

MRP

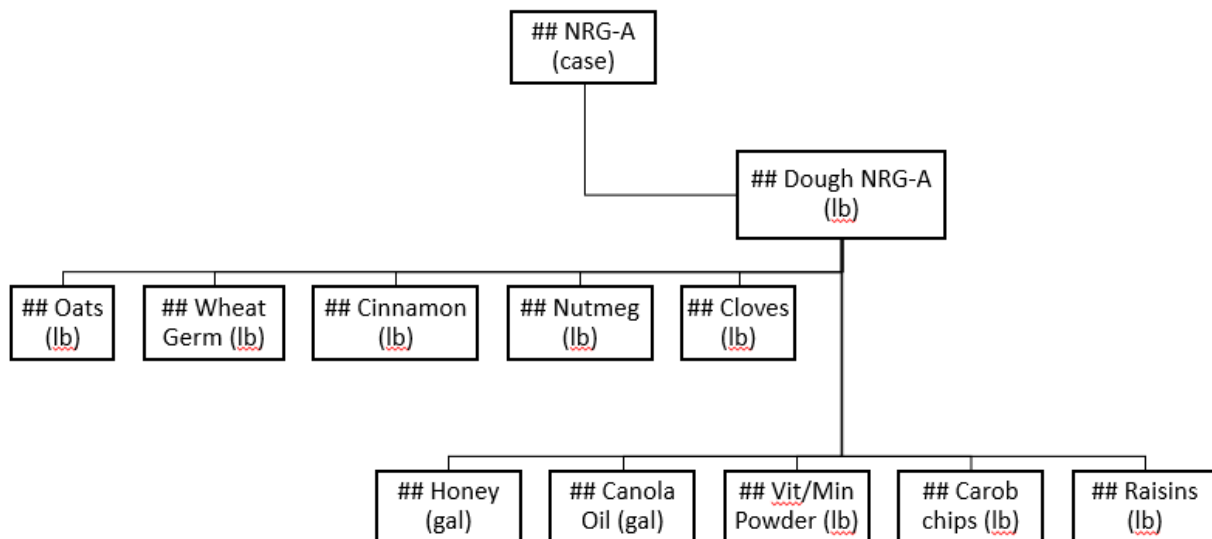
Exercise Introduction

Material resource planning is intended for 3 objectives:

- Ensure materials are available for production and products are available for delivery to customers.
- Maintain the lowest possible material and product levels in store to achieve LEAN processes.
- Plan manufacturing activities, delivery schedules and purchasing activities.

Bill of Material (BOM)

A critical input to the MRP process is the bill of material (BOM), which shows how components and semi-finished products are combined to produce the final product. A graphical representation of the BOM for the NRG-A bar is shown below:



The raw materials (Oats, Wheat Germ, etc.) are combined in a mixer to produce a 500 lb. batch of dough. The dough is then transferred to the baking line, where it is formed into bars, baked and packaged. For simplicity, we have ignored the wrappers, boxes and cases that are needed to produce a complete case of Fitter Snacker bars.

To view the BOMs for Fitter Snacker, follow the menu path:

Logistics > Production > Master Data > Bills of Material > Reporting > BOM Explosion > Material BOM > Multilevel BOM

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Material BOM Edit Goto Extras Settings Environment System Help

Explode BOM: Multi-Level BOM: Initial Screen

Material: 00F100
 Plant: 00PT
 Alternative BOM: ☐
 BOM Application: PP01

Selection
 Valid From: 07/31/2008
 Change Number:
 Required qty:

Enter ##F100 for Material, ##PT for Plant and PP01 for BOM Application, then click on the execute (⏏) icon

Material BOM Edit Goto Extras Settings Environment System Help

Display Multilevel BOM

Material: 00F100
 Plant/Usage/Alt.: 00PT / 1 / 01
 Description: 00 NRG-A
 Base Qty (CS): 7.000
 Reqd Qty (CS): 7

