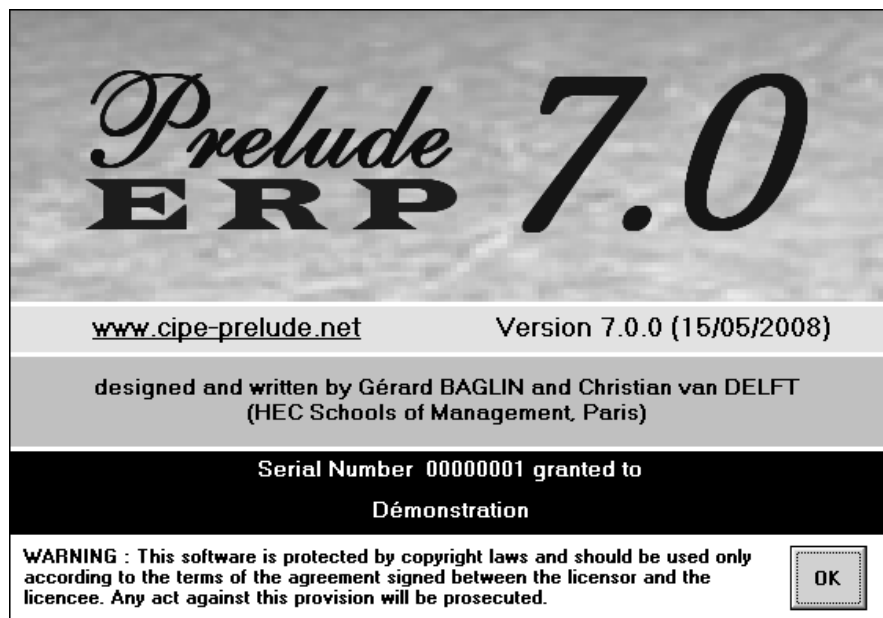


# Introductory Exercise: The Trucks Case

G. Baglin and Ch. van Delft – HEC Paris



---

## 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*”<sup>1</sup>.

---

<sup>1</sup> Date format depends on windows settings. Dates are entered without any delimiter.

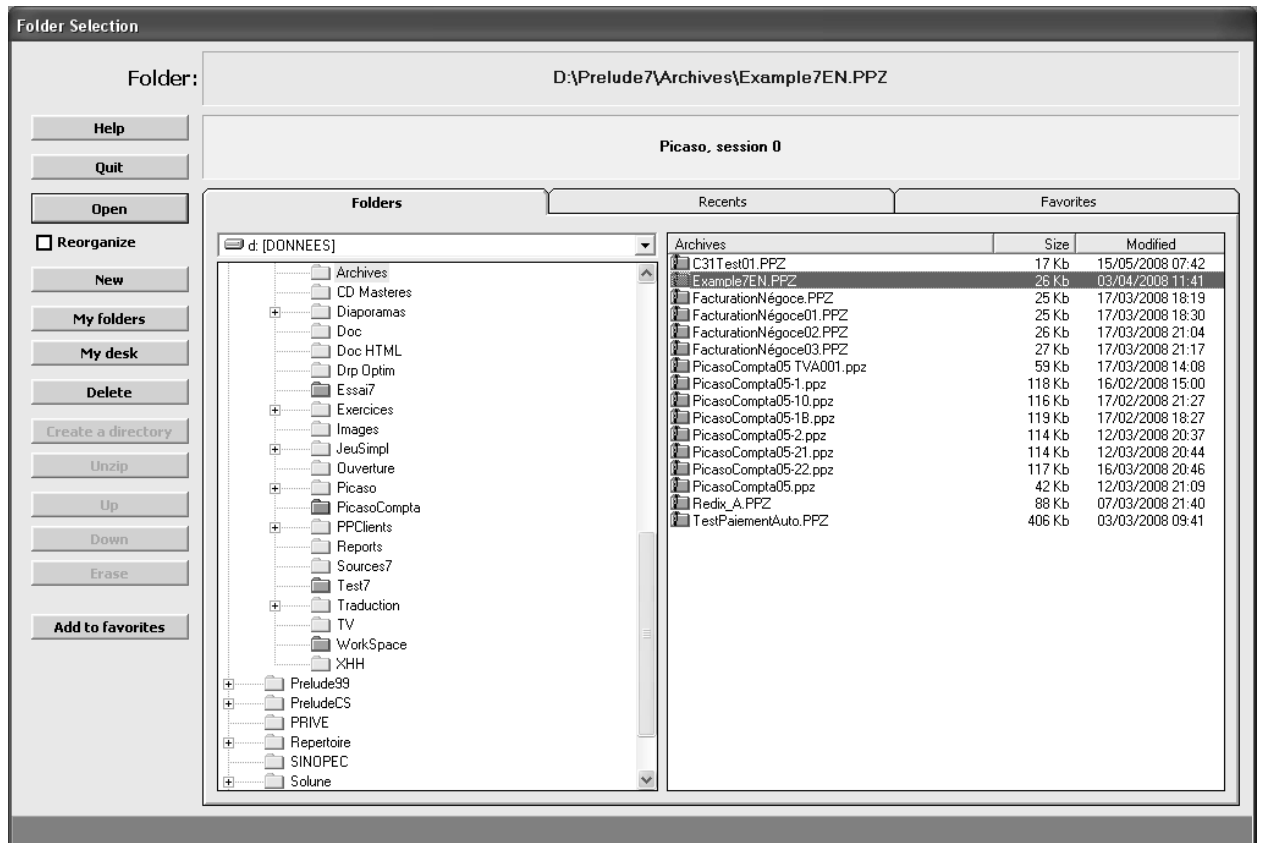
## Getting started with Prelude 7 ERP

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:

The screenshot shows the 'Item Maintenance' window for item **MT100**. The window is divided into several sections:



- Top Section:** Contains fields for 'Item #', 'Select Type' (set to '(all)'), and 'Level' (set to 0). Below these are buttons for 'OK', 'Duplicate', 'Delete', 'BOM', 'Master Sch.', 'Inventory', 'Lists', 'Forecast', 'Statistics', 'Documents', and 'Report'.
- Item Details Section:** Includes 'Description' (Blue Moving Truck), 'Stock U/M' (EA), 'Warehouse' (FP), 'Each' (selected), 'Finished products' (selected), 'Manufactured' (selected), 'MPS Item' (unchecked), and 'Status' (active).
- Additional information Section:** Contains fields for 'Extra Desc.', 'Drawing #', 'Category' (X), 'Nature' (FP), 'ABC Class' (X), 'Planner/Buyer' (GB), 'Inv. Status', 'Weight' (0.000), 'List Price' (0.00), and 'Quantity per pallet' (0).
- Manufacturing Costs Section:** Includes 'Decimals' (Inventory: 0, BOM: 0, Price/Costs: 2).

The window also displays 'Item Number (8 characters)' and 'Last update: 13/02/2007' at the bottom.




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

Vendor Maintenance	
Back	Vendor #: PECHINEY 
Tables	Category: * (default) 
OK	Company: Pechiney Aluminium
Delete	Address 1: <input type="text"/>
Catalog	Address 2: <input type="text"/>
Orders	City / Zip Code: <input type="text"/>
Statistics	Country: <input type="text"/>
Receipts	Phone Number: <input type="text"/>
Invoices	Fax Number: <input type="text"/>
Relations	Correspondent: <input type="text"/>
Account	
Totals	
Documents	Buyer: <input type="text"/>
Report	Discount: 0.00 %
	Payment Term: <input type="text"/>
Last update: 28/09/2006	

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

Customer Maintenance	
Back	Customer #: MILLEN 
Tables	Category: (none) 
OK	Company: Millen and Co
Delete	Address 1: 12 Massasoit Rd
Orders	Address 2: <input type="text"/>
Statistics	City / Zip Code: WALTHAM - MA 1024
Shipments	Country: <input type="text"/>
Invoices	Phone Number: <input type="text"/>
Relations	Fax Number: <input type="text"/>
Account	Correspondent: <input type="text"/>
Totals	Transportation Time: 1 days
Documents	Transportation: <input type="text"/>
Report	Distribution Center: <input type="text"/>
	Discount: 0.00 %
	Payment Term: 
	Credit Limit: <input type="text"/>
Term of payment	
Last update: 01/11/2008	

## 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:

Back Bill of Materials Maintenance

Item #: MT100 Blue Moving Truck Manufactured

Type: Manufacturing BOM Variant: (Standard)

Reference Date: 02/01/2006

Bills of Material Inquiries

Single Level BOM	Multi Level BOM	Summarized BOM	Purchase BOM
Single Level Where-used	Multi Level Where-Used	Cumulative Where-used	Loads

Single Level BOM of MT100 Date: 02/01/2006 3 direct components

Line#	Item	Description	Type	Lev	Dec	Coefficient	Quantity	Comment
001	CH005	Assembled Container Chassis	M	1	0	1	1	
002	H000	Blue Container	M	1	0	1	1	
003	CA000	Blue Assembled Cab	M	1	0	1	1	

List  
 Graphs  
 Maintenance  
 Duplicate  
 Replace  
 Compare  
 Delete  
 Print  
 Documents  
 Report

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.

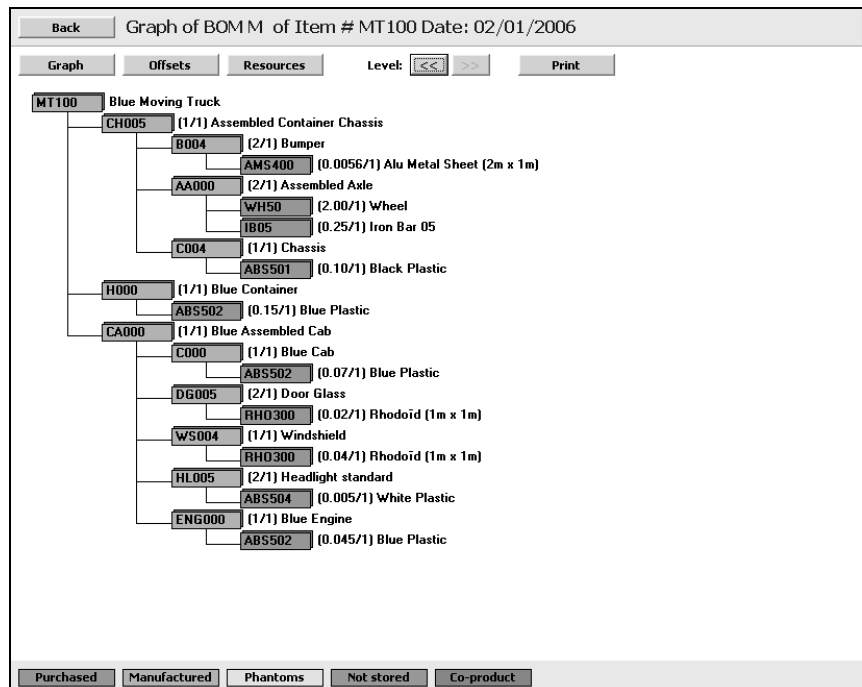
Enter the sequence (link) number.

