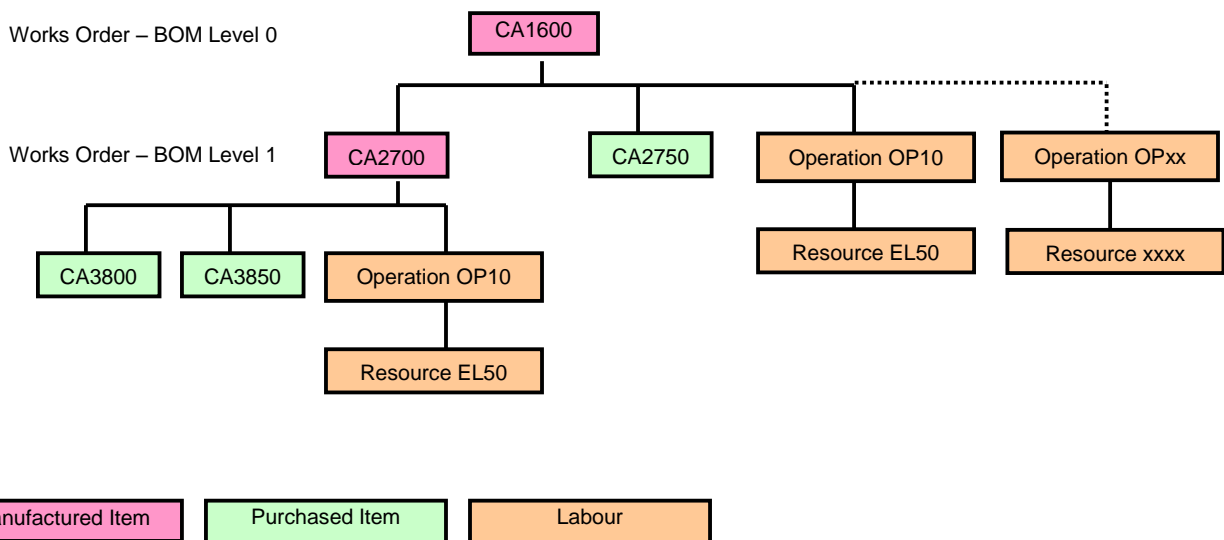


CAUTION !! All new procedures and processes should be checked in the 'Test' environment before being applied to the 'Live' business system.

BILL OF MATERIALS OVERVIEW (Ver 6)

1. INTRODUCTION

The BOM module within Sapphire also contains the Routing function. This document considers both of these together with the required set up of Resources and Process Descriptions. The screens shown are those available from V9 SP12 onwards, but the appendix shows the earlier screens for comparison.



A typical structure is shown above, with the Parent item at Level 0 and a Sub-Assembly at Level 1. There will be a BOM for CA2700 and CA1600. As the Routing is linked directly to the BOM in Sapphire, the Labour is shown together with the Materials. In general, a Works Order will be generated for each level in the structure unless that level is set as a 'Phantom'.

2. CREATE/AMEND BOM - Header

Bill of Materials, BOM Maintenance, Create/Amend BOM

BOM Ref

The Stock Item number for this BOM

Customer Part

The customers part number where this differs from the Stock Item/BOM Ref

Description

This is defaulted from the Stock Item

Notes

Standard

Drawing

Issue Number

Issue Reference

Date Created

System date when the BOM was created

Last Amended

Eco Order Qty

Economic Order Quantity or EOQ. This is the batch size/quantity in which this BOM should be manufactured. If a Works Order is raised for a lesser quantity a warning will be given, but the user is not prevented from proceeding.

Note that any Setup or Finish times will also be factored by this figure in calculating the Standard Cost and the Works Order Cost. For example, if the Eco Order Qty = 10, then 1/10 of the total Setup and Finish Times costs will be added to each item.