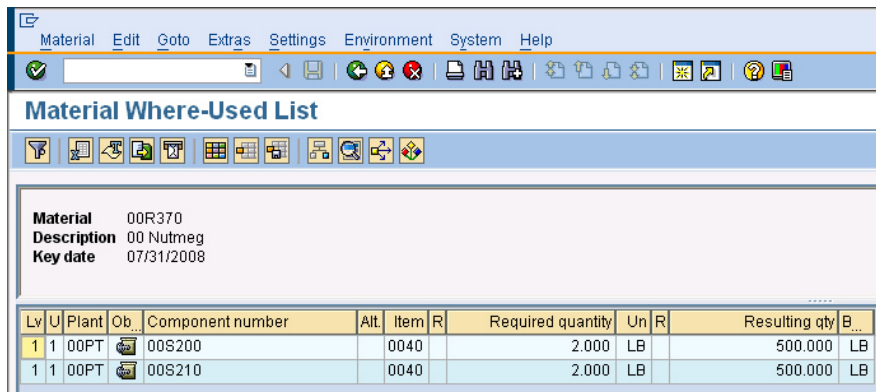
Level no.	Item	Qty	Component	Description	Unit	Reqd Qty	Unit	Unit
..1	0010	00S200						
..2	0010	00R380						
..2	0020	00R420		00 Wheat Germ		50	LB	L
..2	0030	00R320		00 Cinnamon		5	LB	L
..2	0040	00R370		00 Nutmeg		2	LB	L
..2	0050	00R330		00 Cloves		1	LB	L
..2	0060	00R360		00 Honey		10	GAL	L
..2	0070	00R300		00 Canola		7	GAL	L
..2	0080	00R410		00 Vit/Min Powder		5	LB	L
..2	0090	00R310		00 Carob Chips		50	LB	L
..2	0100	00R400		00 Raisins		50	LB	L

This screen shows 7 cases of snack bars requires 500 lbs. of dough, and that to produce 500 lbs. of dough, 300 lbs. of Oats, 50 lbs. of Wheat Germ, etc. are required

This screen shows the recipe required for seven cases of dough. To learn more about any of the materials required to make an NRG-A bar, select the item and click on the detail icon.

With the nutmeg selected, click on the where-used icon (⏏), which will call up the following screen:

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Lv	U	Plant	Ob	Component number	Alt	Item	R	Required quantity	Un	R	Resulting qty	B...
1	1	00PT		00S200		0040		2.000	LB		500.000	LB
1	1	00PT		00S210		0040		2.000	LB		500.000	LB

This screen shows that Nutmeg is used in two products—the dough for NRG-A and NRG-B bars. (You can double click on each line to view the products.) According to help.sap.com, the where-used list can be used to:

- Determine requirements for a specific material
- Select products that are affected by a change to an individual part
- Find assemblies that will be delayed if, for example, there is a delay in the delivery of a raw material
- Calculate the effect on the cost of a product if the price of a raw material rises

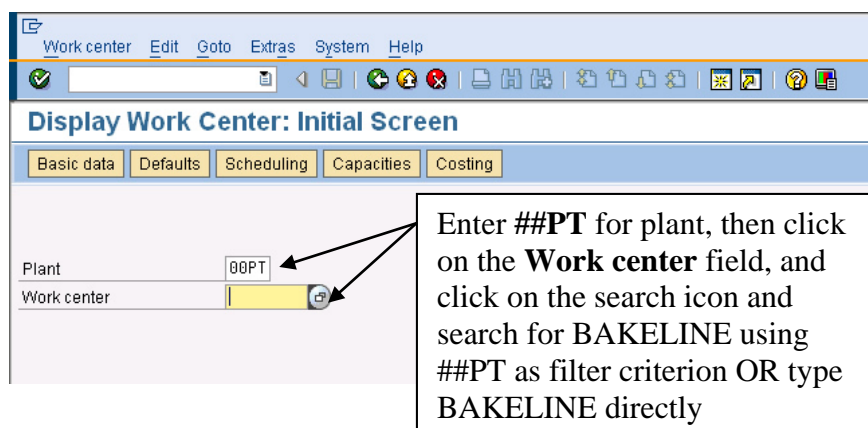
Click on the exit icon (🚪) until you return to the SAP Easy Access screen.

Display Workcenters

Production is carried out at workcenters. In the SAP ERP system, workcenters can represent machines or groups of machines, production lines, assembly lines, employees or groups of employees.

