

# **11*i* Planning and Executing Kanbans**

**Student Guide**

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# Preface

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## Profile

### Before You Begin This Course

Before you begin this course, you should have the following qualifications:

- Thorough knowledge and proficiency in navigating Oracle applications
- Working experience with *a working knowledge of the manufacturing business process*

### Prerequisites

- *Oracle Inventory*
- *Oracle Bills of Material and Oracle Engineering*
- *11i Overview of Flow Manufacturing (e-class)*
- *11i Managing Demand in a Flow Environment (e-class)*
- *11i Designing and Balancing Flow Lines (e-class)*
- *11i Sequencing and Scheduling Flow Lines (e-class)*
- *11i Executing Flow Line Production (e-class)*

### How This Course Is Organized

This is an instructor-led course featuring lecture and hands-on exercises. Online demonstrations and written practice sessions reinforce the concepts and skills introduced.

## Related Publications

### Oracle Publications

<b>Title</b>	<b>Part Number</b>
<i>Oracle Inventory User's Guide</i>	<i>A83507-01</i>
<i>Oracle Bills of Material User's Guide</i>	<i>A75087-01</i>
<i>Oracle Master Scheduling/MRP and Oracle Supply Chain Planning User's Guide</i>	<i>A82941-01</i>
<i>Oracle Flow Manufacturing User's Guide</i>	<i>A69396-01</i>
<i>Oracle Work in Process User's Guide</i>	<i>A83598-01</i>

### Additional Publications

- System release bulletins
- Installation and user's guides
- *read.me* files
- *Oracle Magazine*

# Typographic Conventions

## Typographic Conventions in Text

Convention	Element	Example
Bold italic	Glossary term (if there is a glossary)	The <i>algorithm</i> inserts the new key.
Caps and lowercase	Buttons, check boxes, triggers, windows	Click the Executable button. Select the Can't Delete Card check box. Assign a When-Validate-Item trigger to the ORD block. Open the Master Schedule window.
Courier new, case sensitive (default is lowercase)	Code output, directory names, filenames, passwords, pathnames, URLs, user input, usernames	Code output: <code>debug.set ('I", 300);</code> Directory: <code>bin (DOS), \$FMHOME (UNIX)</code> Filename: Locate the <code>init.ora</code> file. Password: User <code>tiger</code> as your password. Pathname: Open <code>c:\my_docs\projects</code> URL: Go to <code>http://www.oracle.com</code> User input: Enter <code>300</code> Username: Log on as <code>scott</code>
Initial cap	Graphics labels (unless the term is a proper noun)	Customer address ( <i>but</i> Oracle Payables)
Italic	Emphasized words and phrases, titles of books and courses, variables	Do <i>not</i> save changes to the database. For further information, see <i>Oracle7 Server SQL Language Reference Manual</i> . Enter <code>user_id@us.oracle.com</code> , where <i>user_id</i> is the name of the user.
Quotation marks	Interface elements with long names that have only initial caps; lesson and chapter titles in cross-references	Select "Include a reusable module component" and click Finish.  This subject is covered in Unit II, Lesson 3, "Working with Objects."
Uppercase	SQL column names, commands, functions, schemas, table names	Use the SELECT command to view information stored in the LAST_NAME column of the EMP table.

Convention	Element	Example
------------	---------	---------

Arrow	Menu paths	Select File→ Save.
Brackets	Key names	Press [Enter].
Commas	Key sequences	Press and release keys one at a time: [Alternate], [F], [D]
Plus signs	Key combinations	Press and hold these keys simultaneously: [Ctrl]+[Alt]+[Del]

## Typographic Conventions in Code

Convention	Element	Example
Caps and lowercase	Oracle Forms triggers	When-Validate-Item
Lowercase	Column names, table names	SELECT last_name FROM s_emp;
	Passwords	DROP USER scott IDENTIFIED BY tiger;
	PL/SQL objects	OG_ACTIVATE_LAYER (OG_GET_LAYER (`prod_pie_layer`))
Lowercase italic	Syntax variables	CREATE ROLE <i>role</i>
Uppercase	SQL commands and functions	SELECT userid FROM emp;

## Typographic Conventions in Navigation Paths

This course uses simplified navigation paths, such as the following example, to direct you through Oracle Applications.

(N) Invoice > Entry > Invoice Batches Summary (M) Query > Find (B) Approve

This simplified path translates to the following:

1. (N) From the Navigator window, select Invoice > Entry > Invoice Batches Summary.
2. (M) From the menu, select Query > Find.
3. (B) Click the Approve button.

### Notations :

(N) = Navigator

(M) = Menu

(T) = Tab

(I) = Icon

(H) = Hyperlink

(B) = Button

## Typographical Conventions in Help System Paths

This course uses a “navigation path” convention to represent actions you perform to find pertinent information in the Oracle Applications Help System.

The following help navigation path, for example—

(Help) General Ledger > Journals > Enter Journals

—represents the following sequence of actions:

1. In the navigation frame of the help system window, expand the General Ledger entry.
2. Under the General Ledger entry, expand Journals.
3. Under Journals, select Enter Journals.
4. Review the Enter Journals topic that appears in the document frame of the help system window.

## Getting Help

Oracle Applications provides you with a complete online help facility.

Whenever you need assistance, simply choose an item from the Help menu to pinpoint the type of information you want.

### To display help for a current window:

1. Choose Window Help from the Help menu, click the Help button on the toolbar, or hold down the Control key and type 'h'.

A web browser window appears, containing search and navigation frames on the left, and a frame that displays help documents on the right.

The document frame provides information on the window containing the cursor. The navigation frame displays the top-level topics for your responsibility, arranged in a tree control.

2. If the document frame contains a list of topics associated with the window, click on a topic of interest to display more detailed information.

3. You can navigate to other topics of interest in the help system, or choose Close from your web browser's File menu to close help.

### **Searching for Help**

You can perform a search to find the Oracle Applications help information you want. Simply enter your query in the text field located in the top-left frame of the browser window when viewing help, then click the adjacent Find button.

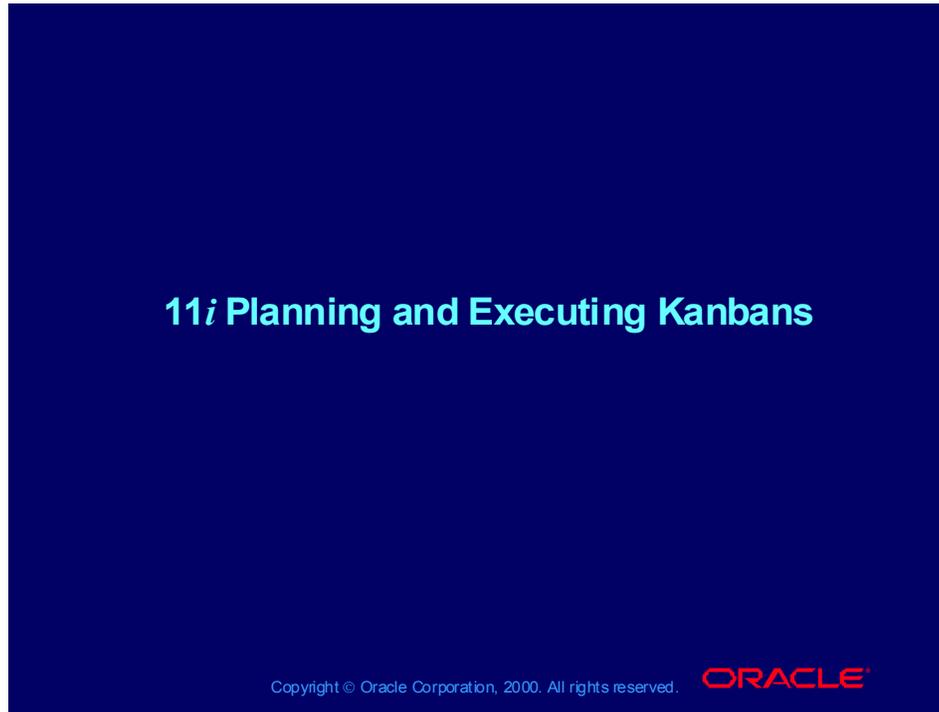
A list of titles, ranked by relevance and linked to the documents in question, is returned from your search in the right-hand document frame. Click on whichever title seems to best answer your needs to display the complete document in this frame. If the document doesn't fully answer your questions, use your browser's Back button to return to the list of titles and try another.

# **11*i* Planning and Executing Kanbans**

## **Chapter 1**

## 11i Planning and Executing Kanbans

---



### Objectives of Kanban Planning

After completing this course, you should be able to do the following:

- Identify the Item, BOM, and Pull Sequence attributes for Kanban
- Create and maintain Kanban Pull Sequences
- Identify the four ways a Kanban location can be replenished
- Create a Kanban plan
- View and compare Kanban plans to production
- Update the production plan with new Kanban sizing

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### Objectives of Kanban Execution

After completing this course, you should be able to do the following:

- **Generate and print Kanban cards**
- **Be familiar with Kanban card statuses**
- **Add nonreplenishable Kanban cards**
- **Replenish kanbans**
- **Create a kanban plan using actual production**

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# Agenda

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## Agenda

- Overview
- Setting up kanban items
- Calculating kanbans
- Planning kanbans
- Executing kanbans

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# Agenda

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## Agenda

- **Overview**
- Setting up kanban items
- Calculating kanbans
- Planning kanbans
- Executing kanbans

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**Kanban Management**

- Minimize inventory investment
- Increase inventory turns
- Stage material at point of use
- Integrate suppliers and other business units into the supply chain (flexibility, reliability)
- No work order kits
- No kit robbing

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## Overview of Kanban Management

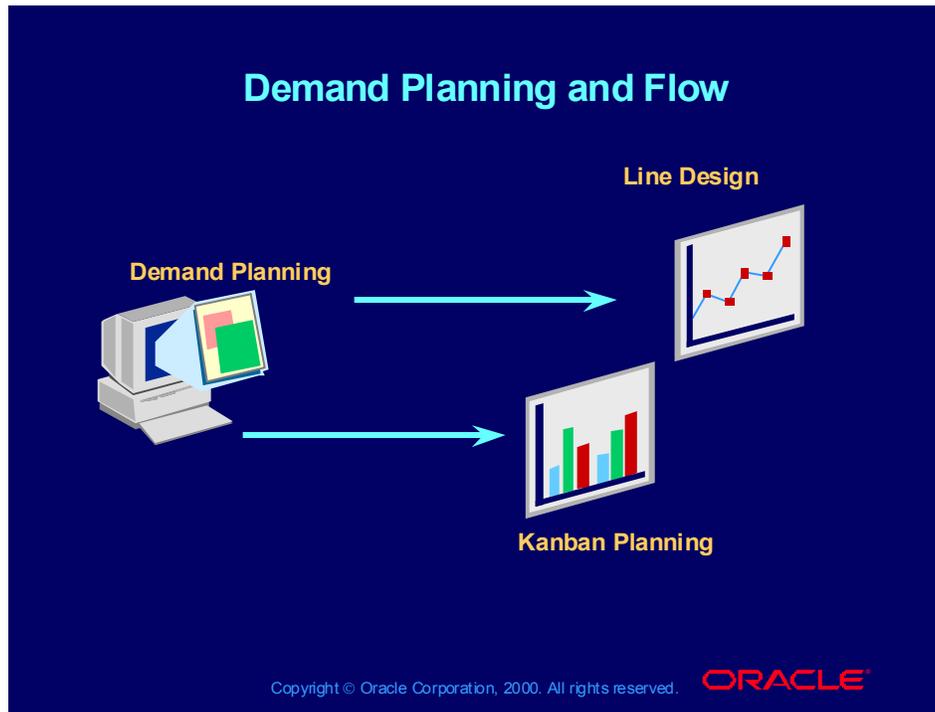
Kanban is a pull replenishment system with objectives of zero stockouts, shorter lead times, and reduced inventory with minimal manual supervision. Instead of waiting for an MRP plan to *push* materials to the floor, each operation *pulls* the material it needs from its sources at the time it needs it, signaling with a replenishment signal.

### **Kanban Definition**

The term Kanban refers to a visual replenishment signal, such as a card or an empty container for material. In a Kanban system, each component storage location adjacent to the line can have several containers, each holding the same quantity of material. Typically, an empty container is a signal to replenish. Meanwhile, work is continued using the other full Kanban containers at the location.

## Demand Planning and Flow

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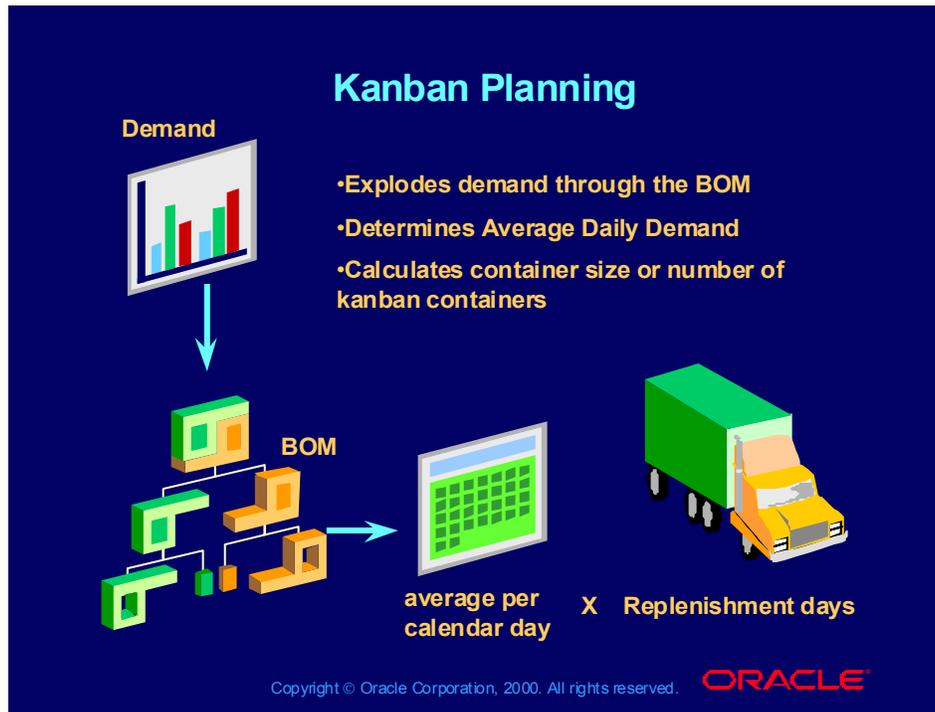


### Demand Planning and Flow Manufacturing

Demand sources are used in Flow Manufacturing for both Line design and Kanban planning.

Specifically, demand planning is used to define the design capacity of the flow lines and establishing line TAKT. Typically, that same demand is used for sizing kanbans to support the line design and customer demand.

# Kanban Planning



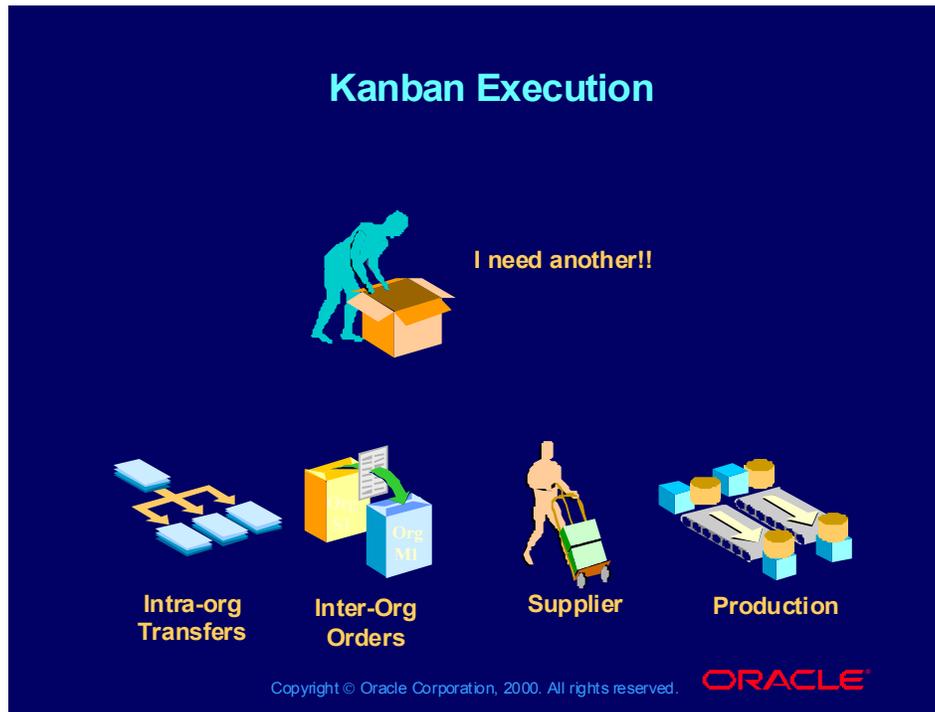
## Kanban Planning

Kanban planning is used to calculate the Kanban container quantity or number of containers (cards) for each component item at each point of use. The demand is specified for the finished assemblies and their bills of material are exploded to derive component quantities at consumption points. Additional factors such as replenishment time, safety stock and lot multipliers are used in the final calculation.

