Oracle® Process Manufacturing

New Product Development User's Guide

Release 11*i*

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Oracle Process Manufacturing New Product Development User's Guide, Release 11*i*

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Preface

Welcome to Release 11*i* of the *Oracle Process Manufacturing New Product Development User's Guide.*

This user's guide includes information to help you effectively work with the Oracle Process Manufacturing (OPM) application and contains information about the following:

- Oracle Process Manufacturing overview and reference information
- Oracle Process Manufacturing functions and features
- Oracle Process Manufacturing programs, reports, and navigation paths
- How to navigate to Oracle Process Manufacturing windows

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

About This New Product Development User's Guide

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

- Chapter 1, Understanding New Product Development, describes the fundamentals of New Product Development. It presents the basic processes required to develop a new product, and it introduces a basic understanding of navigation, workbenches, the status approval workflow, and version control.
- Chapter 2, Setting Up, describes setup requirements in other applications. It presents the setup of responsibilities and menu access, and optional setup of formula classes, operation classes, and routing classes. The chapter also explains the setup of activities, resources, plant resources, laboratories, technical parameters, technical parameter sequences, technical classes, and subclasses.
- Chapter 3, Formulas, includes a basic understanding of formula setup, how to enter item technical data, and how to use the laboratory spreadsheet. It shows how to find a formula. The chapter also presents setting up formula information including how to use formula phantoms. Methods available to scale formulas are discussed. In addition to entering formula details, the chapter provides information on how to define and maintain formulas at the header and line levels, including methods for displaying summaries of products, byproducts, and ingredients. Procedures for running and interpreting the Indented Bill of Materials Report and formula inquiry are provided. The complete process of analyzing a formula, displaying formula analysis results, and overriding default explosion rules are given.
- Chapter 4, Operations, presents information on how to maintain operations, activities, and resources. It shows how to find an operation. The chapter also presents summaries of operations and operation headers to give an overview of operations created. The process to enter operation activity details and activity-resource details is explained with information on how to display activity lines and how to edit a summary of resource lines.
- Chapter 5, Routings, presents information on how to define, maintain, and find routings. It shows how to find a routing. A summary of routings and routing headers delivers an overview of routings created. The process to enter routing details and display the routing step line summary is explained. Procedures to edit routing step lines and to enter routing step dependencies are given. The chapter also presents information on how to display and edit theoretical process loss, and how to search for and replace routings.

- Chapter 6, Recipes, presents information on how to define and maintain recipes. It shows how to find a recipe. A summary of recipes and recipe headers delivers an overview of recipes created. A basic understanding of step quantity calculations is provided with a procedure to enter recipe details and recipe organization details. The process to enter and edit validity rules and to interpret recipe step and material association delivers a basic understanding of recipe use.
- Chapter 7, Tools, presents information on how to perform a search and replace of components in operations, routings, formulas, or recipes.
- Appendix A, New Product Development Navigator Paths, describes how to navigate to each window.
- Appendix B, New Product Development Profile Options, describes profile options.
- Appendix C, New Product Development Status Codes, describes status codes.
- A Glossary provides definitions of terms that are used in this guide.

Intended Audience

This guide assumes that you have working knowledge of your business area's processes, tools, principles, and customary practices. It also assumes that you are familiar with OPM New Product Development. If you have never used OPM, we suggest you attend one or more of the Oracle Process Manufacturing training classes available through Oracle University.

To learn more about Oracle Applications graphical user interface, read the *Oracle Applications User's Guide*.

See: Other Information Sources for more information about Oracle Applications product information.

Other Information Sources

You can choose from other sources of information, including online documentation, training, and support services, to increase your knowledge and understanding of Oracle Process Manufacturing.

If this user guide refers you to other Oracle Applications documentation, use only the Release 11*i* versions of those guides unless we specify otherwise.

Online Documentation

All Oracle Applications documentation is available online (HTML and PDF). Note that the HTML documentation is translated into over twenty languages.

The HTML version of this guide is optimized for onscreen reading, and you can use it to follow hypertext links for easy access to other HTML guides in the library. When you have an HTML window open, you can use the features on the left side of the window to navigate freely throughout all Oracle Applications documentation.

- You can use the Search feature to search by words or phrases.
- You can use the expandable menu to search for topics in the menu structure we provide. The Library option on the menu expands to show all Oracle Applications HTML documentation.

You can view HTML help in the following ways:

- From an application window, use the help icon or the help menu to open a new Web browser and display help about that window.
- Use the documentation CD.
- Use a URL provided by your system administrator.

Your HTML help may contain information that was not available when this guide was printed.

Related Documents

Since Oracle Process Manufacturing shares business and setup information with other Oracle products as well as with our core OPM products, you should consult other related user's guides when you set up and use any OPM product. You can read the guides online by choosing Library from the expandable menu on your HTML help window, by reading from the Oracle Applications Document Library CD included in your media pack, or by using a Web browser with a URL that your system administrator provides.

If you require printed guides, you can purchase them from the Oracle store.

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 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*
- *Using Oracle Order Management with Process Inventory 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 Integration with Advanced Planning and Scheduling User's Guide*
- *Oracle Process Manufacturing MPS/MRP and Forecasting User's Guide*

Product Development

- *Oracle Process Manufacturing New Product Development 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
- Oracle Process Manufacturing API User's Guides

Training and Support

Training

We offer a complete set of training courses to help you and your staff master Oracle Applications. We can help you develop a training plan that provides thorough training for both your project team and your end users. We will work with you to organize courses appropriate to your job or area of responsibility.

Training professionals can show you how to plan your training throughout the implementation process so that the right amount of information is delivered to key people when they need it the most. You can attend courses at any one of our many Educational Centers, or you can arrange for our trainers to teach at your facility. We also offer Net classes, where training is delivered over the Internet, and many multimedia–based courses on CD. In addition, we can tailor standard courses or develop custom courses to meet your needs.

Support

From on-site support to central support, our team of experienced professionals provides the help and information you need. This team includes your Technical Representative, Account Manager, and Oracle's large staff of consultants and support specialists with expertise in your business area, managing an Oracle server, and your hardware and software environment.

Do Not Use Database Tools to Modify Oracle Applications Data

We STRONGLY RECOMMEND that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle Applications tables, unless we tell you to do so in our guides.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle Applications data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle Applications tables are interrelated, any change you make using an Oracle Applications form can update many tables at once. But when you modify Oracle Applications data using anything other than Oracle Applications forms, you might change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle Applications.

When you use Oracle Applications forms to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also keeps track of who changes information. But, if you enter information into database tables using database tools, you may 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.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Standards will continue to evolve over time, and Oracle Corporation is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For additional information, visit the Oracle Accessibility Program Web site at http://www.oracle.com/accessibility/.

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. Oracle Applications provides the E–business Suite, a fully integrated suite of more than 70 software modules for financial management, Internet procurement, business intelligence, supply chain management, manufacturing, project systems, human resources and sales and service management.

Oracle products are available for mainframes, minicomputers, personal computers, network computers, and personal digital assistants, enabling 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 application products, along with related consulting, education and support services, in over 145 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.

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

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Understanding New Product Development

This topic provides the fundamentals of New Product Development. It presents the basic tasks, responsibilities, and process flow required to develop a new product. You are given a basic understanding of navigation, workbenches, the status approval workflow, and version control.

The following topics are covered:

- About This Guide
- About New Product Development
- Tasks and Responsibilities
- Process Flow
- Understanding Navigation
- Understanding Workbenches
- Understanding the Status Approval Workflow
- Understanding Version Control

About This Guide

The purpose of this guide is to provide reference information for end-level users of the OPM New Product Development application. It presents:

- Overviews of all the processes that comprise the New Product Development application, and how these were developed from a detailed analysis of the tasks and responsibilities.
- Overviews of navigation, workbenches, status approval workflow, and version control.
- Prerequisite setup in the OPM System Administration, OPM Inventory Control, and OPM Cost Management applications.
- Setup required in the New Product Development application for: responsibilities and menu access, formula classes, operation classes, routing classes, activities, resources, plant resources, laboratories, technical parameters, technical parameter sequences, and technical class and subclass category sets.
- Procedures for formula management, including: entering item technical data, using the laboratory spreadsheet, setting up formula information, using formula phantoms, defining and maintaining formulas, using formula summaries, entering formula details and editing formula lines, performing an ingredient where used inquiry, running an Indented Bill of Materials Report, using formula inquiry, interpreting a formula inquiry, analyzing a formula, displaying formula analysis results, finding a formula analysis, and overriding default explosion rules.
- Procedures for operation management, including: defining and maintaining operations, defining and maintaining activities, defining and maintaining resources, finding an operation, displaying operations summaries, entering operation activity details, entering activity resource details, displaying operation activity lines, and, editing resource lines.
- Procedures for routing management, including: defining and maintaining routings, finding a routing, using routing summaries, entering routing details, displaying routing step line summaries, editing routing step lines, entering routing step dependencies and, displaying and editing theoretical process loss.
- Procedures for recipe management, including: defining and maintaining recipes, finding a recipe, displaying recipe summaries, understanding step quantity calculations, entering recipe details, entering recipe organization details, entering multi-record validity rules, editing validity rules, and displaying the recipe step and material association.

- Procedures for mass search and replace, including: understanding search and replace, mass search and replace security, performing a search and replace, and using the Replace Results window.

Depending on your system security profile, it is possible that you do not have access to all of the windows and functions described in this guide. If you do not see a menu option described, and you need to access it, contact your system administrator.

About New Product Development

Reducing time to market is one of the most important objectives in developing a successful new product. Research shows that one of the strongest drivers for on time product delivery is the use of a cross-functional, dedicated, and accountable team. To be successful, the team needs a strong leader and top management support. Oracle Process Manufacturing New Product Development delivers a seamless, development environment that helps your team:

- Reduce time to market by using a solid framework that manages recipes from concept through production.
- Expand the enterprise by strengthening relationships with vendors and customers.
- Share project information and collaborate globally using the Internet.
- Manage quality processes proactively.
- Streamline production efficiencies.

New Product Development enhances product consistency and reduces the costs associated with creating and modifying formulas by letting you adapt quickly to different research and development environments. You are able to manage many laboratory organizations and support varying product lines throughout the organization. You can characterize and simulate the technical properties of ingredients and their effects on formulas. You can optimize formulations before beginning expensive laboratory test batches. New Product Development coordinates each development function and enables a rapid, enterprise-wide implementation of new products in your plants.

By managing a recipe from its inception through production you have the ability to reduce the overall product development life cycle time. Recipes account not only for ingredient usage, but also for quality characteristics of those ingredients, costing implications of any alternate materials or processes, specific requirements of customers, corporate manufacturing standards, and regulatory compliance issues. New Product Development combines the previous Laboratory and Formula Management applications into a single, integrated, secure formulation environment. Formulators and Process Engineers are able to collaborate in the development and maintenance of new and existing products using a workbench. The workbench is a job specific role that enables rapid definition and easier maintenance of recipe components. Workbenches increase formula usage flexibility to streamline the overall production process.

Tasks and Responsibilities

One of the most challenging aspects of new product development is effective information transfer. Each job role must collaborate at various points throughout the product development cycle.

The following is representative of the work breakdown structure required to develop a new product. It lists most of the key tasks and the job titles responsible for those tasks:

- Define product requirements.
  - Product Development Manager
  - Marketing Manager
  - Customer
- Search for or copy a formula.
  - Formulator
- Define ingredient parameters.
  - Formulator
- Prototype the formula.
  - Formulator
- Determine production feasibility of the prototype formula.
  - Formulator
  - Purchasing
- Determine formula reproducibility using laboratory scale batches.
  - Formulator
  - Tester
- Determine formula stability.
  - Formulator
  - Packaging Engineer
- Evaluate quality control specifications.
  - Formulator
  - Tester

- Create a routing.
  - Packaging Engineer
  - Process Engineer
- Run pilot plant batches.
  - Process Engineer
- Select the optimal recipe.
  - Marketing Manager
  - Customer
- Obtain field approvals.
  - Plant Manager
  - Process Engineer
- Assign effective date use.
  - Formulator
  - Process Engineer

Process Flow

The New Product Development application provides a seamless integration of the work breakdown structure outlined in the Tasks and Responsibilities topic. The New Product Development process flow consists of the following steps in each of the applications listed. Prerequisite Setup is required before the remaining steps are completed. Formula Setup and Creation, Laboratory Setup, and Routing Setup and Creation can be performed in parallel. Recipe Creation ties all the preceding activities together.

Prerequisite Setup

Prerequisite setup must be completed for each of the following applications:

- OPM System Administration
  - Set up required profile options as described in *Oracle Process Manufacturing Implementation Guide*, *Oracle Inventory User's Guide*, and *Oracle Workflow*. Required.
  - Set up Responsibilities for Formulator and Process Engineer. Required.
  - Set up Version Control. Required.
  - Set up the Status Approval Workflow. Optional.
  - Set up Mass Search and Replace security.
- OPM Inventory Control
  - Set up items, item attributes, unit of measure conversions, and item lot and sublot conversions. Required.
- OPM Cost Management
  - Set up cost analysis codes and the cost calendar. Required.

Formula Setup and Creation

Formula setup and creation is performed in:

- Formulator
  - Set up formula classes. Optional.
  - Create new formulas. Required.

Laboratory Setup

Laboratory setup is performed in:

- Formulator
  - Set up laboratories. Optional.
  - Set up technical parameters. Optional.
  - Set up technical parameter sequences. Optional.

Routing Setup and Creation

Routing setup and creation is performed in:

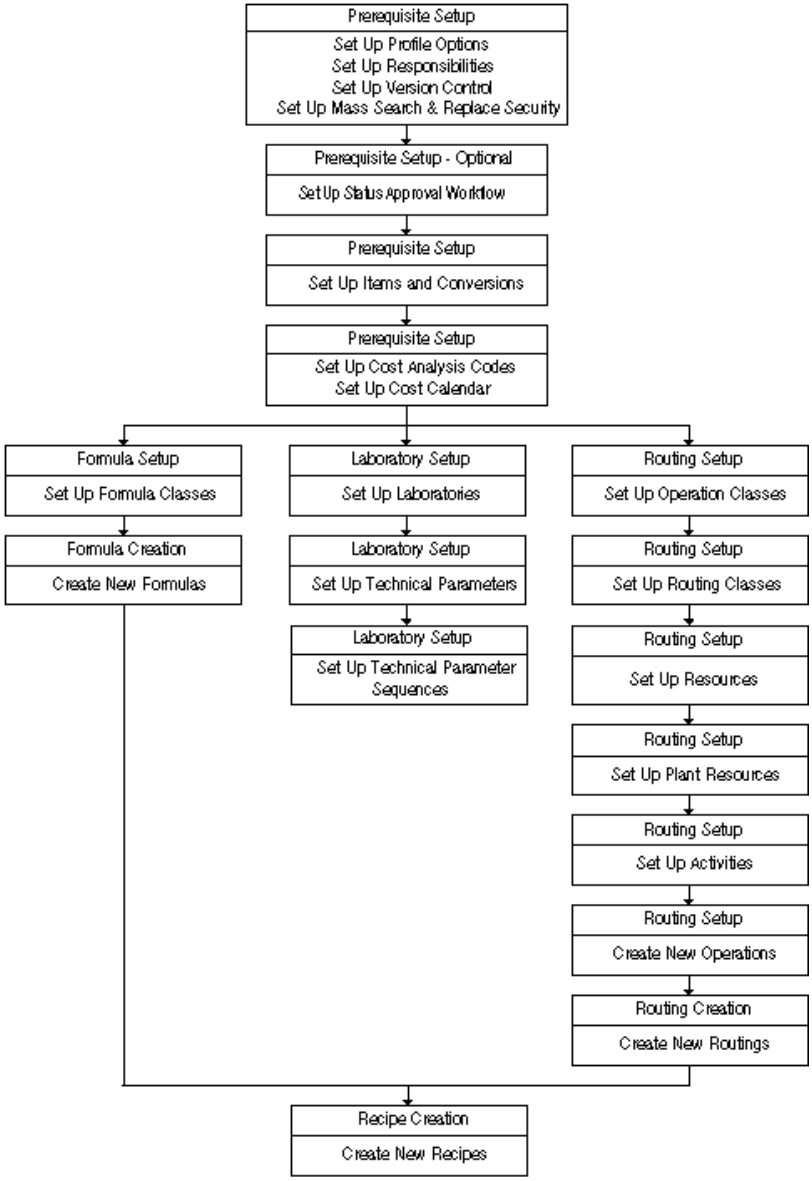
- Process Engineer
  - Set up operation classes. Optional.
  - Set up routing classes. Optional.
  - Set up resources. Required if setting up operations.
  - Set up plant resources. Required if setting up operations.
  - Set up activities. Required if setting up operations.
  - Create new operations. Required if setting up routings.
  - Create new routings. Required if using routings in recipes.

Recipe Creation

Recipe creation is performed in:

- Formulator
  - Create new recipes. Required.

The following depicts the previously described process flow:



Understanding Navigation

The following information is a summary of more detailed discussions found in the *Oracle Applications User's Guide*.

Navigating the New Product Development Application:

In addition to the standard menu and toolbar, a navigator tree provides a hierarchical display of the objects in a treelike framework.

Node and Leaf

The higher level nodes in the navigator tree include forms and database objects. All other nodes, and the objects they contain, are indented to indicate that they belong to these higher level nodes. The terminal node is a leaf. The New Product Development application uses Data Organizer tabs to group various objects such as recipes, formulas, routing and operations. Refer to Identifying Nodes and Tabs on the Navigator for specific nodes and tabs that are used in the New Product Development application.

Menu and Toolbar

Menu and toolbar components let you access all globally available functions.

Data Organizer

The Data Organizer groups objects on separate tabs. Each has a unique icon and its own tree hierarchy.

Summary Views

Summary views provide the highest level of business information and display information. When you select any container on the Data Organizer navigator tree, the summary view can also list the contents of the container in a multirecord block.

Detail Views

Detail views let you display and edit information.

See: *Oracle Applications User's Guide* for more information on navigation.

◗◗ To navigate the New Product Development application:

The following is a typical flow through the New Product Development application Data Organizer navigator tree:

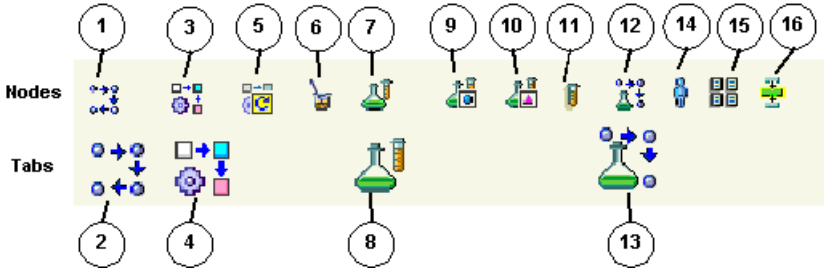
1. Open the appropriate Formulator or Process Engineer workbench. These are assigned by the System Administrator.
2. Click the region that contains the object type of interest. For example, the Process Engineer workbench includes these tabs:
   - Recipe
   - Formula
   - Routing
   - Operation
3. Select the appropriate **View By** field. This field presents records sorted and grouped by the selection you make. View By fields include:
   - Recipe, Formula, Routing, or Operation
   - Status
   - Owner
   - Class
4. Use one of the following methods to find the appropriate object:
   - Expand or collapse entries in the hierarchical Data Organizer tree.
   - Perform a Find operation from the View menu, choose the appropriate object from the results, and optionally, save the object in a Personal or Public folder. Optionally, use the right mouse click feature to perform a Find operation.
5. Use one of the following methods to show selected object Details:
   - Select the object in the Summary view, and click **Details**.
   - Select the top node of an expanded object on the navigator tree, and select **New** from the **File** menu.
   - Select the top node of an expanded object on the navigator tree, and right mouse click. Select **New** from the right mouse click menu.
6. Double-click an expanded node in the Data Organizer until you reach the terminal or leaf object. When you click this object, it opens.
7. Perform actions on the selected object. Navigate from the Detail views to other related items of interest.

8. Use the right mouse click menu to copy objects from the navigator tree nodes and paste them into your Personal Shortcuts. You can retrieve these objects without the need to find them by methods previously described.

Identifying Nodes and Tabs on the Navigator Tree:

The following discussion and graphic identify and explain each of the nodes and tabs displayed on the navigator tree.

- 1 is a Routing node. It identifies a Routing on the Navigator.
- 2 is a Routing tab. Select it to display all Routing available to your Responsibility.
- 3 is an Operation node. It identifies an Operation on the Navigator.
- 4 is an Operation tab. Select it to display all Operations available to your Responsibility
- 5 is an Activity node. It identifies an Activity on the Navigator.
- 6 is a Resource node. It identifies a Resource on the Navigator.
- 7 is a Formula node. It identifies a Formula on the Navigator.
- 8 is a Formula tab. Select it to display all Formulas available to your Responsibility.
- 9 is a Product node. It identifies a Product on the Navigator.
- 10 is a By-Product node. It identifies a By-Product on the Navigator.
- 11 is an Ingredient node. It identifies an Ingredient on the Navigator.
- 12 is a Recipe node. It identifies a Recipe on the Navigator.
- 13 is a Recipe tab. Select it to view all Recipes available to your Responsibility.
- 14 is an Owner node. It identifies an Owner on the Navigator.
- 15 is a Class node. It identifies a Class on the Navigator.
- 16 is a Status node. It identifies a Status on the Navigator.



Understanding Workbenches

The workbench provides you with a complete product, production, technical and cost profiling tool that enables you to model a new product and help you meet initial product specifications rapidly.

One of the major benefits of using a workbench is that you are able to perform what if analyses to facilitate the overall formulation process.

The workbench concept is different from previous approaches used to develop products by process manufacturers. Since new products are developed in the laboratory, the list of ingredients and products are recorded in the laboratory formula. Once the development is complete, production and cost formulas are required to manufacture and assign a cost to the product. With the Formulator Workbench, laboratory and production formulas are differentiated by a change in Status. Changing the status of an experimental formula for use by production, costing, or a Material Safety Data Sheet (MSDS) replaces the previous Formula upload and download functions with a new business process.

By coupling the workbench capability to a Status Approval Workflow, the entire process of initiating and monitoring the development of a new product is simplified.

To display the Process Engineer Workbench:

1. Navigate to the **Process Engineer Workbench**.
2. Expand **Recipes** to view a summary of recipes available to your responsibility.
3. Expand **Personal Shortcuts** to view a summary of all of the personal shortcuts available to your responsibility.
4. Expand **Public Shortcuts** to view a summary of all public shortcuts available to your responsibility.

To display the Formulator Workbench:

1. Navigate to the **Formulator Workbench**.
2. Expand **Formulas** to view a summary of formulas available to your responsibility.
3. Expand **Personal Shortcuts** to view a summary of all personal shortcuts available to your responsibility.
4. Expand **Public Shortcuts** to view a summary of all public shortcuts available to your responsibility.

To display the Engineering Workbench:

1. Navigate to the **Engineering Workbench**.
2. Expand **Routings** to view a summary of routings available to your responsibility.
3. Expand **Personal Shortcuts** to view a summary of all
4. Expand **Public Shortcuts** to view a summary of all public shortcuts available to your responsibility.

See Also

Oracle Applications User's Guide

Understanding the Status Approval Workflow

When the Status Approval Workflow is activated, recipes, formulas, routings, and operations require a series of approvals that result in reassigning their statuses through a predefined approval process. Laboratory Approval is optional in this workflow.

Individual tasks are included in each topic to show you how to manage the approval workflow process.

Understanding Workflow Processes

Oracle Workflow lets you automate and continuously improve business processes by routing information according to a set of business rules. You transmit this information to individuals both inside and outside your enterprise as needed.

Setting Up Approvers

The Status Approval Workflow routes information to an approver. An approver is an individual or a group. Any individual associated with that approver is able to act on the notification. Each notification includes a message associated with all the information an individual must make a decision. Some possible responses are also included. The Status Approval Workflow interprets each response and moves on to the next workflow activity.

Setting Up Workflow Processes

In order for a workflow to operate properly, set up the Oracle Workflow application as described in the *Oracle Workflow Guide*.

A workflow process starts when an application calls a set of Oracle Workflow Engine Application Program Interfaces (APIs). The workflow itself is depicted as a process diagram containing icons that represent activities. The process contains several workflow steps that include approvers, activities, and decision trees that are needed to complete the workflow.

Delivering Electronic Notifications

Oracle Workflow enables you to let people receive notifications of items awaiting their attention through electronic mail by using a web browser, or on a Notification Summary window in Oracle Applications.

Setting Up the Status Approval Workflow

Set up the Status Approval Workflow in the OPM System Administration application. Contact your System Administrator if you are not sure that this is set up.

Your OPM System Administrator must set up the following windows:

- **Workflow Process Activation** to define the approval processes that use the generic workflow process configuration framework. This window enables or disables the approval process in the database instance.
- **Workflow Process Configuration Framework** to define the configuration parameters for each approval process. These configuration parameters customize the approval process. For example, if a configuration parameter is specified as organization, the approval process for an organization could be enabled or disabled.
- **Workflow Activity Approval Configuration Framework** to define the configuration parameters for each approval process activity. These configuration parameters customize the behavior of an activity. For example, if the configuration parameter is specified as organization, the approval process activity behavior could be customized for an organization.
- **Workflow Process Configuration** to customize the approval process behavior at a customer site. Approval can be required based on a business process requirement. This window lets you enable or disable the approval process based on parameters that you defined in the Approval Process Configuration Framework.
- **Workflow Activity Configuration** to customize the approval process activities behavior based on configuration parameters defined in the Approval Process Activity Configuration Workflow. Enable or disable an activity and define an approver if the activity requires approval.

If the workflow does not start, the Workflow Activation window can be set to Deactivate. Contact your OPM System Administrator to determine if this window and all appropriate triggers have been set properly.

> **Note:** New Product Development Workflows do not function if seed data is disturbed.

See: *Oracle Process Manufacturing System Administration User's Guide* for more information.

Enabling the Status Approval Workflow

Enable the Status Approval Workflow by setting it up in the System Administration application. Once it is set up and operating, the workflow is activated by changing the Status of a recipe, formula, routing, or operation from NEW to any of the other available status as listed in Appendix C.

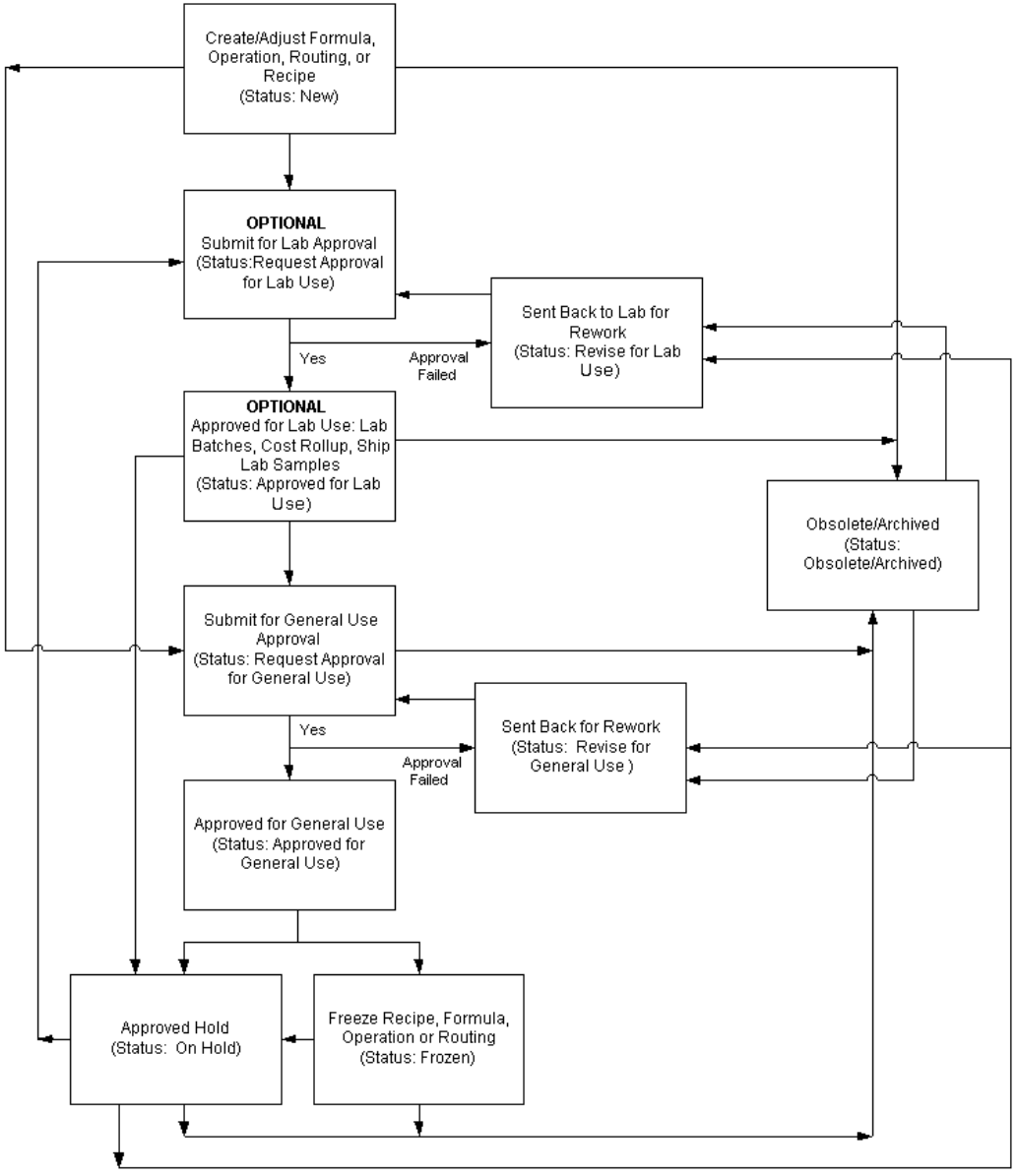
Understanding the Status Approval Workflow

When a formula, routing, operation, or recipe is created, the workflow runs as follows:

1. Upon creation, by default, the **Status** for a recipe, formula, routing, or operation is assigned the Status **NEW**.
2. If you select **Change Status** from the **Actions** menu and then select **Approved for Laboratory Use**, the workflow changes Status to **Request Approval for Laboratory Use**. Once approved, Status changes to **Approved for Laboratory Use**.
3. If you select **Change Status** from the **Actions** menu and then select **Approved for General Use,** the workflow changes Status to **Request Approval for General Use**. Once approved, Status changes to **Approved for General Use**.
4. You have the option to assign the Status **Obsolete** or **Archived**.
5. An **Approved for Laboratory Use** status can be assigned these statuses:
   - On Hold
   - Obsolete or Archived
6. An **Approved for General Use** status can be assigned these statuses:
   - On Hold
   - Frozen
   - Obsolete or Archived
7. A **Pending Approval for Laboratory** status or a **Pending Approval for General Use** status can be assigned these statuses:
   - Obsolete
   - Archived
8. Formulas, routings, operations, or recipes that:
   - Fail the approval of **Pending Approval for Laboratory Use** Status are assigned the Status **Revise for Laboratory Use**.

- Fail the approval of **Request Approval for General Use** Status are assigned the Status **Revise for General Use.**

The following graphic depicts the previously described Status Approval Workflow:



Disabling the Status Approval Workflow

The System Administrator must disable the Status Approval Workflow. If the workflow is disabled, you can still change the Status of a recipe, formula, routing, or operation. However, the Status change of a recipe, formula, routing, or operation does not initiate the Status Approval Workflow.

See Also

Oracle Process Manufacturing System Administration User's Guide

Understanding Version Control

Some businesses require version control to generate an audit trail. By monitoring version changes you define rules for modifying recipes, formulas, routings, operations, and quality specifications. The New Product Development Version Control function lets you determine if an existing version can be modified, or if a new version must be created. New Product Development gives you the ability to:

- Force the creation of new versions so that transaction sources stay intact.
- Deliver a combination of forced version creation and no version control.
- Provide no version control.

These decisions are made at the organization level with proper assignment of User Responsibilities. Status must be Approved for General Use for Version Control to be active. All other statuses do not require that a new version be created each time a change is made.

