12/25	01/01	01/08	01/15	01/22	01/29	02/05	02/12	02/19	02/26	03/05	03/12	03/19
Working Days		5	5	5	5	5	5	5	5	5	5	5	5
Sale Forecasts		20	20	20	20	21	22	22	22	20	19	19	19
Sales Orders													
Internal Req.		9	9	9	9	9	9	9	9	9	8	8	8
Firm Orders													
Planned Orders		59	29	29	29	30	31	31	31	29	27	27	27
Suggested													
Projected invent.	0	39	48	57	66	75	84	93	102	111	119	127	135
Days of supply		7	8	10	11	12	14	16	19	21	21	22	22
Avail. to promise		59	88	117	146	176	207	238					
Releas./Orders													
Sugg. Releases		88	29	29	30	31	31	31	29	27	27	27	27
Number Releases		3	1	1	1	1	1	1	1	1	1	1	1

Use the **Periods** and **Type** commands in the **Workload Profile** window (**Planning** menu) to show the associated workloads. The windows corresponding to the monthly, weekly and daily workloads, for the work center 940, are as follows:



Examine the slack for the planned work orders by using either the **Planned Work Order Slack** window or the **Planned Work Orders** window, **Dates** tab (**Planning** menu):



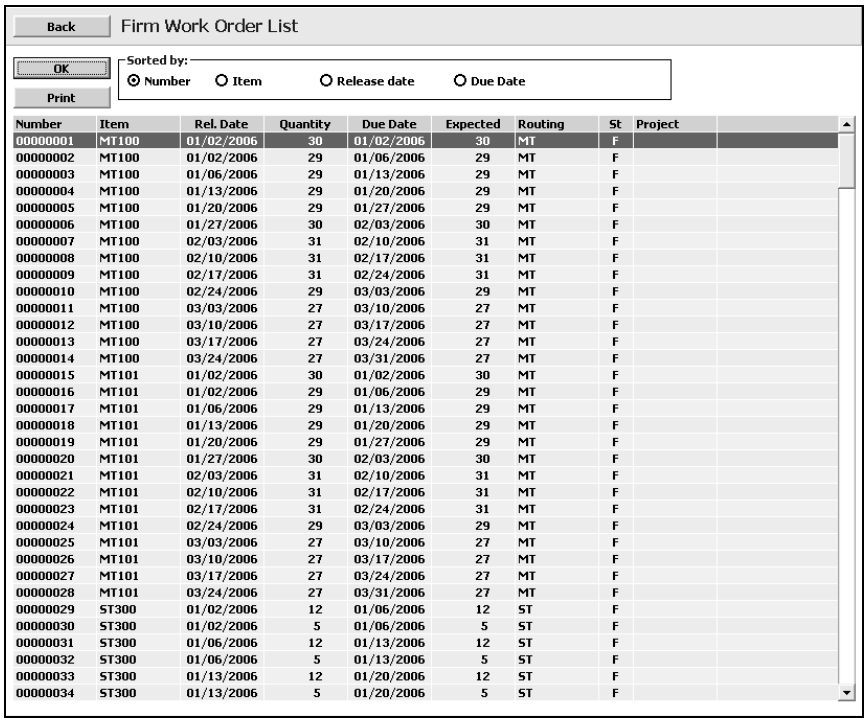
Slack	WO	St	Item	Earliest End Date	Latest End date
-51.07	00000196		AA000	03/27/2006 11:04:26	03/16/2006 16:00:00
-47.01	00000189		AA000	02/03/2006 15:00:50	01/26/2006 16:00:00
-44.98	00000194		AA000	03/10/2006 12:59:02	03/02/2006 16:00:00
-33.48	00000190		AA000	02/09/2006 09:28:50	02/02/2006 16:00:00
-33.48	00000191		AA000	02/16/2006 09:28:50	02/09/2006 16:00:00
-32.80	00000188		AA000	01/26/2006 08:48:14	01/19/2006 16:00:00
-32.13	00000192		AA000	02/23/2006 08:07:38	02/16/2006 16:00:00
-32.13	00000187		AA000	01/19/2006 08:07:38	01/12/2006 16:00:00