Product Structure Record Maintenance	
Parent Item #:	MT100 Blue Moving Truck
Type:	M Manufacturing BOM
Variant:	(Standard)
Link #:	001
Component #:	CH005 Assembled Container Chassis
Qty required:	1 EA Each
/ Parent Qty:	1 Manufactured
Fixed Scrap:	0
Offset:	0 days
Operation #:	000
Start Date:	01/01/1993
End Date:	31/12/9999
Comment:	
<div> <div>OK</div> <div>New</div> <div>Delete</div> </div>	
<div> <div>Link sequence number</div> <div>Last update: 10/03/1997</div> </div>	

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:

Calendar Maintenance

Calendar #: PC Plant Calendar

	Week W1,2000	Monday 03/01	Tuesday 04/01	Wednesday 05/01	Thursday 06/01	Friday 07/01	Saturday 08/01	Sunday 09/01
	40.00	8.00	8.00	8.00	8.00	8.00		
Shift 1	Start:	08:00	08:00	08:00	08:00	08:00		
	Hours:	8.00	8.00	8.00	8.00	8.00		
Shift 2	Start:							
	Hours:							
Shift 3	Start:							
	Hours:							

Shift Start Time

Last update: 23/11/2005

## 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):

Cost Center Maintenance

Cost Center #: ASS

Description: Assemblage

☒ Production Cost Center

Standard Activity		Simulated Activity		Standard Costs	
Machine Hours:	5000	Machine Hours:	0	Machine:	48.22
Direct Labor Hours:	5000	Direct Labor Hours:	0	Direct Labor:	22.25
Setup Labor hours:	0	Setup Labor hours:	0	Setup Labor:	0.00

	BUDGET		SIMULATION	
	Total	Rate	Total	Rate
Labor Setup Cost	0		0	
Direct Labor Costs	100000	20.00	0	
Shop Direct Costs	25000	5.00		
Fiscal Depreciation	300000	60.00	0	
Econ. Depreciation	60000	12.00	0	
Overhead / Machine	120000	24.00	0	
Overhead / Labor	0	0.00	0	

Cost elements:  
 Standard purchase price  
 Manufacturing data (01/01/1996)  
 Routing Standard Lot Size  
 Budget overhead rates:  
 - Directs costs  
 - Economic depreciation  
 - Indirect costs  
 - Purchase costs (10.00%)  
 - Plant overhead (8.00%/12.00%)  
 - Company overhead (3.00%/5.00%)

Budget Line	Description	Setup Lab.	Dir Lab	Work Shop	Fisc Dep	Econ Dep	Shop OH	OH/Labor
AMOE	Amortissement éconon	0	0	0	300000	0	0	0
AMOF	Amortissement fiscal	0	0	0	0	0	0	0
AMORT	Amortissements	0	0	0	0	37500	0	0
ENCA	Encadrement	0	0	0	0	60000	0	0
ENTR	Entretien	10000	0	0	0	0	120000	0
FRAISAT	Frais d'atelier	0	0	25000	0	0	0	0
LOYER	Loyer industriel	0	0	0	0	0	20000	0
MOD	Main-d'oeuvre directe	0	100000	0	0	0	0	0
OUT	Outilsages	0	50	0	0	0	0	0

Cost Center Code

Last update: 11/04/2008




## 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:

Work Center Maintenance

Back

OK Delete Operations Cost Center Calendar Resources Machines Documents Report

Work Center #: 220  ☒ Critical ☐ MPS WC

Description: Drilling

Type: F : Finite Capacity

Workshop #:

Cost Center: FAB  Fabrication

Calendar: PC  Plant Calendar

Capacity Coefficient: 2.00 Efficiency Coef.: 1.00 ☐ Continuous Operations

Qualif. for Setup:

Qualif. for Run:

Wait Time before: 0.0 hours Display Index: 2.00

Machine	Description	Cal.	Effic.	SUT.C	R.T.C	L.S.C	L.R.C
DR1	Drill 1	PC	1.00	1.00	1.00	1.00	1.00
DR2	Drill 2	PC	1.00	1.00	1.00	1.00	1.00

Standard Costs

Machine: 40.09

Direct Lab: 18.35

Setup Lab: 18.35

Work Center Code  Last update: 11/04/2008


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

Machine Maintenance - Work Center 220

Back

OK Duplicate Calendar Delete Documents

Work Center #: 220 Drilling

Machine #: DR1 

Description: Drill 1

Calendar #: PC  Plant Calendar

Efficiency Coefficient: 1.00

Setup Time Coefficient: 1.00

Run Time Coefficient: 1.00

Labor Setup Time Coefficient: 1.00

Labor Run Time Coefficient: 1.00

Breakdown Capacity Loss (%):

Machine Code  Last update: / /10

## 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),

Back Routing Maintenance

OK Duplicate Delete Items using Operations Graph Costs Table Documents Report

Routing #: C00 Cab Fabrication

Revision #: 01 ☐ Approved

Description: Cab Fabrication

Start Date: 04/21/1994 End Date: 12/31/9999

Standard Batch: 500 Fixed Scrap: 0

Transfer Batch: 500 Proportionnal Scrap: 0.00

Cost decimals: 0

Comment:

Oper.	Wk Ct	Setup T.	Lb SUp	Run T.	Labor Time	Qty/time	Qty/cycl	Move T.	Ov	Dp
010	320	2.0000	2.0000	4.0000	4.0000	500	1	4.00		C
020	220	3.0000	3.0000	12.0000	12.0000	500	1	2.00		C
030	620	4.0000	4.0000	0.0000	0.0000	1	1	2.00		C
040	530	4.0000	4.0000	3.0000	6.0000	500	1	2.00		C

Hours Totals

Setup Labor	13.00
Labor/unit	0.0440
Labor/batch	22.00
Setups	13.00
Machine/unit	0.0380
Machine/batch	19.00
Transfer	10.00
Lead Time	42.00
Sub-contract.	0 d.