A kanban plan based on the same demand that was used for line design (establishing the demand at capacity) will help ensure that the components are available to support the production that the line was designed for.

## Kanban Execution

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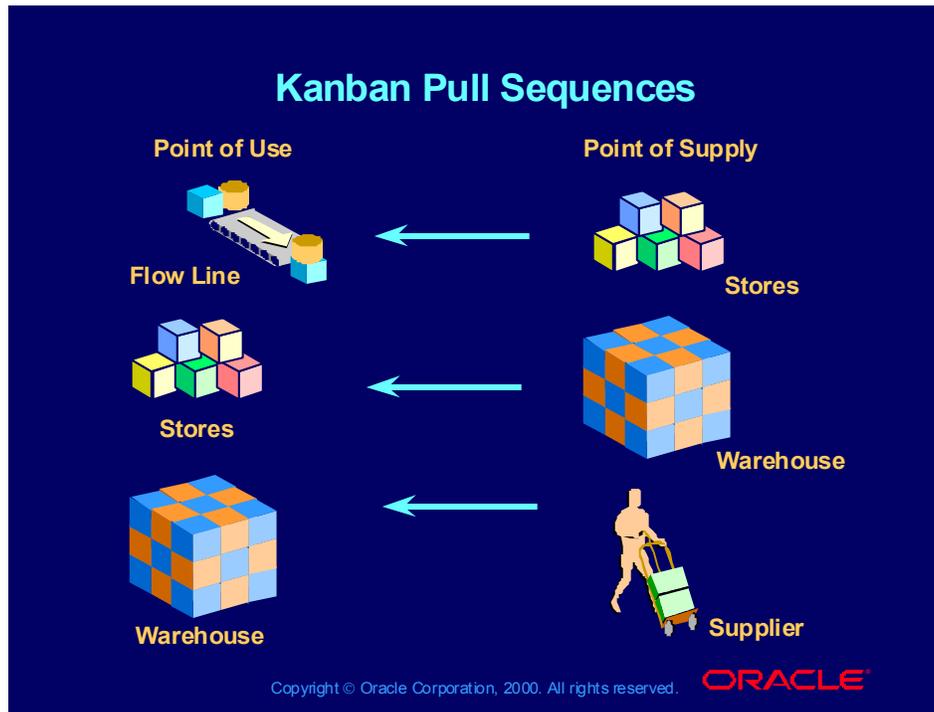
### Kanban Execution

As component material is used it must be replenished. The replenishment is done with a signal, either visual or electronic.

The visual signals typically include the movement of kanban cards, the emptying of a shelf space or just the existence of an empty container.

Electronic signals are used to initiate additional processes within an ERP system such as the automatic creation of a release against a blanket purchase order.

# Kanban Pull Sequences



## Kanban Pull Sequences

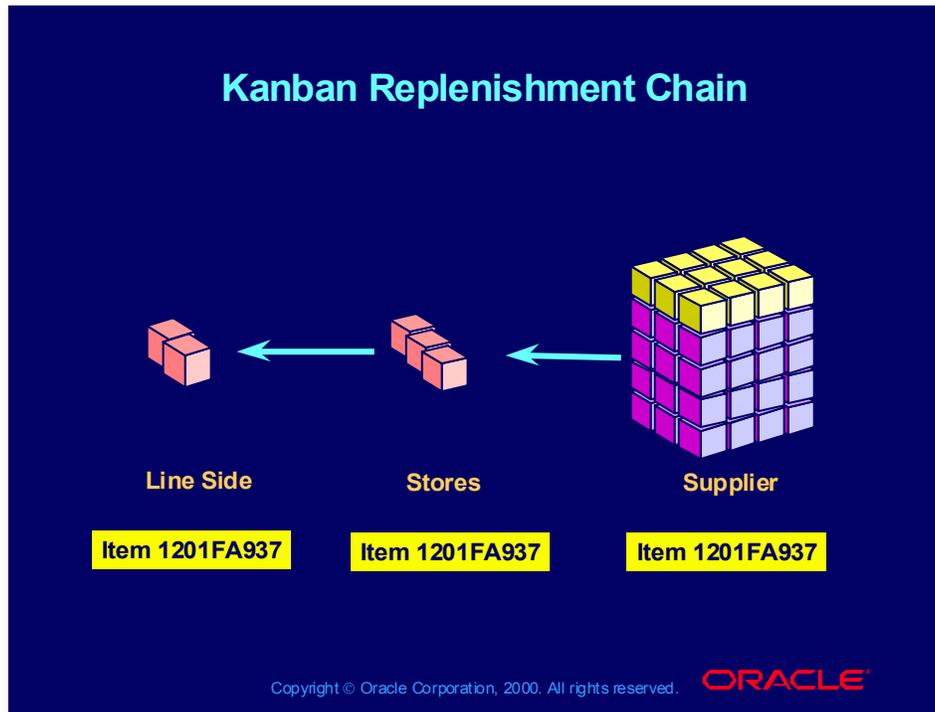
Pull sequences define the relationship between an item, its point of use and its point of supply. The attributes of a pull sequence define the kanban size, number of kanban containers, replenishment time, safety stock, lot multiplier and method of replenishment.

- Intra Org Transfer
- Inter Org Transfer
- Supplier
- Production

Multiple pull sequences may exist for an item if it is pulled from several sources. This is typically referred to as a pull chain.

## Kanban Replenishment Chain

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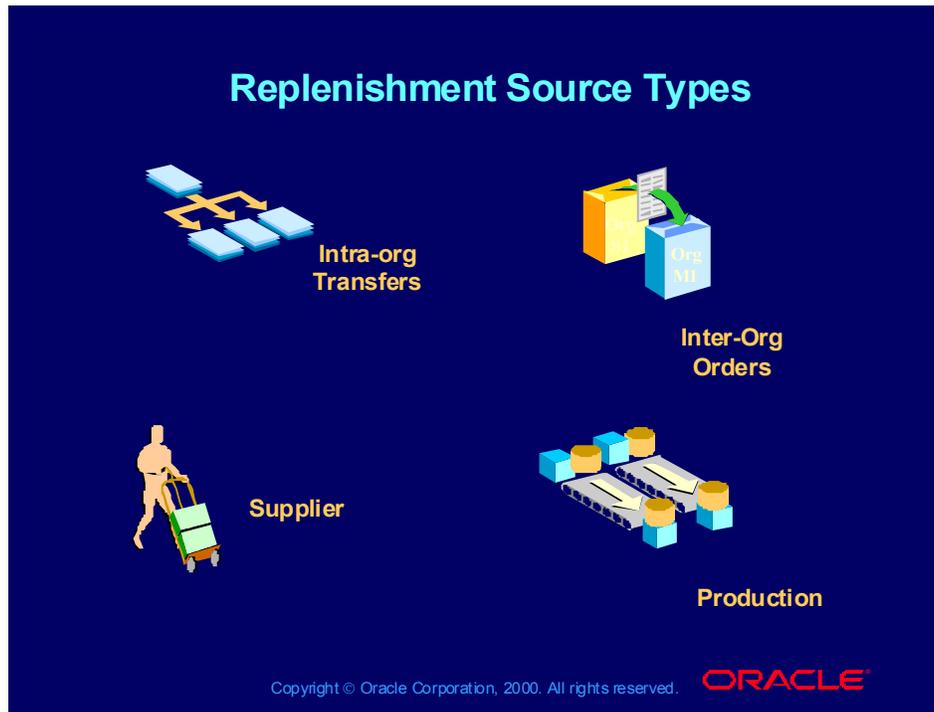
### The Flow Line at Vision Computers

The figure above shows a Kanban replenishment chain supporting a flow line. The Kanban replenishment chain is nothing more than multiple Kanbans that replenish each other.

Each link in the chain would have a different kanban size (or number of containers) based upon the differences in replenishment times and other factors.

## Replenishment Source Types

---



### Four Methods to Replenish Kanban Locations

- Production, if you intend to have the Kanban replenished by a WIP job, Flow Schedule or Repetitive schedule.
- Supplier, if you intend to have the Kanban replenished by an outside supplier.
- Inter-org, if you intend to have the Kanban replenished by another Inventory Organization. The item must be Internal Order enabled at the organization level.
- Intra-org, if you intend to have the Kanban replenished by a subinventory/locator within the same Inventory Organization.

# Agenda

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## Agenda

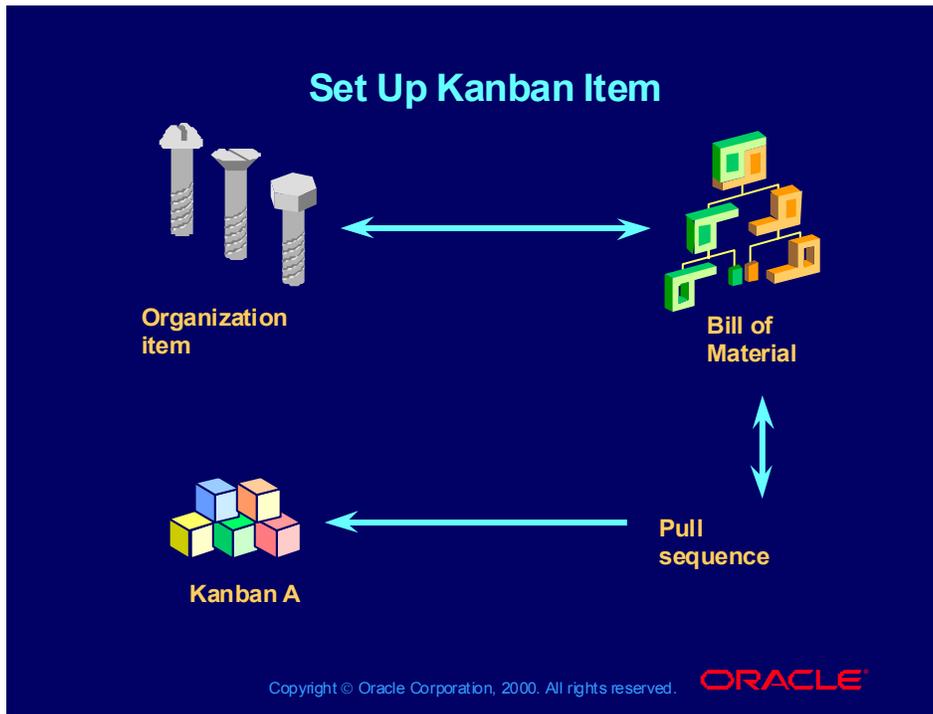
- Overview
- **Setting up kanban items**
- Calculating kanbans
- Planning kanbans
- Executing kanbans

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## Set Up Kanban Item

---



### Kanban Item Setup

There are item attributes that must be set correctly at the organization level, regardless of the item type, in order for the item to be Kanban planned:

#### Inventory tab:

Inventory Planning Method should be Not Planned.

Define a Planner, if desired. This will allow the user to filter information by planner when in the kanban workbench.

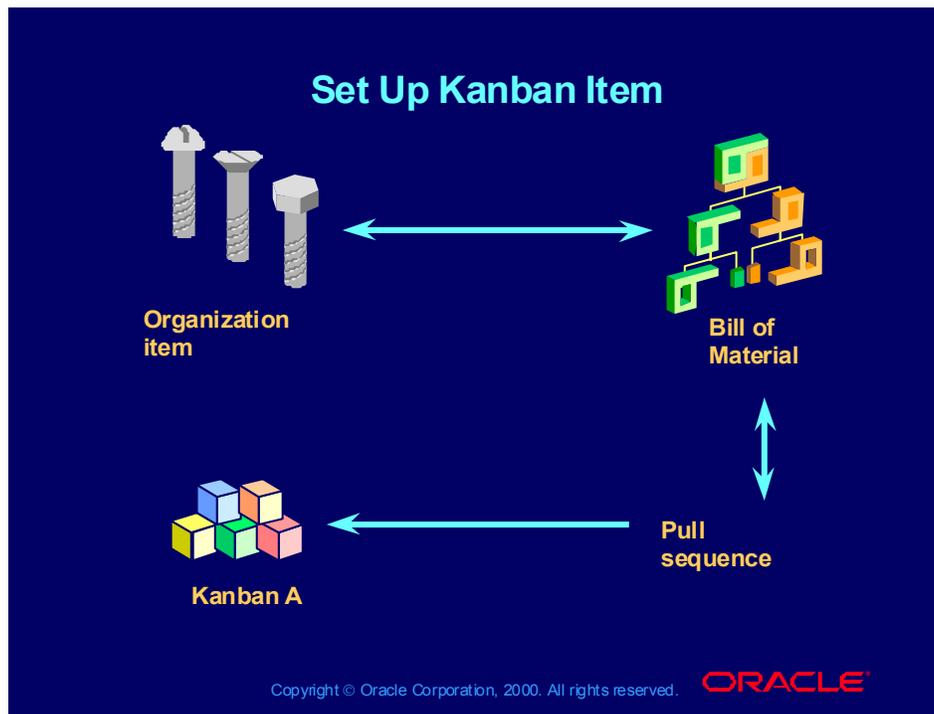
If you set locator control on the sub-inventory to Determine Control at Item Level, you need to set control here.

#### General Planning tab:

You may have multiple pull sequences for the same item that may have different values for the Fixed Lot Multiplier, Safety Stock, and Fixed Order Quantity. Therefore, any information you enter on the Organization item will not be used during kanban planning and execution. Instead, enter data on the kanban pull sequences.

## Set Up Kanban Item

---



### Set Up Kanban Item (continued)

#### MPS/MRP planning tab:

Forecast Control should equal None. This identifies items that have dependent demand that should be calculated by the kanban planning process.

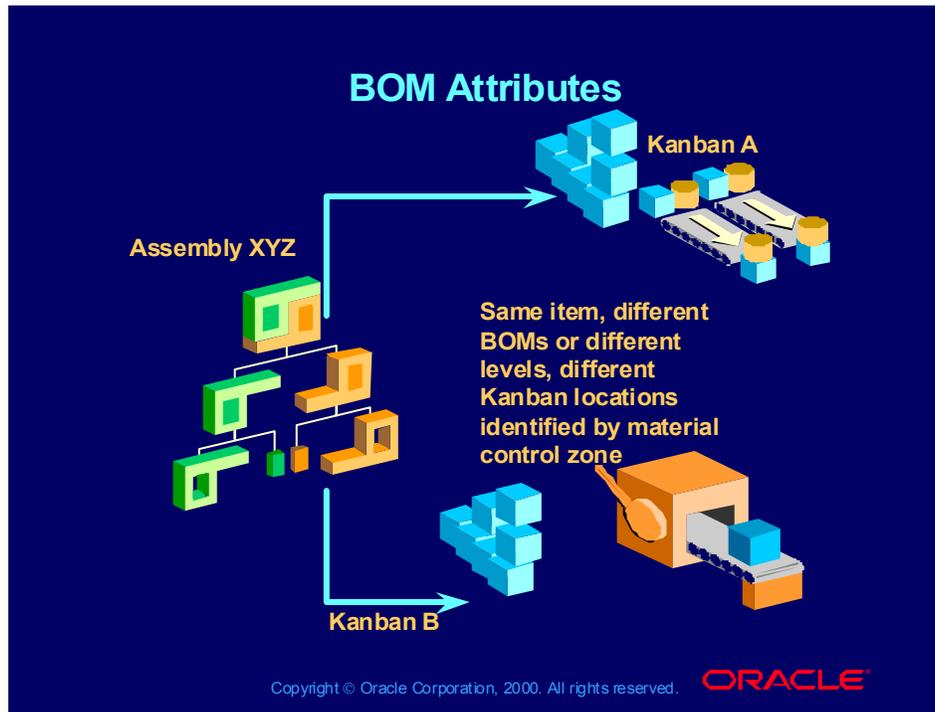
Release Time Fence should equal Kanban Item [Do Not Release]. This will allow kanban planned items to appear in the MRP Planners Workbench for long term planning purposes, and yet prevent the planner from being able to release planned orders for kanban items.

#### Work In Process tab:

If you want to specify kanban locations at the item level, enter the sub-inventory/locator information here.

**Note:** If the subinventory and item is not locator controlled, entering a locator will allow you to specify a specific location (row, rack, bin) for organizing purposes without forcing you to transact at the locator level.

