

Working with Batches with SDScribe™

1. Working with batches – an overview

A batch is both a recipe (ingredients, parts, and instructions) and a record of what was produced and when. Batch records can be created from scratch; from a Substance record; or from another (existing) batch record. The components listed for a Substance become the starting ingredients for the batch. You can add to or remove these ingredients as necessary. You can also add parts such as containers (to be filled), caps, labels, and shipping materials.

After defining the ingredients, parts, and instructions, you can provide workers with a printed batch sheet. During the physical preparation of a batch, workers can then confirm the actual quantity of ingredients and/or the number of parts removed from stock; the lot numbers; and the start date/time, end date/time, and duration (in hours) for each task. The program can use the duration and labor rates to estimate the total labor expense for batch preparation.

Batch preparation will remove the ingredients and/or parts from stock, so it reduces your inventory of these items. In the program, you signify the change in material stock levels by allocating the items against stock (the **Allocate** button on the batch entry form). You might perform this function during planning, or after you receive the completed batch sheet back from the workers.

A scanned copy of a completed batch sheet can be attached to the batch record (the “Attach a batch sheet” menu item, from the **Star[t]** button, on the batch data entry form, Fig. 1).

Batch creation and management is an optional feature of SDScribe™. Without entering the supplementary license, the program will allow you to create a batch, but you won't be able to save it.

The screenshot shows the 'Batch data entry form' for 'Product Laundry Detergent'. The form includes a header with the product name, ID (2016815.174922), and revision number. Below the header, there are fields for 'Lots', 'Preparation lot', 'Filling lot', 'Dates', 'Size', 'Yield', 'Containers', 'Est.', 'Used', 'Filled', 'Sbs Insk', 'Print', 'Allocate', 'To stock', and 'Status'. The main body of the form contains a table with columns for 'Ing/Part', 'Nbr', 'Item', 'Physical', 'Stock', 'Allocated', 'Amt', 'Units', '(lb)', '(gal)', 'Cost ea', 'per', 'Cost ext', 'Actual %', '<>', 'Min %', '<>', and 'Max'. The table lists two ingredients: 'Sodium sulfate' and 'Sodium metasilicate anhydrous'. Below the table, there is a section for 'Task/instruction' with columns for 'Started', 'at', 'Finished', 'at', 'Hours', '\$/hr', 'Total', and 'Worker'. The tasks listed are 'Clean out tank and dry it', 'Obtain ingredients from warehouse. Use forklift to carry bags', and 'Carefully pour ingredients into mixer and set to low. Let mix until completely blended.'. At the bottom of the form, there are 'Notes', 'Costs', 'Ingr.', 'Parts', 'Labor', 'Markup', and 'Other' fields. The 'Costs' field shows a total of \$1,640.63. The 'Batch' field shows a total of \$32.81. The 'Done' button is highlighted in green.

Fig. 1. Batch data entry form.

General Approaches

There are two general approaches to creating a batch record: using a **recipe** or using **component weight percentages**.

a. Recipe approach

The first and most likely approach is that you have a recipe on paper similar to Fig. 2, which indicates the amount of each ingredient to add to the batch. It may also have instructions indicating how to prepare the vessel, the order and manner of adding the ingredients, bottling steps, precautions, and other details. The basic steps in the recipe approach are:

- Create a new batch record.
- Enter the batch product name or product number, linking the batch to a Substance.
- Create the batch items.
- For ingredient items, specify amount and units of measure.
- For part items, specify quantity (each).
- Specify the units of measure for the batch itself.
- Calculate the batch size from the ingredients.
- Calculate the weight percentages of each ingredient.
- Add preparation instructions.

Product Name: <u>Laundry Detergent</u>		Product Number: _____	
Batch Print: <u>13-Sep-2016</u>		Batch Size: 1000 Gallons	
Batch Number: _____		Batch Number: _____	

Wt. %	STEP #	RAW MATERIAL DESCRIPTION	POUNDS	CHECK OFF	ADD WEIGHTS
55.698	1	DEIONIZED OR TAP WATER	4817.09	<input type="checkbox"/>	
4.000	2	SURFACTANT 1	345.94	<input type="checkbox"/>	
20.000	4	SOFTENER	1729.72	<input type="checkbox"/>	
7.000	5	SURFACTANT 2	605.40	<input type="checkbox"/>	
5.000	6	SODIUM XYLENESULFONATE 30	432.43	<input type="checkbox"/>	
0.300	7	D-LIMONENE	25.95	<input type="checkbox"/>	
0.002	8	FD&C BLUE DYE #1	0.17	<input type="checkbox"/>	
5.000	9	DEIONIZED OR TAP WATER	432.43	<input type="checkbox"/>	
97.000			8389.12		

MIXING INSTRUCTIONS:

- 1 Start mixer at 1500 (Approx. 2 minutes)
- 2 Add ingredients in the order list with good mixing
- 3 Mix for 45 minutes
- 4 Sample for QC

Special Instructions: **PRIOR TO FILLING BOTTLES SET PUMP #3 FROM 1200 to 2000 RPM**

Appearance: Clear slightly thickened liquid	Specific Gravity +/- 0.005	1.027
Color: Light Blue	Pounds per Gallon +/- 0.04	8.65
Odor: Clean	pH:	10.0 - 11.0
% Titration: N/A	% Solids:	N/A

To convert pounds to grams multiply pounds by 453.59
 Example: 0.07 pounds x 453.59 = 31.75 grams

Fig. 2. Example of a recipe / bill of materials (BOM) that you might use to enter batch information into SDScribe™. (This form does not originate from SDScribe™)

b. Component weight percentages approach

The other approach addresses the possibility that you do not have a full recipe yet, but instead know the weight-based concentrations of each component in the product mixture. This option may be useful if you have already created a safety data sheet that has components listed in Section 3. The basic steps in this approach are:

- Create a new batch record.
- Enter the batch product name or product number, linking the batch to a Substance.
- Create the batch items.
- For ingredient items, specify weight percentages and units of measure.
- For part items, specify quantity (each).
- Specify the size and the units of measure for the batch itself.
- Calculate ingredient amounts from batch size and weight percentages.
- Add preparation instructions.