-31.45	00000195		AA000	03/15/2006 15:27:02	03/09/2006 16:00:00
-31.45	00000193		AA000	03/01/2006 15:27:02	02/23/2006 16:00:00
-29.00	00000058		ST301	03/22/2006 13:00:00	03/16/2006 16:00:00
-29.00	00000057		ST301	02/15/2006 13:00:00	02/09/2006 16:00:00
-25.79	00000207		B004	03/22/2006 09:47:31	03/16/2006 16:00:00
-25.31	00000200		B004	02/01/2006 09:18:43	01/26/2006 16:00:00
-25.07	00000205		B004	03/08/2006 09:04:19	03/02/2006 16:00:00
-23.71	00000202		B004	02/14/2006 15:42:43	02/09/2006 16:00:00
-23.71	00000201		B004	02/07/2006 15:42:43	02/02/2006 16:00:00
-23.63	00000199		B004	01/24/2006 15:37:55	01/19/2006 16:00:00
-23.55	00000203		B004	02/21/2006 15:33:07	02/16/2006 16:00:00
-23.55	00000198		B004	01/17/2006 15:33:07	01/12/2006 16:00:00
-23.47	00000204		B004	02/28/2006 15:28:19	02/23/2006 16:00:00
-23.47	00000206		B004	03/14/2006 15:28:19	03/09/2006 16:00:00
-16.28	00000160		SS001	02/07/2006 08:16:48	02/02/2006 16:00:00
-16.28	00000161		SS001	03/14/2006 08:16:48	03/09/2006 16:00:00
-6.02	00000158		SS000	03/24/2006 14:01:12	03/23/2006 16:00:00
1.08	00000262		ENG000	03/16/2006 14:54:58	03/16/2006 16:00:00
2.10	00000266		ENG001	01/26/2006 13:53:46	01/26/2006 16:00:00
2.31	00000271		ENG001	03/02/2006 13:41:31	03/02/2006 16:00:00
2.56	00000152		SS000	02/09/2006 13:26:24	02/09/2006 16:00:00
2.56	00000153		SS000	02/16/2006 13:26:24	02/16/2006 16:00:00
2.56	00000151		SS000	02/02/2006 13:26:24	02/02/2006 16:00:00
2.78	00000150		SS000	01/26/2006 13:13:12	01/26/2006 16:00:00
3.00	00000148		SS000	01/12/2006 13:00:00	01/12/2006 16:00:00
3.00	00000149		SS000	01/19/2006 13:00:00	01/19/2006 16:00:00

