Oracle® Process Manufacturing

Formula Management User's Guide

Release 11*i*

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Oracle® Process Manufacturing Formula Management User's Guide, Release 11*i*

Part No. A77221-02

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Preface

Welcome to the Oracle Process Manufacturing *Formula Management User's Guide*. This user's guide includes the information you need to work with the Oracle Process Manufacturing (OPM) application effectively.

This preface explains how this user's guide is organized and introduces other sources of information that can help you.

Intended Audience

This guide assumes that you have working knowledge of your business area's processes and tools. It also assumes that you are familiar with OPM Formula Management. If you have never used OPM, we suggest you attend one or more of the Oracle Process Manufacturing training classes available through Oracle World Wide Education.

This guide also assumes that you are familiar with the Oracle Applications graphical user interface. To learn more about Oracle Applications graphical user interface, read the *Oracle Applications User's Guide*.

About This Guide

This guide contains overviews as well as task and reference information. It includes the following:

Name	Description
Formula Management Prerequisites	Explains how to create routings and set up configurations for effectivity records, optional formula classes, operation classes, and optional routing classes

Formula Setup	Explains how to set up formula headers and products information, and how to add ingredients, by-products, and additional information to formulas; provides an understanding of formula phantoms, and shows how to search for and replace ingredients in formulas
Routings Setup	Explains how to set up activities, resources, operations, alternate resources (optional), and routings
Effectivities	Explains how to set up, view and add to or edit formula effectivities
Formula Scaling and Theoretical Yield Calculations	Explains how to scale formulas and how to calculate theoretical yield
Formula Inquiries and Reports	Explains how to run inquiries, view the queried formula and formula intermediates and to identify where ingredients are used.
Appendix A	Explains typical navigation paths, specific Profile Options that need to be set up, and discusses the use of the Graphical Process Navigator

Information Sources

You can choose from many sources of information, including documentation, training, and support services to increase your knowledge and understanding.

Online Documentation

Oracle Applications documentation is available on CD-ROM, except for technical reference manuals. User's guides are available in HTML format and on paper. Technical reference manuals are available on paper only. Other documentation is available on paper and sometimes in PDF format.

The content of the documentation remains the same from format to format. Slight formatting differences could occur due to publication standards, but such differences do not affect content. For example, page numbers are included on paper, but are not included in HTML.

The HTML documentation is available from all Oracle Applications windows. Each window is programmed to start your web browser and open a specific,

context-sensitive section. Once any section of the HTML documentation is open, you can navigate freely throughout all Oracle Applications documentation.

Related Documents

Oracle Process Manufacturing shares business and setup information with other Oracle products. You may find the following Oracle Applications user's guides useful:

- *Oracle Applications User's Guide*
- *Oracle Application's Flexfields Guide*
- *Oracle Workflow User Guide*
- *Oracle Applications System Administrator's Guide*
- *Oracle General Ledger User's Guide*
- *Oracle Payables User's Guide*
- *Oracle Receivables User's Guide*
- *Oracle Human Resources North American User's Guide*
- *Oracle Purchasing User's Guide*

Oracle Process Manufacturing Guides

The following is a list of documentation in each product group for OPM:

Financials

- *Oracle Process Manufacturing Accounting Setup User's Guide*
- *Oracle Process Manufacturing Cost Management User's Guide*
- *Oracle Process Manufacturing Manufacturing Accounting Controller User's Guide*
- *Oracle Process Manufacturing and Oracle Financials Integration User's Guide*

Inventory Control

- *Oracle Process Manufacturing Intrastat Reporting User's Guide*
- *Oracle Process Manufacturing Inventory Management User's Guide*
- *Oracle Process Manufacturing Physical Inventory User's Guide*

Logistics

- *Oracle Process Manufacturing Order Fulfillment User's Guide*

- *Oracle Process Manufacturing Purchase Management User's Guide*

Process Execution

- *Oracle Process Manufacturing Process Operation Control User's Guide*

- *Oracle Process Manufacturing Production Management User's Guide*

Process Planning

- *Oracle Process Manufacturing Capacity Planning User's Guide*

- *Oracle Process Manufacturing Integration with Advanced Planning and Scheduling User's Guide*

- *Oracle Process Manufacturing MPS/MRP and Forecasting User's Guide*

Product Development

- *Oracle Process Manufacturing Formula Management User's Guide*

- *Oracle Process Manufacturing Laboratory Management User's Guide*

- *Oracle Process Manufacturing Quality Management User's Guide*

Regulatory

- *Oracle Process Manufacturing Regulatory Management User's Guide*

System Administration and Technical Reference

- *Oracle Process Manufacturing Implementation Guide*

- *Oracle Process Manufacturing System Administration User's Guide*

- Oracle Process Manufacturing Technical Reference Manuals

Training

Oracle offers a complete set of formal training courses to help you master Oracle Process Manufacturing and reach full productivity quickly. We organize these courses into functional learning paths, so you take only those courses appropriate to your area of responsibility.

You have a choice of educational environments. You can attend courses offered by Oracle Education Services at any one of our many Education Centers, or you can arrange for our trainers to teach at your facility. In addition, Oracle Training professionals can tailor standard courses or develop custom courses to meet your

needs. For example, you may want to use your organization's structure, terminology, and data as examples in a customized training session delivered at your own facility.

Conventions

The following conventions are used in this guide:

Bolded Text

Buttons, fields, keys, menus, and selections are bolded in procedures only. For example: To access the next window, click **OK**. Otherwise, references to these features appear in regular type.

Additional Menu Options

Only nonstandard menu options are discussed. Standard menu bar options (such as Save) are not discussed. These standard options are described in the *Oracle Applications User's Guide*. Only menu options unique to the use of the specific window are discussed.

Field References

References to fields within procedures are in bold type. References within the body of this guide appear in regular type.

Required Fields

The word Required appears as the last word in the field description of all required fields. When the field is required contingent on the entry in another field, or only in specific situations, "Required if..." is the last sentence of the field description.

Fields Reserved for Future Use

Fields with no current processing implications are referenced by the statement "This field is not currently used" or "Reserved for future use." Do not use these fields for your own reference data, because there are plans to link future functionality to these fields. Fields intended for informational purposes only are referenced by the statement "This field is for informational purposes only."

Pending/Completed Transactions

Discussions about processing transactions that use the words pending and completed refer to the status of a transaction. Pending and completed do not refer to the database tables that are updated as a result of transactions (for example, some completed transactions are stored in the Pending Transactions table).

Procedures

Most topics contain a procedure with numbered steps. Any actions which are subordinate to a step are assigned letters. You can customize your Oracle Application, therefore, all procedures are suggestive only. Navigate to windows and between responsibilities in a way that works best for your particular setup. Also note that fields may appear in a different order than they are discussed.

Use of the Word Character

The word character means an alphanumeric character. Characters that are numeric or alphabetic only are referenced specifically. Depending on your system security profile, you many not have access to all of the windows and functions described in this guide. If you do not see a menu option described in this guide, and you want access to it, contact your System Administrator.

Do Not Use Database Tools to Modify Oracle Applications Data

Oracle Applications tables are interrelated. As a result, any change you make using Oracle Applications can update many tables at once. If you modify the Oracle Applications data using anything other than Oracle Applications, you could change a row in one table without making corresponding changes in related tables. If your tables are not synchronized with each other, you risk retrieving erroneous information and receiving unpredictable results throughout Oracle Applications.

When you use Oracle Applications to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also track who changes information. If you enter information into database tables using database tools, you could store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

Consequently, we strongly recommend that you never use SQL*Plus or any other tool to modify Oracle Applications data unless otherwise instructed by Oracle Support Services.

About Oracle

Oracle Corporation develops and markets an integrated line of software products for database management, applications development, decision support, and office automation, as well as Oracle Applications, an integrated suite of more than 45 software modules for financial management, supply chain management, manufacturing, project systems, human resources, sales, and service management.

Oracle Products are available for mainframes, minicomputers, personal computers, network computers, and personal digital assistants, allowing organizations to integrate different computers, different operating systems, different networks, and even different database management systems, into a single, unified computing, and information resource.

Oracle is the world's leading supplier of software for information management, and the world's second largest software company. Oracle offers its database, tools, and applications products, along with related consulting, education, and support services in over 140 countries around the world.

Thank You

Thank you for choosing Oracle Process Manufacturing and this user's guide.

We value your comments and feedback. At the beginning of this guide is a Reader's Comment Form that you can use to explain what you like or dislike about this user's guide. Mail your comments to the following address or call us directly at 650-506-7000.

Oracle Applications Documentation Manager
Oracle Corporation
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Or, send an electronic mail message to appsdoc@us.oracle.com

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Formula Management Prerequisites

This topic explains the prerequisites for setting up the Formula Management application. You are shown how to create routings and to set up configurations for effectivity records, optional formula classes, operation classes, and optional routing classes.

The following topics are covered:

- Prerequisites for Setting Up Formula Management
- Prerequisites for Creating Routings
- Setting Up Configurations for Effectivity Records
- Setting Up Formula Classes (Optional)
- Setting Up Operation Classes
- Setting Up Routing Classes (Optional)

Prerequisites for Setting Up Formula Management

Before you can use the Formula Management application, there are several prerequisites in other applications, such as the System application and the Inventory Management application. Below is a list of the minimum prerequisites for each of the functions in Formula Management, followed by the paths to the windows on which they are set up. For a full discussion on setting up these prerequisites, see the appropriate application manuals and the online help for the appropriate windows.

You must do set up in OPM System Administration and Inventory Control applications before you use the Formula Management application. The sections that follow list these setups.

Setting Up OPM Systems Administration Prerequisites

In the Systems Administration application, you must set up the following:

- Unit of measure types

- Units of measure

- Units of measure conversions

See: *Oracle Process Manufacturing Implementation Guide*

You must also decide how you want to implement formula security.

Implementing Formula Security

Enable Formula Security by organization using the GMD:Formula Security profile option. Use this profile option to restrict formula information based on the OPM organizations to which the user has access. Based on the level of security selected, the following forms will have restrictions:

- Formula

- View Effectivities

- Effectivities

- Formula Configuration

OPM User Organization information is used to limit organizations to which the individual user has access.

Setting Up Formula Security Profile Options

The following are Profile Option settings for GMD:Formula Security

Profile Option	Restriction Level
0	No Formula Security. Users with this restriction level can view or change all formulas whether or not they have authorization for the Organization. This reflects the previous functionality.
1	Formulas are restricted to QUERY-ONLY without authorization for the Organization. This allows users to update only those Formulas that are associated with the organizations to which they have access.
2	Does not allow users to access formulas if they do not have authorization for the Organization.

The default value will be 0. This value is set at the Site level and should not be changed at the user level.

Impact of Formula Security on the Formula Form

The Formula form behavior has been modified to respond to values set for GMD:Formula Security as follows:

Profile Option	Restriction Level
0	No Formula Security
1	View all formulas Add or modify: ■ formulas without effectivities ■ formulas whose effectivities are defined without an organization ■ formulas whose effectivities are defined under the organizations to which the user has access
2	Add or modify: ■ formulas without effectivities ■ formulas whose effectivities are defined without an organization ■ formulas whose effectivities are defined under the organizations to which the user has access

Impact of Formula Security on the View Effectivities Form

The View Effectivities form behavior has been modified to respond to values set for GMD:Formula Security as follows:

Profile Option	Restriction Level
0	No Formula Security
1	Displays all effectivities
2	Only displays: ■ effectivities defined without an organization ■ effectivities defined under organizations to which the user has access

Effectivities that are defined under organizations that are not accessible to a user will not be accessible.

Impact of Formula Security on the Effectivities Form

The Effectivities form behavior has been modified to respond to values set for GMD:Formula Security as follows:

Profile Option	Restriction Level
0	No Formula Security
1	Lets users view all effectivities Add or modify: ■ effectivities defined without an organization ■ effectivities defined under organizations to which the user has access
2	Users can add or modify: ■ effectivities defined without an organization ■ effectivities defined under organizations to which the user has access

Effectivities that are defined under organizations that are not accessible to a user will not be accessible.

Impact of Formula Security on the Formula Configuration Form

The Formula Configuration form behavior has been modified to respond to values set for GMD:Formula Security as follows:

Profile Option	Restriction Level
0	No Formula Security
1	Organization field validation and list of values (LOV) will allow a user to: ■ View all configurations ■ Add or modify configurations defined under organizations to which the user has access
2	Users can view, add, or modify configurations not associated with any organization.

Configurations that are defined under organizations that are not accessible to a user will not be accessible.

Setting Up Inventory Control Prerequisites

Unit of measure types, units of measure, unit of measure conversions and item specific conversions (Item/Lot Conversion) are synchronized with corresponding Oracle Process Manufacturing (OPM) Financials data.

See: *Oracle Process Manufacturing and Oracle Financials Integration User's Guide*

In the Inventory Control application, you must set up the following:

■ Items and item attributes

■ Unit of measure conversions for each item, between the item's primary inventory unit of measure and the unit of measure you use in the formulas, if different. This is done on the Item/Lot conversions window.

■ Unit of measure type of Time

■ Units of measure of HR (for hour)

Prerequisites for Creating Routings

A routing in OPM defines the method or steps that are taken to manufacture a product.

The prerequisites to setting up routings are:

- Cost analysis codes
- Resources
- Unit of measure type of time
- Units of measure of HR (for hour)

Setting Up Costing Prerequisites

In the Costing Management application, you must set up the following:

- Cost analysis codes

Setting Up Configurations for Effectivity Records

Use of the Configurations window is not required. If you do not use this window to specify how effectivity records are to be created, you must enter effectivities manually.

Prior to this you will want to set up configurations for the effectivity records. You use the Configurations window to enter parameters that control the creation of effectivity records in Formula Management. Effectivity records specify when and in what circumstances a formula can be used.

Use this window to specify how effectivity records are created. The parameters you establish are specific to the organization and formula use you define (that is, whether the formula is used for production, material requirements planning, costing or regulatory. Note that you can create formulas for global use by leaving the Organization field blank to indicate 'All'.

For example, you can set up one set of effectivity creation parameters for formulas used in production and a different set of parameters for formulas used in costing. For each new formula OPM lists the effectivity records based on the Configuration parameters you have set up. For example, if you have four formula configurations and you selected effectivity behaviors of display on save or manual generation, and then you create a formula, the View Effectivities window will list those four effectivity records. You then select one of these effectivities and link it to the formula. If you selected automatic generation of effectivities, then OPM automatically creates them. You can then go back a view each one.

You specify one of the following effectivity creation methods:

- An effectivity record can be created automatically when a user enters a formula

- The system can prompt the user to enter an effectivity record when entering a formula

- A formula can be entered without an effectivity record and the effectivity record added later

You also specify whether the default effective organization for effectivity records (that is, the organization for which the effectivity record is valid) will be the user's default organization or all organizations.

