

ADempiere User Manual

Part C

Manufacturing

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1 Overview

With the introduction of the Manufacturing Management (MFGM), it seems quite reasonable to enhance the Garden World (GW) sample (blue).

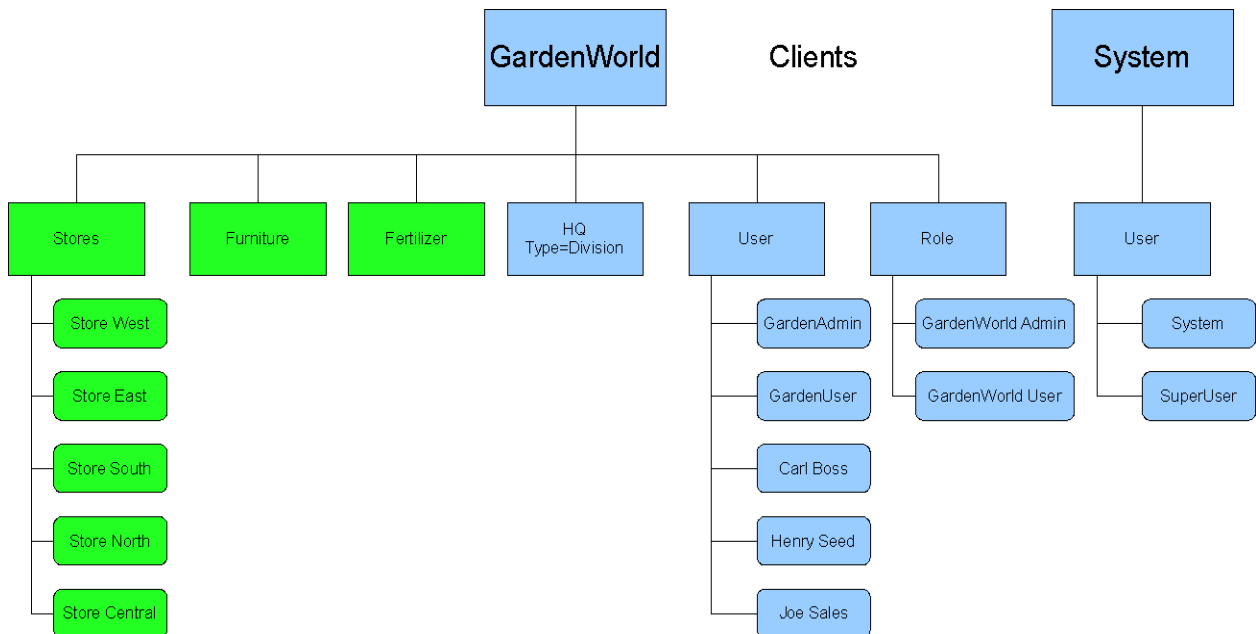
This issue raised when starting the *ADempiere Documentation Project*. There are three (initially – perhaps more to come) goals, which are targeted:

- Get a common understanding of the sample client
- Have a common document as a base for translation
 - The multis will show additional complexity
 - Common base of understanding
- Synchronize testing and documentation

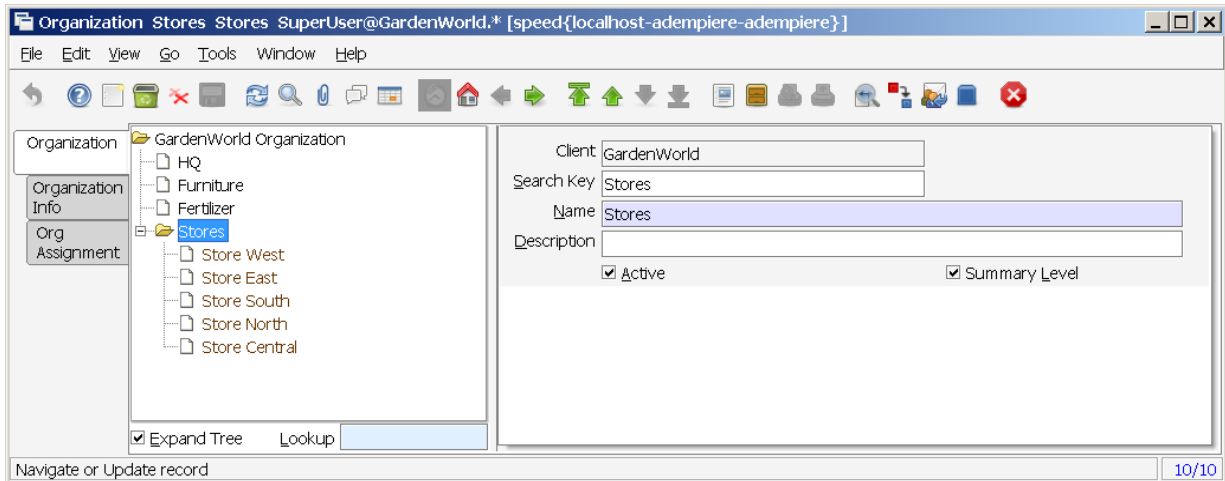
The enhancements are marked green. The enhancements have been implemented as a sponsored development during a workshop at BayCIX GmbH in Landshut from 1.10.-10.10.2008 with the guidance of Victor Perez from e-evolution. The enhancements are marked in green.

1.1 Client Organization

In addition to get a common understanding about the functionality of ADempiere, the proposal to have an production oriented org-chart the following org-chart will be used to explain the Manufacturing Management (MfGM in the following chapters) functionality .



Menu -> System Admin -> Organization Rules -> Organization

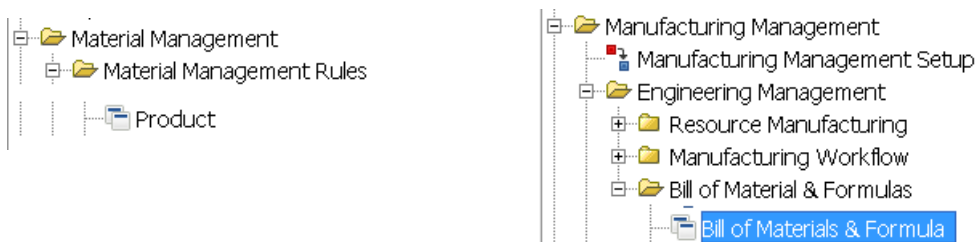


Material Management -> Material Management Rules -> Warehouse & Locators

| Warehouse | Client | Organization | Search Key | Name | Description | Active | In Transit | Address |
|------------|-------------|---------------|---------------|--------------------|--------------------|-------------------------------------|-------------------------------------|---------------------------|
| | GardenWorld | Fertilizer | Fertilizer | Fertilizer | Fertilizer | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Schillerstrabe 18d, D-474 |
| Locator | GardenWorld | Fertilizer | FertilizerT | Fertilizer Transit | Fertilizer Transit | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Fertilizer Transit, , OR |
| Storage | GardenWorld | Furniture | Furniture | Furniture | Furniture | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Carretera Mexico Pachuca |
| | GardenWorld | Furniture | FurnitureT | Furniture Transit | Furniture Transit | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Furniture Transit, , OR |
| Replenish | GardenWorld | HQ | HQT | HQ Transit | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 2828 SW Corbett Ave, Su |
| | GardenWorld | HQ | HQ | HQ Warehouse | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2828 SW Corbett Ave, Su |
| Accounting | GardenWorld | Store Central | Store Central | Store Central | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | , Tangelwood, MA |
| | GardenWorld | Store East | Store East | Store East | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Store East, , OR |
| | GardenWorld | Store North | Store North | Store North | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Store North, , OR |
| | GardenWorld | Store South | Store South | Store South | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Store South, , OR |
| | GardenWorld | Store West | Store West | Store West | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Store West, , OR |

1.2 Product Configuration

The manufactured products and their required bill of materials have to be defined as products within Material (Product) and Manufacturing Management (BOM).



1.3 Product Sample

For manufactured products (to be sold), the products have to be defined as products (green) in Material Management first. In addition, all products to be used as parts of the manufactured product have to be defined as products in Material Management, too.

The screenshot shows the SAP Product List for 'Lawn Fertilizer'. The main product is highlighted in blue. Below it, several related products are listed in green, indicating they are defined in Material Management. The table includes columns for Client, Organization, Bill of Materials, Search Key, Version No, Name, and Description.

| Product | Client | Organization | Bill of Materials | Search Key | Version No | Name | Description |
|-----------------|-------------|--------------|-------------------------------------|----------------|------------|---------------------|------------------------------------|
| Lawn Fertilizer | GardenWorld | * | <input checked="" type="checkbox"/> | Fertilizer | | Lawn Fertilizer | |
| Substitute | GardenWorld | * | <input checked="" type="checkbox"/> | Fertilizer #50 | | Fertilizer #50 | 50 # Bag of Lawn Fertilizer |
| Related | GardenWorld | * | <input checked="" type="checkbox"/> | Fertilizer #70 | | Fertilizer #70 | 70 # Bag of Lawn Fertilizer |
| Replenish | GardenWorld | * | <input checked="" type="checkbox"/> | PatioSet | | Patio Furniture Set | 1 table, 4 Chairs and 1 Sun Screen |
| Purchasing | GardenWorld | HQ | <input type="checkbox"/> | PBackLeg | | Assembly Back Leg | |
| | GardenWorld | * | <input checked="" type="checkbox"/> | PChair | | Patio Chair | Nice Chair for outdoors |
| | GardenWorld | * | <input checked="" type="checkbox"/> | PFRonLeg | | Assembly Fron Leg | |
| | GardenWorld | HQ | <input type="checkbox"/> | Assembly Area | | Assembly Area | |
| | GardenWorld | * | <input type="checkbox"/> | Azalea Bush | | Azalea Bush | |

Before the BOM products (green) have been for the workshop:

The screenshot shows the SAP Bill of Materials & Formula for 'PatioSet'. The parent product is 'PatioSet_Patio Furniture Set'. The table lists various components, including chairs, legs, and fertilizers, with their respective search keys, UOM, and descriptions.

| Parent Product | Client | Organization | Product | Search Key | UOM | Name | Description |
|------------------------------|-------------|--------------|-------------------------------|----------------|----------|---------------------|------------------------------------|
| PatioSet_Patio Furniture Set | GardenWorld | * | PatioSet_Patio Furniture Set | PatioSet | Each | Patio Furniture Set | 1 table, 4 Chairs and 1 Sun Screen |
| | GardenWorld | * | PChair_Patio Chair | PChair | Each | Patio Chair | Nice Chair for outdoors |
| | GardenWorld | * | PBackLeg_Assembly Back Leg | PBackLeg | Each | Assembly Back Leg | |
| | GardenWorld | * | PFRonLeg_Assembly Fron Leg | PFRonLeg | Each | Assembly Fron Leg | |
| | GardenWorld | * | Fertilizer #50_Fertilizer #50 | Fertilizer #50 | Each | Fertilizer #50 | 50 # Bag of Lawn Fertilizer |
| | GardenWorld | * | Fertilizer #70_Fertilizer #70 | Fertilizer #70 | Each | Fertilizer #70 | 70 # Bag of Lawn Fertilizer |
| | GardenWorld | * | Fertilizer_Lawn Fertilizer | Fertilizer | kilogram | Lawn Fertilizer | |

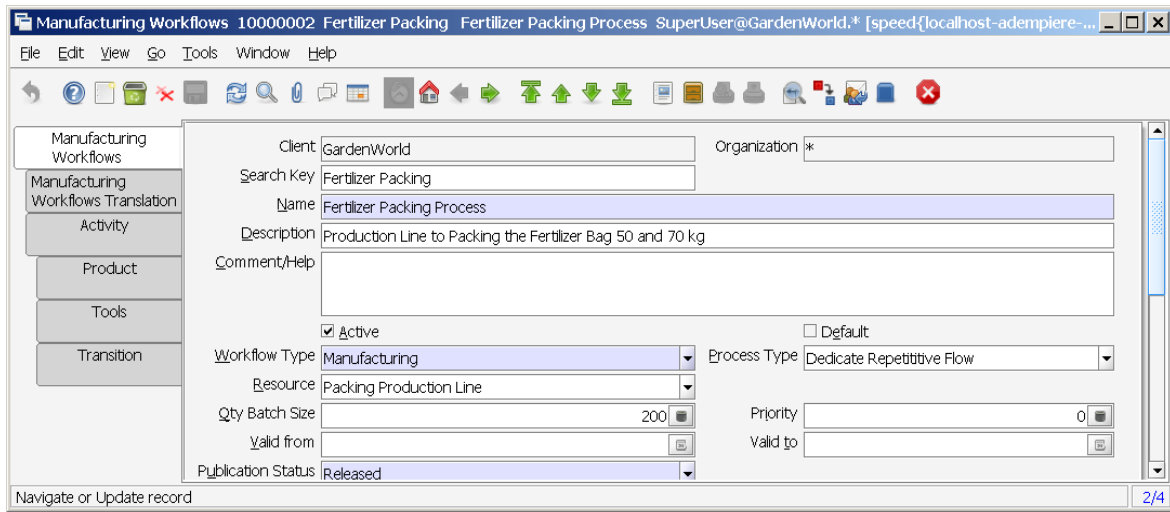
An overview of the sample product „Fertilizer#70“ is shown in the figure below. This sample product will be described in detail later on.

The screenshot shows the SAP BOM & Formula Info for 'Fertilizer #70'. The product is 'Fertilizer #70_Fertilizer #70'. The table lists the components of the fertilizer, including Phosphorus, Nitrogen, Potassium, Whater, and Bag 70 Kg, with their respective line numbers, valid dates, and UOM.

| Select | Active | Line No | Valid from | Valid to | Product | UOM | Is Qty | Percentage |
|--------------------------|-------------------------------------|---------|------------|----------|-----------------|-----|--------|-------------------------------------|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 09/22/2007 | | Lawn Fertilizer | | | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 09/22/2007 | | Phosphorus | | | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 20 | 09/22/2007 | | Nitrogen | | | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 30 | 09/22/2008 | | Potassium | | | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 40 | 09/22/2007 | | Whater | | | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 20 | 09/22/2007 | | Bag 70 Kg | | | <input type="checkbox"/> |

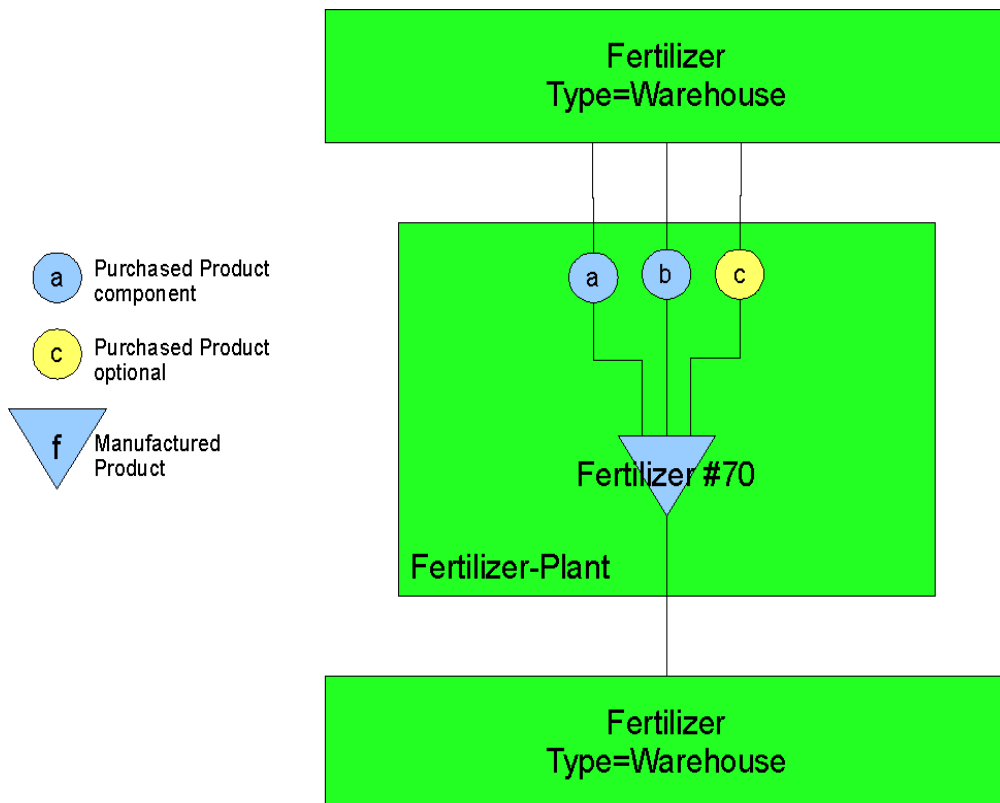
1.4 Workflow

In order to manufacture a product, workflow resources and workflows are required. The manufacturing workflow must have set „Workflow Type = Manufacturing“. A one step workflow process is defined for the sample.



1.5 Manufacturing Configuration Overview

The following figure does show the „Fertilizer #70“ product to be manufactured.



1.6 Manufacturing Management Process

The overall purpose of the Manufacturing Management process is the integration for engineering, planning, production and distribution of goods under the consideration of costing and quality aspects. The Manufacturing Management function of ADempiere (formerly known as libero) is available with ADempiere Version 3.5.x.



1.6.1 Engineering Management

The purpose of Engineering Management is the definition (engineering) of manufacturing resources, products, workflows, and the bill of materials of parent products (BOMs).

1.6.2 Planning Management

The purpose of Planning Management is the basis for planning material requirements, get an overview of required manufacturing resources and use the planning data as base for distribution management.

1.6.3 Production Management

The purpose of Production Management is the setup of manufacturing orders in accordance with sales orders and forecasts under consideration of the just in time delivery of the required material.

1.6.4 Distribution Management

The distribution of the manufactured product is achieved via Distribution Management.

1.6.5 Quality Management

The purpose of Quality Management is to guarantee the quality of manufactured products. Actually this is a very basic implementation.

1.6.6 Costing Management

The purpose of Costing Management is the gathering of all costing, associated with the manufacturing of products, in order to verify the calculated prices.

2 Change Notice

2.1 Change Notice

Menu: Manufacturing Management < Engineering Management < Change Notice

The Change Notice is issued in the Change Notice field of Window: Bill of Materials & Formula
Tab: Parent Product

Bill of Materials & Formula 1000001 PatioSet SuperUser@GardenWorld.* [speed{localhost-ad351p02-adempiere}]

File Edit View Go Tools Window Help

Parent Product

Client: GardenWorld Organization: *

Search Key: PatioSet

Name: Patio Furniture Set

Description: 1 table, 4 Chairs and 1 Sun Screen

Comment/Help:

Active

Document No: 1000001

Valid from: 01/21/2003

Product: PatioSet_Patio Furniture Set

UOM: Each

BOM Type: Product Configure

Change Notice: Patio Furniture 1.0

Revision:

Valid to:

Attribute Set Instance:

BOM Use: Master

Components of the BOM & Formula

Record saved 2/2

2.1.1 Tab: Change Notice

Menu: Manufacturing Management < Engineering Management < Change Notice

Change Notice Patio Furniture 1.0 SuperUser@GardenWorld.* [speed{localhost-adempiere-adempiere}]

File Edit View Go Tools Window Help

Change Notice

Change Request

Requests (source)

Fixed Change Requests

Client: GardenWorld Organization: HQ

Name: Patio Furniture 1.0

Description:

Comment/Help:

Active

Detail Information:

Process Now

Data requered 1/1

2.1.2 Tab: Change Request

Menu: Manufacturing Management < Engineering Management < Change Notice

The screenshot shows a software window titled "Change Notice Patio Furniture 1.0 SuperUser@GardenWorld.* [speed{localhost-ad351p03-adempire}]". The window has a menu bar (File, Edit, View, Go, Tools, Window, Help) and a toolbar with various icons. On the left, there is a navigation pane with buttons for "Change Notice", "Change Request" (which is selected), "Requests (source)", and "Fixed Change Requests". The main area contains a form with the following fields: "Client", "Organization", "Change Request", "Document No", "Name", "Description", "Comment/Help", "Detail Information" (with an "Active" checkbox), and "Fixed in". The status bar at the bottom indicates "Navigate or Update record" and "-1/0".

2.1.3 Tab: Requests (source)

Menu: Manufacturing Management < Engineering Management < Change Notice

The screenshot shows the same software window as above, but with the "Requests (source)" tab selected in the navigation pane. The main area contains a form with the following fields: "Client", "Organization", "Change Request", "Request", "Document No", "Request Type", "Group", "Category", "Related Request", "Status", "Resolution", "Priority", "User Importance", "Summary", "Sales Representative", "Confidentiality", "Business Partner", "User/Contact", "Date last action", "Date next action", "Last Result", and "Product". The status bar at the bottom indicates "Navigate or Update record" and "-1/0".

2.1.4 Tab: Fixed Change Requests

Menu: Manufacturing Management < Engineering Management < Change Notice

The screenshot shows a software window titled "Change Notice Patio Furniture 1.0 SuperUser@GardenWorld.* [speed-{localhost-ad351p03-adempire}]". The window has a menu bar (File, Edit, View, Go, Tools, Window, Help) and a toolbar with various icons. On the left, there is a navigation pane with the following items: "Change Notice", "Change Request", "Requests (source)", "Fixed Change Requests" (which is selected), and "Detail Information". The main area contains several input fields: "Client" (empty), "Organization" (empty), "Change Notice" (empty), "Document No" (empty), "Change Request" (empty), "Name" (empty), "Description" (empty), and "Comment/Help" (empty). There is also an unchecked checkbox labeled "Active". At the bottom of the window, there is a status bar that says "Navigate or Update record" and a page indicator "-1/0".

2.2 BOM Change Notice

Menu: Manufacturing Management < Engineering Management < BOM Change Notice

The screenshot shows a software window titled "BOM Change Notice Patio Furniture 1.0 SuperUser@GardenWorld.* [speed-{localhost-ad351p01-adempire}]". The window has a menu bar (File, Edit, View, Go, Tools, Window, Help) and a toolbar with various icons. On the left, there is a navigation pane with the following items: "Change Notice", "BOM" (which is selected), "BOM Change Request", "Requests (source)", "Fixed Change Requests", and "Detail Information". The main area contains several input fields: "Client" (filled with "GardenWorld"), "Organization" (filled with "HQ"), "Name" (filled with "Patio Furniture 1.0"), "Description" (empty), and "Comment/Help" (empty). There is also a checked checkbox labeled "Active". At the bottom of the main area, there is a button labeled "Process Now". At the bottom of the window, there is a status bar that says "Navigate or Update record" and a page indicator "1/1".

3 Engineering Management

3.1 Resource Manufacturing

A **Manufacturing Resource** is defined as anything required for production and its unavailability can affect the Production Plan. Manufacturing Resources can be: *Plants, Production lines, Work Centers* and *Work Stations*.

It mainly answers the question: Where is the product made?

3.1.1 Resource Type

Menu: Manufacturing Management < Engineering Management < Resource Manufacturing < Resource Type

The **Resource Type Window** is the ADempiere standard option which it is used to calculate the available time for a resource. It allows input of *starting time* and *end time* for the slot according to the working days. For additional information, please have a look at Menu:Partner Relations < Service < Resource

The screenshot shows the ADempiere Resource Type window. The window title is "Resource Type Plants Plants SuperUser@GardenWorld.* [speed{localhost-adempiere-adempiere}]". The menu bar includes File, Edit, View, Go, Tools, Window, and Help. The toolbar contains various icons for navigation and actions. The main form area has the following fields: Client (GardenWorld), Organization (*), Search Key (Plants), Name (Plants), Description (empty), Active (checked), UOM (Hour), Allow UoM Fractions (unchecked), Product Category (Resources), Tax Category (Standard), Single Assignment only (unchecked), Time Slot (unchecked), Day Slot (checked), Monday (checked), Wednesday (checked), Friday (checked), Sunday (checked), Tuesday (checked), Thursday (checked), and Saturday (unchecked). The status bar at the bottom shows "Navigate or Update record" and "2/3".

The *Resource Type* field allows you to identify the capacity for this resource.

The activation of checkbox „Time Slot“ activates the definition of „manufacturing hours“ during a day. The activation of checkbox „Day Slot“ activates the definition of „manufacturing days“.

The available daily time will be calculated for every weekly working day selected, when you tick the *Day Slot*. The calculation to get the available time for a day subtracts the time when the slot starts, from the time when the slot ends.

The current supported unit of measurement for capacity is **Hour**.

3.1.2 Manufacturing Resource

Menu: Manufacturing Management < Engineering Management < Resource Manufacturing < Manufacturing Resource

The following fields are displayed to be set:

Manufacturing Resource Type, Planning Horizon, Queuing Time and Waiting Time.