Planned to Firm Work Order and Purchase Requisition Conversion

Convert the orders planned up to *06/30/2006* by using the **Planned to Firm W.O. Conversion** option (in the **Planning** menu). The window shown below is displayed on your screen:

By using the **Planned to Firm R.O. Conversion** option (in the **Planning** menu), the window shown below is displayed on your screen:

Examine the firm work orders using the **Firm Work Order List** function (**Scheduling** menu):

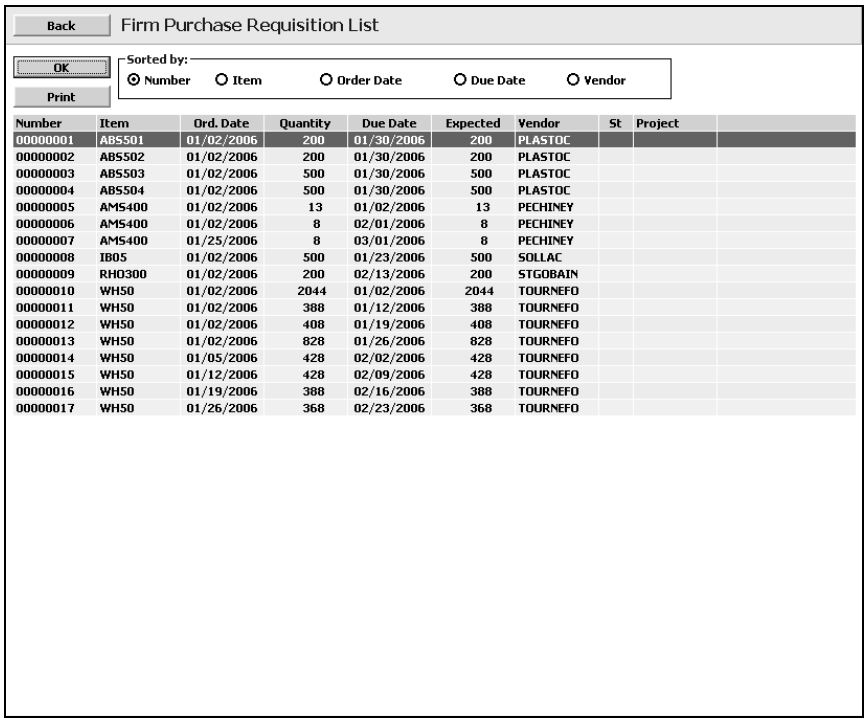


Back | Firm Work Order List

OK | Print | Sorted by: (•) Number ( ) Item ( ) Release date ( ) Due Date

Number	Item	Rel. Date	Quantity	Due Date	Expected	Routing	St	Project
00000001	MT100	01/02/2006	30	01/02/2006	30	MT	F	
00000002	MT100	01/02/2006	29	01/06/2006	29	MT	F	
00000003	MT100	01/06/2006	29	01/13/2006	29	MT	F	
00000004	MT100	01/13/2006	29	01/20/2006	29	MT	F	
00000005	MT100	01/20/2006	29	01/27/2006	29	MT	F	
00000006	MT100	01/27/2006	30	02/03/2006	30	MT	F	
00000007	MT100	02/03/2006	31	02/10/2006	31	MT	F	
00000008	MT100	02/10/2006	31	02/17/2006	31	MT	F	
00000009	MT100	02/17/2006	31	02/24/2006	31	MT	F	
00000010	MT100	02/24/2006	29	03/03/2006	29	MT	F	
00000011	MT100	03/03/2006	27	03/10/2006	27	MT	F	
00000012	MT100	03/10/2006	27	03/17/2006	27	MT	F	
00000013	MT100	03/17/2006	27	03/24/2006	27	MT	F	
00000014	MT100	03/24/2006	27	03/31/2006	27	MT	F	
00000015	MT101	01/02/2006	30	01/02/2006	30	MT	F	
00000016	MT101	01/02/2006	29	01/06/2006	29	MT	F	
00000017	MT101	01/06/2006	29	01/13/2006	29	MT	F	
00000018	MT101	01/13/2006	29	01/20/2006	29	MT	F	
00000019	MT101	01/20/2006	29	01/27/2006	29	MT	F	
00000020	MT101	01/27/2006	30	02/03/2006	30	MT	F	
00000021	MT101	02/03/2006	31	02/10/2006	31	MT	F	
00000022	MT101	02/10/2006	31	02/17/2006	31	MT	F	
00000023	MT101	02/17/2006	31	02/24/2006	31	MT	F	
00000024	MT101	02/24/2006	29	03/03/2006	29	MT	F	
00000025	MT101	03/03/2006	27	03/10/2006	27	MT	F	
00000026	MT101	03/10/2006	27	03/17/2006	27	MT	F	
00000027	MT101	03/17/2006	27	03/24/2006	27	MT	F	
00000028	MT101	03/24/2006	27	03/31/2006	27	MT	F	
00000029	ST300	01/02/2006	12	01/06/2006	12	ST	F	
00000030	ST300	01/02/2006	5	01/06/2006	5	ST	F	
00000031	ST300	01/06/2006	12	01/13/2006	12	ST	F	
00000032	ST300	01/06/2006	5	01/13/2006	5	ST	F	
00000033	ST300	01/13/2006	12	01/20/2006	12	ST	F	
00000034	ST300	01/13/2006	5	01/20/2006	5	ST	F	