With either approach, depending upon how you opened the batch record, whether there is an associated Substance record, and whether the Substance record already contains component information, some of these steps may already be complete when the batch data entry form opens.

Once you have created a batch record by either of these approaches, you can then create **additional batches** of the same product (or a variant of the product) by **duplicating** the existing batch record. If you want to create another batch of the same material, but with a different yield (size), you can scale the duplicate batch to a new size.

If, instead, you want to **alter the recipe**, you would change the ingredient amounts or change the weight percentages; and then recalculate the batch size (when varying the ingredient amounts), or recalculate the ingredient amounts (when varying the percentages). If the new recipe is for the same product, but perhaps reflects an intent to experiment with the original, you would also want to change the **revision number** of the batch ("Rev"), to identify it as a variant on the original recipe.

Each batch must be linked to a **Substance** record representing the batch product. The Substance record retains information about the ingredients as Substance components: the component names, weight percent concentrations, and amounts and units of measure for a batch.

When you save a batch, the program compares batch components to their Substance equivalents, and offers to update the Substance to reflect any changes. As you might have more than one batch record associated with the Substance, it is up to you to determine whether the program should update a Substance record to reflect these changes.

The Substance record **does not retain part information or batch preparation instructions**.

II. Batch Assistant – RECOMMENDED APPROACH

The Batches section of the program includes a **batch assistant** (Fig. 3 - Fig. 14), which can guide you through the process of creating the batch record from a recipe. The program offers you this option when you create a new batch record, and click on the **Star[t]** button.

You can always return to the batch assistant by selecting the first item in the **Star[t]** button pop-up menu, **Batch assistant**. The batch assistant can help you complete existing batches as well as new ones, finding missing items and possible inconsistencies.

If you are a first-time user of the Batches section of SDScribe™, **using the batch assistant is recommended**. By guiding you through the most important steps, the batch assistant will bring you “up to speed” quickly. You won't need to know everything about batch entry before you can be productive.

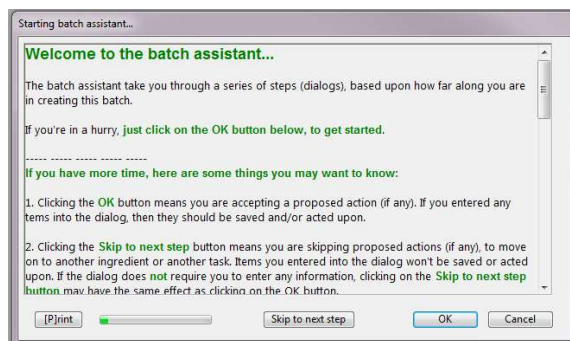


Fig. 3. Batch assistant – first dialog.

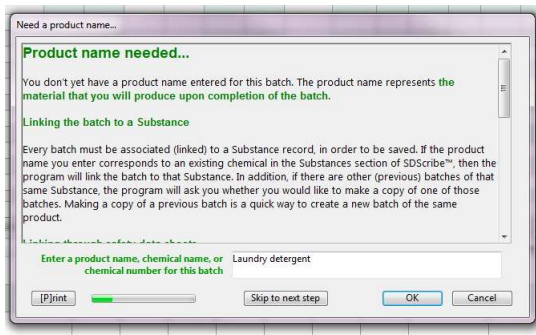


Fig. 4. Batch assistant – enter product name.

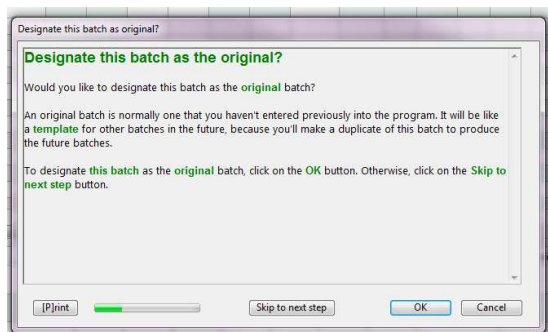


Fig. 5. Batch assistant – designate batch as original.