To display the workcenters used for Fitter Snacker's snack bar production, follow the menu path:

Logistics > Production > Master Data > Work Centers > Work Center > Display



Work center Edit Goto Extras System Help

Display Work Center: Initial Screen

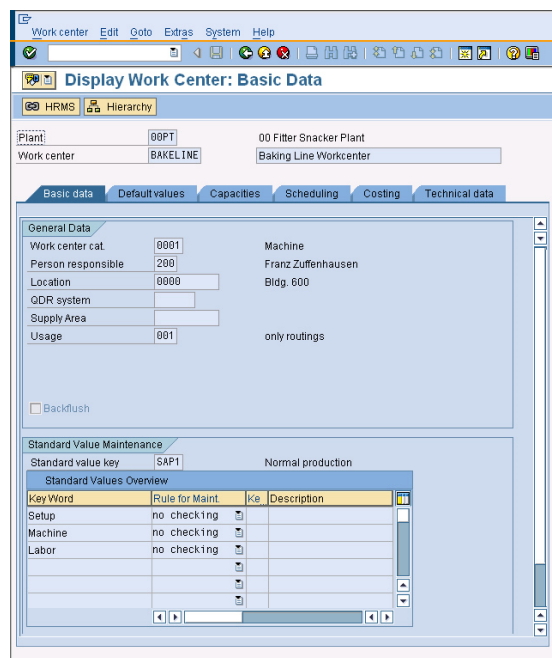
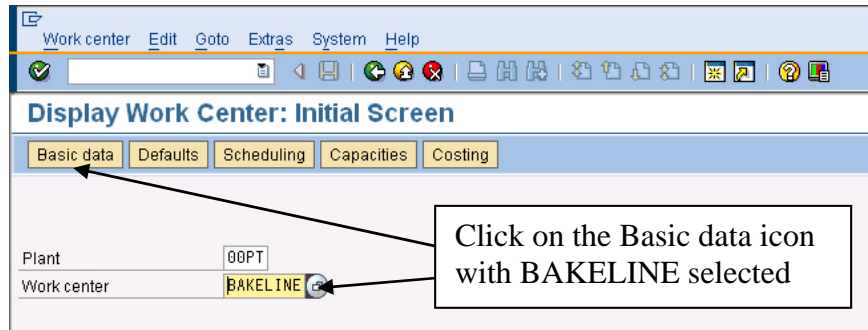
Basic data Defaults Scheduling Capacities Costing

Plant 00PT

Work center

Enter ##PT for plant, then click on the **Work center** field, and click on the search icon and search for BAKELINE using ##PT as filter criterion OR type BAKELINE directly

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This multi-tabbed screen contains all relevant data for the workcenter.
Click on the exit icon (🏠) until you return to the SAP Easy Access screen.

Routings

Routings define the work centers that a product must visit in the production process. Routings also define the operations that must be performed at each workcenter and the components that are needed for each operation.

1. Create ##F100 (NRG-A bar) and ##F110 (NRG-B bar) Routings

To create a routing for the NRG-A bars, follow the menu path:

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Logistics ▷ Production ▷ Master Data ▷ Routings ▷ Routings ▷ Standard Routings
▷ Create

Routing Edit Goto Details Extras Environment System Help

Create Routing: Initial Screen

Copy from Routings Sequences Operations

Material 00F100
Plant 00PT
Sales Document
WBS Element
Group 00GROUP
Validity
Change Number
Key date 08/01/2008
Revision Level
Additional data
Profile

Enter **##F100** for material, **##PT** for plant and **##Group** for Group, then click on the enter icon

Routing Edit Goto Details Extras Environment System Help

Create Routing: Header Details

Routings MatAssignment Sequences Operations CompAlloc

Material 00F100 00 NRG-A

Task list
Group 00GROUP
Group Counter 1
Plant 00PT
Production line
Line hierarchy
General data
Deletion flag
Usage 1
Status 4
Planner group
Planning work center
CAPP order
From Lot Size
Old task list no.