NOTE ! This field was previously named Economic Batch

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BOM Type

The options are

- Standard. This is the conventional structure shown above
- Phantom. The assembly is not held in stock and will not generate a works order. The next higher-level assembly in the structure will call for the components from the Phantom and not the assembly. The Phantom is treated as though it was 'transparent'. The overall effect is to 'flatten' the structure, which is usually desirable, but the use of Phantoms to achieve this should be considered carefully.
- Kit. Used by Sales Order Processing to present the components of the assembly not the assembly itself. Sometimes referred to as 'Component Orders'.

Batch Size

The Batch Size is related to the Total Quantity on the BOM line items. For example if the Batch Size = 10, then the Total Quantities on the line items will be those required to manufacture a quantity of 10 of the Parent item.

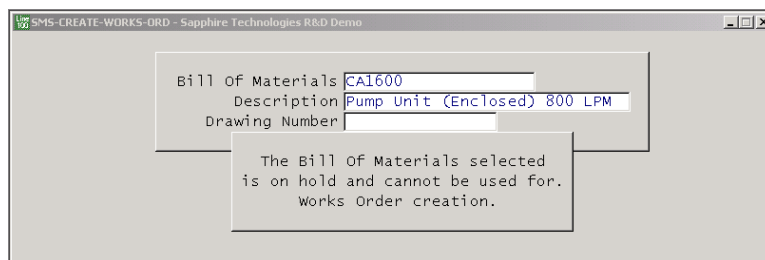
Note that the Batch Size has no relevance to the Routing, where the times are per item NOT per Batch Size

Weight/Per

Analysis

On Hold

A BOM can be Placed and Released from Hold through the menu options under *Bill of Materials, Transaction Entry*. The BOM can also be placed on immediate Hold after creation by using the Parameter setting under Options. QA departments will use this function to prevent a BOM being manufactured until it has been approved or if a quality problem is revealed. Attempting to raise a Works Order will produce a warning message that cannot be overridden.



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2.1 CREATE/AMEND BOM - Lines

In the following examples, an Amend routine is being used on an existing BOM.

An asterisk in the second column indicates that this component is an assembly and has its own BOM. Double clicking this line will enable the user to 'drill down' and see this lower level BOM.

The Build Path will be extended to show that the lower level is being examined. In this screen the Build Path shows that the Parent is the CA1600 which is made from the lower level CA2700 and the BOM that is currently open is the CA2700

'Qty' and 'of Size'

For a single component such as the CA3800 shown above both fields are '1'. The Total Qty field is the multiplication of Qty x Size.

This feature is used for example where 10 pieces (Qty) of steel are required each 500mm long (of Size) to give a total requirement (Total Quantity) of 5m.

Note !! During Item Create/Amend, entering a zero in the Qty field allows direct access to the Total Qty field with 7DP numeric entry instead of being calculated as shown above. This 7DP field is also now displayed immediately on entering the Create/Amend screen before selecting a component for amendment.

3. ROUTING

SMS-BOM-CREATE - Sapphire Technologies R&D Demo

BOM Ref: CA2700
 Title: Pump Assembly 3HP/800LPM
 Operat'n Ref: PR42
 Details: Manual Assembly

Sequence: 10 Max(10)
 Run Time: 1:00
 Run Qty: 1.0000
 Time Per Item: 1:00:00.00

Resource Ref	Description	Type
EL50	Assembly	Labour

Set Up Time: 0:30
 Run Time: 1:00
 Finish Time: 0:00
 Charge Rate: 10.0000

Amend Routing

Sequence

This is the Operation Number within the overall Routing, and the increment can be set in the Parameters. The increment is often set to 10, to give Operation line numbers 10, 20, 30 etc.

Run Time, Run Qty & Time Per Item

The Run Time is divided by the Run Qty to give the Time per Item. The Time per Item is for a quantity of 1 not the Batch Size selected in the BOM header.