Version Control does not validate the Formula, Routing, or Version fields on a recipe header. These fields cannot be changed once a recipe is saved. A new recipe must be created in order to change these fields, whether or not Version Control is used. Version Control does not take the Status field into account when determining whether a new version should be created. This is also true for Mark for Purge and Undelete functions.

How Does Version Control Work?

Profile options for Version Control are:

- GMD: Recipe Version Control
- GMD: Formula Version Control
- GMD: Routing Version Control
- GMD: Operation Version Control

Each profile option is set to one of the following profile values:

- Y means Yes, indicating that Version Control is activated and any change made requires a new version.
- N means No, indicating that Version Control is not activated and any change can be made to the existing version.
- O means Optional, indicating that Version Control is optional. You are asked if you want to create a new version if any change is made to the existing version.

You can set Version Control to any appropriate level of activation. In practice, it is a good idea to set Version Control profile options initially to O. You are notified each time you attempt to save changes. The setting of these options is totally a matter of your individual business requirements.

See: *Oracle Process Manufacturing Implementation Guide* for more specific details on setting these profile options.

Setting Up Version Control at the Organization and Responsibility Level

You must be associated with valid organizations in order to create transactions and perform certain functions in New Product Development. You must be linked to appropriate Responsibilities in order to access specific workbenches. If new Responsibilities are implemented as described in the following example, you can achieve Version Control by association to an organization through a link to a specific Responsibility within the organization. Here is an example of how to set up Version Control:

Users are defined as:

ABC for Formulator ABC

JKL for Formulator JKL

XYZ for Formulator XYZ

Organizations are:

OA for Oracle Applications

OPM for Oracle Process Manufacturing Company, consisting of:

PLT1 for Plant1

PLT2 for Plant2

PLT3 for Plant3

Responsibilities are:

Formulator for PLT1

Formulator for PLT2

Formulator for PLT3

User-Organization Associations are:

ABC for PLT1

JKL for PLT1

XYZ for PLT1

User-Responsibility Associations are:

ABC for Formulator PLT1

JKL for Formulator PLT2

XYZ for Formulator PLT3

Profile Settings are:

GMD: Formula Version Control is set to Y for the Responsibility of Formulator PLT1

At logon, User ABC is presented with a list of Responsibilities for Formulator PLT1. Menus and windows associated with the Formulator Responsibility are accessible to User ABC, and they are configurable. Specific windows and functions can be enabled or disabled within Menus and Responsibilities. Since the user organization association for User ABC is limited to PLT1, and the Formula Version Control profile option is enabled for this Responsibility, any modifications made to a formula during the session for User ABC requires a new version of a formula for PLT1.

If User ABC were to change to a Responsibility where Version Control was set to N, modifications to a formula in that session would not require a new formula version to be created.

If User ABC were to change to a Responsibility where Version Control was set to O, modifications to a formula in that session would notify User ABC that Version Control was optional. Prior to saving a change, User ABC is asked whether or not to change the existing formula version.

2

Setting Up

This topic provides the setup requirements in other applications, and setup required in New Product Development. You must set up responsibilities and menu access. Depending on your individual requirements you set up formula classes, operation classes, routing classes, activities, resources, plant resources, laboratories, technical parameters, technical parameter sequences, and technical class and subclass category sets.

The following topics provide the information required to set up New Product Development:

- Setting Up in Other Applications
- Setting Up Responsibilities and Menu Access
- Setting Up Formula Classes
- Setting Up Operation Classes
- Setting Up Routing Classes
- Setting Up Activities
- Setting Up Resources
- Setting Up Plant Resources
- Setting Up Laboratories
- Setting Up Technical Parameters
- Setting Up Technical Parameter Sequences
- Setting Up Technical Classes and Subclasses

Setting Up in Other Applications

Set up these prerequisites prior to running the New Product Development application:

Setting Up Profile Options in OPM System Administration

In the System Administration Responsibility, set up the following profile options:

- GMD: Byproduct Active
- GMD: Default Lab Type
- GMD: Default Release Type
- GMD: Density
- GMD: Display Specifications
- GMD: Effective Maximum Date
- GMD: Effective Minimum Date
- GMD: Effectivity on Upload
- GMD: Exact Specification Match
- GMD: Formula Security
- GMD: Formula Version Control
- GMD: Mass Unit of Measure Type
- GMD: Operation Version Control
- GMD: QC Grade
- GMD: Recipe Version Control
- GMD: Routing Version Control
- GMD: Scrap Factor Type
- GMD: UOM Mass Type
- GMD: UOM Volume Type
- GMD: Volume Unit of Measure Type
- GMD: Workflow Timeout (in Days)
- GMD: Yield Type

Set up the following:

- Units of Measure
- Units of Measure Classes
- Units of Measure Conversion

Use a common predefined unit of measure for the step quantity and charges calculation process. This approach provides better performance. Conversions must be defined for individual items between the item unit of measure and the common unit of measure. This eliminates the requirement to set up item conversions between the item unit of measure and the associated operation unit of measure.

See Also

Oracle Process Manufacturing Implementation Guide

*Oracle Inventory User's Guid*e

Oracle Workflow

Setting Up OPM Inventory Control

In the OPM Inventory Control application, set up the following:

- Items and item attributes for every raw material, intermediate, and end item.
- 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 entered on the Item / Lot Sublot Conversions window.

Unit of measure types, units of measure, unit of measure conversions, and specific conversions such as item lot and sublot conversions are synchronized with corresponding Oracle Process Manufacturing Financials data.

See Also

Oracle Process Manufacturing Inventory Management User's Guide

Oracle Inventory User's Guide

Setting Up Cost Management

In the Cost Management application, set up the following:

- Cost analysis codes
- Cost calendar

See Also

Oracle Process Manufacturing Cost Management User's Guide

Setting Up Responsibilities and Menu Access

Set up Workbench Responsibilities for each user. The following are menu and submenu selections available to each listed Workbench Responsibility:

- Formulator
  - Formulator Workbench
  - Formulas
  - Recipes
  - Status
  - Mass Search and Replace
  - Spreadsheet
  - Inventory Items
  - Indented Formulas for the Indented Bill of Materials Report
  - Formula Inquiry
  - Technical Data: Technical Parameters
  - Technical Data: Technical Parameter Sequences
  - Technical Data: Item Technical Data
  - Formula Analysis: Parameters
  - Formula Analysis: Analysis
  - Formula Setup: Formula Class
- Process Engineer
  - Engineering Workbench
  - Routings
  - Operations
  - Recipes
  - Routing Setup: Routing Classes
  - Routing Setup: Operation Classes
  - Routing Setup: Activities
  - Routing Setup: Generic Resources

- Routing Setup: Plant Resources
- Routing Setup: Alternate Resources
- Recipe Orgn Details
- Process Loss
- Mass Search and Replace

Setting Up Formula Classes

Formula Classes group formulas with similar characteristics and requirements for reporting purposes. For example, use a formula class to classify all formulas for ACRYLIC paints, or to classify all formulas for ORGANIC paints. Food seasoning formulas could be grouped under a SEASONINGS class. You specify the formula class on the Formula Details window. Defining formula classes is optional.

Prerequisites

- ❑ Analyze all formulas for common properties that are used to classify them.

◗◗ To set up formula classification codes:

1. Navigate to the **Formula Classes** window.
2. Enter the **Class** code that identifies formulas with similar characteristics or requirements. Required.
3. Enter a brief **Description** of the classification you are adding. Required.
4. Save the window.

Setting Up Operation Classes

Group operations with similar characteristics and requirements for reporting purposes. For example, you could set up classes for MIXING, HEATING, DRYING, or GRINDING. Defining operation classes is optional.

Prerequisites

- ❑ Analyze all operations for common properties that are used to classify them.

◗◗ To set up operation classification codes:

1. Navigate to the **Operation Classes** window.
2. Enter the **Class** code that identifies operations with similar characteristics or requirements. Required.
3. Enter a brief **Description** of the classification you are adding. Required.
4. Save the window.

Setting Up Routing Classes

Routings are sequenced sets of operations that must be performed in order to complete a production batch. It is useful to set up routing classes to group routings with similar characteristics and requirements for reporting purposes. Defining routing classes is optional.

Prerequisites

- ❑ Analyze all routings for common properties that are used to classify them.

◗◗ To set up routing classification codes:

1. Navigate to the **Routing Classes** window.
2. Enter the **Class** code that identifies routings with similar characteristics or requirements. Required.
3. Enter a **Routing Class Description** for the Class code entered. Required.
4. Enter the **UOM** for the Class code.
5. Click **Theoretical Process Loss** to display the **Theoretical Process Loss** window. Theoretical Process Loss is discussed in the Routings topic.
6. Save the window.

See Also

Routings

Setting Up Activities

Activities are actions performed during production. For example, mixing and cooling are activities. Activities are usually set up so that they divide a manufacturing process into logical breakpoints. By analyzing and refining the granularity of activities, businesses can improve their work methods and reduce time to manufacture so that activities performed in operations are completed in the shortest possible time with the least effort to deliver the appropriate level of quality.

Cost analysis codes are assigned to activities so that proper cost calculations can be performed.

Prerequisites

- ❑ Set up cost analysis codes.

◗◗ To set up activities:

1. Navigate to the **Activities** window.
2. Enter an **Activity Code** for the name of the activity. Activities are the components that make up an operation. Required.
3. Enter a brief **Description** of the activity. Required.
4. Enter the cost **Analysis Code**. This code is set up in Cost Management application. Required.
5. Save the window.

See Also

Oracle Process Manufacturing Cost Management User's Guide

Setting Up Resources

Resources are assets used to produce product.

Prerequisites

- ❑ Optionally, set up resource classes.
- ❑ Set up component classes.

◗◗ To set up resources:

1. Navigate to the **Resources** window.
2. Enter a code that identifies the **Resource**. Required.
3. Enter a brief **Description** of the **Resource** you are adding. Required.
4. Enter the **Standard UOM** used to measure the output of the **Resource**. Required.
5. Optionally, enter a **Resource Class** to classify this **Resource**.
6. Enter a **Component Class** to link the individual **Resource** to a unit of measure. This lets you establish costing parameters for the resource in Cost Management. Required.
7. Enter the **Minimum** throughput amount per capacity unit for the Resource. Required.
8. Enter the **Maximum** throughput amount per capacity unit for the Resource. Required.
9. Enter the **UOM** for the capacity unit. This is usually specified in hours. Required.
10. Save the window.

See Also

Oracle Process Manufacturing Cost Management User's Guide

Setting Up Plant Resources

Resources can operate at differing capacities from plant to plant. For example, one plant can operate a resource a full 24 hour day, while another plant can only operate that resource at 18 hours a day. Similarly, the cost of using a resource varies from plant to plant.

The Plant-Resources window enables you to enter information regarding available resources at specific plants. This information includes cost management information, resource usage unit of measure, and available hours per day for the resource in a specific production plant. Planning applications use this information to determine the availability and throughput of resources in each specific plant.

Prerequisites

- ❏ Define unit of measure types.
- ❏ Define units of measure.
- ❏ Define units of measure conversions.
- ❏ Define organizations, resources, and resource units of measure, and select the appropriate plant where you want to define plant resources.

◗◗ To create a new plant resource:

1. Navigate to the **Plant-Resources** window.
2. Verify that the appropriate **Organization** is displayed with its description. Required.
3. Enter the **Resource** you are establishing available capacity parameters and planning costs for when used in the designated plant or organization. Required.
4. Enter the **Resource Category**. Categorize the resource that you specified in the previous step into a broader group for reporting purposes. For example, if you specified Blender 1 as **Resource**, group that resource into a more generic group called Blenders. The **Resource Category** field defaults to the value in the **Resource** field if there is no assigned grouping for a resource into a broader category. Required.
5. Enter the **Count** as the number or quantity of the resource used in the plant that you are defining production costs and usage availability for. The number entered here depends on the extent of resource categorization. For example, if the resource was defined as specific Blender 1, enter 1. If you use three blenders, and the resource was defined as Blenders, enter 3. Required.

6. Enter the **Available Use/Daily**. Specify the maximum number of hours this resource is available in this plant each day. Required.
7. Enter the **Usage UOM**. Specify the unit of measure that the resource is measured in at the specified plant. This is usually specified in hours.
8. Enter the **Planning Cost**. This is the cost of this resource when it is used in the specified plant. The cost defaults to 1. This cost is used only for reporting purposes. Required.

Capacity

9. Enter this resource's **Minimum** throughput amount per capacity unit at this plant. Required.
10. Enter this resource's **Maximum** throughput amount per capacity unit at this plant. Required.
11. Enter this resource's **Ideal** or optimum throughput amount per capacity unit at this plant. Required.
12. Enter the **UOM** for the capacity unit. This is usually specified in hours. Required.
13. Select **Capacity Constraint** to indicate that this plant resource must be considered for the calculation of **Charges**.
14. Save the window.

Setting Up Laboratories

After meeting the prerequisites for setup in other applications, you must define laboratories. Laboratories are used to group technical parameters.

Most organizations manufacture a variety of similar products that are often grouped into product lines or families. The same technical parameters are likely to be relevant to the products within a product family and to the ingredients used to manufacture those products. For example, viscosity is likely to be relevant to all lubricants, while opacity or contrast ratio is likely to be relevant to all paints.

When you set up an organization as a laboratory, verify that you select Laboratory as the Plant type on the Organizations window in the System Administration application. This laboratory organization defaults into the Laboratory field on each window where you can enter Technical Parameters. It is the only Laboratory that you can use on the Laboratory Spreadsheet.

See Also

Oracle Process Manufacturing Implementation Guide

Oracle Process Manufacturing System Administration User's Guide

Setting Up Technical Parameters

Technical parameters are those characteristics of items that you want to measure and calculate. There are several types of technical parameters. For example, a gravimetric technical parameter for percent solids by weight (w / w) is Weight%.

For each type of technical parameter, specify certain constraints on the data that can be entered for that parameter, such as the minimum and maximum values.

Prerequisites

- ❏ Define a laboratory organization.
- ❏ Determine the hierarchy of technical parameters to be set up. For example, density, gram percent, gram molecular weight, formula weight, and osmolality. These must be developed so that they can be sequenced in a hierarchy that can be rolled up to the product level.

◗◗ To use expressions in technical parameters:

The following functions are supported for defining expressions, and the mathematical operators to use:

- Addition (+)
- Subtraction (-)
- Multiplication (*)
- Division (/)
- Exponentiation (^)
- Square Root (SQRT)
- Common Logarithm (LOG)
- Natural Logarithm (LN)

For example, if you are defining a technical parameter that is calculated by multiplying two other technical parameters, PARM1 and PARM2, enter the following:

```
PARM1*PARM2
```

To take the square root of PARM1, enter the following:

```
SQRT(PARM1)
```

You cannot put spaces (blanks) in the name of a technical parameter that you use in an expression. For example, (PARM 1) * (PARM 2) cannot be calculated because there is an extra space before and after the * operator.

To use fixed expressions in technical parameters:

Certain technical parameters are fixed expressions that can be summed up for all ingredients in a formula. This is called a formula rollup.

The following technical parameter types are available:

- Weight Percent is calculated as the quantity Sigma t_i multiplied by w_i minus the quantity Sigma t_j multiplied by w_j divided by the quantity Sigma w_i minus the quantity Sigma w_j.
- Volume Percent is calculated as the quantity Sigma t_i multiplied by v_i minus the quantity Sigma t_j multiplied by v_j divided by the quantity Sigma v_i minus the quantity Sigma v_j.
- Specific Gravity is calculated as the quantity Sigma t_i multiplied by v_i minus the quantity Sigma t_j multiplied by v_j divided by the quantity Sigma v_i minus the quantity Sigma v_j.
- Cost is calculated as the quantity Sigma t_i multiplied by I_i minus the quantity Sigma t_j multiplied by I_j.
- Equivalent Weight is calculated as the the quantity Sigma T_i minus the quantity Sigma T_j divided by the quantity Sigma $T_i$divided by t_i minus the quantity Sigma T_j divided by t_j.
- Quantity per Unit is calculated as the quantity Sigma t_i multiplied by I_i minus the quantity Sigma t_j multiplied by I_j.

where:

- Sigma is summation over "i" ingredients or "j" byproducts
- t_i is the value of the technical parameter for the "i-th" ingredient
- t_j is the value of the technical parameter for the "j-th" byproduct
- w_i is the weight of the "i-th" ingredient in the base unit of measure for mass
- w_j is the weight of the "j-th" byproduct in the base unit of measure for mass
- v_i is the volume of the "i-th" ingredient in the base unit of measure for volume
- v_j is the volume of the "j-th" byproduct in the base unit of measure for volume
- I_i is the quantity of the "i-th" ingredient in its primary inventory unit of measure

- I_j is the quantity of the "j-th" byproduct in its primary inventory unit of measure
- T_i is the quantity of the "i-th" ingredient in the units specified for the technical parameter
- T_j is the quantity of the "j-th" byproduct in the units specified for the technical parameter

The following table displays the previously described calculations used for each of the listed technical parameter types.

Technical Parameter Type	Calculation
Weight Percent	$[(\Sigma t_i \cdot w_i)-(\Sigma t_j \cdot w_j)]/[(\Sigma w_i)-(\Sigma w_j)]$
Volume Percent	$[(\Sigma t_i \cdot v_i)-(\Sigma t_j \cdot v_j)]/[(\Sigma v_i)-(\Sigma v_j)]$
Specific Gravity	$[(\Sigma t_i \cdot v_i)-(\Sigma t_j \cdot v_j)]/[(\Sigma v_i)-(\Sigma v_j)]$
Cost	$(\Sigma t_i \cdot l_i)-(\Sigma t_j \cdot l_j)$
Equivalent Weight	$[(\Sigma T_i)-(\Sigma T_j)]/[(\Sigma T_i/f_i)-(\Sigma T_j/f_j)]$
Quantity per Unit	$(\Sigma t_i \cdot l_i)-(\Sigma t_j \cdot l_j)$

Expressions are equations you define that use mathematical operators and previously defined technical parameters.

For example, a technical parameter could be defined as a percent solvent, with each ingredient in a formula contributing a differing portion of its weight to a product as solvent. Use the Technical Parameters window to set up various quantitative relationships between individual parameters. The application finds the weight of solvent contributed by each ingredient and calculates the sum of these contributions. After determining the total formula weight, the application expresses the ratio of percent solvent for each product.

In addition to the technical parameters that you define on the Technical Parameters window, OPM automatically creates a technical parameter for density when you define a laboratory organization. The application uses this density technical parameter for conversions from mass units of measure to and from volume units of measure. It does not use the item specific unit of measure conversions set up on the Item Lot/Sublot Std Conversion window. It does, however, use the regular unit of measure conversions for laboratory formulas. Enter data for the DENSITY technical parameter for all items where you must convert mass to volume or volume to mass.

If this parameter is not set properly, spreadsheet calculations are inaccurate.

GMD: Density defines the density technical parameter.

To set up technical parameters:

1. Navigate to the **Technical Parameters** window.
2. Enter the code for the laboratory **Organization** where you are defining a technical parameter. A description of this laboratory displays. Required.
3. Enter the name of the technical **Parameter Name**. Required.
4. Enter a **Description** or statement about what the technical parameter represents. Required.

Quality Control Assay Link

5. If you are linking this technical parameter to an assay in the Quality Control application, enter the **Organization** code that identifies where the assay is defined. Otherwise, leave this field blank.
6. The **Assay** must be defined with your organization code. Global assays cannot be used. If you are linking this technical parameter to a Quality Control assay, enter the name of the assay. Otherwise, leave this field blank.

Technical Parameters

7. Select one of the following to define the **Data Type** associated with this technical parameter. Supply the required information listed. Only specific gravity, equivalent weight, and expressions are not validated against the units entered in the Quality Control application. Quality Control units of measure are for notational purposes only, and are not used in calculations.

Data Type	Required Information
0 - Character	Enter the minimum and maximum valid character strings based on ASCII sort sequence and maximum length.
1 - Numeric	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.
2 - Validation List	■ Enter the Unit of Measure in the Unit field. ■ Enter a list of valid values in the Validation List fields.
3 - Boolean	No additional definition is required. The entry is unitless.
4 - Expression	■ Enter the Unit of Measure in the Unit field. ■ Enter the mathematical expression for calculating the technical parameter in the Expression field.
5 - Weight Percent	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.
6 - Volume Percent	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.
7 - Specific Gravity	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.
8 - Cost	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.

Data Type	Required Information
9 - Equivalent Weight	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.
10 - Quantity Per Unit	■ Enter the Unit of Measure in the Unit field. ■ Enter the minimum and maximum valid values in Numeric Range fields. ■ Enter the number of significant digits required in the Significant Digits field.

8. Enter the **Unit** of measure for the technical parameter. Technical parameters for specific gravity and equivalent weight use the units of measure set up in the System Administration or Oracle Inventory applications. All other technical parameters use the units of measure set up on the Units window in the Quality Control application. With the exception of equivalent weight, this unit of measure is not used in any calculations.
9. If the Data Type has a **Numeric Range**:
   a. Enter the lower limit of the **Numeric Range** in the first field. Enter the upper limit of the range in the second field. For example, an entry of 20 through 30 represents a Numeric Range from 20 to 30.
   b. Enter the number of **Significant Digits** to display for numeric expressions and calculations.
10. Save the window.

Setting Up Technical Parameter Sequences

After entering the technical parameters for a laboratory organization, specify the order displayed as the technical parameter sequences.

Expression type technical parameters that refer to other technical parameters must come after the technical parameters they reference in the sequence. For example, if PARM_3 is calculated by multiplying PARM_1 by PARM_2, PARM_3 must come after PARM_1 and PARM_2 in the technical parameter sequences. By default, the DENSITY technical parameter, or its equivalent is 1. Do not change this.

Prerequisites

- ❑ Determine if two or more technical parameters are required in a calculation. If they are, verify their proper order prior to sequencing them in the Technical Parameter Sequences window. For example, if you want to determine a Brix-to-Acid ratio, first enter the Brix calculation, then the Acid calculation, and finally, the Brix / Acid calculation.

◗◗ To set up technical parameter sequences:

1. Navigate to the **Technical Parameter Sequences** window.
2. Enter the code for the laboratory **Organization** where you are setting up the technical parameter sequences. The default organization displays. Required.

Parameter Sequences

3. Enter the code for a technical **Parameter** associated with the laboratory organization entered. For example, enter GMW for gram molecular weight.
4. Enter a **Sort** number between 1 and 9999 to determine where in the list of technical parameters this parameter is displayed. When entering technical parameter data, the technical parameters are displayed in numerical order based on the number entered in this field.

   The numbers do not have to be sequential. For example, you could enter 10, 20, 30, and so forth to accommodate for the future addition of technical parameters.
5. When the **Quality Control** check box is selected, the technical parameter is linked to a quality control assay. If the Quality Control check box is not selected, the technical parameter is not linked to a Quality Control assay.
6. The **Description** displays a brief statement about what the technical parameter represents, and is entered from the Quality Control Assay Test Description.
7. Save the window.

Setting Up Technical Classes and Subclasses

The following is an overview of setting up Technical Classes and Technical Subclasses for items in the Oracle Process Manufacturing Inventory Control application.

See: *Oracle Applications User's Guide* and O*racle Applications Flexfields Guide*.

Key Flexfield Segments have been defined for Technical Class & Subclass. You must perform the following tasks in the Oracle Process Manufacturing Inventory Control application to set up Technical Classes and Subclasses for your individual application.

To define Technical Class & Subclass values:

1. Navigate to the **Segment Values** window.
2. Enter the following in the **Find Key Flexfield Segments** window:
   - Enter **Oracle Inventory** as **Application**.
   - Enter **Item Categories** as **Title**.
   - Enter **Technical Class & Subclass** as the **Name** of the Structure created.
3. Click **Find**.
4. Query **Technical Class** as the **Independent Segment**.
5. Enter an appropriate **Value**, **Translated Value**, and **Description** for Technical Class. For example, enter:
   - **Binder** as **Value**, **Translated Value**, and **Description**.
   - **Solvents** as **Value**, **Translated Value**, and **Description**.
6. Select the **Enabled** check box.
7. Select **Save & Proceed**.
8. Query **Technical Subclass** as the **Independent Segment**.
9. Enter an appropriate **Value**, **Translated Value**, and **Description** for Technical Subclass. For example, enter:
   - **Acrylic** as **Value**, **Translated Value**, and **Description**.
   - **Alkyd** as **Value**, **Translated Value**, and **Description**.
   - **Epoxy** as **Value**, **Translated Value**, and **Description**.

- **Organic** as **Value**, **Translated Value**, and **Description**.

10. Select the **Enabled** check box.
11. Select **Save & Proceed**. Repeat steps 8 through 11 for any additional Independent Segments created.

To define Categories:

1. Navigate to the **Categories** window. The **Find Categories** window displays.
2. Click **New**.
3. Enter **Technical Class & Subclass**.
4. Enter each **Category** multisegment flexfield structure to assign meaning to each segment. For example, enter:
   - **Binder.Acrylic** for an acrylic binder.
   - **Binder.Alkyd** for an alkyd binder.
   - **Binder.Epoxy** for an epoxy binder.
5. Enter an appropriate **Value** for each **Segment**.
6. Click **OK**. Return to the **Categories** window.
7. Enter a unique **Description** for each **Category**. For example, **Binder.Acrylic** could have the Description **Binder/Acrylic**.
8. Save the window.

To define Category Sets:

1. Navigate to the **Category Sets** window.
2. Select the appropriate **Inventory Organization**.
3. Click **OK**.
4. Enter a unique **Name** and **Description** for the Category Set. For example, enter:
   - **Technical Classification** as **Name**.
   - **Component Technical Classification** as **Description**.
5. Enter the **Flex Structure** created. For example, enter **Technical Class & Subclass**.
6. Verify that the Category Set is controlled at the **Master Level**. This lets you assign the same Category Value in all organizations where it is assigned.

7. Enter the **Default Category**. For example, enter **Binder.Acrylic**. The default is used when assigning an item to the Category Set.
8. Determine if you want to **Enforce a List of Valid Categories**:
   - Select this check box if you want to assign items only to Categories defined as valid for the current Category Set. Enter each of the Valid Categories.
   - Clear this check box if you want to assign an item to any Category that has the same flexfield structure as the current Category Set.
9. Click **Assign**. The **Item Assignments (OPM) Technical Classification, Master Level** window displays.
10. Query the **Item** you want to assign to the **Category Set**.
11. Select the **Category** and enter the **Segments**.
12. Repeat steps 9 and 10 for each additional **Item** you want to assign.
13. Click **Accept**.

To assign Category Sets to a Process Manufacturing Class:

1. Navigate to the **OPM Category Sets** window.
2. Select the **Category Set** for the appropriate **Process Manufacturing Class**. Enter **Technical Classification** as **Category Set**.
3. Save the window.

See Also

Oracle Process Manufacturing Inventory Control User's Guide

3

Formulas

This topic shows you how to define the formulas that drive your manufacturing process. It includes a basic understanding of formula setup. You are shown how to enter item technical data and use the laboratory spreadsheet. You are introduced to setting up formula information including how to use formula phantoms, methods available to scale formulas, and to find formulas. In addition to entering formula details, you are shown how to define and maintain formulas at the header and line levels. Methods for determining where ingredients are used, the Indented Bill of Materials Report, and formula inquiry help you locate formula information rapidly.

The following topics provide a basic understanding of formulas:

- Understanding Formula Setup
- Requirements
- Solutions
- Entering Item Technical Data
- Using the Laboratory Spreadsheet
- Setting Up Formula Information
- Using Formula Phantoms
- Scaling Formulas
- Defining and Maintaining Formulas
- Finding a Formula
- Displaying the Formula Summary
- Displaying the Formula Header Summary
- Entering Formula Details

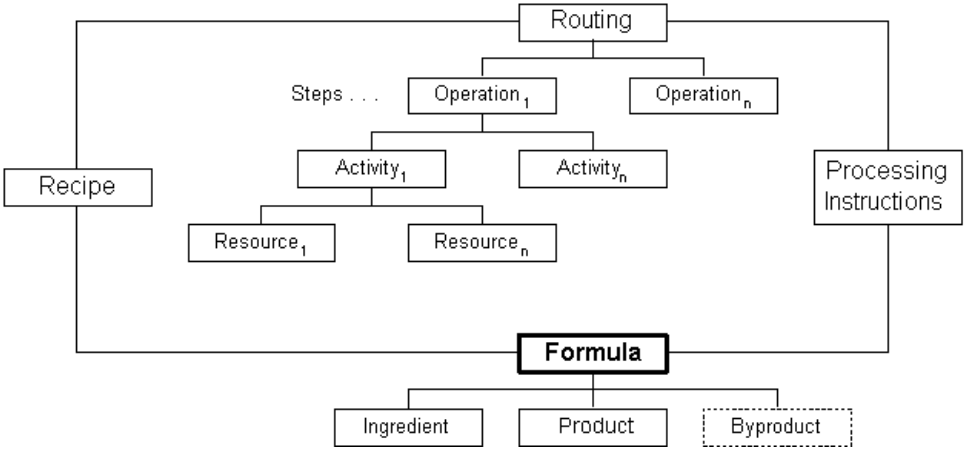
- Displaying the Formula Product Summary
- Displaying the Formula Byproduct Summary
- Displaying the Formula Ingredient Summary
- Displaying a Summary of Formula Product Lines
- Displaying Formula Product Lines
- Editing a Formula Product Line
- Displaying a Summary of Formula Byproduct Lines
- Displaying Formula Byproduct Lines
- Editing a Formula Byproduct Line
- Displaying a Summary of Formula Ingredient Lines
- Displaying Formula Ingredient Lines
- Editing a Formula Ingredient Line
- Running the Indented Bill of Materials Report
- Using Formula Inquiry
- Interpreting a Formula Inquiry
- Analyzing a Formula
- Displaying Formula Analysis Results
- Finding a Formula Analysis
- Overriding Default Explosion Rules

Understanding Formula Setup

This topic explains how to define the formulas that drive your manufacturing process. Formulas are lists of ingredients and products with their associated quantities and processing instructions. In some cases, you can refer to a formula as a process manufacturing bill of material. Production batches are based on formulas defined in New Product Development. Formulas are also used for planning, managing costs, and scheduling.

Formulas are depicted hierarchically in the following diagram that shows the:

- Routing composed of a series of Operations organized in Steps.
- Operations composed of Activities containing Resources.
- Formula composed of Ingredient, Product, and possibly Byproduct.
- Recipe linking the Routing and Formula together with Processing Instructions.



Requirements

Following are some requirements that customers have for formulas in New Product Development. The answers are explained in detail in the Solutions topic.

Can multiple versions of a single product formula be managed at the same time?

Yes. Depending on how version control is implemented, a version number can be assigned to multiple versions of a single product formula.

Can the formula approval process be managed efficiently?

Yes. Use the formula Status field to manage formula approvals quickly and efficiently. By activating the Status Approval Workflow the application manages each step of the approval process with a minimal requirement for intervention.

Is there multilingual support for formulas?

Yes. Use Description and Comments fields to enter translations for each of the installed languages.

Can both standard and packaging formulas be created?

Yes. Use the Formula Details window to create both standard and packaging formulas. The window has a Packaging check box that identifies a formula as a packaging formula.

Can formulas from third party applications be imported into the New Product Development application?

Yes. Use Formula APIs to create new formula headers and details from applications not produced by Oracle. For existing Oracle applications migration scripts are supplied.

Can a laboratory be set up for many product lines with different technical technical characteristics?

Yes. Use technical parameters that are specific to an organization to set up individual product lines with differing technical characteristics.

Is it possible to predict the characteristics of a product based on ingredient composition?

Yes. Use the Laboratory Spreadsheet to model new formulas and predict formula composition based on individual components added.

Is it possible to model catalysts and starter cultures, or any other item that does not change batch size?

Yes. Formulas ingredients can be scaled using rules that specify whether or not an ingredient contributes to yield.

Can Standard Operating Procedures be linked to a specific process or ingredient?

Yes. Complete process instructions can be linked using text insertions and comments at various stages of the formulation process.