## BOM Attributes



### BOM Attributes

If you have not entered subinventory and locator information on the item master or the consumption location varies from BOM to BOM, there are two BOM attributes that must be set correctly in the Material Control region in order for the item to be Kanban planned:

- Subinventory
- Locator

In the Material Control region of the bill, the Subinventory and Locator are the Kanban location for Kanban planned items. These two fields must match exactly the entries for Subinventory and Locator in the Pull Sequence.

The Subinventory and Locator in the bill enable the Kanban Planner to distribute demand for a single item to multiple Kanban locations.

## Kanban Location Considerations

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**Kanban Location Considerations**

 Typically, define one subinventory for the plant as a whole using locators as Kanbans locations to avoid setups

**Manufacturing Plant**

 Locators are required when in a Project Manufacturing environment

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### Considerations

Using subinventories by themselves as Kanban locations is possible, but involves detailed setup that can be avoided by using locators. Typically, you would define one subinventory for the floor as a whole or a line, using locators as the actual Kanban locations.

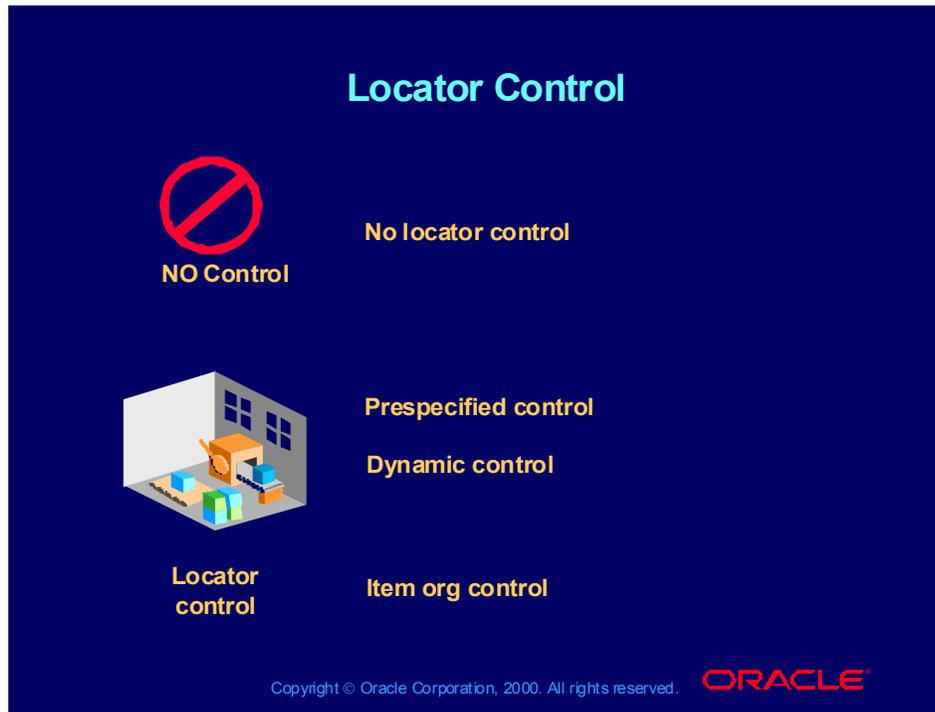
Locators are required when you are working in a Project Manufacturing environment.

Locators can add physical location information.

**Note:** If the subinventory and item is not locator controlled, entering a locator allows you to specify a specific location (row, rack, bin) for organizing purposes without forcing you to transact at the locator level.

## Locator Control

---



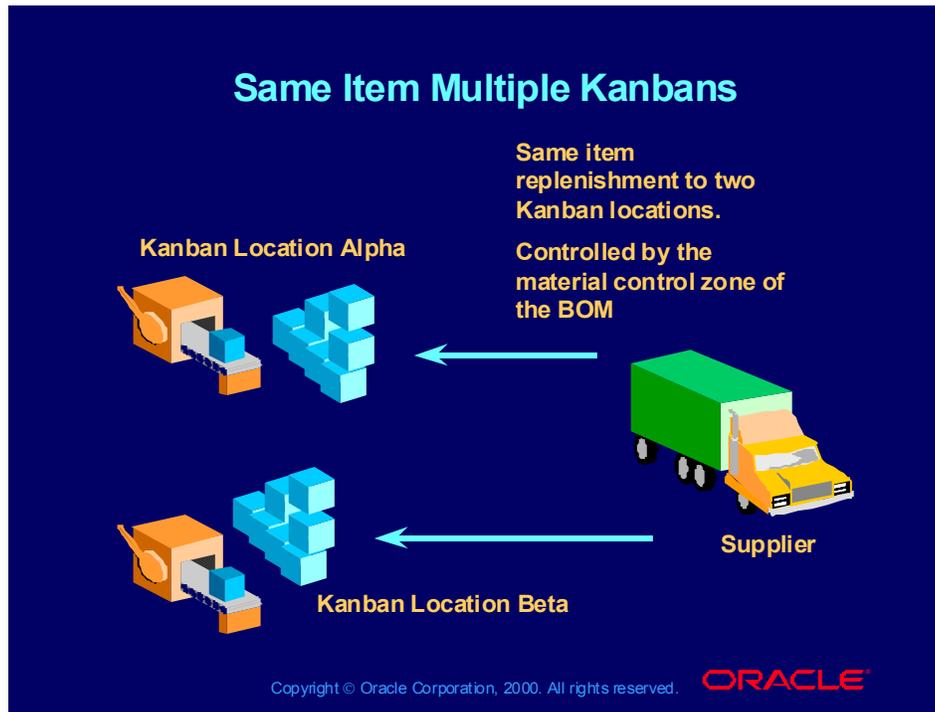
### Subinventory Locator Control

It is important to choose the correct Locator Control for Kanban locations.

- No locator control: Inventory transactions within this subinventory do not require locator information.
- Pre-specified locator control: Inventory transactions within this subinventory require you to enter a valid predefined locator for each item.
- Dynamic entry locator control: Inventory transactions within this subinventory require you to enter a locator for each item. You may choose a valid predefined locator, or define a locator dynamically at the time of transaction.
- Locator control determined at item level: Inventory transactions use locator control information that you define at the item level.

## Same Item Multiple Kanbans

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### Multiple Kanbans for the Same Item

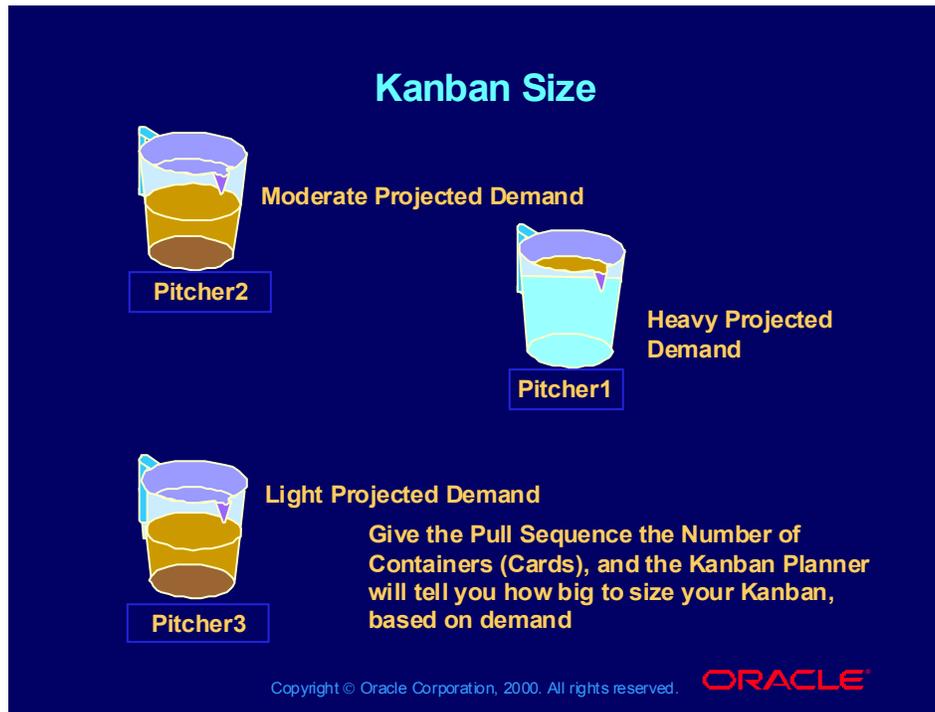
The point of use that defines a kanban pull sequence is derived from the item's supply location in the material control zone of the BOM, or in the WIP Supply location in the organization item attributes. The Kanban planner will look to the BOM first in the material control zone, and, if null, will default to the WIP Supply location organization item attributes.

Only one combination of item, point of use and supply type may be defined. If an component item is used on multiple lines, you must define a unique point of use subinventory and locator on the BOM.

**Note:** The point of use subinventory and locator on the pull sequence must exactly match that defined on the BOM or the organizational item for the kanban planner to determine usage requirements for an item at a specific subinventory / locator.

## Kanban Size

---

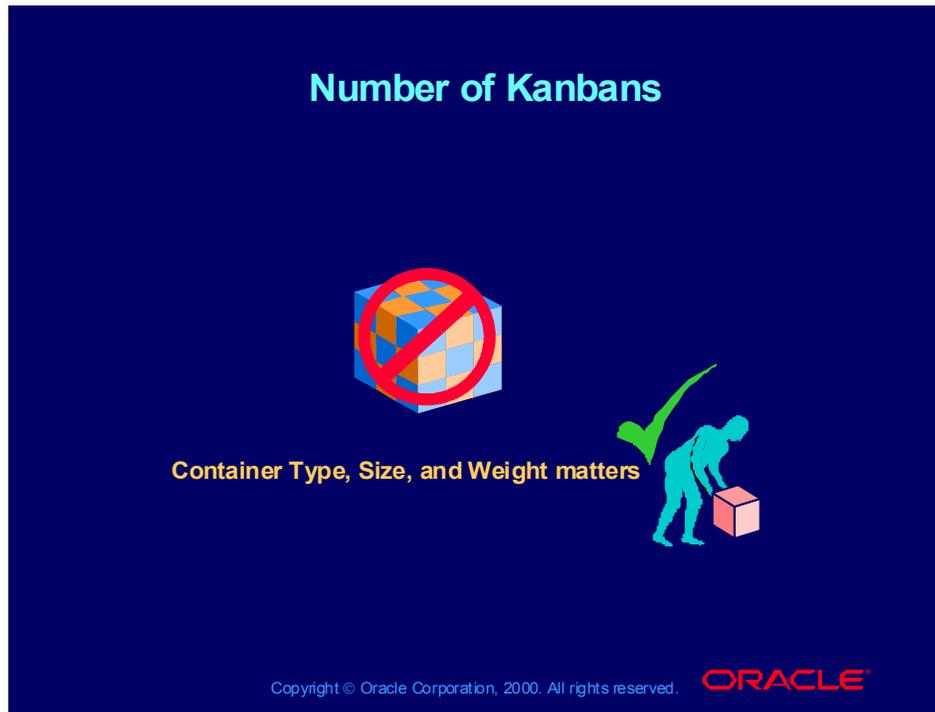


### Kanban Size

Kanban size refers to the number of items in each Kanban container (card). The product of size and number of containers (cards) will satisfy the demand at capacity for the planning horizon.

## Number of Kanbans

---



### Container Type, Size, and Weight

Each Kanban container corresponds to one Kanban card.

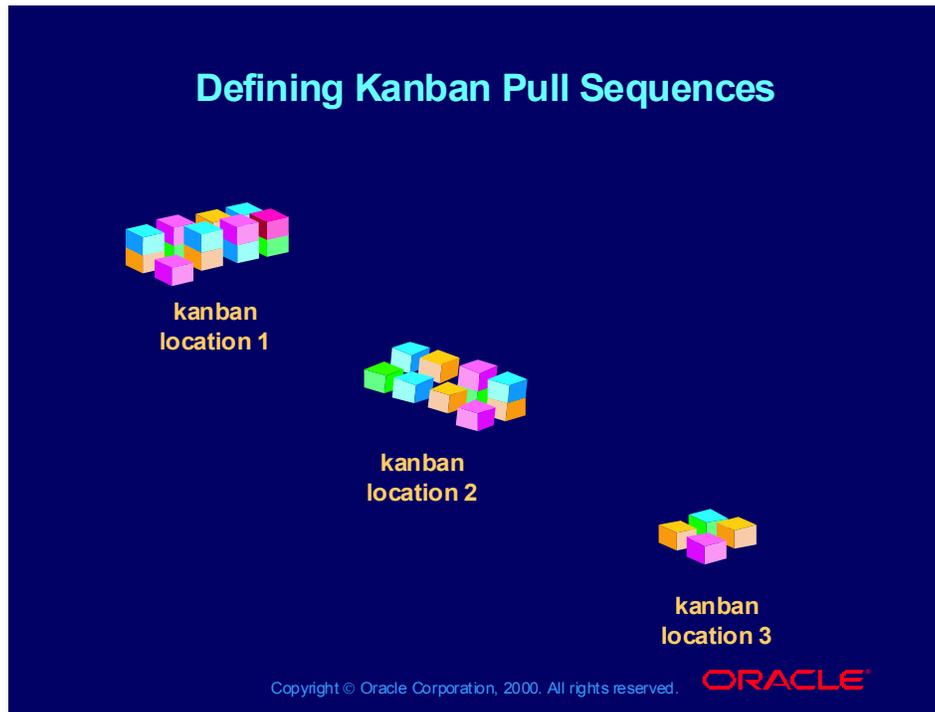
You can indicate in the Pull Sequence that you want the Kanban planner to calculate the number of Kanban containers (cards) needed at the Kanban location to support the demand. Typically, the choice of container type and size depends on:

- The carrying capacity of the replenishing clerk
- The carrying capacity of a forklift
- Employee handbook or labor contract rules on carrying capacity of employees (“...an employee must be able to lift packages up to 50 pounds... for over 50 pounds, a forklift must...”)
- The weight of the container full of material

Based on the considerations above, you might buy a container that carries well, then fit your material to the container so as to not exceed a combined weight that would surpass carrying capacity. You would then enter the Size in the Pull Sequence, and the Planner would calculate the Number of Cards (containers) needed.

## Defining Kanban Pull Sequences

---



### Pull Sequence Summary

Manufacturing and Distribution Manager Responsibility

(N) Flow Manufacturing > Kanbans > Kanban Setup > Pull Sequences

#### Pull Sequence

For every Kanban item, there is a replenishment chain—a series of Kanban locations that models the actual replenishment network on the shop floor or through external suppliers, specifying the sequence to follow to obtain the Kanban item. Each link in the chain is called a pull sequence.

In defining a pull sequence for a Kanban item in Oracle Inventory, you specify the supply source type for a Kanban item at a specific location. You also specify what you want the Kanban calculation program to calculate, the lead time for obtaining the Kanban item, and other modifiers that you want to affect the calculation program.

## Defining Pull Sequences

---

**Defining Pull Sequences**

- Define the kanban item and point of use:
  - Sub-inventory / locator
- Define the supply source:
  - Intra-Org Transfer
  - Inter-Org Transfer
  - Supplier
  - Production

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Setup > Pull Sequences

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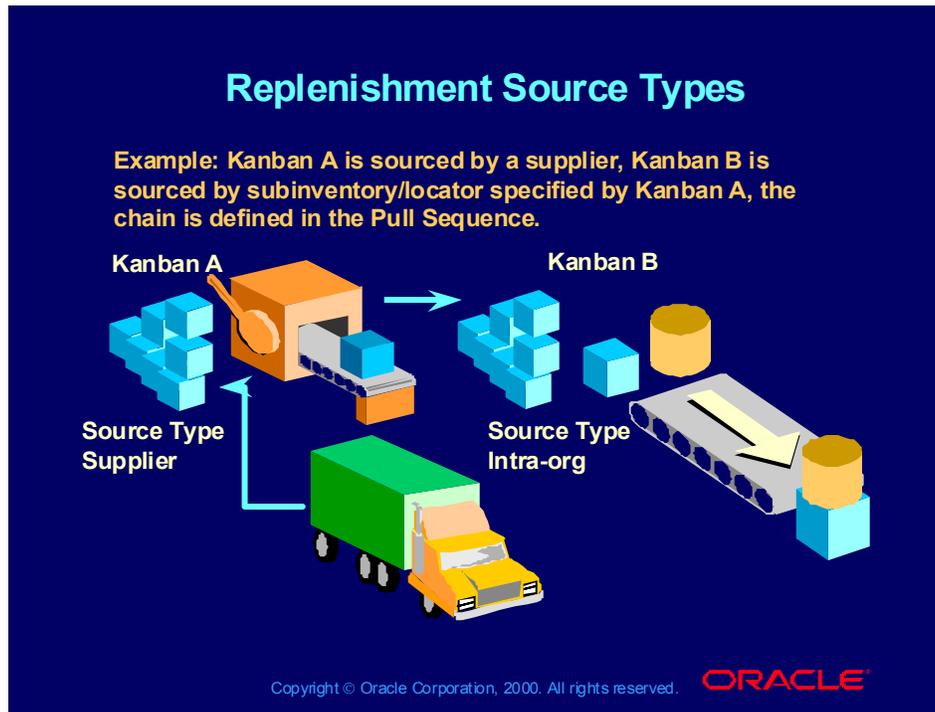
### To Define Pull Sequences

(Help) Oracle Inventory > Inventory Planning and Replenishment > Defining Kanban Pull Sequences

**Note:** If the subinventory and item is not locator controlled, entering a locator will allow you to specify a specific location (row, rack, bin) for organizing purposes without forcing you to transact at the locator level.