Enter **1** for Usage and **4** for Status, then click on the Operations icon

Routing Edit Goto Details Extras Environment System Help

Create Routing: Operation Overview

Work center CompAlloc Sequences PRT Inspection Characteristics

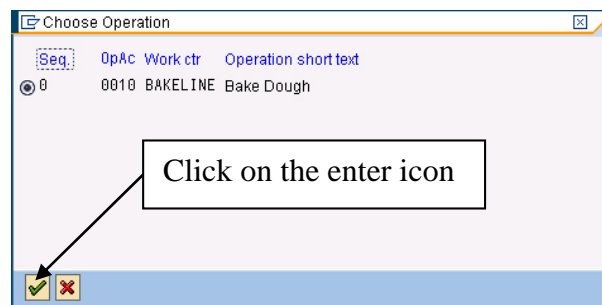
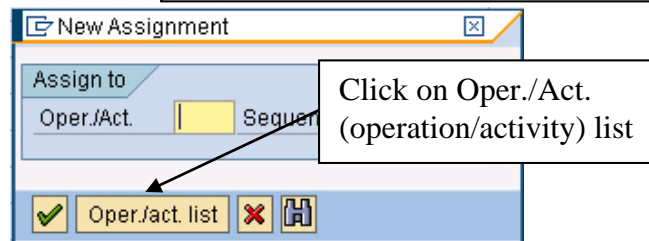
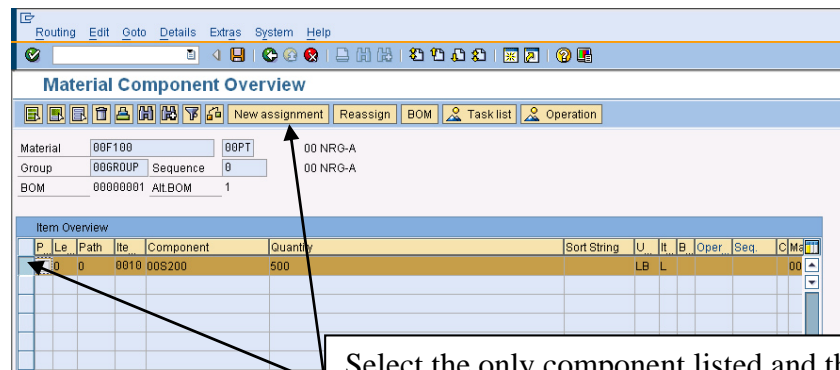
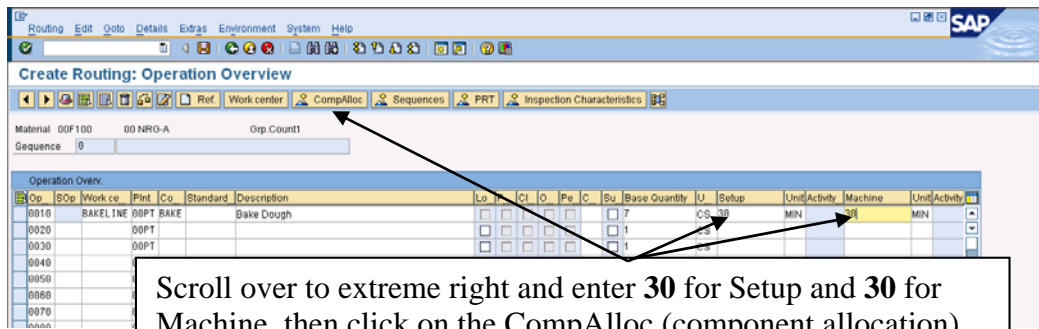
Material 00F100 00 NRG-A
Sequence 0

Operation Overv.

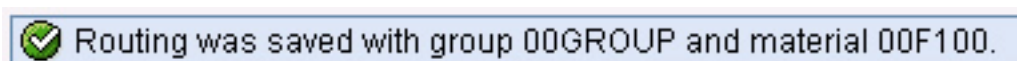
Op	SOp	Work ce	Plant	Co	Standard	Description	Lo	P	Cl	O	Pe	C	Su	Base Quantity	U	StdValuTxd1	UnitActivity	UnitActivity
0010		BAKELINE	00PT	BAKE		Bake Dough								7	CS			
0020			00PT											1	CS			
0030			00PT											1	CS			

Enter **BAKELINE** for Work center
Enter **BAKE** for Control key
Enter **Bake Dough** for Description
Enter **7** for Base Quantity
Then click on the enter icon

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Click on the save icon (💾) to save the routing. You will get a message like the following:



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Return to the beginning of section 1 and repeat the process to create a routing for material **##F110** (NRG-B bars). All entries are the same as for the **##F100** (NRG-A bars).