In addition, if you specified that effectivity records will be created automatically, you must specify how OPM will handle conflicting effectivities (that is, what happens if other formulas for the same product are effective for the same conditions as the formula being created). The options are:

- The system does not modify the other effectivity records. The newly created formula is the default.

- The system sets the end dates on the effectivity records for the other formulas to today, making the new formula the only effective one.

- The system increments the preference number of the other effectivities (thereby decreasing the preference) so that the new formula is used when another formula's effectivity record overlaps with the new formula's effectivity record.

The effectivity information must match exactly with the exception of the formula name and version number for the system to update the previous effectivity record.

Regardless of how effectivity records are created, they can be modified manually.

Setting Up Configurations for Effectivity Records Procedure

Follow the steps below, to set up configurations.

1. Navigate to the **Configurations** window.

2. Complete the fields as described.

3. Save the window.

Configurations Field Reference

The fields on this window are:

Organization

Enter the code identifying the organization for which you are defining effectivity configuration parameters. If you leave this field blank, the configuration parameters will apply to all organizations for which you have not defined specific effectivity configuration parameters.

For costing rollups, you must define a specific organization in your effectivity record.

Formula Use

Select the formula use indicator for which you are defining effectivity configuration parameters. The formula use indicator controls whether the formula is used for production, material requirements planning, costing, or material safety data sheets.

You may select one of the following:

- Production

- Planning

- Costing

- Regulatory

For example, if you select Production, the configuration parameters you enter will determine how effectivity records are created for production formulas, but not for other types of formulas. Required.

Effective Behavior

Specify how you want effectivity records created. You may choose one of the following from the list:

- Manual Entry - You must create effectivity records manually by selecting Effectivities from the Actions menu on the Formulas window or from the Formula Management menu. The Effectivity is created after the formula is saved.

- Display on Save - The Maintain Effectivities window is automatically displayed before you can enter ingredients in a new formula.

- Automatic Generation - The system automatically creates an effectivity record when you save a new formula. The automatically generated effectivity record will have the following parameters: standard quantity equal to the formulated quantity, a minimum quantity of 0, a maximum quantity of 999999999 units, and a start date equal to today's date.

  If you select automatic effectivity behavior, you must also specify how the system will handle situations in which previously defined formulas for the same product are effective under the same conditions. Specify this in the Other Effectivities Conflict field. Required.

Organization Default

Indicate if the default effective organization for effectivity records will be the user's organization or all organizations. The effective organization is the organization to which the effectivity record applies. If you associate only one effectivity record with a formula, and you specify an organization on the effectivity record, that formula can only be used by that organization. You may choose:

- Operators Organization - the default effective organization is the user's organization.

- Blank For All - when you make this selection, the effectivity record will apply to all organizations. Required.

For costing rollups, you must define a specific organization in your effectivity record.

Other Effectivities Conflict

You can only access this field if the Effectivity Behavior field was set to Automatic Generation.

Select how the system will respond if there are previously existing formulas for the same product which are effective under the same conditions as a new formula you are saving.

- No Change - do not modify the other effectivity records.

- New Formula Preferred - (by increasing the preference number for the other formula effectivity records OPM makes the new formula the first preference). An entry of 1 is the highest preference.

- End Date Set To Today - set the end date for the other formula effectivity records to today's date so that they are no longer effective.

Required if you chose Automatic Generation for the effectivity behavior field.

Setting Up Formula Classes (Optional)

Defining classes is optional. Classes group formulas with similar characteristics and requirements for reporting purposes. For example, you may want to classify all formulas for acrylic paints together, and all formulas for water-based paints together. You would define a formula class for each type of paint. On the Formulas window, you would specify the formula class to which the formula belongs.

Setting Up Formula Classes (Optional) Procedure

Follow the steps below to set up formula classification codes:

1. Navigate to the **Formula Classes** window.

2. Complete the fields as described.

3. Save the window.

Formula Classes Field Reference

The fields on this window are:

Class
Enter the classification code that will identify formulas with similar characteristics or requirements. Required.

Description
Enter a brief description of the classification you are adding. Required.

Setting Up Operation Classes

Defining operations classes is an optional procedure. Class codes group operations with similar characteristics and requirements for reporting purposes.

Setting Up Operation Classes Procedure

Follow the steps below to set up operation classification codes:

1. Navigate to the **Operation Classes** window.
2. Complete the fields as described.
3. Save the window.

Operation Classes Field Reference

The fields on this window are:

Class

Enter the classification code that will identify things (formulas, operations, or routings) with similar characteristics or requirements. Required.

Description

Enter a brief description of the classification you are adding. Required.

Setting Up Routing Classes (Optional)

Defining classes is optional. Classes group routings with similar characteristics and requirements for reporting purposes.

Setting Up Routing Classes Procedure

Follow the steps below to set up routing classes:

1. Navigate to the **Routing Classes** window.

2. Complete the fields as described.

3. Save the window.

Routing Classes Field Reference

The fields on this window are:

Class
Enter the classification code that will identify things (formulas, operations, or routings) with similar characteristics or requirements. Required.

Description
Enter a brief description of the classification you are adding. Required.

2

Formula Setup

This topic explains formula setup. It shows you how to set up a formula header and products information. You are also shown how to add ingredients, by-products, and additional information to formulas. This topic provides an understanding of formula phantoms, and shows you how to search for and replace ingredients in formulas.

The following topics are covered:

- Understanding Formula Setup

- Setting Up Formulas

- Setting Up Formula Header and Products Information

- Adding Ingredients to Formulas

- Adding By-products to Formulas

- Adding Additional Information to Formulas

- Understanding Formula Phantoms

- Searching For and Replacing Ingredients

Understanding Formula Setup

Use the Formula Management application to define the formulas that drive your manufacturing process. (Test or prototype formulas may be created and optimized in the OPM Laboratory Management application). Formulas are lists of ingredients and products, and their associated quantities. Formulas window the basis of production. In some cases, you may refer to formulas as the bill of material (BOM). Every batch in the Production Management application is based on a formula defined in the Formula Management application. In addition, formulas are used for planning purposes and by the Costing Management (CM) and the Material Requirements Planning (MRP) applications.

Several windows are used in defining a formula. Two of these windows (the Formulas window and the Ingredients window) are required in order to save the formula as an active formula (a formula without ingredients is inactive); the others are used to enter additional information which may or may not be relevant to your formulas.

Setting Up Packaging Formulas

In addition to defining the way bulk items are produced, formulas can be used to define the way items are packaged. To set up a "packaging" formula, simply enter the packaged item as the product and the bulk item, package (container), and label as the ingredients.

Setting Up Header Information

To create a new formula, you enter header information (formula name, version, and product) that applies to the entire formula on the Formulas window. You also enter the products and product quantities on this window. When a formula produces more than one product, these are sometimes referred to as coproducts. In OPM, products and coproducts are synonymous. Do not confuse coproducts with by-products that are described below.

Setting Up Ingredient Information

You enter ingredients and ingredient quantities on the Formula Ingredients window. Access this window from the Formulas window or the By-products window.

Setting Up By-product Information

If your formula produces by-products, you enter these by-products and by-product quantities on the Formula By-products window. You access this window from either the Formulas window or the Formula Ingredients window. By-products, like products, are items produced by a formula. They differ from products in that you do not plan your production to make by-products. By-products may or may not have value, but generally have less value than products or in some instances there may be a cost associated with disposing of a by-product.

For example, in the production of applesauce you produce apple peels. These peels are not something you plan to manufacture as a product. You would never schedule a batch in order to produce apple peels. These apple peels may not have any value and may be disposed of, or you may find someone who will buy these peels. In either case, you would enter apple peels as a by-product of your applesauce formula.

OPM does not calculate the cost of production of by-products. Any items produced by your formulas for which you want to calculate costs should be entered as products, not by-products. By-products can have an effect on the cost of products, however. For example, the cost of disposing of by-products may increase the cost of producing your products. Alternatively, the money you make from selling the by-products may lower the cost of producing your products.

Additional Information

From each of the three windows just described on which you enter items (ingredients, products, and by-products) in a formula, you can access an Additional Information window by selecting Additional Information from the Actions menu. On this window you can enter additional information, such as scale types and release types, for any of the lines in the formula.

In addition to the windows mentioned above, you can access windows to enter quality control data for items in the formula (specifications, samples, results), to scale the formula, and to calculate theoretical yield. For information on entering quality control data, see the *Oracle Process Manufacturing Quality Management User's Guide* and the online help.

To Add Text to a Formula

Like many other documents in OPM, you can add text to a formula by selecting Edit Text from the Actions menu. You can do this at the header or line level. The text associated with a formula will be copied to batches which are based on the formula if the GMD:Copy Formula Text Profile Option is set to 1. Note that identical paragraph codes must be set up on the Paragraph for the fm_form_mst and pm_btch_hdr tables for header text to be copied, and for the fm_matl_dtl and pm_matl_dtl tables for line item (product, ingredient, or by-product) text to be copied.

See: *Oracle Process Manufacturing Implementation Guide* for more information on setting up paragraph codes.

Setting Up Effectivities

You also set up effectivity records for the formulas. A formula cannot be used until you set up an effectivity record for it.

Setting Up Formulas

This process flow outlines the steps you must complete to set up a formula.

Setting Up Formulas - Process Flow

To set up formulas, proceed as follows:

1. Navigate to the **Formulas** window.

2. Complete the fields as described.

3. Navigate to the **Ingredients** window and complete the fields on the **Formula Ingredients** window.

   See: Adding Ingredients to Formulas.

4. Determine if the formula produces by-products, and proceed as follows:

   1. If the formula produces by-products, navigate to the **By-products** window. Complete the fields as described and proceed to step 5.

   2. If the formula does not produce by-products, proceed to step 5.

5. Determine if you want to add additional information for any lie in the formula, and proceed as follows:

   1. If you want to add additional information (such as whether an item can be scaled or manually released) for any line in the formula, proceed to step 6.

   2. If you do not want to add additional information, proceed to step 6.

6. Place the cursor on the line to which you want to add information, and choose **Additional Information** from the **Actions** menu. The **Additional Information** box is displayed.

7. Complete the fields on the **Additional Information** box as described. Click **OK**. The previous window is displayed.

8. Repeat steps 6 and 7 for each line to which you want to add additional information.

9. Save the formula.

[ ]

The double brackets ([ ]) identify a descriptive flexfield that you can use to add data fields to this window without programming.

Understanding the Effective Behavior Field

If the Effective Behavior field on the Configurations window was set to:

- Manual entry - add an effectivity record for the formula before it can be used.

- Displays on Save or Automatic Generation - an effectivity record has already been created. The formula will be ready to use beginning on the effectivity record's start date.

Understanding the Flow of Ingredients into Products

Here are some important concepts that will help you understand how ingredients are used to produce products.

- A formula establishes the relationship of ingredients to products.

- The batch record is a working copy of a formula.

- A batch ticket represents production batch.

- Ingredients are consumed by production.

- Products, coproducts and by-products are yielded by production batch.

- Material planning is driven by coproducts.

- P/MRP does not consider by-products when suggesting material replenishment.

- Cost of production is distributed over coproducts.

Setting Up Formula Header and Products Information

Use the Formulas window to enter header and product information for a formula.

Setting Up Formula Header and Products Information Procedure

Set up formula header and product information as follows:

1. Navigate to the **Formulas** window.
2. Complete the fields as described.
3. Save the window.

Formulas Field Reference

The fields on this window are:

Formula

Enter the code for the formula you are adding or editing. Required.

Version

Enter the formula's version number. A formula is uniquely identified by the combination of formula code and version number. Required.

Description

Enter a description of the formula/version. This description is displayed on lookups. Required.

Comments

Enter any comments associated with the formula/version. These appear on this window only.

Formula Class

If you have set up formula classes and you want to associate this formula with a formula class, enter the code for the formula class. Classes are used for reporting purposes.

Scaling Allowed

Specify whether a batch can be scaled after it is initially created. The formula's effectivity record dictates the initial scale parameters. Scaling is the proportional increase or decrease of ingredient and product quantities. Select the check box if you want to allow scaling. Required.

Inactive

Specify whether this formula is active or inactive. You cannot create a production batch based on an inactive formula. MRP and Costing will also not use inactive formulas. Select the check box if you want to make the formula inactive. Required.

Seq

This field displays the line number for each product line. This field cannot be edited.

Effective Organization

Entries can only be made in this field when you are creating a formula. Specify the organization for which the formula will be effective. You can also edited this value by accessing Effective Organization from the Actions menu

This field is actually part of the formula's effectivity record and not an attribute of the formula itself. It can only be edited when you are first creating a formula, because once you have saved a formula you can associate it with multiple effectivity records, and so the formula may be effective for multiple organizations. Note that to perform a Cost Rollup, you must specify an effective organization.

Formula Use

You can only edit this field when you are creating a formula, and only if the Effective Behavior field on the Configurations window was set to Displays on Save or Automatic Generation. Use this field to specify the use of this formula. Select on of the following uses:

- Production

- Planning

- Costing

- Regulatory

This field is actually part of the formula's effectivity record and not an attribute of the formula itself. It can only be edited when you are first creating a formula,

because once you have saved a formula you can associate it with multiple effectivity records, and so the formula may be effective for multiple organizations. Note that to perform a Cost Rollup, you must specify an effective organization.

Products

Seq
The sequence of the item in the formula.

Item
Enter the code of the items produced by this formula. If the formula code you entered is the same as an item code, then that item code will display as the default in this field. Required.

Description
The item description of the product defaults from the Item Master table.

Quantity
Enter the quantity of the product that this formula yields. The quantity entered in this field will be the default standard quantity in the effectivity record, but can be changed on the Maintain Effectivities window. Required.

UOM
Enter the unit of measure in which the quantity you entered is expressed. The item's inventory unit of measure is the default. If you enter a different unit of measure, you must first have set up a unit of measure conversion between these two units of measure. Conversions between units of measure of the same unit of measure type (for example, both mass) are defined when the unit of measure is defined on the Unit of Measure window. Conversions between different unit of measure types must be defined for each item on the Item Lot/Sublot Std Conversion window. Required.

Products
Displays the number of products associated with this formula

By-products
Displays the number of by-products associated with this formula.

Ingredients

Displays the number of ingredients associated with this formula.

Formula Header and Products - Actions Menu

The following are available on the Actions menu:

Effectivities

Accesses the Maintain Effectivities window if there are one or zero effectivities associated with the formula, or the View Effectivities window if there are two or more effectivities associated with the formula. Use this option to associate effectivity records with the formula.

See: Setting Up Effectivities.

Additional Information

If the cursor is on a product line, this menu choice accesses the Additional Information box, which allows you to enter additional information, such as scale type and release type, for each product line. This is described in detail later in this section.

Scale

Accesses the Scale Formula box which allows you to scale the quantities of the ingredients, products, and by-products in the formula.

Theoretical Yield

Accesses the Calculate Theoretical Yield box which allows calculation of the product quantities based on the ingredient quantities and a yield factor.

Specifications

Accesses the Production Specifications window.

