Five Ways of Representing Rolls of Material in BellHawk

Introduction

One of the major uses of BellHawk is to track rolls of material. Depending on the application there are different ways to use license-plate tracking to track rolls of material. All involve placing a unique license-plate tracking barcode on each roll. But each has advantages and disadvantages.

BellHawk V78 currently has added attributes of length and width to item master records and to type 1 (single use) containers and individually barcoded items. Currently these are used as attributes

Alternate Methods

1. Treat the roll as a type 1, single use container. Use a separate part number for each width of the roll and use a primary measure type of length for the roll. This is simple as all that is necessary is to track the length of material on, or removed from, the roll. Here we use a container type of roll and an item master part number and description that includes the roll width, such as P101-50 for the part number and "P101 50 wide" for the description. This works well where there are a limited number of roll widths but becomes problematic when rolls can occur in many different widths.

   Here we can map standard unit cost per length between the Item Master in BellHawk and the unit cost in an ERP or accounting system. The biggest problem with this approach is in tracking off-cuts, which have arbitrary widths and lengths, as this requires creating many new part numbers for each offcut width. This is not a problem if arbitrary size off-cuts are not produced as part of the manufacturing process but can preclude the use of this method if they are produced.

2. Treat the roll as a type 1, single use container with a single part number for all widths of a specific material. Use length as the primary measure type and mark the item master as being dimensioned and specify the width dimension as being a used. Then, whenever a roll is being entered into inventory, the width will be requested. Also you can define a composite part number so that inventory of P101-50 can be reported separately from P101-42.

   This is generally the preferred method for tracking rolls.

   In this method, a standard width is specified for the item master. This is used in conjunction with the standard route length for the part being made, as the basis of specifying the quantities to be used to make standard route length quantity of the standard width specified on the item master.

   When a length of a different width is specified to be made then the part-in input quantities can be multiplied by the length x width of the finished product divided by the length x width of the standard route quantity of the standard width.

The standard unit cost per length of the roll on the item master applies to the standard width parameter provided on the item master. When a roll of the part is made its standard cost per length will be adjusted for the actual width of the finished roll.

The disadvantage here is that it is not possible to have a standard unit cost per length for rolls of arbitrary width. This makes cost conversion when exchanging data with an ERP or accounting system more complex but manageable. It usually requires that the accounting system track its unit costs in terms of standard cost per unit area for compatibility purposes.

The big advantage is that inventory can be reported by the length of each width of each material in stock, which is very useful when pulling material from inventory.

3. As an alternative, we can use an area measure, such as square feet, as the standard unit of measure for the roll. Again we would treat the roll as a type 1, single use container with a single part number for all widths and lengths of a specific material. In this case we would mark the item master as being dimensioned and specify the width dimension as being a used. Then, whenever a roll is being entered into inventory, the width will be requested. Also you can define a composite part number so that inventory of P101-50 can be reported separately from P101-42.

   Here a unit cost per unit of area can be used which is the same as the unit cost in an accounting system for the corresponding item master. But the computation of the quantity of part-in materials needed to make a roll will still need to be customized to take into account the length and width of the finished product to be made relative to the standard LxW dimensions on the item master.

   The biggest issue with this approach is that BellHawk transactions are structured to request the quantity of material consumed or produced in a primary unit of measure or its alternates for both the primary (area) and secondary (typically weight) measure types. This works well if materials are being tracked in pounds, which translate directly to area, for example, but not so easily to area measures.

   Thus a transaction will request, for example, how many square feet were entered or produced, with attributes of length and width, to be transferred to the roll entry in BellHawk's container's table. We could customize the transaction not to request the area but simply to request the length and width and then to calculate the corresponding area. But this should only be done for rolls with both width and length dimensions specified as being turned on for data collection in an item master record with a primary measure type of area.

   This method does have the advantage (?) of reporting inventory of the area of each width of roll available in inventory. But this is probably much less use than knowing the length of each width of material in stock, as in Option 2. And, if the areas in stock are required, a custom report can always be produced, using Option 2, as the width and length of each roll are already known.

4. A variation on this is to simply use weight as the primary unit of measure, with no secondary unit of measure. This is useful for rolls where the quantity is simply recorded in pounds. To allow for quantity conversion when these materials are used in part-in records for manufactured rolls then we need to specify a standard area for a unit weight of the item

master. This can be specified as a secondary unit of measure for the item or a standard LxW could be specified on the item master with basis weight that corresponded to the specified LxW dimension. This data could then be used on a customized basis to compute the quantity required for making a specific product. But it would be easier to have a secondary UOM of area, which was computed from the LxW and Basis Weight entered at time of setup for the Item Master for the raw material part.

For standard moves and withdrawals this has the same problem as Option 3 unless the withdrawal or transfer is in a weight unit of measure, which will work just fine.

5. Treat the roll as an individually barcoded item, with a count of 1 roll. Here we record both the length and width of the roll when we enter it into inventory. This has an advantage for entering a customer order as so many rolls of a specific type of material, such as P101 with a length and width specified at time of receipt.

   The disadvantages of this option are:

   - While we could report inventory by different composite part numbers, such as P101-50, for different widths, the inventory report would be in a count of rolls, irrespective of how much material is on the roll.
   - A standard length and width has to be specified on the item master for a "standard" roll. These can then be used as the basis for specifying part-in records for the materials needed to make the roll.
   - The computation of the quantities of material to be consumed to make a specified length and width of the product needs to be customized to take into the account the length and width of each roll to be produced as well as the length and width on the item master.
   - The computation of a standard unit cost to assign to a roll of specific width and length will need to use the unit cost from the item master for the "standard" roll specified on the item master as well as the length and width of the produced roll.

Commentary

So which is best? There is no simple answer.

Option 1 above is best if you only use or produce rolls in a limited range of widths, as this is the simplest approach. But if you use or make rolls or off-cuts in many different width then Option 2 is better, to avoid creating many different item master part numbers, one for each roll.

For those organizations that want to see how much length of a specific product in a specific width they have in stock then Option 2 is the best way to go if they use and make rolls in many different widths.

Option 3 is an alternative to Option 2 but requires a lot of messy customizations and does not appear to offer any benefits over Option 2 for the use cases we have studied.

Option 4 can be beneficial for raw materials received in pounds and consumed in pounds but otherwise should be avoided.

For those organizations that simply receive and ship different sized rolls of material then Option 5 enables an order such as for 3 rolls of P101 18" wide and 50' long to be easily be entered in BellHawk and rolls of the correct size picked for a customer order. It also enable the setting up of a composite part number such as P101-18-400, so that roll inventory can be reported by both length and width.

One issue to consider is the action of simply cutting a length from a roll for shipment to a customer or use in production. With options 1 and 2, we can simply withdraw or move so many feet from the roll. If a different width off-cut results because we didn't need to use all of the length cut-off but only part of its width was used, then the off-cut can be entered into inventory with its own tracking barcode, length and width as a second step.

With Options 3 and 4, this gets a lot more problematic. We cannot simply withdraw a 2"x3" patch or 2 ounces from a roll, compute that we have reduced the area of the roll by 6 square inches or the weight by 2 ounces and have a meaningful result in terms of the remaining length or width, because we have effectively reduced the usable length by 2" and the effective area by 2" by the width of the roll, or its corresponding weight.

With option 3 and 4, this process works correctly if all transformation is done by a work order operation, such as by slitting or cutting and then returning left over material to stock, in a specific length and width, and producing one or more rolls in a different size. It does not work for simply removing material from the roll. This, however, can add a lot of unnecessary complexity to the simple act of cutting a piece of material from the end of a roll.

One of the issues with having length and width as separate attributes that are not directly tied into the primary UOM is what happens when someone simply changes the width (Option2) and/or length of a roll (Option 3 or 4).

Changing the width of a roll may or may not have accounting implications but otherwise could simply be seen as a correction to container inventory, such as if one edge of the roll got damaged. Similarly changing length (Option 3 or 4) may not have much operational implication beside the inventory adjustment.

If we report inventory value by adding up the contents of all rolls, taking into account their actual length and width then this will work correctly for adjusting the inventory quantity and value in an accounting or ERP system.

Commentary

Unless there are special circumstances that would otherwise dictate an alternative, we would recommend the use of Option 2 with rolls being treated as containers containing a length of material as their primary measure of quantity but with the width being specified as a parameter for rolls of this material.

The exception to this may be Option 4 for raw materials rolls with a primary measure type of weight provided that the system is customized to correctly account for quantities needed when these are used as part-in records (in a weight measure type) for making a specified length of rolls of a specified width.