Examine the firm requisition orders using the **Firm Purchase Requisition List** function (**Purchasing** menu):



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OK | Print | Sorted by: (•) Number ( ) Item ( ) Order Date ( ) Due Date ( ) Vendor

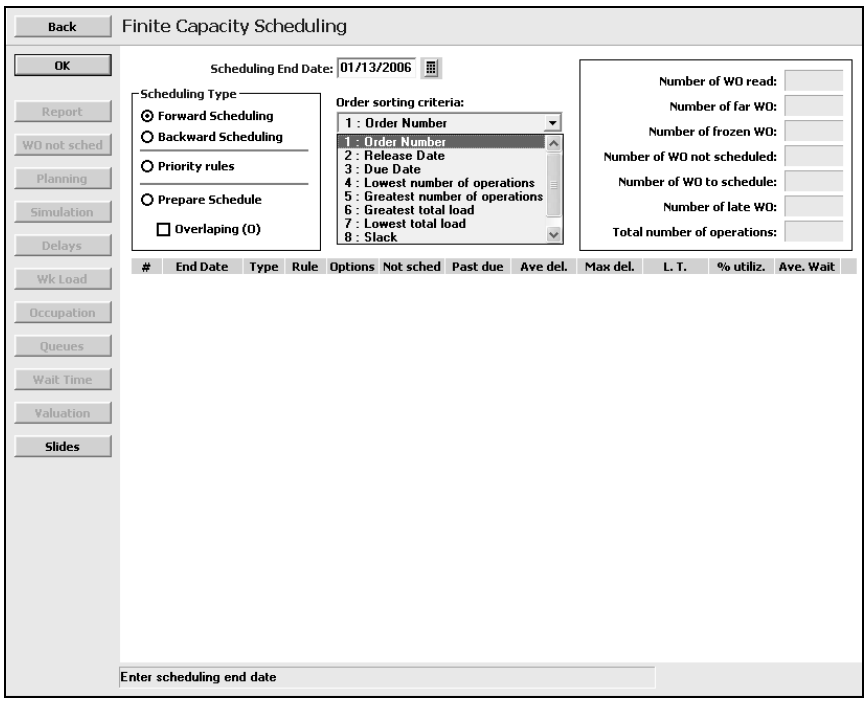
Number	Item	Ord. Date	Quantity	Due Date	Expected	Vendor	St	Project
00000001	ABS501	01/02/2006	200	01/30/2006	200	PLASTOC		
00000002	ABS502	01/02/2006	200	01/30/2006	200	PLASTOC		
00000003	ABS503	01/02/2006	500	01/30/2006	500	PLASTOC		
00000004	ABS504	01/02/2006	500	01/30/2006	500	PLASTOC		
00000005	AMS400	01/02/2006	13	01/02/2006	13	PECHINEY		
00000006	AMS400	01/02/2006	8	02/01/2006	8	PECHINEY		
00000007	AMS400	01/25/2006	8	03/01/2006	8	PECHINEY		
00000008	IB05	01/02/2006	500	01/23/2006	500	SOLLAC		
00000009	RHO300	01/02/2006	200	02/13/2006	200	STGOBAIN		
00000010	WH50	01/02/2006	2044	01/02/2006	2044	TOURNEFO		
00000011	WH50	01/02/2006	388	01/12/2006	388	TOURNEFO		
00000012	WH50	01/02/2006	408	01/19/2006	408	TOURNEFO		
00000013	WH50	01/02/2006	828	01/26/2006	828	TOURNEFO		
00000014	WH50	01/05/2006	428	02/02/2006	428	TOURNEFO		
00000015	WH50	01/12/2006	428	02/09/2006	428	TOURNEFO		
00000016	WH50	01/19/2006	388	02/16/2006	388	TOURNEFO		
00000017	WH50	01/26/2006	368	02/23/2006	368	TOURNEFO		