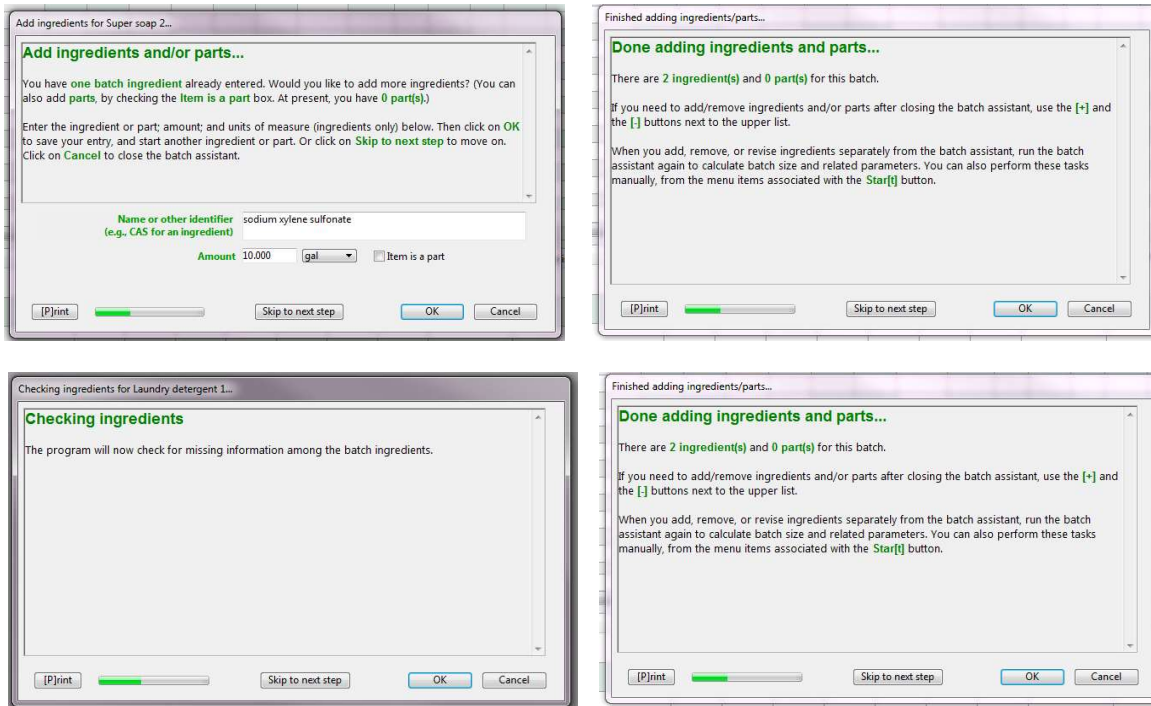


Fig. 6. Batch assistant – add ingredients and/or parts screens.

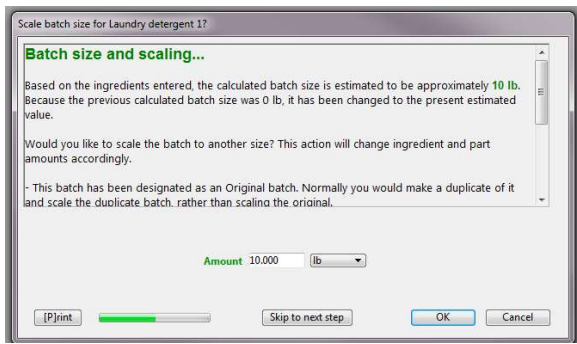


Fig. 7. Batch assistant – scaling.

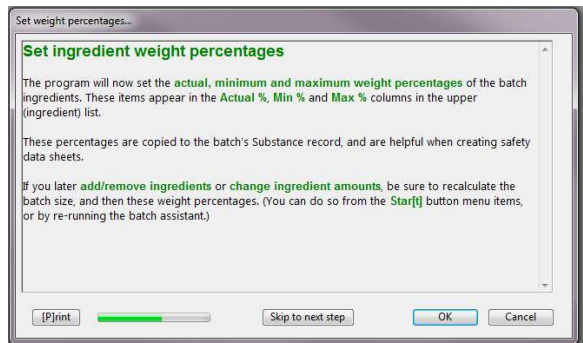


Fig. 8. Batch assistant – set weight percentages.

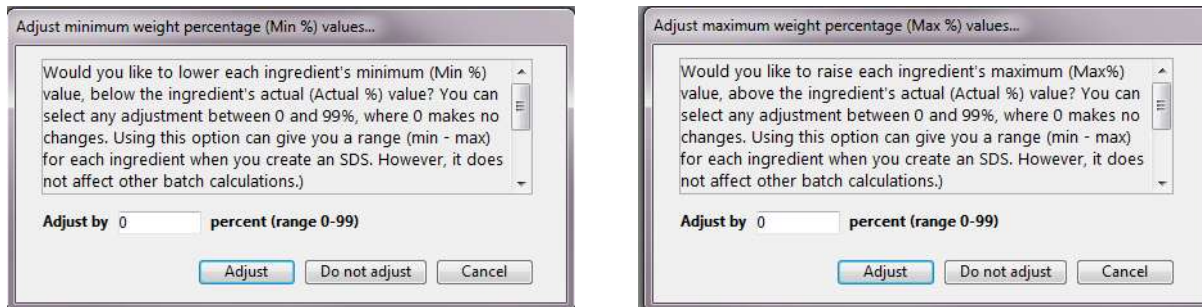


Fig. 9. Batch assistant – adjust Min% and Max % weight percentages.

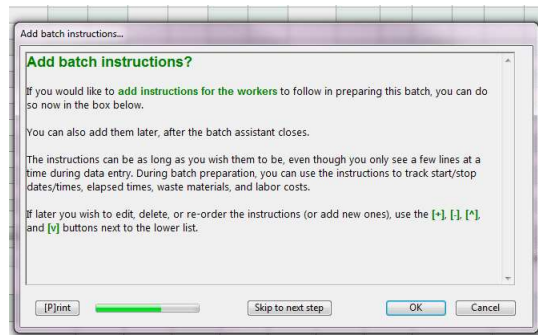


Fig. 10. Batch assistant – add instructions.