See: *Oracle Process Manufacturing Quality Management User's Guide*

Samples

Accesses the Production Samples window.

See: *Oracle Processing Manufacturing Quality Management User's Guide*

Results

Accesses the Production Results window.

See: *Oracle Process Manufacturing Quality Management User's Guide*

Effective Organization

Enables you to access the Effective Organization field and allows you to specify the organization for which this formula is effective. This field can only be accessed when creating a new formula and if the FM Configuration window was set so that either the Maintain Effectivities window displays automatically on formula creation, or an effectivity record is created automatically on saving a formula. To specify the organization for which a formula is effective when you cannot use this menu option, select Effectivities from the Actions menu and specify the effective organization on the Maintain Effectivities window.

Formula Use

Accesses the Formula Use field and allows you to specify the function for which this formula can be used (Production, Material Requirements Planning, Costing, or Material Safety Data Sheets). This menu option can only be used when adding a new formula. It can also only be used if the FM Configuration window was set so that either the Maintain Effectivity window displays automatically on formula creation, or an effectivity record is created automatically on saving a formula. To specify the formula use when you cannot use this menu option, select Effectivities from the Actions menu and specify the formula use on the Maintain Effectivity window.

Adding Ingredients to Formulas

Use the Formula Ingredients window to enter ingredients and ingredient quantities for a formula.

The first two product lines, and the number of products, by-products, and ingredients in the formula are displayed at the bottom of the window. These fields cannot be edited.

OPM provides an ingredient search and replace option.

Note: You can use Attachments with this window. See *Oracle Applications* for detailed information on attachments and folders.

Adding Ingredients to Formulas Procedure

Add ingredients to the formula as follows:

1. Navigate to the **Formula Ingredients** window.

2. Complete the fields as described.

3. Save the window.

Formula Ingredients Field Reference

The fields on this window are:

Formula
 The formula code is displayed.This field cannot be edited.

Version
The version number of the formula is displayed. This field cannot be edited.

Ingredients

Seq
This field displays the line number for each ingredient line. This field cannot be edited.

Item

Enter the item codes of the ingredients in this formula. This information is validated against the Item Master.

Description

The item description of the ingredients defaults from the item master table. This field cannot be edited.

Quantity

Enter the quantity of each ingredient used in the formula. Required if you entered an ingredient.

UOM

Enter the unit of measure in which the quantity you entered is expressed. The item's inventory unit of measure is the default. If you enter a different unit of measure, you first must have set up a unit of measure conversion between these two units of measure. Conversions between units of measure of the same unit of measure type (for example, both mass) are defined when the unit of measure is defined on the Units of Measure window. Conversions between unit of measure types must be defined for each item on the Item Lot/Sublot Standard Conversion window. Required if the ingredient is entered.

Products

Displays the number of products associated with this formula.

By-products

Displays the number of by-products associated with this formula.

Ingredients

Displays the number of ingredients associated with this formula.

Products

Seq

The line number for each product line is displayed. This field cannot be edited.

Item

Displays the item code of the product line. This field cannot be edited.

Description

Displays the description of the product line. This field cannot be edited.

Quantity

Displays the quantity of the product line produced. This field cannot be edited.

UOM

Displays the unit of measure of the product line. This field cannot be edited.

Formula Ingredients - Additional Setup in Formula Management

You can access these options from the Action menu.

Additional Information

If the cursor is on an ingredient line, this menu choice accesses the Additional Information box, which allows you to enter additional information, such as scale type and release type, scrap factor, quantity and phantom type for each ingredient line. This is described in detail later in this section.

Scale

Accesses the Scale Formula box which allows you to scale the quantities of the ingredients, products, and by-products in the formula.

Theoretical Yield

Accesses the Calculate Theoretical Yield box which allows calculation of the product quantities based on the ingredient quantities and a yield factor. See the Processing Scaling and Theoretical Yield section for more information.

Adding By-products to Formulas

Use the Formula By-products window to enter by-products and by-product quantities for a formula. By-products are items produced by a formula, but differ from products in that you do not plan your production to make by-products, and you cannot cost by-products.

The first two product lines, the number of products, by-products, and ingredients in the formula are displayed at the bottom of the window. These fields cannot be edited.

You can access the header information by clicking Products. You can access the Formula Ingredients window by clicking Ingredients.

Adding By-products to Formulas Procedure

Add by-products to the formula as follows:

1. Navigate to the **Formula By-products** window.

2. Complete the fields as described.

3. Save the window.

Formula By-products Field Reference

The fields on this window are:

Formula

The formula code is displayed. This field cannot be edited.

Version

The version number of the formula is displayed. This field cannot be edited.

By-products

Seq

The line number for each by-product line is displayed. This field cannot be edited.

Item

Enter the item codes of the by-products produced by this formula.

Description

The item description of the by-products defaults from the item master table. This field cannot be edited.

Quantity

Enter the quantity of each by-product produced by the formula. Required if you entered a by-product.

UOM

Enter the unit of measure in which the quantity you entered is expressed. The item's inventory unit of measure is the default. If you enter a different unit of measure, you must first have set up a unit of measure conversion between these two units of measure. Conversions between units of measure of the same unit of measure type (for example, both mass) are defined when the unit of measure is defined on the Units of Measure window. Conversions between unit of measure types must be defined for each item on the Item Lot/Sublot Standard Conversion window. Required if you entered a by-product.

Products

Displays the number of products associated with this formula.

By-products

Displays the number of by-products associated with this formula.

Ingredients

Displays the number of ingredients associated with this formula.

Products

Seq

The line number for each product line is displayed. This field cannot be edited.

Item

Displays the item code of the product line. This field cannot be edited.

Description

Displays the description of the product line. This field cannot be edited.

Quantity

Displays the quantity of the product line produced. This field cannot be edited.

UOM

Displays the unit of measure of the product line. This field cannot be edited.

By-products - Actions Menu

The following are available on the Actions menu:

Additional Information

If the cursor is on a by-product, this menu choice accesses the Additional Information box, which allows you to enter additional information, such as scale type and release type, for each by-product line. This is described in detail later in this section.

Scale

Accesses the Scale Formula box which allows you to scale the quantities of the ingredients, products, and by-products in the formula.

Theoretical Yield

Accesses the Calculate Theoretic Yield box which allows calculation of the product quantities based on the ingredient quantities and a yield factor.

Adding Additional Information to Formulas

You can add additional information for any line in a formula (product, ingredient, or by-product) by placing the cursor on that line and selecting Additional Information from the Actions menu. The fields that appear in the box depend on which window you are on.

To add information for a product you must be on the Formulas window, to add information to an ingredient you must be on the Formula Ingredients window, and to select a by-product you must be on the Formula By-products window.

Adding Additional Information to Formulas Procedure

Add additional information as follows:

1. Navigate to the **Formula**, **Ingredient**, or **By-product** window on which you want to add additional information.

2. Choose **Additional Information** from the **Actions** menu.

3. Complete fields as described.

4. Click **OK**.

Additional Information Box Field Reference

The fields on this window are:

Ingredients Additional Information Box

Scrap Factor

Enter the scrap factor for this formula item, expressed as a percentage (ex. 5% is entered as 5). The value entered should represent the anticipated amount of ingredient loss during manufacturing.

This field works in conjunction with the Required Quantity field. When the scrap factor percentage is entered, the required quantity will automatically be calculated using the following algorithm:

required_qty=formula_quantity*(1+scrap_factor%)

Required Quantity

Enter the ingredient quantity required for manufacturing. The value entered should represent the amount of an ingredient needed to manufacture a given product. This includes the scrap, the amount of anticipated ingredient loss during manufacturing.

This field works in conjunction with the Scrap Factor field. When the required quantity is entered, the scrap factor value will be automatically calculated using the following algorithm:

scrap_factor% = (required_quantity/formula_quantity) - 1

Formula, Ingredient or By-product Additional Information Box

Item

The code of the item on the line you selected displays from the previous window. This field cannot be edited.

Description

The description of the item on the line you selected displays from the previous window. This field cannot be edited.

Quantity

The quantity of the item on the line you selected displays from the previous window. This field cannot be edited.

Scale Type

If scaling was enabled on the Formulas window, specify the scale type for this formula line item. Select one of the following:

- Fixed Quantity
- Linear Scaling

Fixed quantity means that this item is not scaled (remains fixed) when the formula is scaled.

Linear scaling means that this item (ingredient) is scaled when the formula is scaled.

Release Type

Select on of the following the release types for this ingredient line:

- Automatic Release - Automatic release, when set for an ingredient line, means that this ingredient line will be released for production when a batch which uses this formula is released.

- Manual Release - Manual release, when set for an ingredient line, means that this ingredient line must be released individually in a batch which uses this formula.

- Incremental Release - Incremental, when set for an ingredient, means that the line will be released incrementally based on entries made using Partial Certification.

For example, if you have an ingredient that must undergo lengthy preparation, you may want to release that line first and wait to release the rest of the batch until preparation is complete. You can also use manual release for partial releases of an ingredient, that is, to release the ingredient quantity a bit at a time.

When used on product lines, manual release allows you to do partial certification of a batch. This is useful for long batches or continuous processing, in which you want to record the fact that a certain amount of the product was yielded without having to wait until the entire batch is complete.

If you do not set this flag on this window, the lines default the type defined by GMD:Default Release Type in your Profile Option.

See: Partial Certification and Backflushing, *Oracle Process Manufacturing Production Management User's Guide.*

Phantom Type

You can only edit this field on the Ingredient Additional Information box. Designate the phantom type you want to use. You have three options:

- Not a phantom

- Auto-Generate Phantom Batches

- Manually Generated Phantom Batches

When you Auto-Generate Phantom Batches the system will create a dependent phantom batch and generate a production ID number to associate the related batches.

When you select Manually Generated Phantom Batches you will have to explode each phantom ingredient by selecting the Create Phantom menu option.

Rework Type

This field is used for reporting purposes only. You may enter a description of the rework type here.

Cost Allocation

This field only displays when you access the Additional Information box from a product line on the Formulas window. Specify how the cost should be proportioned across each of your co-products. By default 100 percent of the cost is assigned to the product on the first line.

Understanding Formula Phantoms

Phantoms are intermediate formulas that you either don't actually manufacture as a product or don't make until you're ready to use them. They are not tracked in inventory, but their ingredients are. A phantom is made only during the production of another product, and may also be known as a transient subassembly or a blowthrough.

Enter the phantoms as formula ingredients and explode them when you enter batch tickets.

Phantom functionality is a fixed method of multi-batch management. Once several batches are linked by a production order number and the phantom type dependency, you can manage them as a single production event. There are two basic tasks associated with using phantoms in FM. They are:

- Identify one or more ingredients in a formula as phantom(s). Use the Phantom Type field on the Ingredient window's Additional Information box to indicate that an item is a phantom.

- Build a formula for each phantom and create effectivities. The method for building a formula that will generate a phantom is the same method used to build a formula for a regular batch. However, the formula ingredient must be defined as a phantom in the Additional Information box on the Formula window. There are two types of phantoms, Auto-Generate Phantom Batches and Manually Generated Phantom Batches. Both are described in more detail below.

Generating Phantom Batches Automatically

When you use the Auto-Generate Phantom Batches function with automatic document numbering, the application automatically creates a dependent phantom batch and generates a production ID number to associate the related batches. Choose Automatic Generation at the Phantom Type field to indicate this phantom as an automatic-Generate phantom.

Generating Phantom Batches Manually

When you use the Manually Generated Phantom Batches function, you will have to explode each phantom ingredient by selecting the Phantom. When you release a production batch that has phantoms in its formula, the system will tell you that the phantom has not been exploded. This message can appear for one of two reasons:

- It is a manual phantom that you need to explode using the Actions menu's Edit Phantom option.

- There is some problem with the phantom, for example, the effectivity is not available, or there is some kind of inventory shortage that affects that production of the phantom.

Examples of Phantom Batches

Here are some examples of phantom batch types:

Phantoms You Make

You use a basic bread dough for a number of kinds of bread. You don't sell it or keep it in inventory; you track only the ingredients. Your formulas for bread contain #BASICBREAD plus whatever other ingredients are needed to turn it into something besides plain white bread.

In a simple case like this, you may need only one version of the #BASICBREAD formula.

Phantoms You Never Actually Make

You make a number of products that use apples. Each product has a different formula, but all of them use apples. However, there are many varieties of apples. Flavor, texture, and sugar content vary significantly among varieties. Price and availability may also vary depending on season or other factors. Therefore, you decide to use an intermediate called #APPLEBLEND, which is made up of two or more apple varieties.

You don't actually make #APPLEBLEND. What you do is use its ingredients in a batch.

Searching For and Replacing Ingredients

OPM provides a search and replace feature for ingredients in a formula. Use Ingredient Search and Replace to change an ingredient in one, all or a range of formulas. You might want to change an ingredient if the original ingredient is unavailable or environmental factors dictate that you use a different ingredient or for regulatory reasons. Ingredient Search and Replace consists of two forms. At the first window, you enter the search and replace criteria: the old and new ingredients, the formula selection criteria, and effectivity criteria. The second Ingredient Search and Replace window displays the formulas that meet the entered search criteria and enables you to enter the quantity for the new ingredient and create a new formula version.

Searching for and Replacing Ingredients Procedure

Here is the process you can use to search for and replace ingredients:

1. Search and replace ingredients in a formula as follows:

2. Navigate to the **Ingredient Search and Replace** box.

3. At the first **Ingredient Search and Replace** box, enter the ingredient you want to replace in the **Old Ingredient** field.

4. Enter the new ingredient in the **New Ingredient** field and if necessary, enter a scaling factor for the new ingredient.

5. In the Formula **From** and **To** fields, enter a single formula and version or a range of formulas and versions. To specify, all formulas, leave the range fields blank.

6. At the Formula Effectivity Criteria panel, select the effectivity criteria for the formulas OPM searches. You can select one or a combination of effectivity search criteria:

    1. Previously - for a Previously Effective Formula

    2. Currently - for a Currently Effective Formula

    3. Future - for a Future Effective Formula

    4. Never - for a Never Effective Formula

7. At the Formula Used In panel, select the usage of the formulas OPM searches. You can select one or any combination of formula usage search criteria:

    1. Production

    2. Planning

    3. Costing

    4. Regulatory

8. At the Formula Effectivity panel, select to create a new formula with the new ingredient without an effectivity or a formula with the 'remaining' effectivity. Click **OK**.

9. At the second **Ingredient Search and Replace** box, click the Selection box next to each formula whose ingredient you want to replace. Enter the quantity of the new ingredient for each formula you want to change in the **Quantity** field in the New Ingredient area and **Save** the window. When you save the window, OPM searches the database for formulas with the criteria you selected and replaces the old ingredient with the new ingredient. When the process is finished, a message is displayed that a new formula has been created.

Ingredient Search and Replace Field Reference - First Window

In the top section of the window, you enter ingredient search criteria as follows:

Organization
The user organization. For display only.