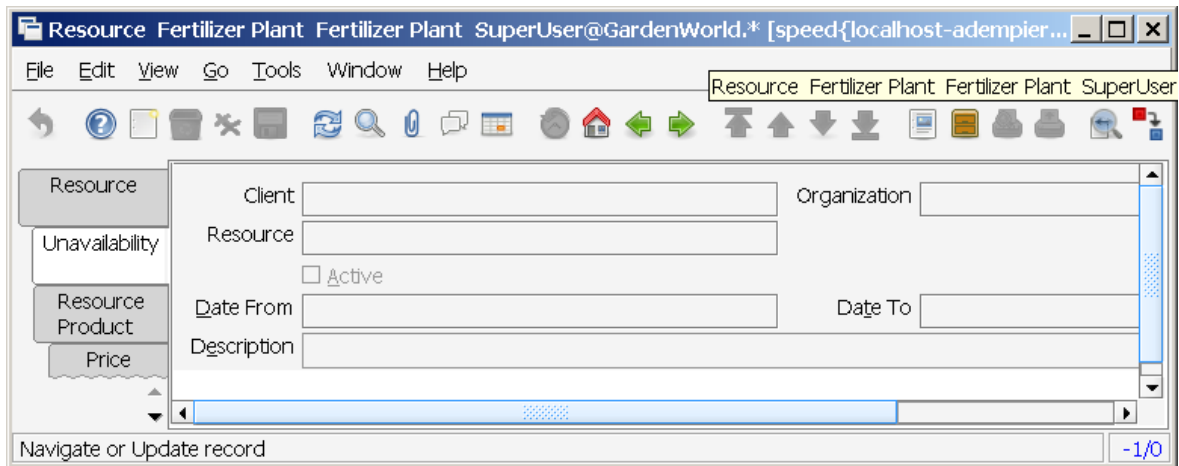
In the **Manufacturing Resource Type** field you can select a **Manufacturing Resource Type** among *Work station, Production Line, Work Center* or **Plant**. Normally a group of work stations will be integrated into a work center, a group of work centers in a Production line and a group of production lines in a **Plant**. This relation is build in a hierarchy which is used to accumulate the required and available capacity since the lower to the upper hierarchies for each resource.

The **Queuing Time** is the time a manufacturing order operation has to wait since it is moved to this operation until it starts to be worked.

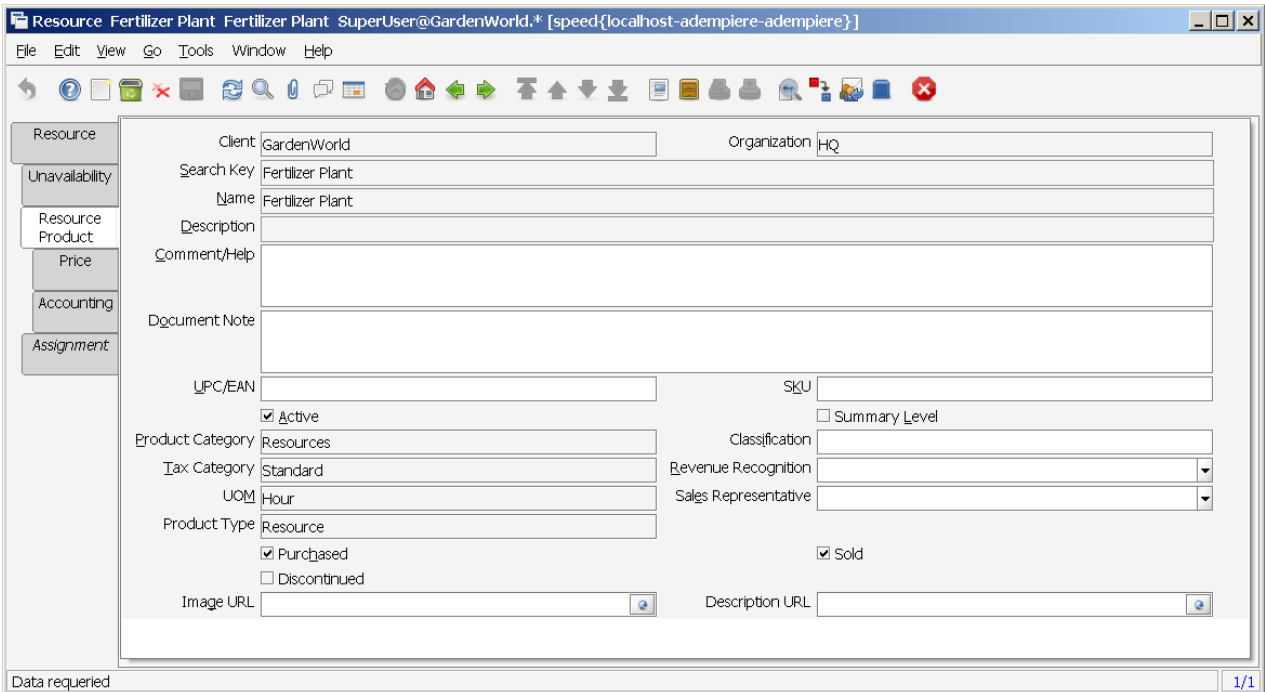
The **Waiting Time** is the time which normally a manufacturing order operation has to wait since it is finished until it is moved to the next operation or to the warehouse. Both, queue time and waiting time entered in the resource are used as default values for the nodes in the workflow.

You can enter *holidays, the planned cost* etc. as you need, when you enter the following Menu: Partner Relations < Service < Resource

Via the „Unavailability“ Tab one is able to define non-working days.

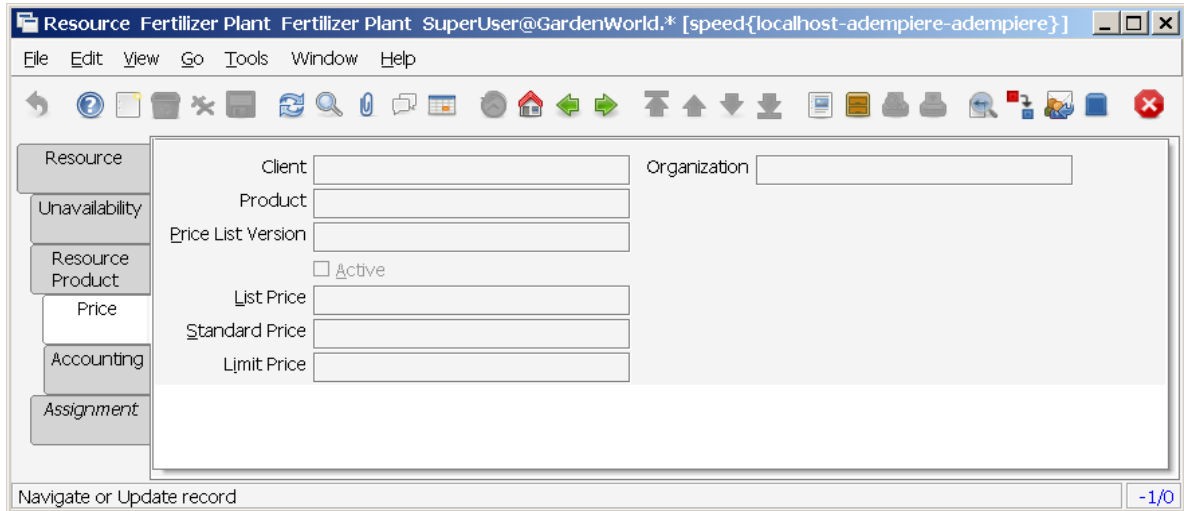


Display the product from a resource perspective.

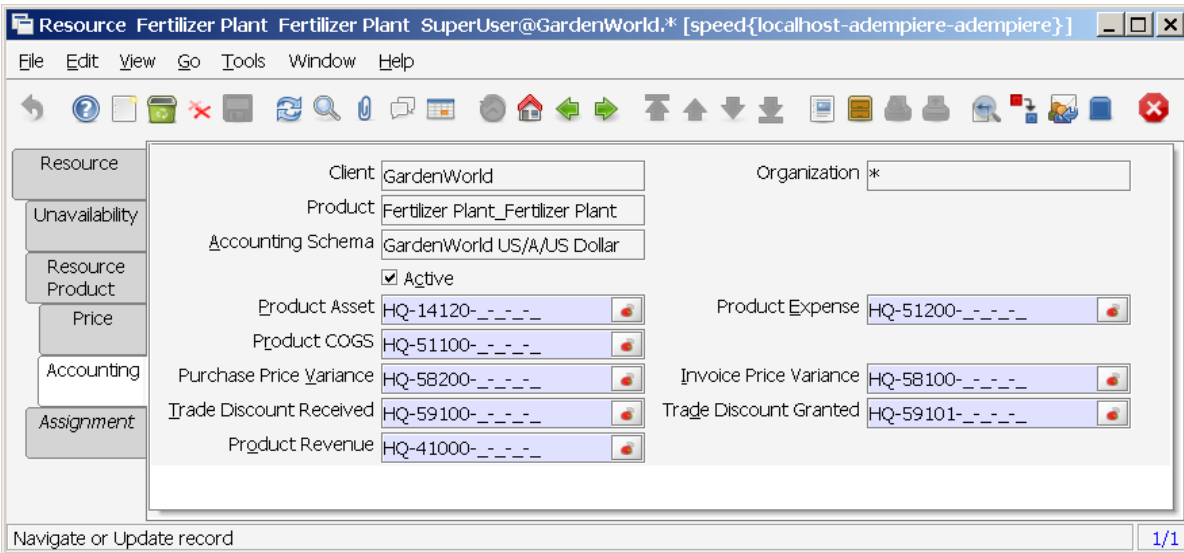


Not all fields on the tab are actually used.

There is the possibility to assign a pricelist to a resource. Not used at the moment.



The Accounting Tab does show the actual assignments of accounts.



3.1.3 Overview of the Manufacturing Resources

Overview of all defined Manufacturing resources

The screenshot shows a software window titled "Resource Fertilizer Plant Fertilizer Plant SuperUser@GardenWorld.*" displaying a table of manufacturing resources. The table has the following columns: Client, Organization, Search Key, Name, Description, Active, Resource Type, and User/Contact. The data is as follows:

| Resource | Client | Organization | Search Key | Name | Description | Active | Resource Type | User/Contact |
|------------------|-------------|--------------|----------------------------|----------------------------|-------------|-------------------------------------|---------------|--------------|
| | GardenWorld | * | Fertilizer Plant | Fertilizer Plant | | <input checked="" type="checkbox"/> | Plants | |
| Unavailability | GardenWorld | Fertilizer | Dry Area | Dry Area | | <input checked="" type="checkbox"/> | Work Center | |
| | GardenWorld | Fertilizer | Fertilizer Inspection Area | Fertilizer Inspection Area | | <input checked="" type="checkbox"/> | Work Center | |
| Resource Product | GardenWorld | Fertilizer | Furniture Plant | Furniture Plant | | <input checked="" type="checkbox"/> | Plants | |
| Price | GardenWorld | Fertilizer | Mixed Area | Mixed Area | | <input checked="" type="checkbox"/> | Work Center | |
| | GardenWorld | Fertilizer | Packing Production Line | Packing Production Line | | <input checked="" type="checkbox"/> | Work Center | |
| Accounting | GardenWorld | Furniture | Assembly Area | Assembly Area | | <input checked="" type="checkbox"/> | Work Center | |
| | GardenWorld | Furniture | Chrome Subcontract Area | Chrome Subcontract Area | | <input checked="" type="checkbox"/> | Work Center | |
| Assignment | GardenWorld | Furniture | Inspection Area | Inspection Area | | <input checked="" type="checkbox"/> | Work Center | |
| | GardenWorld | Furniture | Paint Area | Paint Area | | <input checked="" type="checkbox"/> | Work Center | |
| | GardenWorld | HQ | Mary | Mary Consultant | | <input checked="" type="checkbox"/> | Consultant | |

The bottom status bar says "Sorted: #11" and "1/11".

3.2 Manufacturing Workflows

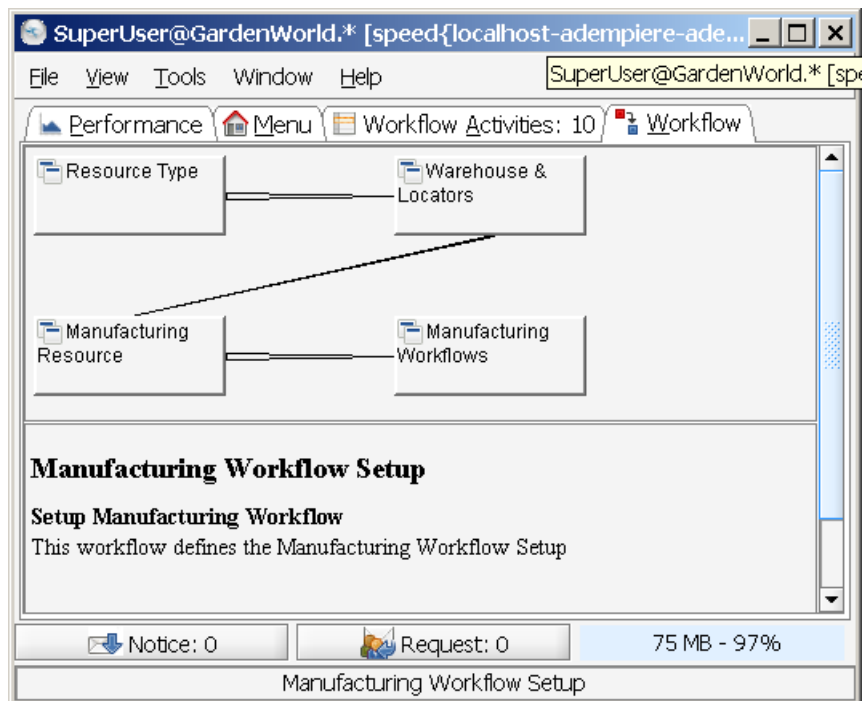
Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow

The Manufacturing Workflow (**Routing**) is a tool which allows to define the required activities to fabricate a product taking into account the process sequence, how long does it take the node (**operation**) and where it should be done.

To use **ADempiere Workflows** gives you a great flexibility for describing the production process. It answers the question: How should the product be made?

3.2.1 Manufacturing Workflow setup

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow < Manufacturing Workflow Setup

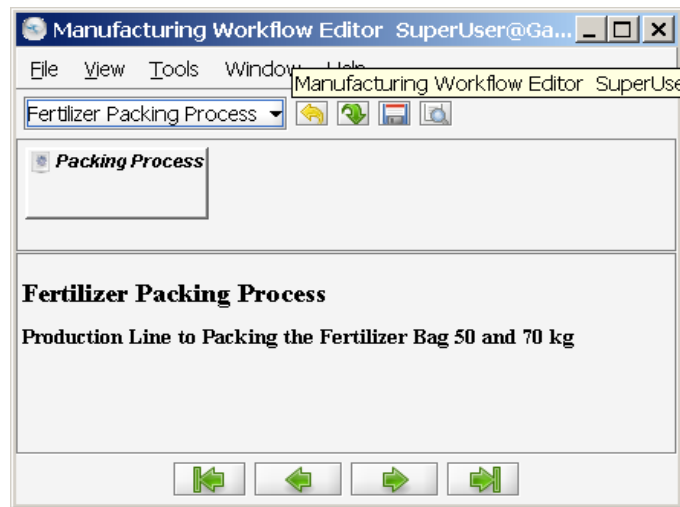


The Manufacturing Workflows Setup Window gives an overview about pre-requisit tasks to be checked.

- Resource Type (Chapter 3.1.1)
- Warehouse & Locators (Chapter ...)
- Manufacturing Resource (Chapter 3.1.2)
- Manufacturing Workflows (Chapter 3.2.2)

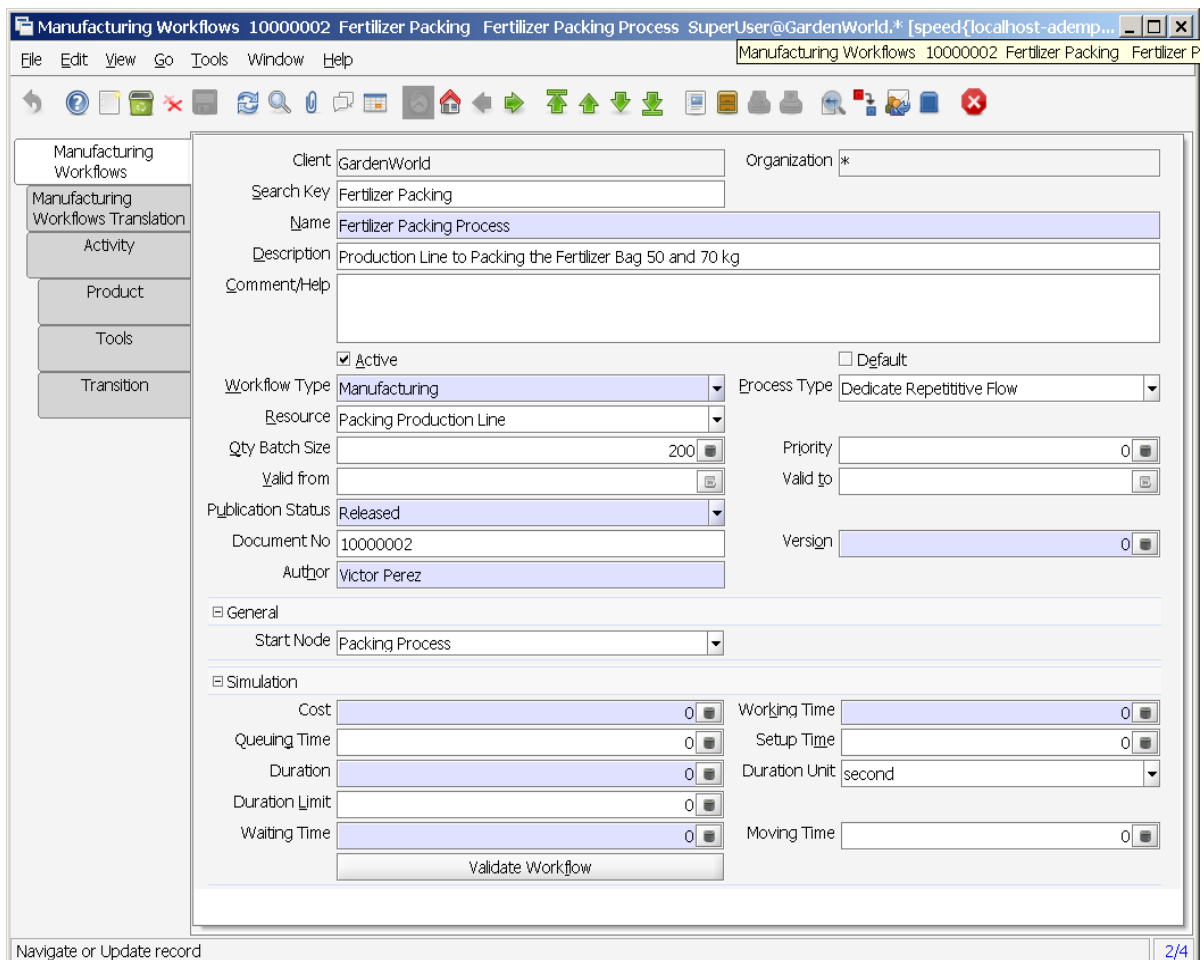
3.2.2 Window: Manufacturing Workflows

Via the *Window: Manufacturing Workflows* it is possible to define a workflow in order to manufacture a product in any organization of the client (Garden World / *) or in a specific organization within a client (Garden World / Fertilizer).



3.2.2.1 Manufacturing Workflows

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow < Manufacturing Workflows

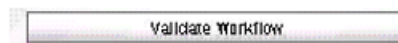


You must use the *Tab: Manufacturing Workflows* to enter the general information,

- Type the **Name** to identify this specific workflow. If the workflow name is the same as the product name this WF will be the default WF for the product.
- Enter a **Description** if you wish.
- The **Workflow Type** has to be set to „Manufacturing“.
- The **Process Type** is selected among several options depending on the characteristics of the process you want to manage. The Process Type is only a reference and has the next valid options according with the APICS classification:
 - Continuous Flow: Continuous flow usually refers to the production or processing of fluids, wastes, powders, basic metals, and other bulk items. An oil refinery crude oil into various petroleum products or a pipeline for water, oil, or natural gas are examples of continuous flow manufacturing and distribution processes.
 - Dedicated Repetitive Flow: Discrete parts such as shafts and connecting rods and discrete assemblies such as microcomputers may be produced by a repetitive flow process. The term dedicated implies that the production facility produces only one product, including product variances (such as color) that require no setup delay in the manufacturing process.
 - Batch Flow: Is functionally the same as the continuous or the repetitive, except two or more products are manufactured in the same facility. Because of long setup times in the batch flow shop, manufacturing runs for each product typically last several hours or several days.
 - Repetitive Flow Mixed Model: It is also used to manufacture two or more models. However, the changeover time between models is minimal, and the different models are intermixed on the same line.
 - Job Shop: is characterized by the organization of similar equipment by function (such as milled, drilled, turned, forging, and assembly). As jobs flow from manufacturing resource to manufacturing resource a different type of operation is performed in each manufacturing resource.
- The **Resource** field is a reference of the manufacturing resource where the work will be made (i.e. Packing Production Line).
- In **Qty Batch Size** you give the product quantity witch can be done by each batch. If we are going to produce more than 1 batch the system will schedule several batches in the manufacturing resource (production line), the quantity of each one will be taken from the pack size quantity to get the MO quantity required.
- **Priority** indicates how important is this entity, the valid entries are Hight, Medium or Low.
- In the field **Valid From-To** is registered the time period during the workflow is valid.
- The **Document No** is allocated by the system and it comes from the sequence defined in the Document Sequence menu option.
- **Author** is the person that created the record.
- The **Start Node** (Packing Process) shows the first activity (node) of the work flow.

- **Cost** is not used.
- **Queueing Time:** Currently is a reference where you enter the accumulated queue time for this WF. The Queue time is the time usually taken since the previous operation is finished, or the components were issued from the warehouse, until the current operation in a manufacturing order starts its process.
- The **Setup Time:** Currently is a reference where you enter the accumulated Setup time for this WF. The Setup time is the time required to execute the necessary activities in a manufacturing resource to be able to start the manufacturing process.
- **Duration:** Currently it is a reference where you enter the accumulated Duration for this WF. The Duration WF is the normal duration of a job, in duration units.
- **Duration Unit:** The time unit of measure for this group of fields (e.g. hours, minutes etc). Every time recorded in this work flow will be referenced at this Duration Unit.
- **Waiting Time:** Currently is a reference where you enter the accumulated Waiting time for this WF. The Waiting Time is the time a job remains at a manufacturing resource until it is moved to the next operation or to the warehouse if the operation is the last one.
- **Moving Time:** Currently is a reference where you enter the accumulated Move time for this WF. It is the estimated time to move the material through the manufacturing resources.

Clicking on the button **Validate Work** verifies that the work flow does not have errors.



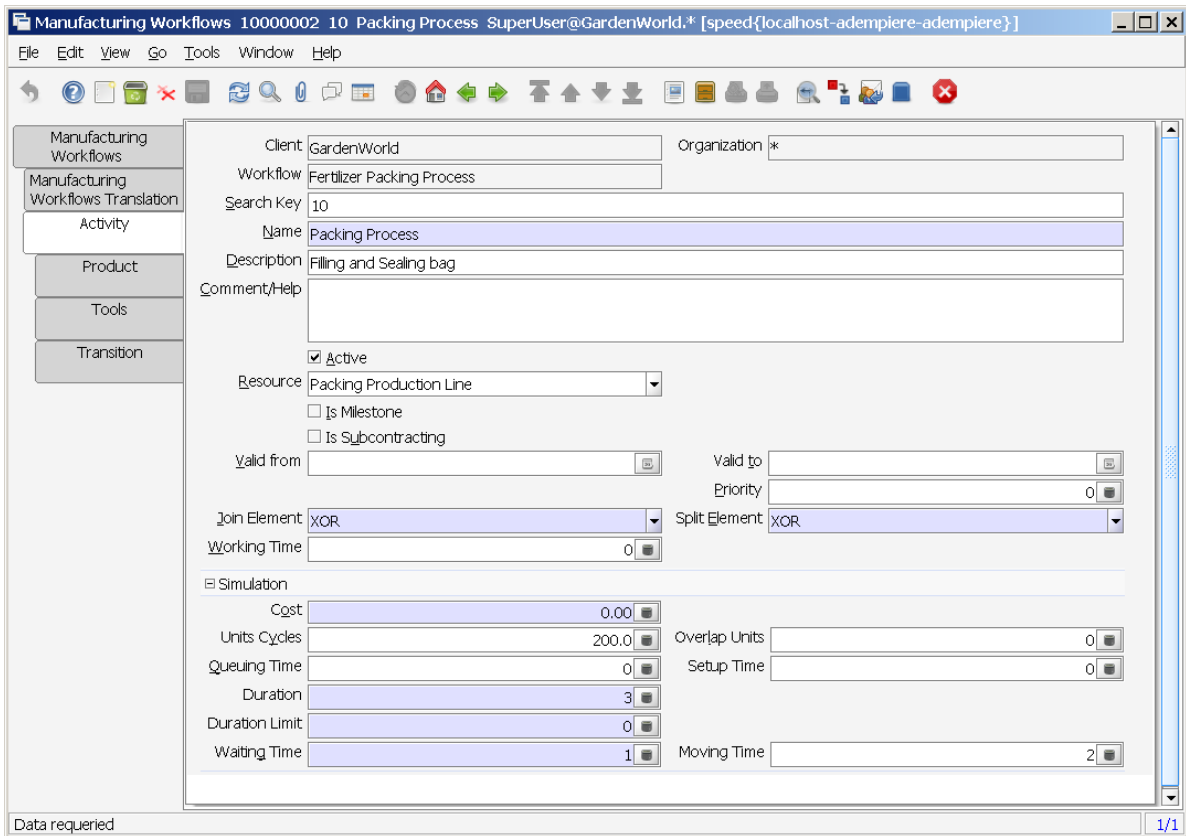
After the process validation has finished it shows the message correct (OK) if the workflow is correct (with a limited verification).