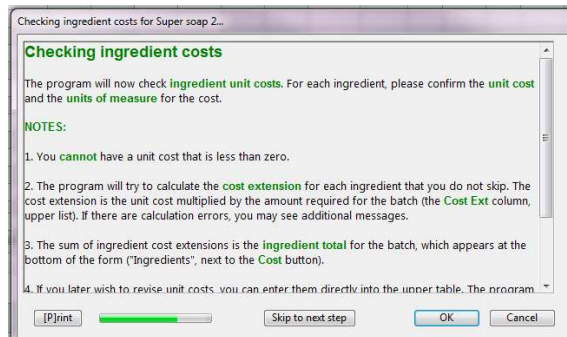


Fig. 11. Batch assistant – checking ingredient costs.

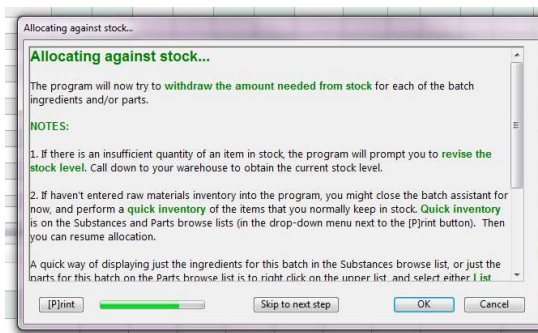


Fig. 12. Batch assistant – allocating against stock levels.

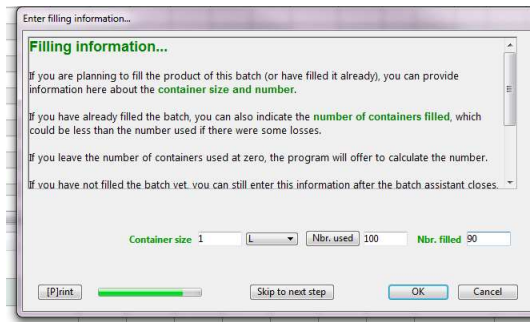


Fig. 13. Batch assistant – filling.

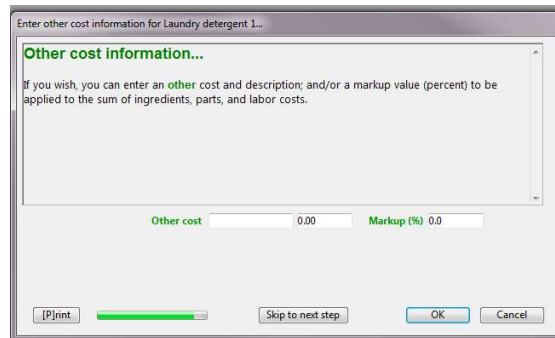


Fig. 14. Batch assistant — other costs.

III. Completing a batch record (Details)

The information/instructions which follow assume that you are not using the batch assistant.

Instead, they step in detailed fashion through the process of completing the batch record, for both of the general approaches discussed in the overview (Section I, above).

1. Create a new batch record.

From the Batch browse list (Fig. 15), click on the **[N]ew batch** button; or right-click on a row in the list and select **Add a batch**.

Alternatives: If you happen to be viewing the Substances browse list, you can instead right-click on a Substance record (row), and then select **Create batch from Substance** in the pop-up menu. A third option would be to right-click on an SDS record in the SDS browse list, and select **Create batch from SDS** in the pop-up menu.

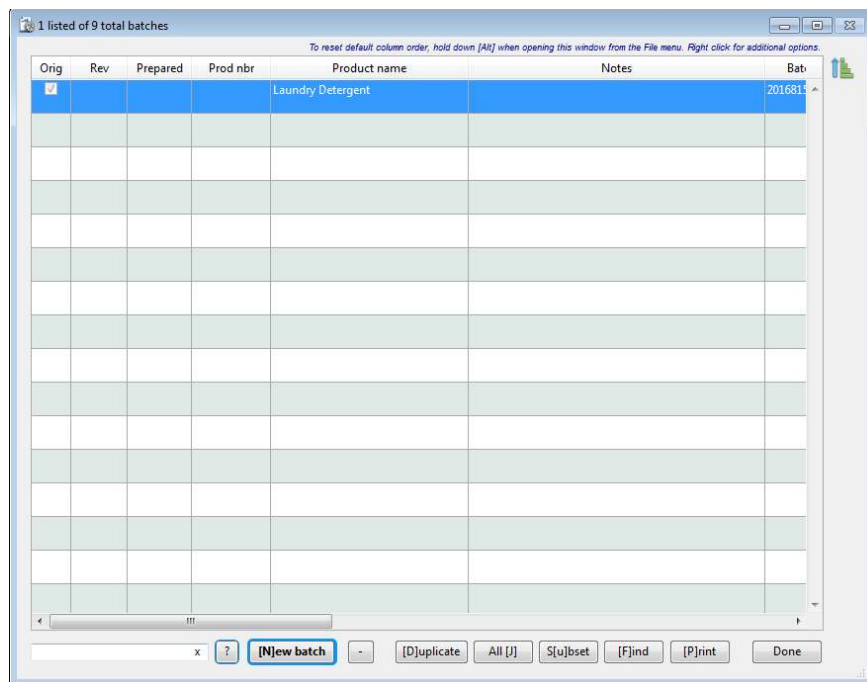


Fig. 15. Batch browse list.