Example 1

In the above Assembly operation, it takes 1 Hour to assemble 1 Pump Assembly. The Run Time of 1:00 hour and Run Qty of 1 give an assembly Time Per Item of 1:00 hour

Example 2

Assume a machine operation that is capable of producing 100 components per hour. The Run Time is 1:00 hour with a Run Qty of 100. The calculated Time Per Item is 36 seconds.

The Run Time is copied from the Operation header to the Resource, but can be overwritten. For Example, an operator may be able to run say 4 CNC machines in a manufacturing cell. The Run time for the machine would be 1 hour, but the Run time for the operator is only 15 minutes.

Note that the Run Time in the Resource is for the Run Qty shown against the Operation.

4. PARAMETERS

Bill of Materials, Utilities, Parameters, Options

Bill Of Materials Options

Default Routing Sequence Increment
 Number Of Characters to Indent

Show Component Costs as
 Order Components During Print BOM By

BOM must have at least one operation
 BOM must have at least one resource

Default BOM Costing Method
 Allow costing of BOM during create/amend

Keep Amendments Log
 Automatically Place New BOMs On Hold

The following tables need to be populated prior to creating Routings. Resources are linked to Resource Groups. This can be say two groups, for Labour and Machines, or contain more groups to accurately types of machines (CNC, Conventional Turning, Conventional Milling etc)

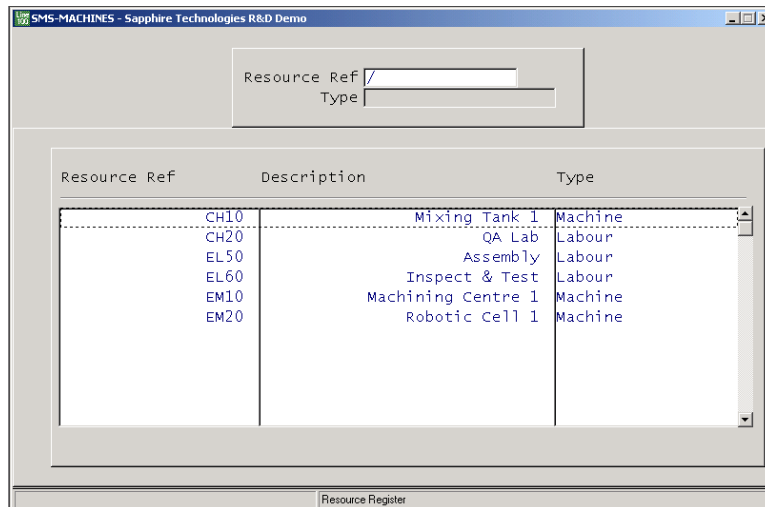
Bill of Materials, Utilities, Parameters, Resource Groups

Resource Group

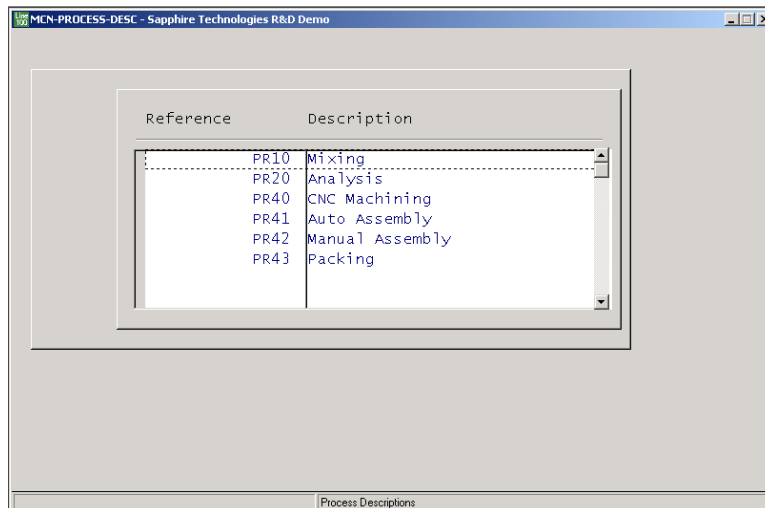
Description

Resource Group	Description
GP10	Electrical (Labour)
GP20	Electrical (Machines)
GP30	Chemical Process

Bill of Materials, Utilities, Parameters, Resource Register



Bill of Materials, Utilities, Parameters, Process Descriptions



Process Descriptions are also known as Standard Operations. They are a list of tasks that can be selected when creating a Routing. The Resource required is then linked to the Process Description.