Solutions

New Product Development provides solutions to help resolve issues at every stage of the product development process. The following represent some of the key performance solutions for formulas.

Manage Multiple Versions of a Single Product Formula If Version Control is on, a change to any component of a formula requires a new formula to be created consisting of the same formula name with a different version number. This is not required for status changes, Mark for Purge, or Undelete operations. If Version Control is off, any change to a formula can be made without requiring a new version. Copy a formula to a new version without the need to reenter information. Version Control is only active when a formula is Approved for General Use. Version Control helps manage multiple versions of a single product formula.

Let Formula Status Indicate Formula Approval Use the Status field in each formula to determine where the formula is in an approval cycle. Activate the Status Approval Workflow to control the approval process. Workflow presents each Approver with an electronic notification so that action can be taken immediately. This expedites the overall approval process.

Use the Description and Comments Text Fields for Multilingual Support for Formulas Two descriptive text fields in the header of a formula allow entry of a formula Description and Comments for each of the installed languages. Text is displayed in the session specific language.

Use the Formula Details Window to Create Both Standard Formulas and Packaging Formulas The Formula Details window allows entry of the formula header and all its products, ingredients, and byproducts. To set up a packaging formula, enter the packaged item itself as product. Then enter the bulk item, packaging container, and package label as ingredients.

Bridge Collaborative Environments with Formula APIs To bridge collaborative formulation environments, an integrated set of Applications Programming Interfaces (APIs) such as legacy systems, spreadsheets, or third party systems. These Formula APIs create, reconcile or update formulas, their components, and their validity rules.

Define Technical Parameters for Rapid Calculations New Product Development allows setup of technical parameters as quality control assays with character, numeric, list of values, Boolean, or weight percent formats. This can be done on an organization

specific basis. A technical parameter within an individual laboratory organization can be defined as percent solvent with each ingredient in a formula contributing a different portion of its weight to the product as solvent. New Product Development finds the weight of solvent contributed by each individual ingredient, the sum of these contributions, and after determining the total formula weight, it calculates the ratio of percent solvent for each product. The application enables technical parameters to be defined in the appropriate units, and allows specification of the minimum and maximum number of significant figures to display. After establishing a formula for laboratory use, and entering its technical data for all appropriate ingredients, the application displays technical parameters within the laboratory formula to see how to roll it up into a recipe. It also enables use of experimental items for evaluation or testing purposes, and the recording of all information and text as detailed notes or comments.

Simulate Formulas and Analyze Their Components The Laboratory Spreadsheet calculates product technical parameters automatically, and enables simulation of the quantity and technical parameter values for all formula components. Formulators can rearrange and adjust quantities of the ingredients and byproducts. The spreadsheet provides the ability to save formula variations as possible new products. This flexibility enables testing of different scenarios during reformulation and provides a rapid evaluation of the results.

Provide Comprehensive Formula and Ingredient Scalability New Product Development delivers full manufacturing scalability. The amounts of material produced or used by a formula can be scaled using methods that fix or vary each ingredient. Scalability provides production cycle flexibility and virtually eliminates the need to recalculate ingredient amounts manually.

Deliver Complete Formula Process Instructions New Product Development enables formulators and process engineers to link new product formulation instructions to production management for use in the manufacturing process. This eliminates the need to transfer information manually. It improves product quality and consistency. Instructions are defined in one or more languages at various levels of the organization to meet quality requirements. This information supports compliance to ISO 9000.

Entering Item Technical Data

Once you have specified a sequence for technical parameters, you are ready to enter the technical parameter data. The data represent technical parameter values for your items.

Prerequisites

- ❏ Set up technical parameters.
- ❏ Set up technical parameter sequences.

In most cases use Weight Percent, Volume Percent, Specific Gravity, Cost, Equivalent Weight, and Quantity per Unit for items that are raw materials or byproducts.

Specifying the Set of technical parameters to Use

When you enter an item that is a product of one or more laboratory formulas, specify the appropriate formula containing the Item Technical Data. Since the item is a product in formulas, its technical parameter values are calculated from specific formulas. Calculated values can be different in each formula.

For example, suppose your company can make orange juice using either of two valid formulas. Each formula uses a different orange juice concentrate. If you use orange juice to make an orange drink, verify that the technical parameter values are selected for the formula you decide to use, since calculated technical parameter values can be different in each formula.

Entering Density for Raw Materials

The application uses the DENSITY technical parameter for unit of measure conversions. Make sure to enter values for this technical parameter for all your raw materials.

If you get a unit of measure conversion error on the spreadsheet, check that you entered density information for all of your raw materials.

Density values must be entered as a ratio between the base unit of measure for the mass unit of measure type and the base unit of measure for the volume unit of measure type.

The base unit of measure for each UOM type is the first unit of measure set up for that UOM type. For example, if the base unit of measure for mass is kilograms and the base unit of measure for volume is liters, enter the density in kilograms per liter rather than pounds per gallon.

You can determine the units of measure that are the base units for mass and volume by entering an item specific UOM conversion between mass and volume on the Item Lot/Sublot Std Conversion window in the Inventory Control application. The units displayed beneath the word Conversion are the base units that are used for mass and volume.

To enter item technical data:

Calculated values for a product are not saved to the Item Technical Data table until you recall the formula on the Laboratory Spreadsheet and update technical parameters from the Actions menu. These values are not visible and are not available for use in other formulas if that product is an ingredient in other formulas.

If you need to enter Item Technical Data for products, be aware that if you recalculate those technical parameter values on the spreadsheet and update technical parameters from the Actions menu, the data that you entered on the Item Technical Data window is overwritten.

To define technical data for items:

1. Navigate to the **Item Technical Data** window.
2. Enter the laboratory **Organization** where you are entering item technical parameter data. You can enter data only for the technical parameters associated with this laboratory organization. Required.
3. Enter the **Item** code you are entering technical parameter data for. Required.
4. If you are entering technical parameter data for a specific lot, enter the **Lot** code.
5. If you are entering technical parameter data for a specific sublot, enter the **Sublot** code.
6. Enter the **Laboratory Formula**. This field only displays if the item is a product in a formula.
7. Enter the **Version** number of the Laboratory Formula. This field only displays if the item is a product in a formula.
8. **Item Unit of Measure** displays the unit of measure for the item. You cannot edit this field.

Details

9. The name of each technical **Parameter** defined for the laboratory organization displays. You cannot edit these fields.

10. Enter the **Value** for each technical parameter. You cannot enter or edit this field if the technical parameter value is calculated by the application.

    For example, you cannot enter or edit this field if the Value is an Expression or if it is derived from a Quality Control assay.

    The value you enter must satisfy the validation parameters displayed at the bottom of the window if entering a numeric value. Otherwise, the value must be in the LOV if the Validation List method is selected as the Data Type.

11. Displays the **Unit** of measure for the technical parameter. Specific gravity and equivalent weight use the units of measure set up on the Unit of Measure window in the OPM System Administration application. All other technical parameters use the units of measure set up on the Units window in the Quality Control application. With the exception of equivalent weight, this unit of measure is not used in any calculations.

12. The **Quality Control** check box displays:

    - If the check box is selected, the Value for a technical parameter comes from a Quality Control assay.
    - If the check box is cleared, the Value for a technical parameter does not come from a Quality Control assay.

13. The **Data Type** displays. You cannot edit this field.

14. The **Calculate** check box displays:

    - If the check box is selected, the Value for a technical parameter is calculated by the application.
    - If the check box cleared, the Value for a technical parameter is not calculated by the application.

15. The selected technical parameter **Range** displays.

16. The number of **Significant Digits** for the Value displays.

17. Save the window.

Using the Laboratory Spreadsheet

The Laboratory Spreadsheet displays each ingredient, product, and byproduct in a formula with the quantity and technical parameter values for each. The Laboratory Spreadsheet lets you manage ingredients and byproducts, and the quantities and technical parameter values for each ingredient and byproduct. Technical parameter values for the product are only calculated for the first product in a formula.

Use the Laboratory Spreadsheet to display and edit laboratory formulas and the Technical parameter values of the items in the formula, and to display the effects that changes to ingredient values have on the product values.

Making changes to a formula on the spreadsheet does not change that formula as it is stored in the database. If you make changes to the items or the item quantities on the spreadsheet, and later retrieve the formula on the Formula Details window, you do not see the changes you have made. This is true even if you saved the spreadsheet. This prevents you from accidentally making permanent changes to a laboratory formula based on scenarios you investigate on the spreadsheet.

To navigate in the laboratory spreadsheet:

After you enter the laboratory formula and formula version that you want to display, the cursor is placed in the Ingredients panel. You can navigate to and from the Ingredients panel and the Technical Parameters panel by pressing Tab, or you can click the appropriate field.

When you enter the Laboratory Spreadsheet, the Products region is displayed following the Ingredients panel.

You can display each region with its appropriate information:

- Products displays the Item, Quantity, and Unit of Measure for each product. Technical parameters are displayed to the right of each product.
- By-products displays the Item, Quantity, and Unit of Measure for each byproduct. Technical parameters are displayed to the right of each byproduct.
- Extended Information displays the description of the ingredient on the line where the cursor is positioned. If the cursor is positioned on a Technical parameter calculated from an expression, the expression is displayed following the ingredient description.

To edit laboratory formulas on a spreadsheet:

1. Navigate to the **Laboratory Spreadsheet** window.

2. The first set of **Technical Parameters** displays. Display additional technical parameters as follows:
   - Click **Next** to display the next series of technical parameters.
   - Click **Previous** to display a previously shown set of technical parameters that are not currently displayed.
   - Click **Recalculate** to recalculate the values displayed on the Laboratory Spreadsheet.
3. The laboratory **Organization** for the current Laboratory displays. You cannot edit this field.
4. Enter the **Formula** code that you want to calculate on the spreadsheet.
5. Enter the Formula **Version** that you want to calculate on the spreadsheet. A **Description** of Formula and version displays. The Description field allows multilingual entries.

Ingredients

6. The following fields are display and can be edited:
   - **Item** code displays for each ingredient. You can add, change, or delete these ingredients.
   - **Quantity** displays for each Item. You can edit these quantities if appropriate.
   - **UOM** for the Quantity displays. You can edit the unit of measure.
   - Columns labeled with names for each technical parameter display. The value of each technical parameter for each item is displayed.
7. If you change the technical parameter values for ingredients, click **Recalculate** to assess the effect on each of the listed ingredient technical parameters.

Products

8. The product **Item** code displays.
9. The **Quantity** of the product displays.
10. The **UOM** for the Quantity displays. technical parameter values for the product are displayed.

By-products

11. The byproduct **Item** code displays.

12. The **Quantity** of the byproduct item displays.
13. The **UOM** for the Quantity displays. Byproduct technical parameter values are displayed.

Extended Information

14. A **Description** of the ingredient displays on the selected line.
15. An **Expression** used to calculate the technical parameter value displays. If an expression is used to calculate the technical parameter value, the cursor must be in the column for an Expression type parameter in order to display that Expression.
16. Save the window.

To list experimental items:

1. Select the **List Experimental Items** check box.
2. Click **Recalculate**.

Saving a Spreadsheet

Save spreadsheets that you can use for comparison purposes.

To save a spreadsheet:

1. Select **Save Spreadsheet** from the **Actions** menu.
2. Enter a **Name** for the Spreadsheet you want to save.
3. Click **OK**.

Retrieving a Spreadsheet

Retrieve spreadsheets of comparisons.

To retrieve a spreadsheet

1. Select **Retrieve Spreadsheet** from the **Actions** menu.
2. Enter a **Name** for the Spreadsheet you want to retrieve.
3. Click **OK**.

Displaying Calculation Errors

Display calculation errors for a product, ingredient, or byproduct.

To display calculation errors:

1. Select **Display Calculation Errors** from the **Actions** menu.
2. Select one of the following:
   - **Product** to display product calculation errors.
   - **Ingredient** to display ingredient calculation errors.
   - **By-product** to display byproduct calculation errors.
3. The following fields are display only:
   - **Type** determines whether the error displayed is for the product, ingredient, or byproduct.
   - **Item** determines whether the technical parameter calculation error is for a product, ingredient, or byproduct.
   - **Technical Parameter** displays the code of the technical parameter where an error occurred.
   - **Error Code** determines a description the calculation error.
   - **Expression** determines the place where the error occurred. A carat (^) points to the approximate location where the error occurred.
4. Click **OK**.

To update a formula:

If you make spreadsheet changes, save the spreadsheet, exit, and then retrieve the spreadsheet for the formula you changed, the changes you made are visible on the Laboratory Spreadsheet window, however the formula itself is not updated with those changes.

You can use the Update Formula command if you want the formula changes you make on the spreadsheet to be saved to the formula in the database.

1. Begin with the appropriate changes displayed on the spreadsheet.
2. Select **Update Formula** from the **Actions** menu.
3. Save the spreadsheet.

To update technical parameters:

Select Update technical parameters before you exit the spreadsheet. If you make changes on the spreadsheet, save it, exit, and then retrieve the spreadsheet for the formula, even though the changes you made are visible on the Laboratory Spreadsheet window, the formula is not be updated with those changes when you select Update Technical Parameters.

You can use the Update Technical Parameters command if you want the formula changes you make on the spreadsheet to be saved to the formula in the database.

1. Begin with the appropriate changes displayed on the spreadsheet.
2. Select **Update Technical Parameters** from the **Actions** menu.
3. Save the spreadsheet.

To interpret spreadsheet calculation errors:

For technical parameters that are calculated from expressions, the Laboratory Spreadsheet displays a string of question marks (?) or asterisks (*) if the application cannot calculate a value.

A string of question marks indicates that a compilation error occurred For example, the value of a variable used in the expression could not be found, or the syntax of the expression is incorrect.

A string of asterisks indicates that the expression could not be calculated for mathematical reasons. For example, division by zero. To display additional information, select Calculation Errors from the Actions menu.

Setting Up Formula Information

Setting Up Header Information

To create a new formula, enter formula header information including formula name, version, and product on the Formula Details window. Formula header information is that information that applies to the entire formula. The Formula Header Summary window lists all formula header information entered.

Setting Up Product and Coproduct Information

Use the Formula Product Lines window to enter each product or coproduct component. For example, skim milk is a coproduct in the production of cream.

Setting Up Ingredient Information

Use the Formula Ingredient Lines window to enter each ingredient component.

Setting Up Byproduct Information

If skim milk were further processed into a fat free cottage cheese product, you could consider the liquid whey as a byproduct. You do not plan for byproducts, but they must be accounted for in the formula.

If the formula produces byproducts, enter these byproducts and their respective quantities on the Formula Details window. Byproducts, like products and coproducts, are items produced by a formula. They differ from products in that you do not plan your production to make byproducts. 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. Depending on the facility, however, these peels can have no monetary value and can require disposal, or they can be sold as raw material for apple cider vinegar. In either case, enter apple peels as a byproduct of your applesauce formula.

OPM does not calculate the cost of production of byproducts. Any items produced by formulas that you want to calculate costs for must be entered as products. They must not be entered as byproducts.

Adding Text to a Formula

Add text to a formula by selecting Edit Text from the Actions menu. You can do this at the header or line level. Text that is associated with a formula is copied to batches that are based on the formula if the GME: Copy Formula Text profile option is set to 1.

See Also

Oracle Process Manufacturing System Administration User's Guide

Using Formula Phantoms

Phantoms are intermediate formulas that are not manufactured as products. Since phantoms are intermediates, they are sometimes referred to as transient subassemblies.

You enter phantoms as formula ingredients, and then explode them when you enter batch tickets. Phantom functionality is a fixed method of multibatch management. Once several batches are linked by a production order number and phantom type dependency, you can manage them as a single production event. There are two fundamental tasks associated with using phantoms:

- Identify one or more ingredients in a formula as phantoms. Use the Phantom Type field to indicate that an item is a phantom.
- Build a formula for each phantom. The method for building a formula that generates 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.

There are two types of phantoms:

- Automatic Generation type creates phantom batches automatically. When you use this function with automatic document numbering, the application automatically creates a dependent phantom batch, and then generates a production identification number to associate all related batches.
- Manual Generation type requires manual intervention to create phantom batches. When you use manual generation, you need to explode each phantom ingredient by selecting the Phantom. When you release a production batch that has phantoms in its formula, a message displays to indicate that the phantom has not been exploded. This advice is given for one of two reasons:
  - It is a manual phantom that you need to explode.
  - There is some problem with the phantom.

Phantoms You Make

You use a basic bread dough for a number of kinds of bread. You do not sell it or keep it in inventory, however you need to track its ingredients. Your formulas for bread contain #BASICBREAD plus whatever other ingredients are needed to turn plain white bread into other kinds of bread such as rye, whole wheat, and pumpernickel.

In this case, you 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. And, there are many varieties of apples. Flavor, texture, and sugar content vary significantly among these apple varieties. Price and availability can vary depending on season or other factors. Therefore, you decide to use an intermediate called #APPLEBLEND that is made up of two or more apple varieties. You do not actually make #APPLEBLEND. However, you use its ingredients in a batch.

Scaling Formulas

You can scale formulas up or down by input or by output:

- If the formula input ingredients are scaled, a specific scaling factor is applied to all scalable ingredients. A calculated output scale factor is applied to all scalable outputs.
- If the formula outputs are scaled, a factor is applied to all scalable outputs. A calculated input scale factor is applied to all scalable ingredients.

In order for this approach to be successful, you need to specify whether the quantities of each item in the formula are fixed or scalable.

Proportional scaling is the least complex scaling type since the given and calculated factors are applied appropriately to the scalable item inputs or outputs. In addition to being present in fixed or scalable quantities, items in a formula can contribute to the yield. In order to scale formulas properly, you need to specify whether the ingredients need to be increased using fixed or proportional scaling. It is possible to have fixed scale ingredients that do not contribute to yield.

Scale Type Definitions

The following lists the types of formula scaling available in New Product Development:

- Type 0 is Fixed scale. Previous releases of the OPM Laboratory Management and OPM Formula Management applications called this scale type Fixed Quantity. This type contributes to yield.
- Type 1 is Proportional scaling. Previous releases of the OPM Laboratory Management and OPM Formula Management applications called this scale type Linear Scaling.
- Type 2 is Fixed scale without yield contribution.

Fixed Scale

To scale a formula or batch with fixed scale items, the application must convert the quantities of ingredients, products, and byproducts to a common unit of measure. The unit of measure used for this calculation is the base unit of measure for the unit of measure type. This is usually mass, and is specified by the GMD: Yield Type profile option in the System Administration application. Item unit of measure conversions to this unit of measure must be performed on the Inventory Control Item Lot/Conversion window for all items that require fixed scaling.

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

Fixed Quantity With Yield Contribution The quantities of items of this scale type are not altered when a formula or batch is scaled. If a formula has a fixed scale ingredient with a quantity of 20kg and the formula output is scaled by a factor of 2, then the quantity remains fixed at 20kg.

These quantities are taken into account when calculating the factor to apply to the scalable ingredients so that the yield ratio is preserved. In the example that follows, the ratio is 100:120 before scaling and 200:240 after scaling the output by a factor of 2.

Item	Formula Quantity	Quantity After Scaling
Product A	100kg	200kg
Ingredient A, Proportional Scaling	50kg	110kg
Ingredient B, Proportional Scaling	50kg	110kg
Ingredient C, Fixed and Contributing	20kg	20kg

Fixed Scale Without Yield Contribution The quantities of items of this scale type are not altered when a formula or batch is scaled. This is the same as the previous example, however the item quantities are not considered when scaling the remaining ingredients. These quantities have no effect on scaling at all. For example in the following, formula Ingredient C is fixed scale without yield contribution. If the product is scaled by a factor of 2, the quantities after scaling appear as if ingredient C were not included.

Item	Formula Quantity	Quantity After Scaling
Product A	100kg	200kg
Ingredient A, Proportional Scaling	50kg	100kg
Ingredient B, Proportional Scaling	50kg	100kg
Ingredient C, Fixed and Noncontributing	20kg	20kg

See Also

Oracle Process Manufacturing Inventory Management User's Guide

Proportional Scale

If the formula contains proportionally scalable ingredients, the scalable ingredients are increased in a direct ratio to produce the new product quantity. In the following example, Product A is proportionally scaled from 100kg to 200kg.

Item	Formula Quantity	Quantity After Scaling
Product A	100kg	200kg
Ingredient A, Proportional Scaling	50kg	100kg
Ingredient B, Proportional Scaling	50kg	100kg

With proportional scaling, Ingredient A and Ingredient B are multiplied by a factor of 2.

Examples of Single and Mixed Scaling Types

The following discussion compares different scaling types:

Single Type Scaling If a formula consists solely of proportionally scalable items then scaling the output or the input scales everything in the same ratio. It is also possible to construct a formula from items that are all fixed scale. This formula would then be ineligible for scaling.

Mixed Type Scaling: Fixed and Proportional All With Yield Contribution If a formula contains both fixed and proportionally scaled items, then the factor applied to the scalable quantities is not the same as the overall scaling factor. Consider a formula that yields 30kg of scalable product by converting 10kg of fixed scale Ingredient 1 and 20kg of scalable Ingredient 2. If the product is scaled by a factor of 2 to produce 60kg, then 50kg of Ingredient 2 is required, not 40kg. The factor applied to the Ingredient 2 quantity is therefore 2.5 rather than 2. If the inputs are scaled by a factor of 2, then the output is 50kg, or 2 times 20kg of Ingredient 2 plus 10kg of Ingredient 1. The yield of the product is scaled by a factor of 1.667 rather than by a factor of 2, as shown in the following:

Item	Formula Quantity	Quantity After Scaling
Product B	30kg	60kg
Ingredient 1 Fixed and Contributing	10kg	10kg
Ingredient 2 Proportional Scaling	20kg	50kg

Mixed Type Scaling: Proportional With Yield Contribution and Fixed Without Yield Contribution If the fixed quantity of an ingredient has no effect on the formula's yield, then the formula line's scaling fields must indicate this. When a fixed quantity item that does not contribute to yield is encountered by the scaling algorithms, the item quantity is not scaled, and is ignored when deriving the scale factor to apply to the remaining items. The formula is treated as consisting only of the remaining items.

If a formula is scaled so that 20kg of scalable product is made by converting 20kg of scalable Ingredient 1 in the presence of 10kg of fixed scale Ingredient 2 that does not contribute to the yield, the output doubles. Scaling the inputs by a factor of 2 doubles the output quantity, since the fixed scale ingredient quantity is not be changed. It would not matter if 100kg of Ingredient 2 were used. The same is true when outputs are scaled.

Item	Formula Quantity	Quantity After Scaling
Product C	20g	40kg
Ingredient 1 Proportional Scaling	20kg	40kg
Ingredient 2 Fixed and Noncontibuting	10kg	10kg

Defining and Maintaining Formulas

Formulas are statements of ingredient requirements. A formula can include processing instructions and ingredient sequencing directions. The formula can also specify the quantities of each item.

Creating a New Formula

Create and define new formulas on the Formula Details window. Specify formula header information and each of the products, ingredients, and byproducts included in the formula. You can display the following windows from the Formula Details window:

- Formula Product Lines
- Formula Product Line Edit
- Formula By-Product Lines
- Formula Ingredient Lines

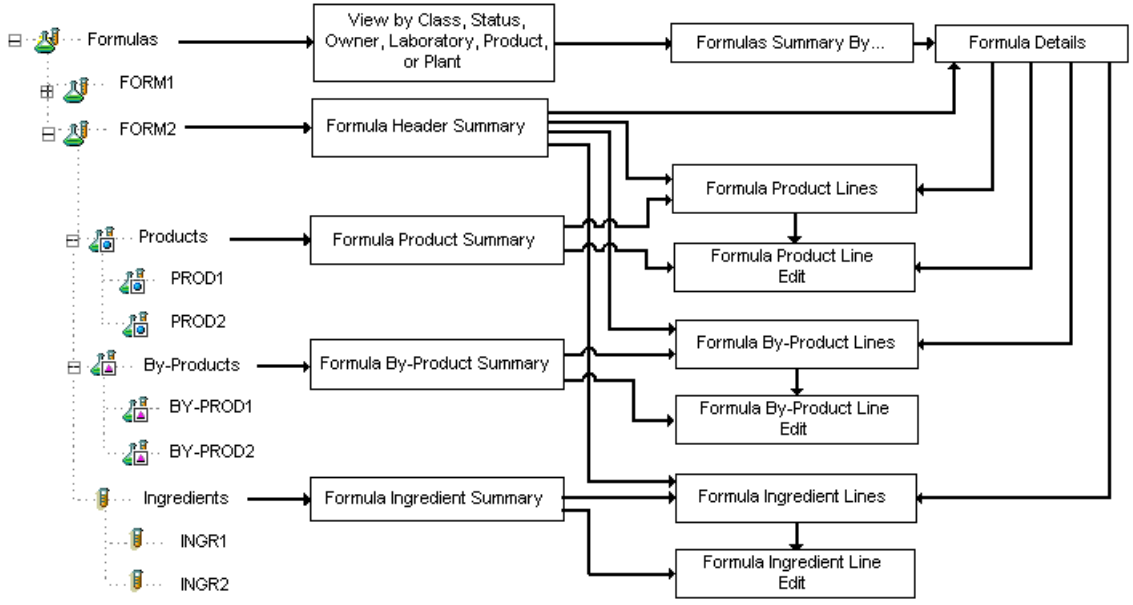
Maintaining Formulas at the Formula Header Level

Use the following windows to maintain formulas at the header level:

- Formula Summary By... to display a list of defined formulas with their individual version numbers and descriptions. These can be displayed by Class, Status, Owner, Laboratory, Product, or Plant. You can display the Formula Details window from the Formula Summary By... window.
- Formula Header Summary to display important descriptive information on a specific formula. You can display the following windows from the Formula Header Summary window:
  - Formula Details
  - Formula Product Lines
  - Formula By-Product Lines
  - Formula Ingredient Lines
- Formula Product Summary to display a summary of all formula products. You can display the following windows from the Formula Product Summary window:
  - Formula Product Lines
  - Formula Product Line Edit

- Formula Product Lines to display individual formula product lines. You can display the Formula Product Line Edit window from the Formula Product Lines window.
- Formula By-Product Summary to display a summary of all formula byproducts. You can display the following windows from the Formula By-Product Summary window:
  - Formula By-Product Lines
  - Formula By-Product Line Edit
- Formula By-Product Lines to display individual formula byproduct lines. You can display the Formula By-Product Line Edit window from the Formula By-Product Lines window.
- Formula Ingredient Summary to display a summary of all formula ingredients. You can display the following windows from the Formula Ingredient Summary window:
  - Formula Ingredient Lines
  - Formula Ingredient Line Edit
- Formula Ingredient Lines to display individual formula ingredient lines. You can display the Formula Ingredient Line Edit window from the Formula Ingredient Lines window.

The following graphic depicts the previously described formula navigation flow from the Formulas node and from the Products, By-Products and Ingredients nodes:



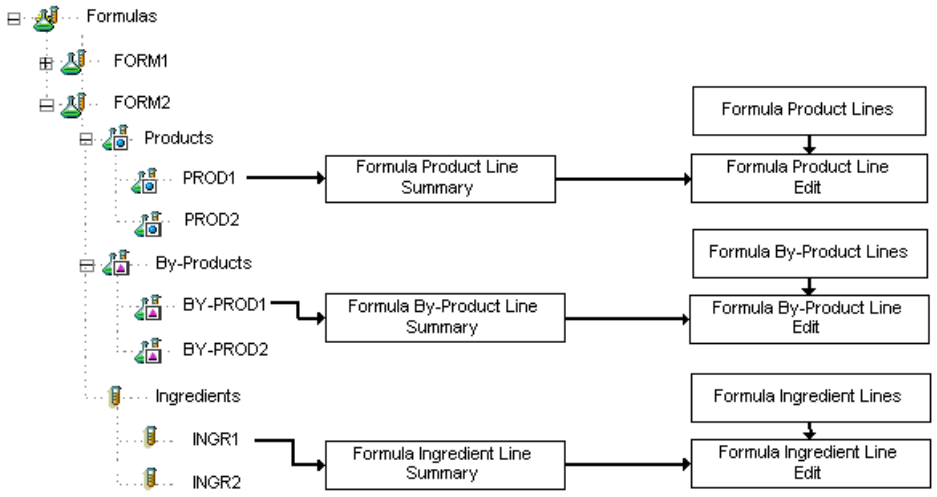
Maintaining Formulas at the Line Level

Use the following windows to maintain formulas at product, byproduct, and ingredient line level:

- Formula Product Line Summary to display a summary of the individual formula product lines, with an item number and unit of measure associated with each line. You can display the Formula Product Line Edit from the Formula Product Line Summary window.
- Formula Product Line Edit to edit individual lines in the Formula Product Line Summary.
- Formula By-Product Line Summary to display a summary of the individual formula byproduct lines, with an item number and unit of measure associated with each line. You can display the Formula By-Product Line Edit window from the Formula By-Product Line Summary window:

- Formula By-Product Line Edit to edit individual lines in the Formula By-Product Line Summary.
- Formula Ingredient Line Summary to display a summary of the individual formula ingredient lines, with an item number and unit of measure associated with each line. You can display the Formula Ingredient Line Edit window from the Formula Ingredient Line Summary window.
- Formula Ingredient Line Edit to edit individual lines in the Formula Ingredient Line Summary.

The following graphic depicts the previously described formula navigation flow from an individual product node (PROD 1), byproduct node (BY-PROD1), and ingredient node (INGR1).



Creating a Packaging Formula

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, enter the packaged item itself as product. Then enter the bulk item, packaging container, and package label as ingredients.

Migrating Formulas from Another Application:

Use the Oracle Process Manufacturing Formula API to migrate formulas to the current release.

See Also

Oracle Process Manufacturing Formula API User's Guide

Finding a Formula

The Find Formulas window enables you to find a specific formula.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To find a formula:

1. Navigate to the **Find Formulas** window.
2. Enter as many parameters as needed to complete the search:
   - Enter search parameters in the **Standard** region for: **Formula**, **Version**, **Description**, **Class**, **Product**, or **Ingredient**.
   - Enter search parameters in the **Advanced** region to enter a specific: **Item**, **Condition**, or **Value**.
3. Click **Find**.
4. Review the results of the search.
5. Close the window.

Displaying the Formula Summary

The Formula Summary window presents a list of formulas associated with the View By... option selected. The window displays individual versions and a brief description of the formula, and can be viewed by Class, Status, Owner, Laboratory, Product, or Plant.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❏ Optionally, enter and save formula classes.
- ❏ Enter and save formulas.
- ❏ Use the View By list to select how you want to view the summary of formulas. Select one of the following:
  - Class to display the list by formula class.
  - Status to display the list by formula status.
  - Owner to display the list by formula owner.
  - Laboratory to display the list by laboratory.
  - Product to display the list by primary product.
  - Plant to display the list by plant.

◗◗ To display a list of all defined formulas:

1. Navigate to the **Formula Summary By...** window.
2. The following fields are display only:
   - **Formula** determines the code assigned to the formula.
   - **Version** determines the version of the Formula.
   - **Description** determines a brief explanation of the Formula.
   - **Product** determines the primary product associated with the Formula.
   - **Quantity** determines the amount of material associated with the Formula.
   - **UOM** determines the primary unit of measure for the material associated with the Formula.
3. Click **Details** to display the **Formula Details** window.
4. Close the window.

Displaying the Formula Header Summary

The Formula Header Summary window displays important descriptive header information on a specific formula.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Optionally, enter and save formula classes.
- ❑ Enter and save formulas.

◗◗ To display a summary of formula headers:

1. Navigate to the **Formula Header Summary** window.
2. Select the appropriate **Formula**.
3. The following fields are display only:
   - **Status** determines the status of the Formula.
   - **Formula** determines the code assigned to the formula.
   - **Version** determines the version of the Formula.
   - **Description** determines a brief explanation of the Formula.
   - **Comments** determines the remarks or notes entered for the Formula.
   - **Class** determines an optional classification assigned to the Formula.
   - **Class Description** determines an optional classification description assigned to the Formula.
   - **Main Product** determines the end item for the listed Formula.
   - **Product Description** displays a description Main Product.
   - **Owner** determines a code for the owner of the Formula.
   - **Owner Name** determines the complete name of the Owner of the Formula.
   - The **Scaling Allowed** check box indicates whether or not the Formula allows scaling. If the check box is selected, scaling is allowed.
   - The **Packaging** check box indicates whether or not the Formula is a packaging type. If the check box is selected, the Formula is a packaging formula.