Old Ingredient
Enter the item code of ingredient you want to replace. The description of the ingredient displays. Required.

New Ingredient
Enter the item code of new ingredient. The description of the ingredient displays. Required.

Scaling Factor
Enter a scaling factor if the new ingredient needs to be scaled. Default to 1 or equal to quantity of old ingredient.

Effectivity

Select one of the following:

- Assume Remaining - to assume a remaining effectivity
- Create Without - to create without an effectivity

Formula Selection

Formula (From/To)

Enter a single formula or a range of formulas in the From and To fields. Leaving these fields blanks indicates that all formulas. Required.

Version (From/To)

Enter a single version or a range of versions in the From and To fields. Required.

Formula Effectivity Criteria

Previously

Select this check box if you want OPM to search formulas whose effectivity dates are expired.

Currently

Select this check box if you want OPM to search formulas that are currently effective.

Future

Select this check box if you want OPM to search formulas whose effectivity dates fall in the future.

Never

Select this check box if you want OPM to search formulas that do not have effectivities.

Formula Used In

Production

Select this check box if you want OPM to search formulas that are flagged for production usage.

Planning

Select this check box if you want OPM to search formulas that are flagged for MRP usage.

Costing

Select this check box if you want OPM to search formulas that are flagged for Costing usage.

Regulatory

Select this check box if you want OPM to search formulas that are flagged for Regulatory.

Ingredient Search and Replace Field Reference - Second Window

After you enter the information on the first Ingredient Search and Replace window, a second window displays the following information.

Old Ingredient

Displays the old ingredient's item code and description.

New Ingredient

Displays the new ingredient's item code and description.

Scaling Factor

Displays the scaling factor you selected for the new ingredient.

Candidates

Displays how many formulas met the search criteria.

(Old Ingredient) Formula

Lists the name of for the formula that contains the old ingredient.

(Old Ingredient) Version

Lists the version number of the old formula.

Line

Lists the line in the formula on which the old ingredient appears.

(Old Ingredient) Quantity

Lists the formula quantity of the old ingredient.

UOM

Displays the unit of measure for the old ingredient quantity.

(New Ingredient) Quantity

Enter the quantity of the ingredient defaults to old quantity times the scale factor.

UOM

Defaults to the unit of measure for the new ingredient quantity but can be edited if the proper conversions are set up.

New Version

OPM assigns a version number when you Save the window.

3

Routings Setup

This topic explains routings and defines a process flow for them. You are shown how to set up activities, resources, operations, alternate resources (optional), and routings.

The following topics are covered:

- Understanding Routings

- Defining Routings - Process Flow

- Setting Up Activities

- Setting Up Resources

- Setting Up Operations

- Setting Up Alternate Resources (Optional)

- Setting Up Routings

Understanding Routings

This section defines routings, and describes how to set them up.

A formula defines the ingredients used to manufacture a product. A routing defines the method or steps that are taken to manufacture that product. Routings consist of operation steps. Operation steps are made up of activities. Here are the steps you need to take to create routings:

- Define the activities. These are actions which are taken during production, such as mixing, heating or cooling. Activities should be divided by logical breakpoints, such as where measurements are taken. Activities can then be associated with resources to form operations.

- Define the resources. A resource is what is used to perform the activity. A resource could be a person (labor) or a machine (equipment). For example, a mixer (resource) could be associated with mixing (activity) to define the mixing operation. Resources are defined in the Capacity Requirements Planning (CRP) application.

- Define the operations which contain the activities. Operations are steps in the routing. The different operations you define are linked to define a routing.

- Create the routings by defining the logical steps (operations).

OPM uses routings to include the noninventory costs associated with the manufacturing process as part of product cost rollups.

See: *Oracle Process Manufacturing Cost Management User's Guide*

Defining Routings - Process Flow

You must define resources in the CRP application before you set up operations.

The following is a process flow for setting up routings:

1. Navigate to the **Activities** window and complete the fields as described. Save the window.

2. Navigate to the **Resources** window and complete the fields as described. Save the window.

3. Navigate to the **Operations** window and complete the fields as described. Proceed accordingly:

   1. If you want to add additional information (such as scale type) for any line in the operation, proceed to step 4.

   2. If you do not want to add additional information, proceed to step 5.

4. Place the cursor on the line to which you want to add additional information and select **Additional Information** from the **Actions** menu.

5. Complete the fields on the **Additional Information** box as described. Click **OK**.

6. Repeat Steps 4 and 5 for each line to which you want to add additional information.

7. Save the **Operation** window.

8. Select **Routing** from the **Formula Management** main menu.

9. Complete the fields as described.

10. Save the routing.

Setting Up Activities

Activities are actions performed during production, for example, mixing or cooling. They should be divided by logical breakpoints in the manufacturing process.

If you are interfacing OPM CRP with *Rhythm Factory Planner*, the only activities which OPM exports to *Rhythm* are POST-OP, RUN-TIME and SET-UP.

You assign cost analysis codes to activities. Cost analysis codes determine how the costs associated with an activity are calculated and processed by the Costing application.

See: *Oracle Process Manufacturing Cost Management User's Guide*

Setting Up Activities Procedure

Set up activities as follows:

1. Navigate to the **Activities** window.

2. Complete the fields as described.

3. Save the window.

Activities Field Reference

The fields on this window are:

Activity Code

Displays the name of the activity. Activities are the components which make up an operation.

Description

Enter a brief description of the activity. Required.

Analysis Code

Enter the cost analysis code. Required.

Setting Up Resources

Resources are the assets you use to produce your product such as production equipment and labor. To create operations you need to set up resources first. Resources are the machinery or labor that perform the activities in the operation.

You set up Resources on the CRP application. You may define each resource very generally (for example, "OVENS") or specifically ("OVEN1, OVEN2, and so on.) For each resource you must assign a component classification for costing purposes.

After you define resources you may want to define alternate resources. An alternate resource can perform the same operation as a primary resource. Alternate resources are defined on the Capacity Management Alternate Resource window.

Setting Up Resources Procedure

Set up resources as follows:

1. Navigate to the **Resources** window.
2. Complete the fields as described.
3. Save the window.

Resources Field Reference

The fields on this window are:

Resource

Enter the code by which you identify this resource. Required.

Description

Enter a brief description of the resource you are adding. Required.

Standard UOM

Indicate the valid unit of measure (for example, hours) by which you measure output of this resource. Note that if you are using OPM with the Rhythm Interface product, Rhythm only recognizes "HR" (for hours) as a valid unit for capacity resource reporting. Required.

Resource Class

You may specify the resource class to which this resource belongs. For example, the resource "Chefs" may be included in the resource class "Labor".

Cost Component Class

A component class links this individual resource to a unit of measure, and allows you to establish costing parameters for the resource in the Costing application. Required.

Setting Up Operations

Define operations on the Operations window. An operation is a combination of one or more activities performed in production batch and the resources used to perform those activities. A resource can be any noninventory item used in production, such as a blender or oven. For example, the operation of mixing is composed of the activity of mixing and the mixer (resource) used to perform the mixing.

After you have set up operations, you may want to define alternate resources. Alternate resources are defined in the Capacity Requirements Planning application CRP.

See: *Oracle Process Manufacturing Capacity Planning User's Guide*

You can also define alternate resources and link them to a specific operation using the Operation Alternate Resource window. After you have defined operations, create a routing which specifies the sequence of operations performed during manufacturing. Routings are defined on the Routings window.

[ ]

The double brackets ([ ]) identify a descriptive flexfield that you can use to add data fields to this window without programming.

Setting Up Operations Procedure

Set up operations as follows:

1. Navigate to the **Operations** window.

2. Complete the fields as described.

3. Save the window.

Operations Field Reference

The fields on this window are:

Operation

Enter the code for this operation. Required.

Description

Enter a brief description of this operation. Required.

Operation Class

Enter the operation class in which this operation is categorized.

Process Qty UOM

Enter the unit of measure in which the flow of production or throughput for this operation will be measured. Required.

Resource Details Fields

Throughput Region

Resource

Enter the code for each resource used in this operation. Required.

Activity

Enter the code for the activity which the resource performs.

Process Quantity

Enter the processing quantity for the resource. This quantity, combined with the value in the Usage field, defines the use rate. For example, if the resource can mix 200 gallons per hour, enter 200 gallons in this field and 1 hour in the Usage field.

UOM

The unit of measure of the process quantity. This is the same as the UOM entered in the header information described above. Required.

Usage Quantity

Enter the resource usage required for the process quantity. This is usually measured in time, but may be measured in other units. If you are using CRP you must set this field as a unit of time.

For example: If the resource can mix 200 gallons per hour, enter 200 in the Process Quantity field and 1 in the UOM field.

UOM

Enter the unit of measure the usage is measured in. This is usually a time unit of measure such as hours.

Cost Information Region

Resource

Enter the code for each resource used in this operation. Required.

Activity

Enter the code for the activity which the resource performs.

Cost Analysis Code

Enter the cost analysis code for the activity defaults from the Activity window. This code allows the Costing application to roll up the costs associated with an operation by cost analysis code. Analysis codes are set up in the Costing application. You can override the default cost analysis code by changing this field.

Required.

Component Class Code

The component class code for the resource defaults from the Resource window. Component classes are used to categorize different classes of resources. You can override the default component class code by changing this field.

Required.

See: *Oracle Process Manufacturing Cost Management User's Guide*

Scheduling Information Region

Resource

Enter the code for each resource used in this operation. Required.

Activity

Enter the code for the activity which the resource performs.

Plan Type

Designates whether this resource is a primary-, secondary- or auxiliary resource.

- Primary resource - the rate determining resource. It limits or determines throughput. It is also referred to as a bottleneck or a critical resource. We recommend that for each operation in a routing, you flag the RUN-TIME

Activity's resource as the primary resource (this is especially recommended if you use CRP.)

- Secondary resource - one which would replace a primary resource when the primary resource is not available. It performs the same task as the primary resource and may have a different usage rate.

- Auxiliary resource - the term auxiliary resource is used for capacity planning purposes. On the Operations window, you need to flag resources as either primary or auxiliary resources when setting up resource and activity pairs. Auxiliary resources work along with the primary resources to perform an activity in an operation. They do not affect the rate of the operation. For example a primary resource in a mixing activity could be a mixer which at 100 gallons/hour. The auxiliary resource could be a worker who operates the mixer. No matter how fast or slow the worker is, the mixer rate remains constant. Capacity Planner does not allow multiple primary resource or activity pairs in a step. It does allow one primary resource and three auxiliary resources.

This field is read only.

Count
Enter the number of resources needed for the activity entered. For example, if two identical blenders are used for mixing, enter "2". Capacity Planner does not consider the entry in the Count field.

Offset
Enter the time delay from the start of the activity to the point at which the resource is actually required. This parameter is used by POC.

Scale Type
Designate whether scaling will be used to determine resource quantity. Scaling is the proportional increase or decrease of resources. Setup and cleanup activities are typically not scaled, while manufacturing activities are.

You may select one of the following from the list:

- Fixed - the resource usage does not change, regardless of an increase or decrease of the quantity of material processed.

- Linear - the resources are doubled if you double the process quantity for an operation. Similarly, the resources are halved if you halve the process quantity.

Required.

Resource Details Fields

Resource Description
Describes the resource. This field is view only.

Activity Description
Describes the activity. This field is view only.

Cost Analysis Description
Describes the cost. This field is view only.

Component Class Description
Describes the component class. This field is view only.

Operations - Additional Setup in Formula Management
You can access these options from the Action menu.

Mark for Purge
Marks the specified Resource Detail for purging.

Specification
Accesses the Production Specifications window.

See: *Oracle Process Manufacturing Quality Management User's Guide*

Samples
Accesses the Production Samples window.

See: *Oracle Process Manufacturing Quality Management User's Guide*

Results
Accesses the Production Results window.

See: *Oracle Process Manufacturing Quality Management User's Guide*

Setting Up Alternate Resources (Optional)

The Operation Alternate Resources window enables you to link alternate resources to a specific operation. At this window, you may set the factors (against the primary resources) for runtime, setup and post operation for the alternate resource. This window is accessed from the Formulas menu or from the Operations forms Actions menu.

Setting Up Alternate Resources (Optional) Procedure

Set up alternate resources as follows:

1. Navigate to the **Operation Alternate Resource** window.

2. Complete the fields as described.

3. Save the window.

4. Enter the time factors for the alternate resource in the **Runtime**, **Setup** and **Post Operation** fields. For example: If the primary resource has a runtime of 1 hour and the alternate resource has a runtime of 1 hour and 30 minutes, the factor is 1.5.

5. Save the window.

Operation Alternate Resources Field Reference

The fields on this window are:

Operation

Enter the identifying code of the operation. For example, MIX.

Resource

Enter the name of the main resource. For example, MIXER1. This primary resource/alternate resource relationship must already be established on the CRP Alternate Resource window

Alternative Resources Details

Resource

Enter the name of the alternate resource. For example, MIXER2.

Factors

Runtime

Enter the time factor for the alternate resource's runtime. For example, the main resource takes 1 hour to run through an operation. The alternate resource takes 1 hour and 30 minutes. The factor is 1.5.

Setup

Enter the time factor for the alternate resource's setup time. For example, the main resource takes 1 hour set up. The alternate resource takes 1 hour and 30 minutes. The factor is 1.5.

Post Operation

Enter the time factor for the alternate resource's post operation time. For example, the main resource takes 1 hour to clean. The alternate resource takes 1 hour and 30 minutes. The factor is 1.5.

Setting Up Routings

A routing represents the sequence of operations or steps used during the manufacturing process. A routing is uniquely identified by the combination of routing code and version number. For example, the routing for making cookies might consist of mixing the ingredients in a mixer, cutting the dough into cookie shapes, and baking in an oven. The Routings window lets you specify each operation in sequential order, the operation quantity, and the total routing quantity. When a routing is associated with a formula through an effectivity record, the nonmaterial costs (routing costs) incurred in the production of the product(s) made by the formula are calculated by the Costing application. You link routings to formulas on the Maintain Effectivities window. After you have set up routings, you can associate formulas used to make products with the routings used with those formulas. In other words, you link the list of ingredients and products (the formula) with the sequence of operations (routing) performed on the ingredients to make the products. Formulas and routings are linked on the Maintain Effectivities window.

[ ]
The double brackets ([ ]) identify a descriptive flexfield that you can use to add data fields to this window without programming.

You can use the Attachments feature with the Routings window header information.

Setting Up Routings Procedure

Set up routings as follows:

1. Navigate to the **Routings** window.

2. Complete the fields as described.

3. Save the window.

Routings Field Reference

The fields on this window are:

Routing Number
Enter the code for the routing to be added or edited. Required.

Routing Version
Enter the version number of the routing to be added or edited. Required.

Description
Enter the description of the routing. Required.

Routing Class
Enter the code of the routing class in which this routing is categorized. Routing classes are set up on the Routing Class window.