2. Enter a product name or product number, corresponding to what the batch will be when complete.

You can enter the product name, internal product reference number, supplier's product number, chemical name, supplier name, or various chemical identification numbers (CAS, EC, Index, UN/NA, RTECS). You enter this information into the Product field, at the top of the form.

You can enter a **partial name** which includes the first few letters of the chemical name, product name, or chemical synonym. For example, you could enter **sodium** to obtain all Substance records whose chemical name, product name, or chemical synonym(s) start with "sodium".

If you know a portion of the name which is not at the beginning, you can prefix the search expression with a **wild card character**, which is the [Shift]-2 symbol on the keyboard, "@".

For example, you might enter "@dinitrile" to search for any Substance record either starting with or containing the expression "dinitrile" (not case-sensitive).

The program uses the product name or number you entered in this step to associate the batch with a Substance record. **A batch must be associated with a Substance before it can be saved.**

The program will try to find a Substance record matching the information you entered. If the program finds **more than one Substance**, it will present a list of Substance options, from which you can select one by highlighting or double-clicking. This situation might arise if you purchase an ingredient from more than one supplier, so that you have more than one Substance record for the same material.

You can also perform quick searches using the box at lower left in the Substances options list, to find a Substance that may not be shown.

If the program **does not find** a suitable Substance, or if you **cancel the dialog** when it presents a list of Substance options, it will then offer to look for an SDS which matches the product name or product number (the **Check for an SDS** button. If it finds more than one potential SDS match, it will present a dialog from which you can select an SDS.

If none of these alternatives are suitable, or if the program finds no matches, you can create a **new** Substance record, based on the new batch itself.

When you associate the batch with an **existing** Substance record, the program checks to see where there is an **earlier batch** which is also associated with the same Substance. If so, it will offer to copy the ingredients, parts, and instructions from the earlier batch. This approach is advantageous, because a previous batch record will contain more information (parts and instructions) than the associated Substance record itself.

If there is **no previous batch** for the selected Substance, it will offer to copy over the components (if any) of the Substance as ingredients.

3. On the batch data entry form, change the batch identification number if desired.

The program automatically inserts a batch number of the format, **prefix-YYYYMMDD.HMMSS** in the **ID field**. The **prefix** that the program will use is located in **Preferences**; you can change or remove it; it is an optional component of the batch number. You can revise the batch number as you wish, but it should be an alphanumeric value that you haven't already used for another batch.

4. Add or remove batch items (ingredients and parts) to/from the upper list as needed.

The program may have already entered batch items, either from a previous batch, an associated Substance, or an SDS that you selected previously. If there are no ingredients, or if you want to add more, click on the [+] button and select **Add an ingredient**. You can also right-click on the list and select **Add an ingredient**; or double-click on the empty area below the last listed ingredient.

To add a part, click on the [+] button and select **Add a part** (or right-click on the list and select the same item). To **remove ingredients or parts that you don't want**, highlight the row(s) and click on the [-] button.

For each new ingredient row, enter a chemical name, product name, or a product number into the Item column. You can also enter various chemical identification numbers (CAS, EC, Index, UN/NA, RTECS). Note that the program will not allow you to add the batch product itself as an ingredient.

To **edit individual cells** in enterable columns of the table, perform a **slow, repeat click into the cell**. A double click beyond the last row will add a new ingredient; and a double-click on an existing row will produce an offer to update row information. The non-colored (gray-and-white) columns are non-editable, for display only.

TIP: Consider entering an internal product number for each Substance that you intend to use in batches, using the following format:

***Supplier code-Name of Ingredient** (e.g., VWR-Sodium Sulfate).*

Then, when you type the prefix ("VWR") in the Item cell of the upper list, the program will present all the Substance records with an internal product number starting with "VWR" (Fig. 16).

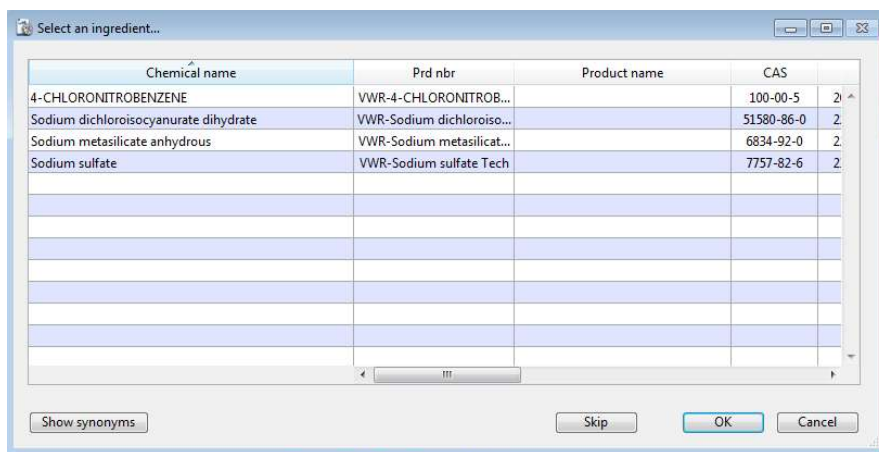


Fig. 16. Select an Ingredient after typing the supplier code prefix.

For each new **part row**, enter the part name or a reference number (supplier's catalog/ID number, or your own internal ID number) into the Item column. If you have prefixed internal part numbers with a supplier code, then you can use the prefix to list all parts from a particular supplier.