Routing Code Last update: 11/04/2008

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

Back Routing Operations Maintenance

OK New Delete Library Destinations Cost Center Costs Documents

Routing #: C00 / 01 Cab Fabrication

Operation #: 010

Description: Emboutissage

Work Center #: 320 Stamping (type F)

Workshop: Fabrication

Cost Center: FAB

Mach. Setup Time: 2.0000 Labor Setup Time: 2.0000

Machine Run Time: 4.0000 Labor Run Time: 4.0000

Quantity per Time: 500 Quantity per Cycle: 1

Move Time: 4.00 (hours)

Fixed Scrap: 0 Proportionnal Scrap (%): 0.00

Reporting: Counting Point

Overlapping: (none)

Machine #:

Tool #:

Comment:

Operation Number Last update: 11/04/2008

## 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:

Item Maintenance

Back

OK Duplicate Delete BOM Master Sch. Inventory Lists Forecast Distrib. Cts Statistics Documents Report

Item #: C000 Select Type: (all) Level: 3

Description: Blue Cab Manufactured

Stock U/M: EA Each ☐ MPS Item

Warehouse: IP In process Status: (active)

Additional Information Parameters Routings Manufacturing Costs

Delete Release Budget Add ...

Release Routing: C00 Budget: C00

Code	Description	Comment	BOM	Backflush
C00	Cab Fabrication	Cab Fabrication		None

Comment: Cab Fabrication Routing

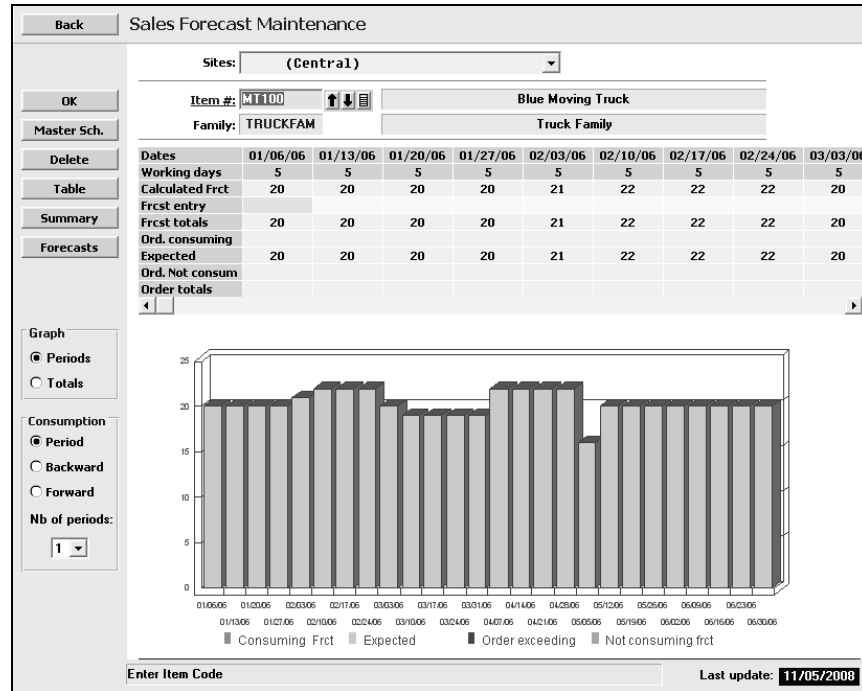
BOM: (standard)

Backflushing: None Priority Index: 0

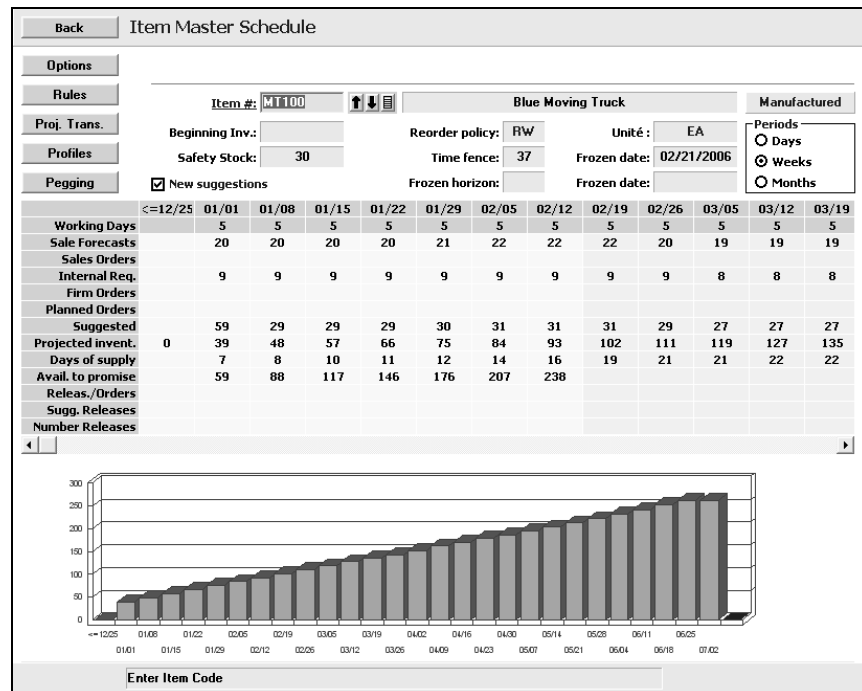
Item Number (8 characters) Last update: 11/04/2008