Routing Quantity
Enter the product quantity for this routing. This is the total quantity for the routing. This quantity is used to scale individual step requirements. Required.

Enter the unit of measure in which the routing quantity is expressed in the field to the right of the Routing Quantity field. Required.

UOM
This defaults from the process quantity unit of measure entered on the Operations window and cannot be changed. Required.

Routing Steps

Step
Enter the step number. If the operations in the routing are performed in sequential order, the first operation performed in the routing should have the number "10," the second should have the number "20," and so forth. This allows you to add intermediate steps later. Required.

Operation
Enter the code for the operation performed in this step in the routing. Required.

Description
The description of the operation is displayed.

Step Quantity
Enter the operation quantity associated with this routing step.

4

Effectivities

This topic explains effectivity records. It shows you how to set them up and how to set up formula effectivities. You are shown how to view effectivities, and how to add to or edit them.

The following topics are covered:

- Understanding Effectivity Records
- Setting Up Effectivity Records
- Setting Up Formula Effectivities
- Viewing Effectivities
- Adding To or Editing Effectivities

Understanding Effectivity Records

Effectivity records specify when, under what conditions, and for what use a particular formula can be used. For example, you may have two different production lines which produce the same product. One line produces 50 kilogram batches and the other produces 500 kilogram batches. The ratio of the ingredient quantities may differ depending on the size of the batch. In this case, you need either two formulas or two versions of a formula to produce the product. You must specify, by creating effectivity records, that the first formula is used when producing 50 kilograms of the product and the second formula is used when producing 500 kilograms of the product.

Your effectivity records would also specify that the 50 kilogram batches use the first production line and the 500 kilogram batches use the second production line. You would specify the production lines by entering the routing corresponding to the first production line in the effectivity record for the first formula and the routing corresponding to the second production line in the effectivity record for the second formula.

Another example of the use of effectivities is restricting formula use by data. For example, you may have a formula which uses a chlorofluorocarbon. Government regulations stipulate that this compound cannot be used after a certain date, so you define a formula which uses a substitute compound. You intend to use the first formula until the new regulations take effect, and then switch to the other formula. You would set the end date of the effectivity for the first formula to the last date the chlorofluorocarbon can be used, and the start date of the effectivity for the second formula to the date the regulations go into effect.

Sometimes formulas can have overlapping effectivities. For example, you may have one formula that is effective for quantities from 10 to 100 pounds and another which is effective for quantities from 50 to 500 pounds. If you are using MRP, it must be able to decide which formula to use when planning. If more than one formula qualifies, there will be a conflict which MRP cannot resolve. Therefore, you should specify which formula is preferred when more than one can be used. Oracle Process Manufacturing provides a field on the effectivity record to indicate this preference.

When you copy a formula, you also copy the formula's configuration attributes and the behavior it defines. For example, if you copy a formula with an effectivity behavior of Manual Entry, then you must create an effectivity for the new formula by selecting Effectivities. But if the formula you copied has a behavior of Automatic Generation, then the new formula will also have that behavior and the list will not display.

Understanding Formula Effectivities

In addition to specifying the conditions under which formulas can be used, effectivity records also specify the purpose for which formulas can be used (referred to as the formula use). Formulas serve as the basis for batches in the Production Management application. Formulas are also used by the MRP (Material Requirement Planning) application for material requirements planning and by the Costing application for calculating cost rollups.

Setting Up Planning Effectivities

If you do not set up a planning effectivity for MRP in addition to the formula effectivity for production, when you run MRP it will use the production effectivity. This works fine for many business situations. However, there are some situations in which you may want MRP to perform its calculations based on different formulas than those used by Production.

For example: You may want MRP to use one standard formula for planning production of a certain product, even though slightly different formulas are used under different conditions or by different plants. In this case, you must set up this standard formula and create a formula effectivity record which specifies a formula use for Planning. This formula will then be used by MRP instead of the production formulas for planning product production.

Setting Up Costing Effectivities

To perform costing calculations, such as product cost rollups, an effectivity record which specifies a formula use of costing can be set up. If you want Costing to use the same formulas as Production, you can use or simply copy the Production effectivities and save as a Costing effectivity. However, if you want to use a standard costing formula for a product even though different formulas are used in Production under different circumstances or in different plants, you must set up the formula to be used specifically for costing, and create an effectivity record which specifies that this formula is to be used for costing this product under all situations.

You must enter a specific organization code in the Organization field when creating a Costing Effectivity, otherwise the costing rollup process will not work.

Setting Up Regulatory Effectivities

Choose regulatory if you need to build formulas for regulatory purposes. For more information on the Regulatory application.
See: *Oracle Process Manufacturing Regulatory Management User's Guide*

Setting Up Effectivity Records

A formula cannot be used until an effectivity record is set up for it. Here are two methods for setting up effectivity records.

Setting Up Effectivity Records Manually

Effectivity records can be set up in several ways, depending on how you set the Effective Behavior field on the Formulas window. If the Effective Behavior field is set to Manual Entry, you must set up effectivity records manually after you save a formula.

There are two ways you can set up effectivity records manually.

- Retrieve the formula using the Formulas window, and select Effectivities from the Actions menu. The Select Effectivities window is displayed. Enter the item which you are establishing effective ways to produce, and any other selection criteria, and select Accept.

- Select Effectivities from the Formulas menu. The Select Effectivity box is displayed. Enter the item which you are establishing effective ways to produce, and any other selection criteria, and select Accept.

Setting Up Effectivity Records Automatically

You can set up the application to display the Maintain Effectivities window automatically by selecting either the Display on Save or Automatic Generation option in the Effective Behavior field.

If the Effective Behavior field is set to:

- Display on Save, the Maintain Effectivities window is automatically displayed when you try to access the Formula Ingredients window when entering a formula. You can still edit or add additional effectivities manually.

- Automatic Generation, an effectivity record is automatically created when you save a new formula. You can still edit or add additional effectivities manually.

Setting Up Formula Effectivities

Use this window to specify the item for which you want to view, add, or edit effectivities. You must also specify the formula use for the effectivities. In addition, you can limit the list of effectivities by several selection criteria described below.

If only one effectivity record exists for the criteria specified on this box, the Maintain Effectivities window is displayed. If more than one effectivity record exists for the specified criteria, the View Effectivities window is displayed.

Setting Up Formula Effectivities Procedure

To add, edit, or view effectivities, proceed as follows:

1. Navigate to the **Select Effectivities** box.

2. Enter the product name in the **Item** field.

3. Indicate whether the effectivity you want to view or create is for:

    1. Production

    2. Planning

    3. Costing

    4. Regulatory

4. Complete the fields as described.

5. Click **OK**.

6. You will now be able to view or maintain effectivities as follows:

    1. If more than one effectivity record already meets the criteria entered, the View Effectivities window is displayed. On this window, click the box next to the formula for which you want the Maintain Effectivities window to display.

    2. If no effectivities or only one effectivity record meets the criteria entered, the Maintain Effectivities window is displayed.

Select Effectivities Field Reference

The fields on this window are:

Item

Enter the code for the desired item. Effectivity records for formulas which produce this item will be displayed. Required.

Description

This field is a view only description of the item.

Formula Use

Indicate the formula use for which you want to view effectivities. You may select one of the following from the list:

- Production

- Planning

- Costing

- Regulatory

Effectivity Range

Organization

Enter a single organization or enter the beginning and ending organization codes in the From and To fields. To indicate All Organizations, leave the field blank.

Effective Quantity

Enter a single quantity or enter the beginning and ending quantities in the From and To fields. To indicate All, leave both the From and To fields blank.

UOM

Displays the unit of measure for the Effective Quantities entered.

Effective Date

Enter a single date or enter the beginning and ending dates in the From and To fields. To indicate All, leave both the From and To fields blank.

Formula

Enter a single formula or enter the beginning and ending formulas in the From and To fields. To indicate All, leave both the From and To fields blank.

Routing Number

Enter a single routing or enter the beginning and ending routing codes in the From and To fields. To indicate All, leave both the From and To fields blank.

Customer

Enter a single customer or enter the beginning and ending customers in the From and To fields. To indicate All, leave both the From and To fields blank.

Viewing Effectivities

Use this box to select from a list of effectivities for the item you want to produce. You can access this window in several ways:

- By selecting Effectivities from the Formula Management main menu, completing the Select Effectivity box, and clicking OK. The View Effectivities box is only displayed if there is more than one effectivity record that meets the specified criteria. Otherwise, the Maintain Effectivities window is displayed.

- By selecting Effectivities from the Actions menu on the Formulas window. The View Effectivities box is only displayed if there is more than one effectivity record associated with the formula. Otherwise, the Maintain Effectivities window is displayed.

Once this window is displayed, you click the selection box of the effectivity you want to display. All of the fields on the View Effectivities window are display-only.

View Effectivities Field Reference

The fields on this window are:

Item

The code identifying the formula to which this effectivity record applies is displayed. If you accessed this window from the Formulas window, this field cannot be edited.

Description

The description of the item. This is populated from the item master record.

Details

Organization

The organization code for this effectivity record is displayed. If this field is blank, the effectivity record applies to all organizations.

Min Qty

The minimum production quantity for which this formula is effective is displayed.

Max Qty

The maximum production quantity for which this formula is effective is displayed.

UOM

Unit of measure of the item in the formula record.

Formula

Displays the name of the formula.

Version

Displays the version of the formula.

Routing

Displays the routing step.

Version

Displays the version of the routing step.

Formula Use

One of the following formula uses displays:

- Production
- Planning
- Costing
- Regulatory

Standard Quantity

The standard production quantity for which this formula is effective is displayed.

Preference

The preference number for the effectivity record is displayed. This prioritizes effectivity records when multiple effectivity records are valid for a given set of conditions. The lower the preference number, the higher the priority.

Effectivity Dates

The start and end dates for the effectivity are displayed.

Customer

The customer code specified on the effectivity record is displayed. This information is validated from Accounts Receivable tables.

Adding To or Editing Effectivities

The Maintain Effectivities window is used to define the conditions under which a formula can be used. This window can be accessed in several ways:

- By selecting Effectivities from the Formula Management main menu, completing the Select Effectivity box, and selecting OK. If there is more than one effectivity that meets the criteria specified on the box, the View Effectivities window will display first.

- By selecting Effectivities from the Actions menu on the Formulas window. If there is more than one effectivity associated with the formula, the View Effectivities window will display first.

- By selecting an effectivity from the View Effectivities window.

- By clicking Ingredients on the Formulas window when adding a new formula/version, if the Effective Behavior field on the Configurations window was set to Maintain Effectivities.

Adding To or Editing Effectivities Procedure

To add an effectivity record:

1. Navigate to the **Maintain Effectivities** window.

2. Complete the fields as described.

3. Save the effectivity record.

4. The **View Effectivities** box or the **Formula** window is displayed, depending on how you accessed the **Maintain Effectivities** window.

Maintain Effectivities Field Reference

The fields on this window are:

Maintain Effectivities Fields

Formula

The code identifying the formula to which this effectivity record applies is displayed. If you accessed this window from the Formulas window, this field cannot be edited. Required.

Version

The version of the formula to which this effectivity record applies is displayed. This field cannot be edited if you accessed this window from the Formulas window. Required.

Description

The description of the formula is displayed. This is populated from the formula header information.

Formula Use

Indicate the formula use for which you want to view effectivities. You may select one of the following from the list:

- Production
- Planning
- Costing
- Regulatory

Product

This field displays the code and description for the default product (first product listed) in the formula.

Description

The description of the product is displayed. This is populated from the Item Master table.

Preference

Enter a preference number for this formula. This is used to indicate which formula is preferred when more than one formula that produces the same product can be used in a given set of circumstances.

For example: You may have a formula that can be used when making between 10 and 150 gallons of product and another that can be used when making between 100 and 1000 gallons of the same product. While either formula can be used between 100 and 150 gallons, there may be a reason to generally prefer the use of one over the other. Lower numbers indicate higher preference. The number "1" indicates the highest possible preference. This is used by MRP in determining which formula to use when translating product demand into ingredient requirements. Required.

Organization

Enter the organization for which you are defining the formula's effectivity. If you leave this field blank, the formula can be used by all organizations. When you create a costing effectivity, you must enter a specific organization, otherwise the costing rollup process will not work.

Quantities

Standard

Enter the standard quantity of the product made with this formula. The product quantity from the Formulas window is the default.

This quantity is only used for product costing. It does not restrict the quantities that can be produced with the formula. Required.

Enter the unit of measure in which this quantity and the minimum and maximum quantities are expressed in the next unlabeled field. Required.

UOM

The unit of measure for the Standard.

Minimum

Enter the minimum quantity that this formula can be used to produce. Required.

For example, if you enter 100 gallons, this formula cannot be selected to produce a batch of 50 gallons.

Maximum

Enter the maximum quantity that this formula can be used to produce. For example, if you enter 100 gallons, this formula cannot be selected to produce a batch of 150 gallons. Required.

Effective Dates

From

Enter the date on which this effectivity will go into effect. The formula cannot be used under the conditions specified before this date (unless another effectivity record with overlapping conditions is linked to the formula). Required.

To

Enter the date after which this effectivity will no longer be in effect. The formula cannot be used under the conditions specified after this date (unless another effectivity record with overlapping conditions is linked to the formula). Required.

Maintain Effectivities Fields

Routing Number

Enter the number of the routing to be used when the formula is used under the circumstances specified in this effectivity record.

For example, you may have a production line that produces 100 gallon batches and another that produces 1000 gallon batches of the same product. You would enter the routing for the first production line on this window and specify 100 gallons in the Maximum field. You then add a second effectivity record with the routing for the second production line and specify 1000 gallons in the Maximum field.

Version

Enter the version of the routing to be used when the formula is used under the circumstances specified in this effectivity record. A routing is uniquely defined by the combination of routing number and routing version number.

Description

The description of the routing displays. This is populated from the routing header information.

Customer Code

Specify the customer for which you use this formula.

For example, one customer may prefer that an item be produced using one formula, while another customer prefers another formula.

This field is for informational purposes only.

Customer Name

The descriptive name of the customer displays. Customer Code and description are populated from Oracle Financials Accounts Receivable records.

5

Formula Scaling and Theoretical Yield Calculations

This topic explains how to scale formulas and how to calculate theoretical yield.

The following topics are covered:

- Scaling Formulas
- Calculating Theoretical Yield

Scaling Formulas

Scaling is the proportional increase or decrease of formula ingredients, products, and by-products. You can use the Scale Formula box on the Actions menu to scale Formulas, Formula Ingredients, or Formula By-products. During production, a formula can only be scaled if it was indicated that it can be scalable on the Formulas window. In any given formula, only those items for which the Scale Type is set to linear scaling will be scaled. The quantity of items for which the Scale Type is set to fixed quantity will remain fixed.