4. Click **Products** to display the **Formula Product Line Summary** window. Drill down to individual formula product lines on the **Formula Product Line Edit** window.
5. Click **By-products** to display the **Formula By-Product Line Summary** window. Drill down to individual formula byproduct lines on the **Formula By-Product Line Edit** window.
6. Click **Ingredients** to display the **Formula Ingredient Line Summary** window. Drill down to individual formula ingredient lines on the **Formula:Ingredient Line Edit** window.
7. Click **Details** to display the **Formula Details** window.
8. Close the window.

Entering Formula Details

The Formula Details window lets you enter the details for a specific formula.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Optionally, enter and save formula classes.

To enter formula details:

1. Navigate to the **Formula Details** window.
2. Enter the code for the **Formula**. Required.
3. Enter the Formula **Version**. Required.
4. After entering all relevant information and saving the Formula with the default Status of **New**, return to this window if you need to change Formula Status by selecting **Change Status** from the **Actions** menu. Depending on whether Workflow is enabled, a different set of statuses is available.

   Select a **Status** for the Formula you are entering from one of the following:

   - **Approved for Laboratory Use** to indicate that the Formula is approved for laboratory use.
   - **Approved for General Use** to indicate that the Formula is approved for use in production.
   - **Obsolete/Archived** to indicate that the Formula is no longer approved for use and is obsoleted, archived, or both.

   If Workflow is enabled, when you select:

   - **Approved for Laboratory Use**, Status changes to **Request Approval for Laboratory Use** until all approvers have accepted the Formula, then its Status changes to Approved for Laboratory Use.
   - **Approval for General Use,** Status changes to **Request Approval for General Use** until all approvers have accepted the Formula, then its Status changes to Approved for General Use.

   Refer to the Understanding the Status Approval Workflow topic for additional information.
5. Enter a **Description** that briefly explains the Formula. Required.

6. Enter **Comments** that need to accompany this Formula. For example, you could enter CUSTOM PROPRIETARY FORMULA. DO NOT COPY. This field also allows multilingual entries.
7. Enter a **Class** for the Formula to identify how it is categorized. The **Class Description** assigned to the Formula displays.
8. **Organization** displays the name of the organization responsible for the Formula. The **Organization Description** assigned to the organization displays.
9. Enter the **Owner** of the Formula. The **Owner Description** displays.
10. The **Scaling Allowed** check box indicates whether or not the Formula allows scaling.
    - Select the check box to indicate that scaling is allowed.
    - Clear the check box to indicate that scaling is not allowed.
11. The **Packaging** check box indicates whether or not the Formula is a packaging formula.
    - Select the check box to indicate that the Formula is a packaging formula.
    - Clear the check box to indicate that the Formula is not a packaging formula.

Products

12. The **Line** number for each product listed displays. These fields cannot be edited.
13. Enter the **Product** code for each item produced by this Formula. If the formula code you entered is the same as an item code, then that item code is displayed as the default in this field. Required.
14. The **Description** of the Product entered displays. This defaults from the Item Master table.
15. Enter **Quantity** of the Product that this Formula yields. The quantity entered in this field is the default standard quantity used for the recipe. It can be changed at the recipe level. Required.
16. Enter the **UOM** for the Quantity entered. The inventory unit of measure for the item is the default. If you enter a different unit of measure, set up a unit of measure conversion between the default and the unit of measure you decide to enter. Conversions between units of measure of the same unit of measure type are defined when the unit of measure is defined in System Administration. Conversions between different unit of measure types must be defined for each

item on the Item Lot/Sublot Standard Conversion window in Inventory Management. Required.

17. Click **Edit Line** to display the **Formula Product Line Edit** window.
18. Click **Products** to display the **Formula Product Lines** window.
19. Click **By-Products** to display the **Formula By-Product Lines** window.
20. Click **Ingredients** to display the **Formula Ingredient Lines** window.

By-Products

21. The **Line** number for each By-Product listed displays. This field cannot be edited.
22. Enter the **By-Product** code for each item produced by this Formula. If the formula code you entered is the same as an item code, then that item code displays as the default in this field. Required if you enter one or more formula byproducts.
23. The **Description** of the By-Product entered displays. This defaults from the Item Master table.
24. Enter **Quantity** of the By-Product that this Formula yields. The quantity entered in this field is the default standard quantity used for the recipe. It can be changed at the recipe level. Required if you enter one or more By-Products for the Formula.
25. Enter the **UOM** for the Quantity entered. The inventory unit of measure for the Item is the default. If you enter a different unit of measure, set up a unit of measure conversion between the default and the unit of measure you decide to enter. 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 in System Administration. Conversions between different unit of measure types must be defined for each item on the Item Lot/Sublot Standard Conversion window in Inventory Management. Required if you enter one or more By-Products for the Formula.
26. Click **Edit Line** to display the **Formula By-Product Line Edit** window.
27. Click **Products** to display the **Formula Product Lines** window.
28. Click **By-Products** to display the **Formula By-Product Lines** window.
29. Click **Ingredients** to display the **Formula Ingredient Lines** window.

Ingredients

30. The **Line** number for each ingredient listed displays. This field cannot be edited.
31. Enter the **Ingredient** code for each item required by this Formula. Required.
32. The **Description** of the ingredient entered displays. This defaults from the Item Master table.
33. Enter **Quantity** of the ingredient that this Formula requires. The quantity entered in this field is the default standard quantity used for the recipe. It can be changed at the recipe level. Required.
34. Enter the **UOM** for the Quantity entered. The inventory unit of measure for the Item is the default. If you enter a different unit of measure, you set up a unit of measure conversion between the default and the unit of measure you decide to enter. 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 in System Administration. Conversions between different unit of measure types must be defined for each item on the Item Lot/Sublot Standard Conversion window in Inventory Management. Required.
35. Click **Edit Line** to display the **Formula Product Line Edit** window.
36. Click **Products** to display the **Formula Product Lines** window.
37. Click **By-Products** to display the **Formula By-Product Lines** window.
38. Click **Ingredients** to display the **Formula Ingredient Lines** window.
39. Save the window.

◗◗ To scale the formula:

1. Select **Scale** from the **Actions** menu. The **Scale Formula** window displays.
2. Select one of the following:
   - **Percent** to scale by a percentage. Enter the value in the **Factor** field.
   - **Item Quantity** to scale by a specific quantity. Enter the **New Quantity**.
3. Click **OK**. The window displays the scaled formula.

◗◗ To mark the formula for purge:

1. Select **Mark for Purge** from the **Actions** menu.
2. Click **OK**.

To change the formula status:

1. Select **Change Status** from the **Actions** menu.
2. Change the **Current Status** displayed by selecting a different status from the **Change Status To** list.
3. Click **OK**.
4. The **Formula Details** window displays the revised **Status** for the Formula.

To edit the formula text:

1. Select **Edit Text** from the **Actions** menu.
2. Make the appropriate edits to formula text.
3. Save the window.

To access the Production Samples window:

1. Select **Samples** from the **Actions** menu. The **Production Samples** window displays.
2. Evaluate production samples.
3. Close the window.

To access the Production Results window:

1. Select **Results** from the **Actions** menu. The **Production Results** window displays.
2. Evaluate production results.
3. Close the window.

To display specifications:

1. Select **Specifications** from the **Actions** menu. The **Specifications** window displays.
2. Evaluate specifications.
3. Close the window.

To select technical data:

1. Select **Technical Data Selection** from the **Actions** menu. The **Technical Data Selection** window displays.

2. Evaluate technical data.
3. Close the window.

To display product technical parameters:

1. Select **Product Technical Parameters** from the **Actions** menu. The **Product Technical Parameters** window displays.
2. Evaluate the technical parameters for the product.
3. Close the window.

To list experimental items:

1. Select **List Experimental Items** from the **Actions** menu. The **List Experimental Items** window displays.
2. Evaluate the list for the **Laboratory Formula** and **Laboratory Version** displayed. The **Experimental Item** and a brief **Description** are displayed for each component in the list.
3. Close the window.

To display theoretical yield:

1. Select **Theoretical Yield** from the **Actions** menu. The **Theoretical Yield** window displays.
2. Evaluate the **Yield Percent.**
3. Click **OK** to close the window.

Displaying Ingredient Technical Parameters

To display ingredient technical parameters:

1. Select **Ingredient Technical Parameters** from the **Actions** menu. The **Ingredient Technical Parameters** window displays.
2. Evaluate technical parameters for selected ingredients and make necessary changes.
3. Close the window.

Using the View Menu to Find a Formula

The Find selection on the View menu enables you to find a formula.

To find a formula from the View menu:

1. Select **Find** from the **View** menu.
2. Enter as many parameters as needed to complete the search:
   - **Status**
   - **Formula**
   - **Version**
   - **Description**
   - **Product**
   - **Formula Class**
   - **Project**
   - **Organization**
   - **Scaling Allowed**
   - **Marked for Deletion**
3. Click **Find**.
4. Review the results of the search.
5. Close the window.

Displaying the Formula Product Summary

The Formula Product Summary window enables you to display a summary of products listed in a formula.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To display the formula product summary:

1. Navigate to the **Formula Product Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for products listed in the Formula.
   - **Item No** determines the item code for products listed in the Formula.
   - **Quantity** determines the amount for products listed in the Formula.
   - **Description** determines a brief explanation of the product entered. This defaults from the Item Master table.
   - **UOM** determines the unit of measure for products listed in the Formula.
   - **Release Type** determines whether each line is released manually or automatically.
   - **Rework Type** determines if the product Line is is Not Rework or the Default Batch Quantity.
   - **Contributes To Step Qty** displays Yes if the the product contributes to the Step, No if it does not contribute, or is blank if this does not apply.
   - **Required Qty** displays the required amount of material for the product.
   - **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
   - **Cost Allocation** indicates how the cost of this item is allocated for financial rollup purposes. This is set on the Formula Ingredients window.
3. Click **Edit Line** to display the **Formula Product Line Edit** window.
4. Close the window.

Displaying the Formula Byproduct Summary

The Formula By-Product Summary window enables you to display a summary of byproducts listed in a formula.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Enter and save formulas.

◗◗ To display the formula byproduct summary:

1. Navigate to the **Formula By-Product Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for byproducts listed in the Formula.
   - **Item No** determines the item code for byproducts listed in the Formula.
   - **Quantity** determines the amount for byproducts listed in the Formula.
   - **Description** determines a brief explanation of the byproduct entered. This defaults from the Item Master table.
   - **UOM** determines the unit of measure for byproducts listed in the Formula.
   - **Release Type** determines whether each line is released manually or automatically.
   - **Rework Type** determines if the byproduct Line is Not Rework or the Default Batch Quantity.
   - **Contributes To Step Qty** displays Yes if the the byproduct contributes to the Step, No if it does not contribute, or is blank if this does not apply.
   - **Required Qty** displays the required amount of material for the byproduct.
   - **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
   - **Cost Allocation** indicates how the cost of this item is allocated for financial rollup purposes. This is set on the Formula Ingredients window.
3. Click **Edit Line** to display the **Formula By-Product Line Edit** window.
4. Close the window.

Displaying the Formula Ingredient Summary

The Formula Ingredient Summary window enables you to display a summary of ingredients listed in a formula.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Enter and save formulas.

◗◗ To display the formula ingredient summary:

1. Navigate to the **Formula Ingredient Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for ingredients listed in the Formula.
   - **Item No** determines the item code for ingredients listed in the Formula.
   - **Quantity** determines the amount for ingredients listed in the Formula.
   - **Description** determines a brief explanation of the ingredient entered. This defaults from the Item Master table.
   - **UOM** determines the unit of measure for ingredients listed in the Formula.
   - **Release Type** determines whether each line is released manually or automatically.
   - **Rework Type** determines if the ingredient Line is Not Rework or the Default Batch Quantity.
   - **Contributes To Step Qty** displays Yes if the the ingredient contributes to the Step, No if it does not contribute, or is blank if this does not apply.
   - **Scrap Factor** displays the anticipated amount of ingredient loss during manufacturing as a percentage.
   - **Required Qty** displays the required amount of material for the ingredient.
   - **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
   - **Phantom Type** determines whether the ingredient is not a phantom, is an autogenerated phantom, or is a manually generated phantom.

3. Click **Details** to display the **Formula Ingredient Line Edit** window.
4. Close the window.

Displaying a Summary of Formula Product Lines

The Formula Product Line Summary window enables you to display formula product lines.

Prerequisites

❑ Enter and save formulas.

◗◗ To display the formula product line summary:

1. Navigate to the **Formula Product Line Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each product listed in the Formula.
   - **Item** determines the item code for each product listed in the Formula.
   - **Description** displays a brief explanation of the product entered. This defaults from the Item Master table.
   - **Quantity** determines the amount for each product listed in the Formula.
   - **UOM** determines the unit of measure for quantities of product listed in the Formula.
   - **Unit of Measure** displays a description of the UOM.
   - **Release Type** determines whether each line is released manually or automatically.
   - **Scale Type** determines if the Formula scale type.
   - **Rework Type** determines if the product Line is Not Rework or the Default Batch Quantity.
   - **Phantom Type** determines whether the product is not a phantom, is an autogenerated phantom, or is a manually generated phantom.
   - **Contributes To Step Qty** indicates that the Line contributes to the step quantity.
   - Select **Contributes To Yield** check box if the Line contributes to yield. Clear the box if the Line does not contribute to yield.
3. Click **Details** to display the **Formula Product Line Edit** window.
4. Close the window.

Displaying Formula Product Lines

The Formula Product Lines window enables you to display formula product lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To display the formula product lines:

1. Navigate to the **Formula Product Lines** window.
2. **Line** displays the line sequence for each product listed in the Formula.
3. Enter the **Item No** as the item code for each product listed in the Formula. Required.
4. Enter the **Quantity** as the amount for each product listed in the Formula. Required.
5. **Description** displays a brief explanation of the product entered. This defaults from the Item Master table.
6. Enter the **UOM** as the unit of measure for the Quantity. Required.
7. Enter the **Release Type** to indicate how the Line is released. Required.
8. Enter the **Scale Type** to indicate whether the scaling is Fixed, Proportional, or Integer Multiple.
9. **Required Qty** displays the required amount of material for the product.
10. Enter the **Rework Type** to indicate if the Line is Not Rework or the Default Batch Quantity.
11. **Contributes To Step Qty** indicates that the Line contributes to the step quantity.
12. **Required Qty** displays the required amount of material for the product.
13. Enter the **Scale Type** as Fixed, Proportional Scaling, Fixed, NOT contributing to yield or Fixed, Contributing to yield. Required.
14. **Cost Allocation** indicates how the cost of this item is allocated for financial rollup purposes. This is set on the Formula Ingredients window.

15. Click **Edit Line** to edit a selected **Line Number**. The **Formula Product Line Edit** window displays.

Editing a Formula Product Line

The Formula Product Line Edit window enables you to edit formula product lines.

Prerequisites

❑ Enter and save formulas.

◗◗ To edit a formula product line:

1. Navigate to the **Formula Product Line Edit** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each product listed in the Formula.
   - **Item** determines the item code for each product listed in the Formula.
   - **Description** determines a brief explanation of the product entered. This defaults from the Item Master table.
3. Enter the **Quantity** for the product Line listed in the Formula. Required.
4. Enter the **UOM** for the Quantity. Required. **Unit Of Measure** displays a description of the UOM.
5. Enter the **Release Type** for the Line. Required.
6. Enter the **Scale Type** as Fixed, Proportional Scaling, Fixed, NOT contributing to yield or Fixed, Contributing to yield. Required.
7. Enter the **Rework Type** for the product Line rework status. Required.
8. Enter the **Phantom Type** to indicate that this Line is not a phantom, is an autogenerated phantom, or is a manually generated phantom. Required.
9. Select the **Contributes To Step Qty** check box if the Line contributes to step quantity. Clear the box if the Line does not contribute to step quantity.
10. Save the window.

Displaying a Summary of Formula Byproduct Lines

The Formula By-Product Line Summary window enables you to display a summary of formula byproduct lines.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To display a summary of formula byproducts:

1. Navigate to the **Formula By-Product Line Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each byproduct listed in the Formula.
   - **Item** determines the item code for each byproduct listed in the Formula.
   - **Description** determines a brief explanation of the byproduct entered. This defaults from the Item Master table.
   - **Quantity** determines the amount for each byproduct listed in the Formula.
   - **UOM** determines the unit of measure for the quantity.
   - **Unit of Measure** displays a description of the UOM.
   - **Release Type** determines if the Line Number is released manually or automatically.
   - **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
   - **Rework Type** determines if the byproduct line is **Not Rework** or the **Default Batch Quantity**.
   - **Phantom Type** indicates whether the byproduct is not a phantom, is an autogenerated phantom, or is a manually generated phantom.
   - **Contributes To Step Qty** indicates that the Line contributes to the step quantity.
3. Click **Details** to display the **Formula By-Product Line Edit** window.
4. Close the window.

Displaying Formula Byproduct Lines

The Formula By-Product Lines window enables you to display formula byproduct lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To display the formula byproduct lines:

1. Navigate to the **Formula By-Product Lines** window.
2. **Line** displays the line sequence for each byproduct listed in the Formula.
3. Enter the **Item No** as the item code for each byproduct listed in the Formula. Required.
4. Enter the **Quantity** as the amount for each byproduct listed in the Formula. Required.
5. **Description** displays a brief explanation of the byproduct entered. This defaults from the Item Master table.
6. Enter the **UOM** as the unit of measure for the quantity. Required.
7. Enter the **Release Type** to indicate how the Line is released. Required.
8. Enter the **Scale Type** to indicate whether the scaling is Fixed, Proportional, or Integer Multiple.
9. **Required Qty** displays the required amount of material for the byproduct.
10. Enter the **Rework Type** to indicate if the Line is Not Rework or the Default Batch Quantity.
11. Click **Edit Line** to edit a selected **Line Number**. The **Formula By-Product Line Edit** window displays.

Editing a Formula Byproduct Line

The Formula By-Product Line Edit window enables you to edit formula byproduct lines.

Prerequisites

❑ Enter and save formulas.

◗◗ To edit a formula byproduct line:

1. Navigate to the **Formula By-Product Line Edit** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each byproduct listed in the Formula.
   - **Item** determines the item code for each byproduct listed in the Formula.
   - **Description** determines a brief explanation of the byproduct entered. This defaults from the Item Master table.
3. Enter the **Quantity** for the byproduct Line listed in the Formula. Required.
4. Enter the **UOM** for the quantity. Required. **Unit Of Measure** displays a description of the UOM.
5. Enter the **Release Type** for the Line. Required.
6. Enter the **Scale Type** as Fixed, Proportional Scaling, Fixed, NOT contributing to yield or Fixed, Contributing to yield. Required.
7. Enter the **Rework Type** for the byproduct Line rework status. Required.
8. Enter the **Phantom Type** to indicate that this Line is not a phantom, is an autogenerated phantom, or is a manually generated phantom. Required.
9. Select the **Contributes To Step Qty** check box if the Line contributes to step quantity. Clear the box if the Line does not contribute to step quantity.
10. Select the **Contributes To Yield** check box if the Line contributes to yield. Clear the box if the Line does not contribute to yield.
11. Save the window.

Displaying a Summary of Formula Ingredient Lines

The Formula Product Line Summary window enables you to display formula product lines.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

❑ Enter and save formulas.

◗◗ To display a summary of formula ingredients:

1. Navigate to the **Formula Ingredient Line Summary** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each ingredient listed in the Formula.
   - **Item** determines the item code for each ingredient listed in the Formula.
   - **Description** determines a brief explanation of the ingredient entered. This defaults from the Item Master table.
   - **Quantity** determines the amount for each ingredient listed in the Formula.
   - **UOM** determines the unit of measure for the quantity.
   - **Unit Of Measure** displays a description of the UOM.
   - **Release Type** determines if the Line Number is released manually or automatically.
   - **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
   - **Rework Type** determines determines if the ingredient line is Not Rework or the Default Batch Quantity.
   - **Phantom Type** indicates whether the ingredient is not a phantom, is an autogenerated phantom, or is a manually generated phantom.
   - **Contributes To Step Qty** indicates that the Line contributes to the step quantity.
   - **Contributes To Yield** indicates that the Line contributes to yield.
   - **Scrap Factor** displays the anticipated amount of ingredient loss during manufacturing as a percentage.

- **Required Quantity** displays the result of multiplying the Formula Quantity by the quantity one plus the Scrap Factor expressed as a percent. For example, if the Scrap Factor is 10 percent and the Formula Quantity is 100 pounds, the Required Quantity is 110 pounds.

3. Click **Details** to display the **Formula Ingredient Line Edit** window.
4. Close the window.

Displaying Formula Ingredient Lines

The Formula Ingredient Lines window enables you to display formula ingredient lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save formulas.

◗◗ To display the formula ingredient lines:

1. Navigate to the **Formula Ingredient Lines** window.
2. **Line** displays the line sequence for each ingredient listed in the Formula.
3. Enter the **Item No** as the item code for the ingredient listed in the Formula. Required.
4. **Description** displays a brief explanation of the ingredient listed in the Formula.
5. Enter the **Quantity** as the amount for each ingredient listed in the Formula. Required.
6. Enter the **UOM** as the unit of measure for the quantity. Required.
7. **Unit Of Measure** displays a description of the UOM.
8. Enter the **Release Type** to indicate how the Line Number is released. Required.
9. Enter the **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple**.**
10. Enter **Rework Type** to indicate whether the product Line is Not Rework or the Default Batch Quantity. Required.
11. Enter the **Phantom Type** to indicate whether the ingredient is not a phantom, is an autogenerated phantom, or is a manually generated phantom. Required.
12. Enter the **Scrap Factor** as the anticipated amount of ingredient loss during manufacturing as a percentage.
13. **Required Quantity** displays the result of multiplying the Formula Quantity by the quantity one plus the Scrap Factor expressed as a percent. For example, if the Scrap Factor is 10 percent and the Formula Quantity is 100 pounds, the Required Quantity is 110 pounds.

14. Click **Edit Line** to edit a selected **Line Number**. The **Formula Ingredient Line Edit** window displays.

Editing a Formula Ingredient Line

The Formula Ingredient Line Edit window enables you to edit formula ingredient lines.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

❑ Enter and save formulas.

◗◗ To edit a formula ingredient line:

1. Navigate to the **Formula Ingredient Line Edit** window.
2. The following fields are display only:
   - **Line** determines the line sequence for each ingredient listed in the Formula.
   - **Item** determines the item code for each ingredient listed in the Formula.
   - **Description** determines a brief explanation of the ingredient entered. This defaults from the Item Master table.
3. Enter the **Quantity** for the ingredient Line listed in the Formula. Required.
4. Enter the **UOM** for the quantity. Required. **Unit Of Measure** displays a description of the UOM.
5. Enter the **Release Type** for the Line. Required.
6. Enter the **Scale Type** as Fixed, Proportional Scaling, Fixed, NOT contributing to yield or Fixed, Contributing to yield. Required.
7. Enter the **Rework Type** for the product Line rework status. Required.
8. Enter the **Phantom Type** to indicate that this Line is not a phantom, is an autogenerated phantom, or is a manually generated phantom. Required.
9. Select the **Contributes To Step Qty** check box if the Line contributes to step quantity. Clear the box if the Line does not contribute to step quantity.
10. Select **Contributes To Yield** check box if the Line contributes to yield. Clear the box if the Line does not contribute to yield.
11. **Scrap Factor** displays the anticipated amount of ingredient loss during manufacturing as a percentage.
12. **Required Quantity** displays the result of multiplying the Formula Quantity by the quantity one plus the Scrap Factor expressed as a percent. For example, if

the Scrap Factor is 10 percent and the Formula Quantity is 100 pounds, the Required Quantity is 110 pounds.

13. Save the window.

Running the Indented Bill of Materials Report

The Indented Bill of Materials Report is also called the Indented Formulas Report. The report displays all of the ingredients and ingredient quantities that are used to produce an item. Any ingredients that are intermediates can be exploded into their ingredients. Note that circular references are allowed one level deep so that 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.

Prerequisites

❑ Enter and save formulas.

Understanding the Indented Bill of Materials Report

The Indented Bill of Materials Report window enables you to specify the formula, item, or range of formulas for the report. You enter other parameters to specify the formula to use, such as the type of laboratory, whether the formula is used for production, MRP, or cost management, and the effective date of that formula.

The Indented Bill of Materials Report window has two modes of operation:

- Interactive, where the application initially displays a list of all of the formulas that meet the parameters entered. For example, if you enter an item and batch quantity, and there are several valid formulas for making the specified quantity and effective date for the item, the application lists each of those formulas. You select the appropriate formula, and the Indented Bill of Materials Report is generated for that formula.
- Noninteractive, where the application picks the formula to use based on the effective date preference. If two or more formulas have the same preference level, the application uses the most recent formula.

◗◗ To process the report:

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

Selection Range

2. Determine how you want to explode formulas:
   - Select the **Interactive** check box to use the interactive mode. This enables you to select from a list of effective dates.
   - Clear the **Interactive** check box to use the noninteractive mode. This uses the most recent effective date for a formula.

3. When you run an IBOM report for the first time, the report explodes a formula regardless of the selection indicated in this field. Determine if you want to reexplode formulas that have already been exploded in previous reports:
   - Select the **Re-Explode** check box if you want to reexplode formulas that appear in the report.
   - Clear the **Re-Explode** check box if you do not want to reexplode formulas that appear in the report.
4. Determine if you want to explode inactive formulas:
   - Select the **Inactive** check box if you want to explode inactive formulas.
   - Clear the **Inactive** check box if you do not want to explode inactive formulas.
5. Select the **Single Formula** radio button if you want to print the Indented Bill of Materials Report for a single formula. When you click this button, the Formula and Version fields become available for entry.
6. Enter the code of the **Formula** for the Indented Bill of Materials Report. This field is editable if you selected to explode a single formula Required when displayed.
7. Enter the Formula **Version** you want for the Indented Bill of Materials Report. This field is editable if you selected to explode a single formula. Required when displayed.
8. Select the **Single Item** radio button if you want to print the Indented Bill of Materials Report for a specific product. Select one of the following buttons:
   - **Interactive mode** to list formula effective dates for the specified batch quantity of this product.
   - **Noninteractive mode** to have the application select a formula to use for the report based on formula effective date preferences.
9. Enter the **Item** code for the product you for the Indented Bill of Materials Report. This field only displays when you select to explode a single item. Required when displayed.
10. Enter the **Batch Qty** of the product you want for the Indented Bill of Materials Report. This quantity is used to determine the formula to use. The formula must be valid for this quantity and capable of proper ingredient scaling. This field is only displayed if you selected to explode a formula for a single item. Required when displayed.

11. Enter the **UOM** for the batch quantity. This field is only displayed if you selected to explode a formula for a single item. Required when displayed.
12. Select the **Formula Range** radio button if you want to print the bills of materials for a range of formulas. You cannot enter formula ranges if you are using interactive mode.
13. Enter the starting and ending **Range** of formulas you want in the report. This field is only editable if you selected the **Formula Range** button.

Other Options

14. Enter **Scale By** as the appropriate scaling percent. Zero is the default and indicates no scaling. If you enter 100 percent, formula quantities display without scaling.
15. Enter the number of **Levels** you want printed on report. The default value is All.
16. Select a formula **Effective Type** that you want to use as the basis of the report. You can select a production, planning, costing, or regulatory formula.
17. Enter the **Effective Date** for the Formula. Only formulas that are effective on this date are used as the basis for the report. Required.
18. Select the **UOM Type**.

Print Options

19. Enter the number of **Copies** of the report you want printed.
20. Enter the code identifying the **Printer** that you want to use to print the report. Required.
21. Select the report **Style** as **Landscape** or **Portrait**.
22. Click **OK**.

◗◗ To interpret the Indented Bill of Materials Report:

1. Run the **Indented Bill of Materials Report**.
2. The following fields are display only:
   - **Formula** is the code for the formula used for the Indented Bill of Materials Report. A colon appears before the formula version number. A description of the Formula and the Version displays.

- **Type** indicates whether the formulas use is for production, planning, costing, or regulatory.
- **Effective Date** specified. Formulas that appear on the report are effective on this date.
- **Products** produced by the Formula. To the right of each product item code two numbers appear in parentheses. Each number is separated by a slash mark. The first number displays the batch quantity of the product. This number is either the 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 for the batch quantity and formula quantity follow in parentheses with the item description of the product.
- **Scale Percent** indicates the scaling percent for the Formula. A scale percent of zero indicates that a formula is not scaled, and is the same as the scale percent of 100.
- **Use Inactive Formulas** has a 0 if no inactive formulas were used, or a 1 if inactive formulas were used.
- **Max Explode Levels** indicates the maximum number of levels to explode formulas.
- **Exploded Date** is the date the Formula was exploded.
- **Ingredient -- Description** indicates the item code for each ingredient in the exploded formula followed by the ingredient description. In addition to ingredients, byproducts are displayed, and are preceded by the label By-product. If any of the ingredients is an intermediate, or a product in another formula, the ingredient line is followed by the label Formula. This line displays formula codes and versions used to explode intermediates into their ingredients. Following this line are the ingredients in this Formula. In addition to the ingredients, byproducts are identified with the label Byp: and coproducts are identified by Cop: label. Byproducts, coproducts, and ingredients in the Formula that produces the intermediate are indented separately from the ingredients in the main formula. Once the indentation ends, the items that begin at the left margin of the report are ingredients in the main formula listed at the top of the report page.
- **Levels** of indentation are displayed for item lines from the main formula listed at the top of the report page. The highest level is level one is identified by a 1. Intermediates are at level two is identified by 2. The

indentation progresses for each of the defined Levels. For example, 3, 4, and 5 are indentations for levels 3, 4, and 5 respectively.

- **Batch Quantity** is the amount of ingredient necessary to produce the batch quantity of the product. For byproduct or coproduct lines, this is the quantity of the byproduct or coproduct that is produced when the batch quantity of the main product is produced.
- **Formula Quantities** are the amounts of ingredients, byproducts, and coproducts in the Formula.
- **Standard Quantity** of product is the amount used to produce any intermediates. If the quantity of an intermediate needed in the main formula is different from this standard quantity, the intermediate formula is automatically scaled. The scaled product quantity and scaled ingredient quantities are shown in the Batch Quantity column.
- **UOM** is the unit of measure for the Standard Quantity.

To display the output of the Indented Bill of Materials Report:

1. Run the **Indented Bill of Materials Report**.
2. Select **Requests** from the **View** menu.
3. Select **All My Requests**, and click **Find**.
4. Choose the indicator next to the requested **Indented Bill of Materials Report** that you want to display. Make sure that the report phase has completed without errors.
5. Click **View Output**. The report you selected is displayed.

Using Formula Inquiry

The Formula Inquiry Selection window is the starting point for all Formula Inquiry queries. OPM displays this when you select the Formula Inquiry option from the menu. Formula Inquiry enables you to display formula information without edit capabilities. Following are some examples of how you might use Formula Inquiry.

Prerequisites

- ❏ Enter and save formulas.

◗◗ To perform a formula inquiry:

1. Navigate to the **Formula Inquiry Selection** window.
2. Select **Formula Status** as:
   - **Active** to display formulas that are active.
   - **Inactive** to display formulas that are inactive.
   - **All** to display all active and inactive formulas.
3. Select **Effectivity** as how you want to display formulas:
   - **Defined** for defined effectivity.
   - **Undefined** for undefined effectivity.
   - **Both** for all formulas.

Formula Used In

4. 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 cost management.
   - **Regulatory** for use in regulatory management.

Selection Range

5. Select whether you want to display a specific **Formula**, a range of formulas, or all formulas. To select a specific Formula, enter the same formula in the **From** and **To** fields. To select a range of formulas, enter different formula numbers in the **Range From** and **To** fields. To select all formulas leave the fields blank.

6. Select whether you want to display a specific **Formula Version**, a range of versions or all 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 **Range From** and **To** fields. To select all versions leave the fields blank. Required.