3.2.2.2 **Tab: Activity**

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Activity

In the Activity (Node) Tab, the required activities are defined

- Required: The field **Name** is used to identify the operations from the manufacturing routing.
- Optional: Use the **Description** for describing the operation.
- Optional: Use the **Comment/Help** for further advice to help the user.
- **Active**
- From the selection list Resource select the manufacturing resource (previously defined) where you want to execute the operation. For the product costing, the Resource rate is taken from the cost element introduced in the window Product Costing.
- **IsMilestone:** not used
- **IsSubcontracting:** if the check box Is Subcontract is selected, it indicates that this operation will be executed by an external Resource.
- The following fields are described and used as in the standard workflows:
 - Valid from, Valid to, Priority, Join Element, Split Element, Working Time

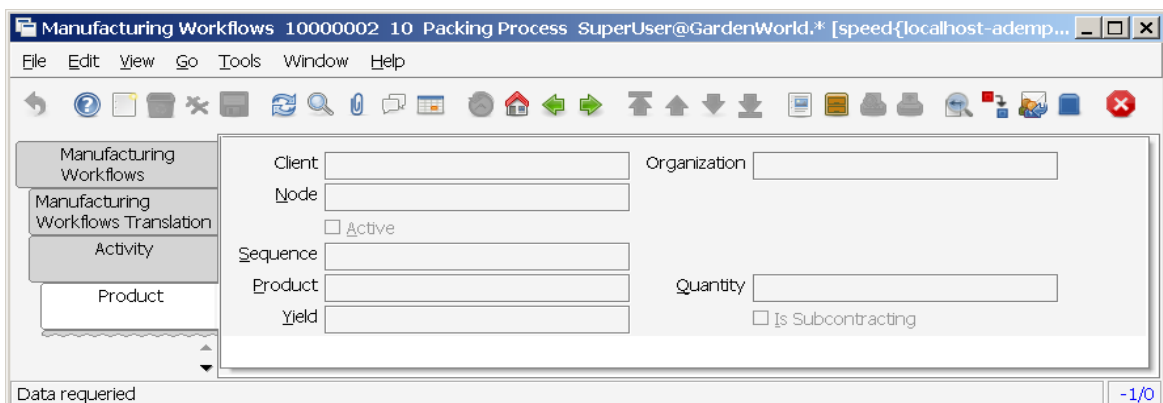


- The following fields are described in the previous chapter:
 - Working Time, Cost, Queuing Time, Setup Time, Duration, Duration Limit, Waiting Time, Moving time
- **Units Cycles** define

3.2.2.3 Tab: Product

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Product

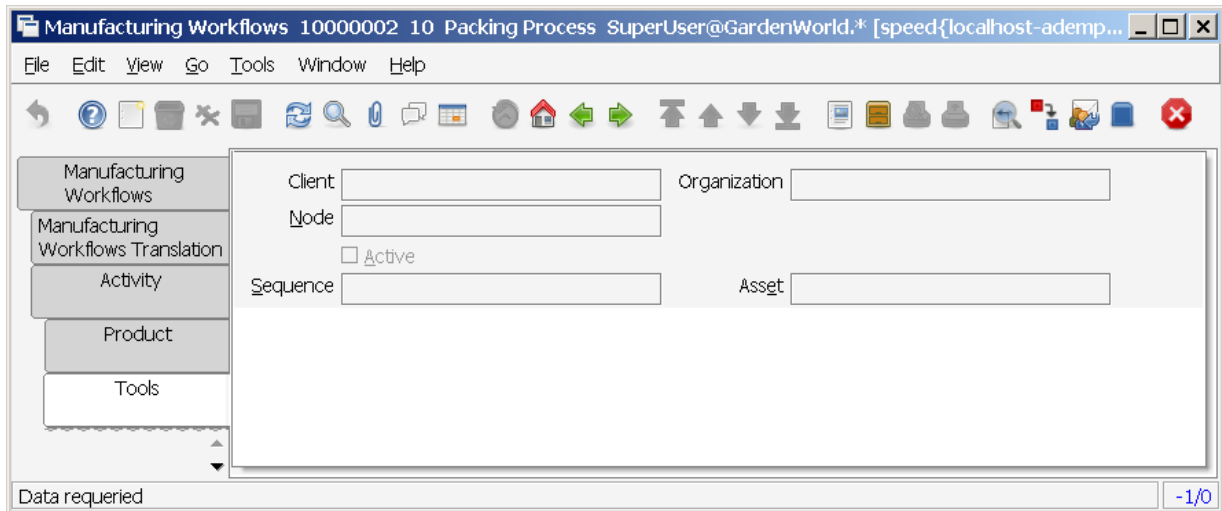
Within the Tab:Product it is possible to define manufacturing sequences for critical processes like in the chemical industry..



3.2.2.4 Tab: Tools

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Tools

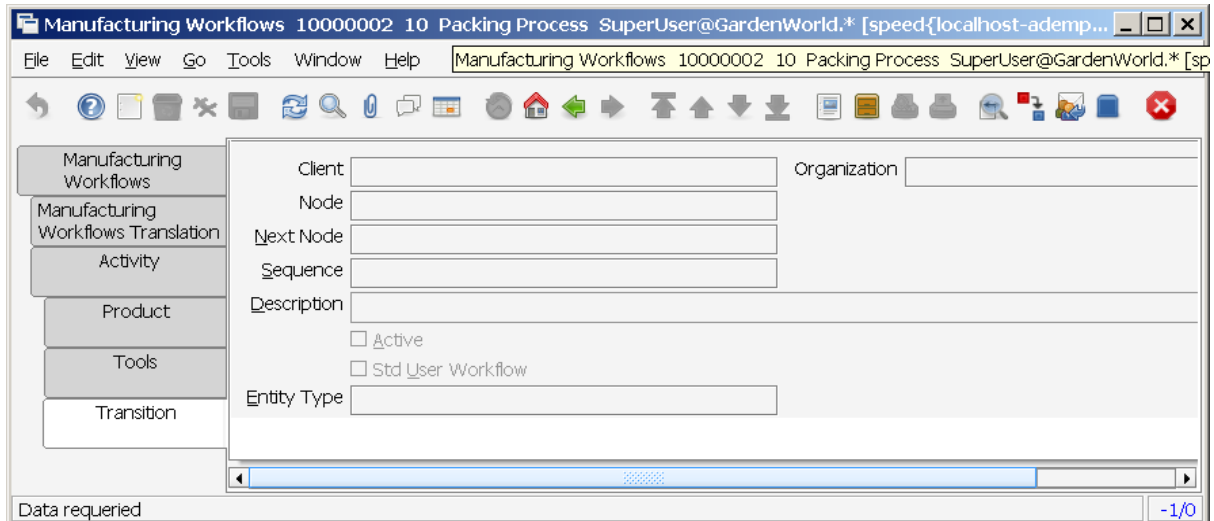
Only a screenshot, which is not used in this configuration. It just shows the parameters.



3.2.2.5 Tab: Transition

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Transition

Via Tab:Transition the next workflow activity is defined (if there are more than one).



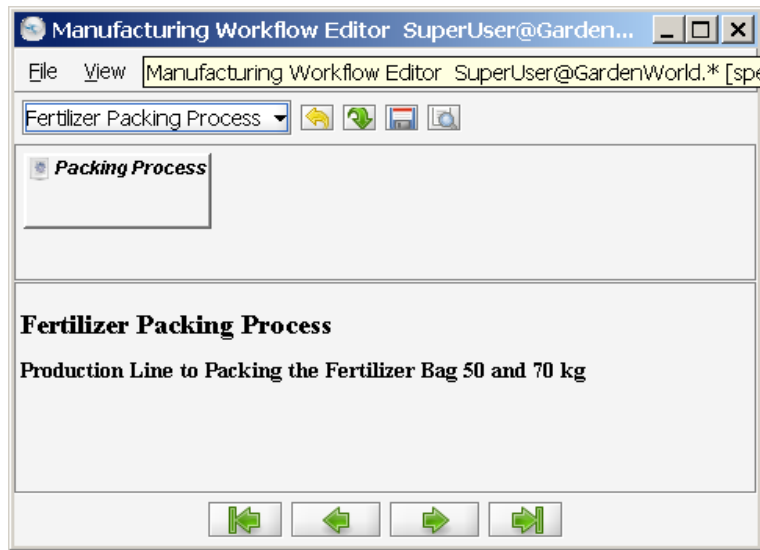
3.2.3 Workflow Editor

This Menu item does provide an interface to search for specific workflow to be edited. The required information to establish the sequence of nodes in the Tab:Activity and in the field Start Node field introduced in the Workflow Tab.

To be able to define a Manufacturing Schedule both forward or backward, the system uses the characteristics set in the Tab:Activity and the sequence from the Sequence tab.

By Work Flow Editor it is possible to visualize in graphic mode the operations of the production process and its execution sequence. At the same time you can see the information registered in the fields: Name, Description and Help from the Work Flow window.

When you select the zoom icon you get the Workflow window.

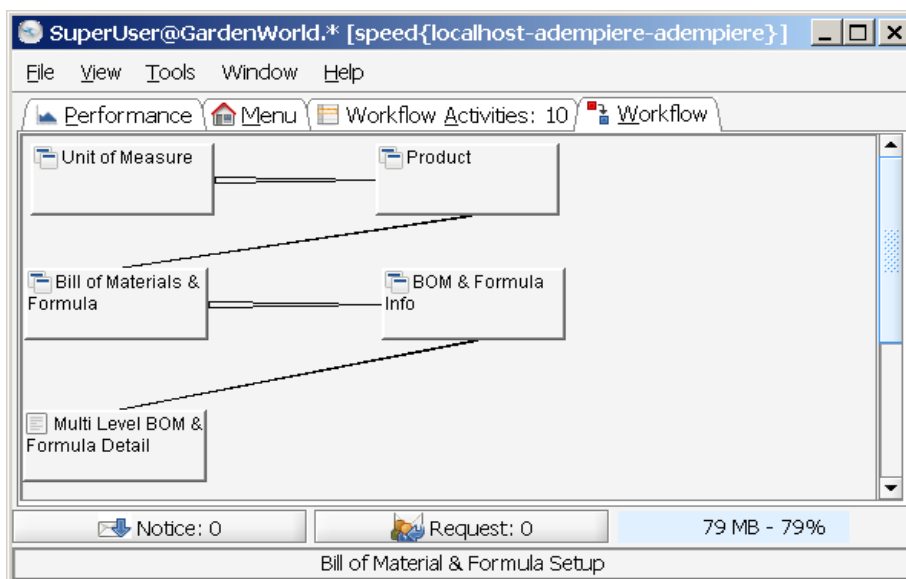


3.3 Bill of Material & Formulas

It is a list of all the subassemblies, intermediates, parts and raw material that go into a parent assembly showing the quantity of each required to make an assembly. There are a variety of display formats for bill of material, including single level bill of material, indented bill of material, modular (planning), costed bill of material, etc. May also be called “formula,” “recipe”, “ingredients list” in certain industries. It answers the question, what are the components of the product?

3.3.1 Bill of Material & Formula Setup

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Bill of Material & Formula Setup



3.3.2 Bill of Materials & Formula

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Bill of Materials & Formula

In the Bills of Material Tab the following fields are required to identify in a specific way the bills of Material: Client, Organization, Search Key and Name.

Additionally with the Engineering Change Document number you can track the modifications made to the BOM. The sequence of the ECD is allocated by the system using the Sequence entered for this Document Type.

Initially, create a BOM Product within Material Management < Material Management Rules < Product. This is achieved, selecting the BOM checkbox. This Product definition is required, like the example of „Fertilizer #70“. Don't forget to run BOM Verify, after all data in the required tabs within Window:Product have been entered. This process will set the checkbox verified.

The following example of Fertilizer #70 is used to explain the dependancies:

The screenshot displays the 'Bill of Materials & Formula' window for '50004 Fertilizer#70'. The 'Parent Product' tab is active, showing the following fields:

- Client: GardenWorld
- Organization: *
- Product: Fertilizer #70_Fertilizer #70
- Attribute Set Instance: *
- Search Key: Fertilizer #70
- UOM: Each
- Name: Fertilizer #70
- Description: 70 # Bag of Lawn Fertilizer
- Comment/Help: (empty)
- Active:
- Change Notice: (empty)
- Document No: 50004
- Revision: (empty)
- Valid from: 09/22/2007
- Valid to: (empty)
- BOM Type: Current Active
- BOM Use: Manufacturing

Below the fields is a table titled 'Components of the BOM & Formula':

| Line No | Product | Component Type | UOM | Attribute Set Instance | Description | Comment/Help | Active | Change Notice |
|---------|----------------------------|----------------|----------|------------------------|-------------|--------------|-------------------------------------|---------------|
| 10 | Fertilizer_Lawn Fertilizer | Component | kilogram | | | | <input checked="" type="checkbox"/> | |
| 20 | Bag70_Bag 70 Kg | Packing | Each | | | | <input checked="" type="checkbox"/> | |

In Tab:Parent Product (Bill of Material) the following fields are required:

- Client, Organization, and Name to identify in a unique way the bill of material and the Engineering Change Document Number used to track the modification.
- **Product:** Fertilizer # 70, which will set the Search Key, too.
- **UOM:** The manufacturing Unit of Measure is introduced and will be taken into account for the quantities entered for the components.
- **BOM Type:** Set to „Make-to-order“
- **BOM Use:** Manufacturing

- The **Revision** field shows the number of revision you have made for this BOM and the Valid from and Valid to indicates the valid period for this BOM (In that period you can use de BOM in a manufacturing order).
- The detailed information every required component are defined within the group: **Components of the BOM & Formula**. All components must have been defined as products in „Material Management“.
- The required information in the Bill of Materials is the Product child and the Attribute Set Instance.
- The Valid From and Valid To dates indicate the valid time period to use the BOM in a Manufacturing Order.

The following picture will show the component „Lawn Fertilizer“ as bill of material for product „Fertilizer #70“.

The screenshot displays the 'Bill of Materials & Formula' window for '50004 Fertilizer#70'. The main area is titled 'Components of the BOM & Formula' and contains the following fields and options:

- Line No:** 10
- Product:** Fertilizer_Lawn Fertilizer
- Component Type:** Component
- UOM:** kilogram
- Attribute Set Instance:** (empty)
- Description:** (empty)
- Comment/Help:** (empty)
- Active**
- Valid from:** 09/22/2007
- Valid to:** (empty)
- Is Qty Percentage**
- Quantity:** 70.0
- Is Critical Component**
- % Scrap:** 1.0
- Quantity Assay:** 0
- Issue Method:** BackFlush
- Backflush Group:** (empty)
- Lead Time Offset:** 0

At the bottom, there is a 'Data required' field with a value of 1/ and a 'Copy BOM Lines From' button. The status bar at the bottom indicates 'Navigate or Update record' and '6/7'.

The Component Type Selection List has the next options:

- **Component:** identify a raw material, ingredient, part, or subassembly that goes into a higher level assembly, compound or other item.
 - **By Product:** This entity is a non scheduled product gotten as a consequence of another production process. It has a sales value but it is minimum.
 - **Option:** Define Option, if the product is supposed to be optional.
 - **Phantom:** indicates the product is a fictitious assembly, that is to say, a set of components that are grouped only to make easier the analysis in a separated way from the rest of the BOM. When the MRP generates a requirement of the phantom and the

projected on hand is not available, the process goes to the lower level and start a new MRP cycle but does not create Planned Orders for the phantom product.

- Packing: This product will not be taken into account to calculate the total quantity of components when the IsQtyPercentage check box is ticked.
- Planning: The parent product will be used for the planning process of the different options of similar products. (e.g. 30 % bread with fiber and 70 % bread without fiber)
- Tools: The product is a tool which is going to be used in a production operation.
- Variant: Define Variant for Product Configure BOM
- **IsQtyPercentage:** means you need to introduce the quantity of the component as a percentage of all the components. If you do not click the IsQtyPercentage checkbox then you need to introduce in the Qty field the quantity of the component to produce a unit of measure of the parent product.
- **IsCritical checkbox:** if selected, a manufacturing order will not be released to the shop floor if this component is not on hand.
- **Quantity Assay:** enter a percentage of components that will be used to make a test.
- **Scrap:** is introduced as a component percentage factor that is expected not to be useful as a part of the parent production.
- **Issue Method:** permits you to select between Issue or Backflush.
 - If you choose **issue** you need two steps, first you issue the components from the warehouse and after production you need a second warehouse movement of receiving the finished product into the warehouse.
 - If you choose **backflush** in one single movement you receive the finished product in the warehouse and automatically you issue the components required from the warehouse.
- **Backflush Group:** is used in order to group components that you want to issue together in a Backflush process.
- **Lead Time:** offset is the number of days after you start to produce the finished product when you need this component.

3.3.3 BOM & Formula Info

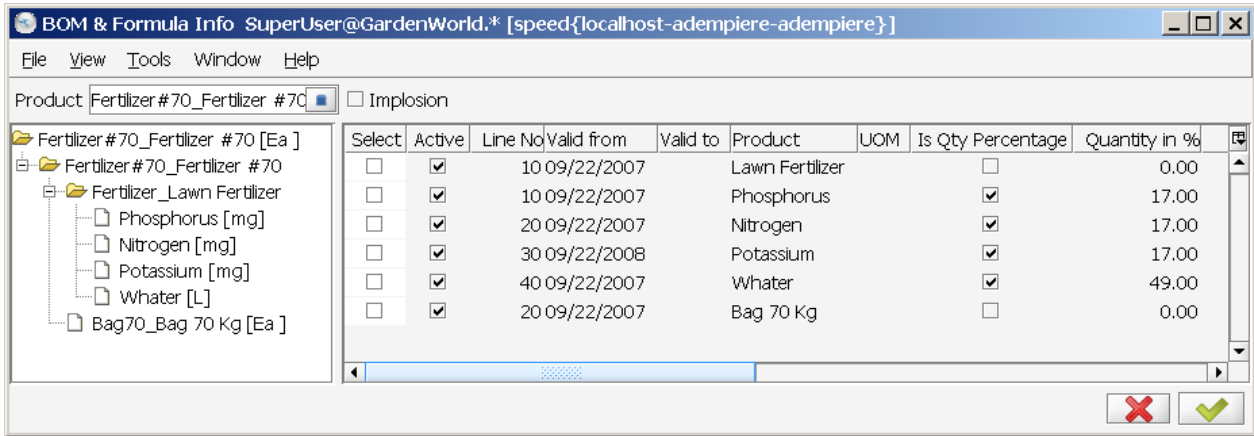
Menu: Manufacturing Management < Engineering Management < Bill of Material & Formulas < BOM & Formula Info

The BOM & Formula Review option menu shows in two different panels the parent-component relationship for the product entered in the Product field.

You need to introduce the parent product you want to see its components then click the OK button, next drag the left margin of the panel to the right and you will have the two panels.

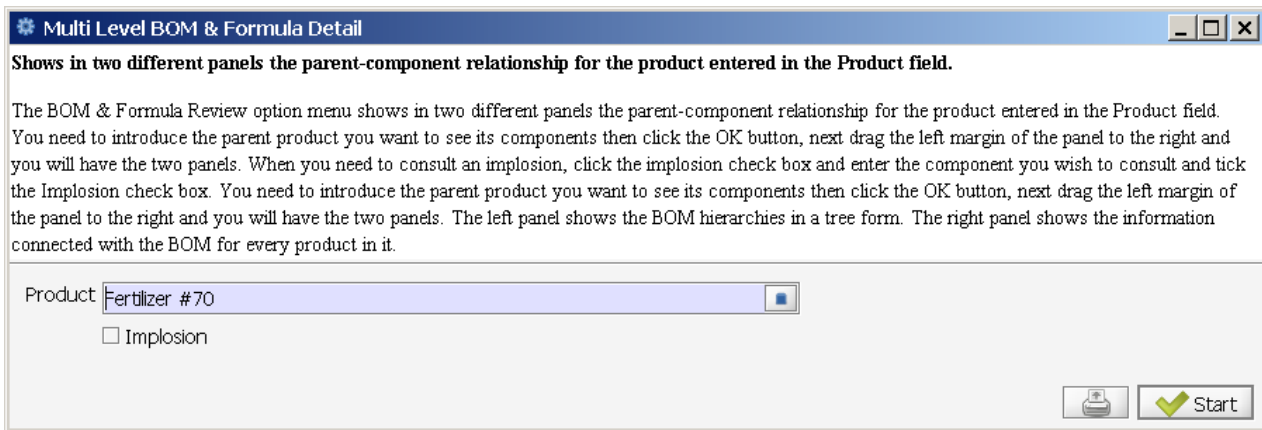
When you need to consult an implosion, click the implosion check box and enter the component you wish to consult and tick the Implosion check box.

The left panel shows the BOM hierarchies in a tree form. The right panel shows the information connected with the BOM for every product in it. To get more information around the meaning of the fields please refer to the upper section of this Chapter.

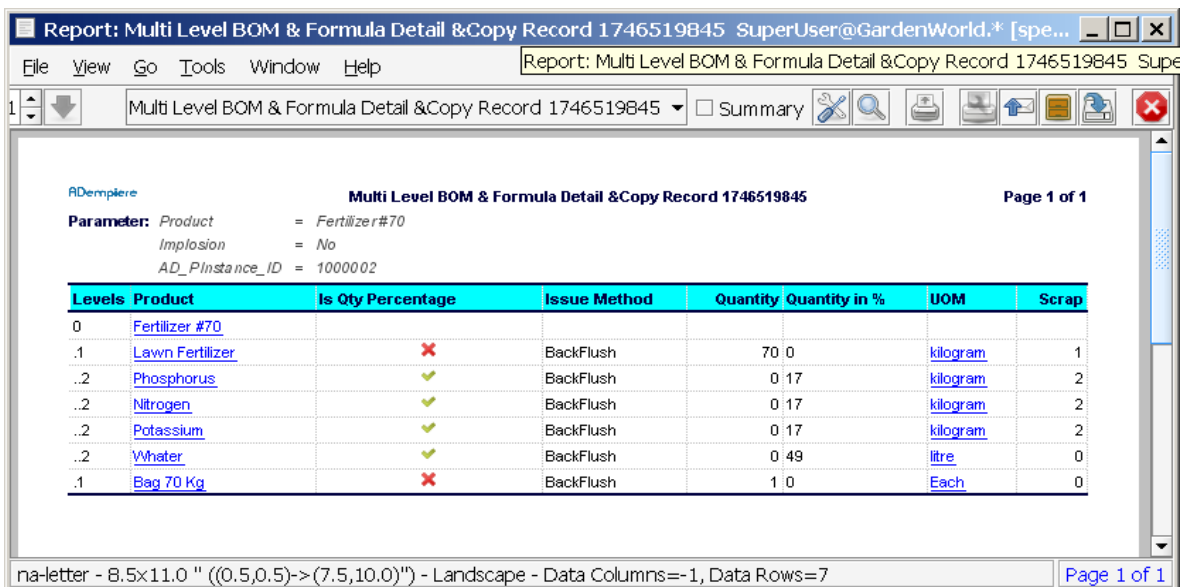


3.3.4 Multi Level BOM & Formula Detail

Menu: Manufacturing Management < Engineering Management < Bill of Material & Formulas < Multi Level BOM & Formula Detail



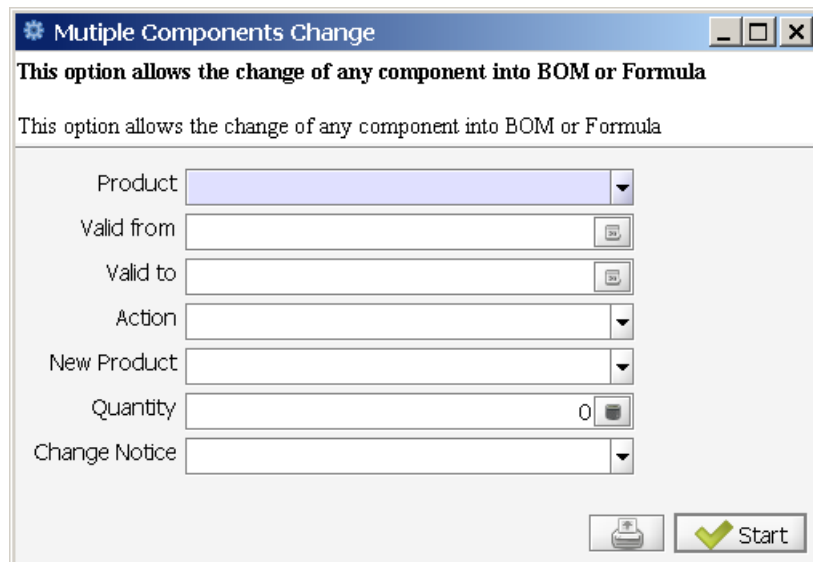
The levels displayed in the first row of this process is the result of running process „Calculate Low Level“ as part of the „Material Requirement Planning (MRP)“. The levels will be set in the product table of „Material Management“.



3.3.5 Multiple Components Change

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Multiple Components Change

This process is used for changes to BOM structures. Just the Window is shown, no testing has taken right now by the author.



3.3.6 Product Configuration BOM

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Product Configuration BOM (known as BOM Drop function)

This function has been developed in order to generate testing data. The following description is taken from previous alpha release 3.5.1a documentation.

Before dropping a BOM into a sales order (SO), it is necessary to create a non-complete SO (Standard Order with DocNo:50000_0) with just the Order and no order-line. The Order Line will be set due to the execution of this function. The _0 for DocNo 50000_0 does mean, that there i a cost value of 0.

The Product Configuration BOM is only visible, when the BOM product has been be verified and the BOMTYPE=ProductConfigure and BOMUSE=Master.