Finite Capacity Scheduling

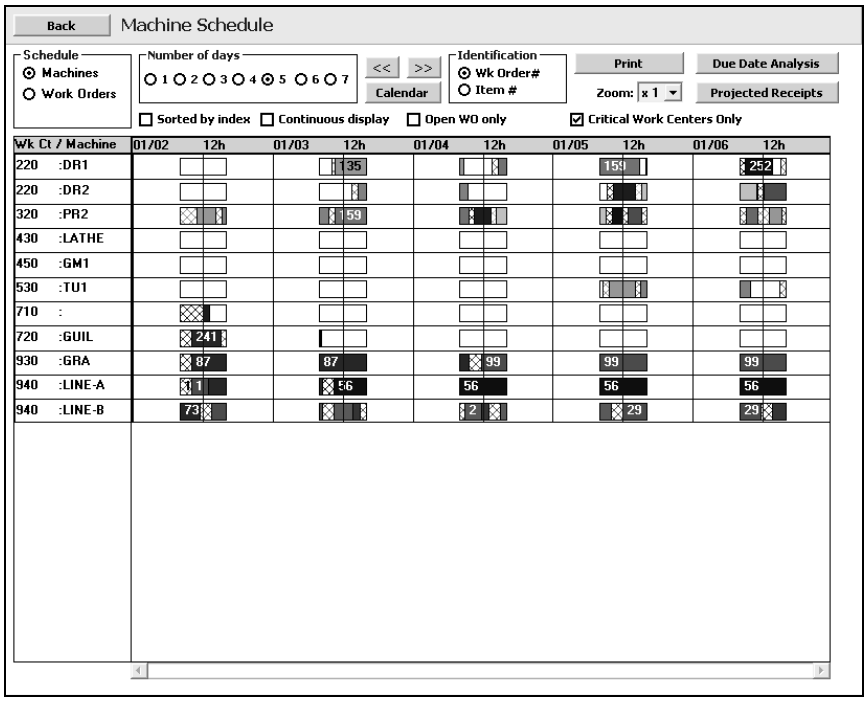
Now, a finite capacity schedule has to be computed for the orders. Select the **Finite Capacity Scheduling** window via the **Finite Capacity Scheduling** function (**Scheduling** menu). Enter the Scheduling End Date (i.e. *01132006*):

In the finite capacity scheduling procedure, several scheduling types and order sorting criteria can be chosen, as shown in the window below.

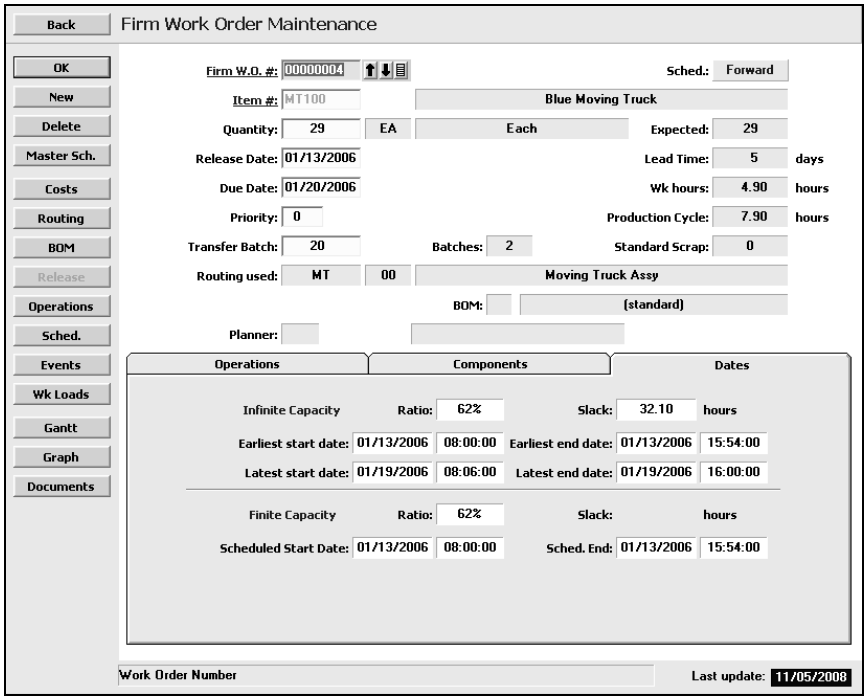
As an example, select a **Forward scheduling** (with **Due date** as Order sorting criterion). Enter *01132006* as Scheduling End Date. The dialog box shown below is displayed on your screen:



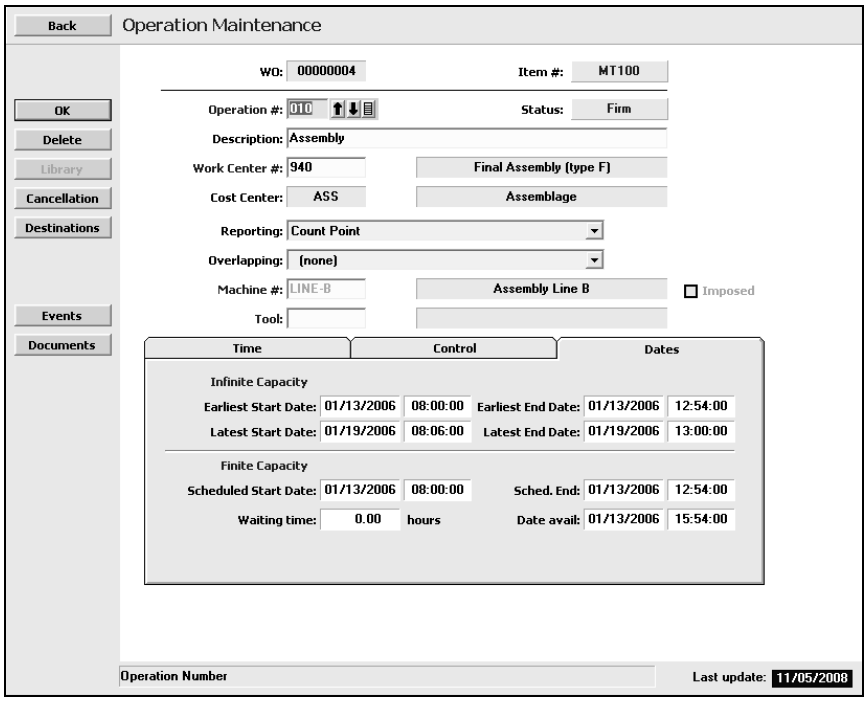
Then click on the **OK** button. The corresponding timetable is obtained by the **Planning** button. Use the **Number of days displayed** function to parameterize the presentation of these timetables. An example of a timetable for five days is shown below, which displays the work hours of the different machines (white zones) and their unavailability (with black zones).



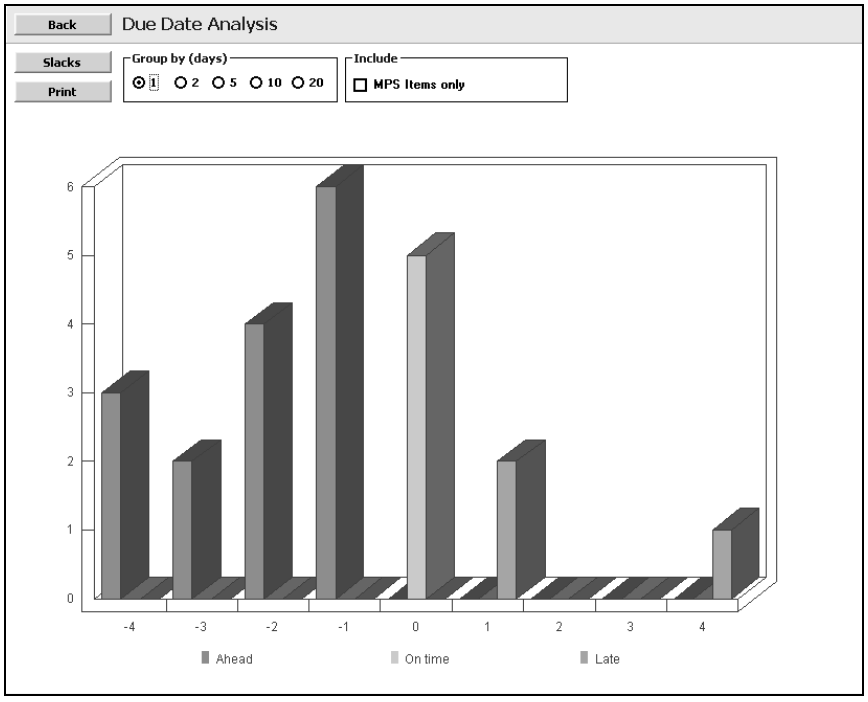
The operations of the scheduled work orders are now planned. This information is given in the **Firm Work Order** window. Let's consider the firm work order, (via the **Firm Work Orders** function, **Scheduling** menu):