7. Select whether you want to display a specific **Routing**, a range of routings or all 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 **Range From** and **To** fields. To select all routings leave the fields blank.

8. Select whether you want to display a specific **Routing Version**, a range of routing versions or all 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 **Range From** and **To** fields. To select all routing numbers leave the fields blank.

9. Select whether you want to display formulas for a specific **Organization**, a range of organizations or all organizations effective for your user code. To select a specific organization, enter the same Organization in the **From** and **To** fields. To select a range of organizations enter Organization in the **Range From** and **To** fields. To select all organizations leave the fields blank.

10. Select whether you want to display the formulas for a specific **Effective Date**, a range of effective dates or all 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 **To** fields. To select all dates leave the fields blank.

11. Select whether you want to display formulas for a specific **Customer**, a range of customers or all 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 **To** fields. To select all formulas leave the fields blank.

12. Enter the item number in this field to display formulas for a specific **Product**.

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

14. Enter the **Ingredient** used to display formulas that contain it. The **Formula Inquiry Summary View** window displays.

To display an expanded formula:

1. Navigate to the **Formula Inquiry Selection** window.
2. Enter the selection parameters. Click **OK**.
3. The **Formula Inquiry Summary View** window appears listing formulas that meet the parameters entered. Formulas with a # preceding them cannot be displayed. These formulas are associated to an organization that is not listed in your organization.
4. Click the selected box next to the formula you want to display. 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 can **Expand** a formula, that is, see its line details on the same window as the parent formula. Or you can decide to display 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 of the window. Intermediate formulas you can display 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 select **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, select **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 they did before you expanded the formula.

To display a lower level or intermediate formula:

1. Navigate to the **Formula Inquiry Selection** box.
2. Enter the selection parameters. Click **OK**.
3. Click the box next to the Formula you want to display. The **Formula View** box appears with the formula you selected. The header and the components of the Formula are displayed. From this list, you can **Expand** a formula to display its line details on the same window as the parent formula. Or, you can decide to display 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 of the window. Intermediate formulas you an display have a + sign preceding them. Intermediate formulas that you cannot display have a # preceding them. You can display any level

formula on the Intermediate Formula View as long as you have access to it. To display formulas that follow level one, drill down to those levels. You do this by exploding intermediate formulas as described previously, and then following a process similar to the one that follows. Alternately, you could enter parameters in the Formula Inquiry Selection box to display these intermediate formulas on the Formula Inquiry Summary View.

4. Select a formula **Line** that is preceded by a + sign. The number displayed indicates the number of levels you can drill down to.
5. Select **Lower Level** from the **Actions** menu. The **Intermediate Inquiry Summary View** appears listing the various effective dates 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** displays.
6. Select an effectivity. The **Intermediate Formula View** window appears with the header information for the intermediate formula with its components listed. At this point, it is not possible to expand any lower level formulas.

Interpreting a Formula Inquiry

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

From this window, you can obtain additional information for any formula. Formula Inquiry Summary consists of two window areas. The top area is scrollable and lists the organization, formula number and version, routing, and minimum and maximum quantity from the formula effectivity record. The bottom area of the window is synchronized with the line that is selected in the upper area and lists the Start and End Dates, the Formula Status, the Standard Quantity, the Customer, and Formula Use.

Formulas you are not permitted to access are shown with a # symbol in the far left column.

You can use flexfields with this window. See *Oracle Applications User's Guide* and O*racle Applications Flexfields Guide*.

Prerequisites

- ❑ Complete the appropriate entries in the Formula Inquiry window to display the Formula Inquiry Summary View.

◗◗ To interpret the Formula Inquiry Summary:

1. Navigate to the **Formula Inquiry Summary View** window.
2. You can display the following fields on the upper area of the **Formula Inquiry** window:
   - **Organization** where the formula is effective. You can only display formulas effective to organizations linked to your user code. A # sign indicates you cannot display the formula.
   - **Formula** code for each formula.
   - **Version** number for each Formula.
   - **Routing** number for each Formula Version.
   - **Version** number for each Routing.
   - **Maximum Qty** for where this Formula is effective.
   - **UOM** listed for each Formula.
3. You can display the following fields on the lower area of the window. Data in this area scrolls as you select different lines on the upper area of the window.

- **Effective Dates** lists the dates that formulas and versions are valid.
- **Active Formula** indicates whether or not a specific Formula is active. It is blank if the Formula is inactive.
- **Standard Qty** is the typical quantity that is produced by each formula.
- **Customer** is the name of the individual or company who buys the listed formulas.

4. **Formula Use** displays the intended use for formulas in production, planning, costing, or regulatory.
5. Close the window.

To display details from a formula inquiry:

The Formula View window initially displays the parent formula or the highest level of the formula.

The window has three areas:

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

Lines have several symbols that indicate if you can display or access a formula:

- a line with a + sign indicates that the item has a formula you can display. 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. You cannot have access to a formula unless appropriate permission is given to you.

1. Select the appropriate **Formula** from the **Formula View Inquiry** window.
2. Select **Formula View** from the **Actions** menu.
3. The following fields are display only:
   - **Formula** displays the unique identifying code for the formula selected.
   - **Version** displays the version of the Formula.

- **Description** displays the detailed descriptive information about the Formula.
- **Comments** displays any comments that you added at the header level.
- **Formula Class** displays how the Formula is classified at the header level.
- **Active Formula** check box is selected if you are displaying an active formula. It is cleared if you are displaying an inactive formula.
- **Scaling Allowed** check box is selected if scaling is allowed on the formula. It is cleared with scaling is not allowed. This information is taken from the formula's additional information.

Details

- **Type** indicates whether the item is a product, byproduct, or ingredient of the formula. The drill down indicator box to the left of Type lets you drill down to a subcomponent.
- **Item** displays the item code of the product, byproduct, or ingredient of the formula.
- **Description** displays a brief description of the item.
- **Quantity** displays the quantity of the item used in the formula.
- **UOM** displays the unit of measure of the item.

4. This information is located in the lower area of the window. The data scrolls as you choose each item in the middle area.

Formula View Fields

- **Phantom Type** indicates whether the ingredient is not a phantom, is an autogenerated phantom, or is a manually generated phantom.
- **Scrap Factor** displays the anticipated amount of ingredient loss during manufacturing as a percentage.
- **Scale Type** displays whether the scaling is Fixed, Proportional, or Integer Multiple.
- **Cost Allocation** indicates how the cost of this item is allocated for financial rollup purposes. This is set on the Formula Ingredients window.
- **Release Type** indicates whether the item is automatic release or manual release. This is set on the Formula Ingredients window.

5. Close the window.

To display formula text:

1. Select **View Text** from the **Actions** menu.
2. The **Text Editor** window for the formula displays. If the cursor is on:
   - the formula header area, header text displays.
   - an unexpanded detail line, text associated with the ingredient displays.
   - an expanded detail line, product text displays.
3. Edit appropriate text.
4. Save the window.

To display an intermediate formula:

The intermediate formula can only be displayed if the intermediate product row is preceded with a + sign.

1. Select **Lower Level** from the **Actions** menu.
2. The intermediate formula of the selected item or product displays on the **Intermediate Formula View Inquiry** window.
3. Close the window.

To expand an intermediate formula:

The intermediate formula is only expand if it is preceded by a + sign.

1. Select **Expand** from the **Actions** menu.
2. The **Formula Inquiry Summary View** displays. It contains the components of the selected intermediate formula.
3. Close the window.

To condense an intermediate formula:

The cursor must be on a line preceded by a - sign. All expanded formulas that follow that line are already condensed.

1. Select **Condense** from the **Actions** menu.
2. The window contracts the display of lower level formulas.
3. Close the window.

Analyzing a Formula

Formula analysis enables you to simulate the contribution of formula components in a product by weight or by volume. You can determine the quantities and percentages of ingredients that have been classified by a Technical Class and a Technical Subclass. For example, a Technical Class could include all volatile organic solvents in a formula. Technical Subclasses of volatile organic solvents could include mineral spirits or alcohols.

The Formula Analysis Parameters window lets you analyze a formula for Technical Class and Technical Subclass composition. You display the results of the analysis in the Formula Ingredient Contribution Analysis window.

Formula analysis is performed in the concurrent program manager so that results can be queried at your convenience. Each time this process is repeated for a specific formula in a specific organization, any previously calculated data is replaced for that formula in that organization. A log file provides an audit trail of these activities.

Prerequisites

- ❏ Set up technical parameters and appropriate sequences.
- ❏ Enter item technical data for the density of every ingredient in formulas to be analyzed.
- ❏ Set up technical classes and technical subclasses for all ingredients that are included in a formula analysis.
- ❏ Enter and save formulas.

◗◗ To analyze a formula:

1. Navigate to the **Formula Analysis Parameters** window.
2. Specify the rule to use during the explosion of formula intermediates:
   - Select **Use Production Formulas** to explode intermediates using a formula that is Approved for General Use. Experimental intermediates are exploded using a formula that is Approved for Laboratory Use.
   - Select **Use Laboratory Formulas** to explode all intermediates using a formula that is Approved for Laboratory Use.

   Required.
3. Enter the code for the **Organization** where you want to analyze the formula. The organization entered retrieves and uses appropriate recipe validity rules

when it explodes an intermediate. If no validity rules are available for the organization entered, global validity rules are applied. Required.

4. Enter the **Formula** to be used in the analysis. Required.
5. Enter the **Version** of the formula to be used in the analysis. Required.
6. The following fields are display only:
   - **Description** of formula entered.
   - **Status** of the formula entered.
7. Enter the **Analysis Quantity** as the total formula output required for this analysis. This value must be greater than zero. Required.
8. Enter the **UOM** for the Analysis Quantity. The unit of measure entered here must be defined in the profile option GMD:UOM Mass Type or GMD:UOM Volume Type. Required.
9. Click **Analyze**. Note the **Request ID** number.
10. Select **View** from the menu, and choose **Requests** to view the status of your request in the concurrent program manager.
11. When your **Request ID** has completed with a **Status** of **Normal**, display the results of the analysis as described in the Displaying Formula Analysis Results topic.
12. Select **View Log...** on the **Requests** window to view the explosions performed on intermediates using the rule that you specified in step 2. If any problems were encountered in the explosion, they are listed in the Log file.

Displaying Formula Analysis Results

The Formula Ingredient Contribution Analysis window displays the details of the analysis of a particular formula in a specified organization. The window consists of two separate views that display Technical Class and Technical Subclass analysis results by weight or by volume.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Analyze a formula as described in the Analyzing a Formula topic.

◗◗ To display the results of a formula analysis by weight:

1. Navigate to the **Formula Ingredient Contribution Analysis** window.
2. Query the analyzed formula.
3. Select **View By Weight**.
4. The following fields are display only:
   - **Organization** displays the facility that owns the formula analyzed.
   - **Analysis Date** displays the date of the analysis.
   - **Formula** displays the formula used in the analysis.
   - **Version** displays the version of the formula used in the analysis.
   - **Status** displays the approval Status of the formula used in the analysis. For example, Approved for Laboratory Use indicates that the formula can be used in the laboratory.
   - **Product** displays the main item in the formula analyzed.
   - **Description** displays a description of the main item in the formula analyzed.
   - **View By** displays the current type of view displayed. When View By Weight is selected, **Weight** displays in this field.
   - **Explosion Rule** displays the currently selected Explosion Rule used to explode intermediates.
   - **Technical Class** displays the Technical Class used to group ingredient contributions.

- **Direct Weight** displays the actual weight of ingredients in the selected Formula Technical Class.
- **Direct (%)** displays the Direct Weight of the Formula Technical Class as a percentage of the Total Weight.
- **Indirect Weight** displays the weight of ingredients within exploded intermediate products in the selected Formula Technical Class.
- **Indirect (%)** displays the Indirect Weight of the Formula Technical Class as a percentage of the Total Weight.
- **Total Weight** displays the sum of the Direct Weight and Indirect Weight in the selected Formula Technical Class.
- **Total (%)** displays Total Weight of the Formula Technical Class as a percent of the entire Formula weight.

Item Detail

5. The following fields are display only:

- **Subclass** displays the Formula Technical Subclass.
- **Item** displays the selected ingredient item in the Formula Technical Subclass.
- **Direct Weight** displays the actual weight of ingredients in the selected Formula Technical Subclass.
- **Direct (%)** displays the Direct Weight of the Formula Technical Subclass as a percentage of the Total Weight.
- **Indirect Weight** displays the weight of ingredients within exploded intermediate products in the selected Formula Technical Subclass.
- **Indirect (%)** displays the Indirect Weight of the Formula Technical Subclass as a percentage of the Total Weight.
- **Total Weight** displays the sum of the Direct Weight and Indirect Weight in the selected Formula Technical Subclass.
- **Class (%)** displays the percentage contribution of the selected Formula Technical Subclass to the entire Formula Technical Class.
- **Formula (%)** displays the percentage contribution of the selected Formula Technical Subclass as a percentage of the total Formula weight.

Subtotal

6. The following fields are display only:
   - **Subclass** displays the Formula Technical Subclass.
   - **Direct Weight** displays the actual weight of ingredients in the selected Formula Technical Subclass.
   - **Direct (%)** displays the Direct Weight of the Formula Technical Subclass as a percentage of the Total Weight.
   - **Indirect Weight** displays the weight of ingredients within exploded intermediate products in the selected Formula Technical Subclass.
   - **Indirect (%)** displays the Indirect Weight of the Formula Technical Subclass as a percentage of the Total Weight.
   - **Total Weight** displays the sum of the Direct Weight and Indirect Weight in the selected Formula Technical Subclass.
   - **Class (%)** displays the percentage contribution of the selected Formula Technical Subclass to the entire Formula Technical Class.
   - **Formula (%)** displays the percentage contribution of the selected Formula Technical Subclass as a percentage of the total formula weight.

To display results of a formula analysis by volume:

1. Navigate to the **Formula Ingredient Contribution Analysis** window.
2. Query the analyzed formula.
3. Select **View By Volume**.
4. The fields displayed are calculated in terms of volume rather than weight.

Interpreting a Formula Ingredient Contribution Analysis

The following example illustrates a simple formula analysis of Formula F1. It assists you in the interpretation of results displayed on the Formula Ingredient Contribution Analysis window.

Formula F1 makes 100 pounds of Product 1. The Analysis Quantity of Formula F1 is 200.00 pounds. Formula F1 contains an intermediate, INT1. The intermediate INT1 is produced by Formula F2.

Formula F1 is composed of:

- 40 pounds of ingredient 1

- Technical Class is Binder
- Technical Subclass is Acrylic

- 10 pounds of ingredient 2
  - Technical Class is Solvent.
  - Technical Subclass is Organic
- 50 pounds of intermediate 1
  - Technical Class is Binder
  - Technical Subclass is Epoxy

Intermediate INT1, Formula F2, is 50 pounds, and is composed of:

- 10 pounds of ingredient 1
  - Technical Class is Binder
  - Technical Subclass is Acrylic
- 25 pounds of ingredient 3
  - Technical Class is Binder
  - Technical Subclass is Acrylic
- 15 pounds of ingredient 4
  - Technical Class is Solvent
  - Technical Subclass is Alcohol

The following presents the Formula Analysis of Formula F1:

Step 1 Calculate the ingredient direct contributions at the formula level:

- ING1 is scaled to 80.00 pounds
- ING2 is scaled to 20.00 pounds
- INT1 is scaled to 100.00 pounds

Step 2 Calculate the ingredient contributions at the exploded lower levels. These calculations consist of exploding each intermediate found at each level of the formula. There is only one intermediate, INT1, in this example. The formula that produces this intermediate does not contain any additional intermediates. Therefore, the formula is exploded only one level. INT1 is exploded using Formula

F2. Formula F2 is scaled by the quantity of INT1 consumed by F1 after scaling, or 100 pounds.

Exploding F1 results in the following:

- 80.00 pounds of ING1 calculated from the direct contribution
- 20.00 pounds of ING1 calculated from the explosion of INT1
- 20.00 pounds of ING2 calculated from the direct contribution
- 50.00 pounds of ING3 calculated from the explosion of INT1
- 30.00 pounds of ING4 calculated from the explosion of INT1

The Formula Ingredient Contribution Analysis for this example is:

Direct Weight

Binder

- Acrylic
  - ING1 is 80.00 pounds, representing 100% of the Direct Weight contribution
  - Subclass Direct Weight is 80.00 pounds
  - Class Direct Weight Total is 80.00 pounds

Binder Class Total is 80.00 pounds

Solvent

- Organic
  - ING2 is 20.00 pounds, representing 100% of the Direct Weight contribution
  - Subclass Direct Weight is 20.00 pounds

Solvent Class Total is 20.00 pounds

Indirect Weight

Binder

- Acrylic
  - ING1 is 20.00, representing 28.60% of the Indirect Weight contribution
  - ING3 is 50.00, representing 71.40% of the Indirect Weight contribution
  - Subclass Indirect Weight is 70.00 pounds

Binder Class Total is 70.00 pounds

Solvent

- Alcohol
  - ING 4 is 30.00 pounds, representing 100% of the Indirect Weight contribution

Solvent Subclass Total is 30.00 pounds

Total Weight

Binder

- Acrylic
  - ING1 is 100.00 pounds, representing 66.67% of the Class
  - ING3 is 50.00 pounds, representing 33.33% of the Class

Binder Subclass Total is 150.00 pounds, representing 100.00% of the Class and 75.00% of the formula weight

Solvent

- Organic
  - ING2 is 20.00 pounds, representing 40.00% of the Subclass

Solvent Subclass Total is 20.00 pounds, representing 40.00% of the Subclass and 10.00% of the formula weight

- Alcohol
  - ING4 is 30.00 pounds, representing 60.00% of the Subclass

Solvent Subclass Total is 30.00 pounds, representing 60.00% of the Subclass and 15.00% of the formula weight

Ingredient Contribution Summary

Binder is 75.00% of the formula weight

Solvent is 25.00% of the formula weight, with 10% Organic Subclass and 15% Alcohol Subclass

Finding a Formula Analysis

The Find Analysis window helps you find an existing Formula Ingredient Contribution Analysis.

Prerequisites

- ❑ Analyze formulas as described in the Analyzing a Formula topic.

◗◗ To find a formula analysis:

1. Navigate to the **Find Analysis** window.
2. Enter one or more of the following fields to narrow your search:
   - **Organization** where the analysis was performed.
   - **Formula** code of the formula.
   - **Version** number of the Formula.
   - **Product** as the main item in the Formula.
3. Click **Find**.
4. The **Formula Ingredient Contribution Analysis** window displays the analysis found that meets your search parameters.

Overriding Default Explosion Rules

The Item Technical Data Selection window enables you to specify the formula sources for intermediate technical parameter values, thereby overriding automatic selection.

Prerequisites

- ❑ Set up technical parameters.
- ❑ Set up technical parameter sequences.
- ❑ Enter item technical data for the density of every ingredient in formulas to be analyzed.
- ❑ Set up technical classes and technical subclasses for all ingredients that are included in a formula analysis.
- ❑ Enter and save formulas.

◗◗ To override default explosion rules:

1. Navigate to the **Formula Details** window.
2. Select the **Ingredient** for custom explosion rules.
3. Select **Item Technical Data Selection** from the **Actions** menu. The **Item Technical Data Selection** window displays.

Spreadsheet

4. This region is not used in this procedure.

Ingredient Contribution

5. Enter the **Formula** number and **Version** to be used for the explosion of the intermediate during the formula ingredient contribution analysis calculation.
6. Click **OK**.

4

Operations

This topic shows you how to define and maintain operations, activities, and resources. You are also shown to find an operation. Summaries of operations and operation headers provides an overview what is created. The process to enter operation activity details and activity-resource details is explained. You are also shown how to display activity lines and edit a summary of resource lines.

The following topics provide a basic understanding of operations:

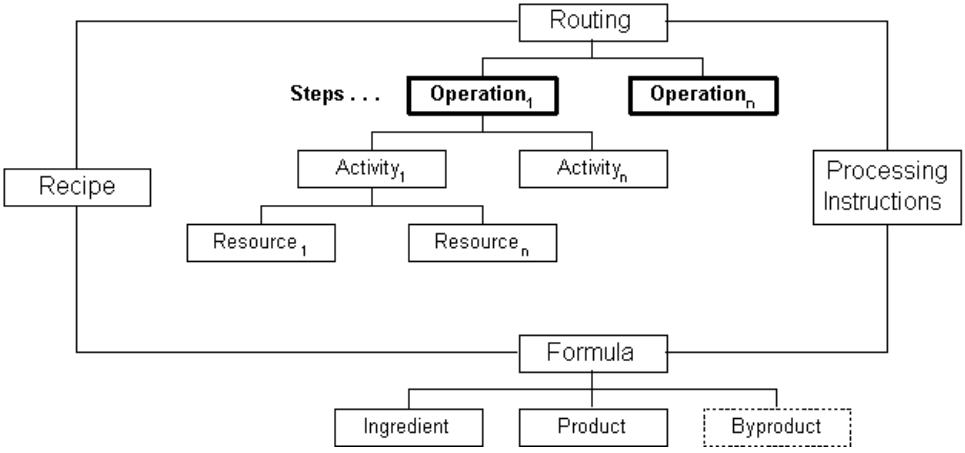
- Understanding Operations
- Requirements
- Solutions
- Defining and Maintaining Operations
- Defining and Maintaining Activities
- Defining and Maintaining Resources
- Finding an Operation
- Displaying the Operations Summary
- Displaying the Operation Header Summary
- Entering Operation Activity Details
- Entering Activity-Resource Details
- Displaying Operation Activity Line Summary
- Displaying the Resource Line Summary
- Editing a Resource Line

Understanding Operations

An operation is an ordered set of activities that have to be completed for a predetermined step in a production batch. Resource requirements that are needed to perform these activities are usually specified. You build operations from activities that require resources.

Operations are depicted hierarchically in the following diagram that shows the:

- Routing composed of a series of Operations organized in Steps.
- Operations composed of Activities containing Resources.
- Formula composed of Ingredient, Product, and possibly Byproduct.
- Recipe linking the Routing and Formula together with Processing Instructions.



The assembly of several operations in a stepwise progression creates a Routing.

Requirements

Following are some requirements that customers have for operations in New Product Development. The answers are explained in detail in the Solutions topic.

Does the application maximize production capacity resource usage?

Yes. By using the Charge to calculate resource usage, the application captures the number of passes required to process a step based on the maximum capacity of that step. This is derived from specific resources used and can assist in maximizing usage of production capacity resources.

Can the application simplify the repeated entry of the same data for the same activity?

Yes. Using an Activity Factor defines the number of iterations that a specific activity can be performed during an operation. The Activity Factor is considered in planning and calculating resource usage.

Solutions

New Product Development provides solutions to help resolve issues at every stage of the product development process. The following represent some of the key performance solutions for operations.

Charges Refine Processing Requirements for Better Planning and Cost Management In many process manufacturing plants, the capacity of a step is determined by the equipment used. For example, a mixing tank has a maximum capacity of 1000 gallons. If more than 1000 gallons of material is added to this tank, it would overflow. This maximum capacity determines the number of charges or iterations that are required to process the ingredients required for a defined batch. The time that it takes to mix any volume of material through this operation is a fixed value. For example, one charge can require one hour of mixing. The problem arises when a batch is greater than the step capacity, and the step must be repeated several times to make a full batch volume. Proportional scaling does not always reflect the processing requirements. For example, if a batch is planned for 4500 gallons and the routing step can have a tank capacity of 1000 gallons, five charges, or mini-batches, would be required to process the full 4500 gallons. Proportional scaling results in only 4.5 hours of process time, whereas the actual required process time would be five hours. By refining the process requirements, the application delivers a better assessment of usage rates that affect planning and cost management.

Activity Factors Streamline Resource Definition An Activity Factor defines the number of times an activity is performed. For example, if a quality test must be performed at the beginning, middle, and end of a mixing time period, you must use an Activity Factor of three. Activity Factors are applied to resource usage when planning and calculating resource costs. They can be set to zero to exclude a particular activity or to select specific equipment or resources.

Defining and Maintaining Operations

Operations are composed of a sequence of activities and required resources. You enter and maintain the sequence of activities in the operation, and specify the resource, resource usage, and process quantity used for each activity. For example, a mixing activity can require one-half hour of use of a mixing system. Resource usage and cost analysis codes that are associated with each activity are used to calculate activity-based product costing.

Creating a New Operation

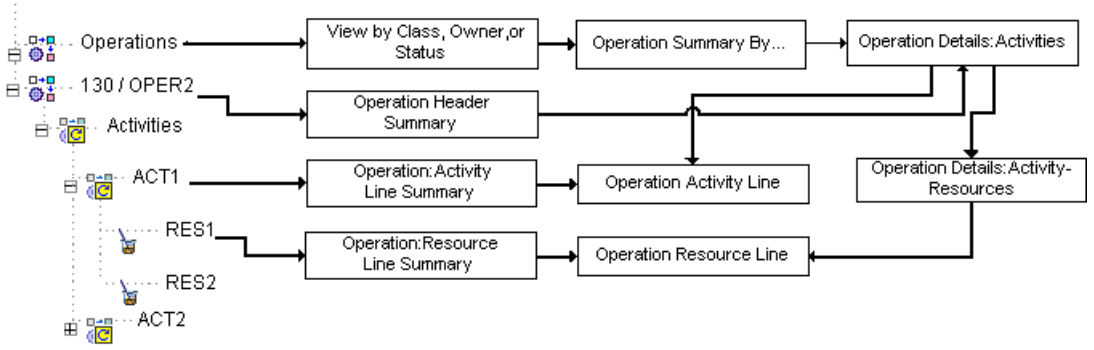
Create new operations on the Operation Details Activities window. When you define an operation, specify a combination of one or more activities performed in the production batch and assign the resources used to perform those activities. A resource can be any noninventory item that is used in production, such as a blender or a heating device.

Maintaining Operations

Use the the following windows to maintain operations:

- Operations Summary By... to display a list of all defined operations with their individual version numbers and validity rules. These are summaries by Class, Status, or Owner. Display the Operation Details Activities window from the Operations Summary By... window.
- Operation Header Summary to display descriptive information on a specific operation. Display the Operation Details Activities window from the Operation Header Summary window.
- Operation Details Activities to enter, view, and edit an operation. Display the following window from the Operation Details Activities window:
  - Operation Activity Line
  - Operation Details Activity Resources

The following graphic depicts the previously described operation navigation flow:


Operations
130 / OPER2
Activities
ACT1
RES1
RES2
ACT2
View by Class, Owner,or Status
Operation Summary By...
Operation Details:Activities
Operation Header Summary
Operation:Activity Line Summary
Operation Activity Line
Operation Details:Activity-Resources
Operation:Resource Line Summary
Operation Resource Line

Defining and Maintaining Activities

Activities are the basic tasks performed at your plant such as setup, mixing, cleanup, or cooling. You combine activities with resources such as blender, oven, labor, or utilities to define operations. Basic plant activities are identified by activity codes. These codes are then combined to define the sequence of activities that can make up an operation. You can associate a cost analysis code with each activity. For example, by defining cost classes, you can categorize individual activities on whether or not they add value. Activity costs are the basic components of an activity based accounting system.

Prerequisites

❑ Set up activities.

Attaching Activities to Operations

Attach activities that were created in setup to specific operations using the Operation Details Activities window.

Maintaining Activities

You can use the the following windows to maintain activities:

- Operation Activity Line Summary to view a summary of a specific activity line including its description, process parameter, and factor. You can display the Operation Activity Line window from the Operation Activity Line Summary window.
- Operation Activity Line to view and edit pertinent information that is relevant to a specific operation line selected.

Defining and Maintaining Resources

You define and maintain resources on the Operation Activity window. Resources are the assets to produce batches, including production equipment, and employee labor. You can define each resource very generally, for example, OVENS, or specifically OVEN 1, OVEN 2 . . . OVEN n. For each resource assign a classification code for cost management purposes. You can group resources into resource classifications, for example, group OVENS and STOVES into COOKING UNITS.

Prerequisites

❑ Set up resources.

See Also

Oracle Process Manufacturing Cost Management User's Guide

Attaching Resources to Activities

Attach resources that were created in setup to activities using the Operation Activity window.

Maintaining Resources

Use the the following windows to maintain resources:

- Operation Resource Line Summary to view a summary of resource lines. You can display the Operation Resource Line window from the Operation Resource Line Summary window
- Operation Resource Line to view and edit specific resource lines.

Finding an Operation

The Find Operations window enables you to find a specific operation.

Prerequisites

❑ Enter and save operations.

◗◗ To find an operation:

1. Navigate to the **Find Operations** window.
2. Enter as many parameters as needed to complete the search:
   - Enter search parameters in the **Standard** region for: **Operation**, **Version**, **Description**, **Class**, **Valid From** date, **Valid To** date, **Process Quantity**, or **Status**.
   - Enter search parameters in the **Advanced** region for a specific: **Item**, **Condition**, or **Value**.
3. Click **Find**.
4. Review the results of the search.
5. Close the window.

Displaying the Operations Summary

The Operations Summary By... window displays a list of all defined operations with their individual version numbers and validity rules, by class, owner, or status. Display the Operation Details Activities window to view specific activities associated with each of the operations.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❏ Optionally, enter and save operation classes.
- ❏ Enter and save operations.
- ❏ Use the View By list to select how you want to view the summary of operations. Select one of the following:
  - Class to display the list by operation class.
  - Owner to display the list by owner.
  - Status to display the list by operation status.

◗◗ To display a list of all defined operations:

1. Navigate to the **Operations Summary By...** window.
2. The following fields are display only:
   - **Operation** is the name of the Operation.
   - **Version** is the version of the Operation.
   - **Valid From** is the date the Operation is effective.
   - **Valid To** is the date the Operation is no longer effective.
   - **Description** is a brief explanation of the Operation.
   - **Class** is the optional class of the Operation.
   - **Process Quantity UOM** is the unit of measure for the process quantity associated with the Operation.
3. Click **Details** to display the **Operation Details Activities** window.
4. Close the window.

Displaying the Operation Header Summary

The Operation Header Summary window displays important descriptive information on a specific operation. Use the Operation Details Activities window to enter, view, and edit an operation.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Optionally, enter and save operation classes.
- ❑ Enter and save operations.

◗◗ To display a summary of the operation headers:

1. Navigate to the **Operation Header Summary** window.
2. Select the appropriate **Operation**.
3. The following fields are display only:
   - **Status** is the status of the Operation. Statuses are entered on the **Operation Details Activities** window.
   - **Operation** is the name of the Operation.
   - **Version** is the version of the Operation.
   - **Description** is a brief explanation of the Operation.
   - **Class** is the optional class assigned to the Operation.
   - **Class Description** is a brief description of the Class.
   - **Valid From** is the date the Operation is effective.
   - **Valid To** is the date the Operation is no longer effective.
   - **Process Qty UOM** is the unit of measure for the process quantity associated with this Operation.
4. Click **Details** to display the **Operation Details Activities** window.
5. Close the window.

Entering Operation Activity Details

Operations are a combination of one or more activities performed in a production batch and the resources used to perform those activities. The Operation Details Activities window links operations to activities. Use the Activity Factor and activity-resource association to enter an activity several times within an operation. Activity Factor simplifies data entry of the same activity several times by defining the specific number of times that an activity is performed during an operation. Activity factor is taken into consideration for planning and resource calculation purposes. Display the Operation Activity window to link one or more resources to a single activity. Go to the Operation Activity Line Edit window to edit individual activity lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❏ Optionally, enter and save operation classes.
- ❏ Enter and save activities.
- ❏ Enter and save resources.

◗◗ To enter operation details and activities:

1. Navigate to the **Operation Details Activities** window.
2. Enter a name for the **Operation** to be entered. Required.
3. After entering all relevant information and saving the Operation with the default Status of **New**, return to this window if you need to change Operation Status by selecting **Change Status** from the **Actions** menu. Depending on whether Workflow is enabled, a different set of statuses is available.

   Select a **Status** for the Operation you are entering from one of the following:

   - **Approved for Laboratory Use** to indicate that the operation is approved for laboratory use.
   - **Approved for General Use** to indicate that the operation is approved for use in production.
   - **Obsolete/Archived** to indicate that the operation is no longer approved for use and is obsoleted, archived, or both.