To scale a formula with fixed scale items, the system must convert the quantities of the ingredients, products, and by-products to a common unit of measure. The unit of measure used for the calculation is the base unit of measure for the unit of measure type (usually mass) specified by the GMD:Yield Type option. The base unit of measure for a unit of measure type is the first unit of measure of that type entered into OPM. Therefore, in order to scale a formula or batch, unit of measure conversions to this unit of measure must be set up for all of the items in the formula or batch. Item unit of measure conversions are set up on the Inventory Control application Item Lot/Conversion window.

Scaling Methods

There are two ways to scale formulas by:

- Percentage
- Item quantity

Scaling by a Percentage

When you enter the Scale Formula box, you are in percentage scaling mode. You can enter a percentage by which any scalable products will be scaled. For example, if you enter 100 percent, the product quantity will be scaled up by 100 percent (in other words, doubled), and the ingredient quantities will be increased accordingly. If you enter -50 (negative fifty) percent, the product quantity will be decreased by half. Percentage scaling is illustrated in Example 1.

Formula Percentage Scaling - Example

All products and ingredients are set to linear scaling and scaled by 50 percent (equivalent to multiplying the starting quantity by 150% or a factor of 1.5) will yield:

Before Scaling

- Product 130 kilograms

  - Ingredient 110 kilograms

  - Ingredient 220 kilograms

After Scaling

- Product 145 kilograms

  - Ingredient 115 kilograms

  - Ingredient 230 kilograms

Scaling by an Item Quantity

You can scale by item quantity. You can do this from the Formulas, Formula Ingredients, or the Formula By-products forms.

Place the cursor on the item you want to use as the basis for scaling before you select Scale from the Actions menu. This must be a line item for which linear scaling is allowed as specified on the Formula Additional Information box. To switch from percentage scaling to item quantity scaling, select Item Quantity. Enter the new quantity which will be used (for an ingredient) or produced (for a product or by-product) in the New Quantity field and click OK. The rest of the formula will be scaled accordingly. Item quantity scaling is illustrated in Example 2.

Formula Item Quantity Scaling - Example

All products and ingredients are set to linear scaling and scaled by Ingredient 1 (by item quantity) which is changed from 10 to 20 kilograms would yield:

Before Scaling

- Product 130 kilograms

    - Ingredient 110 kilograms

    - Ingredient 220 kilograms

After Scaling

- Product 160 kilograms

    - Ingredient 120 kilograms

    - Ingredient 240 kilograms

For both types of scaling, the items in the formula for which the Scale Type on the Additional Information window has been set to linear scaling will be scaled, while the quantity of items for which the Scale Type indicator was set to fixed quantity will remain fixed. If you scale by percent, the product quantity will be scaled by the percent entered.

Scaling with a Fixed Quantity

If the formula contains fixed quantity ingredients, the scalable ingredients will be scaled by an amount necessary to produce the new product quantity, not by the percent entered as the scale factor. This is illustrated in Example 3 below. If all products are set to fixed quantity, no quantities in the formula will be changed.

Formula Scaling - Example

Ingredient 1 set to fixed quantity, product 1, ingredient 2, and ingredient 3 are set to linear scaling. If you scale by 100 percent, you would observe the following:

Before Scaling

- Product 150 kilograms

    - Ingredient 110 kilograms

    - Ingredient 220 kilograms

    - Ingredient 320 kilograms

After Scaling

- Product 1100 kilograms

  - Ingredient 110 kilograms

  - Ingredient 245 kilograms

  - Ingredient 345 kilograms

Ingredients 2 and 3 are scaled to the quantities necessary to increase the product quantity by 100 percent. Since ingredient 1 was fixed, the quantities of ingredients 2 and 3 were increased by more than the scale factor. This would be used, for example, when one of your ingredients (ingredient 1) is a catalyst that is not recovered. The quantity of the catalyst does not need to be increased to produce more of the product, but the quantity of the other ingredients does.

Scaling Formulas Procedure

Use the Scale Formula box to scale ingredient and product quantities in a formula.

1. Navigate to the **Scale Formula** box.

2. Select the **Percent** or **Item Quantity** button.

3. Complete the fields as described. Remember to enter parameters for either percent (factor) scaling or item quantity scaling, but not both.

4. Click **OK**.

Scale Formulas Field Reference

The fields on this window are:

Percent

Select this button to scale by percent. This is the default.

Factor

Enter the percent by which you want the formula scaled.

For example: To scale the formula up by 100% (that is, to double the formula), enter 100. To scale the formula down by 20%, enter -20. If you select Item Quantity scaling, this field is not available.

Item Quantity

Select this button to scale by item quantity.

Line

The number of the line the cursor was on when you selected scaling from the previous window is displayed. This field cannot be edited.

Item

The item you are using as the basis for scaling is displayed from the previous window. This field cannot be edited.

Description

The description of the item you are using as the basis for scaling is displayed. This field cannot be edited.

Old Quantity

The quantity before scaling (that is, the quantity indicated on the previous window) is displayed. This field cannot be edited.

New Quantity

Enter the new quantity for this item. The system calculates the percent difference between the old quantity and the new quantity and scales the rest of the formula accordingly. If you selected Percent scaling, then this field appears dimmed.

Calculating Theoretical Yield

In process manufacturing, the product quantities in a formula do not necessarily equal the sum of the ingredient quantities. For example, in a certain process you may know that five percent of the mass is lost to evaporation. OPM can use this information to calculate the theoretical yield (that is, the adjusted product quantities) of a formula. You can have OPM calculate theoretical yield using the Calculate Theoretical Yield box. The example below illustrates the yield OPM will calculate if you specify a yield percent of 95.

Theoretical Yield - Example

- Ingredient 175 pounds

- Ingredient 225 pounds

- Product 95 pounds

OPM adds the ingredient quantities and multiplies by the yield percent.

To calculate theoretical yield, the system must convert the quantities of the ingredients, products, and by-products to a common unit of measure. The unit of measure used for the calculation is the base unit of measure for the unit of measure type (usually mass) specified by the GMD:Yield Type option. The base unit of measure for a unit of measure type is the first unit of measure of that type entered into OPM. Therefore, in order to calculate theoretical yield, unit of measure conversions to this unit of measure must be set up for all of the items in the formula. Generally, this means that the quantities of all of the items in the formula must be convertible to a "mass" unit of measure.

The theoretical yield used to calculate a formula product yield is not saved. You may wish to note this in a comment or text.

Calculating Theoretical Yield Procedure

Follow the steps below to use the Theoretical Yield box.

1. Navigate to the **Calculate Theoretical Yield** box from the **Actions** menu on the **Formulas**, **Ingredients**, or **By-products** windows.

2. Enter the percent yield for the formula as described.

3. The system will add the ingredient quantities, taking unit of measure conversions into account, and multiply the sum of the ingredient quantities by the percentage entered.

4. Click **OK**.

If the formula yields 100 percent, you can still use this box to have OPM calculate the product quantities for you, or to check that you have added correctly; use 100 percent as the yield percent.

Calculate Theoretical Yield Field Reference

The field on this window is:

Yield Percent

Enter the percentage of ingredient quantities yielded in the product quantities. OPM will add the ingredient quantities, taking unit of measure conversions into account, and multiply the sum of the ingredient quantities by this percentage.

6

Formula Inquiries and Reports

This topic explains how to view formula information. You are shown how to run inquiries on formulas and how to view the queried formula. You are also shown how to view formula intermediates and to identify where ingredients are used. This topic also explains how to run the Indented Formulas Report.

The following topics are covered:

- Viewing Formula Information
- Using the Formula Inquiry Selection
- Viewing the Formula Inquiry Summary
- Viewing the Formula Queried
- Viewing Formula Intermediates
- Ingredient Used Inquiry
- Running the Indented Formulas Report

Viewing Formula Information

Formula Inquiry enables you to view formula information without edit capabilities. Formulas provide the basis for the production process and drive the calculation of inventory demands. They represent company standards which determine the utilization of corporate assets. Therefore, it is necessary for individuals with various functions in your company to be able to view formulas and their components but not be able to edit them. Below are some examples of how you might use Formula Inquiry.

User Requirement	Formula Inquiry Feature
Production supervisor needs to view new formula for production batch that is scaled.	System permits "read only" access to formula information and displays linearly scaled ingredient formulas.
Production supervisor needs to view valid alternative formulas for producing a specific product.	System displays rows which have valid effectivities for the organization associated with the User code.
Process engineer must associate a routing to all formulas which do not yet have an effectivity associated to them.	Only formulas with no corresponding effectivity are displayed.
Regulatory chemist needs to assemble ingredient line declaration information.	System permits "read only" percentage view of exploded formula.

Using Formula Inquiry, you may view but not edit:

- Formulas with a drill down to lower levels

- Intermediate formulas

- Text

- Formula structures

- Text editor

Formula Inquiry enables you to:

- Expand a formula to see its components.

- View a formula's lower level components (intermediate formulas).

If a formula calls for an ingredient that has a intermediate formula that needs to be scaled to meet the quantity, Formula Inquiry will show the scaling of the ingredients. Fixed scaled items will also be scaled linearly.

Viewing Formula Information Procedures

In this section, you will find two process flows for using the Formula Inquiry options: one for expanding a formula and one for viewing an intermediate formula. You should use these process flows as guidelines only. FM Inquiry is a highly flexible tool and your needs will dictate the method and the order in which you will navigate through the windows.

To View an Expanded Formula

To view an expanded formula, proceed as follows:

1. Navigate to the **Formula Inquiry Selection** box.

2. Enter the selection criteria. Click **OK**.

3. The **Formula Inquiry Summary View** box appears listing formulas that meet the criteria entered. Formulas with a "#" preceding them cannot be viewed. These formulas are associated to an organization which is not listed in your Organization.

4. Click the highlighted box next to the formula you want to view. The **Formula View** box appears with the formula you selected. The formula header and the components of the formula are displayed. From this list, you may **Expand** a formula, that is, see it's line details on the same window as the parent formula. Or you may decide to view a **Lower Level** formula with its header level information and line details on a separate window. The components of the formula, including intermediate formulas are listed in the middle region of the window. Viewable intermediate formulas have a "+" sign preceding them.

5. To expand a formula, click the box next to a formula line with a "+" sign next to it and choose **Expand** from the **Actions** menu. If there is more than one effectivity for the formula, the **Intermediate Formula Inquiry Summary View** appears with a list of the effectivities for the intermediate formula you want to expand. The lines of the intermediate formula display immediately after the ingredient.

6. To condense the intermediate formula, choose **Condense** from the **Actions** menu. This removes the formula's lower levels from the window and places a "+" sign next to the item. The formula lines display as the did before you expanded the formula.

To View a Lower Level or Intermediate Formula

To view a lower level or intermediate formula, proceed as follows:

1. Navigate to the **Formula Inquiry Selection** box.

2. Enter the selection criteria. Click **OK**.

3. Click the box next to the formula you want to view. The **Formula View** box appears with the formula you selected. The formula header and the components of the formula are displayed. From this list, you may **Expand** a formula, that is, see its line details on the same window as the parent formula. Or you may decide to view a **Lower Level** formula with its header level information and line details on a separate window. The components of the formula, including intermediate formulas are listed in the middle region of the window. Viewable intermediate formulas have a "+" sign preceding them. Intermediate formulas that you cannot view have a "#" preceding them. You can view any level formula on the Intermediate Formula View as long as you have access to it. To view formulas below level one, you need to drill down to those levels. You do this by expanding the different levels of the intermediate formulas as described previously and then following a process similar to the one below. Alternately, you could enter criteria in the Formula Inquiry Selection box that will display these intermediate formulas on the Formula Inquiry Summary View.

4. Highlight the box of a formula line that is preceded by a "+" sign. This number indicates the number of levels you can drill down to.

5. From the **Actions** menu, choose **Lower Level**. The Intermediate FM Inquiry Summary View appears listing the various effectivities for the intermediate formula if there is more than one effectivity (proceed to the next step). If there is only one effectivity the **Intermediate Formula View** will appear immediately.

6. Click the box to select an effectivity. The **Intermediate Formula View** window appears with the header information for the intermediate formula and a list of it's components. Note that at this inquiry window you may not further expand or select to view lower level formulas.

Using the Formula Inquiry Selection

The Formula Inquiry Selection box is the starting point for all Formula Inquiry queries. Oracle Process Manufacturing displays this box, when you select the Formula Inquiry option on the Formula Menu. At this box, you specify the selection criteria of the formula you want to view.

Using Formula Inquiry Selection Procedure

1. Navigate to the **Formula Inquiry Selection** box.

2. Complete the fields as described.

3. The application displays the **Formula Inquiry Summary View** window.

Formula Inquiry Selection Field Reference

The fields on this window are:

Formula Status

Specify if you want to view active, inactive or all formulas.

Effectivity

Specify how you want to view formulas by selecting:

- Defined - for defined effectivity

- Undefined - for undefined effectivity

- Both - for all formulas

Formula Used In

Select the radio buttons to specify which type formulas you want to view. The default is Production. You may select one, all or any combination of the following Formula uses:

- Production - for use in production

- Planning - for use in planning

- Cost - for use in costing

- Regulatory - for use in regulatory

Selection Range

Formula

Select to view all formulas, a specific formula or a range of formulas. To select a specific formula, enter the same formula number in the From and To fields. To select a range of formulas, enter different formula numbers in the Range From and/or To fields. To select all formulas leave the fields blank.

Formula Version

Select to view all versions of a formula, a specific version, or a range of versions. To select a specific version, enter the same version number in the From and To fields. To select a range of formula versions, enter different version numbers in the From and To fields. To select all versions leave the fields blank. Required.

Routing

Select to view all routings of a formula, a specific routing, or a range of routings. To select a specific routing, enter the same routing number in the From and To fields. To select a range of routings, enter different routing numbers in the From and To fields. To select all routings leave the fields blank.

Routing Version

Select to view all routing versions, a specific routing version, or a range of routing versions. To select a specific routing version, enter the same routing number in the From and To fields. To select a range of routing numbers, enter different routing numbers in the From and To fields. To select all routing numbers leave the fields blank.

Organization

You can view formulas for all organizations, a specific organization or a range of organizations effective for your user code. To select a specific organization, enter the same organization number in the From and To fields. To select a range of organizations enter different organization numbers in the Range From and/or To fields. To select all organizations leave the fields blank.

Effective Date

You can view the formulas for all effective dates, for a specific effective date or a range of effective dates. To select a specific date, enter the same date in the From and To fields. To select a range of dates, enter different dates in the Range From and/or To fields. To select all dates leave the fields blank.

Customer

You can view the formulas for all customers, for a specific customer or a range of customers. To select a specific customer, enter the same customer code in the From and To fields. To select a range of customers, enter different customer numbers in the Range From and/or To fields. To select all formulas leave the fields blank.

Product

Enter the item number in this field to view formulas for a specific item.

Effective Qty

Enter the quantity of the item produced by the formula. This field becomes available if you indicate a specific formula and version or a specific item produced.

Ingredient

To view formulas for a specific ingredient used, enter the ingredient used in this field.