2. Create Routings for material **##S200** (dough for NRG-A bars) and **##S210** (dough for NRG-B bars)

To create a routing for **##S200** (dough for NRG-A bars), again follow the menu path:

Logistics ▷ **Production** ▷ **Master Data** ▷ **Routings** ▷ **Routings** ▷ **Standard Routings** ▷ **Create**

Routing Edit Goto Details Extras Environment System Help

Create Routing: Initial Screen

Copy from Routings Sequences Operations

Material 00S200
Plant 00PT
Sales Document
Sales Document Item
WBS Element
Group 00GROUP

Validity
Change Number
Key date 08/01/2008
Revision Level

Additional data
Profile

Enter ##S200 for material, ##PT for plant and ##Group for Group, then click on the enter icon

Routing Edit Goto Details Extras Environment System Help

Create Routing: Header Details

Routings MatlAssignment Sequences Operations CompAlloc

Material 00S200 00 Dough NRG-A
Task list
Group 00GROUP
Group Counter 3
Plant 00PT
00 Dough NRG-A
Long text exists

Production line
Line hierarchy

General data
Deletion flag
Usage 1
Status 4
Planner group

Enter 1 for Usage and 4 for Status, then click on the Operations icon

MRP

Routing Edit Goto Details Extras Environment System Help

Create Routing: Operation Overview

Material 00S200 Sequence 0

Enter the information shown, then click on the enter icon (✓)

Op	SOp	Work	Plnt	Mo	Standard	Description	Lo	P	Cl	O	Pe	C	Su	Base Quantity	U	StdVs
0010		MIXERS	00PT	MIX		Mix Dough								500	LB	
0020			00PT											1	LB	
0030			00PT											1	LB	

Routing Edit Goto Details Extras Environment System Help

Create Routing: Operation Overview

Material 00S200 00 Dough NRG-A Grp.Count3 Sequence 0

Scroll over to the right and enter 30 for Setup and 30 for Machine, then click on CompAlloc

Op	SOp	Lo	P	Cl	O	Pe	C	Su	Base quantity	U	Setup	Unit Activity	Machine	Unit Activity	Labor	Unit Activity
0010									500	LB	30	MIN	30	MIN		
0020									1	LB						
0030									1	LB						

Routing Edit Goto Details Extras System Help

Material Component Overview

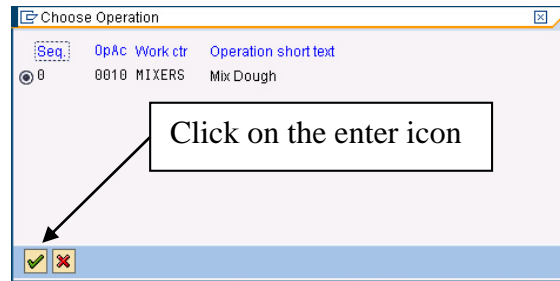
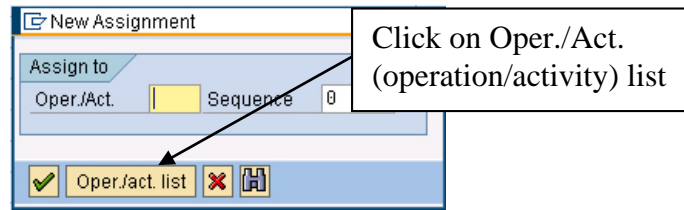
Material 00S200 00PT 00 Dough NRG-A
Group 006R0UP Sequence 0 00 Dough NRG-A
BOM 00000001 AILBOM 1


New assignment Reassign BOM Task list Operation


Select all components, then click on the New assignment icon

P	Le	Path	Itc	Component	C	M	Q	U	StdVs
0	0	0010	00R380						00
0	0	0020	00R420						00
0	0	0030	00R320						00
0	0	0040	00R370						00
0	0	0050	00R330						00
0	0	0060	00R360						00
0	0	0070	00R300						00
0	0	0080	00R410						00
0	0	0090	00R310						00
0	0	0100	00R400						00

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Click on the save icon () to save the routing. You will get a message like the following:

 Routing was saved with group 00GROUP and material 00S200.

Return to the beginning of section 2 and repeat the process to create a routing for **##S210** (dough for NRG-B bars).
All entries are the same as for **##S200** (dough for NRG-A bars).

3. Create Product Group

Many firms produce hundreds of products, and planning for each product individually is not feasible or desirable. What these firms do is create product groups, and then plan production for a small number of product groups and then transfer these plans to individual products based on historic percentages. While Fitter Snacker does not have a large of number products, we will use the product group process anyway.

To create a product group for Fitter Snacker, follow the menu path:

Logistics ▷ Production ▷ SOP ▷ Product Group ▷ Create

which will produce the following screen:

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Product groups Edit Goto Extras System Help

Create Product Group: Initial Screen

Product group 00 NRG Group 00 NRG-Aand NRG-B Bars

Plant 00PT

Base Unit CS

Members

☒ Materials

☐ Product groups

Enter ## NRG Group and ## NRG-A and NRG-B Bars
Enter ##PT for Plant
Enter CS for Base unit
Then click on the enter icon

Product groups Edit Goto Extras System Help

Create Product Group: Maintain Members (Materials)

Hierarchy graphic Versions... Master data... Product grp. graphic

Product group 00 NRG GROUP 00 NRG-Aand NRG-B Bars

Plant 00PT 00 Fitter Snacker Plant

Base Unit CS

Member number	Plnt	Unit conv. Short Text	Aggr. fact.	Proportion	UoM	V M Fx
00F100	00PT		1	70		<input type="checkbox"/>
00F110	00PT		1	30		<input type="checkbox"/>

Enter ##F100 and ##F110 for member numbers
Enter ##PT for Plnt, 1 for Aggr. fact. for both bars
Enter 70 for the Proportion for NRG-A and 30 for the proportion for NRG-B bars

These proportions mean that whatever production is planned for the NRG group, it will be assumed that 70% of the production should be NRG-A bars and 30% should be NRG-B bars. Click on the enter icon (✓) to confirm that you have the correct products in the group:

MRP

Product groups Edit Goto Extras System Help

Create Product Group: Maintain Members (Materials)

Hierarchy graphic Versions... Master data... Product grp. graphic

Product group 00 NRG GROUP 00 NRG-Aand NRG-B Bars

Plant 00PT 00 Fitter Snacker Plant

Base Unit CS

Member number PInt Unit conv. Short Text

00F100	00PT	1	1	70	CS	<input type="checkbox"/>
00F110	00PT	1	1	30	CS	<input type="checkbox"/>
		00 NRG-B	1	30	FERT	<input type="checkbox"/>

Confirm the two products are the NRG-A and NRG-B bars

Click on the save icon (💾) to save the product group.

4. Run MRP

We can run the MRP process on our new product group. To do this, follow the menu path:

Logistics ▷ Production ▷ MRP ▷ Planning ▷ Multilevel Single-Item Planning (MD02)

Planning Edit Goto Settings Extras System Help

Single-Item, Multi-Level

Material 00 NRG Group

Plant 00PT

Scope of planning

☒ Product group

MRP control parameters

Processing key NETCH

Create purchase req. 2

Delivery schedules 3

Create MRP list 1

Planning mode 1

Scheduling 1

Process control parameters

☐ Also plan unchanged components

☐ Display results before they are saved

☐ Display material list

☐ Simulation mode

Enter (or search for) **## NRG GROUP** for Material
 Enter **##PT** for Plant
 Check **Product group** for Scope of planning
 Confirm the following MRP control parameters:
 Processing key: **NETCH**
 Create purchase req.: **2**
 Delivery schedules: **3**
 Create MRP list: **1**
 Planning mode: **1**
 Scheduling: **1**

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Stock/Requirements List: Initial Screen

Individual access **Collective access**

Plant 00 Fitter Snacker Plant

Selection by

☒ MRP controller

☐ Product group

☐ Vendor

☐ Production line

☐ Class

Class Type

Click on the **Collective access** tab.
Enter **##PT** for Plant and **0##** for MRP controller, then click on the enter icon

Stock/Requirements List: Material List

Selected stock/requirements lists Define traffic light Exception groups

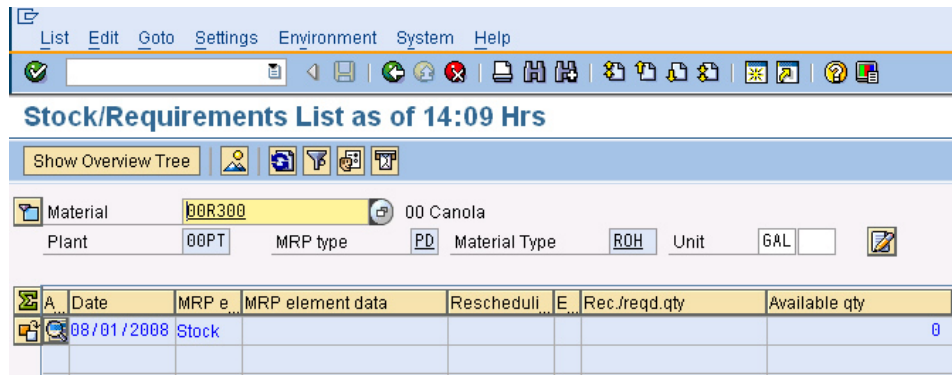
Plant 00 Fitter Snacker Plant

MRP Controller FS Controller

Light	Material	Material Description	A...	Supply	1stRDS	2nd	1	2	3	4	5	6	7	8	Plant sto	B...	MTyp	PT	S...	A...	MT	Cde	C
<input type="radio"/>	00F100	00 NRG-A	<input type="checkbox"/>	999.9	999.9	999.9									0	CS	FERT	E			PD	000	<input checked="" type="checkbox"/>
<input type="radio"/>	00F110	00 NRG-B	<input type="checkbox"/>	999.9	999.9	999.9									1,000	CS	FERT	E			PD	000	<input checked="" type="checkbox"/>
<input checked="" type="radio"/>	00R300	00 Canola	<input type="checkbox"/>	999.9	999.9	999.9									0	GAL	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R310	00 Carob Chips	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R320	00 Cinnamon	<input type="checkbox"/>																			002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R330	00 Cloves	<input type="checkbox"/>																			002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R340	00 Dates	<input type="checkbox"/>																			002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R350	00 Hazelnuts	<input type="checkbox"/>																			002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R360	00 Honey	<input type="checkbox"/>	999.9	999.9	999.9									0	GAL	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R370	00 Nutmeg	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R380	00 Oats	<input type="checkbox"/>	999.9	999.9	999.9							3		44,000	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R390	00 Protein Powder	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R400	00 Raisins	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R410	00 Vit/Min Powder	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00R420	00 Wheat Germ	<input type="checkbox"/>	999.9	999.9	999.9							3		2,000	LB	ROH	F			PD	002	<input checked="" type="checkbox"/>
<input type="radio"/>	00S200	00 Dough NRG-A	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	HALB	E			PD	001	<input checked="" type="checkbox"/>
<input type="radio"/>	00S210	00 Dough NRG-B	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	HALB	E			PD	001	<input checked="" type="checkbox"/>

Select **## Canola** and then click on the Display Selected stock/requirements lists icon

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Click on the back icon, which will bring you back to the list of your materials. Note that there is now a check mark next to ## **Canola** in the column **Already accessed**:

Light	Material	Material Description	A...	Supp	Already accessed			
	00F100	00 NRG-A	<input type="checkbox"/>	999.9	999.9	999.9		
	00F110	00 NRG-B	<input type="checkbox"/>	999.9	999.9	999.9		
	00R300	00 Canola	<input checked="" type="checkbox"/>	999.9	999.9	999.9		
	00R310	00 Carob Chips	<input type="checkbox"/>	999.9	999.9	999.9		
	00R320	00 Cinnamon	<input type="checkbox"/>	999.9	999.9	999.9		
	00R330	00 Cloves	<input type="checkbox"/>	999.9	999.9	999.9		

This feature helps the MRP controller keep track of which materials they have already reviewed. The traffic lights also help the MRP controller focus on critical materials. The traffic light concept is used in many areas of the SAP system to help the user prioritize tasks. In our case, the materials with a red traffic light have a non-zero safety stock specified. As there have been no goods receipts for these materials, they are below their safety stock levels and, hence, the red lights.

It is possible to customize the traffic lights.

Click on the Define traffic lights icon (), which will produce the following:

MRP

Define Traffic Light

Define traffic light depending on ranges of coverage

Days' supply	≤	Traffic Light	≥
Days' supply	≤ 1 -	Red	≤ 999.9
1st rcpt days'supply	≤ 0.1 -	Red	≤ 999.9
2nd rcpt days'supply	≤ 0.1 -	Red	≤ 999.9

Define traffic light depending on exception groups

Exception Group	Traffic Light
1 New; opening date in the past	Red
2 New; start date in the past	Red
3 New; finish date in the past	Red
4 General messages	Red
5 Exception during BOM explosion	Red
6 Exception during availability	Red
7 Exception during rescheduling	Red
8 Terminations	Red

Basic Setting | Exception groups

This screen shows that the SAP system provides the user with a great deal of flexibility in how to configure the traffic light system for issuing warnings as required. Click on the cancel icon (✖) to close this window.

We will keep the Stock/Requirements list open so that we can easily review the results of the MRP process. We will use the following materials to evaluate the MRP process (see figure below):

- ## NRG-A
- ## NRG-B
- ## Dough NRG-A
- ## Dough NRG-B
- ## Canola