Once you have entered text into the Item column, the program will attempt to **associate an ingredient with a Substance record**, in the same fashion as it associates the batch itself to a Substance record after you enter a product name or number. The name that ultimately appears in the cell will match the chemical name for the associated Substance record.

For parts, the program will attempt to associate the item with a part record.

If you don't like the capitalization or spelling of the ingredient or part name, then you should change it on the original record, by right-clicking on the row, and selecting **Show Substance for this item** or **Show part for this item**. Changes may not appear until you save the batch, using the **[S]ave** button or the **Done** button.

5. [RECIPE APPROACH ONLY] - Add amounts and units of measure (for ingredients) or quantity (for parts).

NOTE: If you are using the component weight percentages approach, skip to Step 9, **Specify the weight percentage for each ingredient**, below.

Each ingredient should have an amount to be added (in the **Amt** column) and the units of measure (in the Units column, such as pounds, gallons, kilograms, quarts, etc.), to produce the particular batch size called for in the recipe.

For more information on units of measure for ingredients, refer to [About units of measure](#) at the bottom of this article.

For batch items that are **parts**, you can enter a quantity in the **Amt** column, but the unit of measure will always be **each**. If you enter a value in the **Amt** column that is not an integer, the program will display an error message, and revise the quantity upwards to the next integer value.

6. [RECIPE APPROACH ONLY] - Select the batch units of measure, and determine the calculated batch size.

Select the batch size units in the drop-down menu, just to the right of the **Size: yield** label (top left). Then click on the **Star[t]** button, and select **Set batch size from ingredients** from the pop-up menu. The

program will total the ingredients by weight and enter the total into the calculated batch size field (**Size: calc**).

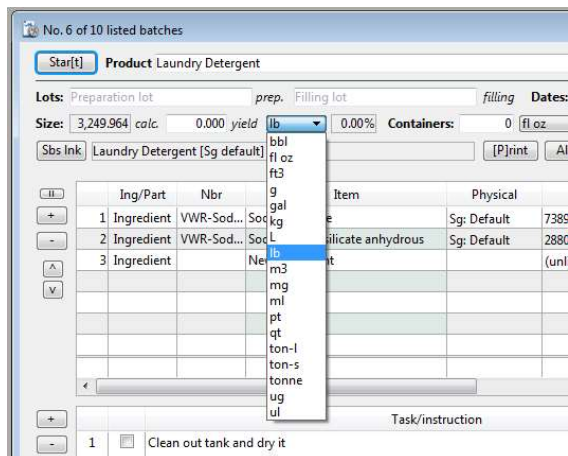


Fig. 17. Selecting batch size units

7. [RECIPE APPROACH ONLY] - Scale batch as necessary.

If you are making a **larger or smaller batch** than indicated by your original recipe, click on the **Star[t]** button and select **Scale batch size** from the pop-up menu. The program will prompt you for a new batch size, and then adjust the amounts of each ingredient listed. Prior to scaling a batch, you should have an **amount** and the **units of measure** for each ingredient in the list.

NOTE: If you add ingredients, remove ingredients, or change ingredient amounts after determining the batch size in the previous step (**Set batch size from ingredients** menu item), you must repeat that step before scaling the batch.

About scaling batches

Once you scale a batch, the amount of each ingredient is a calculated value, rather than a direct user entry. Similarly, the total batch size (from the ingredient amounts) is a calculated value. As digital representations of real numbers, these values are subject to floating-point number inaccuracy, which may increase each time you scale a batch. So you **won't return to exactly the same values** if you scale a batch, say, from 30 gallons to 50 gallons, and then back again to 30 gallons.

Therefore, it is a good idea to always scale **a duplicate copy** of the original batch, where you directly entered the ingredients and their respective amounts. The **Orig** check box at upper right on the form permits you to designate your first batch of a product as the original recipe. You can verify how many times a batch record has been scaled by the number located just to the right of the **Orig** check box.

8. [RECIPE APPROACH ONLY] - Calculate ingredient weight percentages.

The Substance record associated with this batch maintains component information, based on the ingredients present in the batch. Of particular use is the concentration of each ingredient as **a range of weight percentages of the total batch size**. This information can be useful when creating an SDS for the Substance. The components list in Section 3 of the SDS may specify a low and high range for each ingredient.

In some cases, the weight percentages may already appear in the **Min %**, the **Max %** and/or the **Actual %** columns of the ingredient list. Ideally, the columns should each total in the range of 100 percent.

Because you have entered the amounts of the ingredients and of the batch itself, you should now calculate or recalculate the weight percentages for the **Min %**, the **Max %**, and/or the **Actual %** columns, based

upon the current ingredient amounts and total batch size. In fact, each time you adjust an ingredient amount, you should first recalculate the total batch size (**Select the batch units of measure, and determine the calculated batch size**, Step 6 above); and then recalculate the ingredient weight percentages.

From the **Star[t]** button, select **Min wt percent from amount**, **Max wt percent from amount** or **Actual wt percent from amount** from the pop-up menu, to calculate the weight percent of each ingredient in the batch as a whole. If you perform the calculation on all columns, the values will be identical. You can then adjust them for the minimum and maximum concentration range anticipated for each ingredient. (The program will also offer to calculate the **Min %** and **Max %** values based upon a percentage below or above the actual calculated values.)

The **Actual %** column can be used to represent the **true/accurate content** of each ingredient in the batch. The program does not copy the information in this column onto the SDS. You can then adjust the **Min %** and **Max %** values so that the range of values encompasses the **Actual %** value.