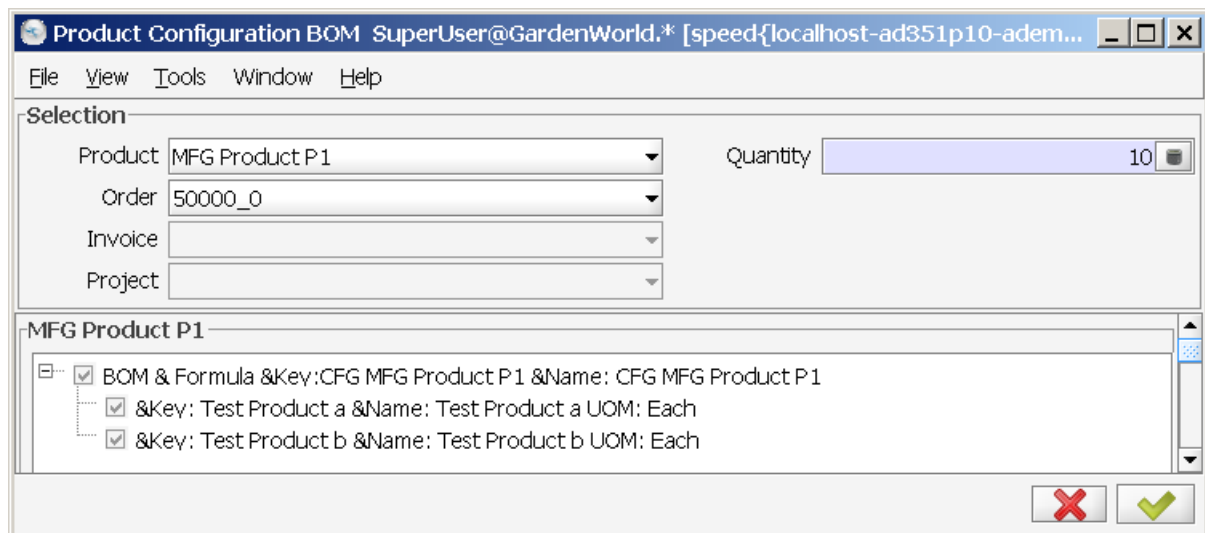
BOMTYPE and BOMUSE combinations and their meaning.

Vn = Valid n (--> Rule n and Meaning), I = Invalid , U = Unknown

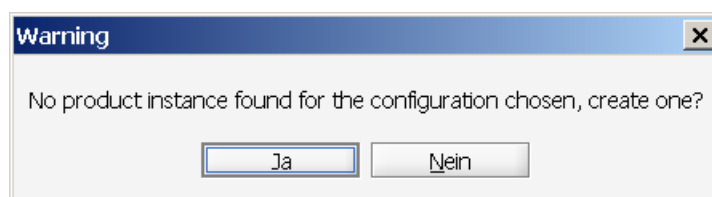
| BOM Type/Use | Master | Engineering | Manufacturing | Planning | Quality |
|----------------|--------|-------------|---------------|----------|---------|
| Current Active | V1 | U | U | U | U |
| Make to Order | U | U | U | U | U |

| | | | | | |
|-------------------|---|---|----|---|---|
| Previous | U | U | U | U | U |
| Previous Spare | U | U | U | U | U |
| Future | U | U | U | U | U |
| Maintenance | U | U | U | U | U |
| Repair | U | U | U | U | U |
| Product Configure | U | U | V2 | U | U |

- V1 = Default
- V2 = Required for



After hitting the OK Button, the following warning is displayed. The warning tells the user, that there is no OrderLine right now, and ask if to proceed (ja = yes / German Windows Language) or nein = no. We continue with JA.



Without any further message the process ends. We have to verify, that the SO 50000 has now an Order Line added.

We will see, that the quantity of 10 Products has been taken into account, calculated correctly. The Sum is added to this Order Line.

4 Planning Management

Before the manufacturing process will be started, it is necessary to plan all activities which are required to deliver all required components and material in time. Planning Management does answer the question: What is the optimal input for manufacturing to fulfill sales orders in time and keep warehouse costs at a minimum.

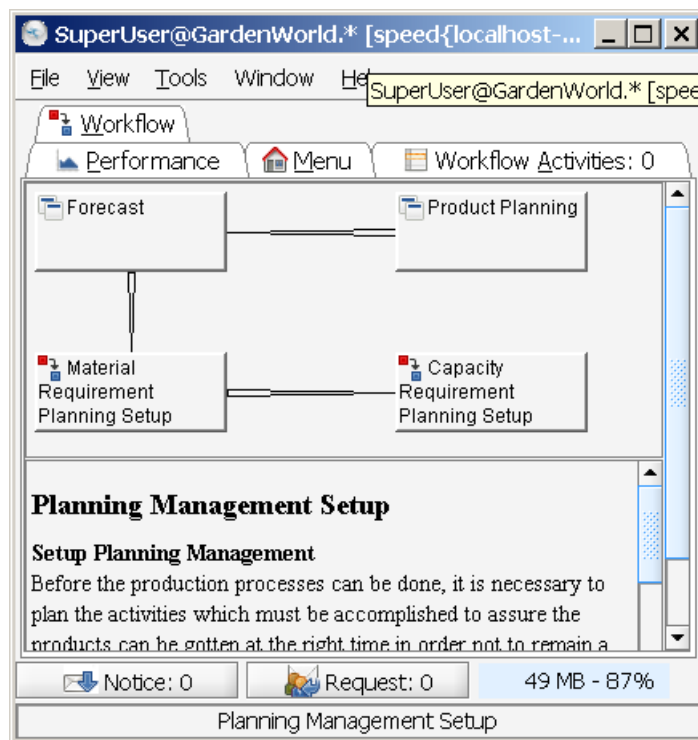
Another subject to take into account are the production costs and the capacity of shipping good quality products.

Using Production Planning answers the question: When and How Many products we must get?

4.1 Planning Management Setup

Menu: Manufacturing Management < Planning Management < Planning Management Setup

The Planning Management Setup provides an overview about the required actions.



Before the production processes can be started, it is necessary to plan the activities which must be accomplished to assure that the products are available at the right time, in ordered quantity and quality. This is necessary in order to keep cost at a minimum and keep manufacturing going.

4.2 Product Data Planning

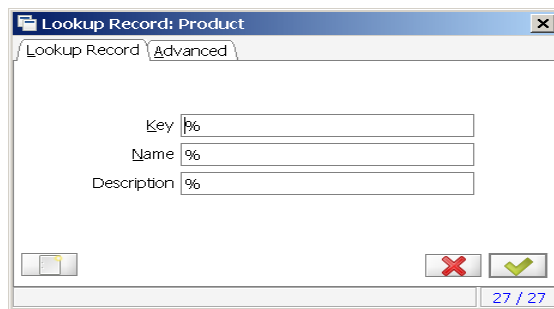
Additionally to the data loaded in the Product window, where the characteristics of each product are defined, you enter the product information in the Window: Product Planning which will serve as a base to execute the algorithms of Material Requirement Planning, along with PMP, open orders and inventories.

Menu: Manufacturing Management < Planning Management < Product Data Planning < Product Planning.

4.2.1 Product Planning

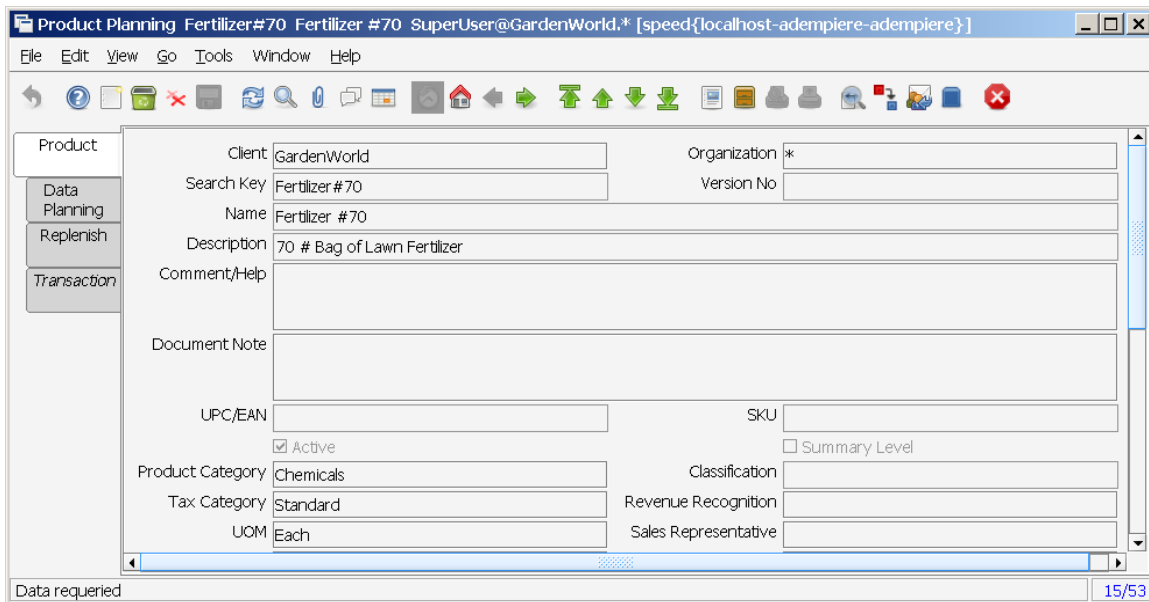
Menu: Manufacturing Management < Planning Management < Product Data Planning < Product Planning.

In the Window:Product Planning one has to select the product for the planning process. In our sample case Fertilizer #70.



4.2.1.1 Tab: Product

In the Tab: Product the product information of the MProduct is displayed, but with other Tabs as in Material Management.



In the subordinate tabs, planning data is inherited from the master tab.

4.2.1.2 Tab: Data Planning

- **Resource:** A manufacturing resource is a place where a product will be made.
- **Warehouse:** place where you locate and control the products
- **Planner:** ...
- **BOM & Formula:**
 - This field will be considered the default BOM to produce the product Fertilizer #70 in this Organization-Plant-Warehouse.
 - If one will not fill this field the default BOM & Formula for this entity will be the BOM/Formula which has the same name as the product.
- **WorkFlow:**
 - The Workflow you introduce in this window will be considered the default Workflow to produce the product in this Organization-Plant-Warehouse.
 - If you do not fill this field the default Workflow for the entity will be the Workflow with the same name as the product.
- *Is MPS*
 - You indicate the product in this Organization-Plant-Warehouse can satisfy a demand from the Master Production Schedule
- *Is Create Plan*
 - indicates MRP must create planned orders for this Product-organization-warehouse (HQ-Warehouse)
 - Need to use the Tab: Replenishment and control the inventory level using the Replenish

Report.

- *Required Calculate MRP*

- Indicates a change in some element which affect the MRP Calculation for this product, i.e BOM, Orders, Inventory, PMP, etc. and therefore you need to recalculate the MRP to adjust the Planned Orders to the new conditions and to get the updated action messages.

- No recalculation done.

- The **Time Fence** is the number of days since you execute the MRP process inside of which the system must not change the planned orders. The system will generate action messages warning if some order needs to be modified or created into the time fence .

- In the **Promised Delivery Time** field you must enter the average number of days to receive the product in the warehouse since you approve the requisition or manufacturing order until you receive the material in the warehouse . If the product is bought you must register the calendar days required since you make the PO until you receive the material in the warehouse. If the product is manufactured in your plant you must register the number of working days since you release the MO until you receive the material in the warehouse.

- **Transfer Time** is the number of days the product needs to be moved from one warehouse to another.

- **Order Policy** is referred to the way MRP should adjust Planned Order to the Organization-Warehouse-Resource needs. The valid options are:

- Fixed Order Quantity

- Lot for Lot

- Period Order Quantity

- Use Fixed Order Quantity when you always need to ask the same Quantity of product, this Quantity is entered in the field Order Qty.

- If the order policy is not FOQ and you enter a quantity in the Order Qty field, this quantity is the Economic Order Quantity.

- The Lot for Lot Policy means MRP process must generate one planned order for each demand not satisfied.

- The Order Period Quantity policy refers to the way MRP create one single planned order with every net requirements for a certain number of days. this days are entered in the field Order Period.

- *Is Issue*

- When this product is a component of a MO, it will be issued from the warehouse.

- This component will be taken from the shop floor inventory.

- *Is Phantom*

- Indicates the product is a virtual assembly, that is to say when the MRP require a phantom and it is on hand MRP take it as a supply but if the on hand quantity required is not complete, instead of generate a planned order for this phantom product MRP look for the components and continue the process

- ?

- If amount is registered in Order Qty is indicated that this is the economic batch size.

- When you enter a quantity in the Order Pack Qty field, the Planned orders should be created in multiples of this quantity. , this is useful when the vendor only sells fixed quantities of products or when by effects of the MRP calculation you get fraction of products which must be gotten in integer quantities.
- Minimum Order Quantity is used when the orders should be done at least for this quantity because of vendor policies or fabrication limitations. The MRP process will use this quantity when the calculated planned order is for a smaller quantity than the Minimum Order Quantity then MRP creates the planned order for the Minimum Order Quantity. The system generates a message warning this quantity change.
- Order max is the maximum order quantity and it is used when the orders should be done at the maximum for this quantity because of vendor policies or warehouse limitations. The MRP process will use the quantity calculated to create the planned order but generates a message warning the quantity is greater than the maximum quantity.
- In the field Working Time you enter the accumulated time (using the Promising Delivery Time) in the critical path of the BOM for this product. It is the required time to produce the product as if you would not have any component on hand.
- In the Yield field enter the percentage of the product you expect will satisfy the QA specifications vs the total quantity to be produced.
- The remaining tabs are part of the ADempiere Product window please refer to the Reference Manual.

4.2.1.3 Tab: Replenish

Depends on *Tab:Data Planning* - *Is create Plan*

TBD.

Product Planning Fertilizer:#70 Fertilizer #70 SuperUser@GardenWorld.* [speed{localhost-adempiere-adem...]

File Edit View Go Tools Window Help Product Planning Fertilizer #70 Fertilizer #70 SuperUser@GardenWorld.* [sp

Product

Data Planning

Replenish

Transaction

Client

Organization

Product

Warehouse

Active

Replenish Type

Minimum Level

Maximum Level

Navigate or Update record -1/0

4.2.1.4 Tab: Transaction

TBD.

The screenshot displays a web-based application interface for 'Product Planning Fertilizer#70'. The window title bar includes the user 'SuperUser@GardenWorld.*' and the browser address. The interface features a top menu bar (File, Edit, View, Go, Tools, Win) and a toolbar with various navigation and utility icons. On the left, a vertical sidebar contains four tabs: 'Product', 'Data Planning', 'Replenish', and 'Transaction', with 'Transaction' currently selected. The main content area is a form with the following fields and controls:

- Client: Text input field
- Organization: Text input field
- Product: Text input field
- Attribute Set Instance: Dropdown menu
- Active: Checkable box
- Locator: Text input field
- Movement Quantity: Text input field
- Movement Date: Text input field
- Movement Type: Text input field
- Shipment/Receipt Line: Text input field
- Phys.Inventory Line: Text input field
- Move Line: Text input field
- Production Line: Text input field
- Manufacturing Order: Text input field
- Project Issue: Text input field
- Manufacturing Order BOM Line: Text input field

The status bar at the bottom of the window displays the text 'Navigate or Update record' and a page indicator '-1/0'.

4.2.2 Create Product Planning

In order to facilitate to load planning data of similiar products, one can run teh process „Create Product Planning“ and this process will create the data planning register for every product, which fits the parameters: Product Category, Warehouse and Resource. One must indicate the planning parameters defined in the last section for every Product Category, Warehouse and Resource Set. Every Product which does fit with these three parameters will hava a data planning record with the same data planning values you enter in this form.

You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.

The meaning of the fields are explained in the previous section of this Chapter.

Create Product Planning

This process will create the data planning register for every product

In order to facilitate to load the data planning of similar products, you can run the process Create product Planning and this process will create the data planning register for every product which fits the parameters: Product category, Warehouse and Resource. You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.

Product Category: Standard

Warehouse: Fertilizer

Resource: Fertilizer Plant

Is Create Plan

Is MPS

Network Distribution:

Workflow: Fertilizer Packing Process

Time Fence: 0

Transfert Time: 0

Safety Stock Qty: 0

Minimum Order Qty: 0

Order Max: 0

Order Pack Qty: 0

Order Qty: 0

Working Time: 0



Yield: 0

Promised Delivery Time: 0

Order Policy: Fixed Order Quantity

Order Period: 0

Planner:

Create Product Planning

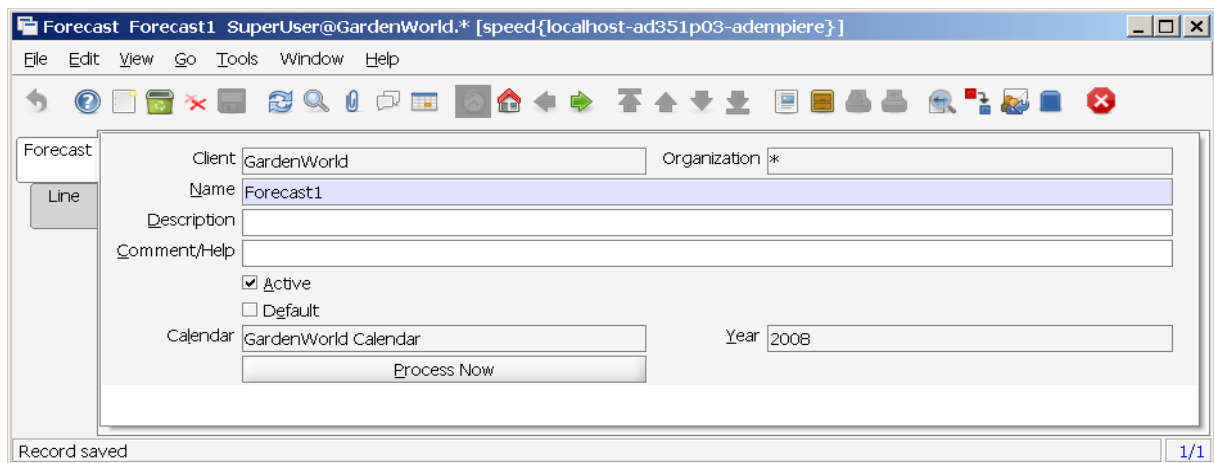
This process will create the data planning register for every product

In order to facilitate to load the data planning of similar products, you can run the process Create product Planning and this process will create the data planning register for every product which fits the parameters: Product category, Warehouse and Resource. You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.

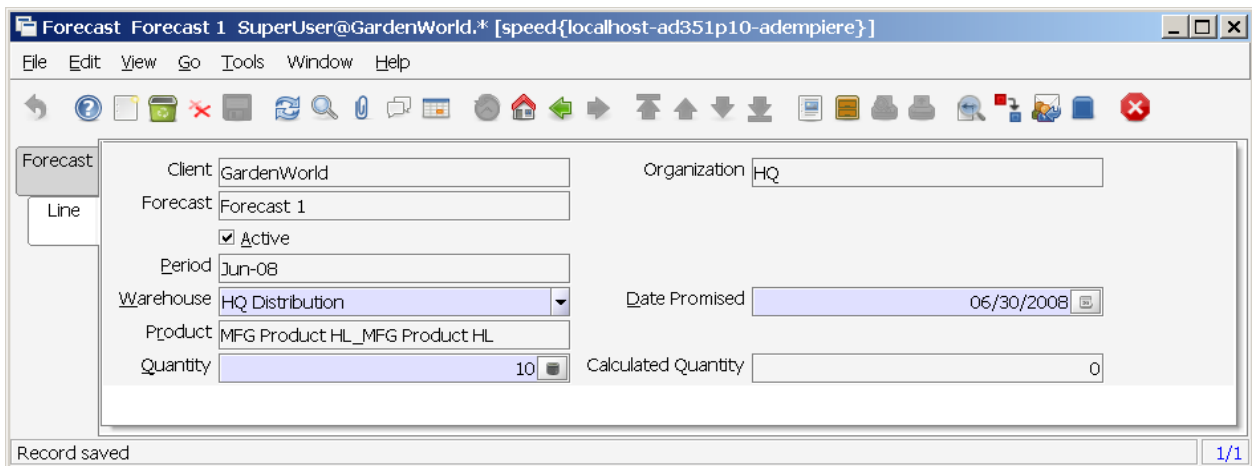
** ok

4.3 Forecast Management



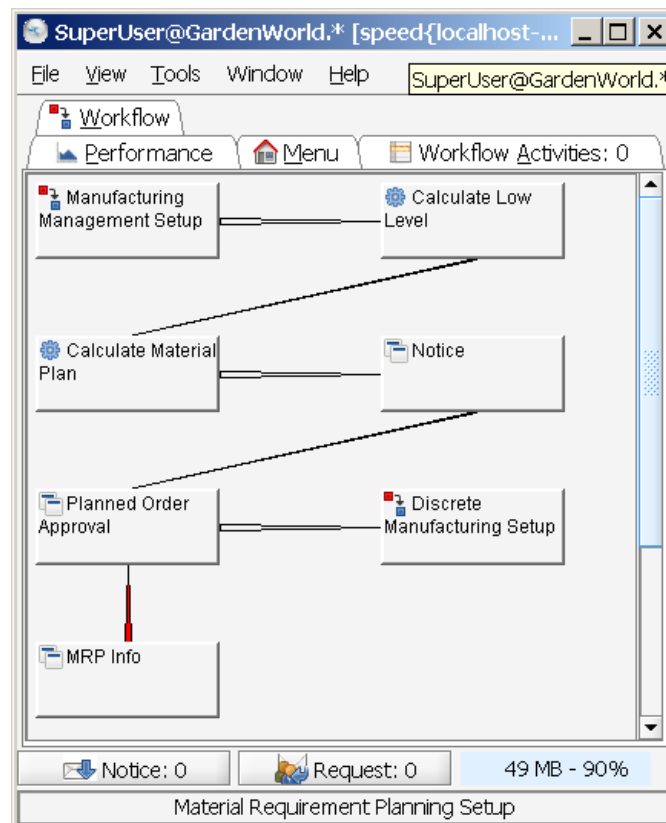
What will happen when Button Process Now is clicked ? --- nothing I can see right now.
I think the result can be seen in MRP Info as FCT (Forecast).



4.4 Material Resource Planning – MRP

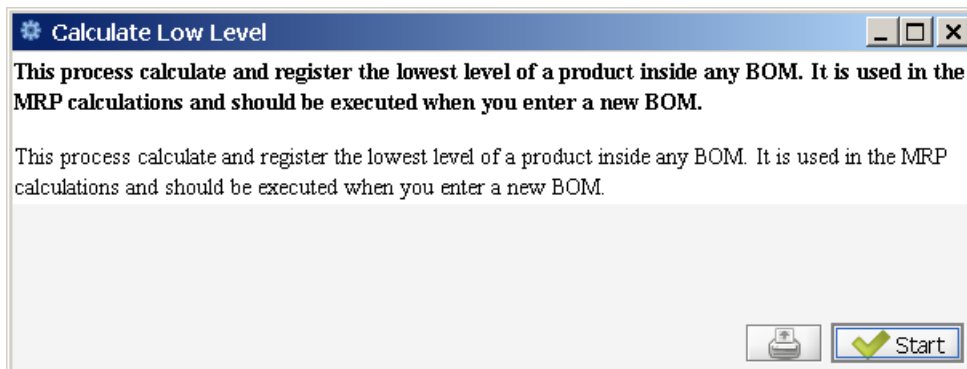
MRP is a set of techniques which uses Bills of Material, Inventory Data and Master Production Schedule (MPS) to calculate requirements for materials. It does create planned manufacturing orders to balance demand and supply for products and it does issue recommendations to receipt material with the right quantities and just in time to satisfy the MPS in the most efficient way.

4.4.1 Material Requirement Planning setup



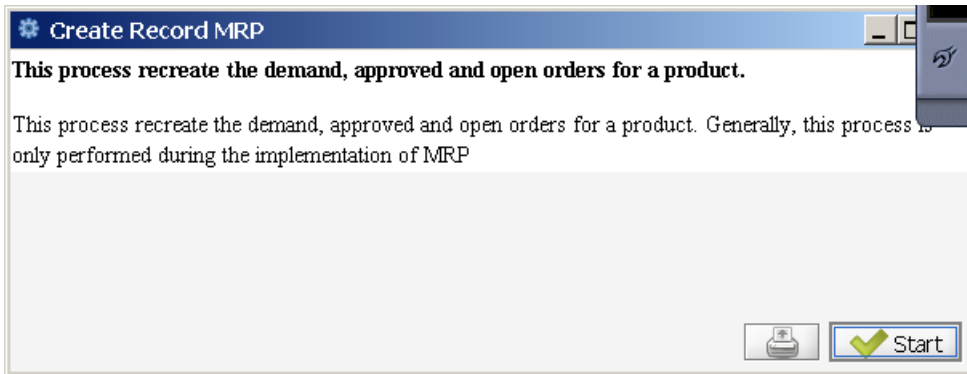
4.4.2 Calculate Low Level

This process calculate and register the lowest level of a product inside any BOM. It is used in the MRP calculations and should be executed when you enter a new BOM.