Viewing the Formula Inquiry Summary

The Formula Inquiry Summary View window is the first window you see after you make entries in the Formula Inquiry box. It lists formulas that meet the entered criteria.

From this window, you can obtain further information for any formula. Formula Inquiry Summary View consists of two regions. The top region is scrollable and lists the organization, formula number and version, routing, and minimum and maximum quantity from the formula effectivity record. The bottom region is synchronized with the line that is highlighted in the upper region and lists the Start and End Dates, the Formula Status, the Standard Quantity, the Customer and Formula Use (production, costing, etc.).

Formulas you are not permitted to access are shown with a "#" symbol in the far left column. To obtain access, you would need to have the organization indicated or the effectivity line associated to your User Profile.

Viewing the Formula Inquiry Summary Procedure

You must complete the appropriate entries in the Formula Inquiry box to display the Formula Inquiry Summary.

Formula Inquiry Summary View Field Reference

All information for these fields is taken from the Formula header, Formula detail and Effectivity tables. You cannot edit these fields.

Organization

The organization for which the formula is effective. You can only view formulas effective to organizations linked to your user code. A "#" sign indicates you can not view the formula.

Formula

The formula code appears here.

Version

The version number of the formula.

Routing

The routing number for the formula version.

Version

The routing version number.

Minimum Qty

The minimum quantity for which this formula is effective is displayed.

Maximum Qty

The maximum quantity for which this formula is effective is displayed.

UOM

The unit of measure from the formula's effectivity record.

The following fields are located on the lower region of the window. The data in this region scrolls as you highlight the boxes of different lines on the top half of the window.

Effective Dates

This field lists the dates during which the formula (formula version) is effective.

Active Formula

This check box has a check in it if the formula active. It is blank if the formula is inactive.

Standard Qty

The typical quantity that is produced by the formula. This is specified in the effectivity record.

Customer

The customer for which this formula is produced (if specified in the effectivity record).

Formula Use

Displays the use for which the formula is intended. Formula uses are:

- Production

- Planning

- Costing

- Regulatory

Formula Inquiry Summary View Actions Menu

You may not have access to a formula unless appropriate permission has been given to you.

Formula View

Displays the highlighted formula on the Formula View Inquiry window.

Viewing the Formula Queried

When the Formula View window first appears, it displays the parent formula or the highest level of the formula for which you are making the inquiry.

The window has three regions:

- the upper region displays the formula header information
- the middle region contains the formula detail information and the list of formula line items including the lower level formulas
- the lower region displays the additional information for the item highlighted in the middle region.

Lines have several symbols that indicate formula view ability and access:

- a line with a "+" sign indicates that the item has a formula you may view. The formula is effective for your organization.
- a line with the "#" symbol indicates the item has a formula, but you do not have access to it.

The formula level is displayed at the beginning of each row. The application can display up to 99 levels.

Formula View Field Reference

The fields on this window are:

Formula

This field displays the formula's unique identifying number. You can tab into this field to scroll the text.

Version

This field displays the formula's version number. You can tab into this field.

Description

This field displays the detailed descriptive information about the formula. cannot be tabbed into.

Comments

This field displays any comments that you added at the Formula Header.

Formula Class
If the formula was classified at the header level, this information appears here.

Active Formula
This box is checked if you are viewing an active formula. It is not checked when you are viewing an inactive formula. This information is taken from the formula's header.

Scaling Allowed
This box is checked if scaling is allowed on the formula. It is not checked with scaling is not allowed. This information is taken from the formula's additional information.

[ ]
The double brackets ([ ]) identify a descriptive flexfield that you can use to add data fields to this window with programming.

Details

Type
Indicates if the item is a product, by-product, or ingredient of the formula. The drill down indicator box to the left of Type lets you drill down to a subcomponent.

Item
This field displays the Item code of the product, by-product or ingredient of the formula.

Description
A more detailed description of the item.

Quantity
This field displays the quantity of the item used in the formula.

UOM
The unit of measure of the item.

This information is located in the lower region of the window. The information scrolls as you highlight a different item in the middle region.

Formula View Fields

Phantom Type

Indicates if the ingredient is not a phantom, is and auto-generated phantom or a manually generated phantom.

Scrap Factor

Indicates how much of the item is expected to be lost (scrapped) during production. This information is taken from the Additional Information box on the Formula Ingredients window. This number is entered as a percentage. This is set on the Formula Ingredients window's Additional Information box.

Scale Type

If scaling was enabled, this field indicates if the scaling is fixed or linear. This is set on the Formula Ingredients window's Additional Information box.

Cost Allocation

Indicates how the cost of this item is allocated for financial rollup purposes. This is set on the Formula Ingredients window's Additional Information box.

Release Type

Indicates is the item is automatic release, manual release or incremental release. This is set on the Formula Ingredients window's Additional Information box.

Formula View - Additional Setup in Formula Management

You can access these options from the Actions menu.

View Text

Displays the Text Editor for the formula. If the cursor is in the header area, it will display the header text. If the cursor is on an unexpanded detail line, the text associated with the ingredient will be displayed. If the cursor is on an expanded detail line, the product text will be displayed.

Lower Level

Enables you view the intermediate formula of the highlighted item/product on the Intermediate Formula View Inquiry window. The intermediate formula can only be displayed if the intermediate product row is preceded with a "+" sign.

When you select Lower Level, OPM displays the Formula Inquiry Summary View with all valid effectivities listed if the formulas has any effectivities. See the Intermediate Formula View section for a description of this inquiry window.

Expand

Enables you to view the components of an intermediate formula on the same window much like showing a directory with its subdirectories below it. The intermediate formula will only be expanded if it is preceded by a "+" sign. When you select Expand, OPM displays the Formula Inquiry Summary View.

Condense

Eliminates the display of lower level formulas of the line on which the cursor is placed. The cursor must be on a line preceded by a "-" sign. All expanded formulas below that level are condensed.

Viewing Formula Intermediates

OPM displays this window when you select Lower Level or Expand from the Actions menu on the Formula View window and the formula has more than one effectivity. From this window, you select the formula want to expand or view at a lower level (the intermediate formula on a separate window).

Viewing Formula Intermediates Procedure

To view formula intermediates, proceed as follows:

1. Navigate to the **Formula View** window.

2. Display the desired formula.

3. If the formula has more than one effectivity, you will be able to select **Lower Level** or **Expand** from the **Actions** menu.

Intermediate Formula Inquiry Summary Field Reference

The fields on this window are:

Organization

The organization for which the formula is effective. This information is taken from the formula header records.

Formula

The code for the intermediate/lower level formula. This information is taken from the formula header records.

Version

The version number of the intermediate formula. This information is taken from the formula header records.

Routing

The routing number used with this formula. This information is taken from the effectivity record.

Version

The routing version. This information is taken from the effectivity record.

Minimum Qty

The minimum quantity for which this formula is effective is displayed. This information is taken from the effectivity record.

Maximum Qty

The maximum quantity for which this formula is effective is displayed. This information is taken from the effectivity record.

UOM

The unit of measure that is effective for this formula.

The following fields are located on the lower part of the window. The data in this region scrolls as you highlight different lines on the top half of the window.

Effective Dates

This field displays the dates between which the formula is effective.

Active Formula

This box is checked if the formula is active. The box is blank if it is an inactive formula.

Standard Qty

The typical quantity that is produced by the formula.

Customer

The customer for which this formula is produced (if specified) on the formula's effectivity record

Formula Use

This field displays the use for which the formula is intended. Formula uses are:

- Production

- Planning

- Costing

- Regulatory

Viewing an Intermediate Formula

OPM displays this window when you select Lower Level from the Formula View window and then select an effectivity from the Intermediate FM Summary Inquiry window described in the previous section. The title bar of this window displays the level of the formula displayed in brackets (in this example, [Level 1]). When this window is displayed, you cannot expand or view lower level formulas.

Ingredient Used Inquiry

The Ingredient Used inquiry shows you all formulas which use a specified ingredient or any of a list of ingredients. You will need this information if you are planning to substitute one ingredient for another in your formulas. For example, you may want to do this when you can get a comparable ingredient at a lower cost, or because an alternate ingredient may possess superior qualities.

Ingredient Used Inquiry Procedure

To show where an ingredient is used follow the steps below:

1. Navigate to the **Ingredient Search List** box.

2. Complete the fields as described.

3. Click **Find** to display the **Ingredient - Where Used** window.

Ingredient Search List Field Reference

The fields on this box are:

Line
A number displayed to help you reference the total number of ingredients found in the search.

Ingredient
Enter the code for the ingredient for which you want OPM to search. All formulas which use this item as an ingredient will be displayed on the Ingredient - Where Used window.

Description
Displays the description of the item from the item master record.

Using the Ingredient Where Used Window

The Ingredient Used window lists all of the formulas that use the item(s) entered on the Ingredient Search List box as an ingredient.

1. Navigate to the **Ingredient - Where Used** window.

2. View the fields as described.

Ingredient Used Field Reference

The fields on this window are:

Formula
This field displays the code for each formula which uses the specified item as an ingredient.

Version
This field displays the version of the formula which uses the specified item as an ingredient.

Type
This field indicates if the item is a product or by-product of the formula.

Product
This field displays the first product produced by the formula.

Description
This field displays the detailed description of the product. This information comes from the Item Master record.

Product Qty
This field displays the quantity of the product produced by the formula. The next field displays the unit of measure in which the product quantity is expressed.

UOM
The unit of measure for product quantity.

Ingredient
This field displays the ingredient you requested OPM to search for.

Ingredient Quantity
This field displays the quantity of the ingredient used in the formula.

The next field displays the unit of measure in which the ingredient quantity is expressed.

Running the Indented Formulas Report

The Indented Formulas report shows all of the ingredients and ingredient quantities that are used to produce an item. Any ingredients which are intermediates can be exploded into their ingredients. Note that circular references are allowed one level deep (that is, an item can be both an ingredient and a product in a formula). Circular references beyond one level, however, are identified with an error message (that is, the item cannot again be an ingredient in the lower-level formula).

Understanding the Indented Formulas Report Box

The Indented Formulas report box enables you to specify the formula, item, or range of formulas for which the bill formula report will be printed. You also enter other criteria specifying which formula to use, such as the type of formula which will be used (production, MRP, Costing) and the effective date.

The Indented Formulas Report Box has two modes of operation:

- Interactive - where the application will first display a list of all of the formulas which meet the criteria entered. For example, if you enter an item and batch quantity, and there are several effective formulas for making the specified quantity of the item (and which also meet the other criteria specified, such as effective date), the system will list each of those formulas. You will then click the box next to one desired. The Indented Formulas Report will be generated for the selected formula. If the formula for which you are printing this report contains ingredients which are intermediates, interactive mode also lets you select which formula to use for exploding the intermediates, if they are produced by more than one formula.

- Noninteractive - where the application picks the formula to use (if more than one meets the criteria specified on the box), based on the effectivity preference. If two or more formulas have the same preference level, the application uses the formula which was most recently modified.

Submitting the Report

Run the report as follows:

1. Navigate to the **Indented Bill of Materials Report** window.

2. Complete the fields as described.

3. Click **OK**.

Viewing the Indented Formulas Report Online

1. From the **View** menu select **Requests**.

2. Select **All My Requests**, and click **Find**.

3. Highlight the box next to the requested **Indented Formulas** report that you want to view. Make sure that the report phase is completed.

4. Click **View Output**. The report you selected is displayed on the window.

Selected Report Parameters

The selected report parameters are:

Selection Range

Interactive

Select this check box to use interactive mode. Leave the box blank to use non-interactive mode. Interactive mode allows you select from a list of effectivities. Non-interactive mode uses the most recent effectivity for the formula or formulas exploded.

Re-Explode

Select this check box if you want to re-explode the report. When you run an IBOM report for the first time, the report will explode out the formula regardless of what value you have in this field. Exploded formulas are held in the Formula IBOM header table and the Formula IBOM detail table (fm_ibom_hdr and fm_ibom_dtl). OPM checks these tables first whenever you generate an IBOM report. Running already exploded IBOM reports from this table greatly enhances run-time performance.

Use Inactive

Select this check box if you want to explode inactive formulas.

Single Formula

Select this radio button if you want to print the indented formulas report for a single formula. When you click the box, the Formula and Version fields become available for entry.

Formula

Enter the code of the formula for which you want to print the indented formulas report. This field is editable if you selected to explode a single formula Required when displayed.

Version

Enter the formula version for which you want to print the indented formulas report. This field is editable if you selected to explode a single formula to explode. Required when displayed.

Single Item

Select this radio button if you want to print the indented formulas report for specific product.

- Interactive mode - a list of formula effectivities for the specified batch quantity of this product will be displayed.

- Noninteractive mode - the system will select a formula to use for the report based on formula effectivity preference.

Item

Enter the code for the product for which you want to print the indented formulas report. This field is only displayed if you selected to explode a single item. Required when displayed

Batch Qty

Enter the quantity of the product for which you want to print the indented formulas report. This quantity is used in determining which formula to use (the formula must be effective for this quantity) and in scaling ingredient quantities. This field is only displayed if you selected to explode a formula for a single item. Required when displayed

UOM

Enter the unit of measure in which the batch quantity is expressed. This field is only displayed if you selected to explode a formula for a single item. Required when displayed

Formula Range

Select this radio button if you want to print the bills of materials for a range of formulas. You can not enter formula ranges if you are using interactive mode.

Range

Enter the beginning and ending of the range of formulas for which bills of materials will be printed. This field is only editable if you clicked the Formula Range radio button.

Other Options

Scale By

Enter the percentage by which you want to scale the formula. For example, if you want the quantities doubled, enter 200. If you want the quantities decreased by half, enter 50. Leave this field set to zero (or enter 100) if you want to view the formula quantities without scaling.

Levels

The default value is All. Enter the number of levels of the indented formulas report you want printed. If you enter a number greater than one, ingredients in the formula which are intermediates will be exploded into their ingredients. If you leave this set to "All," the indented formulas report will be exploded down to raw materials.

Effective Type

Select the type of formula (what the formula is used for) which you want to use as the basis of the report. Your selections are:

- Production

- Planning

- Costing

- Regulatory

Effective Date

Type the date for which the formula must be effective. Only formulas which are effective on this date will be used as the basis of the report. Required.

UOM Type
Select either formula or the inventory item master units of measure.

Print Options

Copies
Enter the number of copies of the report you want printed.

Printer
Enter the code identifying the printer on which the report will be printed. Required.

Style
Select whether you want this report to print as Landscape or Portrait.

Selected Report Output

The fields on the Indented Formulas report are:

Formula
The code for the formula on which the indented formula report is based, followed by a colon and the formula version number. The description of the formula/version appears next.

Scale Percent
The percentage by which the formula was scaled. Note that a scale percent of zero indicates that the formula was not scaled (it is the same as a scale percent of 100).

Effective Type
This field indicates what the formulas use is. It can be one of the following:

- Production
- Planning
- Costing
- Regulator

Effective Date

The effective date you entered on the box. All formulas which appear on the report are effective on this date.