**Note:** The subinventory and locator on the first pull sequence in your replenishment chain must equal the subinventory and locator on either the material control region of all bills of material using this kanban location or the WIP supply location on the Organization Item Master. If these values do not match exactly, kanban planning for the item will not be correct.

## Replenishment Source Types



### To Define Pull Sequences (continued)

Enter the Source Type:

- Production, if you intend to have the Kanban replenished by a WIP job, Flow Schedule or Repetitive schedule.
- Supplier, if you intend to have the Kanban replenished by an outside supplier.
- Inter-org, if you intend to have the Kanban replenished by another Inventory Organization. The item must be Internal Order enabled at the organization level.
- Intra-org, if you intend to have the Kanban replenished by a subinventory/locator within the same Inventory Organization.

### Calculation Methods

You can select the calculation method as follows:

- **Do Not Calculate:** Enter a value in the Size and Number of Cards fields.
- **Kanban Size:** Enter a value in the Number of Cards field.
- **Number of Cards:** Enter a value in the Size field.

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### Calculate

- **Kanban Size:** You will enter the number of Kanban Cards, and the Kanban Planner will calculate the Kanban size.
- **No of Cards:** You will enter the size of the Kanban, and the Kanban Planner will calculate the number of cards.
- **Do not Calculate.** The Kanban planner will not plan for this location. You must enter both Kanban size and number of containers.

## Planning Parameters

---

**Planning Parameters**

1. Your supplier may deliver in packages that work well as Kanban containers.



Shop Floor

2. Or you may want to set your Minimum Order Quantity to not less than the items per your suppliers container, or some multiple using Fixed Lot Multiplier.



Supplier

3. The whole process, supplier to stores to Kanban, is your Lead Time plus Safety Stock Days.

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### Planning Parameters

**Minimum Order Quantity:** This quantity represents the minimum quantity that is released to the source. Actual container size is generally a factor of this number and replenishment signals are held until the minimum value is reached. The Minimum Order Quantity is typically justified by vendor cost discounts, or vendor container issues. For example, you may get a 10% discount by your vendor for material ordered in quantities of 100—in this case, you might decide to set your Minimum Order Quantity to 100 but store this in four containers of 25 each. This is sometimes referred to as dual card Kanban and/or Aggregation.

**Lot Multiplier:** If your vendor only ships in a specified size, the lot multiplier value will adjust the calculations so that the kanban size is a multiple of the lot.

**Replenishment Lead Time:** This is to be expressed in days. This is how long it will take to physically replenish the Kanban. For example, if you enter two (2), the Kanban Planner will increase the size of the Kanban by 2 times the average daily demand.

**Note:** Lead times of less than a day may be expressed by using decimals.

**Safety Stock Days:** A factor, along with the item's average gross requirements and the Safety Stock percent, that is used to calculate safety stock quantities for the item.

# Agenda

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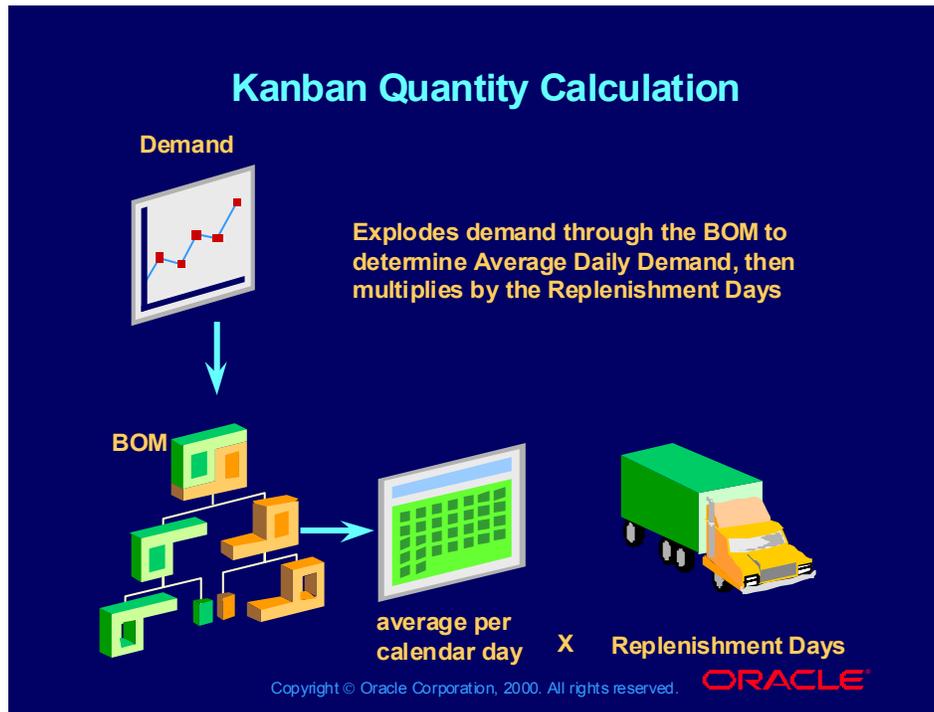
## Agenda

- Overview
- Setting up kanban items
- **Calculating kanbans**
- Planning kanbans
- Executing kanbans

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# Kanban Quantity Calculation



## Calculation Formula

One of the most important tasks of a Kanban planning system is determining the optimal number of Kanban cards. The Kanban planning software takes care of this calculation provided you enter correct values for Kanban size, average daily demand for the Kanban item, and the lead time to replenish one Kanban.

By default, the standard calculation is:

$$(C - 1) * S = D * (L + SSD)$$

where SSD is the Safety Stock Days

where:

**C** is the number of Kanban cards

**S** is the Kanban size

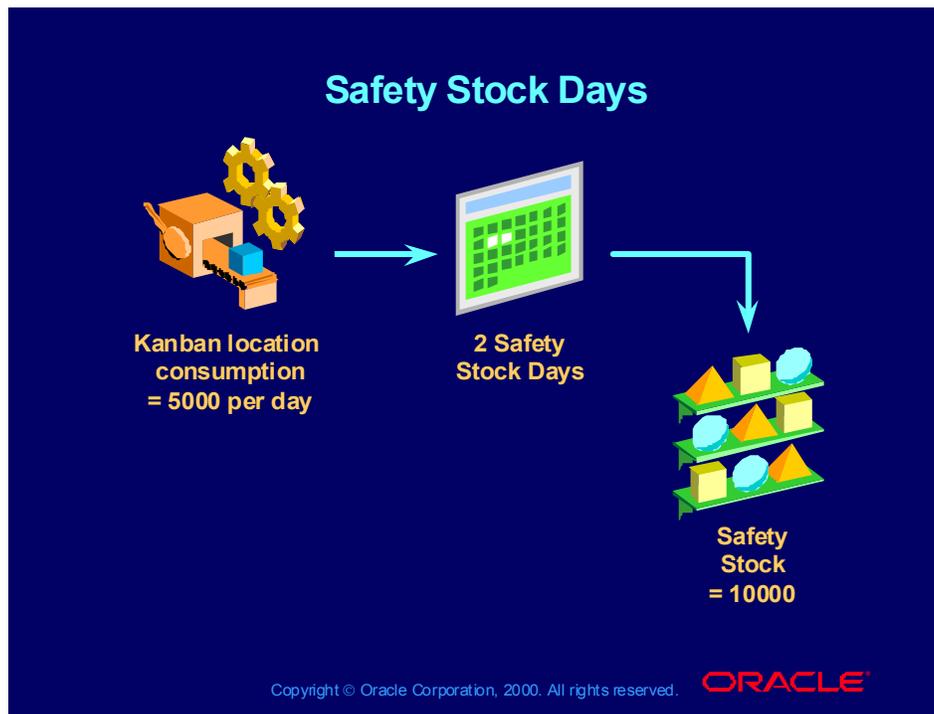
**D** is the average daily demand

**L** is the lead time (in days) to replenish one Kanban

**Note:** We also provide an API that can be used to provide a customized calculation.

## Safety Stock Days

---



### Days Versus Quantity

In an MRP planned manufacturing environment, we added safety stock quantities to hedge spikes in demand without knowing how long that quantity would last.

In Flow Manufacturing the demand is smoothed before use in Kanban Planning. The key to avoiding stockouts in Kanban locations is to have enough days' supply to feed production while the empty bins are being replenished.

Safety stock can be used to account for fluctuation in the demand smoothed out by the kanban planner and for fluctuation in the supplier lead time.

#### Example

Safety Stock Days = 2

Average Daily Demand = 5,000

Safety Stock quantity in Kanban location to cover 2 days of Production = 10,000

# Agenda

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## Agenda

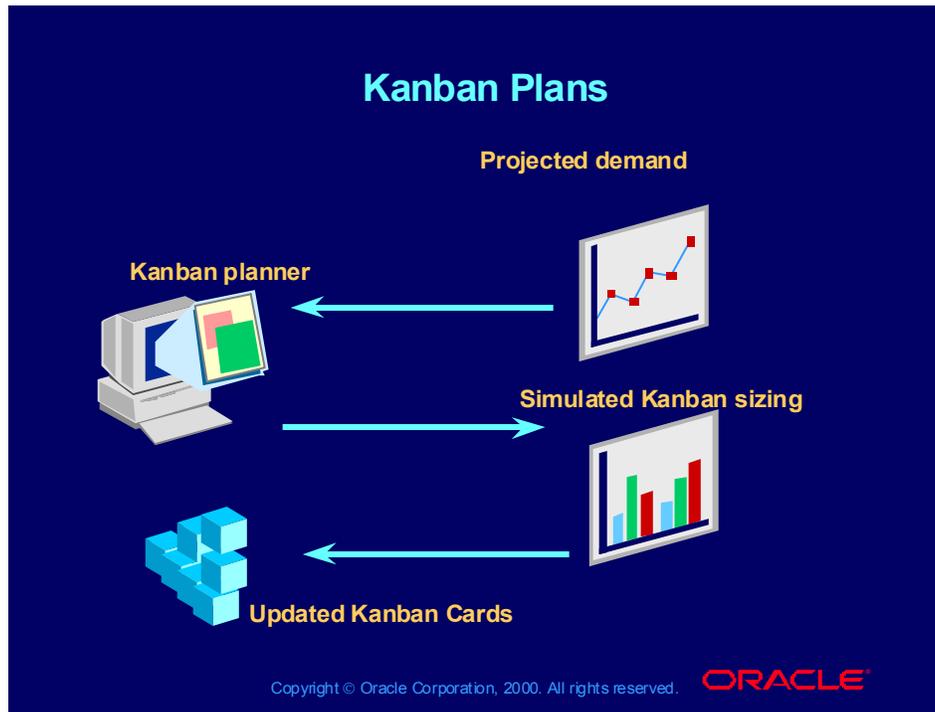
- Overview
- Setting up kanban items
- Calculating kanbans
- **Planning kanbans**
- Executing kanbans

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## Kanban Plans

---



### Create Kanban Plans

(Help) Oracle Master Scheduling/MRP > Using the Kanban Calculation Program

Calculating the kanban size or the number of kanban cards involves two steps:

- telling the application what demand information to use
- submitting a request for the calculation program

In the Kanban Names form, you are able to define any number of Kanban plans in which you can calculate and store Kanban quantities for each item/Kanban location. You will be able to calculate optimal Kanban quantities based on any demand schedule you choose.

Once created, you are able to compare the new Kanban quantities to those in the current production system and optionally make updates to the production system.

## Creating Kanban Plans

---

**Creating Kanban Plans**

Use the Kanban Names window to complete:

- Plan Name
- Description
- Demand Type
- Forecast/Schedule

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Planning > Names

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### Creating Kanban Plans

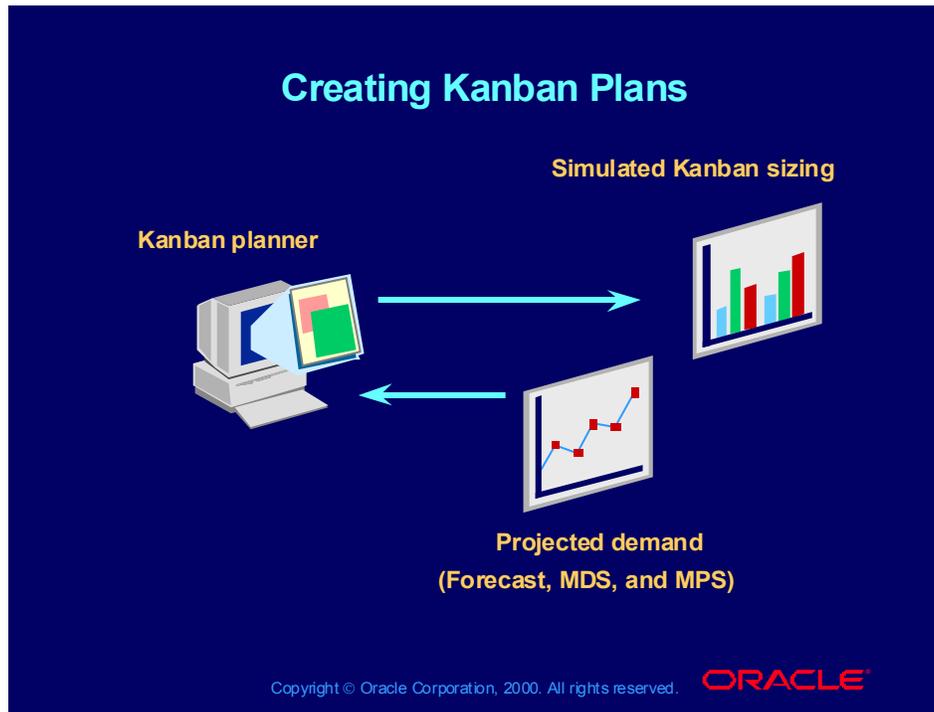
(Help) Oracle Master Scheduling/MRP > Using the Kanban Calculation Program

- Enter a user-defined Plan Name and Description
- Select Forecast, MDS, MPS, or Actual Production for the Demand Type
- For Forecast/Schedule, select an existing Schedule name

**Note:** It is suggested that the Demand Schedule used to size component Kanbans be the same as the one used to balance the line.

## Creating Kanban Plans

---

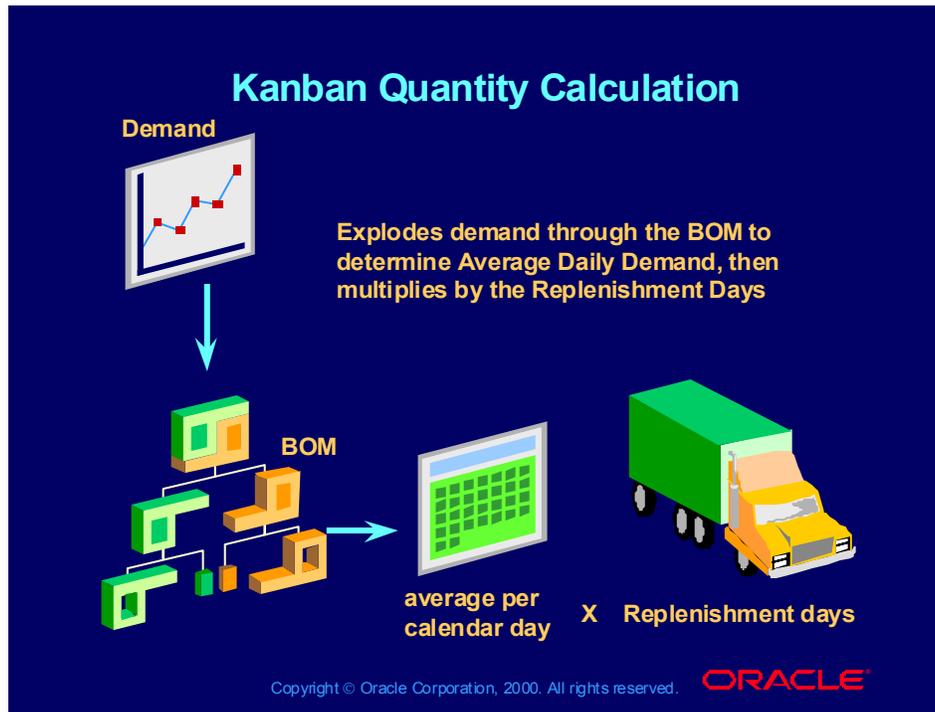


### Kanban Plan Names

In choosing a demand type of either MDS, MPS, or Forecast, you are defining your intent to load one of those demand schedules into the Kanban Plan when you launch the Kanban Plan. The Forecast/Schedule field is the actual demand you wish to base your sizing calculations on.