## 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):



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



## 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 screenshot shows the 'Item Maintenance' window with the 'Parameters' tab selected. The item is 'MT100', a 'Blue Moving Truck' at level 1. The stock unit is 'EA' (Each) and the warehouse is 'FP' (Finished products). The status is 'active'. The parameters are set as follows:

Parameter	Value
Reorder Policy	R : Net Requirements
Lot Sizing Rule	W : Weekly Requirements
Safety Stock	30
Lead Time	5 days
Minimum Batch	0
Cumulative Lead Time	41 days
Multiple Quantity	0
Time Fence	37 days
Frozen Horizon	0 days
Std Lot Size (budget)	300
Planning Group	0
Simulated Lot Size	1
Annual Demand	0

At the bottom, the item number is 'Item Number (8 characters)' and the last update is '11/04/2008'.

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:

The screenshot shows the 'Material Requirements Planning' window. The calculation end date is '06302006'. The start group is '0' and the end group is '9'. The planning options are as follows:

Option	Selected
Include in MRP	Forecasts and sales orders
Replenish safety stock at first requirement	<input type="checkbox"/>
Automatic split of long Work Orders	<input type="checkbox"/>
Do not plan WO during the lead time	<input type="checkbox"/>
Do not plan WO during the time fence	<input type="checkbox"/>
Operation Overlapping	<input type="checkbox"/>
Include Work Center safety time	<input type="checkbox"/>
Lead Time calculated from routing	<input type="checkbox"/>
Link components planning to operations	<input type="checkbox"/>
Scheduling	per day
	per hour

At the bottom, there is a note: 'Make sure that low-level codes are up-to-date' and a field for 'Enter reference date'.

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):

Planned Work Order List								
Back								
OK		Sorted by:						
Print		<input checked="" type="radio"/> Number <input type="radio"/> Item <input type="radio"/> Release date <input type="radio"/> 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		

Planned Purchase Requisition List								
Back								
OK		Sorted by:						
Print		<input checked="" type="radio"/> Number <input type="radio"/> Item <input type="radio"/> Order Date <input type="radio"/> Due Date <input type="radio"/> 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	AM5400	01/02/2006	13	01/02/2006	13	PECHINEY		
00000006	AM5400	01/02/2006	8	02/01/2006	8	PECHINEY		
00000007	AM5400	01/25/2006	8	03/01/2006	8	PECHINEY		
00000008	IB05	01/02/2006	500	01/23/2006	500	SOLLAC		
00000009	RH0300	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):

Back Planned Work Order Maintenance

OK

Planned W.O. #: 00000001

Item #: MT100 Blue Moving Truck

Quantity: 30 EA Each Expected: 30

Release Date: 01/02/2006 Lead Time: 5 days

Due Date: 01/02/2006 Wk hours: 5.00 hours

Priority: 0 Production Cycle: 8.00 hours

Transfer Batch: 20 Batches: 2 Standard Scrap: 0

Routing used: MT 00 Moving Truck Assy

BOM: (standard)

Planner:

Routing			Components				Dates			
Op.	Wk Ct	Description	Quantity	Mch ST	Lab ST	Mch RT	Lab RT	Transfer	Op.	St
010	940	Final Assembly	30	2.00	0.00	3.00	3.00	3.00		C

Work Order Number Last update: 11/05/2008

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

Routing			Components				Dates			
Line	Component	Description	Required	Available	Avail/reL	Op.				
001	CH005	Assembled Container Chassis	30	0	127	010				
002	H000	Blue Container	30	0	59	010				
003	CA000	Blue Assembled Cab	30	0	87	010				

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

Planned Purchase Requisition Maintenance	
Back	Planned PR #: 00000001
OK	Item #: ABS501
Delete	Vendor #: PLASTOC
Master Sch.	Quantity: 200 KG
Firm PR	Order Date: 01/02/2006
	Required Date: 01/30/2006
	Priority: 0
	Weight: 0.000
	Buyer: OB
	Lead Time: 20 days
	Vendor Scrap: 0.00 %
	Quantity expected: 200
	Total: 2000.00
	Black Plastic
	Plastoc
	Kilo
	Bruel
Purchase Requisition Number	
Last update: 11/05/2008	

## 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:

Infinite Capacity Loading and Scheduling	
Back	Infinite Capacity Scheduling End Date: 03/31/2006
OK	Start Group: 0 End Group: 9
Slides	Scheduling Options
	<input type="checkbox"/> Operation Overlapping
	<input type="checkbox"/> Include Work Center safety time
Enter reference date	