Products

The items produced by the formula.

To the right of the product's item code appear two numbers in parentheses, separated by a slash (/). The first number is the batch quantity of the product. This number is either the formula product quantity multiplied by the scale or the batch quantity you entered in the Batch Quantity field.

The second number is the product quantity from the formula.

The unit of measure in which the batch quantity and formula quantity are expressed follows the parentheses. The item description of the product appears next.

Scale Percent

The scaling percent applied to the formula.

Use Inactive Formulas

A "0" indicates that no inactive formulas were used.

A "1" indicates that inactive formulas were used.

Max Explode Levels

The maximum number of levels to which formulas can be exploded.

Exploded Date

The date on which the formula was last exploded.

Ingredient - Description

The item code for each ingredient is displayed, followed by the ingredient description.

In addition to the ingredients, by-products are also displayed, preceded by "By-product".

If any of the ingredients is an intermediate (that is, it is the product in another formula), the ingredient line is followed by a line beginning with "Formula." This

line displays the formula code and version used to explode the intermediate into its ingredients. Following this line are the ingredients from this formula. In addition to the ingredients, by-products (identified with "Byp:") and coproducts (identified by "Cop:") in this formula are also displayed.

Note that the by-products, coproducts, and ingredients of the formula which produces the intermediate are indented from the ingredients in the main formula. Once the indentation ends, the items which start back at the left margin are ingredients in the main formula listed at the top of the page.

Levels

The level in the indented bill of material. Item lines from the main formula (listed at the top of the page) are identified by a "1." Item lines from a formula used to produce an ingredient in the main formula (that is, an intermediate) are identified by a "2," and so forth.

Batch Quantity

The quantity of the ingredient necessary to produce the batch quantity of the product. For by-product or coproduct lines, this is the quantity of the by-product or coproduct which is produced when the batch quantity of the main product is produced.

Formula Quantity

The quantities of the ingredients, by-products, and coproducts in the formula.

Standard Quantity

The formula product quantity of formulas used to produce any intermediates. Note that if the quantity of the intermediate needed in the main formula is different from this standard quantity, the intermediate formula is automatically scaled to produce the necessary quantity of the intermediate. The scaled product quantity and scaled ingredient quantities are shown in the Batch Quantity column.

UOM

The unit of measure in which quantities are expressed.

A

Appendixes

This topic explains typical navigation paths and specific Profile Options that need to be set up.

The following topics are covered:

- Formula Management Navigator Paths

- Profile Options Related to Formula Management

- Using the Graphical Process Navigator

Formula Management Navigator Paths

Although your system administrator may have customized your navigator, typical navigation paths are described in the following tables. In some cases, there is more than one way to navigate to a window. These tables provide the most typical default path.

Window	Path
Activities	OPM Product Development:Formula Management:Setup:Activities
Additional Information	OPM Product Development:Formula Management:Formulas:Actions:Additional Information or OPM Product Development:Formula Management:Formulas:Ingredients:Actions:Additional Information or OPM Product Development:Formula Management:Formulas: By-products:Actions:Additional Information
Configurations	OPM Product Development:Formula Management:Setup:Configuration
Formula Inquiry Selection	OPM Product Development:Formula Management:Formulas Inquiry
Formula Inquiry Summary View	OPM Product Development:Formula Management:Formulas Inquiry:OK
Formula By-products	OPM Product Development:Formula Management:Formulas:By-products
Formula Classes	OPM Product Development:Formula Management:Setup:Formula Class
Formula Ingredients	OPM Product Development:Formula Management:Formulas:Ingredients
Formula View	OPM Formula Management:Formula Inquiry:OK:Formula Inquiry Summary View:Actions:Formula View
Formulas	OPM Product Development:Formula Management:Formulas
Indented Bill of Materials Report	OPM Product Development:Formula Management:Reports:Indented Formulas

Window	Path
Ingredient Search and Replace	OPM Product Development:Formula Management:Item Search/Replace
Ingredient - Where Used	OPM Product Development:Formula Management:Ingredient Used:Ingredient Search List:Find
Ingredients Search List	OPM Product Development:Formula Management:Ingredient Used
Intermediate Formula Inquiry Summary View	OPM Product Development:Formula Management:Formula Inquiry:OK:Formula Inquiry Summary View:Actions Menu:Formula View:Actions:Lower Level or Expand
Maintain Effectivities	OPM Product Development:Formula Management:Effectivities:select effectivity:OK:View Effectivities:Actions:Add or Change or OPM Product Development:Formula Management:Formulas:Actions:Effectivities:View Effectivities:Actions:Add or Change
Operation Alternate Resources	OPM Product Development:Formula Management:Setup:Op Alternate Res
Operation Classes	OPM Product Development:Formula Management:Setup:Operation Classes
Operations	OPM Product Development:Formula Management:Operations
Routing Classes	OPM Product Development:Formula Management:Setup:Routing Classes
Routings	OPM Product Development:Formula Management:Routings
Scale Formula	OPM Product Development:Formula Management:Formulas:Actions:Scale or OPM Product Development:Formula Management:Formulas:Ingredients:Actions:Scale or OPM Product Development:Formula Management:By-products:Actions:Scale
Select Effectivities	OPM Product Development:Formula Management:Effectivities

Window	Path
Theoretical Yield	OPM Product Development:Formula Management:Formulas:Actions:Theoretcial Yield
	OPM Product Development:Formula Management:Ingredients:Actions:Theoretcial Yield
	or
	OPM Product Development:Formula Management:Formulas: By-products:Actions:Theoretcial Yield
View Effectivities	OPM Product Development:Formula Management:Effectivities:OK
	or
	OPM Product Development:Formula Management:Formulas:Actions:Effectivities

Profile Options Related to Formula Management

During your implementation, you or your system administrator set values for selected profile options to specify how your Formula Management application controls access to and processes data. The profile options related to Formula Management are listed below.

- GMD:By-product Active

- GMD:Default Release Type

- GMD:Effective Maximum Date

- GMD:Effective Minimum Date

- GMD:Formula Security

- GMD:Scrap Factor Type

- GMD:Yield Type

- GMD:Copy Formula Text

You might set up these profile options when you set up other applications prior to your Formula Management implementation. Refer to the other product user's guides for more details on how other products use these profile options.

Your system administrator sets user profile options at one or more of the following levels: Site Application, Responsibility, and User. Use the Personal Profile Options window or view or set your profile options at the user level. You can consult *the Oracle Process Manufacturing Implementation Guide* for a complete description of the profile options listed below. Consult your *Oracle Applications System Administrator's Guide* for a list of profile options common to all Oracle Applications.

Using the Graphical Process Navigator

A Graphical Process Navigator (GPN) is available for New Product Development. The Graphical Process Navigator offers an alternative to the traditional menu structure. For more information please refer to the *Oracle Applications User's Guide*.

You can access the Graphical Process Navigator from the Processes tab on Navigator - OPM New Product Development.

- Click an icon to display its related process.

- Double click an icon to navigate to the window described under Process in the following table.

Step	Action	Process
1. Create Item	Navigates to the Items window	Using the OPM Inventory responsibility, define the Item and its default attributes which will be used throughout the Process Manufacturing application to record Inventory transactions.
2. Create Assays	Navigates to the Assays window	Within the OPM Product Development responsibility you can define measurements to be taken for items and lots. These measurements, called Assays, define all the attributes or characteristics you plan to measure and record in quality control. For example: concentration, saturation, temperature, viscosity, color, or flavor. Assays will be used to help define quality control Specifications.
3. Create Item/Location Specification	Navigates to the Item/Location Specifications window	Quality specifications can be defined for a particular inventory item/lot/sublot, (which can be used per warehouse or application wide). One or more Assays are required to define a Specification. Target values or ranges, date ranges and preferences can be associated with each Assay.
4. Create Item/Location Sample	Navigates to the Item/Location Samples window	Use the Item/Location Sample window when sampling material directly from inventory for quality control testing is required. Specify the organization, warehouse, location, lot/sublot, quantity, UOM, and date drawn for each sample.

Step	Action	Process
5. Enter Results for Item/Location Sample	Navigates to the Item/Location Results window	Enter the result of quality control tests performed against each Assay for the materials you sampled from Inventory. You can add additional assay tests at this point if you performed additional quality control tests on the material other than those set up for the item on the specification.
6. Verify/Set Laboratory Type	Navigates to the Personal Profile Values window	The Profile window is used to set default values at different levels (application, site, responsibility, user) which the application uses to populate fields. The default Lab Type is used to determine under which Laboratory a user will be creating Technical Specifications or Lab Formulas.
7. Create Technical Parameters	Navigates to the Technical Parameters window	Technical parameters are those characteristics of items which you want to measure and calculate. There are several types of technical parameters, each type determines what kind of data will be entered or calculated for the Technical Parameter. For example, a technical parameter for percent solids by weight would be of the type "weight percent." For each type of technical parameter, you specify certain constraints on the data that can be entered, such as the minimum and maximum values.
8. Sequence Technical Parameters	Navigates to the Technical Parameter Sequences window	After you have entered the technical parameters for a lab type, you must specify the order in which they will be displayed on other windows using the Tech Parameter Sequences window. Note that any expression type technical parameters (type 4) which refer to other technical parameters must come after the technical parameters they reference in the sequence. By default, the DENSITY technical parameter is 1. You should not change this.
9. Assign Values for Technical Parameters	Navigates to the Item Technical Data window	You can create a Lab Formula by manually entering the information on the Lab Formula window or you can download a formula from Formula Management by selecting Download Formula from the Action menu on the Lab Formulas window.

Step	Action	Process
10. Create Laboratory Formula	Navigates to the Laboratory Formulas window	The Lab Spreadsheet displays each ingredient, product, and by-product in a formula, and the quantity and technical parameter values for each. You can manipulate ingredients and by-products, and the quantities and technical parameter values for each ingredient and by-product. For technical parameters of types 5 through 10, you can see how this affects the technical parameter values of the products. Product technical parameter values are only calculated for one product in a formula.
11. Display Laboratory Spreadsheet	Navigates to the Laboratory Spreadsheet window	The Laboratory Spreadsheet displays each ingredient, product, and by-product in a formula, and the quantity and technical parameter values for each. You can manipulate ingredients and by-products, and the quantities and technical parameter values for each ingredient and by-product. For technical parameters of types 5 through 10, you can see how this affects the technical parameter values of the products. Product technical parameter values are only calculated for one product in a formula.
12. Enable GMD:Effectivity on Upload to 1	Navigates to the Personal Profile Values window	This profile option will indicate to the Lab and Formula modules that when a Lab Formula is uploaded for production use, that an Effectivity for that Formula should be created.
13. Make Laboratory Formula a Production Formula with effectivity	Navigates to the to the Laboratory Formulas window where you can upload the formula	Use the Upload Lab Formula to Production dialog box to copy a formula from the Laboratory Management module to the Formula Management module. An existing formula cannot be overwritten, rather a new version of the formula will be created if a duplicate is found. If the profile option "GMD: Effectivity on upload" is set to "1", you may be prompted to enter an effectivity record when you upload the formula.

Step	Action	Process
14. Verify Quantities for Ingredient Items	Navigates to the Unallocated Inventory Summary window	This inquiry lists nettable, allocated, and unallocated quantities for the specified item and warehouse. Inventory availability is listed based on the nettable indicators for Production, Order Processing, Shipping, and P/MRP. The only enterable fields are Item, Warehouse and Nettable.
15. Create Production Specification	Navigates to the Production Specifications window	Quality specifications can be defined for a particular Batch, formula, effectivity, routing or operation. One or more Assays are required to define a Specification. Target values or ranges, date ranges and preferences can be associated with each Assay.
16. Create Production Batch	Navigates to the Batches window	Choose either an Item or Formula to base this Batch upon, and if you're using a Formula then an Effectivity must also be chosen.
		Assuming a Formula is used, the Products, Ingredients and their quantities will display automatically. Make any changes and do any necessary scaling. The Batch will go through multiple phases, any of which a sample can be drawn from.
17. Create Production Sample	Navigates to the Production Samples window	Use the Production Sample window when sampling material created by a Batch for quality control testing. Specify at least the Batch Number and item fields. You can alternatively specify a formula, routing or operation that you want to base a sample on. The quantity, UOM, and date drawn for each sample is also required.
18. Enter Results for Production Sample	Navigates to the Production Results window	Enter the result of quality control tests performed against each Assay for the materials you sampled from the Batch. You can add additional assay tests at this point if you performed additional quality control tests on the material other than those set up for the Batch on the specification.

Glossary

Activity

Action performed during the manufacturing process, such as mixing or heating.

Byproduct

Refer to By-product.

By-product

An item produced by a formula in addition to the product. By-products differ from products in that you do not plan your production to make by-products. By-products may or may not have value, but generally have less value than products or in some instances there may be a cost associated with disposing of a by-product.

Component Class

A way of classifying item costs. Examples of component classes are labor or overhead.

Coproduct

One of several products produced by a formula. The term coproduct is sometimes used when a formula produces more than one product. OPM does not distinguish between products and coproducts. Compare with by-product.

Cost Analysis Code

A code which generally specifies whether an activity is value-added or non-value-added.

Effectivity

A set of parameters that specify under what circumstances a formula can be used. These parameters include date of production and product quantity. Effectivities also link formulas with routings.

Formula

The "recipe" upon which production batches are based. A formula consists of products, ingredients, and, optionally, by-products. The formula also specifies the quantities of each item. Formulas are used by the Costing and Material Requirements Planning applications as well as the Production application.

Formula Management

Formula Management may previously have been referred to as Formula Mgmt.

Formula Mgmt

Refer to Formula Management.

Formula Use

The application for which a formula will be used, either Production, Costing, Material Requirements Planning, or Material Safety Data Sheets (future functionality).

Ingredient

An item which is used in a formula to produce a product.

Mod Date

Refer to Modified Date.

Modified Date

Modified Date may previously have been referred to as Mod Date.

Op Alternate Res

Refer to Operation Alternate Resources.

Operation

A combination of one or more activities and the resources used to perform those activities. For example, the combination of mixing (activity) and the mixer (resource) defines the mixing operation.

Operation Alternate Resources

Operation Alternate Resources may previously have been referred to as Op Alternate Res.

Product

An item which is produced by a formula. See also coproduct.

Resource

Any noninventory item used in production, like a mixer or oven.

Routing

A sequence of operations performed in manufacturing a product.

Scaling

The proportional increase or decrease of product, by-product, and ingredient quantities in a formula or batch.

Std Qty

Refer to Standard Quantity.

Standard Quantity

Standard Quantity may previously have been referred to as Std Qty.

Theoretical Yield Calculation

A calculation that calculates product quantities yielded by a formula given a specified yield percentage.

Vers

Refer to Version.

Version

A number identifying a variant of a formula or routing. All formulas and routings are uniquely identified by a combination of formula or routing code and version number. Version may previously have been referred to as Vers.

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