**Note:** Remember, we are sizing the Kanbans to capacity, even though daily demand requirements will tend to be less. This is something typically done only once or twice a year, unless there is a huge increase in demand (maybe new product is added to the Product Family). Spikes in demand do not warrant new Kanban sizing as they are resolved with Nonreplenishable Kanbans. You can use the compare functionality with an actual production kanban plan to identify spikes in demand.

# Kanban Quantity Calculation



## Kanban Quantity Calculation Program

(Help) Oracle Master Scheduling/MRP > Calculation Formula

You can calculate the Kanban quantities for every item/Kanban by invoking the Kanban Quantity Calculation program. This program accepts an MPS, MDS, a forecast or actual scheduled production as input. It explodes the end assembly demand through the BOM structure and, based on the user defined replenishment chains, calculates the average demand for the components at each Kanban location. Using the average demand and the replenishment lead time for an item, the program determines how many Kanbans are needed at a particular location to prevent a stock out.

## Launching the Kanban Plan

---

**Launching the Kanban Plan**

Use the Kanban Planning Launch Parameters window to complete:

- Plan Name
- Range of Items (optional)

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Planning > Launch

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### Launching the Plan

(Help) Oracle Master Scheduling/MRP > Using the Kanban Calculation Program Launch the Kanban Plan paying particular attention to the following imperatives:

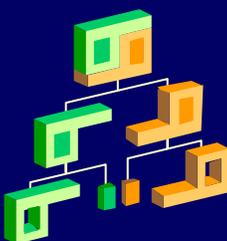
- Select from List of Values the Plan Name field to load a Kanban Plan.
- Optionally, enter a range of items. If you do not limit the launch of the Kanban Plan to a range of items, the Kanban Planner plans for all Kanban Planned items.

## BOM Effectivity

---

**BOM Effectivity**

**BOM: Model A**



**Your effectivity is 8 A.M. today; launch with Date equals Tomorrow."**



**BOM Effectivity in the Launch window means 00:00:00 of the date chosen. If the date chosen is today, and the actual BOM's effectivity is after 00:00:00 today (like 08:00:00), then choose tomorrow.**

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### BOM Effectivity

Enter a BOM Effectivity date.

Use the following example to help you decide on a BOM Effectivity date. If the bill being used in your demand schedule was created yesterday or earlier, you can use the current date as the BOM Effectivity date.

If you created the bill being used in your demand schedule today, then you must use tomorrow's date as the BOM Effectivity date. This is because the timestamp on the bill you created today is probably between working hours; when you enter the BOM Effectivity date of today, it means at 00:00:00 today, which is before working hours. So the Kanban Planner will not see the bill you created during working hours. If on the other hand, you enter for the BOM Effectivity date tomorrow's date, the Kanban Planner looks for all bills created before 00:00:00 tomorrow, which would include those bills created during today's working hours.

## Demand Start and Cutoff Dates

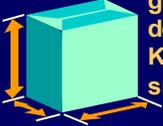
---

**Demand Start and Cutoff Dates**



If you choose a horizon less than that of the demand schedule, then Kanbans are sized too small. →

Because average daily demand is directly affected by the date range chosen here.



If you choose a horizon greater than that of the demand schedule, then Kanbans are sized too small. →

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### Demand Start and Cutoff Dates

- Enter a Demand Start Date and Demand Cutoff Date.
- The Demand Start Date and Demand Cutoff Date are critical input. You must enter the precise date range within which your demand schedule falls. Any deviation by one day longer or shorter will directly affect the calculation of the Average Daily Demand.
- Recall how Average Daily Demand is used in the sizing calculations:  
$$(\text{No of Kanbans} - 1) * \text{Kanban size} = \text{average daily demand} * (\text{lead time} + \text{safety stock days})$$
- Click Submit, then Navigate to View My Requests and verify that the process completed Normal.

## Viewing Kanban Plans

---

### Viewing Kanban Plans



- **Kanban Plans:**
- **Recalculate Kanban quantities for all or a subset of items**
- **Compare quantities across plans**
- **Selectively merge changes back into production system**

**Manufacturing and Distribution Manager Responsibility**  
**Flow Manufacturing (N) Kanbans > Kanban Planning > Workbench**

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### View Kanban Plans

(Help) Oracle Master Scheduling/MRP >

Viewing and Updating Kanban Calculations

You can use the Kanban Workbench to review that the demand loaded correctly, then analyze the sizing recommendations.

From the Kanban Workbench, you can check to see that the Kanban Planner based its calculations on expected demand. Use the Demand button, and the Find Kanban Demand entries to limit your search to items you want to analyze in particular.

Check that the following occurred:

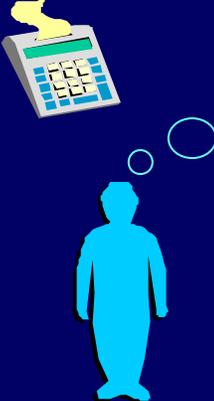
- Demand exploded through the bill to component items properly
- Sales orders consumed forecasts

# Mathematics Revisited

---

**Mathematics Revisited**

**(No. of Kanbans - 1)(Size) = Avg. Daily.Demand (Lead Time)**



**What if:**

- The number of Kanbans equals 1?**
- Lead Time is in hours or minutes?**
- The average is heavily skewed by one data point?**

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## Test Your Understanding

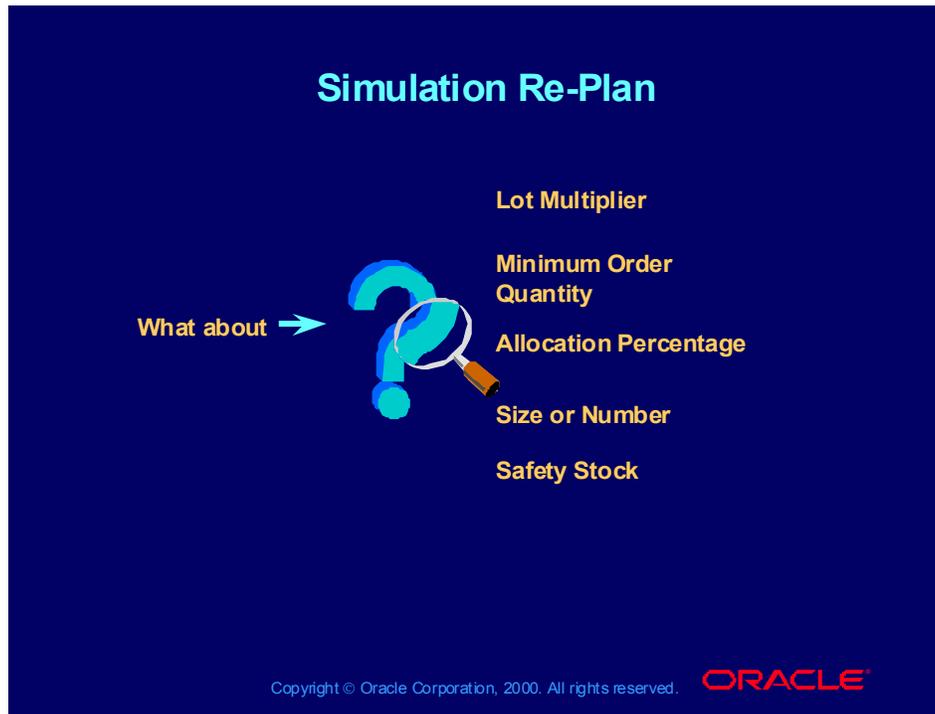
Given:

- Kanban Size = 2000
- Average Daily Demand = 8000
- Lead Time = 1 day

Calculate Number of Kanbans

## Simulation Re-Plan

---



### Simulation Re-Plan

(Help) Oracle Master Scheduling/MRP >

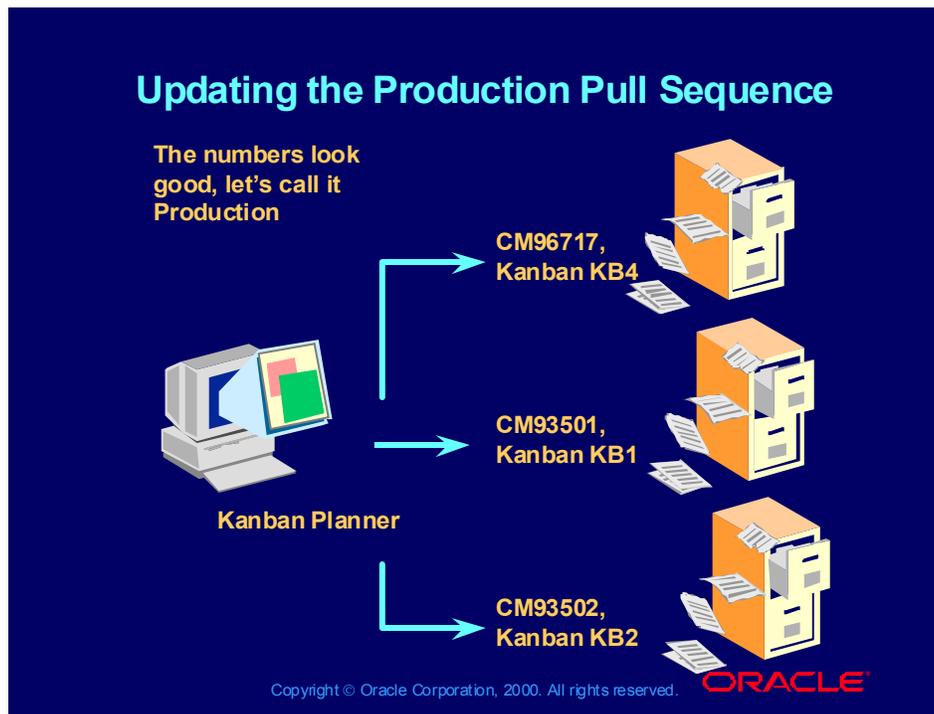
Viewing and Updating Kanban Calculations

You can update the planned Pull Sequence attributes and then run a simulation plan to test different options that affect the Kanban sizing, including Lead Time, Number of Cards, or Kanban Size.

**Note:** the changes made to Pull Sequence within a plan do not effect the production pull sequences or cards until the Update production option is selected.

## Updating the Production Pull Sequence

---



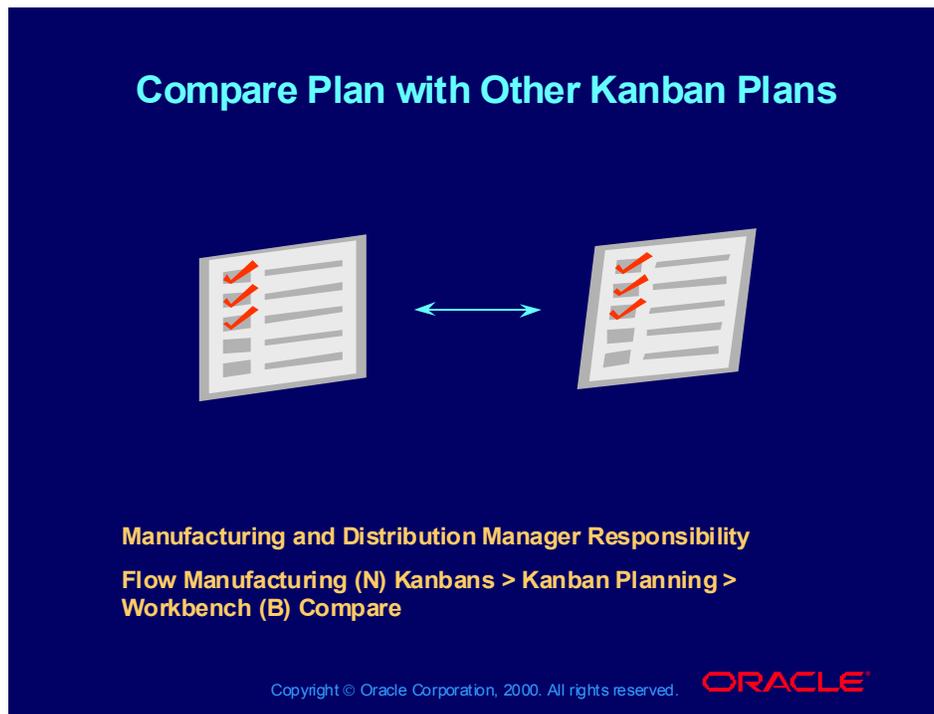
### Update Pull Sequence

Now that you have run the Kanban Planner, and performed your 'what if' analysis using simulation plan, use the Kanban Details window to update the Production Kanban Pull Sequence with the changes. The Production Kanban Pull Sequence is your record of decisions made based on the recommendations of the Kanban Planner. You can accept the Kanban sizing recommendations and update the Pull Sequence directly from the Kanban Workbench.

**Note:** To initialize the Production kanbans and print cards for the first time you select all rows and update production.

## Compare Plan with Other Kanban Plans

---



### Comparing Plans

From the Kanban Workbench window, use the Compare button to open the Kanban Comparison Criteria window. You can compare the most recent launch of the Kanban plan with the recommendations previously saved in the Pull Sequence. This is essentially comparing your kanban plan to Production kanbans.

Instead of comparing Kanban planned items one-for-one, you can limit your comparison by using the following criteria:

- Category
- Item
- Locator
- Planner
- Subinventory
- Variance

You can do this by picking on the Field segment in the Kanban Comparison Criteria window.

## Compare Plan with Other Kanban Plans

**Compare Plan with Other Kanban Plans**

Field	Condition	From
KB-S1-Flow	equals	Production

<b>Plan 1</b>	KB-S1-Flow	<b>Plan 2</b>	Production
Forecast/Schedule	F-S1-Flow		

Item	Subinventory	Variance	Plan 1 Cards	Plan 1 Size
CM93501	KB1	0	9	25
CM93502	KB2	25	25	10
CM96717	KB4	21.6	2	304

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### Comparing Plans (continued)

Selecting the Find button yields a comparison between the current launch of the Kanban Plan with the size values of the same item in the Pull Sequence. Note the following criteria:

- The Field segment is the kanban plan name
- The Condition statement is “equals”
- The From segment is Production

In the figure above, Plan 1 (KB-S1-Flow) is being compared to Plan2 (Production). Item CM96717 has a Variance of 21.6 percent. You can see that the size value in Plan 1 is 304 units.

## Compare Plan with Other Kanban Plans

---

### Compare Plan with Other Kanban Plans

<b>Plan 1</b>	<b>KB-S1-Flow</b>	<b>Plan 2</b>	<b>Production</b>
<b>Forecast/Schedule</b>	<b>F-S1-Flow</b>		

<b>Item</b>	<b>Subinventory</b>	<b>Plan 1 Size</b>	<b>Plan 2 Cards</b>	<b>Plan 2 Size</b>
CM93501	KB1	25	9	25
CM93502	KB2	10	20	10
CM96717	KB4	304	2	250

Notice that Plan 2 has a size value of 250 units. The variance is calculated as:  $(304 - 250) / 250 = 21.6$  percent.

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## Practice KB-1

Replace *nn* with your initials.

In this practice, you will learn how to:

- Define kanban pull sequences
- Set up and launch a forecast type kanban plan
- Set up and launch another kanban plan based on actual production
- Compare the two kanban plans

**NOTE:** all organization assignments are for M1, Seattle Manufacturing

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### Create Three Pull Sequences

1. Navigate to the Pull Sequence window.

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanban > Kanban Setup > Pull Sequences

2. Set up pull sequences as follows:

Item	Sub-inventory	Source	Type	Calculate	Number of Cards
nn-KB1	RIP	Supplier		Kanban size	2
nn-KB1	Stores	Supplier		Kanban size	2
nn-KB2	RIP	Supplier		Kanban size	2
nn-KB3	RIP	Supplier		Kanban size	2
nn-KB4	RIP	Supplier		Kanban size	2

3. Save your work

### Set up and launch a forecast type kanban plan

4. Navigate to Kanban Names window.

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanbans > Kanban Planning > Names

### Practice KB-1

Replace *nn* with your initials.