9. [WEIGHT PERCENTAGES APPROACH ONLY] - Specify the weight percentage for each ingredient.

NOTE: If you are using the recipe approach, skip to the step, **Add preparation instructions**, Step 13, below.

If you created the batch from an existing Substance record, then ingredient weight percentages may already appear in the upper list, with their respective concentrations shown in the **Min %**, **Max %** and/or **Actual %** concentration columns for each ingredient row. The values in any of these three columns can then be used to calculate the amounts of each ingredient to be added to the batch.

Each weight percentage value should be between zero and 100. The total of the percentages for the column you plan to use in calculations should be **as close as possible to 100 percent**. The total percent for the column is shown in the footer of the upper list.

10. [WEIGHT PERCENTAGES APPROACH ONLY] - Specify the units of measure for each ingredient.

Select units of measure for each of the ingredients in the upper list.

The units of measure do not need to be the same for each ingredient, and they do not need to be the same as for the batch as a whole. However, if some of the ingredients or if the batch itself is/are measured in volumetric units (gallons, quarts, liters, etc.), then the program will need to convert them to weight-based units (lbs., kilograms, etc.) in calculations adding ingredients together. This conversion takes place automatically as needed. For more information, refer to [About units of measure](#), at the bottom of this article.

Ideally, you would use the same units of measure as you use for the ingredient in your raw materials stock.

NOTE: With the component weight percentages approach, **you do not enter the ingredient amounts**. The program will calculate these amounts, based on the total batch size and the weight percentages.

11. [WEIGHT PERCENTAGES APPROACH ONLY] - Set the calculated total batch size, and batch size units.

From the **Star[t]** button, select **Set batch size manually** from the pop-up menu, and then enter the total amount and the units of measure for the batch itself. The program will place the quantity you entered into the **Size: calc** field (top left).

12. [WEIGHT PERCENTAGES APPROACH ONLY] - Calculate amounts for each ingredient.

From the **Star[t]** button, select one of the "Amounts from...wt percent" items from the pop-up menu, to assign the amounts of each ingredient to be added to the batch. The option you select will depend on whether you want to calculate the ingredient amounts from the minimum, maximum, or actual weight percent columns (**Min %**, **Max %**, or **Actual %**), or some combination of Min % and Max %:

- **Amounts from actual weight percent:** Calculate ingredient amounts from the **Actual %** column percent values.
- **Amounts from min weight percent:** Calculate ingredient amounts from the **Min %** column percent values.
- **Amounts from max weight percent:** Calculate ingredient amounts from the **Max %** column percent values.
- **Amounts from min then max wt percent:** Calculate ingredient amounts from the **Min %** column percent values if available. Otherwise, use values from the **Max %** column.
- **Amounts from max then min wt percent:** Calculate ingredient amounts from the **Max %** column percent values if available. Otherwise, use values from the **Min %** column.
- **Amounts from min+max wt pct average:** Calculate ingredient amounts as the average of **Min %** and **Max %** columns.

The weight percentage calculations do not take into account any "less than", "less than or equal", "greater than", etc. designations; they only use the numeric value itself.

13. Add preparation instructions.

Press the [+] button next to the lower list to create a new instruction. Enter the directions into the **Task/instruction** column. If you need to enter more text than the cell can display, click the **zoom** button to the right of the list. The cursor **must be entered into a cell** in the **Task/instruction** column.

The lower list has additional columns which can be completed after the workers finish the batch. Examples are start and stop dates/times for the task, the overall duration in hours of the task, the worker and supervisor names, the combined labor rate for the workers, a description of wastes generated, and other comments. You can maintain a **default labor rate** in **Preferences**.

If you have entered a **duration** in hours and an **hourly labor rate** for a row (task), then the program will calculate the labor cost for that task, and add it to the total **labor cost for the batch**. If you have not entered a duration, but you have entered start and stop dates/times, then the labor calculation will make use of the entire interval between the start and stop times. This assumption may not be valid if, for example, a batch sits unattended for a portion of that time.

In specifying a labor rate for each instruction (or in setting the default labor rate in Preferences) you may want to account for the number of workers and/or supervisors involved in preparing the batch.

14. Link to a Substance record.

If you haven't already associated the batch with a Substance record by entering the product name (Step 2), you will need to do so before you can save the batch. Click on the **Sbs lnk** button and select **Link to Substance** from the pop-up menu. Then select the appropriate Substance to associate with the batch.

If you do not find a suitable Substance, cancel the dialog and click again on the **Sbs lnk** button, this time selecting **Create Substance from batch** from the pop-up menu. This selection will create a Substance record with components corresponding to the batch ingredients and their respective weight percentages.

The batch record can also update the linked Substance at a later time, if the batch information changes. Refer to the item, [Saving the batch](#), below.

15. Print a batch sheet for the workers to use in production.

If desired, you can click on the **[P]rint** button and select **Print batch sheet** from the pop-up menu, to produce a BOM with instructions and a log, for workers who will prepare the batch. (This task also appears in the **Star[t]** button pop-up menu, as **Print a batch sheet**).

The workers can enter information that becomes available during preparation, such as the actual batch size (labeled **Size: yield**); actual quantity produced, amounts picked from stock, start/stop/elapsed time for instructions, ingredient lot numbers, spillage, etc.

16. Allocate against stock.

During batch planning or when you actually remove ingredients and parts from stock, you can click on the **Allocate** button to reduce stock levels accordingly. You can highlight individual row(s) that you wish to allocate against stock (**Allocate selected items**), or allocate all items against stock (**Allocate all items**).