4.4.3 Create Record MRP

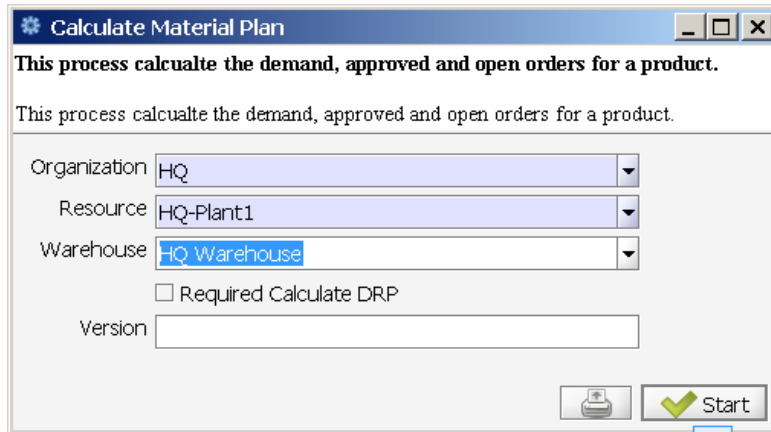
This process recreate the demand, approved and open orders for a product.




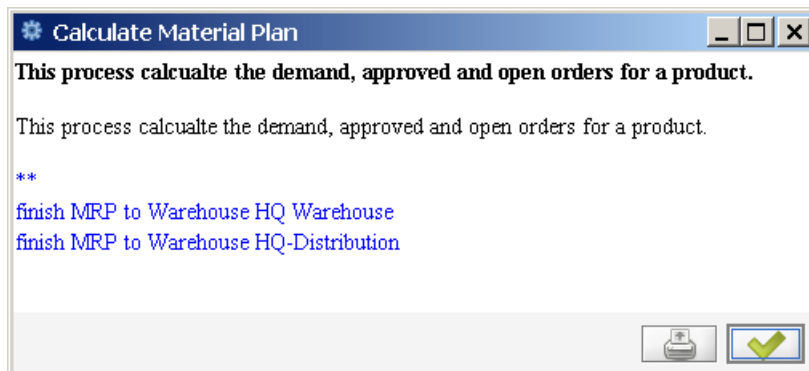
4.4.4 Calculate Material Plan

Menu: Manufacturing Management < Planning Management < MRP

Click the option **Calculate Material Plan** to start the calculation. A dialog box is displayed informing the process of data global load is going to start.



When selecting  the following window will appear. **Actually there is no plan.**



It is displayed a form which ask you to enter the Organization for which you wish to make a material plan and the version of this plan. You can have several versions in such a way you can decide the most convenient version you want to use.

4.4.5 MRP Info

Menu: Manufacturing Management < Planning Management < MRP < MRP Info

| Key | Name | Resource | Warehouse | Date Promised | Gross Reqs. | Schedule Receipt | Plan Orders | Proj QOH | Details | TypeMRP | Document No | Document Status |
|-----|----------------|----------------|-----------------|---------------|-------------|------------------|-------------|----------|---------|---------|-------------|-----------------|
| | MFG Product HL | MFG Product HL | HQ Distribution | 06/30/2008 | 10.00 | | | -10.00 | D | FCT | IP | |

PatioSet has TypeMRP = FCT (Forecast). On Lookup Record the result is seen in chapter 4.2.4.

In the heading you enter the Product, Plant, Warehouse and the period of time when you want to inquiry the demands and supplies. As usually if you left blank a parameter all the possibilities will be considered.

Then you press the refresh button and two sets of data are displayed: In the upper panel the product planning data and the product on hand are displayed. In the lower one are shown the information around the Manufacturing Resource where the product will be made, the demand and supply Warehouse and the information for both documents of demand and supply.

The fields shown are:

- The Gross Requirements are the Demand quantity. The demand source can be an Independent demand (Sales Order, Forecast) or the components required for a manufacturing order (dependent demand).
- Date Promised is the due date for the demand or supply.
- Scheduled Receipts shows the supply orders quantities which will be receipted with its due date. The source of the scheduled receipts can be an open purchase order, a requisition, an open manufacturing order or any planned order.
- The Projected Quantity On Hand is calculated from the starting on hand showed in the heading adding the supplies and subtraction the Gross Requirements. Negative quantity on hand indicates is necessary to generate a planned order to satisfy the demand in such a way at the end of the MPS the projected quantity on hand must be at least zero.
- The Details column has two possible entries, D and S. D indicates the order generates a demand (the product is a component of a MO, a product of a SO line or a forecast line). A S code indicates the order generates a supply (the product is a finished product of a MO, a product included in a PO line or a requisition).
- The Type column indicates the type of demand or supply, the valid types are:
 - SOO – Sales Order, Open
 - POO – Purchase Order, Open
 - POR – Purchase Requisition
 - MOP – Manufacturing Order Planned

- The Order Column shows us the Order Document Number
- The possible States of the Order are:
 - DR – Draft
 - NA – Not Approved
 - IP – In Process (Firm Planned)
 - CO – Complete
- Manufacturing Resource-Type
 - *MANUFACTURINGRESOURCETYPE_AD_Reference_ID=50008;*
 - *MANUFACTURINGRESOURCETYPE_ProductionLine = "PL";*
 - *MANUFACTURINGRESOURCETYPE_Plant = "PT";*
 - *MANUFACTURINGRESOURCETYPE_WorkCenter = "WC";*
 - *MANUFACTURINGRESOURCETYPE_WorkStation = "WS";*

4.4.6 Action Messages

It is a group of messages generated for the MRP process. It indicates to the scheduler the actions he needs to do to reach the Master Production Schedule. The action messages are set as notices for the planner when he sign up the Compiere session.

The possible action messages are:

| MRP Code | Action Message |
|-----------------|--|
| MRP - 001 | Beginning Quantity Less Than Zero. |
| MRP - 020 | Create - A Supply Order should be created to satisfy a negative projected on hand balance. This message is only generate if Create Plan is No or if a new requirement appears the time fence. |
| MRP - 030 | De Expedite - Indicates that a scheduled supply order is due before it is needed and should be delayed, or demand rescheduled to an earlier date. |
| MRP - 040 | Expedite - Indicates that a scheduled supply order is due after is needed and should be rescheduled to an earlier date, or demand rescheduled to a later date. |
| MRP - 050 | Cancel - Indicate that a scheduled supply order is no longer needed and should be deleted. |
| MRP - 060 | Release Due For - Indicate that a schedule order should be released. |
| MRP - 070 | Release Past Due For - Indicate that a supply order was not released when it was due, and should be either released or expedited now, or the demand rescheduled for a later date. |
| MRP - 080 | Quantity Less than Minimum - Indicates that a supply order was created for a quantity less than the minimum quantity set in the product planning |
| MRP - 090 | Quantity Less than Maximum - Indicates that a supply order was created for a quantity for a quantity greater than than maximum quantity set in the product planning |
| MRP - 100 | Past Due Time Fence - Indicates that there is an unsatisfied material requirement inside the planning time fence for this item. You should either manually schedule and expedite orders to fill this demand or delay fulfillment of the requirement that created the demand. |
| MRP - 110 | No exists Demand Warehouse - indicates that the product planning is not set Demand |
| MRP - 120 | No exist supply warehouse - indicates that the product planning is not set supply |

4.4.7 MRP Notice

Menu: Manufacturing Management < Planning Management < MRP < MRP Notice

The screenshot shows a web browser window titled "MRP Notice SuperUser@GardenWorld.* [speed{localhost-ad351p01-adempiere}]". The browser's address bar and menu bar are visible. The main content area contains a form with the following fields and controls:

- Client: GardenWorld
- Organization: *
- Message: (highlighted in red)
- User/Contact: SuperUser
- Workflow Activity: (empty)
- Table: (empty)
- Reference: (empty)
- Text Message: (empty)
- Description: (empty)
- Created: (empty)
- Record ID: (input field)
- Acknowledge:
- Delete Notices: (button)

The status bar at the bottom indicates "Inserted" and "+?1/1".

4.4.8 MRP Details

Menu: Manufacturing Management < Planning Management < MRP < MRP Details

The screenshot shows a web browser window titled "MRP Details". The main content area contains a form with the following fields and controls:

- Show the detail of MRP calculation (text)
- Show the detail of MRP calculation (text)
- DateStart: (input field)
- Date Promised: (input field)
- TypeMRP: (dropdown menu)
- Type: (dropdown menu)
- Is MPS:
- Document Status: (dropdown menu)
- Start: (button with a green checkmark)

- DateStart
- Date Promised
- Type MRP
 - FCT
 - MOP
 - POO
 - POR
 - SOO

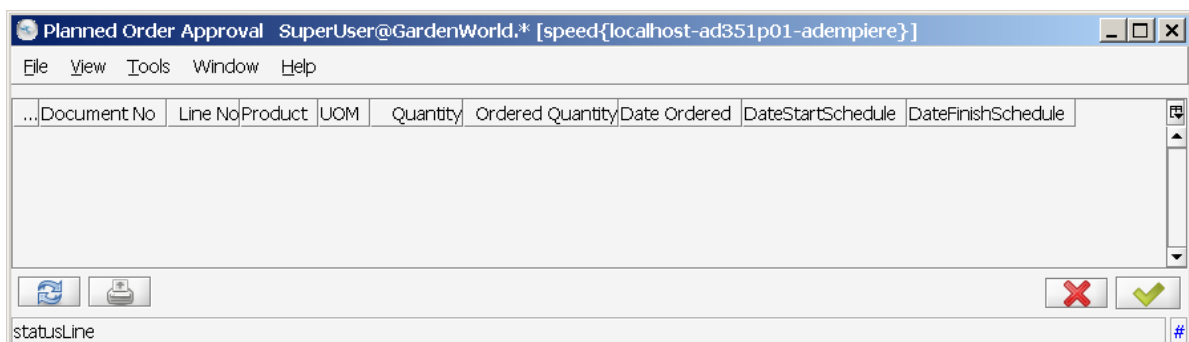
- Type
 - D – Order generates a Demand
 - S – Order generates a Supply
- isMPS
 - checked
 - unchecked
- Document Status
 - Approved
 - Closed
 - Completed
 - Drafted
 - In Progress
 - Invalid
 - Not Approved

4.4.9 Planned Order Approval

Menu: Manufacturing Management < Planning Management < MRP < Planned Order Approval

A planned manufacturing order is a manufacturing order suggested by the MRP process and contains its quantity and its release and promise dates. when you approve a manufacturing planned order you convert it in a manufacturing order with the status of *In Process*.

When you approve a planned order you are telling the system that the manufacturing order is ready to start its process with the approval you change the order status from *Draft* to *In Process*.



Actually there is an error when press the OK button.

4.5 Capacity Requirements Planning - CRP

Menu: Manufacturing Management < Planning Management < CRP

The process of Capacity Plan Calculation allows us to know the available time in each manufacturing resource, as well as the required time to satisfy the Master Production Schedule (MPS). It is a set of techniques which uses the planned manufacturing orders by MRP, open manufacturing resources and the workflows to calculate the required time for each resource along

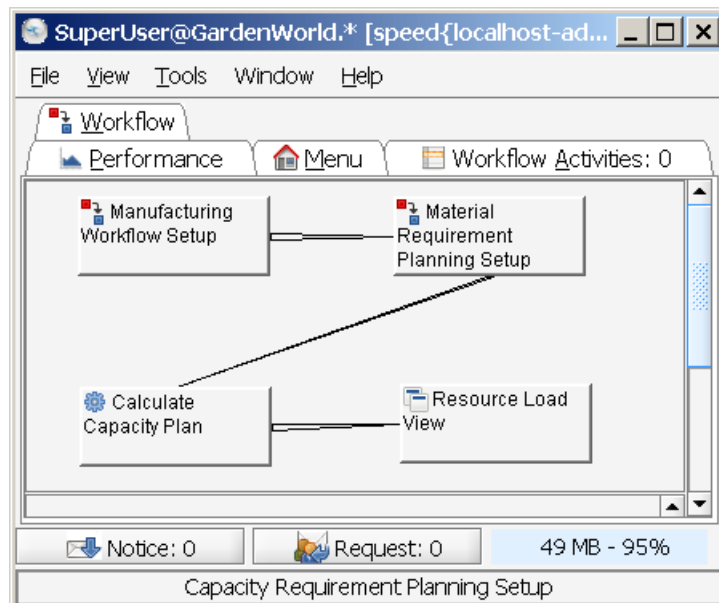
with the available time. With this information, we are able to balance the time demand with the available time. Though the knowledge of the required and available capabilities it is possible to adjust the MPS until we arrive at a realistic time.

It is a set of techniques which uses the planned orders by MRP, open manufacturing orders, manufacturing resources and the work-flows to calculate the required time for each resource along with the available time. With this information, we are able to balance the time demand with the available time. Through the knowledge of the required and available capacities it is possible to adjust the **Master Production Schedule(MPS)** until we arrive at a realistic one.

CRP answers the question: Is the available capacity sufficient to satisfy the required time demand at each manufacturing resource?

4.5.1 Capacity Requirement Planning Setup

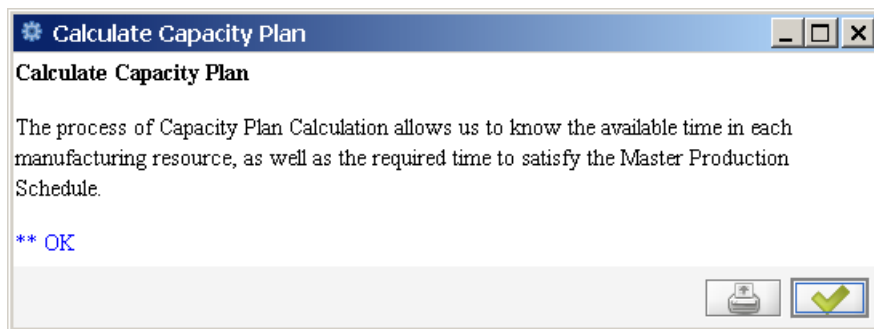
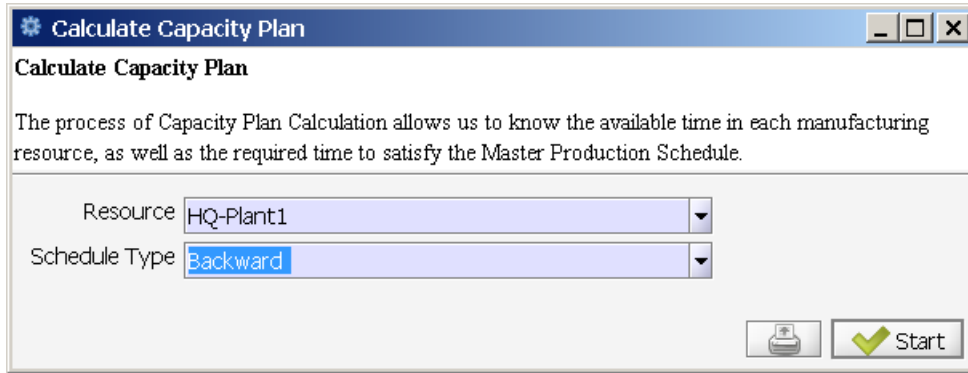
Menu: Manufacturing Management < Planning Management < CRP < Capacity Requirement Planning Setup



4.5.2 Calculate Capacity Plan

Menu: Manufacturing Management < Planning Management < CRP < Calculate Capacity Plan

The process of Capacity Plan Calculation allows us to know the available time in each manufacturing resource, as well as the required time to satisfy the Master Production Schedule.

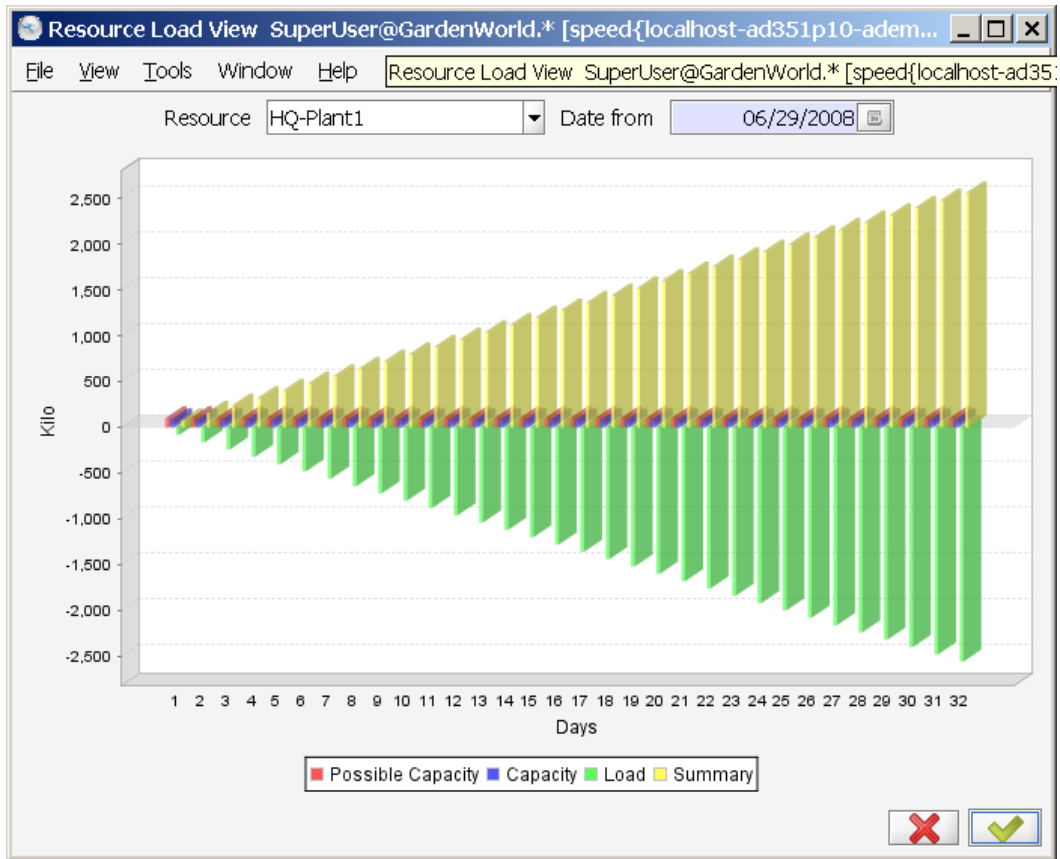


4.5.3 Resource Load View

Menu: Manufacturing Management < Planning Management < CRP < Resource Load View

It shows graphically of the required and available time for each manufacturing resource.

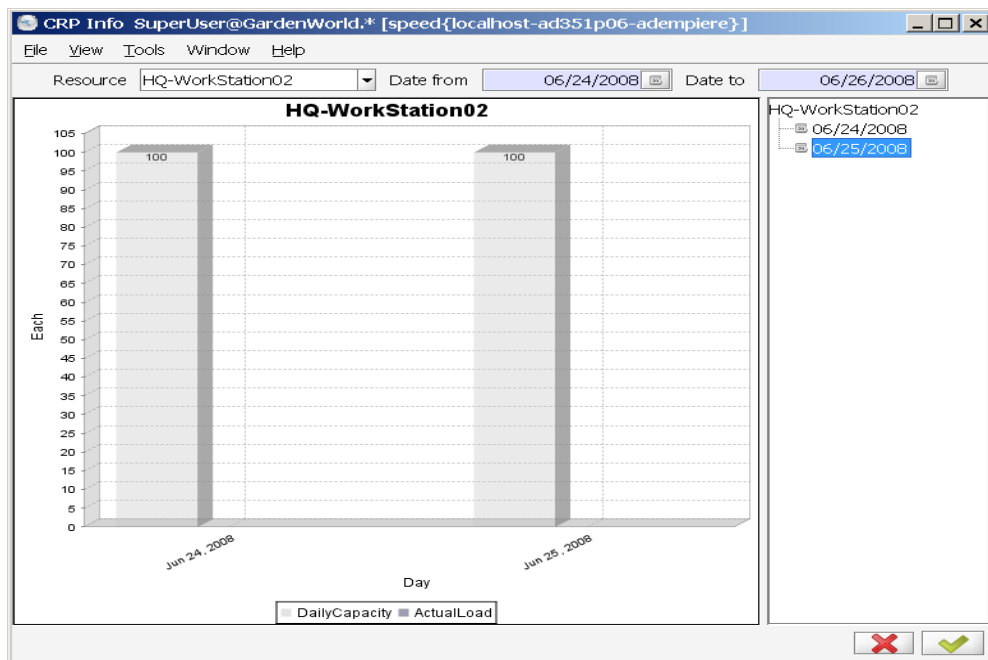
- The required parameters to get the Resource Load View are:
 - the resource you want to analyze and the date at the beginning of the month you wish to analyze.
 - Next click the OK button and you will see the daily available capacity at the selected resource. The bar of the graph shows the required capacity, the available capacity and the difference between them.
 - The accumulated times from other periods are not considered for these calculations.



The Resource Load View result Looks strange.

4.5.4 CRP Info

Menu: Manufacturing Management < Planning Management < CRP < CRP Info

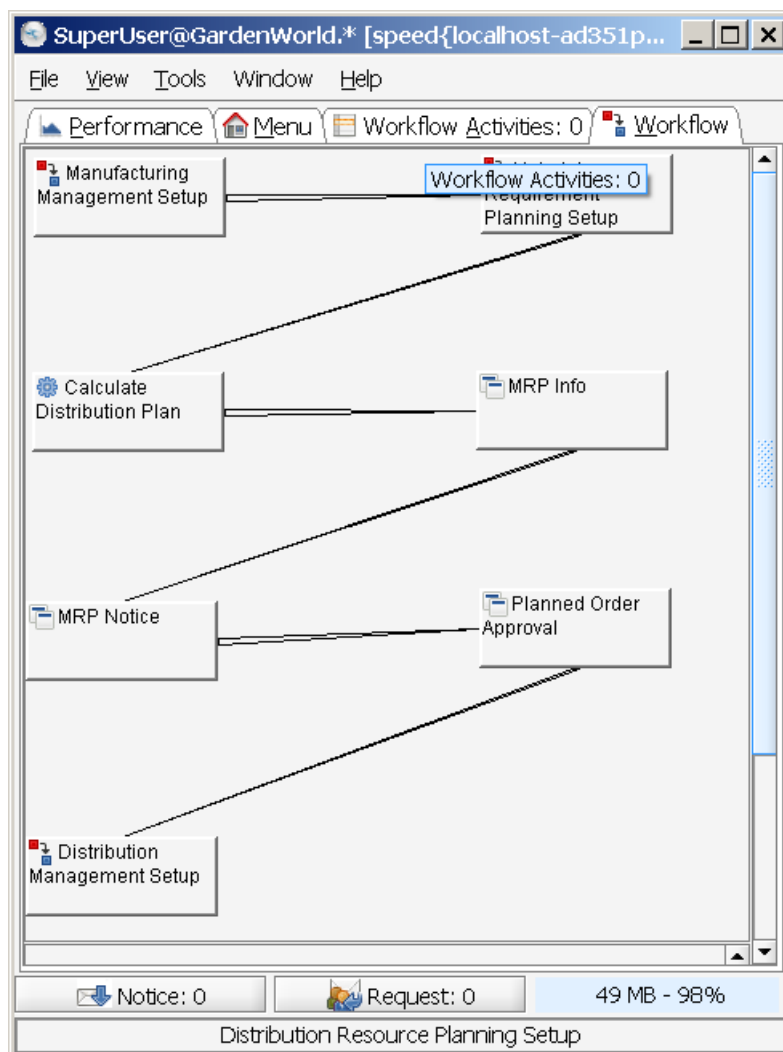


The CRP Info Report gives an overview of the actual load capacities on the various manufacturing resources.

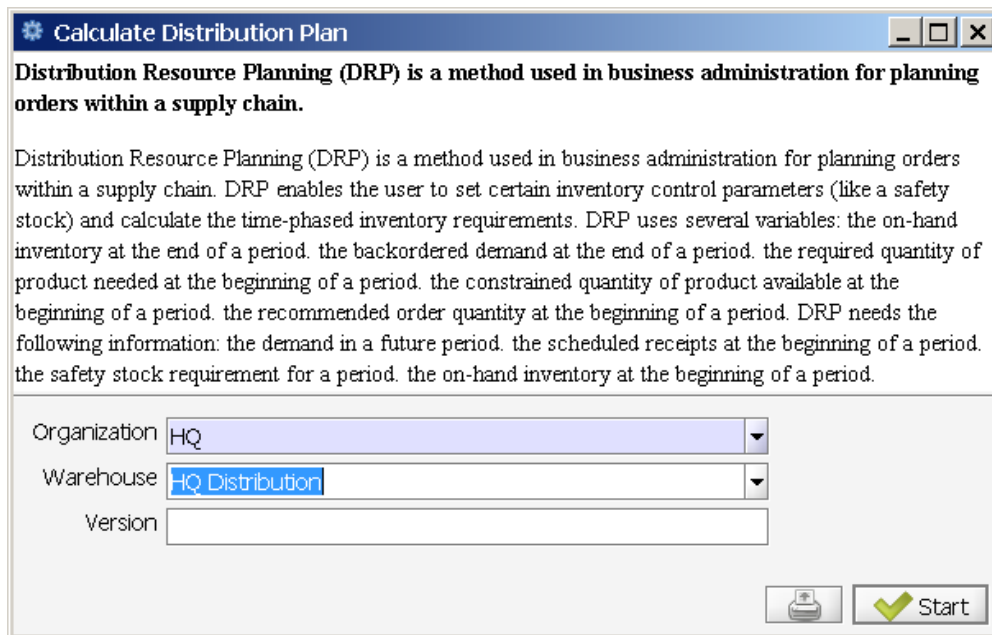
4.6 Distribution Resource Planning - DRP

Distribution planning does support supply chain aspects. It takes in account the various demand from SO, PO and MO to provide the optimal availability to deploy (ATD).

4.6.1 Distribution Resource Planning Setup



4.6.2 Calculate Distribution Plan



Calculate Distribution Plan



Distribution Resource Planning (DRP) is a method used in business administration for planning orders within a supply chain.

Distribution Resource Planning (DRP) is a method used in business administration for planning orders within a supply chain. DRP enables the user to set certain inventory control parameters (like a safety stock) and calculate the time-phased inventory requirements. DRP uses several variables: the on-hand inventory at the end of a period, the backordered demand at the end of a period, the required quantity of product needed at the beginning of a period, the constrained quantity of product available at the beginning of a period, the recommended order quantity at the beginning of a period. DRP needs the following information: the demand in a future period, the scheduled receipts at the beginning of a period, the safety stock requirement for a period, the on-hand inventory at the beginning of a period.

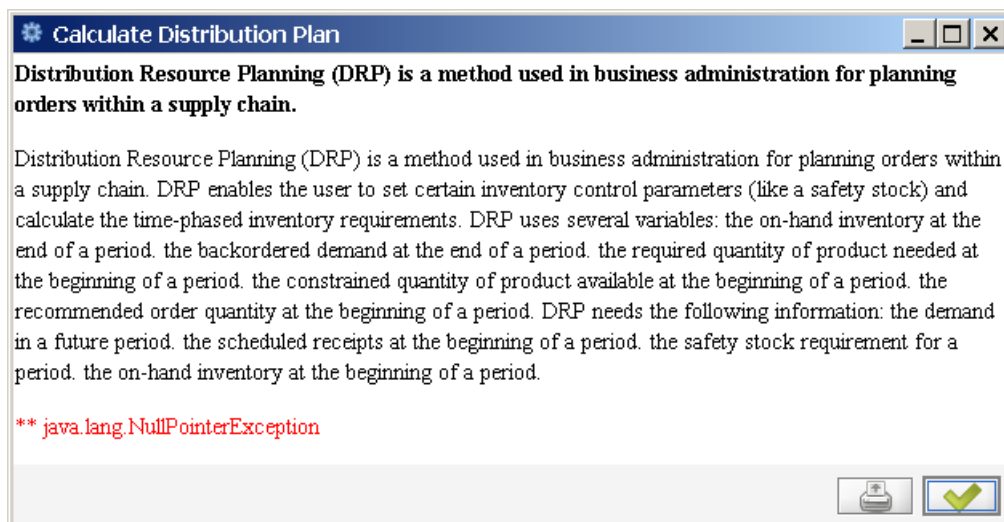
Organization:

Warehouse:

Version:

And as a result





Calculate Distribution Plan

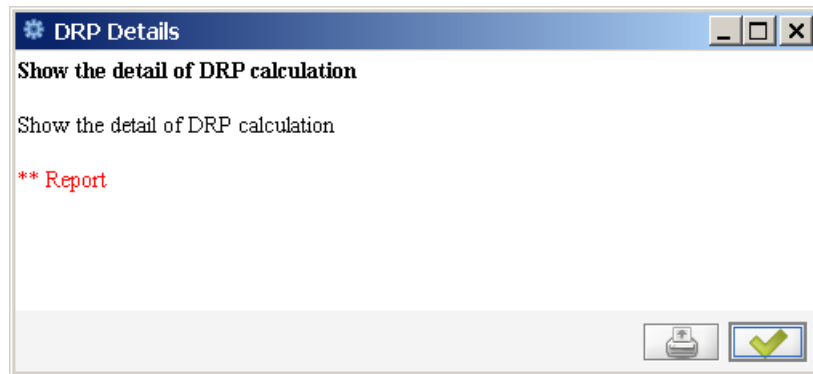
Distribution Resource Planning (DRP) is a method used in business administration for planning orders within a supply chain.

Distribution Resource Planning (DRP) is a method used in business administration for planning orders within a supply chain. DRP enables the user to set certain inventory control parameters (like a safety stock) and calculate the time-phased inventory requirements. DRP uses several variables: the on-hand inventory at the end of a period, the backordered demand at the end of a period, the required quantity of product needed at the beginning of a period, the constrained quantity of product available at the beginning of a period, the recommended order quantity at the beginning of a period. DRP needs the following information: the demand in a future period, the scheduled receipts at the beginning of a period, the safety stock requirement for a period, the on-hand inventory at the beginning of a period.

**** java.lang.NullPointerException**

4.6.3 DRP Details



5 Production Management

Once the production planning process has been executed, the production control process let us to check the execution activities in order to be sure we can reach the material plan.

Each time you need to release an order you need to be sure the components are complete in the warehouse, this can be obtained tracking the release and due dates for every component, this is easy to get using the shortage reports and from this module.

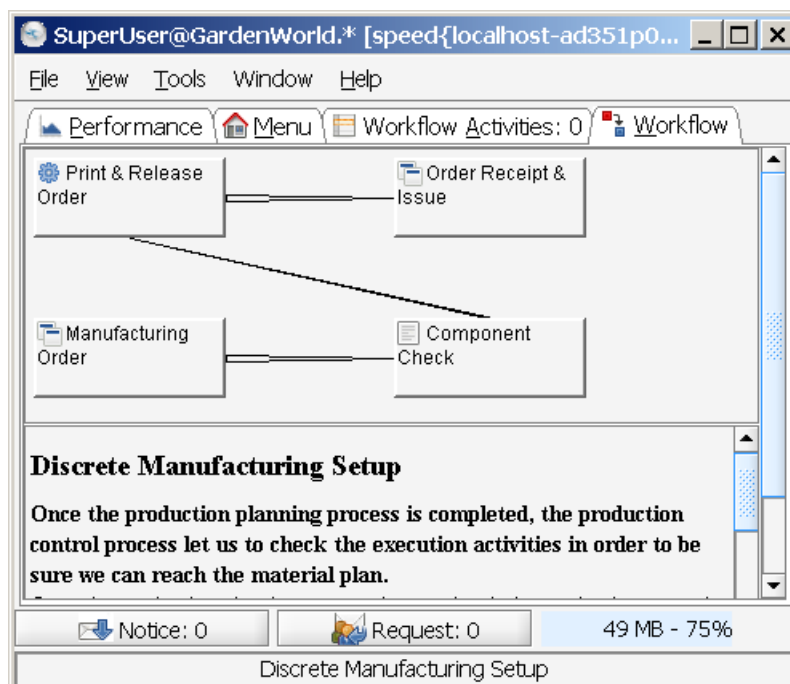
This module mainly answer the question: What do I need to do to accomplish the MPS?

...and if you are in trouble and you can not cover the MPS as you had planned, this module gives you information to decrease the effect on the costs and on the customer service.

5.1 Discrete Manufacturing

5.1.1 Discrete Manufacturing Setup

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Discrete Manufacturing Setup



Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order

The Manufacturing Order is a document or schedule identity conveying authority for the manufacture of specified products in specified quantities.

5.1.1.1 Tab: Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order

The screenshot shows the SAP Manufacturing Order form. The main data is as follows:

| Field | Value |
|----------------------|--|
| Client | GardenWorld |
| Organization | HQ |
| Document No | 1000000 |
| Line No | 0 |
| Target Document Type | Manufacturing Order |
| Description | |
| Product | MFG Product HL_MFG Product HL |
| Resource/Plant | HQ-Plant1 |
| Warehouse | HQ Distribution |
| Workflow | Test MFG WF 01 |
| BOM & Formula | CFG MFG Product HL_CFG MFG Product HL_1000 |
| Priority | Medium |
| Date Ordered | Jun 29, 2008 12:00:00 AM CEST |
| Date Promised | Jun 30, 2008 8:09:00 PM CEST |
| Date Delivered | |
| Date Start Schedule | Jun 29, 2008 12:00:00 AM CEST |
| Date Finish Schedule | |
| Quantity | 10 |
| UOM | Each |
| Yield | 100 |
| Document Status | Drafted |
| Document Type | <0> |

- **Date Ordered** – is the date when the order was generated. If the MO is created manually the default date ordered is the system date. If the MO was generated by MRP the default date ordered is the day of the MRP process.
- **Date Promised** – Is the date we commit to give the order to the warehouse. If the MO is created manually the default date promised is the system date. If the MO was generated by MRP this date is filled automatically using its algorithm calculation.
- **Approval Date** – Is the date on which the planned order should be approved to be released to the shop floor.
- **Delivered Date** – Is the Date on which the finished material of this order was received by the warehouse.
- **Start Date Scheduled** – Is the date, scheduled by MRP, when the MO should be released to the shop floor.
- **Finish Date Scheduled** Is the date, scheduled by MRP, when the MO should be received by the warehouse.

- **Start Date** – It is the date when the first manufacturing order movement is reported, this movement can be an inventory or labor movement.
- **Finish Date** - It is the date when the last manufacturing order movement is reported, It is the closing order date.
- **Before Float** – It will be used in future releases in order to balance the resource loading.
- **After Float** – It will be used in future releases in order to balance the resource loading.
- In the **Quantities** group of fields you can see the next fields:
 - The product Quantity to be fabricated and the Unit of Measure of this quantity.
 - The Qty Batches is the number of batches you are going to do to fabricate all the product in the order.
 - The Qty. Batch Size is the quantity of product to be made in each batch.
- In the **Yield** field you can see the Product Yield defined as the the product quantity which fit the quality specifications divided by the total order quantity.
- **Delivered Quantity** is a read only field which contains the quantity delivered to the warehouse up to date.
- The Rejected Quantity is the quantity of product out of quality specifications reported to the manufacturing order. When Quality assurance take a decision around the rejected product, this product will have to be later reworked or sent to scrap. When you report Scrap Quantity, this will be added to the scrap quantity for the manufacturing order.
- Qty Scrap is the quantity of material out of specifications and of such characteristics that rework is impractical.
- Project and Campaign refer to the standard Compiere dimensions.
- The data contained in the Status group of fields have the normal use of Adempiere.
- The BOM & Formula used in the Manufacturing Order are taken from the Product Planning data window.
- BOM and Workflows used by the manufacturing orders are taken from the Product Data Planning. The information relative to every component that will be used in the manufacture of the finished product is taken from the Bill of Materials. This information is contained in the Order BOM/Formula tab.

The information relative to every component that will be used in the manufacture of the finished product is taken from the **Bill of Materials**. This information is contained in the Order **BOM/Formula tab**.

To get more information around the BOM heading data used in the MO you use the Order BOM/Formula tab. The data contained in this tab is explained in the section BOM/Formula in this Chapter.

The information around every component which will be used in the finished product fabrication are taken from the BOM lines.

You can find this information in the Order BOM/Formula Lines tab.

5.1.1.2 Tab: Order Parent Product

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Order Parent Product

Client: GardenWorld
 EP_Order_ID: 1000000_HQ-Plant1
 Search Key: CFG MFG Product HL
 Name: CFG MFG Product HL
 Description:
 Comment/Help:
 Active
 Document No: 1000003
 Valid from: Jun 29, 2008 12:00:00 AM CEST
 Product: MFG Product HL_MFG Product HL
 UOM: Each
 BOM Type: Product Configure
 Change Notice:
 Revision:
 Valid to:
 Attribute Set Instance:
 BOM Use: Master
 PP_Order_BOM_ID: Copy From
 Process Now

Questions to be answered:

- Are BOMUSE and BOMTYPE set correctly ?
- What is the meaning of PP_Order_BOM_ID and the Copy_From button ?

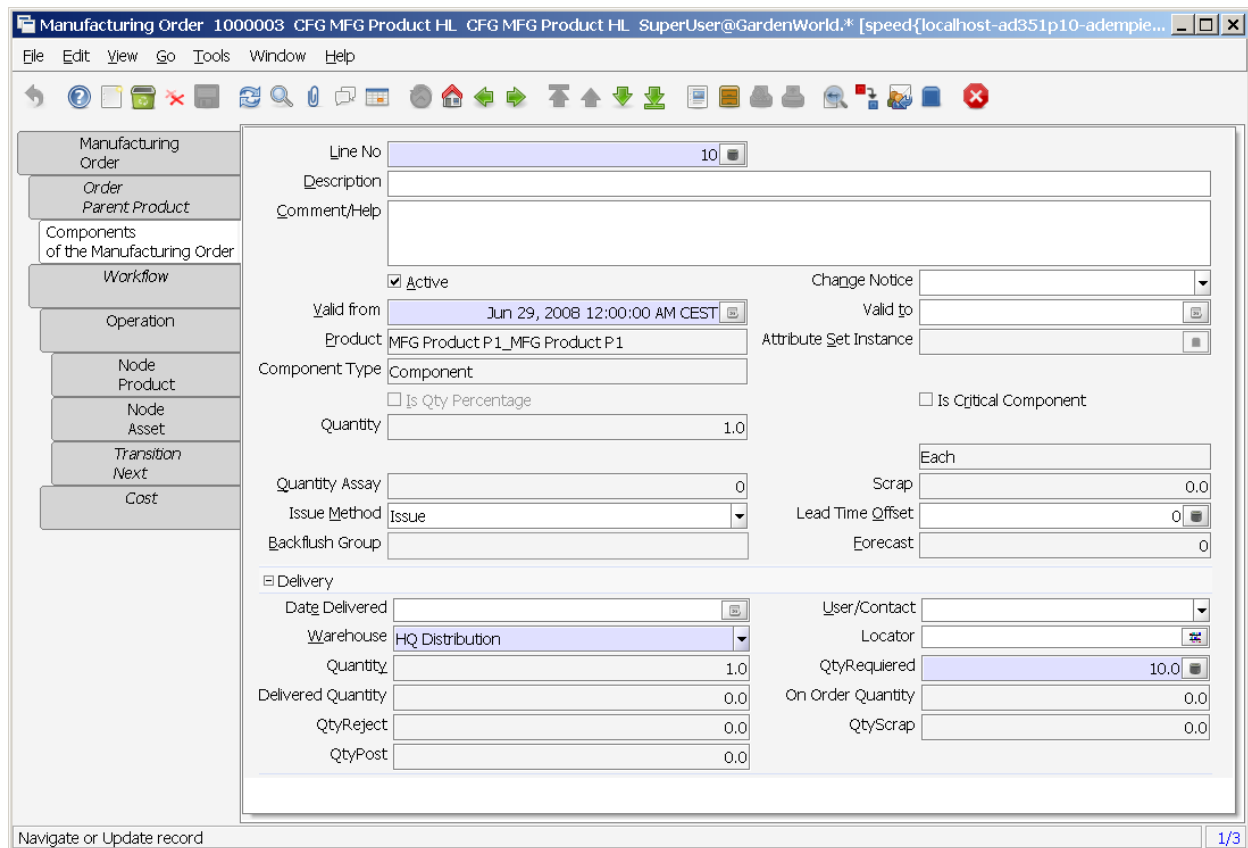
5.1.1.3 Tab: Components of the Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Components of The Manufacturing Order

Overview in grid display mode:

| Line No | Valid from | Product | Description | Comm |
|---------|-------------------------------|--------------------------------|-------------|------|
| 10 | Jun 29, 2008 12:00:00 AM CEST | MFG Product P1_MFG Product P 1 | | |
| 10 | Jun 29, 2008 12:00:00 AM CEST | MFG Product P2_MFG Product P 2 | | |
| 10 | Jun 29, 2008 12:00:00 AM CEST | Test Product e_Test Product e | | |

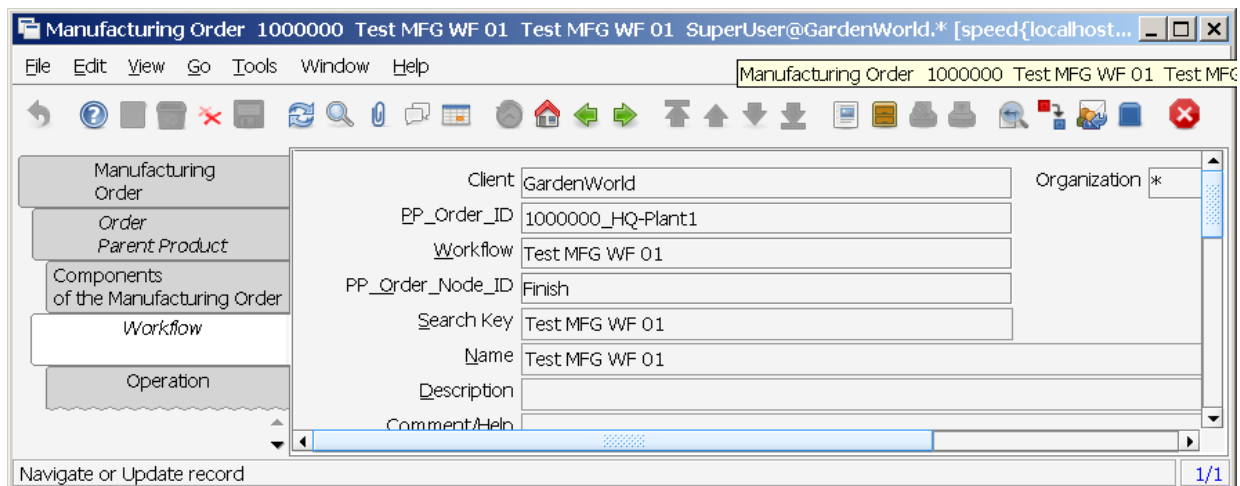
Display single record:



5.1.1.4 Tab: Workflow

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Workflow

Workflow is created during Engineering Management. This is just copied in. There are no updatable fields. So refer to the previous chapter (workflow ?).



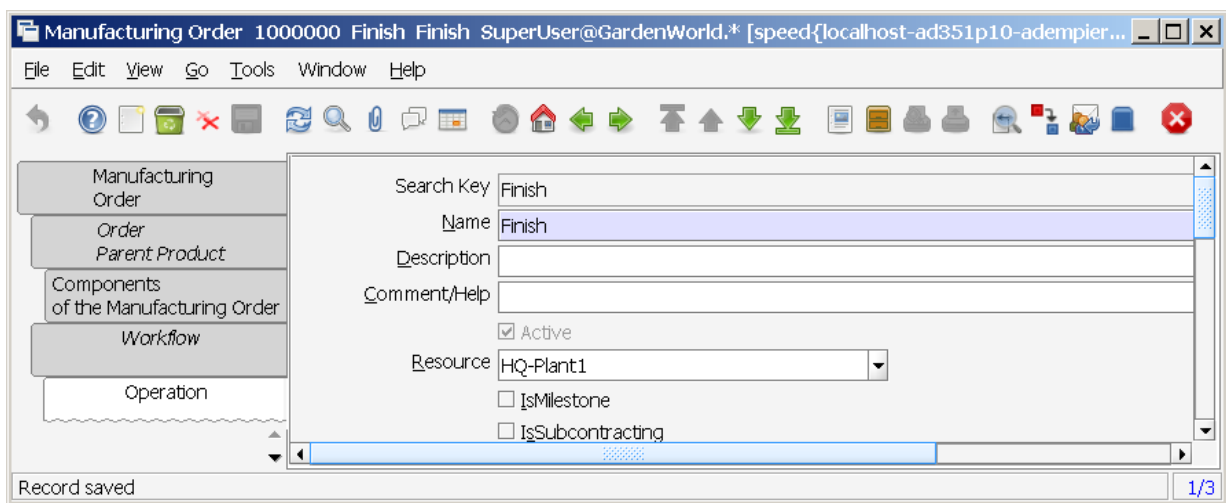
To get information about the Workflow heading which will be used in the Manufacturing Order, you must select the Workflow tab. Data contained in this tab are explained in the Manufacturing Workflow (Routes and Processes) section in this Manual.

5.1.1.5 Tab: Operation

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Operation

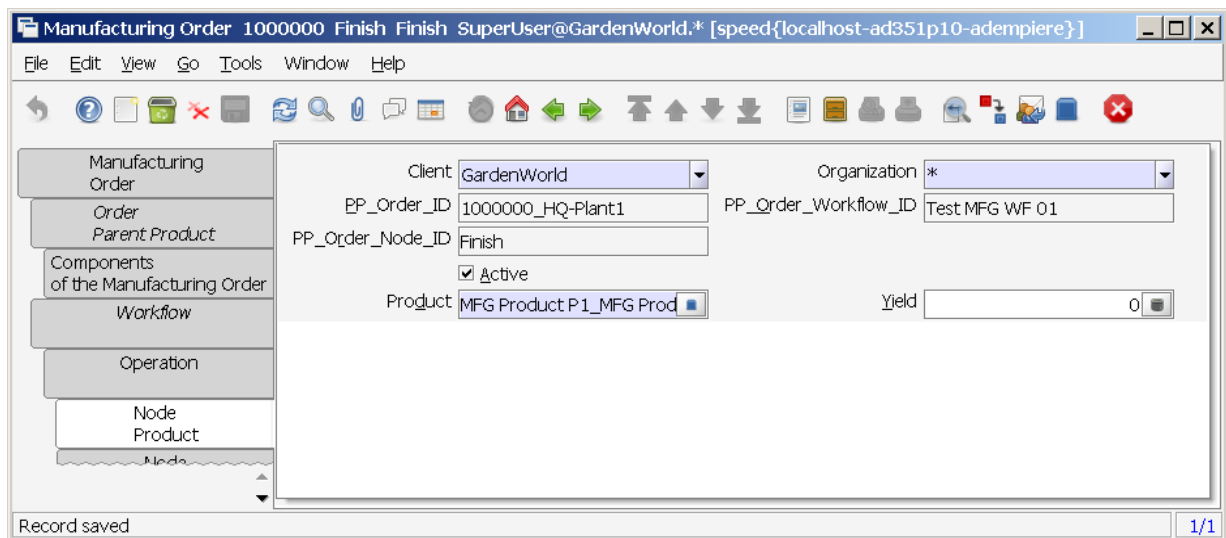
The relative information to each node (Or operations) will be used in the production of a product and will be taken from the nodes registered in the Manufacturing Workflow Windows in the Nodes tab. This data can be modified and also the data from the transition tab. To get detailed information around the fields please see the section Manufacturing Workflow in this Chapter.

Field Resource was empty – has to be set. Is this correct ?



5.1.1.6 Tab: Node Product

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Node Product

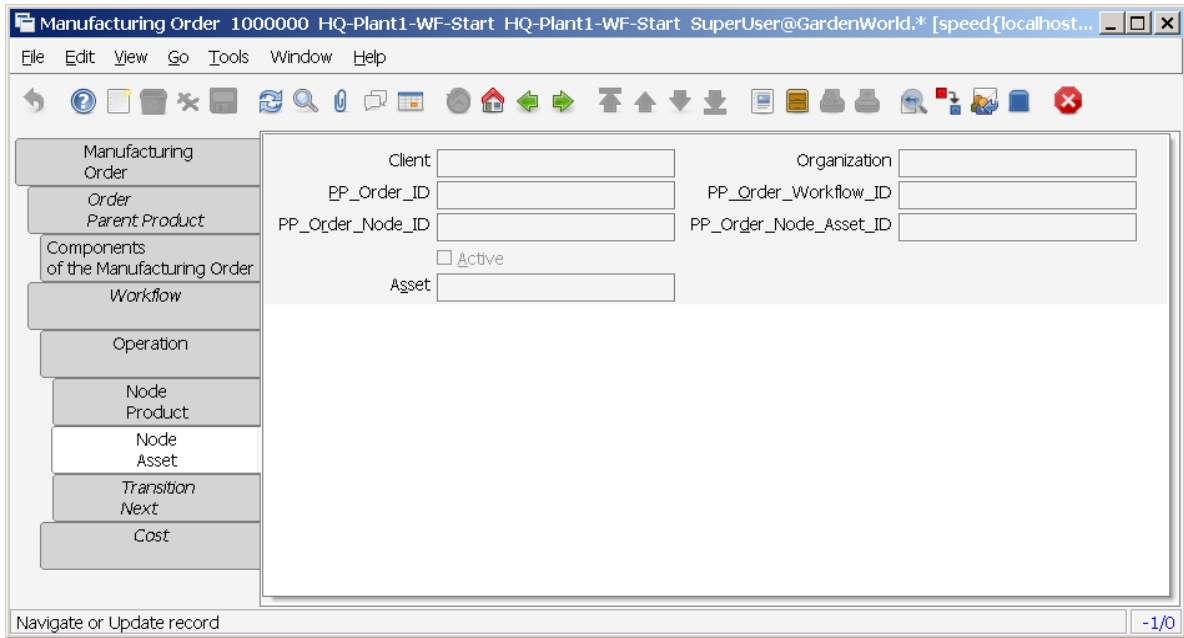


The field Product was not set. Is that correct ?

5.1.1.7 Tab: Node Asset

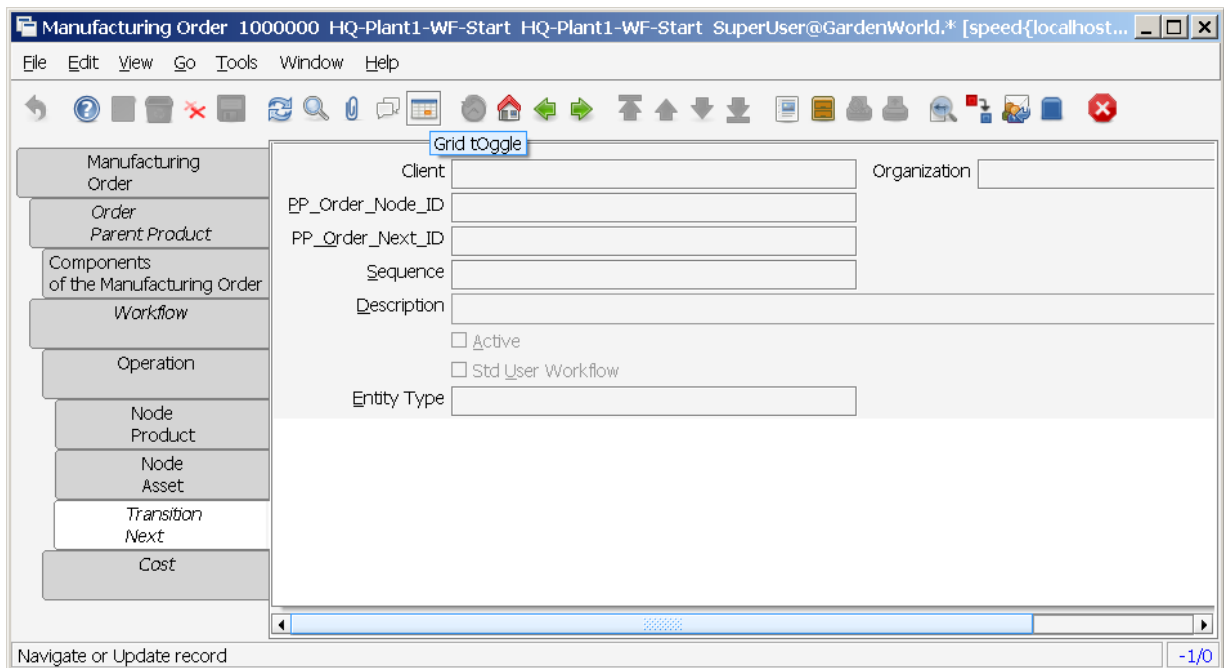
Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Node Asset

Not used right now. Displayed, just to show the fields.



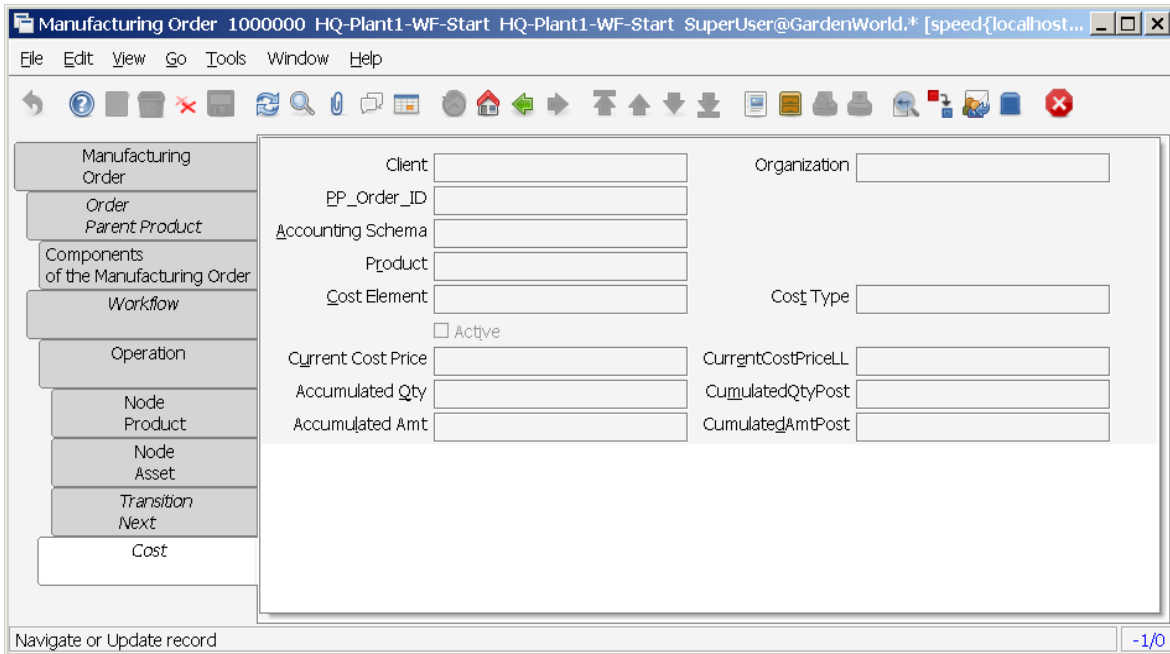
5.1.1.8 Tab: Transition Next

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Transition Next



5.1.1.9 Tab: Cost

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Cost



In the Cost Tab we have a record for each Cost Element defined in the Product to be produced, for these Organization, Warehouse, Cost Group and Resource.

You can see the standard amounts for each Cost Element at this level and for each Cost Element at lower level for the product. The cost at this level refers to the Cost Elements of the product to be produced (just at the level of the finished product). Cost elements at lower levels refers to the cost of the the product to be produced (including the cost of the Cost Elements of every component).

The last four fields are related to the accumulated quantities and amounts for product movements and posted movements. These fields are for each cost element:

- Cum Qty Cost Element: This field shows the sum of the quantities of the product that have had movements.
- Cost Element Cum Qty Post: This field shows the sum of the quantities of the product that have had movements and have been posted to the GL for the cost elements.
- Cum Amt Cost Element: This field shows the sum of the amounts of the product that have had movements.
- Cum Amt Cost Element Post: This field shows the sum of the amounts of the product that have had movements and have been posted to the GL.

5.1.2 Manufacturing Orders Review

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Orders Review

It is a report of every Manufacturing Orders filtering according with the characteristics the user is interested to select.

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 1(1,1) of 7(1,7)

| Document No | Line No | Target Doc Type | Description | Product | Attribute Set Instance | Resource | Workflow |
|-------------|---------|---------------------|-------------|---------------------------|------------------------|-----------|----------|
| 1000000 | 0 | Manufacturing Order | | TestProduct - TestProduct | | HQ-Plant1 | HQ-WF01 |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 2(1,2) of 7(1,7)

| Document No | Warehouse | BOM & Formula | Planner | Priority | Date Ordered |
|-------------|--------------|-------------------------|---------|----------|-------------------------------|
| 1000000 | HQ Warehouse | PP_HL - PP_HL - 1000001 | | Medium | Jun 25, 2008 12:00:00 AM CEST |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 3(1,3) of 7(1,7)

| Document No | Date Promised | DateConfirm | Date Delivered | DateStartSchedule | DateFinishSchedule |
|-------------|------------------------------|-------------|----------------|-------------------------------|--------------------|
| 1000000 | Jun 25, 2008 6:31:00 AM CEST | | | Jun 25, 2008 12:00:00 AM CEST | |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 4(1,4) of 7(1,7)

| Document No | DateStart | Finish Date | FloatBefore | FloatAfter | Quantity UOM | QtyBatches | QtyBatchSize | Ordered Qty |
|-------------|-----------|-------------|-------------|------------|--------------|------------|--------------|-------------|
| 1000000 | | | 0 | 0 | 1 Each | 0 | 0 | 1 |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 5(1,5) of 7(1,7)

| Document No | Delivered Qty | Yield | QtyReject | QtyScrap | Project | Campaign | Activity | Trx Organization | User 1 | User 2 | Doc Status |
|-------------|---------------|-------|-----------|----------|---------|----------|----------|------------------|--------|--------|------------|
| 1000000 | 0 | 100 | 0 | 0 | | | | | | | Drafted |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 6(1,6) of 7(1,7)

| Document No | Doc Type | Approved | Printed | Selected | Processed | Quantity Assay Is | Qty Percentage | Lot No | Order Type |
|-------------|-----------|----------|---------|----------|-----------|-------------------|----------------|--------|------------|
| 1000000 | ** New ** | ✗ | ✗ | ✗ | ✗ | 0 | ✗ | | |

ADempiere Manufacturing Orders Review Copiar registro 4082309 &Copy Page 7(1,7) of 7(1,7)

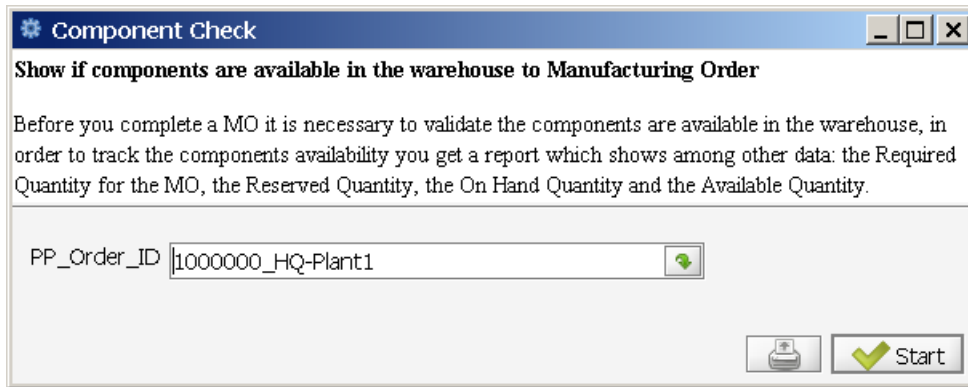
| Document No | Sales Transaction | Schedule Type | Serial No |
|-------------|-------------------|---------------|-----------|
| 1000000 | ✗ | D | |

5.1.3 Component Check

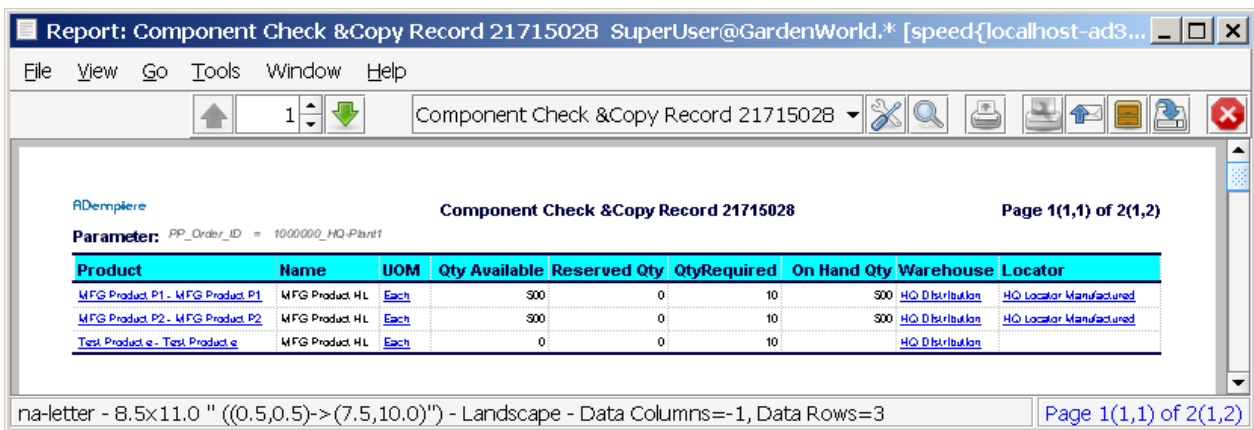
Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Component Check

Before you complete a MO it is necessary to validate the components are available in the warehouse, in order to track the components availability you get a report which shows among

other data: the Required Quantity for the MO, the Reserved Quantity, the On Hand Quantity and the Available Quantity.

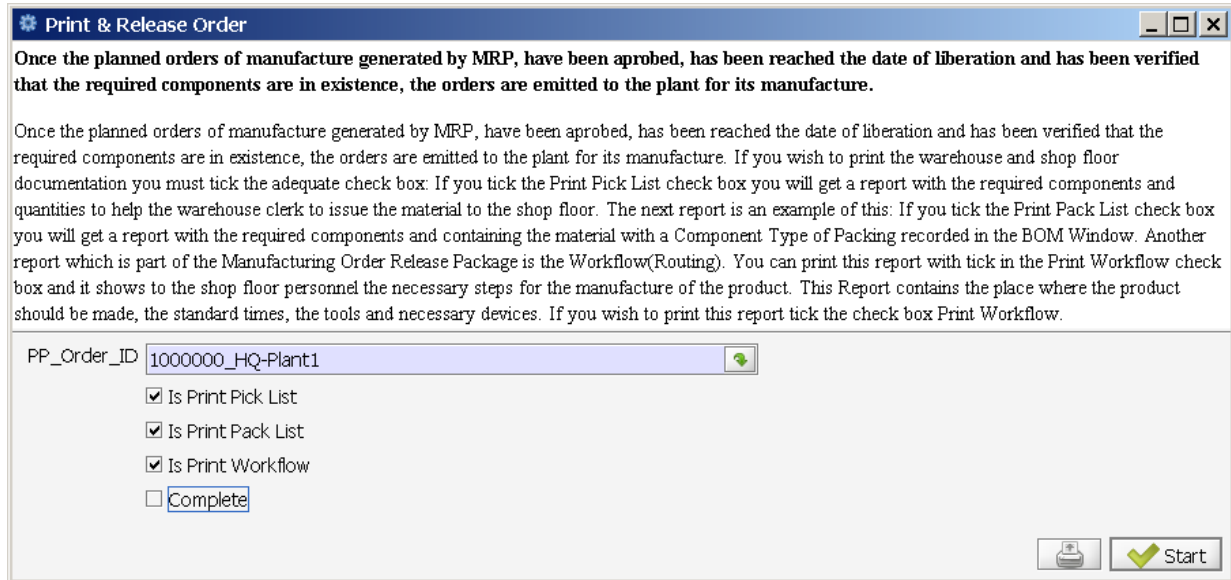


Click OK (Start) will create the following report.



5.1.4 Print & Release Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Print & Order Release



Print & Release Order

Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture.

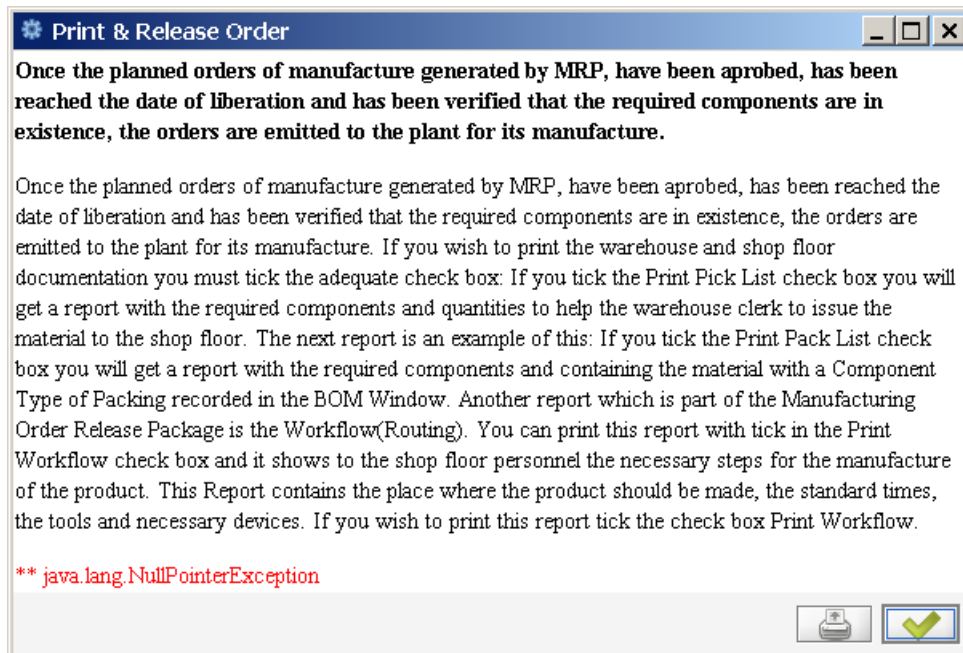
Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture. If you wish to print the warehouse and shop floor documentation you must tick the adequate check box: If you tick the Print Pick List check box you will get a report with the required components and quantities to help the warehouse clerk to issue the material to the shop floor. The next report is an example of this: If you tick the Print Pack List check box you will get a report with the required components and containing the material with a Component Type of Packing recorded in the BOM Window. Another report which is part of the Manufacturing Order Release Package is the Workflow(Routing). You can print this report with tick in the Print Workflow check box and it shows to the shop floor personnel the necessary steps for the manufacture of the product. This Report contains the place where the product should be made, the standard times, the tools and necessary devices. If you wish to print this report tick the check box Print Workflow.

PP_Order_ID: 1000000_HQ-Plant1

Is Print Pick List
 Is Print Pack List
 Is Print Workflow
 Complete

Start

Actual result:



Print & Release Order

Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture.

Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture. If you wish to print the warehouse and shop floor documentation you must tick the adequate check box: If you tick the Print Pick List check box you will get a report with the required components and quantities to help the warehouse clerk to issue the material to the shop floor. The next report is an example of this: If you tick the Print Pack List check box you will get a report with the required components and containing the material with a Component Type of Packing recorded in the BOM Window. Another report which is part of the Manufacturing Order Release Package is the Workflow(Routing). You can print this report with tick in the Print Workflow check box and it shows to the shop floor personnel the necessary steps for the manufacture of the product. This Report contains the place where the product should be made, the standard times, the tools and necessary devices. If you wish to print this report tick the check box Print Workflow.

** java.lang.NullPointerException

Start

Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture.

If you wish to print the warehouse and shop floor documentation you must tick the adequate check box:

If you tick the Print Pick List check box you will get a report with the required components and quantities to help the warehouse clerk to issue the material to the shop floor. The next report is an example of this: OPEN

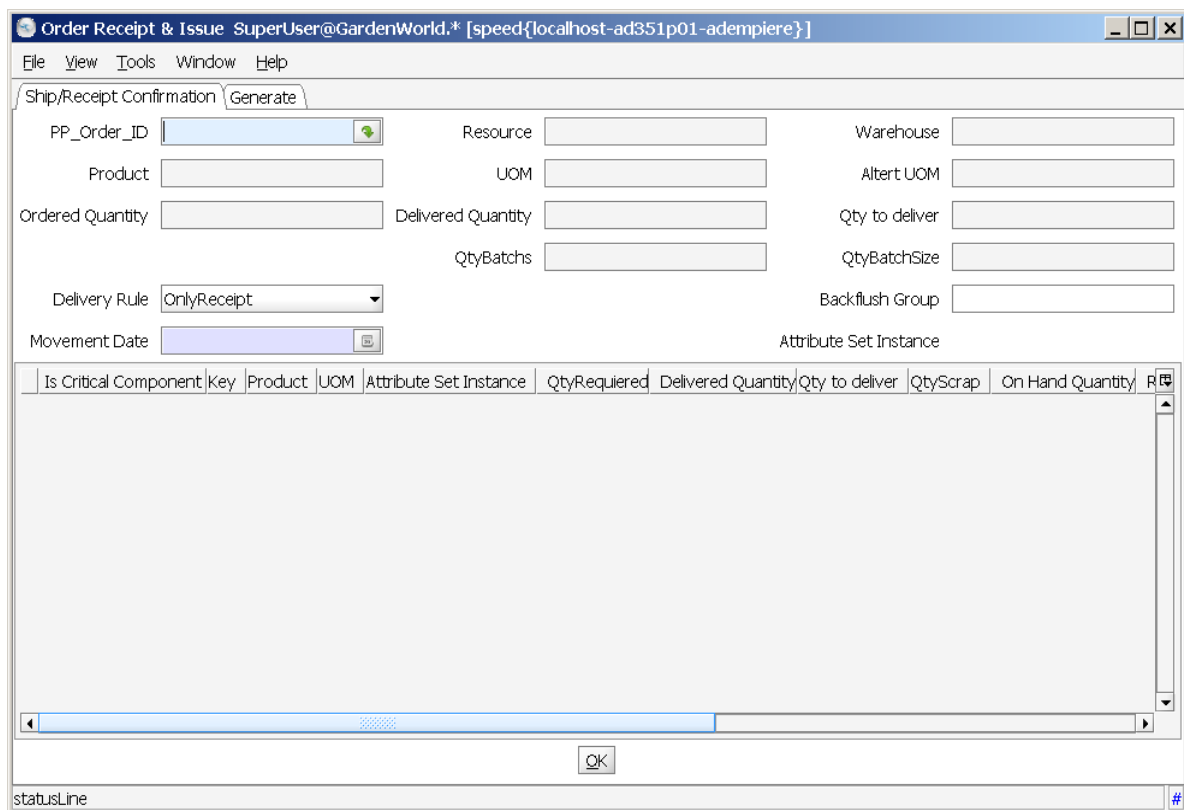
If you tick the Print Pack List check box you will get a report with the required components and containing the material with a Component Type of Packing recorded in the BOM Window.

Another report which is part of the Manufacturing Order Release Package is the Workflow (Routing). You can print this report with tick in the Print Workflow check box and it shows to the shop floor personnel the necessary steps for the manufacture of the product. This Report contains the place where the product should be made, the standard times, the tools and necessary devices. If you wish to print this report tick the check box Print Workflow.

5.1.5 Order Receipt & Issue

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Order Receipt & Issue

The last step in the fabrication process with a Manufacturing Order is to receipt the finished product in the warehouse. This last step is accomplished here.



The window shows at the upper side static information around the product and the manufacturing resource where it has to be made, it also shows a summary of the quantities to be controlled in the MO such as the Original and delivered quantities and the Quantity to deliver for the MO up to date.

If the production process requires production in batch, then the Qty Batches shows the Number of batches the shop floor needs to do and the Qty Batch Size contains the size of every batch to be produced.

If you want to issue the MO components before you receive the finished product you should tick the checkbox Is Delivery, this case is recommended when you have a long to medium lead time and you want to have the inventory quantities as reliable as possible at every moment.

If you have small lead time and you wish to save clerk time then you must tick Is Backflush checkbox and you will receive the finished product at the same time you issue automatically the components

The Backflush Group field is used when you want to issue just components belonging to this group. (This characteristic could not be included in the current version).

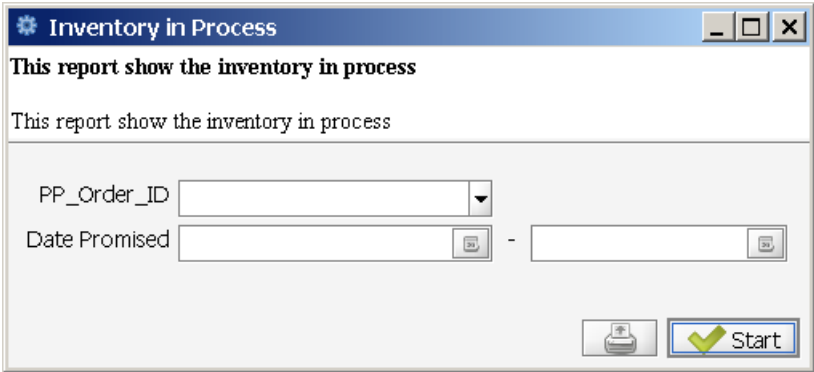
At the lower part of the window you can find the list of every MO component, this can be modified according with the real products and quantities given to the shop floor.

The quantities to be issued are selected with the checkbox at the first column of the list of components. If the actual quantity is different from the standard quantity showed in the column Qty to deliver you should edit this field to enter the right quantity to be issued.

Finally a message box asks if you want to close the OM document, you should click the ok button if this MO will not have any more transactions and must be closed.

5.1.6 Inventory in Process

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Inventory in Process



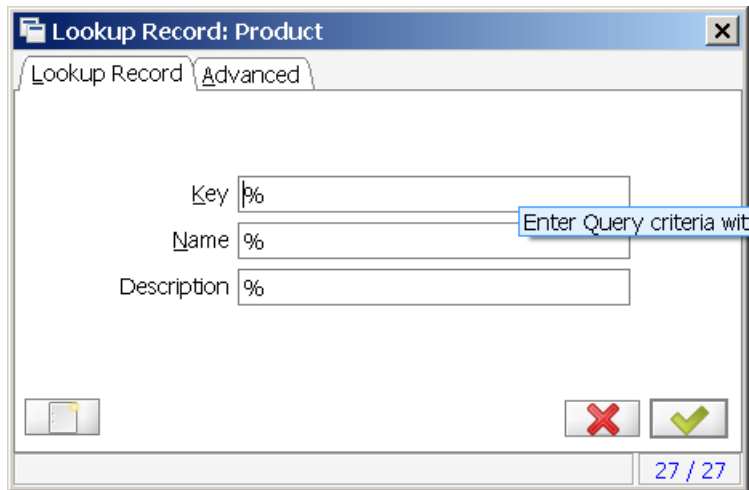
5.1.7 Order Transactions

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Order Transactions

With this report we can verify the detail of every Manufacturing Order transaction executed with a Manufacturing Order including information like document number, quantities, products and the date in which the transactions were made, etc.

5.1.8 Management Maintenance

Menu: Manufacturing Management < Production Management < Management Maintenance
 What are the Spare Parts for ?