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,

Planned Work Order Maintenance

Planned W.O. #: 00000010

Item #: MT100 Blue Moving Truck

Quantity: 29 EA Each Expected: 29

Release Date: 02/24/2006 Lead Time: 5 days

Due Date: 03/03/2006 Wk hours: 4.90 hours

Priority: 0 Production Cycle: 7.90 hours

Transfer Batch: 20 Batches: 2 Standard Scrap: 0

Routing used: MT 00 Moving Truck Assy

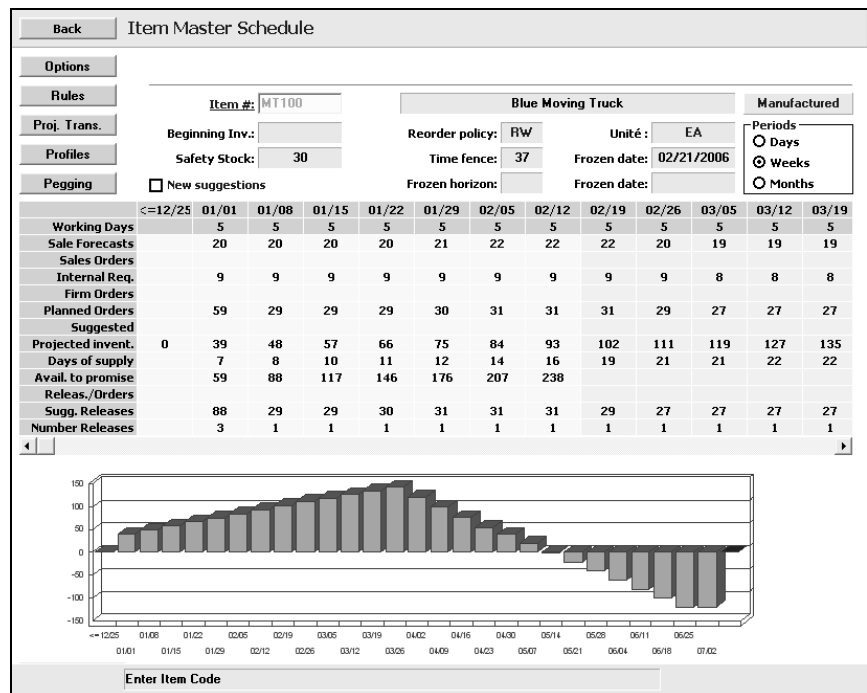
BOM: (standard)

Planner:

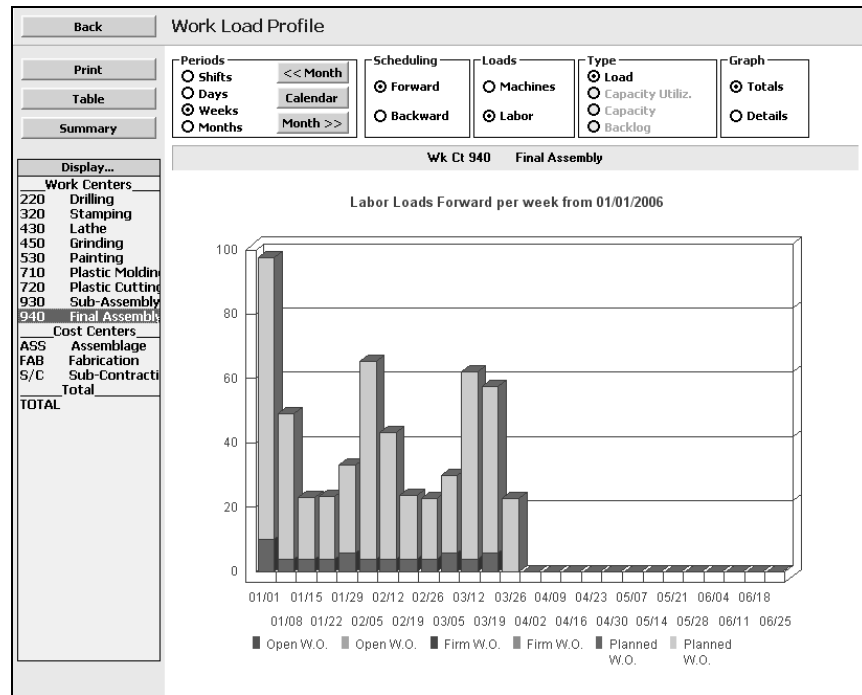
Routing	Components	Dates
Infinite Capacity	Ratio: 62%	Slack: hours
Earliest start date: 02/24/2006 08:00:00	Earliest end date: 02/24/2006 15:54:00	
Latest start date: 03/02/2006 08:06:00	Latest end date: 03/02/2006 16:00:00	

Work Order Number Last update: 11/05/2008

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



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):

Back Planned Work Order Slack Analysis

OK Print

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		S5001	02/07/2006 08:16:48	02/02/2006 16:00:00
-16.28	00000161		S5001	03/14/2006 08:16:48	03/09/2006 16:00:00
-6.02	00000158		S5000	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		S5000	02/09/2006 13:26:24	02/09/2006 16:00:00
2.56	00000153		S5000	02/16/2006 13:26:24	02/16/2006 16:00:00
2.56	00000151		S5000	02/02/2006 13:26:24	02/02/2006 16:00:00
2.78	00000150		S5000	01/26/2006 13:13:12	01/26/2006 16:00:00
3.00	00000148		S5000	01/12/2006 13:00:00	01/12/2006 16:00:00
3.00	00000149		S5000	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):

Firm Work Order List								
Back								
OK		Sorted by:						
Print		<input checked="" type="radio"/> Number <input type="radio"/> Item <input type="radio"/> Release date <input type="radio"/> 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):