   If Workflow is enabled, when you select:

- **Approved for Laboratory Use**, Status changes to **Request Approval for Laboratory Use** until all approvers have accepted the operation, when its Status changes to Approved for Laboratory Use.
- **Approval for General Use,** Status changes to **Request Approval for General Use** until all approvers have accepted the operation, when its Status changes to Approved for General Use.

Refer to the Understanding the Status Approval Workflow topic for additional information.

4. Enter the **Version** number for this operation. The combination of operation number and version must be unique. Required.
5. Enter a brief **Description** for the Version entered. Required.
6. Enter a **Class** for this operation to identify how it is categorized. The **Class Description** assigned to the Class displays.
7. Enter a **Valid From** date as a validity rule for this operation. The default date is the current system date. Required.
8. Enter a **To** date as a validity rule for the expiration of this Operation. If there is no expiration date for this Operation, leave the field blank.
9. Enter a **Process Qty UOM** for this Operation. Required.

Activities

10. Enter an **Activity** required for this Operation. A **Description** of this activity displays.
11. Enter the **Activity Factor** to specify the number of times the activity is performed in this Operation.

    For example, if a quality test must be performed at the beginning, middle, and end of a mixing time period, rather than defining the activity and associated resources three times, use the Activity Factor or multiplier to indicate the number of iterations for the same activity.

    To indicate that the activity must be performed at the beginning, middle, and end of the mixing time period, enter a factor of 3. Factors are applied to usage of a resource when planning and calculating cost. Set the Activity Factor to zero to exclude a particular activity. You can also use this to select equipment used for a production run within this specific plant.
12. Enter the **Offset Interval** as the time delay from the start of the activity to the point where the resource is actually required.

13. Repeat steps 10 through 12 for each Activity you need to enter for the specified Operation.
14. Save the window.
15. Click **Resources** to display the **Operation Activity** window.
16. Click **Edit Activity Line** to display the **Operation Activity Line Summary** window.

To mark an operation for purge:

1. Select **Mark for Purge** from the **Actions** menu.
2. Click **OK**.

To edit operation text:

1. Select **Edit Text** from the **Actions** menu.
2. Make the appropriate edits to operation text.
3. Save the window.

To display specifications:

1. Select **Specifications** from the **Actions** menu. The **Specifications** window displays.
2. Evaluate specifications
3. Close the window.

To display quality control Samples:

1. Select **Samples** from the **Actions** menu. The **Samples** window displays.
2. Evaluate the samples.
3. Close the window.

To display quality control Results:

1. Select **Results** from the **Actions** menu. The **Results** window displays.
2. Evaluate the results.
3. Close the window.

To view alternate resources for the operation:

1. Select **Operation Alternate Resources** from the **Actions** menu.
2. The window displays the alternate resources available to this Operation if any exist.
3. Close the window.

To change the operation status:

1. Select **Change Status** from the **Actions** menu.
2. Change the **Current Status** displayed by selecting a different Status from the **Change Status To** list.
3. Click **OK**.
4. The **Operation Details Activities** window displays the revised **Status** for the Operation.

Using the View Menu to Find an Operation

The Find selection on the View menu enables you to find an operation.

To find an operation from the View menu:

1. Select **Find** from the **View** menu.
2. Enter one or more of these search parameters.
   - **Status**
   - **Operation**
   - **Version**
   - **Description**
   - **Operation Class**
   - **Activity**
   - **Resource**
   - **Mark for Deletion**
3. Click **Find**.

Entering Activity-Resource Details

The Operation Activity window assigns resources to each activity, and lets you edit a resource line once activities are associated with an operation. You access this window when you click Resources on the Operation Details Activities window.

Charge calculates resource usage by capturing the number of passes required to process a step. This is based on the maximum capacity of the step as derived from specific resources used.

You can use flexfields with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Enter and save operations.

◗◗ To assign resources to an activity:

1. Navigate to the **Operation Activity** window.
2. Enter the **Operation** to associate activities. Required.
3. The **Status** assigned to the Operation displays.
4. The current **Version** number for the Operation displays.
5. Select the **Activity** to enter or edit a resource.
6. Click **Resources**.

Throughput

Process units of measure and usage units of measure are derived from the plant resource if one is defined. You can override these values using this window. A process quantity is converted to an operation process quantity unit of measure if needed.

7. The **Resource** and its **Description** displays.
8. Enter the planned **Process Quantity** for the Resource. Required.

   This value combined with the Usage quantity define the usage rate. For example, if a resource can mix 200 gallons per hour, enter 200 as the Process Quantity, 1 as the Usage, and the unit of measure for hours.
9. The **UOM** entered on the header displays. This is the unit of measure for the planned process quantity.
10. Enter the planned resource **Usage**. This is typically expressed in hours.

11. Enter the **UOM** as the unit of measure for the Resource. Required.

Cost Information

12. The **Resource** and its **Description** displays.
13. Enter the **Component Class** code. The **Component Class Description** for the Resource displays. The Component Class is set up in the Cost Management application and defaults from the Resource. Required.
14. The **Cost Analysis Code** and **Cost Analysis Description** for the Activity displays. This code defaults from the Activity.

Scheduling Information

15. The **Resource** and its **Description** displays.
16. Select a **Plan Type**. You need to determine if this Resource is Auxiliary, Primary, or Secondary. Required.
    - Select **Auxiliary** for resources that work as companions with the primary resources to perform an activity in the Operation. These resources do not affect the rate of the Operation. For example, a primary resource in a mixing activity is a mixer with a throughput rate of 100 gallons per hour. An auxiliary resource is the worker who operates the mixer. No matter how fast or slow the worker is, the mixer rate remains at a constant 100 gallons per hour.
    - Select **Primary** to indicate that this is the rate determining resource. It limits or determines throughput. It is also referred to as the bottleneck or critical resource. It is recommended that the RUN-TIME activity's resource be assigned this way.
    - Select **Secondary** to indicate the resource that would replace the primary resource when it is not available. This resource performs the same task as the primary resource, but can have a different usage.
17. Enter the **Count** as the number of resources needed for the activity entered. For example, it two blenders are used for mixing, enter a 2 in the count. Required.
18. Enter the **Offset Interval** as the time delay from the start of the activity to the point where the resource is actually required.
19. Select the **Scale Type**. You can designate whether scaling is used to determine resource quantity. Scaling is defined as the proportional increase or decrease of resources. For example, setup and cleanup activities are usually not scaled, while manufacturing activities are scaled. This field defaults to Linear scaling.

- Select **Linear** if the resources change in a ratio that is proportional to the quantity of material being processed.
- Select **Fixed** if the resources do not change, regardless of the quantity of material being processed.
- Select **Fixed By Charge** if resources change as a result of number of charges specified. With this type of scaling:

  Resource Usage = Count multiplied by Usage multiplied by Charges

Process Parameters

20. The **Resource** and its **Description** displays.
21. Enter **Process Parameter 1 - 5**.
22. Save the window.

To edit a resource line:

1. Select the appropriate **Resource** line.
2. Click **Edit Resource Line** to display the **Operation Resource Line Edit** window.
3. Make the appropriate changes to the line.
4. Save the window.

Displaying Operation Activity Line Summary

The Operation Activity Line Summary window presents all pertinent information that is relevant to a specific operation line selected. Use this window to edit the selected activity line. To edit this information click Details to display the Operation-Activity Line Edit window.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save operations.
- ❑ Enter and save activities.

◗◗ To display information about an operation activity line:

1. Navigate to the **Operation Activity Line Summary** window.
2. The following fields are display only:
   - **Activity** indicates the activity selected for this Operation.
   - **Description** is a brief explanation of the activity.
   - **Factor** is the process factor entered for the activity. Required.
   - **Offset Interval** is the time required before the activity begins. In process operations, this is usually the number of hours from the batch step start to the start time of this activity.
3. Click **Details** to display the **Operation Activity Line** window.
4. Close the window.

◗◗ To edit an operation activity line:

1. Navigate to the **Operation Activity Line** window.
2. The following fields are display only:
   - **Activity** displays the activity selected for the Operation.
   - **Description** is a brief explanation of the activity.
3. Enter the **Factor** as the process factor for the activity. Required.
4. Enter the **Offset Interval** as the time delay from the start of the activity to the point where the resource is actually required.

5. Save the window.

Displaying the Resource Line Summary

The Operation Resource Line Summary window presents all pertinent information that is relevant to a selected operation-activity line.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save operations.
- ❑ Enter and save activities.

To display the resource line summary:

1. Navigate to the **Operation Resource Line Summary** window.

Resource

2. The following fields are display only:
   - **Resource** and its **Description** indicate the Resource you are editing.
   - **Quantity** displays the process amount for the Resource with **Quantity UOM** as its unit of measure.
   - **Usage** displays the rate of use for the resource. **Usage UOM** is the unit of measure for the Resource. This is usually specified in hours.
   - **Component Class** and **Class Description** indicate the assigned component class for the Resource.
   - **Cost Analysis Code** indicates the cost code assigned to the resource with its associated **Cost Analysis Descriptor**.
   - **Plan Type** displays whether this resource is a primary, secondary, or auxiliary resource. **Auxiliary** indicates resources that work as companions with the primary resources to perform an activity in the Operation. **Primary** indicates a the rate determining resource. **Secondary** indicates the resource that would replace the primary resource when it is not available. This resource performs the same task as the primary resource, but can have a different usage.
   - **Count** indicates the number or quantity of the resource used in the specified plant where you are defining production costs and usage availability.

- **Scale Type** displays which type of scaling is used to determine resource quantity. **Proportional** scale type indicates the resources change in a ratio that is proportional to the quantity of material being processed. **Fixed** scale type indicates the resources do not change, regardless of the quantity of material being processed. **Fixed By Charge** indicates resources change as a result of number of charges specified. With this type of scaling:

  Resource Usage = Count multiplied by Usage multiplied by Charges

- **Offset** indicates the time delay from the start of the activity to the point where the resource is actually required. This lag time is used by Process Operation Control.

Process Parameters

3. The following fields are display only:

   - **Resource** indicates the Resource you are displaying.
   - **Process Parameter 1 - 5** displays the first through fifth Process Parameter.

4. Click **Details** to display the **Operation Resource Line** window where you can edit individual Resource lines.

Editing a Resource Line

The Operation Resource Line window enables you to edit resource lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Enter and save operations.
- ❑ Enter and save activities.

◗◗ To edit a resource line:

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

Resource

2. **Resource** and its **Description** indicate the Resource you are editing.
3. Enter the appropriate process **Quantity**. Required.
4. The **Quantity UOM** displays for the process quantity entered.
5. Enter the appropriate **Usage** as the rate of use for the Resource. This value is usually expressed in hours or partial hours. For example, one hour and 15 minutes would be entered as 1.25. Required.

   Resource Usage = Count multiplied by Usage multiplied by Charges
6. Enter the appropriate **Usage UOM** as the unit of measure the resource is measured in the specified plant. This is usually specified in hours. Required.
7. Enter the appropriate **Component Class**. The **Class Description** assigned to the Component Class displays. Required.
8. Enter the appropriate **Cost Analysis Code** for the resource. Required.
9. The **Cost Analysis Descriptor** associated with the Cost Analysis Code displays.
10. **Plan Type** indicates whether this Resource is an auxiliary, primary, or secondary resource.
    - Select **Auxiliary** for resources that work as companions with the primary resources to perform an activity in the Operation. These resources do not affect the rate of the Operation. For example, a primary resource in a mixing activity is a mixer with a throughput rate of 100 gallons per hour. An auxiliary resource is the worker who operates the mixer. No matter how

fast or slow the worker is, the mixer rate remains at a constant 100 gallons per hour.

- Select **Primary** to indicate that this is the rate determining resource. It limits or determines throughput. It is also referred to as the bottleneck or critical resource. It is recommended that the RUN-TIME activity's resource be assigned this way.
- Select **Secondary** to indicate the resource that would replace the primary resource when it is not available. This resource performs the same task as the primary resource, but can have a different usage.

These fields are read only.

11. Enter the appropriate **Count**. This is the number or quantity of the resource used in the specified plant where you are defining production costs and usage availability. The number you enter depends on how broad a resource categorization you are defining. For example, if you define the resource as Blender 1, enter 1. If you use three blenders in the production line, and you define the resource as Blenders rather than defining each individually, enter 3. Required.
12. Enter the appropriate **Scale Type**. You can designate whether scaling is used to determine resource quantity. Scaling is defined as the proportional increase or decrease of resources. For example, setup and cleanup activities are usually not scaled, while manufacturing activities are scaled. This field defaults to Linear scaling.
    - Select **Proportional** if the resources change in a ratio that is proportional to the quantity of material being processed.
    - Select **Fixed** if the resources do not change, regardless of the quantity of material being processed.
    - Select **Fixed By Charge** if resources change as a result of number of charges specified. With this type of scaling:

      Resource Usage = Count multiplied by Usage multiplied by Charges
13. Enter the appropriate **Offset** as the time delay from the start of the activity to the point where the resource is actually required. This lag time is used by Process Operation Control.

Process Parameters

14. View the **Resource** you are editing.

15. Enter the appropriate **Process Parameter 1 - 5**.
16. Click **Details** to view **Operation Activity Resource Line** window.
17. Click **Process Parameters** to view **Process Parameters**, then click **Details** to view details of these parameters.

5

Routings

This topic shows you how to define and maintain routings. You are also shown how to find a routing. A summary of routings and routing headers provides an overview of the routings that are available. The processes of entering routing details and displaying the routing step line summary are explained. You are also shown how to edit routing step lines, and how to enter routing step dependencies. Procedures for displaying and editing theoretical process loss are provided.

The following topics provide a basic understanding of routings:

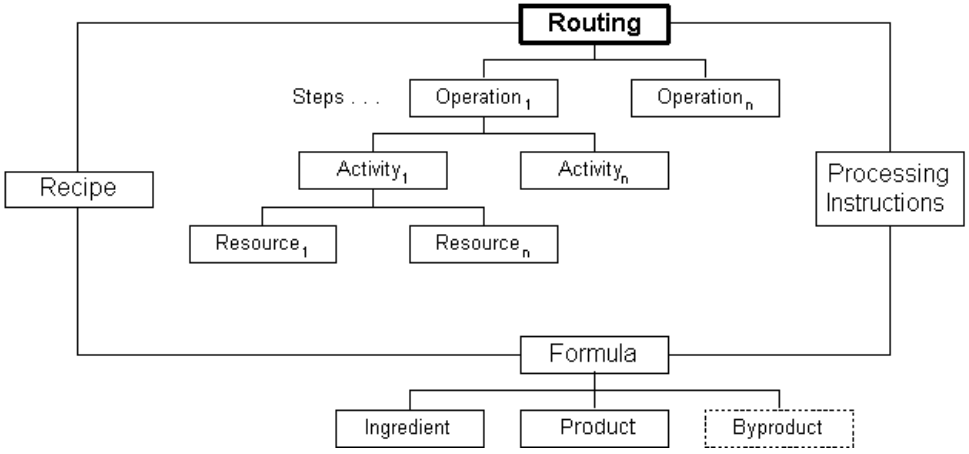
- Understanding Routings
- Requirements
- Solutions
- Defining and Maintaining Routings
- Finding a Routing
- Displaying the Routings Summary
- Displaying the Routing Header Summary
- Entering Routing Details
- Displaying the Routing Step Line Summary
- Editing Routing Step Lines
- Entering Routing Step Dependencies
- Displaying Theoretical Process Loss
- Editing Theoretical Process Loss

Understanding Routings

A routing is a sequenced set of operations that need to be performed to complete a production batch. The operations are presented in a series of steps that organize these operations into an orderly set of activities that have individual resources associated to them.

Routings are depicted hierarchically in the following diagram which shows the:

- Routing composed of a series of Operations organized in Steps.
- Operations composed of Activities containing Resources.
- Formula composed of Ingredient, Product, and possibly Byproduct.
- Recipe linking the Routing and Formula together with Processing Instructions.



Requirements

Following are some requirements that customers have for routings in New Product Development. The answers are explained in detail in the Solutions topic.

Can a default routing be set up?

Yes. Set up a default routing with average material. Material flow can be specified at the validity rule level. By having a default routing, the expected average material throughput is defined as a benchmark.

Can process loss be captured as a cost?

Yes. Use Theoretical Process Loss to reflect a planned percentage of material that is lost for a specific routing. Calculate the actual ingredient usage from a production perspective, which accommodates for that loss in standard costing.

Does the application support automatic calculation of step quantities based on material input and output?

Yes. The application automatically calculates step quantities based on the amount of materials input and output for each step.

Can manufacturing activities and routings be managed on the manufacturing floor?

Yes. The Process Engineer workbench manages routings, operations, and recipes at the shop floor level.

Is it possible to model when ingredients are relieved from inventory?

Yes. The application provides three separate methods to update inventory: automatic release, manual release, and incremental release.

Solutions

New Product Development provides solutions to help resolve issues at every stage of the product development process. The following represent some of the key performance solutions for routings.

Operations Throughput Enhanced by Default Routings Process speeds and feeds must be updated at the item or step level to eliminate the need to have a unique routing whenever the throughput varies by material viscosity or evaporation. Set up a default routing with an average material throughput, while indicating material-specific flows at the validity rule level. By locating routing management in this area, the larger corporate process engineering responsibilities are better defined and controlled.

Process Loss Factors Enable Better Material Planning Due to factors such as evaporation or changeovers, materials can be lost or unrecoverable in a production step. These lost materials need to be planned for to achieve the targeted process quantity for a step. The loss can vary depending on the material being processed, therefore a production loss factor must be defined at a product operation level, and it must be reflected in production and planning for ingredients associated to the step. New Product Development allows entry of a process loss factor to enable better material planning.

Step Quantity Calculations Deliver Accurate Total Quantity Usage All step quantities are calculated based on the routing step definitions and ingredient usage per step. Quantities are cumulative in that ingredients in step one are added to ingredients in step two. When byproducts or coproducts are yielded at the step they decrease the total step quantity. New Product Development accounts for this yield to deliver an accurate total step usage.

Seamless Integration of Product Development Responsibilities In addition to the default Recipe Data Organizer, the Process Engineer can manage all routings, operations, and recipes as part of a seamless integration of all pertinent job functions on the shop floor.

Select the Appropriate Ingredient Release Method Release method specification enables the automatic release of ingredients after each step is completed, on a step by step basis using manual release, or using an incremental release to keep inventory quantities current.

Defining and Maintaining Routings

Routings are defined in terms of operations. You enter and maintain the sequence of operations and step quantities used in a routing. Define multiple versions for a routing that makes the same product to accommodate for several production lines with differing characteristics. Since routings and operations are modeled into the structure of a new recipe, several attributes are defined at the recipe level, including planned process loss, step quantity, capacity, and activity factor.

Since a single product can be associated with several routings on the manufacturing floor, it can have different costs depending on the specified routing. New Product Development tracks the route that the ingredients follow, thereby tracking appropriate costs.

Creating a New Routing

Create and define new routings on the Routing Details window. A routing represents the sequence of operations or steps used during the manufacturing process. Specify each of the operations in sequential order, with their respective step quantities, and total routing quantities. You can display the following windows from the Routing Details window:

- Operation Details Activities
- Routing Step Dependencies
- Routing Step Line

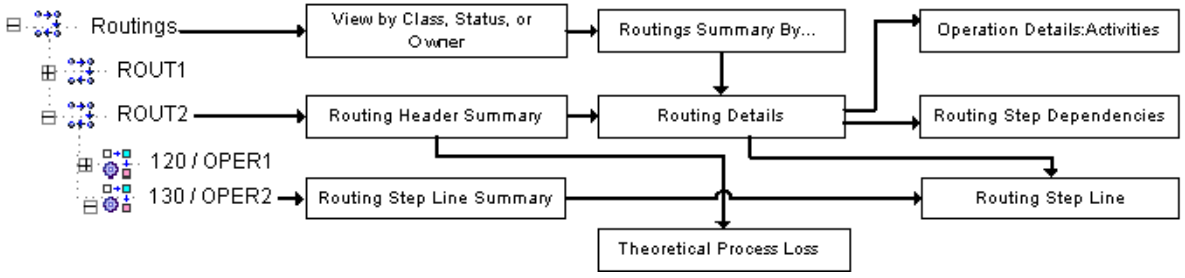
Maintaining Routings

Use the following windows to maintain routings:

- Routings Summary By... to display a list of defined routings with their individual version numbers and descriptions. These can be viewed by Class, Status, or Owner. You can display the Routing Details window from the Routings Summary By... window.
- Routing Header Summary to display important descriptive information on a specific routing. You can display the following windows from the Routing Header Summary window:
  - Routing Details
  - Theoretical Process Loss

- Routing Step Line Summary to determine the step number, operation, step quantity, and unit of measure for the step in a specific routing. You can display the Routing Step Line window from the Routing Step Line Summary window:
- Routing Step Dependencies to create and modify the interrelationships between routing steps. Step dependencies are those relationships between steps that establish whether a specific step can or cannot start until another step is completed.
- Theoretical Process Loss to enter the theoretical percent loss expected for a range of material processed during a specified routing.
- Routing Step Line to edit individual routing step lines.

The following graphic depicts the previously described routing navigation flow:



Finding a Routing

The Find Routings window enables you to find a specific routing.

Prerequisites

❑ Enter and save routings.

◗◗ To find a routing:

1. Navigate to the **Find Routings** window.
2. Enter as many parameters as needed to complete the search:
   - Enter search parameters in the **Standard** region for: **Name**, **Version**, **Description**, **Class**, or **Product**.
   - Enter search parameters in the **Advanced** region to enter a specific: **Item**, **Condition**, or **Value**.
3. Click **Find**.
4. Review the results of the search.
5. Close the window.

Displaying the Routings Summary

The Routing Summary window displays a list of all defined routings with their individual version numbers and descriptions. You can view these by Class, Status, or Owner. You can display the Routing Details window from this window to view specific steps and operations associated with each of the routings displayed.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❏ Optionally, enter and save routing classes.
- ❏ Enter and save routings.
- ❏ Use the View By list to select how you want to view the summary of routings. Select one of the following:
  - Class to display the list by routing class.
  - Status to display the list by routing status.
  - Owner to display the list by routing owner.

◗◗ To display a list of all defined routings:

1. Navigate to the **Routings Summary By...** window.
2. The following fields are display only:
   - **Routing** displays the name of the routing.
   - **Version** displays the version number of the Routing.
   - **Quantity** displays the product Quantity associated with this Routing. This is the total Quantity from which individual step requirements are scaled.
   - **UOM** displays the unit of measure for the Quantity. This unit of measure defaults from the process Quantity unit of measure entered on the **Operation Details Activities** window.
   - **Class** displays the optional class entered for the Routing.
   - **Valid From** displays the date on which the Routing is effective.
   - **Valid To** displays the date on which the Routing is no longer effective.
   - **Status** displays the current status of the Routing.

3. Click **Details** to display the **Routing Details** window.
4. Close the window.

Displaying the Routing Header Summary

The Routing Header Summary window displays important descriptive information on a specific routing.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Optionally, enter and save routing classes.
- ❑ Enter and save routings.

◗◗ To display a summary of routing headers:

1. Navigate to the **Routing Header Summary** window.
2. Select the desired **Routing**.
3. The following fields are display only:
   - **Status** displays the approval status of the Routing.
   - **Routing** displays the code assigned to the routing.
   - **Version** displays the version number of the Routing.
   - **Description** displays a brief explanation of the Routing.
   - **Valid From** displays the date on which the Routing is effective.
   - **Valid To** displays the date on which the Routing is no longer effective.
   - **Class** determine the optional class assigned to the Routing.
   - **Class Description** determine the optional class description assigned to the Routing.
   - **Theoretical Loss** displays the theoretical quantity of material lost in the Routing.
   - **Planned Loss** displays actual quantity of material lost in the Routing.
   - **Quantity** displays the amount of material assigned to the displayed Routing.
   - **UOM** displays the unit of measure for the Quantity of material.
   - **Owner** displays the initiator of the Routing.
4. Click **Details** to display the **Routing Details** window.

5. Click **Theoretical Process Loss** to display the **Theoretical Process Loss** window.
6. Close the window.

Using the View Menu to Find a Routing

The Find selection on the View menu enables you to find a routing.

To find a routing from the View menu:

1. Select **Find** from the **View** menu.
2. Enter one or more of these search parameters:
   - **Status**
   - **Routing Number**
   - **Routing Version**
   - **Description** of the routing
   - **Routing Class**
   - **Valid From** date
   - **To** date
   - **Owner**
   - **Routing Quantity**
   - **UOM**
   - **Process Loss**
   - **Marked for Deletion**
3. Click **Find**.

Entering Routing Details

The Routing Details window enables you to enter the details for a specific routing.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❑ Optionally, enter and save routing classes.

◗◗ To enter routing details:

1. Navigate to the **Routing Details** window.
2. Enter the code for the **Routing**. Required.
3. Enter a **Version** of the Routing. Required.
4. After entering all relevant information and saving the Routing with the default Status of **New**, return to this window if you need to change Routing Status by selecting **Change Status** from the **Actions** menu. Depending on whether Workflow is enabled, a different set of statuses is available.

   Select a **Status** for the Routing you are entering from one of the following:

   - **Approved for Laboratory Use** to indicate that the Routing is approved for laboratory use.
   - **Approved for General Use** to indicate that the Routing is approved for use in production.
   - **Obsolete/Archived** to indicate that the Routing is no longer approved for use and is obsoleted, archived, or both.

   If Workflow is enabled, when you select:

   - **Approved for Laboratory Use**, Status changes to **Request Approval for Laboratory Use** until all approvers have accepted the Routing, at which time its Status changes to Approved for Laboratory Use.
   - **Approval for General Use,** Status changes to **Request Approval for General Use** until all approvers have accepted the Routing, at which time its Status changes to Approved for General Use.

   Refer to the Understanding the Status Approval Workflow topic for additional information.
5. Enter a **Description** that briefly describes the Routing. Required.

6. Enter a **Class** for the Routing to identify how it is categorized. The **Class Description** assigned to the Class displays.
7. Enter the **Valid From** date as a validity rule for this Routing. The default date is the current system date. Required.
8. Enter a **Valid To** date as a validity rule for the expiration of this Routing. If there is no expiration date for this Routing, leave the field blank.
9. Enter the process **Quantity** for this Routing. This is the total quantity of material for the Routing, and is used to scale individual step requirements. Required.
10. Enter the process Quantity **UOM** associated with this Routing. The process Quantity UOM must interconvert with the UOM defined for Theoretical Process Loss based on the primary product UOM conversion in the Routing. Required.
11. Enter the planned **Process Loss** for this Routing. This value is expressed as a percent. For example, a Process Loss of 1.304% would be entered as 1.304. Required.
12. The **Theoretical Process Loss** for this Routing displays. This value is entered on the Theoretical Process Loss window, and is based on the value assigned to the Class associated with this Routing.
13. Enter the **Owner** to indicate the individual who is responsible for initiating this Routing. Required.
14. Enter the **Owner Organization** to indicate the plant, laboratory, or other facility that is responsible for initiating this Routing. Required.

Routing Steps

15. Enter the **Step** number to associate with an Operation in this Routing. It is recommended that the first number in this sequence be 10, the second 20, and so forth. This enables you to add intermediate steps between 10 and 20 at a later time. Required.
16. Enter the code for the **Operation** performed in this Routing.
17. Enter a **Version** number for the Routing.
18. The **Description** of the Operation entered displays.
19. Enter the Operation **Step Quantity** as the quantity of material associated with this Step. The **UOM** for the Step Quantity displays.

20. Select the appropriate **Release Type**. Select the release types for this ingredient line:

    - Select **Automatic Release** if the line is released for production automatically for any batch that uses a formula containing it.
    - Select **Manual Release** if the line must be released individually for any batch that uses a formula containing it.
    - Select **Incremental Release** if the line must be released as batch materials are consumed in order for inventory quantities to be updated in a timely manner.

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

    If you do not make this selection, the lines default to the type defined by the GMD: Default Release Type profile option.

21. Save the window.
22. Click **Step Dependencies** to display the **Routing Step Dependencies** window.
23. Click **Edit Operation** to display the **Operation Details Activities** window.
24. Click **Edit Step Line** to display **Routing Step Line** window.

To mark the routing for purge:

1. Select **Mark for Purge** from the **Actions** menu.
2. Click **OK**.

To edit the routing text:

1. Select **Edit Text** from the **Actions** menu.
2. Make the appropriate edits to routing text.
3. Save the window.

To display specifications:

1. Select **Specifications** from the **Actions** menu. The **Specifications** window displays.
2. Evaluate specifications.

3. Close the window.

To display the quality control Samples window:

1. Select **Samples** from the **Actions** menu. The **Samples** window displays.
2. Evaluate the samples.
3. Close the window.

To display the quality control Results window:

1. Select **Results** from the **Actions** menu. The **Results** window displays.
2. Evaluate the results.
3. Close the window.

To change the routing status:

1. Select **Change Status** from the **Actions** menu.
2. Change the **Current Status** displayed by selecting a different Status from the **Change Status To** list.
3. Click **OK**.
4. The **Routing Details** window displays the revised **Status** for the routing.

To generate step dependencies:

1. Position the cursor in the routing header.
2. Select **Generate Step Dependencies** from the **Actions** menu. A message displays to indicate that the dependencies have been generated.
3. Click **OK**.
4. Select the dependent **Step**.
5. Click **Routing Step Dependencies**. The **Routing Step Dependencies** window displays. Enter data as described in the Entering Routing Step Dependencies topic.

Displaying the Routing Step Line Summary

The Routing Step Line Summary window enables you to determine the step number, operation, step quantity, and unit of measure for the step in a specific routing. You can go to the Routing Step Line window to edit individual lines.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❏ Optionally, enter and save routing classes.
- ❏ Enter and save routings.

◗◗ To display the routing step summary:

1. Navigate to the **Routing Step Line Summary** window.
2. The following fields are display only:
   - **Step Number** displays the unique number for the step.
   - **Operation** displays the name of the operation associated with the Step Number.
   - **Operation Version** displays the version number of the Operation.
   - **Operation Description** displays a description of the Operation.
   - **Step Quantity** displays the quantity of material being processed by this step.
   - **UOM** displays the unit of measure associated with the Step Quantity.
   - **Step Release Type** displays **Automatic**, if the step is released automatically, **Manual**, if the step is released manually, or **Incremental** if the step is released incrementally as in a partial certification.
3. Click **Edit Line** to display the **Routing Step Line** window to edit individual lines.
4. Close the window.

Editing Routing Step Lines

The Routing Step Line window enables you to edit individual step lines.

Prerequisites

- ❑ Optionally, enter and save routing classes.
- ❑ Enter and save routings.

◗◗ To edit routing steps:

1. Navigate to the **Routing Step Line** window.
2. Enter the desired **Step Number**. This number must be unique. Required.
3. Enter the desired **Operation** to be associated to the Step Number displayed.
4. Enter the desired **Operation Version**. The **Operation Description** displays.
5. Enter the desired **Step Quantity**. The unit of measure for this quantity displays. You cannot enter a zero for this quantity. The **UOM** for Step Quantity displays.
6. Select the desired **Step Release Type**:
   - Select **Automatic** if the line is released automatically for any batch that uses a formula containing it.
   - Select **Manual** if the line must be released individually for any batch that uses a formula containing it.
   - Select **Incremental** if the line must be released as batch materials are consumed in order for inventory quantities to be updated in a timely manner.
7. Save the window.

Entering Routing Step Dependencies

The Routing Step Dependencies window enables you to create and modify the interrelationships between routing steps. Step dependencies are those relationships between routing steps that establish whether a specific step can or cannot start until another step is completed. Routing Step Dependencies reduce the routing development time by establishing a default sequence for operation steps during a production run. Step dependencies are implemented at the routing maintenance level to enable automatic step quantity calculation in recipes.

You are able to define new dependencies or delete the ones you do not want. For example, if step 10 is BAKING and step 20 is the COOLING step, then step 10 must be completed before step 20 can begin. By this definition, step 20 is dependent on the completion of step 10. Step dependencies are used to calculate planned start times however, they can be overwritten.

Any previous step must be validated against any routing currently being edited, and it must not be the same as the current step. Avoid defining circular references, for example Step 10 is less than Step 20 is less than Step 10.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

❑ Enter and save routings.

◗◗ To enter routing step dependencies:

1. Navigate to the **Routing Step Dependencies** window.
2. Enter the name of the **Routing** to set up step dependencies. Required.
3. Enter the **Version** of the Routing to set up step dependencies. Required.
4. The **Description** of the Routing displays.
5. Enter the **Routing Step** number. Required.
6. The following fields are display only:
   - **Operation** displays the operation associated with the Routing.
   - **Version** displays the version number of the Operation.
   - **Description** displays a statement about the Operation associated with the Routing.

Dependencies

7. Enter the **Previous** step that the currently selected step is dependent on. The dependent step must immediately follow the Routing Step entered in this field. Required.
8. The **Operation** associated with the Routing Step displays.
9. The **Version** of the Operation associated with the Routing Step displays.
10. Select **Dependency Type** as:
    - **Start-to-start** if the dependent step starts at the same time as the step on which it is dependent.
    - **Finish-to-start** if the dependent step starts after the previous step ends. For example, when Step 2 is dependent on Step 1 and there is no specified offset, Step 2 is scheduled to start when Step 1 finishes. If an offset of one hour is specified, Step 2 is scheduled to start one hour after Step 1 ends. You create overlapping steps by defining an Finish-to-start dependency with a negative offset so that Step 2 starts before step 1.
11. Enter the **Transfer %**. This is the percentage of the step quantity from which the current step is dependent. The default is 100%. The only time this value is less than 100% is when the current step is dependent on two steps. In that case, the Transfer Percent is entered as the amount that splits to each step. Required.
12. The following fields are display only:
    - **Transfer Quantity** displays the amount of material transferred in the Operation.
    - **UOM** displays the unit of measure for the Transfer Quantity.
13. Save the window.

Displaying Theoretical Process Loss

Theoretical Process Loss can vary depending on the routing or the individual quantity being processed by a routing. This loss is defined at the routing level and is based on a minimum and maximum range of quantities.

The Theoretical Process Loss window enables you to enter the theoretical percent loss expected for a range of material processed during a specified routing. For example, if you mix a quantity of material up to 100 pounds, you could predict a loss of 1.50 percent theoretical process loss, or up to 1.5 pounds is lost. However, if you mixed a quantity between 100 and 500 pounds, you might predict a loss of 1.75 percent theoretical process loss, or up to 8.75 pounds lost. The loss could be attributable to equipment, evaporation, or any other aspect of the routing that would not deliver the full quantity of material added.

Prerequisites

- ❏ Enter and save routings.
- ❏ Enter and save routing classes.
- ❏ Optionally, enter and save routing step dependencies.

To display theoretical process loss:

1. Navigate to the **Theoretical Process Loss** window.
2. The following fields are display only:
   - **Routing Class** displays the optional class assigned to the Routing.
   - **Description** displays a brief description of the Routing Class.

Theoretical Process Loss

3. The following fields are display only:
   - **Min Quantity** displays the lower limit for which the displayed Theoretical Process Loss percent applies. Required.
   - **Max Quantity** displays the upper limit for which the displayed Theoretical Process Loss percent applies. Required.
   - **UOM** displays the unit of measure for the minimum and maximum quantities.
   - **Process Loss** displays the loss of process material for a range between the Min Quantity lower limit and Max Quantity upper limit.

Editing Theoretical Process Loss

The Theoretical Process Loss Edit window lets you edit Theoretical Process Loss.

Prerequisites

- ❑ Enter and save routings.
- ❑ Enter and save routing classes.
- ❑ Optionally, enter and save routing step dependencies.

◗◗To edit theoretical process loss:

1. Navigate to the **Theoretical Process Loss** window.
2. Query the desired routing **Class**.
3. Enter the desired **Min Quantity** to specify the lower limit for which the displayed Theoretical Process Loss percent applies.
4. Enter the desired **Max Quantity** to specify the upper limit for which the displayed Theoretical Process Loss percent applies.
5. Enter the **Theoretical Process Loss** as a percent. For example, enter 1.32 for a Theoretical Process Loss of 1.32 percent.
6. Save the window.

6

Recipes

This topic shows you how to define and maintain recipes. You are shown how to find a recipe. You are also shown how to display a summary of recipes and recipe headers. Procedures to enter recipe details, recipe organization details, and edit validity rules demonstrate the process flow for recipe development. You learn how to display and interpret recipe validity rules and how to display the recipe step and material association.

The following topics provide a basic understanding of recipes:

- Understanding Recipes
- Requirements
- Solutions
- Defining and Maintaining Recipes
- Finding a Recipe
- Displaying the Recipes Summary
- Displaying the Recipe Header Summary
- Understanding Step Quantity Calculations
- Entering Recipe Details
- Entering Recipe Organization Details
- Entering Multi-Record Recipe Validity Rules
- Editing Recipe Validity Rules
- Displaying the Recipe Step / Material Association

Understanding Recipes

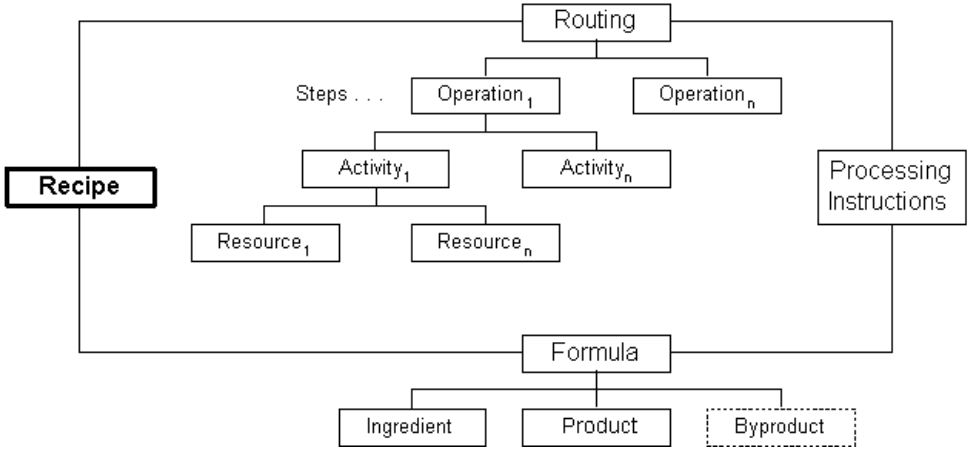
Recipes standardize the structure of all information that describes production of one or more products. Recipes have:

- Formulas that define the relationship of material resources (products, ingredients, and byproducts).
- Routings that define the relationships of nonmaterial resources (labor and equipment operations with activities and their associated resources). Routings are optional.
- Processing instructions that encompass the work instructions needed to produce the products.

To provide the greatest flexibility to process manufacturers, formulas and routings are built independently. They are linked using a Recipe that has validity rules. Different formulas can use the same routing, or one formula can be associated to several different routings.

Recipes are depicted hierarchically in the following diagram that shows the:

- Routing composed of a series of Operations organized in Steps.
- Operations composed of Activities containing Resources.
- Formula composed of Ingredient, Product, and possibly Byproduct.
- Recipe linking the Routing and Formula together with Processing Instructions.



Requirements

Following are some requirements that customers have for recipes in New Product Development. The answers are explained in detail in the Solutions topic.

Does the application support effectivities already developed for in-house formulas?

Yes. Migrate Effectivities to Recipe Validity Rules with special scripts provided by Oracle.

Is there one place in the application that shows exactly how to make a product?

Yes. Use the Recipe Details window. After evaluating the information on the Recipe Details window, display Organization Details, Validity Rules, and the Recipe Step and Material Association needed to determine exactly how to make a product.

Does a New Product Development recipe support cost management and production execution requirements?

Yes. By linking input and output of materials to individual operation steps and providing an automatic step quantity and charge calculation, the application supports the requirements for accurate cost rollup and flexible production execution.

Can an item be made differently depending on the manufacturing plant or the time of year?

Yes. Recipes enable rule based execution. By applying this logic to formula selecting, plant specific and seasonal formulations are possible.

Does the application support SP88 terms for batch manufacturing?

Yes. The application offers enhanced standards for Master Recipe definition.

Solutions

New Product Development provides solutions to help resolve issues at every stage of the product development process. The following represent some of the key performance solutions for recipes.

Migrate Effectivities with Scripts Oracle provides a customized series of scripts that migrate existing formula information into the New Product Development application.

Use the Recipe Details Window to Determine All Product Manufacturing Requirements The Recipe Details window displays all product manufacturing requirements. In each step of building a new product, components are created that appear on the Recipe Details or the Organization Details windows.

Use Recipes as the Foundation for Cost Management and Production Execution Where routings are used to specify process related requirements such as equipment, labor, and energy, the recipe defines the input and output of each operation step. This is achieved by linking formula materials and quantities to appropriate routing steps, and is a prerequisite to enabling automatic step calculation.

Enhance Product Consistency with Rule-Based Execution If not managed appropriately, manufacturing variability can lead to product inconsistency and complexity. Rule-Based Execution enhances product consistency and manufacturing simplicity by letting planners, quality control specialists, and cost accountants specify the conditions under that recipe components must be applied. When a recipe is needed for production, planning, or costing purposes, the application selects the appropriate version to support the activity. This capability improves consistency by applying rule-based logic to formula selection for use in specific environments and under specific conditions based on status.

New Product Development uses Validity Rules that are based on several key factors including date, production site, plant, customer, and required quantities. Some recipes are seasonal and based on ingredient availability. Other recipes are determined by whether they are small, medium, or large production runs. Different plants can use different versions of a target recipe, so the choice of recipe depends on the plant that is producing the batch. By using Validity Rules an organization can set the standard quantity and effective dates of a recipe to specify what, where, when, and how formulas, recipes, routings, and operations must be applied.

With rule-based execution, production gains a tighter control over the business and is able to select an optimized recipe. When several recipes have overlapping validity dates, business logic selects the optimum valid recipe.

Offer Enhanced Industry Standards for Recipe Definition The concept of effective date is refined into a recipe structure that complies with industry standards for recipe definition. A Master Recipe combines a formula and a routing at a global level to streamline the overall approval process. The Master Recipe serves as the basis for subsequent planning, manufacturing, costing, and regulatory calculations.

Defining and Maintaining Recipes

Recipes contain the minimum set of information that uniquely defines the manufacturing requirements for a specific product. Recipes provide a way to describe products and how those products are produced.

Creating a New Recipe

Create and define new recipes on the Recipe Details window. To create a new recipe, you have the option to specify product code and quantity, or formula number and version. If you enter product code and quantity, you get a list of all valid or effective formulas. Select the one you want to use to create the recipe. You also have the option to specify a routing in the recipe. You can override routing attributes such as Capacity, Activity Factor, Charges, and Resource Usage for each recipe you define. If a recipe is set up for Automatic Step Quantity Calculation you must ensure that formula material is properly associated to each appropriate routing step. You can display the following windows from the Recipe Details window:

- Recipe Organization Details
- Recipe Validity Rules
- Recipe Step / Material Association

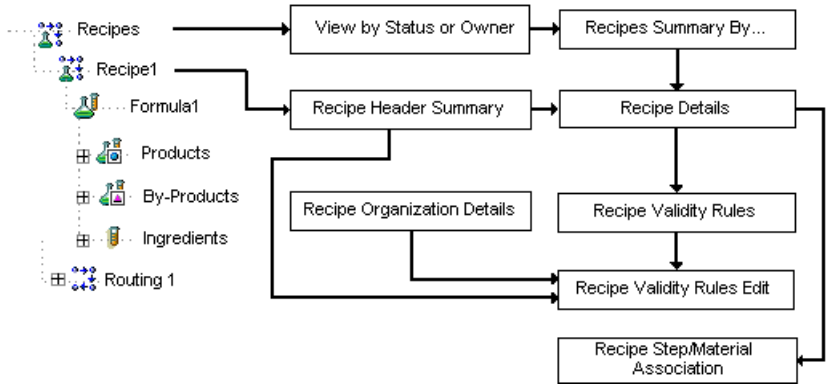
Maintaining Recipes

Use the following windows to maintain recipes:

- Recipes Summary By... to display a list of defined recipes with their individual version numbers and descriptions. These can be viewed by Status or Owner. You can display the Recipe Details window from the Recipes Summary By window.
- Recipe Header Summary to display important descriptive information regarding a particular recipe. You can display the following windows from the Recipe Header Summary window:
  - Recipe Validity Rules Edit
  - Recipe Details
- Recipe Organization Details to display and, if necessary, override information defined for specific operations and routings at the Organization level. You can display the Recipe Validity Rules Edit window from the Recipe Organization Details window.

- Recipe Validity Rules is a multi-record window to enter or edit a complete list of Validity Rules for Organizations you can access. You can display the Recipe Validity Rules Edit window from the Recipe Validity Rules window.
- Recipe Validity Rules Edit enables you to edit validity rules for a specific recipe.
- Recipe Step / Material Association to display all items from the recipe's formula and associate them with specific routing steps.

The following graphic depicts the previously described recipe navigation flow:



Finding a Recipe

The Find Recipes window enables you to find a specific recipe. At least one search parameter needs to be entered.

Prerequisites

- ❑ Enter and save recipes.

◗◗ To find a recipe:

1. Navigate to the **Find Recipes** window.
2. Enter as many parameters as needed to complete the search:
   - Enter search parameters in the **Standard** region for: **Recipe**, **Description**, **Formula**, **Routing**, or **Product** with appropriate **Version** for Recipe, Formula, or Routing. You can also enter **Organization**, **Customer**, **From Date**, **To Date**, **Status**, and **Recipe Use**.
   - Enter search parameters in the **Advanced** region for a specific: **Item**, **Condition**, or **Value**.
3. Click **Find**.
4. Review the results of the search
5. Close the window.

Displaying the Recipes Summary

The Recipes Summary window displays a list of all defined recipes with their individual version numbers and descriptions. You can display these by Status or Owner. Multilingual support is provided for the Recipe Description.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

- ❑ Enter and save recipes.
- ❑ Use the View By list to select how you want to view the summary of recipes. Select one of the following:
  - Status to display the list by recipe status.
  - Owner to display the list by recipe owner.

◗◗ To display a list of all defined recipes:

1. Navigate to the **Recipes Summary By...** window.
2. The following fields are display only:
   - **Recipe** is the recipe code.
   - **Version** is the version of the Recipe.
   - **Description** is a brief explanation of the Recipe.
   - **Formula** is the formula for the currently selected Recipe.
   - **Formula Version** is the Version of the Formula for the currently selected Recipe.
   - **Routing** is the Routing for the currently selected Recipe.
   - **Routing Version** displays the Version of the Routing for the currently selected Recipe.
3. Click **Details** to display the **Recipe Details** window.

Displaying the Recipe Header Summary

The Recipe Header Summary window enables you to display important descriptive information regarding a particular recipe.

You can use folders with this window. See: *Oracle Applications User's Guide*.

Prerequisites

❑ Enter and save recipes.

◗◗ To display recipe header information:

1. Navigate to the **Recipe Header Summary** window.

Summary

2. The following fields are display only:
   - **Status** is the current status of the Recipe.
   - **Recipe** is the name of the Recipe.
   - **Version** is the version of the Recipe.
   - **Description** is a brief explanation of the Recipe.
   - **Formula** is the Formula number used in the Recipe.
   - **Version** is the version of the Formula with its **Description**.
   - **Main Product** is the end item in the Formula.
   - **Total Output Quantity** is the total output of material in the Formula **UOM**.
   - **Routing** is the routing number.
   - **Version** is the Routing version with its **Description**.
3. Click **Products** to display the **Formula Product Summary** window.
4. Click **Details** to display the **Recipe Details** window.

Validity Rules

5. The following fields are display only:
   - **Organization** displays the plant or laboratory organization code.
   - **Product** displays the coproduct of the Formula.

- **Recipe Use** displays if the Recipe is used in Production, Planning, Costing, MSDS, or Technical class and subclass determination.
- **Status** displays the Status of the Validity Rules.

6. Click **Details** to display the **Recipe Validity Rules Edit** window.

Customers

7. The following fields are display only:
   - **Customer** displays the customer number.
   - **Name** displays the customer name.

Understanding Step Quantity Calculations

The quantity of material required in a specific step is dependent on the weight of material that passes into and out of that step. Input material consists of ingredients that are injected directly into steps or material that is transferred from preceding steps.

The following example shows how material can be input, transferred, and output from a series of production steps.

Step 1: Add 10 pounds of Ingredient 1 to 25 pounds of Ingredient 2. The result is 5 pounds of Byproduct 1 and 30 pounds of Intermediate 1. Transfer of Intermediate 1 is as follows:

- 25% or 7.5 pounds to Product 1
- 35% or 10.5 pounds to Step 2
- 40% or 12 pounds to Step 3

Step 2: Transfer of 10.5 pounds of Intermediate 2 is as follows:

- 25% or 2.625 pounds to Step 3
- 75% or 7.785 pounds to Product 1

Step 3: Add 12 pounds of Ingredient 3 to the mixture of Intermediate 1 and Intermediate 2. This yields 3 pounds of Byproduct 2 and 23.625 pounds of Intermediate 3.

The final yield of Product 1 consists of:

- 7.500 pounds from Step 1
- 7.785 pounds from Step 2
- 23.625 pounds from Step 3

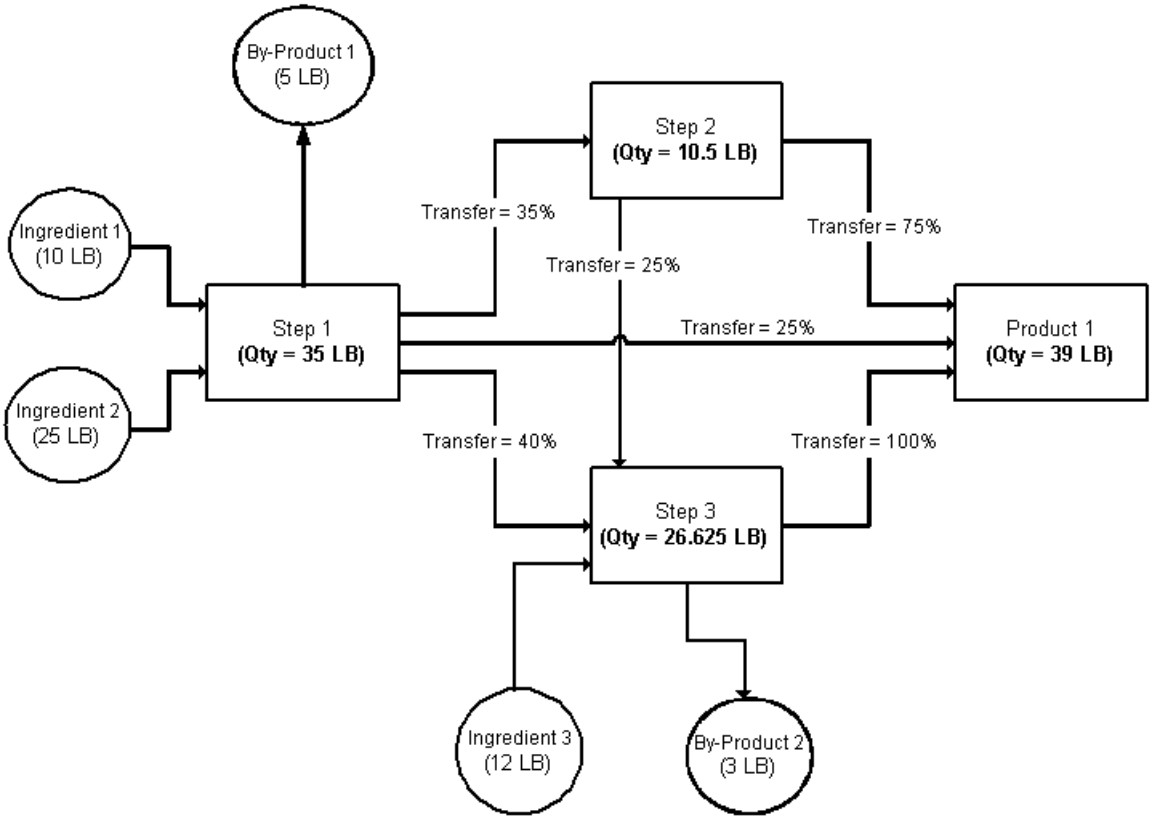
Total Product 1 produced is 39 pounds.

Total Byproduct produced is 8 pounds, and is comprised of:

- 5 pounds of Byproduct 1
- 3 pounds of Byproduct 2

In this example, there is yield is 100%. There is no process loss in the transfer of material.

The following depicts the previously described example. LB is equal to pounds.



Entering Recipe Details

The Recipe Details window enables you to enter the details for a specific recipe. A Plant or a Laboratory can be associated with all the materials and resources required to make a product at the recipe level. One or more customers can be associated to the recipe for informational purposes.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

- ❏ Optionally, enter and save operations.
- ❏ Optionally, enter and save routings.
- ❏ Enter and save formulas.

Understanding Step Quantity Calculations

When you select the Calculate Step Qty box on the Recipe Details window, the application checks to determine if there are proper step quantity material associations. You must use a routing. Step and material associations must be made. If any of these associations are defective, you receive an error message. When you use the Automatic Step Quantity Calculation, it checks quantities in each step to verify that material is available to pass into and out of each step. The quantity of material for a particular step is dependent on the quantity of material that passes into or out of it. The input material can be either the ingredient that is injected directly into the step, or it can be the output of preceding steps. Output is represented typically by coproducts or byproducts.

◗◗ To enter recipe details:

1. Navigate to the **Recipe Details** window.
2. Enter the code for the **Recipe** to be entered. Required.
3. Enter a **Version** of the Recipe. Required.
4. Enter a **Description** for the Recipe.
5. After entering all relevant information and saving the Recipe with the default Status of **New**, return to this window if you need to change Recipe Status by selecting **Change Status** from the **Actions** menu. Depending on whether Workflow is enabled, a different set of statuses is available.

   Select a **Status** for the Recipe you are entering from one of the following:

- **Approved for Laboratory Use** to indicate that the Recipe is approved for laboratory use.
- **Approved for General Use** to indicate that the Recipe is approved for use in production.
- **Obsolete/Archived** to indicate that the Recipe is no longer approved for use and is obsoleted, archived, or both.

If Workflow is enabled, when you select:

- **Approved for Laboratory Use**, Status changes to **Request Approval for Laboratory Use** until all approvers have accepted the Recipe, then its Status changes to Approved for Laboratory Use.
- **Approval for General Use,** Status changes to **Request Approval for General Use** until all approvers have accepted the Recipe, then its Status changes to Approved for General Use.

Refer to the Understanding the Status Approval Workflow topic for additional information.

6. Enter the main **Product** for the Formula associated with this Recipe. If you enter a new Recipe, enter the Formula to fill this field automatically.
7. The Output **Quantity** displays the sum of all materials. **UOM** indicates the unit of measure for the Formula associated with this Recipe.
8. Enter the **Formula** number for the Recipe. Required. Once a recipe is saved, this field cannot be edited. You cannot use an inactive Formula in a recipe. The formula **Version** displays.
9. **Creation Organization** displays the organization code for the initial Owner. This field is not updateable for an existing Recipe. Required.
10. Enter a **Routing** number for the Recipe. A routing can be added to an existing Recipe. The **Version** for the Routing entered displays.
11. **Theoretical Process Loss** displays the hypothetical loss of process material associated to a routing as a percentage. If no routing is associated to a recipe, or if no routing class is associated to a given routing, and no Process Loss is defined for that routing, this field is blank.
12. Enter the **Planned Process Loss** as the loss of process material observed during production of a batch using the recipe. If no value is entered in this field, it defaults to the Theoretical Process Loss. You can change this value on a New or existing recipe.

13. **Total Output Qty** displays with its **UOM**.
14. Enter the **Laboratory** that has current ownership of the recipe.
15. Enter the **Owner Organization**. This field is the default organization for the Owner of the Recipe. In order for you to enter or edit information for the Recipe, you must have an association with this organization and permission to access and change this field. Required.
16. Enter the **Owner** of the Recipe. The Owner name must be a valid User name. This field defaults to the current User. Required.

Note: You must enter all information on this window before you select the Calculate Step Qty check box.

17. The **Calculate Step Qty** check box indicates whether you want to enter step quantities manually or have the application calculate them for you.
    - Select the **Calculate Step Qty** check box to enable the application to calculate step quantities automatically. Quantities are based on the amount of materials that go into and out of each supported step. Step Quantity fields cannot be entered after you select the check box. You must associate all items marked as contributing to step quantity to specific Steps on the **Recipe Step/Material Association** window.
    - Clear the **Calculate Step Qty** check box to enter step quantities manually. Step quantities default from the default routing steps. You can change any of the quantities in the **Step Quantity** region. Upon making an entry in the **Step Quantity** field, the application checks to determine if preceding steps have been set up for the current step dependencies. If quantities are less than the sum of the Quantity transferred to this step, an appropriate error message displays.

Plant/Laboratory

18. The following fields are display only:
    - **Organization** displays the Organization code that the Process Loss is being defined for. This must be a plant or a laboratory. Required.
    - **Organization Name** displays a description of the plant or laboratory.
    - **Type** indicates whether this is a plant or a laboratory.
    - **Process Loss** displays the material that is lost through the process. This field is blank if you did not enter a Routing.

Customer

19. Enter the **Customer** number. Required.
20. **Name** indicates the name of the Customer associated with the Customer number entered.

Step Quantity

If a routing has not been entered, this region is not available.

21. The following fields are display only:
    - **Step** indicates the step number associated with the listed Operation in the displayed Routing. Steps cannot be added or deleted here. However, if a step is deleted in the base routing used for this Recipe, and the Step field is overwritten, you must select **Delete** from the **Edit** menu to delete the orphaned Step. Charges are calculated for each Step displayed. You can associate text with each Step.
    - **Operation** displays the operation associated with the Step. The operation **Version** and **Description** are displayed.
    - **Step Quantity** indicates the default quantity of material associated with the Step. The **UOM** for the Step Quantity displays. You can enter a new value in the Step Quantity field if you do not use the Automatic Step Quantity Calculation. If Automatic Step Quantity Calculation is used, this field is not enterable. Required if the Step is associated to material, and you are not using Automatic Step Quantity Calculation.
22. Click **Organization Details** to display the **Recipe Organization Details** window.
23. Click **Validity Rules** to display the **Recipe Validity Rules** window.
24. Click **Step/Material Association** to display the **Recipe Step/Material Association** window.
25. Save the window.

◗◗ To mark a recipe for deletion:

1. Select the **Recipe** to delete.
2. Select **Mark for Delete** from the **Actions** menu. When a recipe is marked for deletion, all of its Validity Rules are also marked for deletion. By default, those recipes that have been marked for deletion do not appear in the LOV.

To copy a recipe:

1. Select the **Recipe** to copy.
2. Select **Copy** from the **Edit** menu. Copying a recipe creates a new recipe. All header fields in the the new recipe are editable. You must change the recipe number or recipe version in the copied recipe before saving it. Duplicate recipe names are not allowed. The current Owner and Organization are assigned to the new recipe. Recipes that have been marked for deletion cannot be copied.
3. Click **OK**.

To add text:

1. Select **Add Text** from the **Edit** menu to add text to the recipe header, or **Organization Process Loss**, **Customer**, or **Step Quantity**.
2. Enter the desired text.
3. Save the window.

Using the View Menu to Find a Recipe

The Find selection on the View menu enables you to find a recipe. At least one search parameter needs to be entered.

To find a recipe from the View menu:

1. Navigate to the **Recipe Details** window.
2. Select **Find** from the **View** menu.
3. Enter search parameters for: **Recipe**, **Version**, **Description**, **Status**, **Product**, **Description**, **Formula**, **Version**, **Routing**, **Version**, **Owner**, **Owner Organization**, **Laboratory**, or **Marked for Deletion**.
4. Click **Find**.

Entering Recipe Organization Details

The Recipe Organization Details window enables you to display and, if necessary, override information defined for specific operations and routings at the plant or laboratory level.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Enter and save recipes.

◗◗ To enter recipe organization details:

1. Navigate to the **Recipe Organization Details** window. The **Find Recipe Organization Details** window displays.
2. Enter the **Organization** that owns the recipe. Required.
3. Click **Find**.
4. The following fields are display only:
   - **Organization** indicates the code for the Plant or Laboratory that owns the recipe.
   - **Type** displays **Plant** if the Organization is a plant, or a **Laboratory** if the Organization is a laboratory.
   - **Organization Name** displays the description assigned to the Organization. This field defaults to the entry from the Recipe Details window. Required.
   - **Planned Process Loss** displays the loss of process material observed during production of a batch using the recipe as a percentage. You can enter and save a different Planned Process Loss value for the recipe used in the Organization displayed. This value defaults to the Theoretical Process Loss when no entry is made on the Recipe Details window.
   - **Theoretical Process Loss** displays the hypothetical loss of process material associated to a routing. If no routing is associated to the recipe, this field is blank.

Validity Rules

5. Enter a **Product** for the formula used in the recipe. Required.

6. **Recipe Use** displays if the recipe is used in Production, Planning, Costing, MSDS, or Technical when it is used to define technical classes and subclasses. Required.
7. Enter the **From Date** as the date the Validity Rule becomes effective. The date must be within the effective date for any routing associated to the recipe. Required.
8. Enter **To Date** as the date to stop using the Validity Rule. This is an optional field and must be left blank if no expiration date is defined for the Validity Rule.
9. **Status** displays the status of the Validity Rule entered on the Recipe Validity Rules window.
10. Click **Details** to display the Validity Rules window.

Activities

11. The following fields are display only:
    - **Step** indicates the step number associated with the listed Operation. Steps cannot be added or deleted here.
    - **Operation** displays the operation associated with the Step. The operation **Version** and **Description** are displayed.
    - **Activity** displays the Activity associated with the Operation. The Activity **Description** is displayed.
12. Enter **Factor** as the number of times the Activity is performed in the displayed Operation. This value can change when resources that are specific to the Organization are associated with ingredients. Required.

Capacity

13. The following fields are display only:
    - **Step** indicates the step number associated with the listed Operation. Steps cannot be added or deleted here.
    - **Operation** displays the operation associated with the Step. The operation **Version** is displayed.
    - **Activity** displays the activity associated with the Operation. Activities cannot be added or deleted here.
    - **Resources** displays the Resource associated to each displayed Activity.

14. The following fields display and can be edited:
    - **Min Capacity** displays the minimum throughput amount per capacity unit as defined on the Resources window.
    - **Max Capacity** displays the maximum throughput amount per capacity unit as defined on the Resources window.
15. **UOM** displays the unit of measure for both Min Capacity and Max Capacity.

Throughput

16. The following fields are display only:
    - **Step** indicates the step number associated with the listed Operation. Steps cannot be added or deleted here.
    - **Operation** displays the operation associated with the Step. The operation **Version** is displayed.
    - **Activity** displays the activity associated with the Operation. Activities cannot be added or deleted here.
    - **Resources** displays the Resource associated to each displayed Activity.
17. **Process Qty** displays the total quantity of material for the Step with its **UOM**. You can enter and save a different Process Qty.
18. **Usage** displays the unit of the Resource used to perform the activity on the displayed Step. The Usage **UOM** displays. You can enter and save a new Usage quantity.

Process Parameters

19. The following fields display only:
    - **Step** indicates the step number associated with the listed Operation. Steps cannot be added or deleted here.
    - **Operation** displays the operation associated with the Step. The operation **Version** is displayed.
    - **Activity** displays the activity associated with the Operation. Activities cannot be added or deleted here.
    - **Resources** displays the Resource associated to each displayed Activity.
20. **Parameter 1 - 5** displays Process Parameter 1 - 5, respectively. These fields can be edited.

21. Save the window.

Using the Find Recipe Organization Details Window

The Find Recipe Organization Details window displays when you navigate to the Recipe Organization Details window.

To find the recipe organization:

1. Enter the **Organization** that owns the recipe. Required.
2. The **Name** of the Organization displays.
3. Click **Find**.