APPENDIX 1

The screens were amended from V9 Service Pack SP12 to standardise the terminology and remove fields that were used for special applications only.

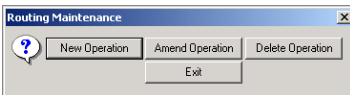
BOM NEW SCREENS

BOM EARLIER SCREENS

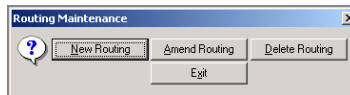
New Name	Old Name
Total Quantity	Quantity
Qty	Batch Qty
of Size	Batch Size

Data Sheet for Bill of Materials

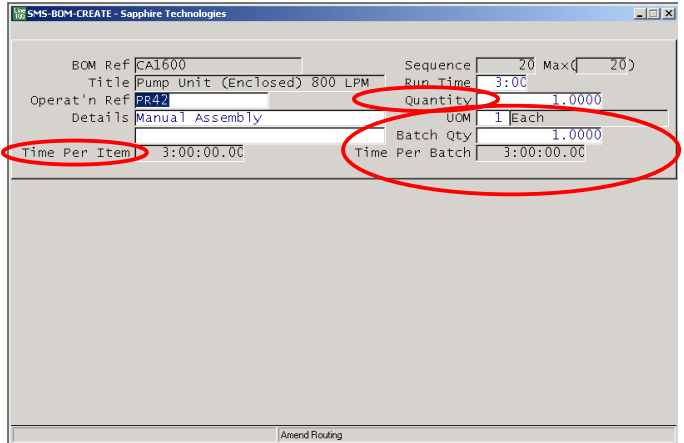
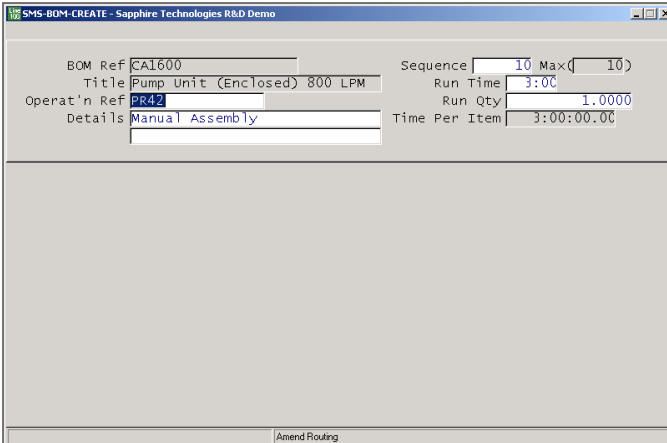
ROUTING NEW SCREENS



ROUTING EARLIER SCREENS

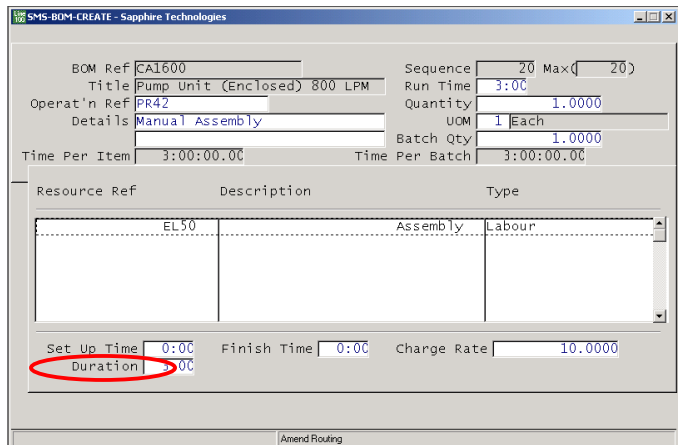
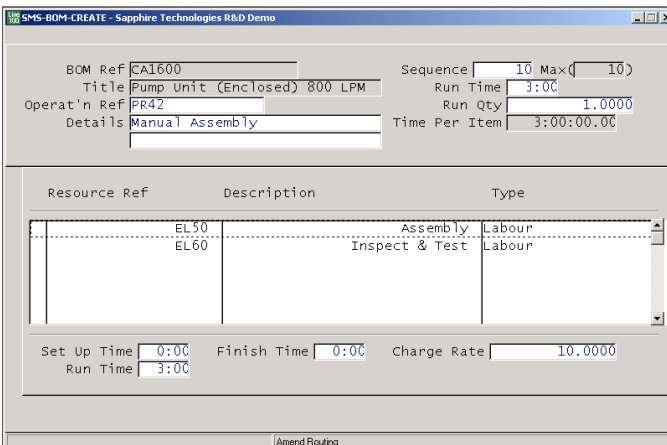


New Name **Old Name**
 Operation Routing



New Name **Old Name**
 Run Qty Quantity

UOM, Batch Quantity and Time Per Batch are deleted
 Time Per Item is relocated



New Name **Old Name**
 Run Time Duration

APPENDIX 2

The files related to the above changes are standard from V9 SP12 and in V10

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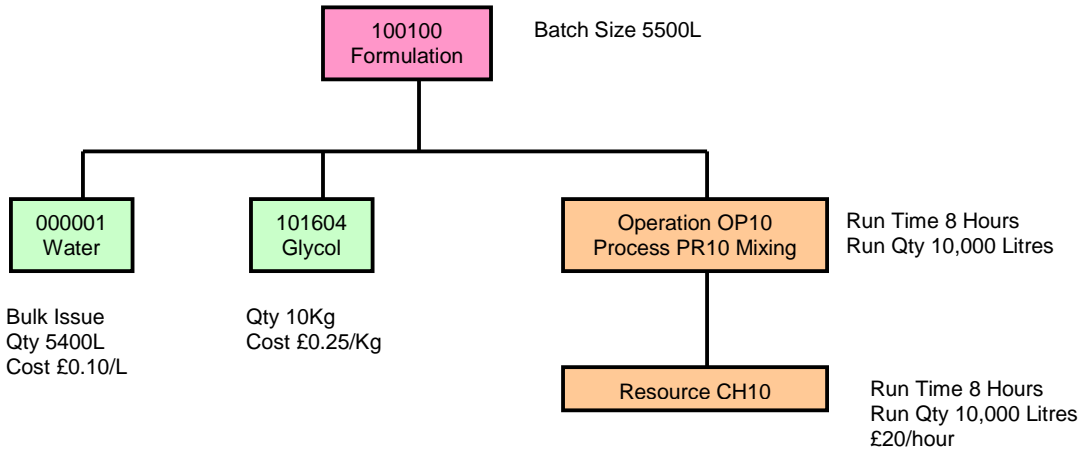
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APPENDIX 3

The following BOM example is included to show the use of Batch Sizes. This is particularly relevant when considering chemical formulations.