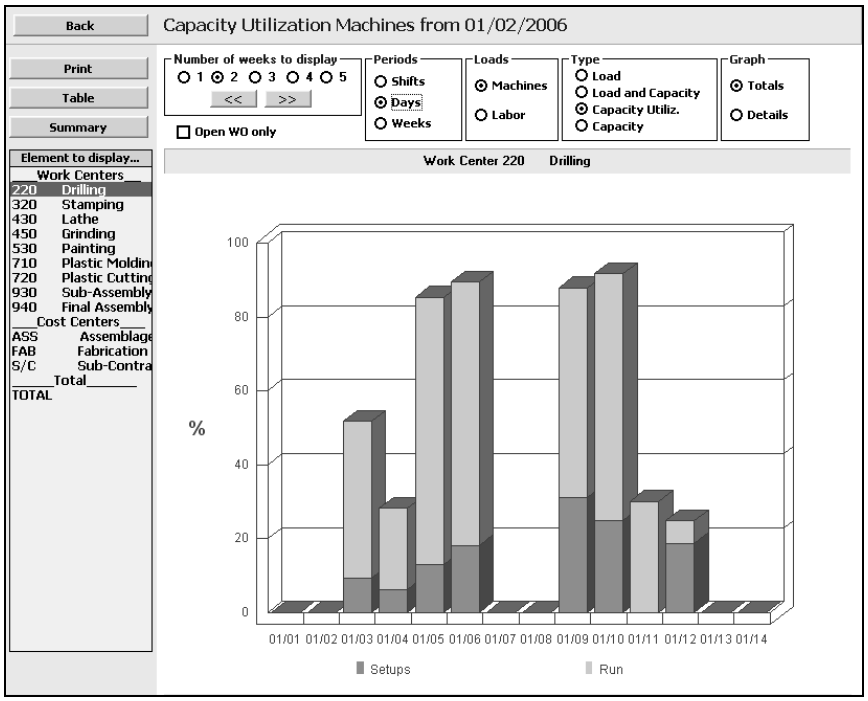
By clicking on the **OPERATIONS** button you get more details, as shown below:



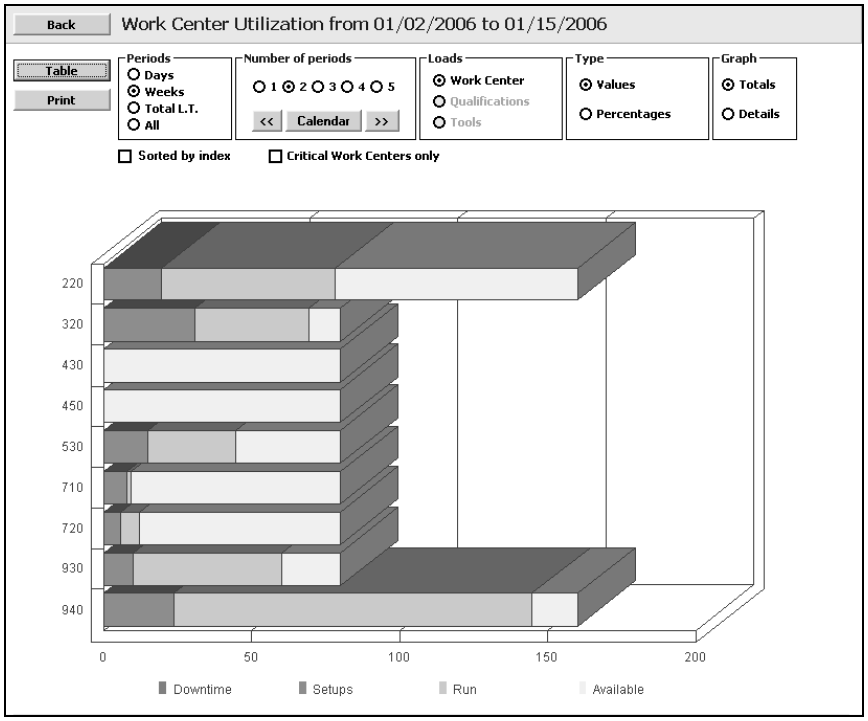
You can automatically calculate the lateness of the orders with respect to the due dates using the function **W.O. Release and Due Date Analysis** (**Scheduling** menu), as shown below:



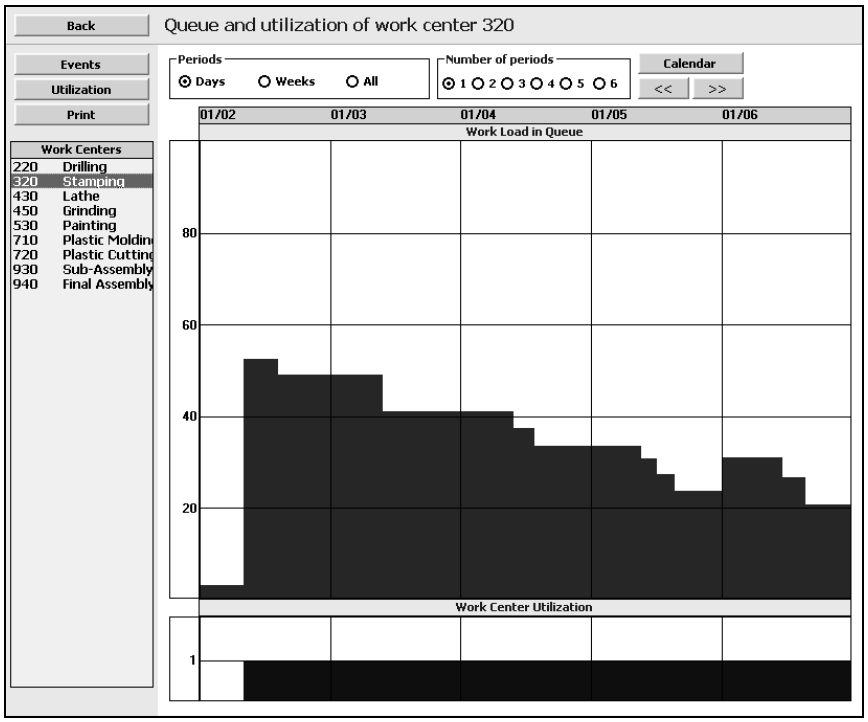
Use now the **Machines** and **Capacity Utilization** commands in the **Work Load Profile** window (**Scheduling** menu) to show the day by day capacity utilization and the work load of the different work centers. As an example, let's consider the *Drilling Machines:*



A summary of the capacity utilization of the different work centers can be accessed via the **Work Center Utilization** function (**Scheduling** menu):



The work-in-process inventory at each work center is computed by the function **Queue Profile** (**Scheduling** menu). The window below shows work-in-process inventory profile for the *Stamping machines*: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Queue and utilization of work center 320
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