Entering Multi-Record Recipe Validity Rules

The Recipe Validity Rules Multi-Record window lets you enter or edit a complete list of Validity Rules for organizations you can access. Validity Rules provide a combination of a quantity of material and an effective date that is used by production, planning, costing, or MSDS in one or more specified organizations. Validity Rules that have been marked for deletion are not updateable. Validity Dates are ordered by Organization, Product, Recipe Use, and Start Date.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Enter and save recipes.

◗◗ To view multi-record recipe validity rules:

1. Navigate to the **Recipe Validity Rules** window.
2. The following fields are display only:
   - **Formula** displays the formula used in the recipe with its **Version** and **Description**.
   - **Routing** displays the routing used in the recipe with the routing **Version** and **Description**.
3. **Organization** displays the organization that owns this Validity Rule to produce products. This can be your plant or laboratory. When left blank, this field enables the Validity Rule to be global. You can enter and save a new Organization.
4. Enter a **Product** for the Validity Rule. The **Product Description** field displays. Required.
5. Select **Recipe Use** as:
   - **Production** for use in production of products.
   - **Planning** for use in planning material consumption.
   - **Costing** for use in establishing costs.
   - **MSDS** for use in preparing Material Safety Data Sheets.
   - **Technical** for use in establishing technical classes and subclasses.

   Required.

6. Enter the **Preference** number for the Validity Rule. When more than one formula can be used to produce the same product, Preference is used to show the Validity Rule that must be used first, second, third, and so forth. Required.
7. Enter the **From Date** as the date the Validity Rule becomes effective. The date must be within the effective date for any routing associated to the recipe. Required.
8. Enter **To Date** as the date to stop using the Validity Rule. This is an optional field and must be left blank if no expiration date is defined for the Validity Rule.
9. Enter the **Standard Quantity** of Product made with this Formula. This quantity is only used for costing. It does not restrict quantities that can be produced by the Formula displayed. Required.
10. Enter the **UOM** for the Standard Quantity. Required.
11. Enter the **Min Quantity** as the minimum quantity of Product that can be made using the Formula. Required.
12. Enter the **Max Quantity** as the maximum quantity of Product that can be made using the Formula. Required.
13. Click **Details** to display the **Recipe Validity Rules Edit** window.
14. Save the window.

Editing Recipe Validity Rules

The Recipe Validity Rules Edit window enables you to edit validity rules for a specific recipe. Use this window to apply global or specific organization rules to batches, cost management, planning, and MSDS data when producing the same product. Validity Rules can be added, updated, or marked for deletion.

You can use folders and flexfields with this window. See: *Oracle Applications User's Guide* and *Oracle Applications Flexfields Guide*, respectively.

Prerequisites

❑ Enter and save recipes.

To edit recipe validity rules:

1. Navigate to the **Recipe Validity Rules Edit** window.
2. The following fields are display only:
   - **Formula** displays the formula used in the recipe with its **Version** and **Description**.
   - **Routing** displays the routing used in the recipe with the routing **Version** and **Description**.
   - **Status** displays the Status of the Validity Rule. This field cannot be higher than its associated recipe. For example, a Validity Rule cannot be Approved for General Use until the recipe associated to it is Approved for General Use.
3. **Organization** displays the organization that owns this Validity Rule, and the **Organization Description**. This must be your Plant or Laboratory. You can enter and save a new Organization.

Validity Rule

4. Select **Recipe Use** as:
   - **Production** for use in production of products.
   - **Planning** for use in planning material consumption.
   - **Costing** for use in establishing costs.
   - **MSDS** for use in preparing Material Safety Data Sheets.
   - **Technical** for use in establishing technical classes and subclasses.

Required.

5. Enter a **Product** in the Formula for the Validity Rule. The **Product Description** field displays. Required.
6. Enter the **Preference** number for the Validity Rule. When more than one formula can be used to produce the same product, the Preference field is used to show the Validity Rule that must be used first, second, third, and so forth. Preference defaults to 1. Required.

   For example, one formula can be used to produce between 10 and 150 gallons of a product. Another formula can be used to produce between 100 and 1000 gallons of the same product. Since either formula can be used to produce 100 to 150 gallons of material, the Preference field shows the suggested order of use. Lower numbers indicate a higher Preference. The number 1 indicates the highest Preference.

Quantities

7. Enter the **Standard** quantity of product made with this Formula. This quantity is only used for product costing. It does not restrict quantities that can be produced with the Formula. Standard defaults to the quantity provided in the Formula displayed. Required.
8. **UOM** is the unit of measure for the standard quantity. You can enter and save a different unit of measure. Required.
9. Enter the **Minimum** quantity of product that can be made using the Formula. Minimum defaults to 1. Required.
10. Enter the **Maximum** quantity of product that can be made using the Formula. Required.

Effective Dates

11. Enter the **From** date as the date the Validity Rule becomes effective. The date must be within the effective date for any routing associated to the recipe. Required.
12. Enter **To** date as the date to stop using the Validity Rule. This is an optional field and must be left blank if no expiration date is defined for the Validity Rule.
13. Save the window.

Displaying the Recipe Step/Material Association

The Recipe Step / Material Association window displays all items from the recipe formula and lets you associate these items with specific routing steps.

Note: Data appearing on this window is entered and saved using the Recipe Details window.

You can use folders with this window. See: *Oracle Applications User's Guide.*

Prerequisites

- ❑ Enter and save recipes.
- ❑ If the Automatic Step Quantity Calculation is used:
  - – A routing must be associated with the recipe.
  - – Each item marked as contributing to step quantity must be associated with a step, and have a conversion specified between the standard mass unit of measure and standard volume unit of measure.
  - – All operations must use a mass or volume unit of measure.

◗◗ To display recipe step/material associations:

1. Navigate to the **Recipe Step/Material Association** window.
2. The following fields are display only:
   - **Formula** displays the formula used in a recipe with the **Formula Version** and **Formula Description**.
   - **Routing** displays the routing used in a recipe with the **Routing Version** and **Routing Description**.

Associations

- **Step** displays the step number associated with the listed Operation in the displayed Routing. You cannot add a Step to a routing on this window. You must do this on the **Routing Details** window. Required.
- **Operation** displays the operation associated with the Step. The operation **Version** is displayed.
- **Step Quantity** displays the default quantity of material associated with the Step. The **UOM** for the Step Quantity displays.

- **Line** displays the Line number for each product, byproduct, or ingredient listed. Required.
- **Item** displays the code associated with each product, byproduct, or ingredient listed.
- **Line Type** displays the type of Line associated in the Step as a product, byproduct, or ingredient.
- **Quantity** displays the Quantity of product, byproduct, or ingredient yielded by the listed Formula.
- **Line UOM** displays the unit of measure for the Item Quantity.

3. Close the window.

7

Tools

This topic presents multipurpose tools that help you manage recipes, formulas, routings, and operations. It includes a basic understanding of each tool. Several customer requirements are stated for New Product Development tools and some typical solutions are provided. A discussion of tools shows you how New Product Development enhances your ability to manage routine and advanced search and replace operations.

The following topics provide a basic understanding of tools:

- Understanding Search and Replace
- Requirements
- Solutions
- Performing a Search and Replace

Understanding Search and Replace

The New Product Development Search and Replace window enables you to search for and replace records in:

- Operations
- Routings
- Formulas
- Recipes

The Find list enables you to select the target for the search, such as an operation or a routing. You can only search for one target at a time. The Basic and Advanced search regions let you specify conditions to narrow the search. Once you have selected a target, and initiated a search, clear the window before searching for a new target.

Using the Basic Search Region

The Basic search region enables you to specify any combination of Name, Version, Description, Owner, or Status. Enter specific search data, or use the wildcard % for search string matching.

For example, if you search for:

Owner JDOE

Name A%

The results contain all entries where the Owner is JDOE and that start with the letter A.

Using the Advanced Search Region

The Advanced search region enables you to specify conditions to narrow the search for one or more Item field entries. You can specify different conditions for each search target.

Specifying the Item Field in an Advanced Search

- For Operations you can specify search conditions for:
  - Effective End Date
  - Effective Start Date
  - Inactive

    - Operation
    - Operation Class
    - Operation Version
    - Owner
    - Resource
    - Status
- For Routings you can specify search conditions for:
    - Effective End Date
    - Effective Start Date
    - Inactive
    - Operation
    - Owner
    - Routing
    - Routing Class
    - Routing Version
    - Status
- For Formulas you can specify search conditions for:
    - Byproduct
    - Inactive
    - Formula
    - Formula Class
    - Formula Version
    - Ingredient
    - Owner
    - Product
    - Status
- For Recipes you can specify search conditions for:
    - Formula

- Owner
- Owner Organization
- Recipe
- Routing
- Status
- Version

Specifying the Condition Field in an Advanced Search

In an advanced search of operations, routings, formulas, or recipes, select any of the following conditions for one or more Items entered:

- Equal To finds targets equal to the specified Value entered.
- Greater Than finds targets greater than the specified Value entered.
- Less Than finds targets less than the specified Value entered.
- Greater Than or Equal To finds targets greater than or equal to the specified Value entered.
- Less Than or Equal To finds targets less than or equal to the specified Value entered.
- In finds targets that contain the information specified in single quotation marks.

  For example, if you specify the Item as Owner, select the Condition In, and enter 'JDOE' as the Value, you find all targets whose owners are JDOE. You can enter one or several Values for the search. You must separate each entry with a comma.

  For example, if you specify the Item as Product, select the Condition In, and enter 'FORMULA 101','ROUTING 100' you find each target product that contains the entries specified within single quotation marks.
- Not In finds targets that do not contain the information specified in single quotation marks.

  For example, if you specify the Item as Owner, select the Condition Not In, and enter 'JDOE' as the Value, you find all targets whose owners are not JDOE. You can enter one or several Values for the search. You must separate each entry with a comma.

For example, if you specify the Item as Product, select the Condition Not In, and enter 'FORMULA 101','ROUTING 100' you find each target product that does not contain entries specified within single quotation marks.

- Like finds targets similar to the the information specified using the wildcard %.

  For example, if you specify the Item as Product, select the Condition Like, and enter FORM% you find each target Product that contains entries with the letters FORM.

Mass Search and Replace Security

Your System Administrator sets up the security level for Mass Search and Replace. This is done in the System Administrator responsibility using the Applications Functions window. When functions are registered for the appropriate responsibility that can use Mass Search and Replace two parameters are passed with the following settings:

- Enable_status=No disables the ability to make a change of status using Mass Search and Replace. If you cannot change status and you feel you should be able to, please contact your System Administrator.
- Enable_status=Yes is the default and enables the responsibility to make a change of status using Mass Search and Replace.
- Enable_replace=No disables the replace capability. If you cannot use the replace capability, and you feel you should be able to, please contact your System Administrator.
- Enable_replace=Yes is the default and enables the responsibility to use the replace capability.

Requirements

Following are some requirements that customers have for tools in New Product Development.

Can the application perform a mass search and replace for ingredients in formulas?

Yes. By using the New Product Development Search and Replace tool, the application searches for and replaces specified records in recipes, formulas, routings, and operations.

Does mass search and replace support change management control by allowing status and version updates?

Yes. As part of change management control, mass search and replace enables rapid component substitution while supporting status and version control updates for each formula, recipe, routing, or operation affected by the substitution.

Solutions

New Product Development provides solutions to help resolve issues at every stage of the product development process. The following represent some of the key management solutions for tools.

New Product Development Search and Replace Provides Efficient Substitutions in Formulas, Routings, Operations, and Recipes The New Product Development Search and Replace window enables the identification and replacement of key components in formulas, routings, operations, and recipes for single or multiple organizations. The basic features of the search and replace tool permit the query for fundamental components such as the name, version, description, owner, and status. Advanced search and replace features facilitate the search and replacement of components using conditions and specific values in formulas, routings, operations, and recipes.

Mass Search and Replace Supports Change Management Control Formula ingredient substitution is a critical business need for process industries to meet stringent product specifications during batch production. The tool enables rapid identification and replacement of approved ingredient substitutions.

Ingredients are replaced for various business reasons such as obsolescence, customizations, pricing, or regulatory compliance. Mass Search and Replace takes into account the affected formula and status in order to recalculate step quantities, technical parameters, and formula contribution by class and subclass. As part of change management control, this tool assists in the management of status and version for each changed component.

Performing a Search and Replace

The New Product Development Search and Replace window enables you to search for and replace components in recipes, formulas, operations, and routings.

Prerequisites

- ❑ Determine if your responsibility has the authority to use the Search and Replace function.
- ❑ Read the Understanding Search and Replace topic.

◗◗ To search for and replace components:

1. Navigate to the **New Product Development Search and Replace** window.
2. Select **Operations**, **Routings**, **Formulas**, or **Recipes** from the **Find** list to specify the type of records you need to search and replace.
3. The **Basic** and **Advanced** regions let you specify the search criteria.

   Enter one or more of the search parameters. It is not necessary to enter them all. You can use string search matching by entering **%** as wildcard.

Basic

4. Enter the **Name** of the record type you need to search and replace.
5. Enter the **Version** number of the record type you need to search and replace.
6. Enter the **Description** of the record type you need to search and replace.
7. Select a **Status** of the record type you need to search and replace.
8. You have the option to:
   - Click **Find** to search for all records that match the Basic search criteria. If you do this, proceed to step 11.
   - Click the **Advanced** region to enter additional search criteria. If you do this, proceed to step 9.

Advanced

9. Enter an **Item**, **Condition**, and **Value** to specify a condition for the search. For example, to search for all formulas with a version of 1, select **Formula Version** as the **Item**, **Equal To** as the **Condition**, and enter a Value of 1.

10. Click **Find** to search for all records that match **Basic** and **Advanced** search criteria.

11. The **Results** of the search display. If no results are found, you not able to use **GoTo** or **Replace**. To review the details for each record found perform one of the following:

    - Double-click the drill down indicator next to the appropriate **Name**.
    - Select the appropriate **Name** and click **Go To**.

    Return to the **New Product Development Search and Replace** window to continue.

    Note: You cannot use the Replace capability unless you have proper authorization. Contact your System Administrator if you have questions regarding this authorization.

Replace

12. Click the **Replace** region.

13. Select the component to be replaced from the **Replace** list. Enter the **Old** component **Name** and, if required, the **Version**.

14. Enter the **New** component **Name** that you want to replace in selected Results. If required, enter a new **Version**. If the component being replaced is a formula, you must enter an appropriate **Scale Factor**.

15. Select the **Update** check box next to each Name that you want to replace with the entry made in the New **Name** field. To update the entire list, select **Select All** from the **Actions** menu. To clear all selections, select **Deselect All** from the **Actions** menu.

16. Press **Replace** to perform the specified changes. The message "Are you sure you want to replace this?" is displayed:

    - Enter **Y** to indicate that you want to replace the selected records with the **New Name** field.
    - Enter **N** to indicate that you do not want to replace the selected records with the **New Name** field.

    If automatic version control is not active, the message "Create new version?" displays.

    - Enter **Y** to indicate that you want to create a new version.

- Enter **N** to indicate that you do not want to create a new version.

If no records are found that meet the replace criteria, the message "No records were found that meet the replace criteria." is displayed.

17. Note the **Request ID** number displayed.
18. Select **View** from the menu, and choose **Requests** to view the status of your request in the concurrent program manager.
19. When your **Request ID** has completed normally, select **View Log** to determine if there were any problems. The log displays all successful and failed updates. The log specifies if there were no records found for the replacement operation.
20. The **Replace Results** window displays.

Using the Replace Results Window

The Replace Results window displays the records that have had something replaced. It enables you to change the status of a Name to the Default Target Status or to a Status you specify. Submit Status Change is not available if you changed Status using the Replace function itself.

> **Note:** You cannot change Status unless your have proper authorization. Contact your System Administrator if you have questions regarding this authorization.

To change status to the Default Target Status:

1. Search for and replace records as described in the Performing a Search and Replace topic. All updated records have a check box next to them.
2. Click **Default Target Status**. The **Default Target Status** window displays.
3. Enter the appropriate **Status** for all records selected.
4. Click **OK**.

> **Note:** The Status of a Name does not change to the Default Target Status if the Status is not valid for the selected Name.

5. All selected records are updated to the **Default Target Status**.

6. To change the **Status** displayed for one or more records, select the appropriate Status from the LOV, and select the **Update** check box.
7. Click **Submit Status Change** to save changes to the records selected for updating.
8. Click **Errors** to determine if any errors occurred when the updated Status was applied to the database.
9. Click **Close**.

A

New Product Development 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	Process Engineer:Routing Setup:Activities
Alternate Resources	Process Engineer:Routing Setup:Alternate Resources
Display Calculation Errors	Formulator:Spreadsheet:Laboratory Spreadsheet:Actions:Calculation Errors
Find Analysis	Formulator:Formula Analysis:Analysis:Formula Ingredient Contribution Analysis:View:Find...
Find Formulas (from the Navigator)	Formulator:Formulator Workbench:click the Formula tab:View:Find...
Find Formulas (from the View Menu)	Formulator:Formulas:Formula Details:View:Find...
Find Operations (from the Navigator)	Process Engineer:Engineering Workbench:click the Operation tab:View:Find...
Find Operations (from the View Menu)	Process Engineer:Operations:Operation Details Activities:View:Find...
Find Recipe Organization Details	Formulator:Recipe Orgn Details
Find Recipes (from the Navigator)	Formulator:Formulator Workbench:click the Recipe tab:View:Find...

Window	Path
Find Recipes (from the View Menu)	Process Engineer:Recipes:Recipe Details:View:Find...
Find Routings (from the Navigator)	Process Engineer:Engineering Workbench:click the Routing tab:View:Find...
Find Routings (from the View Menu)	Process Engineer:Routings:Routing Details:View:Find...
Formula Analysis Parameters	Formulator:Formula Analysis:Parameters
Formula By-Product Lines	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:select a formula:Formula Header Summary:click By-Products (also available from Formula By-Product Summary and Formula Details)
Formula By-Product Line Edit	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula:select By-Products:Formula By-Product Summary:select a Line:click Edit Line (also available from Formula By-Product Line Summary, Formula By-Product Lines, and Formula Details)
Formula By-Product Line Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:expand By-Products:select a byproduct node
Formula By-Product Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula:select By-Products
Formula Classes	Formulator:Setup:Formula Class
Formula Details	Formulator:Formulas (also available from Formulas Summary By... and Formula Header Summary)
Formula Header Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:select a formula node label
Formula Ingredient Contribution Analysis	Formulator:Formula Analysis:Analysis

Window	Path
Formula Ingredient Lines	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:select a formula:Formula Header Summary:click Ingredients (also available from Formula Ingredient Summary and Formula Details)
Formula Ingredient Line Edit	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:select Ingredients:Formula Ingredient Summary:select a Line:click Edit Line (also available from Formula Ingredient Line Summary, Formula Ingredient Lines, and Formula Details)
Formula Ingredient Line Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:expand Ingredients:select an ingredient node
Formula Ingredient Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:select Ingredients
Formula Inquiry Selection	Formulator:Formula Inquiry
Formula Inquiry Summary View	Formulator:Formula Inquiry:Formula Inquiry Selection
Formula Product Line Edit	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:select Products:Formula Product Summary:select a Line:click Edit Line (also available from Formula Product Line Summary, Formula Product Lines, and Formula Details)
Formula Product Lines	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:select a formula node:Formula Header Summary:click Products (also available from Formula Product Summary)

Window	Path
Formula Product Line Summary	Formulator:Formulator Workbench:click the Formula tab:expand Formulas:expand a formula node:expand Products:select a product node
Formula Product Summary	Formulator:Formulator Workbench:expand Formulas:expand a formula node:select Products
Formula Summary By...	Formulator:Formulator Workbench:click the Formula tab:select View By:select Class, Status, Owner, Laboratory, Product, or Plant:expand Formulas By...:select an unexpanded node
Indented Bill of Materials Report	Formulator:Indented Formulas
Item Technical Data	Formulator:Technical Data:Item Technical Data
Item Technical Data Selection	Formulator:Formulas:Formula Details:select Technical Data Selection from the Actions menu
Items	Formulator:Inventory Items
Laboratory Spreadsheet	Formulator:Spreadsheet
New Product Development Search and Replace	Formulator:Mass Search And Replace
Operation Activity Line	Process Engineer:Engineering Workbench:click the Operation tab:select View By Operations:expand Operations:select an operation node:Operation Header Summary:click Details:Operation Details Activities:select an activity (also available from Operation Activity Line Summary)
Operation Activity Line Summary	Process Engineer:Engineering Workbench:click the Operation tab:select View By Operation:expand Operations, expand an operation node:select an activity
Operation Classes	Process Engineer:Routing Setup:Operation Classes

Window	Path
Operation Details Activities	Process Engineer:Operations (also available from Operation Summary By..., Operation Header Summary, and Routing Details)
Operation Details Activity-Resource	Process Engineer:Operations:Operation Details Activities:query an operation:select an Activity:click Resources
Operation Header Summary	Process Engineer:Engineering Workbench:click the Operation tab:select View By Operation:expand Operations:select an operation node label
Operation Resource Line	Process Engineer:Engineering Workbench:click the Operation tab:select View By Operation:expand Operations:select an operation:Operation Header Summary:click Details (also available from Operation Details Activity-Resource)
Operation Resource Line Summary	Process Engineer:Engineering Workbench:click the Operation tab:select View By Operation:expand Operations:expand an operation node:expand an activity node:select a resource
Operations Summary By...	Process Engineer:Engineering Workbench:click the Operation tab:select View By:select Class or Status:expand Operations By...:select unexpanded operation node
Plant Resources	Process Engineer:Routing Setup:Plant Resources
Recipe Details	Process Engineer:Recipes Formulator:Recipes (also available from Recipe Header Summary and Recipes Summary By...)
Recipe Header Summary	Formulator:Formulator Workbench:click the Recipe tab:select View By Recipe:expand Recipes:select a recipe node label

Window	Path
Recipe Organization Details	Formulator:Recipe Orgn Details:Find Recipe Organization Details:enter search parameters:click Find (also available from Recipe Details)
Recipe Step / Material Association	Formulator:Formulator Workbench:click the Recipe tab:select View By Recipe:select a recipe:Recipe Header Summary:click Details:Recipe Details:click Step / Material Association
Recipe Validity Rules	Formulator:Recipes:query a recipe on the Recipe Details window:click Validity Rules (also available from Recipe Header Summary)
Recipe Validity Rules Edit	Formulator:Formulator Workbench:click the Recipe tab:select View By Recipe:expand Recipes:select a recipe node:Recipe Header Summary:click Validity Rules tab:select desired validity rule:click Details (also available from Recipe Organization Details and Recipe Validity Rules)
Recipes Summary By...	Formulator:Formulator Workbench:click the Recipe tab:select View By:select Status or Owner:expand Recipes By...:select unexpanded node
Resources	Process Engineer:Routing Setup:Generic Resources
Retrieve Spreadsheet	Formulator:Spreadsheet:Laboratory Spreadsheet:select Retrieve Spreadsheet from Actions menu
Routing Classes	Process Engineer:Routing Setup:Routing Classes
Routing Details	Process Engineer:Routings (also available from Routings Summary By... and Routing Header Summary)
Routing Header Summary	Process Engineer:Engineering Workbench:click the Routing tab:select View By Routing:expand Routings:select a routing node label

Window	Path
Routing Step Dependencies	Process Engineer:Routings:Routing Details:query a routing:select a Step:click Step Dependencies
Routing Step Line	Process Engineer:Routings:Routing Details:query a routing:select a Step (also available from Routing Step Line Summary)
Routing Step Line Summary	Process Engineer:Engineering Workbench:click the Routing tab:select View By Routing:expand Routings:expand a routing node:select an operation node
Routings Summary By...	Formulator:Formulator Workbench:click the Routing tab:select View By:select Class, Status, or Owner:expand Routings By...:select an unexpanded node
Save Spreadsheet	Formulator:Spreadsheet:Laboratory Spreadsheet:select Retrieve Spreadsheet from Actions menu:make appropriate changes:select Save Spreadsheet from Actions menu
Status Codes	Formulator:Status:Status Codes
Technical Parameter Sequences	Formulator:Technical Data:Technical Parameter Sequences
Technical Parameters	Formulator:Technical Data:Technical Parameters Formulator:Formulas:Formula Details:query the formula:select Ingredients region:select Line containing technical parameters:select Ingredient Technical Parameters from Actions menu
Theoretical Process Loss	Process Engineer:Process Loss (also available from Routing Header Summary and Routing Classes, where values can be edited)

B

New Product Development Profile Options

During your implementation, you set a value for selected profile options to specify how your New Product Development application controls access to and processes data. New Product Development uses the listed profile options.

- GMD: Byproduct Active
- GMD: Default Lab Type
- GMD: Default Release Type
- GMD: Density
- GMD: Display Specifications
- GMD: Effective Maximum Date
- GMD: Effective Minimum Date
- GMD: Effectivity on Upload
- GMD: Exact Specification Match
- GMD: Formula Security
- GMD: Formula Version Control
- GMD: Mass Unit of Measure Type
- GMD: Operation Version Control
- GMD: QC Grade
- GMD: Recipe Version Control
- GMD: Routing Version Control
- GMD: Scrap Factor Type

- GMD: UOM Mass Type
- GMD: UOM Volume Type
- GMD: Volume Unit of Measure Type
- GMD: Workflow Timeout (in Days)
- GMD: Yield Type

You can set up these profile options when you set up other applications prior to your New Product Development implementation. Refer to the other product user's guides for more details on how these 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 to 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. Consult your *Oracle Applications System Administrator's Guide* for a list of profile options common to all Oracle Applications.

C

New Product Development Status Codes

This appendix outlines how status codes change when workflow is and is not running.

Workflow Running and Approval Required for the Current Data

A status of New changes to a status of:

- Pending Approval for Laboratory Use when the Requester selects Approve for Laboratory Use.
- Pending Approval for General Use when the Requester selects Approve for General Use.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Pending Approval for Laboratory Use changes to a status of:

- Approved for Laboratory Use when the Approver approves the request.
- Revise for Laboratory Use when the Approver rejects the request.

A status of Revise for Laboratory Use changes to a status of:

- Pending Approval for Laboratory Use when the Requester selects Approve for Laboratory Use.

A status of Approved for Laboratory Use changes to a status of:

- Pending Approval for General Use when the Requester selects Approve for General Use.
- On Hold when the Requester selects On Hold.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Pending Approval for General Use changes to a status of:

- Approved for General Use when the Approver approves the request.
- Revise for General Use when the Approver rejects the request.

A status of Revise for General Use changes to a status of:

- Pending Approval for General Use when the Requester selects Approve for General Use.

A status of Approved for General Use changes to a status of:

- On Hold when the Requester selects On Hold.
- Frozen when the Requester selects Frozen.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of On Hold changes to a status of:

- Pending Approval for Laboratory Use when the Requester selects Approve for Laboratory Use.
- Revise for Laboratory Use when the Requester selects Revise for Laboratory Use.
- Revise for General Use when the Requester selects Revise for General Use.
- Pending Approval for General Use when the Requester selects Approve for General Use.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Frozen changes to a status of:

- On Hold when the Requester selects On Hold.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Obsolete or Archived changes to a status of:

- Revise for Laboratory Use when the Requester selects Revise for Laboratory Use.
- Revise for General Use when the Requester selects Revise for General Use.

Workflow Not Running

A status of New changes to a status of:

- Approve for Laboratory Use when the Requester selects Approve for Laboratory Use.

- Approve for General Use when the Requester selects Approve for General Use.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Approved for Laboratory Use changes to a status of:

- Approve for General Use when the Requester selects Approve for General Use.
- On Hold when the Requester selects On Hold.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Approved for General Use changes to a status of:

- On Hold when the Requester selects On Hold.
- Frozen when the Requester selects Frozen.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of On Hold changes to a status of:

- Approve for Laboratory Use when the Requester selects Approve for Laboratory Use.
- Approve for General Use when the Requester selects Approve for General Use.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Frozen changes to a status of:

- On Hold when the Requester selects On Hold.
- Obsolete or Archived when the Requester selects Obsolete or Archived.

A status of Obsolete or Archived changes to a status of:

- Approve for Laboratory Use when the Requester selects Approve for Laboratory Use.
- Approve for General Use when the Requester selects Approve for General Use.

Glossary

Activity

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

Activity Factor

The number of times an activity is performed. For example, a quality test must be performed at the beginning, middle, and end of a mixing time period. Rather than defining the activity and associated resources three times, use a factor or multiplier to indicate several iterations of the same activity. In example of performing a test at the beginning, middle, and end of a mixing time period, you would define a factor of 3. Factors are applied to resource usage when planning and calculating resource costs. Factors can be set to zero to exclude a particular activity. This is also a means to select the equipment (resources) that are used for this production run within this specific plant.

Boolean

A logical combinatorial system that represents the symbolic relationships between entities. Typical logical operators are: AND, OR, and NOT. In Boolean searching, the AND operator between two words indicates a search for both words. For example "pear AND apple" searches for information containing both words.

Byproduct

An item produced by a formula in addition to the product. Byproducts differ from products in that you do not plan your production to make byproducts. Byproducts can have monetary value, but generally have less monetary value than products. In some instances there can be a cost associated with disposing of a byproduct.

Category

Code used to group items with similar characteristics, such as plastics, paints, inks, or foods.

Category Set

Grouping scheme consisting of categories. Typical category sets include purchasing, materials, costing, and planning.

Charges

Often in a process manufacturing plant the capacity of a step is determined by the equipment used. For example, a mixing tank that has a maximum capacity of 1000 gallons overflows if more is added. A charge is defined as one full load that can be accommodated in a single pass through equipment. The maximum capacity determines the total number of charges that are required to process the ingredients required for a batch. In the previous example, a batch size of 5000 gallons requires five charges at 1000 gallons each.

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 byproduct.

Cost Analysis Code

A code that generally specifies whether an activity is value-added.

Density

The quantity of a material per unit volume. In general, density is mass divided by volume.

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.

Exponentiation

The act or process of raising a quantity to a power.

Formula

A statement of ingredient requirements. A formula can also include processing instructions and ingredient sequencing directions. The formula can also specify the quantities of each item.

Gravimetric

Of or relating to measurement by weight.

Ingredient

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

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.

Process Parameter

A processing instruction. Processing parameters are used to provide operators with information needed for managing equipment that is used during the preparation of a product or to drive a production decision, such as the type of filter to use, or the quantity of product required to fill a container. There is no direct linkage between a process parameter and the equipment it describes.

Product

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

Project

In the context of product development, this represents an endeavor undertaken to develop a new product or to perform changes to an existing product. A project gathers information about the project manager, participants and objectives to be met such as start dates, end dates, unit cost, and quality specifications.

Recipe

An entity that contains the minimum set of information that uniquely defines the manufacturing requirements for a specific product. Recipes provide a way to describe products and how those products are produced.

Resource

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

Routing

A sequenced set of operations that need to be performed in order to complete a production batch.

Routing Process Loss

The capability to account for material lost during the production process at the routing level. This loss can vary depending on the routing and quantity being processed by the routing. A loss factor is defined at the routing level based on a range of quantities.

Scaling

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

Specific Gravity

The ratio of the density of a substance to the density of some other substance, usually pure water, taken as a standard when both densities are obtained by weighing in air at standard temperature and pressure.

Specification

Identify the target or ideal result of a quality control assay test performed on an item or lot. Assay codes and item attributes are combined to devise test specifications for specific items and lots.

Technical Class

An item category that is used to identify and group ingredients. It is used to analyze ingredients within a formula by contribution of the class. This can assist in both development and maintenance of a formula, wherein the overall contribution of specific technical characteristics of ingredients is significant.

Technical Subclass

An item category that is used to identify and group ingredients within a technical class. The technical subclass refines the analysis of ingredients within a formula a level beyond the technical class. For example, if a technical class is RESIN, a technical subclass could be EPOXY.

Theoretical Process Loss

The capability to account for the material lost during the production process at the routing level. This loss can vary depending on the routing or the individual

quantity being processed by the routing. This loss is defined at the routing level and is based on a minimum and maximum range of quantities.

Theoretical Yield Calculation

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

Validity Rule

Formerly effectivity. The combination of a quantity of material and an effective date that is used by production, planning, costing, or MSDS in one or more specified organizations.

Version

A number identifying a variant of a formula, operation, routing, or recipe.

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