Firm Purchase Requisition List								
Back								
OK		Sorted by:						
Print		<input checked="" type="radio"/> Number <input type="radio"/> Item <input type="radio"/> Order Date <input type="radio"/> Due Date <input type="radio"/> Vendor						
Number	Item	Ord. Date	Quantity	Due Date	Expected	Vendor	St	Project
00000001	ABSS01	01/02/2006	200	01/30/2006	200	PLASTOC		
00000002	ABSS02	01/02/2006	200	01/30/2006	200	PLASTOC		
00000003	ABSS03	01/02/2006	500	01/30/2006	500	PLASTOC		
00000004	ABSS04	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	WHS0	01/02/2006	2044	01/02/2006	2044	TOURNEFO		
00000011	WHS0	01/02/2006	388	01/12/2006	388	TOURNEFO		
00000012	WHS0	01/02/2006	408	01/19/2006	408	TOURNEFO		
00000013	WHS0	01/02/2006	828	01/26/2006	828	TOURNEFO		
00000014	WHS0	01/05/2006	428	02/02/2006	428	TOURNEFO		
00000015	WHS0	01/12/2006	428	02/09/2006	428	TOURNEFO		
00000016	WHS0	01/19/2006	388	02/16/2006	388	TOURNEFO		
00000017	WHS0	01/26/2006	368	02/23/2006	368	TOURNEFO		

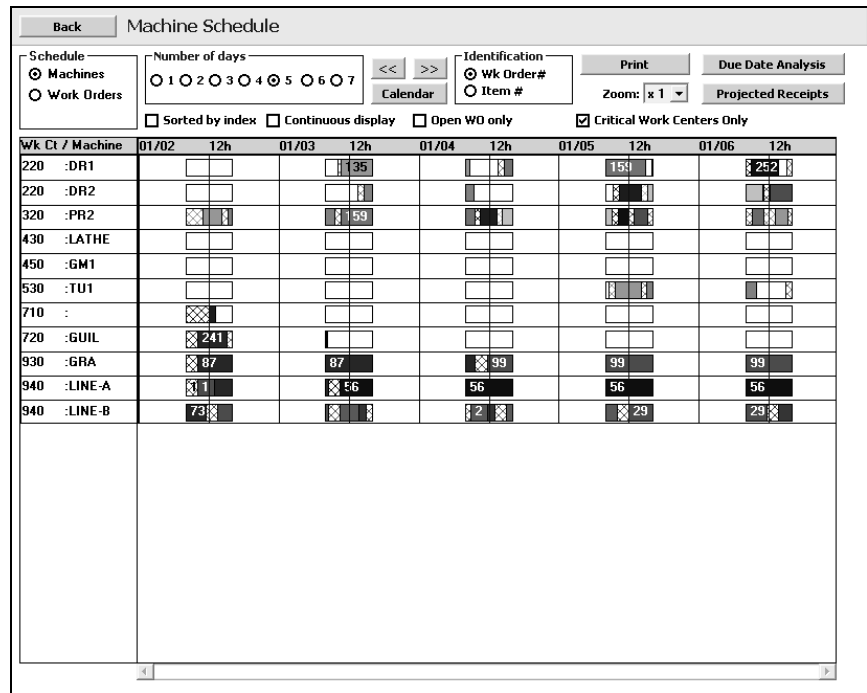
## Finite Capacity Scheduling

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. *01/13/2006*):

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 *01/13/2006* 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):

Firm Work Order Maintenance

Back

OK New Delete Master Sch. Costs Routing BOM Release Operations Sched. Events Wk Loads Gantt Graph Documents

Firm W.O. #: 00000004

Sched.: Forward

Item #: MT100 Blue Moving Truck

Quantity: 29 EA Each Expected: 29

Release Date: 01/13/2006 Lead Time: 5 days

Due Date: 01/20/2006 Wk hours: 4.90 hours

Priority: 0 Production Cycle: 7.90 hours

Transfer Batch: 20 Batches: 2 Standard Scrap: 0

Routing used: MT 00 Moving Truck Assy

BOM: (standard)

Planner:

Operations	Components	Dates
Infinite Capacity	Ratio: 62%	Slack: 32.10 hours
Earliest start date: 01/13/2006 08:00:00	Earliest end date: 01/13/2006 15:54:00	
Latest start date: 01/19/2006 08:06:00	Latest end date: 01/19/2006 16:00:00	
Finite Capacity	Ratio: 62%	Slack: hours
Scheduled Start Date: 01/13/2006 08:00:00	Sched. End: 01/13/2006 15:54:00	

Work Order Number Last update: 11/05/2008

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

Back Operation Maintenance

WO: 00000004 Item #: MT100

Operation #: 010 Status: Firm

Description: Assembly

Work Center #: 940 Final Assembly (type F)

Cost Center: ASS Assemblage

Reporting: Count Point

Overlapping: [none]

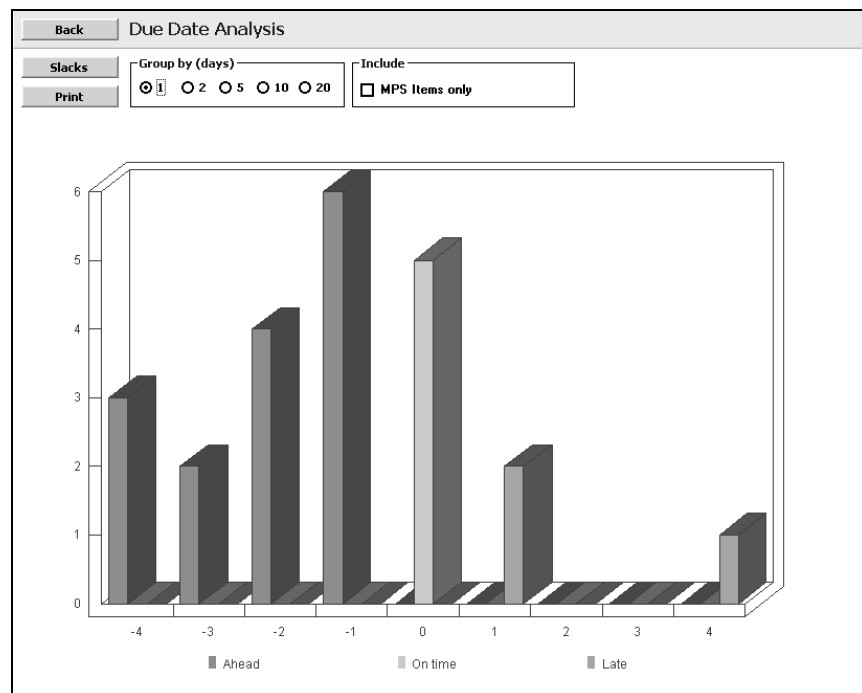
Machine #: LINE-B Assembly Line B ☐ Imposed