SMS-BOM-CREATE - Sapphire Technologies R&D Demo

BOM Ref: 100100
 Customer Part: []
 Description: Formulation
 Notes: []
 Standard: []
 Drawing: []
 Issue Number: []
 Issue Reference: []
 Date Created: 18 Mar 2005
 Last Amended: []
 Eco Order Qty: 0
 BOM Type: Standard
 Batch Size: 5500.0000
 weight: 0.0000 Per: 0
 Analysis: [] On Hold: []

Create BOM

MCN-BOM-VIEW - Sapphire Technologies R&D Demo

BOM Ref: 100100 Sequence: 10 Max: 10
 Title: Formulation Run Time: 8:00
 Operat'n Ref: PR10 Run Qty: 10000.0000
 Details: Mixing Time Per Item: 0:00:02.88

Resource Ref	Description	Type
CH10	Mixing Tank 1	Machine

Set Up Time: 1:00 Finish Time: 0:00 Charge Rate: 20.0000
 Run Time: 8:00

View Routing

NOTE THAT THE RESOURCE RUN TIME IS FOR THE RUN QTY SHOWN FOR THE OPERATION

MCN-BOM-VIEW - Sapphire Technologies R&D Demo

Bill of Materials: 100100 Level: 1
 Description: Formulation UOM: Litres
 Build Path: 100100 »
 Issue Number: 0

Seq	Item Number	Description	Total Qty
1	000001	Water	5400.0000
2	101604	Monoethylene Glycol	10.0000

Qty: 1.0000 of Size: 5400.0000 Total Qty: 5400.0000000

Raw Material: [] In stock: 0.0000
 UOM: Litres Component Ref: []
 Minimum Issue: 0 Bulk Item: [] Unit Cost: 0.1000

View BOM

Works Order for 5,500L of Formulation

The Quantity Required is the same as the Batch Size and hence the component quantities are the same as the BOM quantity

Component Quantities are equal to the:

$$(W/O Qty/Batch Size) \times BOM Total Qty$$

For item 000001

$$5500/5500 \times 5400 = 5400$$

Bill of Materials, Enquiries, View BOM

Item Number	Total Required	Issued	Outstanding
B 000001	5400.0000	0.0000	5400.0000
101604	10.0000	0.0000	10.0000

Works Order: 5033, Qty Required: 5500.0000, BOM Ref: 100100, Description: Formulation, Status: 0 Direct Entry, Manufactured: 0.0000, Outstanding: 5500.0000

Works Order Processing, Enquiries, View Resource Loading

The Resource Loading is calculated by the:

$$(Run Time/Run Qty) \times W/O Qty$$

$$= 8 \text{ Hours}/10000 \times 5500$$

$$= 2.88 \text{ secs} \times 5500 = 4 \text{ Hrs } 24 \text{ mins}$$

Works Ord	BOM Reference	Operation Reference	Actual	Expect	Out'ing
5033	100100	PR10	0:00	4:24	4:24
5034	100100	PR10	0:00	8:00	8:00

Resource: CH10, Type: Machine, Description: Mixing Tank 1, Group: GP30

Op Start Date: , Op End Date: , Total: 0:00, 12:24, 12:24

Works Order for 10,000L of Formulation

Bill of Materials, Enquiries, View BOM

Works Order	5034	Qty Required	10000.1000
BOM Ref	100100	Manufactured	0.0000
Description	Formulation	Outstanding	10000.1000
Status	0 Direct Entry		

Item Number	Total Required	Issued	Outstanding
000001	9818.2800	0.0000	9818.2800
101604	18.1820	0.0000	18.1820

Component works Order Number
Description Water

Component Quantities are equal to the:

(W/O Qty/Batch Size) x BOM Total Qty

For item 000001

$10000/5500 \times 5400 = 9818.28$

Works Order Processing, Enquiries, View Resource Loading

The Resource Loading is calculated by the:

(Run Time/Run Qty) x W/O Qty

$= 8 \text{ Hours}/10000 \times 10000$

$= 2.88 \text{ secs} \times 10000 = 8 \text{ Hrs}$

Resource	CH10	Type	Machine
Description	Mixing Tank 1	Group	GP30

Works Ord	BOM Reference	Operation Reference	Actual	Expect	Out'ing
5033	100100	PR10	0:00	4:24	4:24
5034	100100	PR10	0:00	8:00	8:00

Op Start Date
Op End Date

Total 0:00 12:24 12:24

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