In this practice, you will learn how to:

- Define kanban pull sequences
- Set up and launch a forecast type kanban plan
- Set up and launch another kanban plan based on actual production
- Compare the two kanban plans

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### Set up and launch a forecast type kanban plan (continued)

5. Set up a kanban plan as follows:

Plan Name: nn-KBP

Description: nn kanban plan

Demand Type: Forecast

Forecast/Schedule: nn-fexp

6. Save your work

7. Click the Forecast/Schedule button and record the dates of your forecast:

Date \_\_\_\_\_ End Date \_\_\_\_\_

8. Return to the previous window.

9. Click the Launch button for your nn-KBP plan.

10. Set the Demand Start and Demand Cutoff dates to the dates that you recorded in step 7.

11. Submit your request.

### Practice KB-1

Replace *nn* with your initials.

In this practice, you will learn how to:

- Define kanban pull sequences
- Set up and launch a forecast type kanban plan
- Set up and launch another kanban plan based on actual production
- Compare the two kanban plans

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#### Set up and launch a forecast type kanban plan

12. Navigate to the Kanban workbench.

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanbans > Kanban Planning > Workbench

13. Display the details for your nn-KBP plan.

14. Review and record your generated details.

Calculated size for nn-KB1 at RIP: \_\_\_\_\_

Calculated size for nn-KB1 at Stores: \_\_\_\_\_

Calculated size for nn-KB2 at RIP: \_\_\_\_\_

Calculated size for nn-KB3 at RIP: \_\_\_\_\_

Calculated size for nn-KB4 at RIP: \_\_\_\_\_

**Question:** Do these values correspond to your daily forecast and component usage requirements?

15. From the Kanban Details window, update production with all three records.

**Note:** Do not print the kanban cards.

### Practice KB-1

Replace *nn* with your initials.

In this practice, you will learn how to:

- Define kanban pull sequences
- Set up and launch a forecast type kanban plan
- Set up and launch another kanban plan based on actual production
- Compare the two kanban plans

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### Create a Kanban Plan Using Actual Production

16. Navigate to the Kanban Names window.

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanbans > Kanban Planning > Names

17. Set up a kanban plan as follows:

- Plan Name: nn-Actual
- Description: nn kanban plan actual production
- Demand Type: Actual Production

18. Save your work.

19. Launch your nn-Actual plan.

20. Set the Demand Start and Demand Cutoff dates to the dates that you recorded from practice LS-5 (in the 11i Sequencing and Scheduling Flow Lines component).

21. Submit your request.

### Practice KB-1

Replace *nn* with your initials.

In this practice, you will learn how to:

- Define kanban pull sequences
- Set up and launch a forecast type kanban plan
- Set up and launch another kanban plan based on actual production
- Compare the two kanban plans

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### Record and Review Your Results

22. Navigate to the Kanban Workbench.

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanbans > Kanban Planning > Workbench

23. Display the details of your nn-Actual plan.

24. Review the generated details.

Question: What is the calculated size for nn-KB1 at RIP?

Question: What is the calculated size for nn-KB1 at Stores?

Question: What is the calculated size for nn-KB2 at RIP?

Question: How do these values relate to the scheduled production?

25. Return to the Kanban workbench window.

26. Compare your two plans. The following information is populated by the system.

- Field: Plan2
- Condition: Equals
- From: Production

27. Compare the sizes of your two kanban plans.

Question: Do you need to make adjustments to your kanban containers, or can you create a nonreplenishable kanban?

# Agenda

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## Agenda

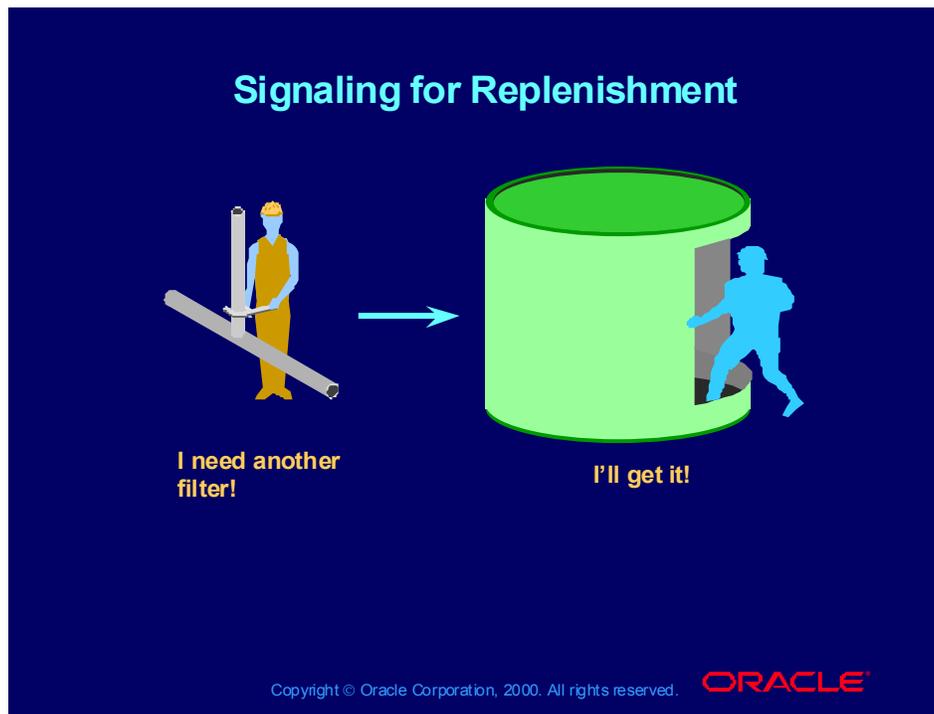
- Overview
- Setting up kanban items
- Calculating kanbans
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- **Executing kanbans**

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## Signaling for Replenishment

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### Kanban Replenishment

(Help) Oracle Inventory > Inventory Planning and Replenishment >

#### Defining Kanban Cards

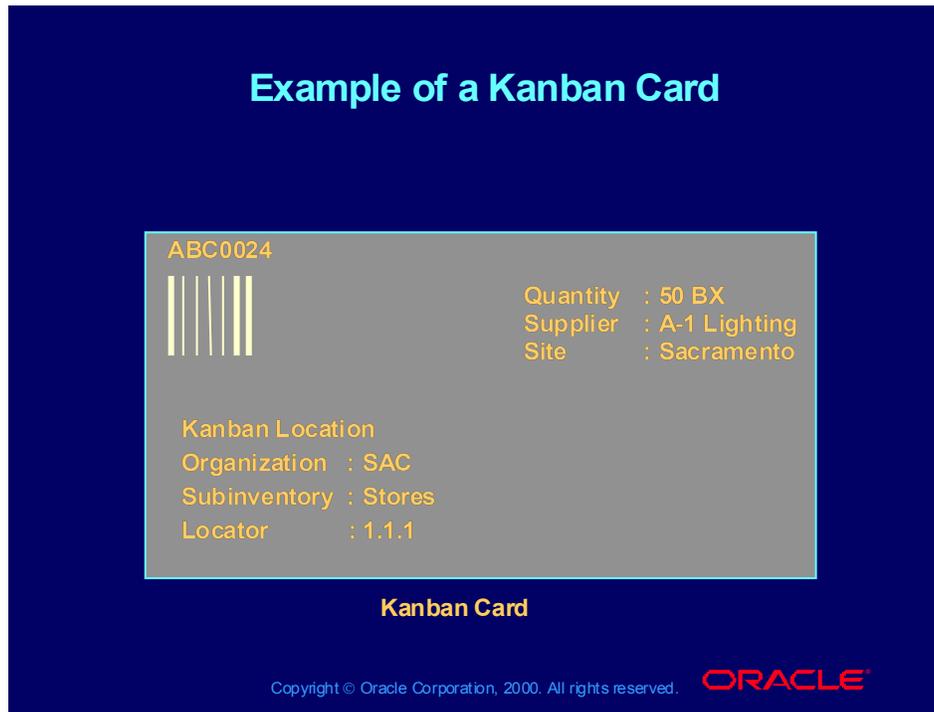
Kanbans represent replenishment signals that are usually manual and highly visible, such as a color-coded card that moves with the material, a light that goes on when replenishment is required, or an empty bin that is moved to the supply location to trigger replenishment.

The system provides support for external devices such as bar code readers to read Kanban cards and trigger a replenishment signal.

Kanbans are generally replenishable and cycle through the system from full to empty, remaining active until they are withdrawn. One-time signals called nonreplenishable Kanbans are used primarily to manage sudden spikes in demand.

## Example of a Kanban Card

---



### Cards

Kanban cards are created for an item, subinventory, and locator (optional). They are uniquely identified by a Kanban number.

For cards generated from a Kanban pull sequence, the number is automatically generated. For manually defined cards, both replenishable and nonreplenishable, you can enter an unused Kanban number or let the system create the number.

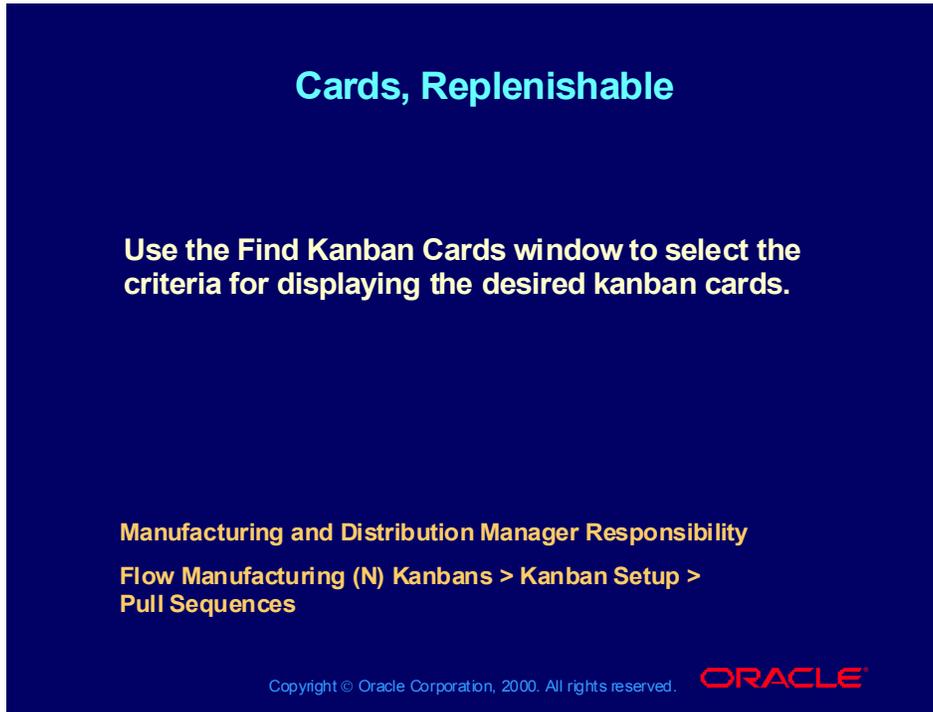
### Support of External Devices to Trigger Replenishment

An open API exists to enable the use of Bar Code readers, RF terminals to read a Kanban card and trigger replenishment.

The card example above is an example of customizations that can be done once a barcode has been added. Oracle Applications do print Kanban cards, but they do *not* include barcode. They do include the Item, From Locations, To Locations, and Quantity.

## Cards, Replenishable

---



**Cards, Replenishable**

**Use the Find Kanban Cards window to select the criteria for displaying the desired kanban cards.**

**Manufacturing and Distribution Manager Responsibility**  
**Flow Manufacturing (N) Kanbans > Kanban Setup > Pull Sequences**

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### Replenishable Cards

(Help) Oracle Inventory > Inventory Planning and Replenishment > Defining Kanban > Generating Kanban Cards

You can use the Generate Kanban Cards window to generate cards automatically or create cards manually in the Kanban Cards window.

You cannot override the quantity for generated cards, but you can add additional cards or delete existing cards from the pull sequence to control the inventory in the replenishment chain. Function security is provided for this feature.

You can manually override the quantity and supply source on a pull sequence only before the cards have been printed.

- You are able to automatically create replenishable cards for Kanban planned items based on the replenishment chain information: item, Kanban location, quantity, and sourcing information.
- You can create replenishable cards manually for an item and Kanban location.

Changes to the pull sequence will not be reflected until the old cards are deleted and new ones are created.

**Cards, Replenishable**

**Use the Find Kanban Cards window to select the criteria for displaying the desired kanban cards on the Kanban Cards Summary window.**

**Manufacturing and Distribution Manager Responsibility**  
**Flow Manufacturing (N) Kanbans > Kanban Setup > Pull Sequences**

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### Replenishable Cards (continued)

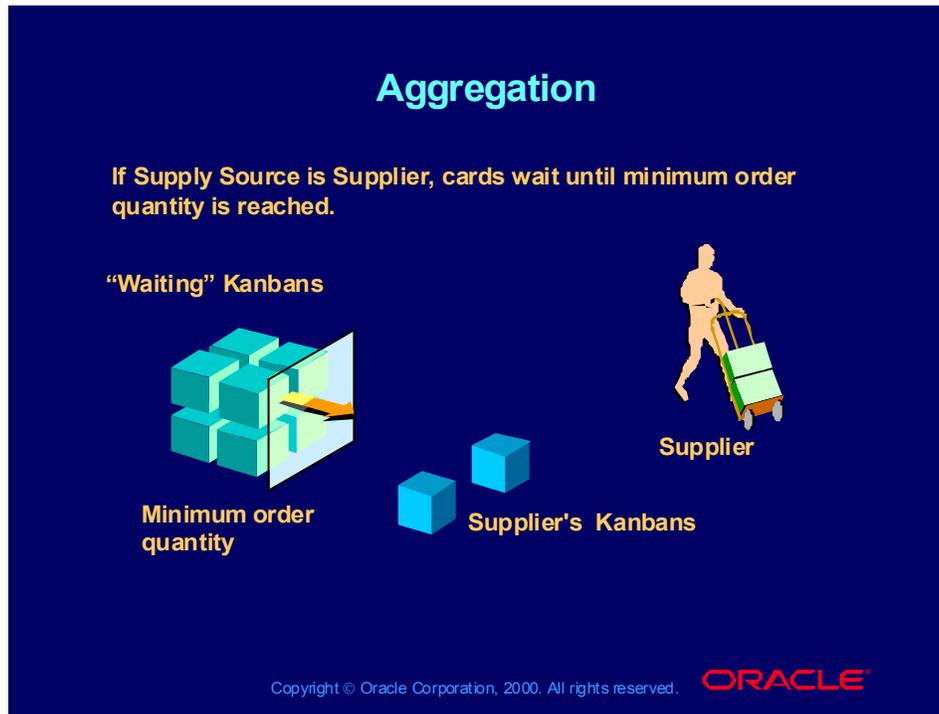
(Help) Oracle Inventory > Inventory Planning and Replenishment >

Defining Kanban Cards > Printing Kanban Cards

- You can create and print Kanban cards in a single step at the time of card creation. The system tracks whether a card has already been printed.
- Kanban size is defaulted from the pull sequence.
- If the quantity or source is changed for a replenishment plan, you need to manually delete existing cards from the system and create new ones for the new plan.
- You can override the supply source on a pull sequence. However, you cannot override the supply source on a kanban card.

# Aggregation

---



## Dual Kanban or Aggregation

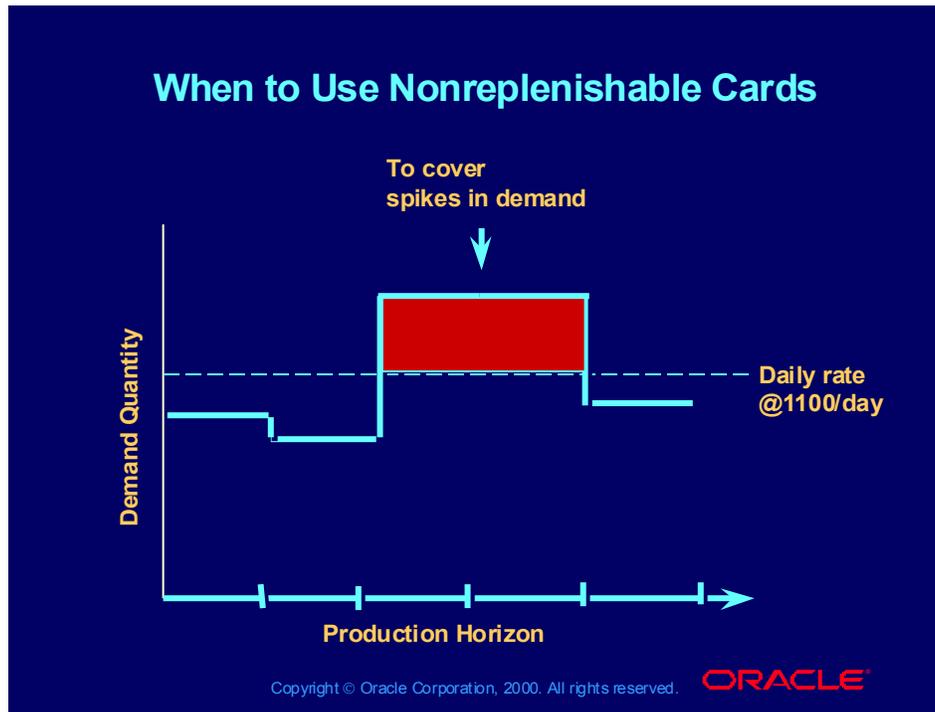
You can aggregate Kanbans before releasing them for replenishment. Set the minimum order quantity on the Pull Sequence to a multiple of the Kanban card size. This will tell you how many Kanbans are to wait before being replenished.