Tool:

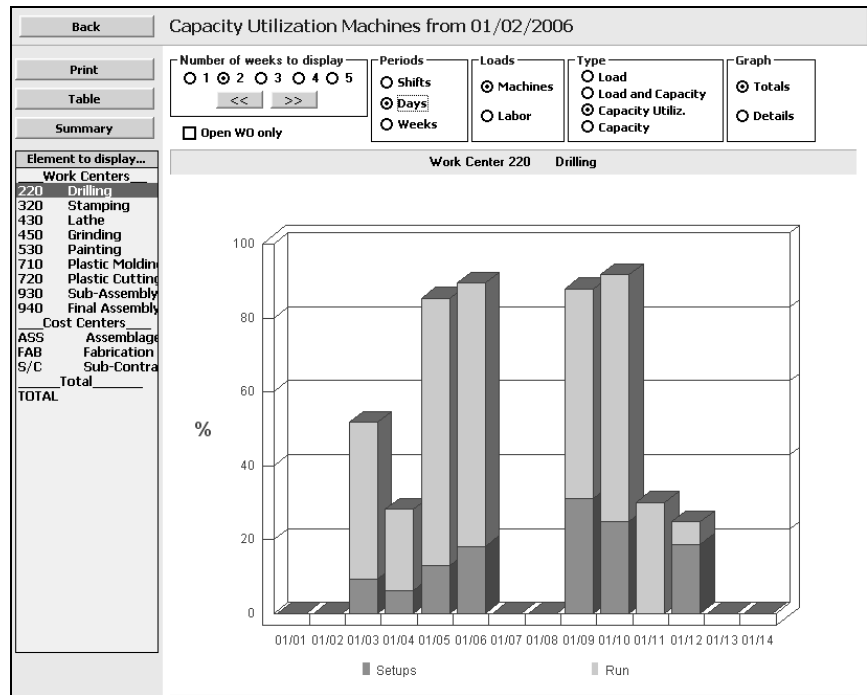
Time	Control	Dates
Infinite Capacity		
Earliest Start Date:	01/13/2006 08:00:00	Earliest End Date: 01/13/2006 12:54:00
Latest Start Date:	01/19/2006 08:06:00	Latest End Date: 01/19/2006 13:00:00
Finite Capacity		
Scheduled Start Date:	01/13/2006 08:00:00	Sched. End: 01/13/2006 12:54:00
Waiting time:	0.00 hours	Date avail: 01/13/2006 15:54:00

Operation Number Last update: 11/05/2008

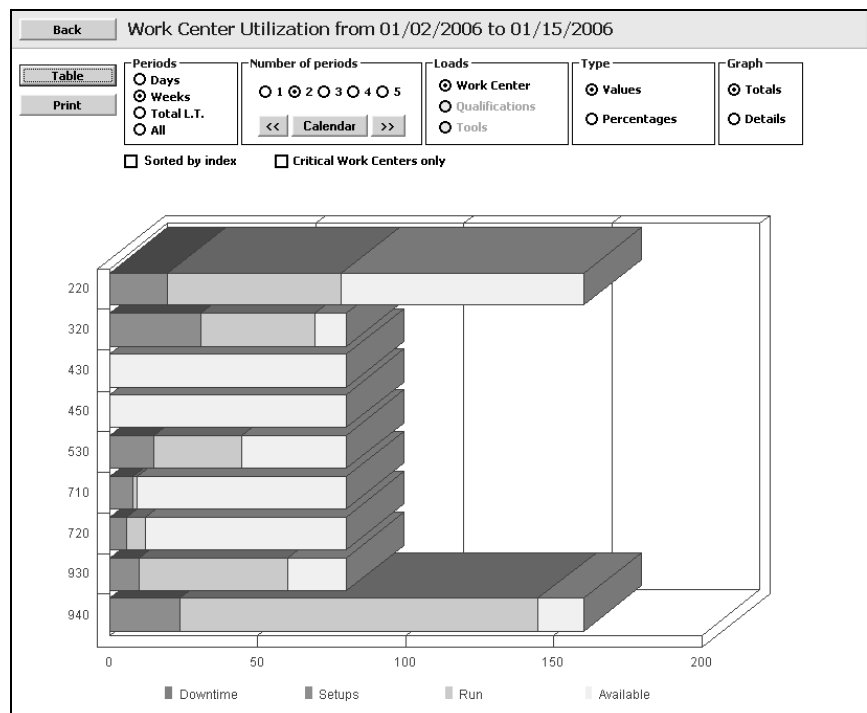
You can automatically calculate the lateness of the orders with respect to the due dates using the function **W.O. Release and Due Date Analysis (Scheduling menu)**, as shown below:



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*:

