Batch Specific UOM Inventory Management: Stock Keeping with Dynamic Conversion Factor

Applies to:
SAP ECC6.0 Version
For more information, visit the Enterprise Resource Planning homepage.

Summary
This article will be helpful to the consultants in cross functional areas like Materials Management, Production Planning and Sales and Distribution. This explains step by step procedure of configuration of batch specific unit of measure functionality with business scenario examples in simple and easy to understandable way.

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Created on: 4 March 2010

Author Bio
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Introduction to Batch Specific UOM

Batch

In Industry business process the batch is the quantity or partial quantity of a certain material or product that has been produced according to the same recipe, and represents one homogenous, non-reproducible unit with unique specifications.

Eg: In steel industry, you would use the term “Heat No” if a material is manufactured in several charges in a furnace which are of same order. The result of each charge is identified as batch.

Batch Management

Batch Management is cross application component of Logistics in SAP. Batch management is integrated in all application of logistics process from procurement to sales. It supports the management and processing of batches in all of a company’s business processes.

Configuration of batch management is pre-requisite for using Batch specific UOM. To use Batch management in SAP following minimum configuration is required

1. Specifying Batch level and activating batch status management

   IMG → Logistics General → Batch Management → Specify batch level and activate status management

   Select Batch level as per your requirement; here three options are displayed with radio button.
   (i) Batch unique at plant level – If selected the batch number will be unique with respect to plant and material
   (ii) Batch unique at material level – If selected the batch number will be unique with respect to the material
   (iii) Batch unique at Client level – If selected the batch number will be unique at client level.

   In our example we have set Batch unique at material level.

2. Activating Batch Number assignment

   IMG → Logistics General → Batch Management → Batch number assignment

   Select Batch number assignment as per your requirement; here options are available to activate internal batch number assignment. Do this only if you need to generate batch number internally by the system else just maintain the number range for external number assignment. In our example we have activated internal batch number assignment.

3. Define Movement types for batch creation

   IMG → Logistics General → Batch Management → Creation of new batches

   Here select the movement types for which new batch needs to be created. In our example we have set “Automatic/No manual creation” against movement type 101, 511, 501, 561 and 531

Batch specific unit of measure

The batch-specific material unit is an alternative unit of measure of a material, for which you can define the conversion ratio into the base unit of measure on a batch-specific basis.

In some industry sectors (for example, the pharmaceutical, chemical, steel, or paper industry sectors), the composition or attributes of products vary to some degree. Therefore, you cannot use a fixed conversion factor to convert quantities of these products into various units of measure. Instead, each batch has to be given an individual conversion factor.

These materials consist of one or more active ingredients, concentrates, carrier materials, or impurities, and so on. The potency of the active ingredients varies from batch to batch.

This can be handled by configuring batch specific UOM functionality in SAP. Planned conversion factor is stored as character in material master record. Actual conversion factor is maintained during the transactions and stored in batch master record.
**Business Benefits of Batch specific UOM**

- Material can be tracked throughout the logistics chain in alternate UOM which has dynamic conversion ratio. This will reduce creation of different materials for every conversion ratio.
- Conversion ratio can be calculated automatically by inputting factors of batch dependencies if they are known.
- Material valuation of batch is possible on the basis of batch specific UOM. Material value is determined based on the amount of active ingredient or conversion ratio.
- Material requirement planning can be done according to variable conversion ratio. MRP uses inventory correction factors to consider the actual proportion of stock available at plant and storage location level.
- Sales price determination is possible using the product or proportion quantity the product may contain. Sales price is updated depending on the material batch data.

**Business Scenarios**

Batch specific UOM is consisting of TWO components: Product Units and Proportion Units.

**Scenario 1: Product Units**

This is a unit of measure that describes the total quantity of a material as an alternative to the base unit of measure.

Certain materials transactions are used not only in their base UOM but also in alternate UOM. There will be certain situation where a conversion ratio (CR) between Base UOM and alternate UOM is not fixed. It...
fluctuates depending on certain criteria. Even in this scenario it is possible to use the conversion ratio between two UOM for all the stock monitoring and transactions.
For e.g.:

Chemical is procured in bulk qty in Liters and stored in inventory in small cans. Conversion from Barrels to can is not fixed. This depends on the size of the can available in the market at the time of goods receipt. Can volume can be 5lt, 10lt, 50lt or any other volume available in the store/market. All the inventory transaction will be in UOM cans.

**Scenario 2: Proportion Units**
This is a unit of measure in which you can enter proportions of the material's base unit of measure. The total quantity (or physical quantity) can consist of various proportions.

Business requires to measure and show the active ingredients of materials within the physical quantity of the material and also to use them for goods movement.
For e.g.:

Chemical consists of many ingredients. For e.g. 1ltr of Orange Juice contains 30g of Vitamin C, Also this proportion is variable based on the batch. Goods movement and stock movement is carried out in ltr of orange juice (physical quantity) where as valuation, planning, and availability check is carried out for vitamin C (Active ingredient)
Configuration Settings

Batch specific UOM needs following configuration.

- **Activation of batch specific UOM** – As first step you need to activate Batch specific UOM. Until this is activated, you cannot carry out the batch specific UOM setting in material master.
- **Define which units of measure you want to use as “Batch specific UOM”. Before Defining Batch specific UOM you need create same UOM in global data.**
- **Calculation of Proportion factors** – This session should be configured only if business requirement to use Proportion Units. For e.g. refer Business Scenario 2
- **Product Quantity conversion** - This session should be configured only if business requirement to use Proportion Units. For e.g. refer Business Scenario 1

**Activation of Batch Specific UOM**

In this step you need to activate Batch specific UOM

[Image: Configuration settings diagram]

And activate batch specific unit of measure

[Image: Batch-specific units of measure configuration]
Edit batch Specific Unit of Measure

For Eg: If you require to maintain your stock in cans for specific batch you can maintain “CAN” or If you are working with active ingredients then you should maintain grams of active ingredients “GAI”

**Note:** This unit of measures should be defined globally before maintaining in this screen.

<table>
<thead>
<tr>
<th>Batch-specific UoM</th>
<th>Reference UoM</th>
<th>Dimension text</th>
</tr>
</thead>
<tbody>
<tr>
<td>10L</td>
<td>BRL US Barrels</td>
<td>Volume</td>
</tr>
<tr>
<td>50L</td>
<td>BRL US Barrels</td>
<td>Volume</td>
</tr>
<tr>
<td>5L</td>
<td>BRL US Barrels</td>
<td>Volume</td>
</tr>
<tr>
<td>Can</td>
<td>Liter</td>
<td>Volume</td>
</tr>
<tr>
<td>KAP</td>
<td>Liter</td>
<td>Volume</td>
</tr>
</tbody>
</table>

**Calculation of Factors**

In this step you need to maintain base unit of measure, character unit of measure and alternate unit of measure.
For Product Units

IMG → Logistics General → Batch Management → Batch specific Material UOM → Product quantity conversion → define calculation of base quantity from product quantity

![Diagram showing SAP Batch Management setup]

### Define Calculation of Product Quantity from Base Quantity

![Table showing product units and conversions]

<table>
<thead>
<tr>
<th>Technical</th>
<th>Measurement unit text</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>KT per PC</td>
</tr>
<tr>
<td>002</td>
<td>KT per M</td>
</tr>
<tr>
<td>BRLBRL</td>
<td>US Barrels</td>
</tr>
<tr>
<td>can</td>
<td>can</td>
</tr>
<tr>
<td>L</td>
<td>Liter</td>
</tr>
<tr>
<td>L1C</td>
<td>Lt per Can</td>
</tr>
</tbody>
</table>

### Define Calculation of Base Quantity from Product Quantity

![Form showing batch-specific UOM setup]

<table>
<thead>
<tr>
<th>Batch-specific UoM</th>
<th>can</th>
<th>can</th>
</tr>
</thead>
</table>

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For Proportion Units

<table>
<thead>
<tr>
<th>Business Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMG → Logistics General → Batch Management → Batch specific Material UOM → Calculate proportion factors → Define calculation of proportion quantity from base quantity</td>
<td></td>
</tr>
</tbody>
</table>

---

### Recap: Configuration Settings

Following are the configuration settings carried out in for demo business scenario

**For Product unit**
- Batch specific UOM is activated
- UOM "L", "CAN" and "L/C" is maintained for batch specific UOM. "L/C" will be assigned to characteristics to maintain variable conversion ratio
- "L/C" is defined for calculation of base quantity from product quantity

**For Proportion unit**
- Batch specific UOM is activated
- UOM "L", "GAI" and "GAI/L" is maintained for batch specific UOM. "GAI/L" will be assigned to characteristics to maintain active ingredient qty.
- "GAI/L" is defined for calculation of proportion quantity from base quantity
Master data Settings

Batch specific UOM needs following Master Data setup.

- In classification Master data you need to create a characteristic. This characteristic is used to store the conversion ratio during transaction.
- In classification master data you need to create a class with class type "023". All the characters are assigned to this class.
- In material master assign the class and maintain Product/Proportion data in additional data screen

Create Characteristics

Characters are used to store the conversion factors.
For eg. In scenario 1 its liters / Can i.e. L/C
In scenario 2 its grams of active ingredients / ltr i.e. GAI/L

SAP Menu → Cross application components → Classification system → Master data → Characteristics (CT04)

Create characteristic with

In Basic Data Screen,
Data type – Numeric format
Assign UOM defined for conversion ratio
Single value – Checked
Entry required – Checked – This will ensure the maintenance of conversion ratio during batch creation in transaction.

Create Characteristic

**Basic data**
- **Description**: batch UOM - ltr/can
- **Chars Group**: 
- **Status**: 1 Released
- **Auth.Group**: 

**Format**
- **Data Type**: NUM Numeric Format
- **Number of Chars**: 1C
- **Decimal Places**: 3
- **Unit of Measure**: ltr/can
- **Template**: 
- **Exp. display**: 0 No exponent

**Value assignment**
- **Value assignment**: Single value
- **Interval vals allowed**: 
- **Negative Vals Allowed**: 
- **Restrictable**: 
- **Entry Required**: 

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In Values data screen

You can maintain the conversion rates which will be used regularly. Maintaining values in this screen will enable to select this maintained value during transactions.

Also check additional values if you required maintaining the conversion factors during transaction which are not listed in the values.

Create Characteristic

Create Class

You need to create a class and assign all the characteristics to the class.

SAP Menu → Cross application components → Classification system → Master data → Classes (CL02)

In Basic Data  Class type should be **023 – Batch**

Organizational view is **S**
Create Material code

SAP Menu → Logistics → Material Management → Material Master → Material → Create (General) → Immediately (MM01)

Create Material code with following mandatory data.

In basic data view maintain the UOM which is defined for product base UOM in our example Liter – L
In classification view assign previously created class to material
In purchasing view maintain Batch Management Checked
Under additional data **Proportion / Prod. Unit view**

In Units of measure usage field maintain "B" for product unit. You can maintain "A" if business process requires to use proportion unit.

Also you can maintain planed conversion rate in this screen. The actual conversion rate can only be known when the mixture actually exists. Until this point, planned conversion rate is used for all the calculation purpose. This planned value is replaced by the actual value as soon as it is known.

**Create Material H2SO4 (Raw material)**
Create Material H2SO4 (Raw material)

You can follow the same steps create Material with Proportion unit. In Units of measure usage field maintain “A” for proportion unit.

Recap: Master Data

For Product Unit

- Z_VOLUME characteristic is created with UOM as L/C
- Z_VOL_BATCH class is created with class type 023
- Characteristic Z_VOLUME is assigned to class Z_VOL_BATCH
- Material H2SO4 is created, Class Z_VOL_BATCH is assigned to material in classification view
- Product unit and planned conversion rate is maintained for material in additional data

Similar activities can be carried out to create material for business scenario 2 Proportion unit
Transactions and Reports

Scenario 1: Product Units
Whenever inventory transaction is carried out for this material i.e. Goods receipt or Goods issue actual conversion rate will be asked. Actual conversion rate should be maintained at this point. In all the future transactions this actual conversion rate is taken care.

Purchase Order Creation
Purchase order is created for this material for a quantity of 1000L H2SO4

SAP Menu → Logistics → Material Management → Purchasing → Purchase Order → Create (ME21N)

Create Purchase Order

Goods Receipt for Purchase Order
Goods receipt is carried out with respect to the PO. Goods receipt is carried out in 3 lines and each line will be maintained with different conversion ratio.

SAP Menu → Logistics → Material Management → Inventory Management → Goods Movement → Goods Movement (MIGO)

First line item is received with CR 5L/C and quantity received is 50CANs, system automatically calculated qty in base UOM as 250L

Second line item is received with CR 50L/C and quantity received is 10CANs, system automatically calculated qty in base UOM as 500L

Third line item is received with CR 10L/C and quantity received is 25CANs, system automatically calculated qty in base UOM as 250L
Goods Receipt Purchase Order 4500017354 - 283549

Batch Specific UOM Inventory Management: Stock Keeping with Dynamic Conversion Factor

Classification

Object

Material: H2SO4 – Sulphuric Acid
Batch: 0000000394
Class Type: 823 – Batch

Values for Class Z_VOL_BATCH - Object H2SO4 0000000394

<table>
<thead>
<tr>
<th>Characteristic Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch UOM Lt per can</td>
<td>50.000 L/C</td>
</tr>
</tbody>
</table>
Until conversion ratio is not maintained in Batch classification data, system will use planned conversion ratio which was maintained in material master for the calculation purpose.
Stock Overview

If you see the stock available system will show the quantity separately for each conversion rate. Also conversion rate can be seen for each batch.

Stock Overview: Basic List

You can see the conversion ratio by selecting the batch and in "Extras" Batch classification data.

Goods Issue

During the goods issue system will automatically carry the conversion rate maintained for batch during goods receipt. Only you need to select the specific batch and quantity for Issue. Conversion will be pulled from batch characteristics.

Enter Goods Issue: Details 0001 / 0001
Scenario 2: Proportion Units

Material CITRA is created with Classification data active ingredient as characteristic, Batch specific UOM grams of active ingredient (GAI) is maintained for this material.

During goods receipt for 2 different batches, you can maintain TWO different proportions of active ingredients in batch classification data. This will be recorded in batch master data and can be called for all the future transaction of this material from inventory.

SAP Menu → Logistics → Material Management → Inventory Management → Goods Movement → Goods Movement (MIGO)

Goods Receipt Other - Naveena Shetty

Line | Mat. Short Text | Qty in Unit | E | StLoc | GL Account | Date
--- | -------------- | ---------- | --- | ------ | ----------- | ---
1    | Citra - Orange flavor | 100        | L | Austief Lager | 0000000049 | 02-02-2016
2    | Citra - Orange flavor | 400        | L | Austief Lager | 0000000049 | 02-02-2016

Plant: Berlin
Storage Location: Austief Lager
Inventory is valued based on the proportion of active ingredients maintained for the material in batch master during goods receipt.

SAP Menu → Logistics → Material Management → Inventory Management → Goods Movement → Goods Movement (MIGO) → Display material document → FI Document
Additional Functions in Batch Specific UOM

Valuation on the Basis of Batch Specific UOM

It’s possible to valuate a batch by the amount of active ingredient the batch contains. For this you need to maintain a valuation record for the active ingredient on which batch valuation depends.

SAP Menu → Logistics → Central functions → Batch Management → Batch specific UOM → Standard Price → create (MWB1)

Enter Material, Plant and Batch specific UOM for which you need valuation record and press enter

Change CharVals for Prop. Units/l

<table>
<thead>
<tr>
<th>Material</th>
<th>CITRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>1100</td>
</tr>
<tr>
<td>Prop./Prod. Unit</td>
<td>GAI</td>
</tr>
</tbody>
</table>

Here you can maintain the value of active ingredient.

Change CharVals for Prop. Units/Prod. Units: Initial Screen

<table>
<thead>
<tr>
<th>Standard price</th>
<th>Price Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>CITRA</td>
</tr>
<tr>
<td>Valuation Area</td>
<td>1100</td>
</tr>
<tr>
<td>Batch-specific UoM</td>
<td>GAI</td>
</tr>
<tr>
<td>Characteristic Name</td>
<td>Z_AIS</td>
</tr>
</tbody>
</table>

General data

<table>
<thead>
<tr>
<th>Base Unit of Measure</th>
<th>L</th>
<th>Liter</th>
<th>Valuation Category</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency</td>
<td>EUR</td>
<td></td>
<td>Current period</td>
<td>2 2010</td>
</tr>
</tbody>
</table>

Current material valuation

<table>
<thead>
<tr>
<th>Valuation Class</th>
<th>3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price control</td>
<td>V</td>
</tr>
<tr>
<td>Price Unit</td>
<td>1 L</td>
</tr>
<tr>
<td>Moving price</td>
<td>35.00</td>
</tr>
<tr>
<td>Standard price</td>
<td>20.00</td>
</tr>
<tr>
<td>Total Stock</td>
<td>1,000</td>
</tr>
<tr>
<td>Total Value</td>
<td>35,000.00</td>
</tr>
</tbody>
</table>

Current proportion valuation

<table>
<thead>
<tr>
<th>Standard price</th>
<th>100.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price unit</td>
<td>GAI</td>
</tr>
<tr>
<td>Previous price</td>
<td>0.00</td>
</tr>
<tr>
<td>Last price change</td>
<td></td>
</tr>
</tbody>
</table>
**MRP on the Basis of Batch Specific UOM**

Planned value of an active ingredient proportion always differs from the actual value of the batch. This will result in less or more active ingredient quantity available than identified in the stock overview.

Available amount can be corrected only for planning purpose using inventory correction factor (ICF). ICF corrects available stock temporarily for planning purpose before MRP calculation.

**Stock/Requirements List as of 10:30 hrs**

<table>
<thead>
<tr>
<th>Date</th>
<th>MRP element data</th>
<th>Rescheduled</th>
<th>L ReceiptRegmt</th>
<th>Receipt/Rot Pro</th>
<th>L Available</th>
<th>Y</th>
<th>Available Qty</th>
<th>L</th>
<th>CAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. 02. 2010</td>
<td>Stock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**STO on the Basis of Batch Specific UOM**

Stock transfer between the batches with different conversion ratio is possible.

**Sales Price Determination on the Basis of Batch Specific UOM**

By creating a condition record on the basis of proportion unit, you can base the sales price on the quantity of active ingredient.
References

Enterprise Resource Planning (ERP) Articles

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http://forums.sdn.sap.com/thread.jspa?messageID=8669180#8669180
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