Use Dual Kanban, or Aggregation Kanbans when:

- Long setup times for replenishing resources (that is machine setup times)
- Supplier has minimum order quantity larger than the Kanban size

## When to Use Nonreplenishable Cards

---



### Nonreplenishable Cards

Once the line and Kanbans have been sized to the Design Demand needed to support the production volumes, any unforeseen spikes in demand can be crippling. Instead of creating safety stocks of finished goods, the goal of Flow Manufacturing is to keep materials at their raw state, enabling the line to flex to produce a product mix.

Nonreplenishable Kanban cards are used to stage additional materials on the flow line to cover the known spikes in demand. Launch the Kanban Planner with the current Demand Schedule (or Actual Production) into a simulation plan. Compare the simulation plan to the production plan. Create nonreplenishable Kanbans for those materials with high variances between the two plans.

As the name implies, these cards are one-use only, and will not be replenished when emptied.

## Nonreplenishable Kanban Cards

---

**Nonreplenishable Kanban Cards**

Use the Kanban Cards Summary window to complete:

- Item
- Subinventory
- Size

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Setup > Kanban Cards

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### Nonreplenishable Kanban Cards

You can manually define nonreplenishable cards by entering the item, location, supply source, and quantity in the Kanban Cards Summary window.

Nonreplenishable cards do not have to be associated with a Pull Sequence.

- You will be able to create nonreplenishable Kanban cards manually by providing information on item, location, supply source, and size for Kanban planned items.
- You will enter the Kanban size manually. The system does not suggest a size. The quantity must be entered before a Kanban card can be printed. Once a Kanban card has been printed, you cannot change the quantity.

---

## Generating Kanban Cards



Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanban > Kanban Setup > Pull Sequences

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### Final Update of Pull Sequence Information

Before you proceed with generating and printing Kanban Cards, you can make final updates to the supply information. Once a Kanban Card has been generated from the Pull Sequence table information, it cannot be changed. You would have to cancel the card, make your changes, regenerate, and print.

### To View Pull Sequences

1. Navigate to the Find Pull Sequences window by selecting Pull Sequences from the menu.
2. Enter selection criteria. You can restrict the search by Item, Subinventory, Locator range, Source Type, Supplier and Supplier Site, Source Organization, Source Subinventory and Source Locator, and Line Code.
3. Select the Find button to display the search result in the Pull Sequence Summary window.

## Sourcing Rules and the Approved Supplier List

---

### Sourcing Rules and the Approved Supplier List

Use the Find Pull Sequence window to select the criteria for displaying the desired items on the Pull Sequence Summary window.

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Setup > Pull Sequences

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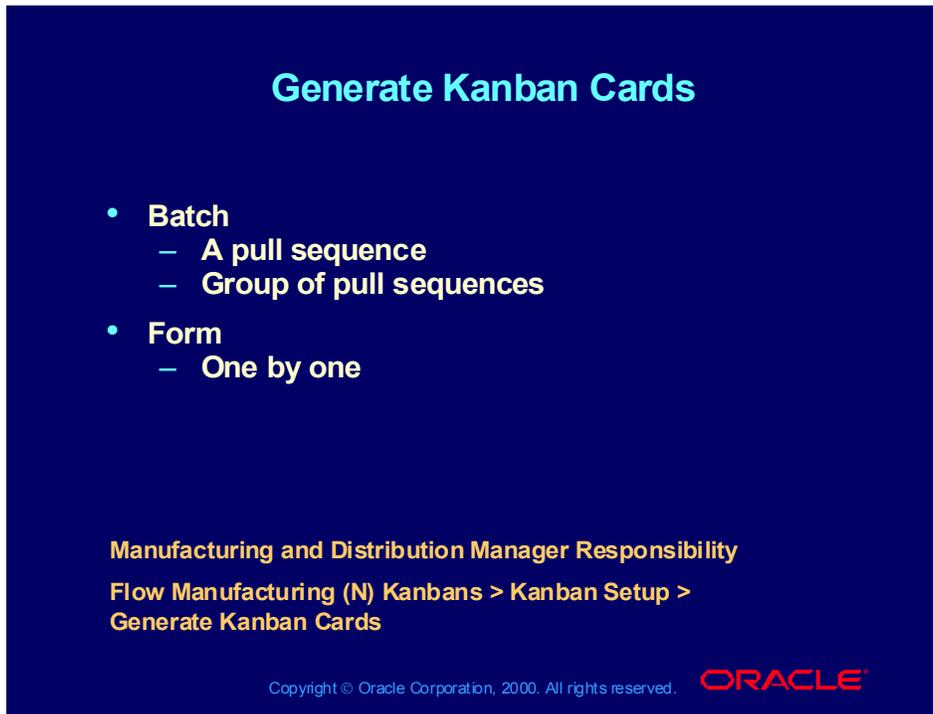
### Sourcing Rules and the Approved Supplier List (ASL)

You can enter the supplier/supplier site on the Pull Sequence. If the information is entered by the user in the Pull Sequence then it is carried over as is to the requisition via the Requirement Import process. However, if the user does not enter the supplier and supplier site information on a Pull Sequence and a replenishment signal is generated, then the resulting requisition can pull the source information as follows:

1. Check MRP profile option for Default Assignment Set.
2. Get Sourcing Rule for Item in Organization.
3. Get supplier/site from the ASL.

## Generate Kanban Cards

---



The screenshot shows a dark blue background with the title 'Generate Kanban Cards' in light blue. Below the title is a bulleted list with two main items: 'Batch' and 'Form'. 'Batch' has two sub-items: 'A pull sequence' and 'Group of pull sequences'. 'Form' has one sub-item: 'One by one'. At the bottom of the screenshot, there is a navigation path: 'Manufacturing and Distribution Manager Responsibility > Flow Manufacturing (N) Kanbans > Kanban Setup > Generate Kanban Cards'. The Oracle logo and copyright information are also visible at the bottom.

- **Batch**
  - A pull sequence
  - Group of pull sequences
- **Form**
  - One by one

Manufacturing and Distribution Manager Responsibility  
Flow Manufacturing (N) Kanbans > Kanban Setup >  
Generate Kanban Cards

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### **Kanban Card Generation**

(Help) Oracle Inventory > Inventory Planning and Replenishment >  
Defining Kanban Pull Sequences > Generating Kanban Cards

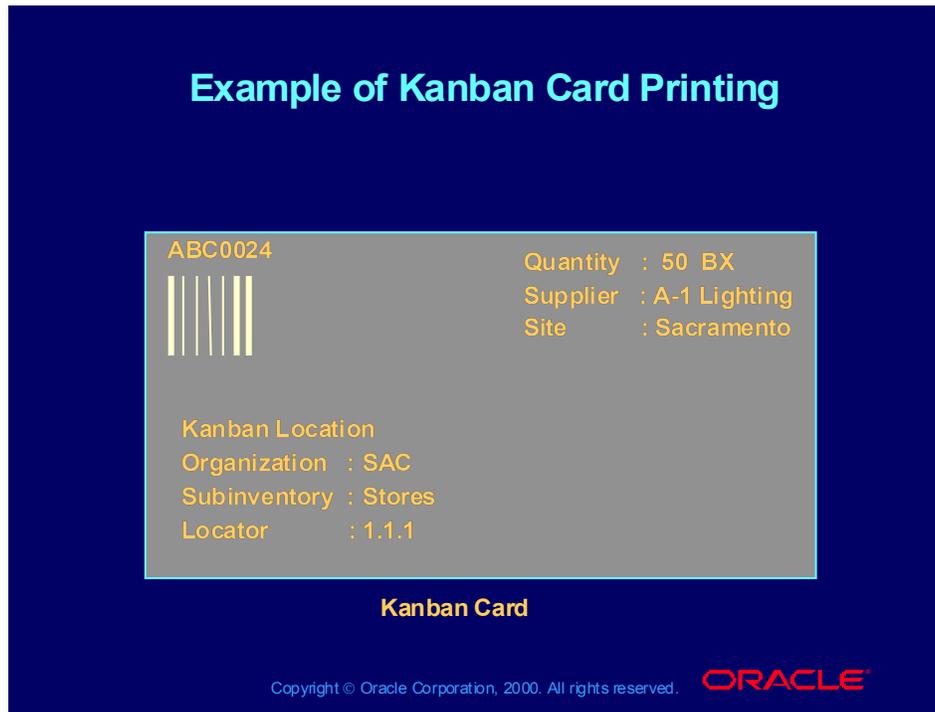
Use the Generate Kanban Cards process to automatically generate Kanban cards. You can generate cards for individual pull sequences in the Pull Sequences Summary and Pull Sequences windows.

### **Default Status**

When generating Kanban cards, the system will default to a status of New. You can optionally set the status to Empty or Full when generating the cards. If set to Empty or Wait, then the replenishment cycle is triggered, if Full then you are at the end of the replenishment cycle.

## Example of Kanban Card Printing

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### Card Printing

Manufacturing and Distribution Manager Responsibility

Flow Manufacturing (N) Kanbans > Kanban Setup > Print Kanban Cards

(Help) Oracle Inventory > Inventory Planning and Replenishment >

Defining Kanban Cards > Printing Kanban Cards

You can print Kanban cards for a replenishment plan or a replenishment chain when you generate the cards. You can also print cards individually if the card information is complete. Use the Print Kanban Cards process to batch print Kanban cards with card status Active and Hold. You can print cards individually in the Kanban Cards window.

## Kanban Card Statuses

---

**Kanban Card Statuses**

<b>Card Status</b>	<b>Card Supply Status</b>
<ul style="list-style-type: none"><li>• Active</li><li>• Hold</li><li>• Canceled</li></ul>	<ul style="list-style-type: none"><li>• New</li><li>• Empty</li><li>• Full</li><li>• Wait</li><li>• In-Process</li><li>• In-Transit</li><li>• Error</li></ul>

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### **Card Status**

When Kanban cards are generated, they contain both Card and Supply Status Codes.

#### **Active**

Kanban cards are generated with a default Card Status of Active. When you define a card manually, you can initially give it either Active or Hold status.

#### **Hold**

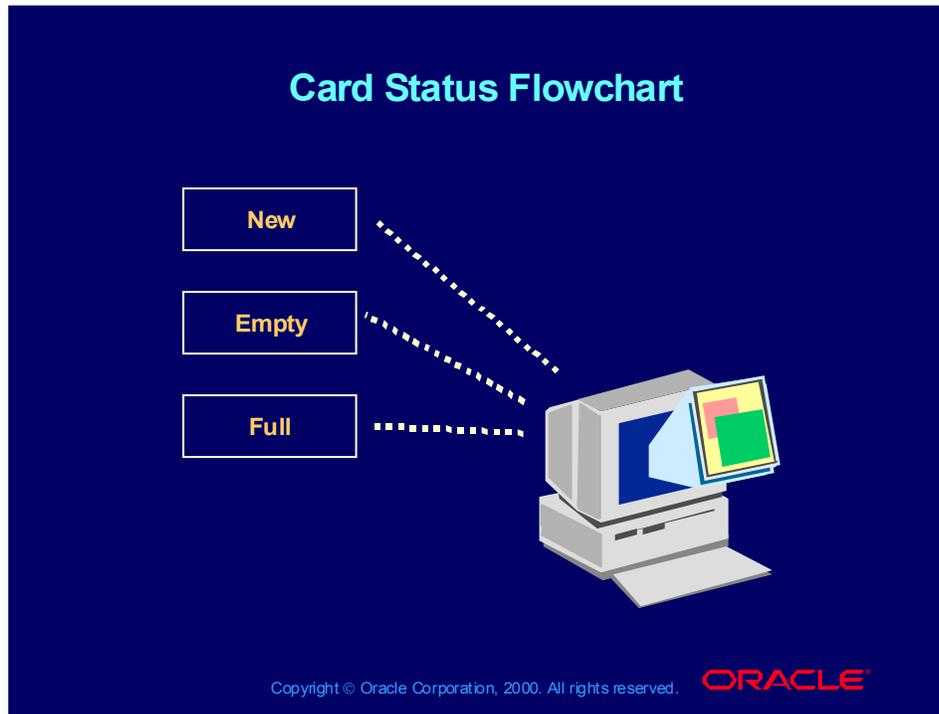
You can place a Kanban card on hold, preventing it from any further activity until the hold is released to a Card Status of Active or Canceled. You can temporarily pull a card out of the replenishment chain by changing the Card Status to Hold.

#### **Canceled**

You can terminate use of a card by changing the Card Status to Canceled, but you cannot reverse this change. Only Canceled cards can be deleted.

## Card Status Flowchart

---



### Supply Status

All cards are generated by default with a status of New. You can switch this status to Empty to trigger a Kanban replenishment signal.

During initial setup, you can switch the status to Full if you are starting out with a full container (card). When you are defining a card manually, you can create a card with a status of Empty, Full, or New.

All the following Supply Status codes can be set manually.

#### **New**

The Kanban has just been created and is not yet part of the replenishment chain.

#### **Empty**

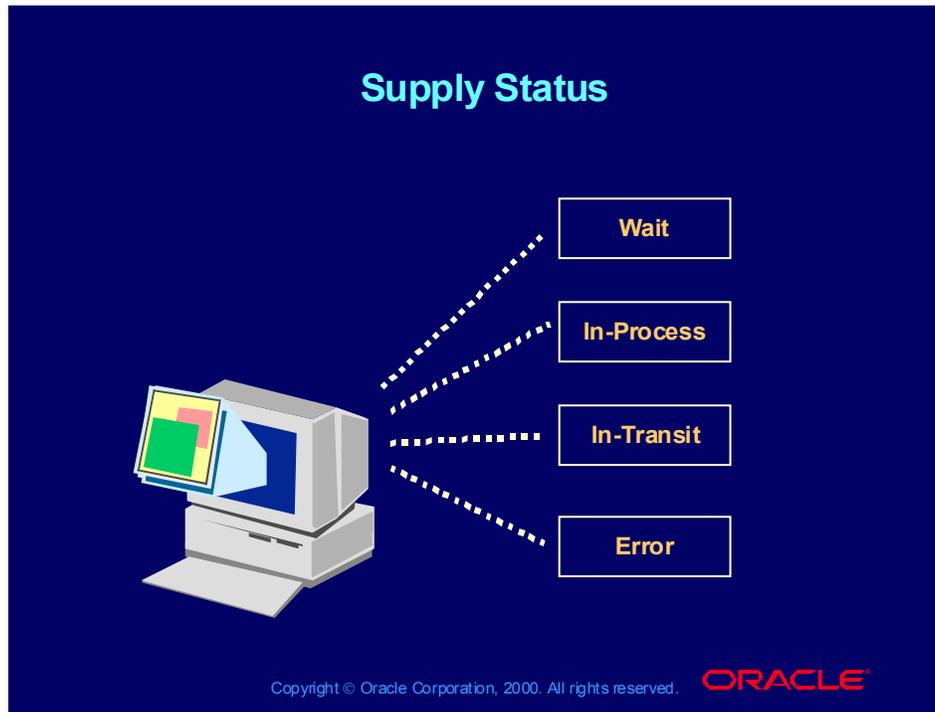
The Kanban is empty and a replenishment signal has been generated.

#### **Full**

The Kanban has been replenished.

## Supply Status

---



### Supply Status (continued)

#### **Wait**

The Kanban is waiting until the minimum order quantity has been met by the aggregation of cards.

#### **In-Process (Supplier and Inter Org only)**

For the Supplier source type, the purchase order has been approved. For the Inter Org source type, the internal requisition has been approved.

#### **In-Transit (Supplier and Inter Org only)**

You have received an Advanced Shipment Notice (ASN) indicating that the Kanban quantity has been shipped from the replenishment source, but you have not yet received it.

#### **Error**

Kanban information is incomplete and the card has been flagged with an error code.

## Changing Status Codes

---

### Changing Status Codes

- You can manually change the Supply Status codes on a Kanban card, with restrictions
- The default Supply Status Code is “New”
- When generating the cards, you can initialize the cards to “Empty” or “Full”

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### Matrix of Allowable Status Changes

The following matrix outlines the approved From and To changes that are allowed.