5.2 Shop Floor Control

Menu: Manufacturing Management < Production Management < Shop Floor Control

5.2.1 Activity Control Report

Menu: Manufacturing Management < Production Management < Shop Floor Control < Activity Control Report

5.2.2 Shop Floor Transaction Details

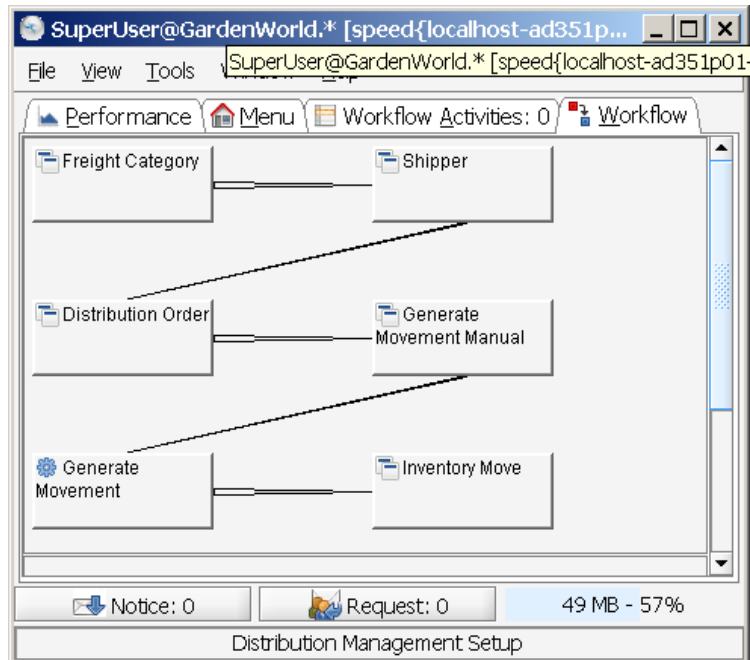
Menu: Manufacturing Management < Production Management < Shop Floor Control < Shop Floor Transaction Details

The screenshot shows a software window titled "Shop Floor Transaction Details". Below the title bar, there is a sub-header "Show the Shop Floor Transaction Details". The main area contains several input fields and buttons:

- PP_Order_ID**: A text input field with a green refresh icon on the right.
- Document Status**: A dropdown menu.
- Resource**: A dropdown menu.
- DateStartSchedule**: A date input field with a calendar icon on the right, followed by a hyphen and another date input field with a calendar icon.
- DateFinishSchedule**: A date input field with a calendar icon on the right, followed by a hyphen and another date input field with a calendar icon.
- Buttons**: A "Print" button (with a printer icon) and a "Start" button (with a green checkmark icon).

6 Distribution Management

6.1 Distribution Management Setup



6.2 Distribution Network

Distribution Network 1000000 HQ-Distribution HQ-Distribution SuperUser@GardenWorld.* [speed{localhost-ad351p03...]

File Edit View Go Tools Window Help

Client: GardenWorld Organization: *

Search Key: HQ-Distribution

Name: HQ-Distribution

Description:

Comment/Help:

Document No: 1000000 Change Notice: Product P1

Revision:

Active

Valid from: Valid to:

Network Line

Source Warehouse: HQ Warehouse Target Warehouse: HQ-Distribution

Active

Valid from: Valid to:

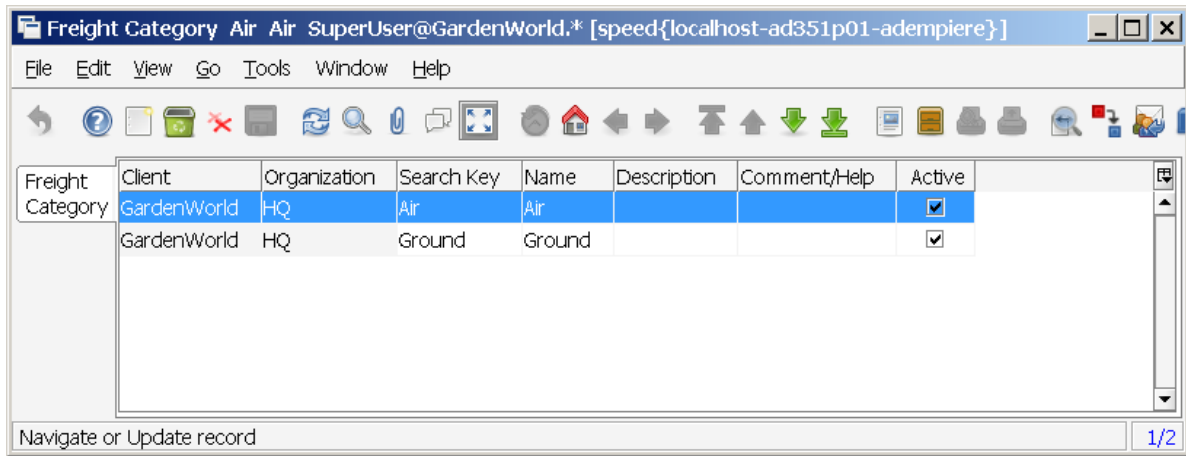
Shipper: Transfer Time: 0

Percent: 0.0 Relative Priority: 0

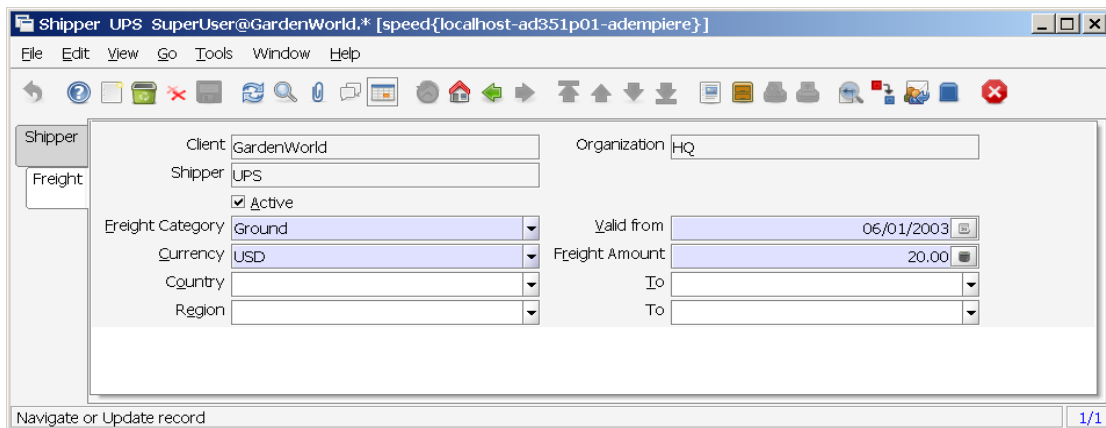
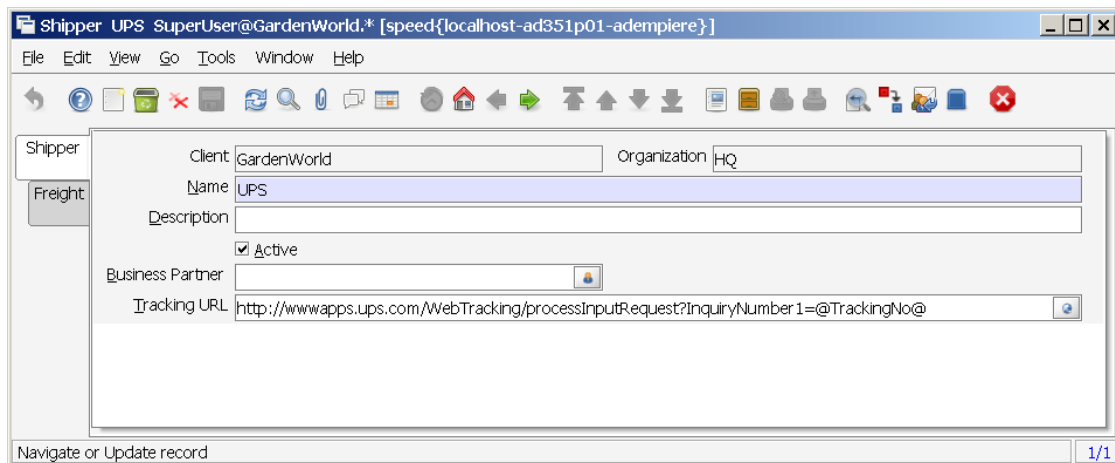
Data queried 1/1

Data queried 1/1

6.3 Freight Category



6.4 Shipper



6.5 Distribution Order

Distribution Order SuperUser@GardenWorld.* [speed{localhost-ad851p01-adempire}]

File Edit View Go Tools Window Help

Order

Client Organization

Document No Order Reference

Description

Document Type Company Agent

Date Ordered Date Promised

Delivery

Business Partner Partner Location

Shipper User/Contact

Delivery Via Delivery Rule

Transit Warehouse Drop Shipment

Priority

Weight Volume

Reference

Project

Campaign Trx Organization

Order Line

| Line No | Date Ordered | Date Promised | Product | PO Quantity | Locator | Locator To | Instance | Instance To |
|---------|--------------|---------------|---------|-------------|---------|------------|----------|-------------|
| | | | | | | | | |

Navigate or Update record -1/0

6.6 Generate Movement - Manual

Generate Movement Manual SuperUser@GardenWorld.* [speed{localhost-ad351p01-adempiere}]

File View Tools Window Help

Select Generate

Receipt Warehouse HQ Warehouse BPartner

| Organization | Document Type | Document No | Business Partner | Date Ordered | Total Lines |
|--------------|---------------|-------------|------------------|--------------|-------------|
|--------------|---------------|-------------|------------------|--------------|-------------|

Select orders to generate shipments

6.7 Generate Movement - Process

Generate Movement

Generate and print Movement from open Distribution Orders

Movement for open Distribution Orders are created based on the delivery rule of the Distribution Order and the relative order priority. If a Promise Date is selected only orders up to (including) the date are selected.

If several Distribution Orders of a business partner have the same location, the Distribution orders can be consolidated into one Movement.

You can also include Distribution orders who have outstanding confirmations (e.g. ordered=10 - not confirmed movements=4 - would create a new movement of 6 if available).

Warehouse

Movement Date

Business Partner

Date Promised

Orders with unconfirmed Shipments

Document Action

Consolidate to one Document

6.8 Inventory Move

Inventory Move SuperUser@GardenWorld.* [speed{localhost-ad351p01-adempire}]

File Edit View Go Tools Window Help

Move
Move Line

Client: GardenWorld Organization: HQ

Distribution Order: []

Document No: [] Sales Representative: []

Description: []

Movement Date: 06/04/2008 Document Type: Material Movement

Delivery

Business Partner: [] Partner Location: []

Shipper: [] User/Contact: []

Delivery Via: [] Delivery Rule: []

Priority: [] Freight Cost Rule: []

Reference

Project: []

Campaign: []

Status

Approved Approval Amount: 0.00

In Transit

Date received: []

Document Status: Drafted

Navigate or Update record +1/1

Inventory Move SuperUser@GardenWorld.* [speed{localhost-ad351p01-adempiere}]

File Edit View Go Tools Window Help

| | | | |
|---------------------------------|----------------------|-------------------------|----------------------|
| Client | <input type="text"/> | Organization | <input type="text"/> |
| Inventory Move | <input type="text"/> | | |
| Line No | <input type="text"/> | Distribution Order Line | <input type="text"/> |
| Description | <input type="text"/> | | |
| Search Key | <input type="text"/> | | |
| <input type="checkbox"/> Active | | | |
| Product | <input type="text"/> | Attribute Set Instance | <input type="text"/> |
| Attribute Set Instance To | <input type="text"/> | | |
| Locator | <input type="text"/> | Locator To | <input type="text"/> |
| Movement Quantity | <input type="text"/> | | |
| Target Quantity | <input type="text"/> | Scrapped Quantity | <input type="text"/> |
| Confirmed Quantity | <input type="text"/> | | |

Navigate or Update record -1/0

7 Quality Management

7.1 Window: Quality Specifications

Menu: Manufacturing Management < Quality Management < Quality Specifications

7.1.1 Tab: Quality Specifications

Menu: Manufacturing Management < Quality Management < Quality Specifications

The screenshot shows a software window titled "Quality Specifications 1000000 SuperUser@GardenWorld.* [speed{localhost-ad351p03-adempire}]". The window contains a form with the following fields and values:

| | | | |
|--|---------------------|--------------|--------------|
| Client | GardenWorld | Organization | HQ |
| Search Key | 1000000 | | |
| Name | | | |
| Description | | | |
| <input checked="" type="checkbox"/> Active | | | |
| Product | Product1_P1 | | |
| BOM & Formula | Product1_P1_1000001 | Workflow | HQ-Plant1-WF |
| Attribute Set | Fertilizer Lot | | |
| Valid from | | Valid to | |

Record saved 1/1

7.1.2 Tab: Quality Specifications Line

Menu: Manufacturing Management < Quality Management < Quality Specifications

The screenshot shows a software window titled "Quality Specifications UseFactor SuperUser@GardenWorld.* [speed{localhost-ad351p03-adempire}]". The window contains a form with the following fields and values:

| | | |
|------------|------------|----------|
| Sequence | 0 | |
| Attribute | Use Factor | |
| Operation | = | |
| Search Key | UseFactor | |
| Valid from | | Valid to |
| And/Or | Or | |

Record saved 1/1

7.2 Bill of Materials & Formula

Menu: Manufacturing Management < Quality Management < Bill of Materials & Formula

| Line No | Product | Component Type | UOM | Attribute Set Instance | Description | Comment/Help | Active | Change Notice | Valid from |
|---------|---------|----------------|------|------------------------|-------------|--------------|-------------------------------------|---------------|------------|
| 20 | P1b_P1b | Component | Each | | | | <input checked="" type="checkbox"/> | | 06/15/2008 |
| 10 | P1a_P1a | Component | Each | | | | <input checked="" type="checkbox"/> | | 06/15/2008 |
| 30 | P1c_P1c | Option | Each | | | | <input checked="" type="checkbox"/> | | 06/15/2008 |

7.3 Print Test Results

Menu: Manufacturing Management < Quality Management < Print Test Results

8 Standard Costing Management

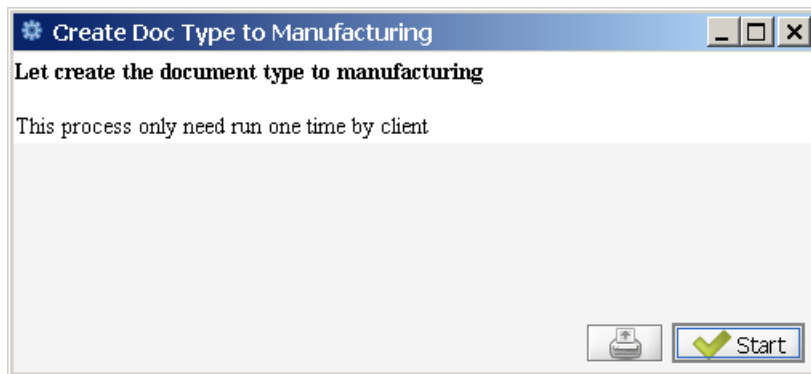
The Cost Management system is used to segregate the most important problems from those which are less important using the production cost criteria. . With Cost Management we know the actual cost of the cost elements grouped into cost types: material, labor, burden, overhead, subcontracts and distribution for every product used in production. Knowing costs and its variances: current vs standard, you will be able to take the correcting actions at the right time.

The Cost group allows you to define as many as you wish, different costs for the same product at an organization. For Instance, you can set one or more Cost Groups to do an analysis of “What if” in case of possible cost changes because of the economic company environment. On the other hand you need to define one Cost Group to be used in the accounting transactions.

With this module you mainly answer the question: are every cost element used in the Manufacturing Orders inside the production plan?

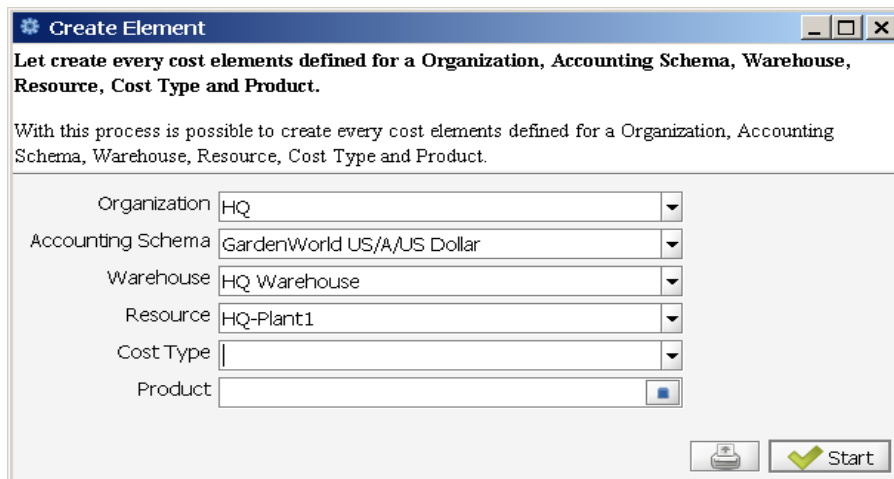
8.1 Create Doc Type to Manufacturing

Menu: Manufacturing Management < Standard Costing Management < Create Doc Type to Manufacturing



8.2 Create Element

Menu: Manufacturing Management < Standard Costing Management < Create Element



A Cost Element is a cost component that can be controlled in a separate way and it is part of the groups defined as Cost Type. The Cost Type can be: Material, Labor, Overhead, Burden, Distribution and Subcontract. For instance: the Cost type Material can be segregated in one Cost Element named Freight and another Cost Element named material.

The Cost Element can be controlled in different accounting elements in the Tab Account Cost Elements CMPCS.

You must enter the next Accounts:

COGS CMPCS : The account to register the costs associated with producing a product. This cost account is used when you make a customer shipment.

Absorption Cost CMPCS: The account to register the cost proportion of the productive cost, it is referred to labor and burden cost.

Use variance: Is used to register the cost variance due to a difference between the real quantity used in the transaction and the standard quantity.

Rate variance: Is used to register the cost variance due to a difference between the real rate used in the transaction and the standard rate.

Method variance: Is used to register cost variances because of substitution of routing operation or substitution of components in the BOM. When the MO is closed any amount remaining in WIP will be taken to this variance.

To enter the cost elements for every set of Organization, Accounting Schema, Warehouse, Resource, Cost Group and product select the menu option: Cost Management < Cost Element:

The Product Tab shows the basic information about a product. It is the same information that is registered in the Product Tab from the Product option menu.

The Product Cost Tab allows you to enter the cost in the field This Level amount for Cost Element CMPCS, which is the cost product at the level of the product and this cost element is given for an Organization, Accounting Schema, Warehouse, Resource and Cost Group.

In the same tab you can see the Lower Level Amounts for Cost Element CMPCS. Here you can see the result of adding the cost element amounts for the given product in every BOM lower levels.

The file Cum Qty Cost Element CMPCS shows the addition of the product quantities that have been issued to Manufacturing Orders with the same conditions of the windows elements.

The field Cumulative Amount of Cost Element shows the addition of all the product cost amounts which has been issued to MO with the same conditions of the cost elements of the window.

To watch the cost elements for every set of Product, Organization, Accounting Schema, Warehouse, Resource and Cost Group select the menu option: Cost Management < Product Cost Report.

The next form will be displayed:

Click the OK button and you will get a report showing for the products filtered the Cost Element, Cost Group, Cost Amounts at this and lower levels and Product Category.

8.3 Product Costing

Menu: Manufacturing Management < Standard Costing Management < Product Costing

Product Costing

To watch the cost elements for every set of Product, Organization, Accounting Schema, Warehouse, Resource and Cost Type

To watch the cost elements for every set of Product, Organization, Accounting Schema, Warehouse, Resource and Cost Type.

Product Category: Chemicals

Product: HQ-Plant1_HQ-Plant1

Cost Element:

Warehouse:

Start

8.4 Copy Price to Standard Cost

Menu: Manufacturing Management < Standard Costing Management < Copy Price to Standard Cost

Copy Price to Standard Cost

This process allow copy a Price from Price list Version to Element Cost

This process allow copy a Price from Price list Version to Element Cost

Cost Type:

Organization: *

Accounting Schema: GardenWorld US/A/US Dollar

Cost Element:

Price List Version:

Start

8.5 Workflow Cost Roll-Up

Menu: Manufacturing Management < Standard Costing Management < Workflow Cost Roll-Up

Workflow Cost Roll-Up

This Process allow integrate Labor and Overhead Cost to a Manufacturing Workflow

This Process allow integrate Labor and Overhead Cost to a Manufacturing Workflow Labor Cost
Operation = (Qty Batch Size * Setup Time) * Duration * Labor Rate to this Resource Overhead Cost
Operation = (Qty Batch Size * Setup Time) * Duration * Overhead Rate to this Resource Labor Cost
Workflow = Sum of every the Labor Cost Operation Overhead Cost Workflow = Sum of every the
Overhead Cost Operation Cost Workflow = Labor Cost Workflow + Overhead Cost Workflow

Organization *

Accounting Schema GardenWorld US/A/US Dollar

Cost Type

Product

Product Category Standard

Start

8.6 Cost Workflow & Process Details

Menu: Manufacturing Management < Standard Costing Management < Cost Workflow & Process Details

Cost Workflow & Process Details

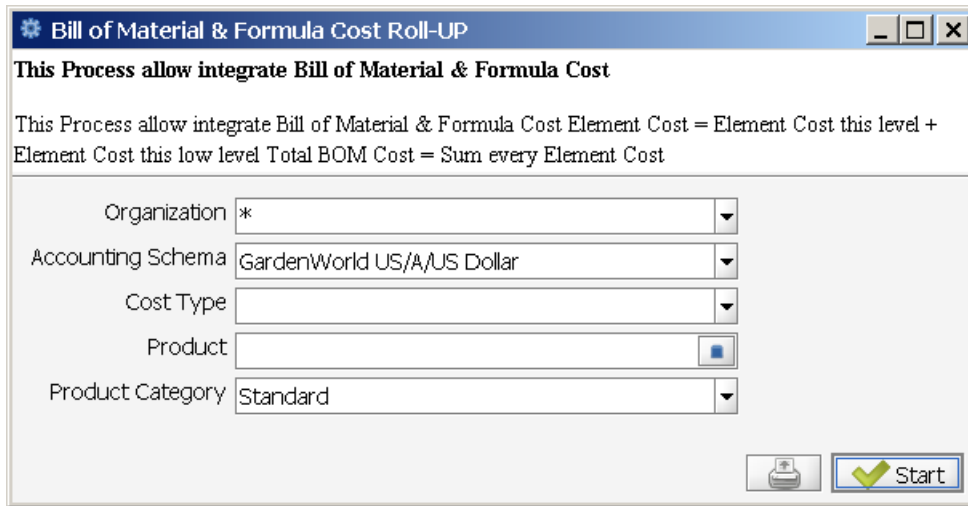
This report show every cost element to a BOM or Formula

This report show every cost element to a BOM or Formula

Start

8.7 Bill of Material & Formula Cost Roll-Up

Menu: Manufacturing Management < Standard Costing Management < Bill of Material & Formula Cost Roll-Up

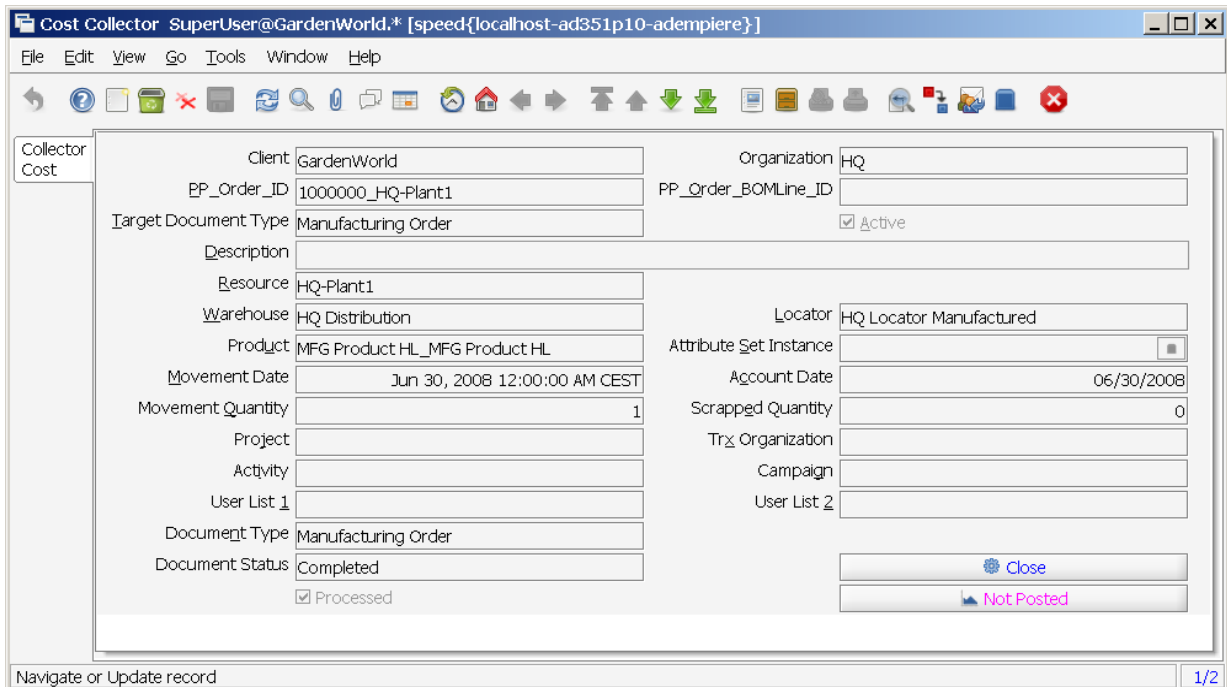


8.8 Cost Collector

Menu: Manufacturing Management < Standard Costing Management < Cost Collector

The cost collector is a repository of all the MO transactions. This real transactions relation allows to compare it with the standard transactions in order to be able to calculate variations by cost element.

To get access to the Cost Collector you must select the menu option Manufacturing < Costing Management < Cost Collector then the next window is displayed:



9 Simulation

There have been seen many simulation extensions on various window:tabs. This will be addressed in this chapter.

Simulation seems to be misleading. The Simulation groups within the various manufacturing tabs are used to set the time, quantity and usage values.

Perhaps another term should be used.