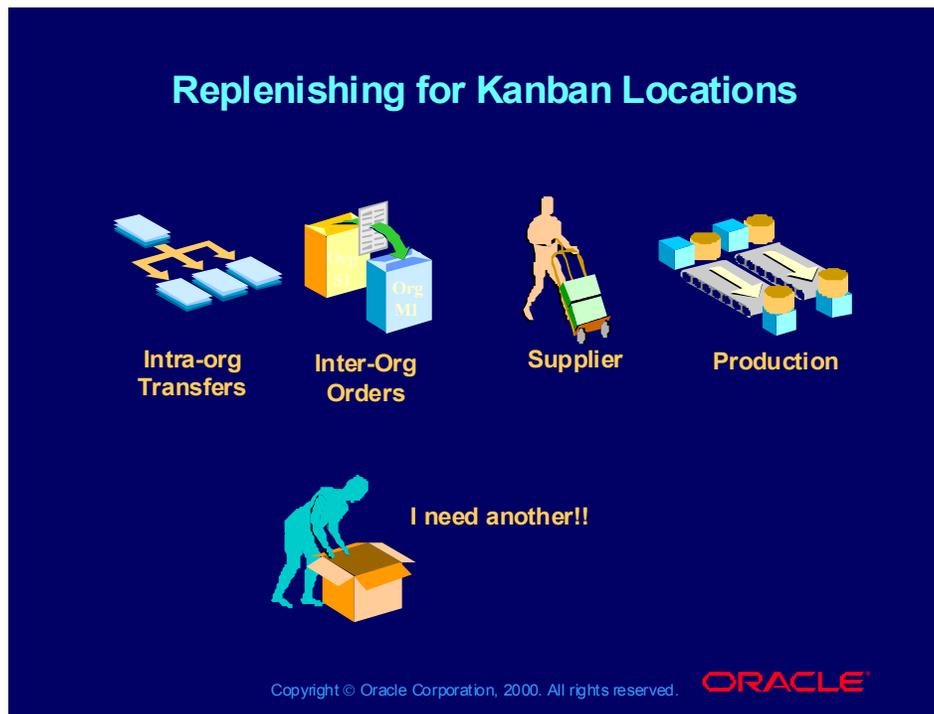
<b>From To</b>	<b>New</b>	<b>Empty</b>	<b>Full</b>	<b>Wait</b>	<b>In-Process</b>	<b>In-Transit</b>
<b>New</b>	n/a	No	No			
<b>Empty</b>	Yes	n/a	Yes	Yes	No	No
<b>Full</b>	Yes	Yes	n/a	No	Yes	
<b>Wait</b>	Yes	No	Yes	n/a	No	No
<b>In-Process</b>	No	Yes	No	No	n/a	No
<b>In-Transit</b>	No	No	No	No	Yes	n/a

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## Replenishing for Kanban Locations

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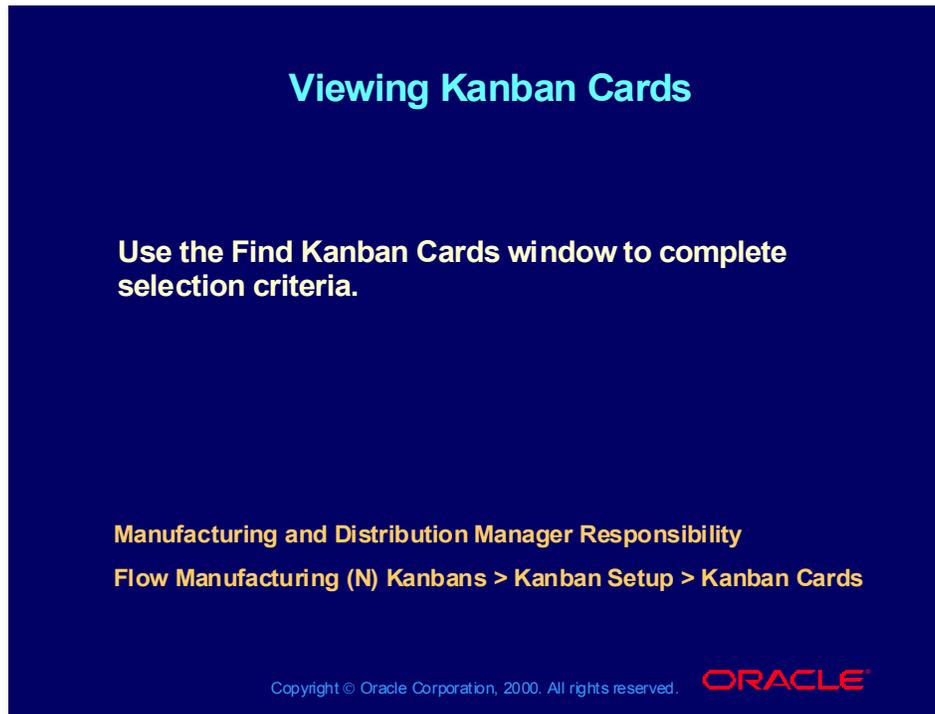


### Supply Status = Empty

- Supplier Re-supply
  - Sends Purchase Order (PO)requisition to Purchasing
  - Follow standard PO release and receipt transactions
  - PO Receipt update Kanban card to Full
- Inter-org Re-supply
  - Sends PO requisition to Purchasing
  - Follow standard internal PO/SO release and receipt transactions
  - PO Receipts update the Kanban card to Full
- Intra-org Re-supply
  - Inventory Transaction creates a move order to transfer material from one subinventory/location to another.
- Production Re-supply
  - Creates a Flow Schedule, Discrete Job or Repetitive Schedule.

## Viewing Kanban Cards

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### To View Kanban Cards

(Help) Oracle Inventory > Inventory Planning and Replenishment >

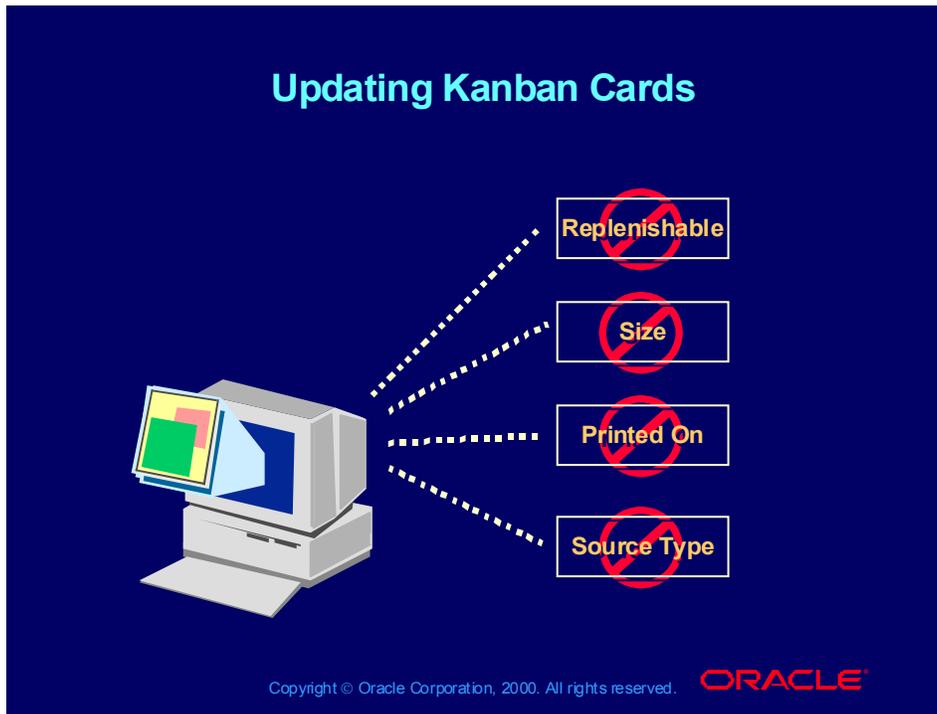
Defining Kanban

Use the Kanban Cards Summary window to view, define, and update Kanban cards.

1. Navigate to the Find Kanban Cards window by selecting Kanban Cards from the menu.
2. Enter selection criteria. You can restrict the search by Card Number range, Item Subinventory, Locator range, Source Type, Supplier, and Supplier Site, Source Organization, Source Subinventory, and Source Locator.
3. Select the Find button to display the search results in the Kanban Cards Summary window.

## Updating Kanban Cards

---



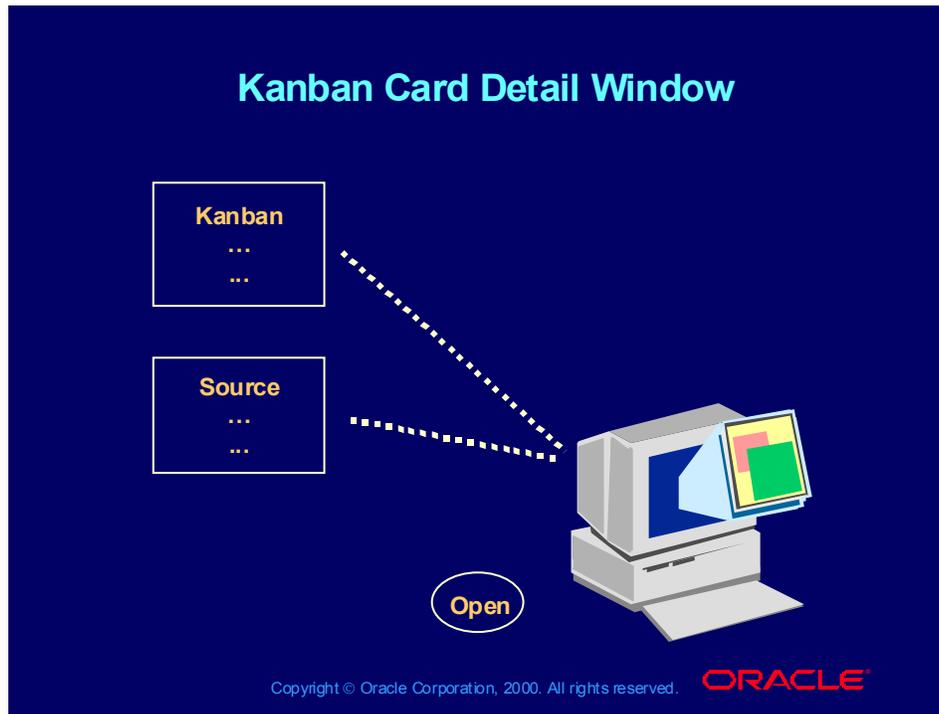
### To Update Kanban Cards

In the Kanban Cards Summary window, you can update the following fields:

- Under the Kanban tab: All fields except Replenishable, Size, and Printed On
- Under the Source tab: All fields except Source Type

## Kanban Card Detail Window

---

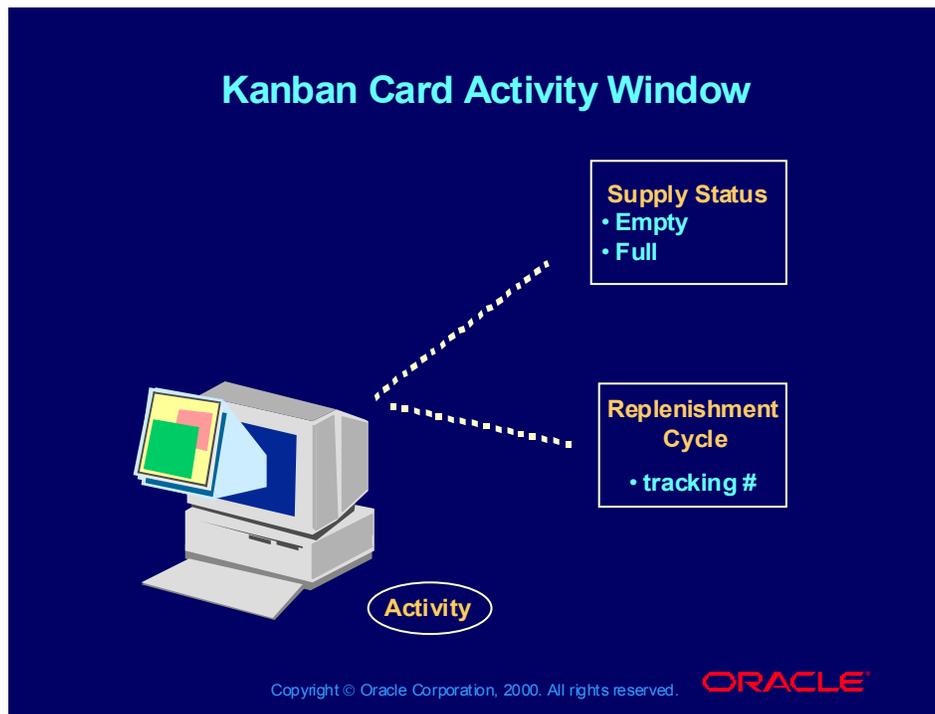


### Opening the Details Window

To make viewing and entering information easier, you can select the Open button in the Kanban Cards Summary window to open the Kanban Cards window for the current line. Here you can enter any of the information that you could under the tabs on the summary window.

## Kanban Card Activity Window

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### Displaying Kanban Card Activity

You can select the Activity button while you are in either the Kanban Cards Summary window or the Kanban Cards window to open the Card Activity window for the selected Kanban card. For each replenishment cycle, this window displays a variety of activity information.

Each time a card begins a new replenishment cycle, it does so by signaling to Replenish and setting the Supply Status to Empty. A unique tracking number is created and displayed in the Replenishment Cycle column. When the Kanban card has returned to Full, the cycle is complete. Each activity between Empty and Full is tracked with this unique tracking number.

### Practice KB-2

Replace *nn* with your initials.

In this practice, you will learn how to:

- Create a pull sequence for a Production Kanban
- Create a kanban card
- Replenish the card and verify that the subassembly is scheduled
- Complete the subassembly and verify that the card has been replenished

**NOTE:** This practice relies on data created in optional practice LS-6.

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### Create a Pull Sequence for the Subassembly

1. Navigate to the Pull Sequence window.  
(N) Flow Manufacturing > Kanban > Kanban Setup > Pull Sequences
2. Set up pull sequences as follows:
  - Item: nn-M3
  - Sub-inventory: RIP
  - Source Type: Production
  - Size: 5
  - Number of cards: 2
  - Line code: nn-LINE2
3. Save your work.

### Practice KB-2

Replace *nn* with your initials.

In this practice, you will learn how to:

- Create a pull sequence for a Production Kanban
- Create a kanban card
- Replenish the card and verify that the subassembly is scheduled
- Complete the subassembly and verify that the card has been replenished

**NOTE:** This practice relies on data created in optional practice LS-6.

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#### Create kanban cards for the pull sequence

4. Click the Generate Cards button, answering No to the Print prompt.
5. Click the Cards button  
Verify the generation of the cards and their supply status.  
**Note:** it may take a few minutes for the cards to be generated.
6. Click the Replenish button for the first card
7. Record the following data:
  - Card number \_\_\_\_\_
  - Supply status \_\_\_\_\_
8. Click the Activity button.
9. Review the details of the replenishment cycle (Document Type and Number).

### Practice KB-2

Replace *nn* with your initials.

In this practice, you will learn how to:

- Create a pull sequence for a Production Kanban
- Create a kanban card
- Replenish the card and verify that the subassembly is scheduled
- Complete the subassembly and verify that the card has been replenished

**NOTE:** This practice relies on data created in optional practice LS-6.

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#### **Verify that Your nn-M3 Subassembly is Scheduled**

10. Navigate to the Scheduling workbench.  
(N) Flow Manufacturing > Line Scheduling > Scheduling Workbench
11. Display the Flow Schedule Summary window for your nn-LINE2.
12. Verify that nn-M3 subassembly is scheduled.
13. Drill to the details form and scroll until you see the kanban number

#### **Perform a Completion Transaction**

14. Select Completions from the Tools menu.
15. Verify all the completion information
16. Save your work.
17. Wait for the inventory transaction to process
18. Review the activity and supply status of the kanban card.

### Summary

In this lesson, you learned to:

- Identify the Item, BOM, and Pull Sequence attributes critical to enabling an item for Kanban planning
- Create and maintain Kanban Pull Sequences and replenishment chains
- Identify the four ways a Kanban location can be replenished
- Generate a Kanban plan from a Forecast, MDS, MPS or Actual Production

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### Summary

**In this lesson, you learned to:**

- **Update production plan with new Kanban sizing**
- **View and compare Kanban plans to production plan**
- **Generate and print Kanban cards**
- **Be familiar with Kanban card statuses**
- **Add nonreplenishable Kanban cards**

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