If there are any non-zero values in the **Amt picked** column, the program will offer to allocate based on those values rather than the **Amt** (amount in batch) column. If you make use of the "picked" values, you should also use them again if you need to deallocate.

If an ingredient or part has insufficient stock, the program will prompt you to revise the amount of the item in stock. The dialog affords you the opportunity to correct errors, if any, in the actual inventory. Of course, you should not adjust an insufficient stock level if it is indeed a valid number.

The **Allocate** button can also be used to deallocate ingredients and parts, thus returning to stock the quantity removed.

NOTE: If you haven't yet established a raw materials inventory in SDScribe™, you can do so from the browse list in the Substances section of the program. From the drop-down menu adjacent to the **[P]rint** button, select **Quick inventory** [show-hide], and the program will present an editable variant of the browse list. There you can search for the Substances associated with batch ingredients, and directly enter current inventory, unit costs, and threshold reorder levels. (A similar functionality exists for part stock, on the part browse list.)

17. Enter container filling information.

If your workers will be filling the batch into containers, specify the container size, units of measure, and number of container to be removed from stock for the operation. These items are located next to the **Containers:** label, at top center on the batch data entry form. The program can estimate the number of containers needed from the calculated batch size and the container volume, if you click on the **Est.** button.

When the filling operation is finished, enter the number of containers actually filled, using the **Containers: __ filled** field.

If you wish for containers and associated items (caps, labels, etc.) to be included in the total cost of the batch, then you should enter these materials as parts in the upper (item) list.

18. Update batch dates and status.

In the **Dates: __ prep** field, indicate the date when your workers begin to prepare the batch. You can change the **Status** drop-down menu as appropriate, to indicate the current status of the batch. There are also date fields for indicating when the batch is completed, and when it is filled into containers.

19. Place product into stock.

Click on the **To stock** button to place the finished product into stock. The program will display a dialog prompting you for the amount of the batch product to place into finished goods stock.

In the dialog, the program will estimate the amount to be placed into stock as the product of containers filled and container size. If you did not enter a number of containers filled on the batch entry form, then the program will use the batch yield or the calculated batch size as the amount to place into stock. You may also enter some other amount in the dialog, however.

If the total batch size units of measure differ from the stock units of measure, then the program will perform a conversion before placing the batch into stock. Warnings concerning volume-to-mass unit conversions also apply here; refer to [About units of measure](#), at the bottom of this article.

NOTE: You cannot place a batch into stock which does not have all items (ingredients and parts) allocated against materials stock (Step 16, [Allocate against stock](#), above). Additionally, there must be a calculated batch size (**Size: __ calc**) or a batch yield (**Size: __ yield**), and units of measure for the batch itself, as well as preparation and completion dates. You cannot place a batch into stock when it is not linked to a Substance record.

20. Determine batch cost information.

Columns representing **unit and extension costs** for each ingredient appear in the upper (item) list. You can revise unit costs for ingredients or parts by entering them into the **Cost ea** column. To obtain the current cost for the item from the Substance and Parts sections of the program, **double click on the row** representing the item to be updated. Or right-click and select either **Refresh unit cost for this item** or **Refresh all unit costs**. For parts, the program will take into account any volume discounts you have entered on the part data entry form.

Labor costs appear in the lower list, when the hourly labor and time duration for the task(s) are specified. If you have entered a default labor rate in Preferences, then the program will automatically insert this rate when you add an instruction row to the lower list. Changing the default labor rate in Preferences **does not affect existing rows** in the lower list; only new rows.

The subtotal costs of ingredients, parts, and labor for the batch appear at the bottom of the form, along with a box for specifying a **percentage mark-up** for the subtotals. You can also add an **Other** cost (not subject to the percentage mark-up), if you need to adjust the total batch cost for other reasons.

If you have entered the number of containers filled, the program will also calculate the **total cost per filled container**.

21. Saving the batch.

When you press the **[S]ave** or the **Done** button to save your work on the batch, the program will recalculate the expected whole batch size from the ingredient amounts, and compare it to the current total. If they differ by more than 2 percent, the program will ask whether it should revise the entered batch total. This recalculation does not occur, however, if the batch has been placed into finished goods stock.

In addition, the program also detects changes to the individual batch ingredient entries. If revisions exist, it will ask whether the associated Substance record should be updated to conform to the batch ingredients.

Remember that you **cannot save a batch that is not linked to a Substance**. If you have activated **Autosave** by specifying a non-zero interval in Preferences, and there is no Substance link, the autosave will not take place.

22. Other notes

- The weight percentage values used in the program are (weight of ingredient/weight of batch) x 100. You cannot use (weight of ingredient/volume of batch) or (volume of ingredient/volume of batch) to represent weight percent.
- You cannot allocate or deallocate ingredients or parts if the batch itself has already been placed into finished goods stock (the **To Stock** button is blue, indicating it is “on”). You must **un-click** the **To Stock** button before deallocating.
- For each batch ingredient listed, the total amount of the ingredient in raw materials stock will appear in the Stock column of the table.
- You can **examine and revise stock levels** of each ingredient in the Substances section of the program; and for each part in the Parts section of the program. From the data entry form for the relevant Substance or part, click on the Stock tab. From the Stock activity list, you can click on the **Stock** button to adjust the stock level for the Substance or part.
- You can perform a quick inventory for Substances from the Substances browse list, or for parts from the Parts browse list, by selecting **Quick inventory** from the drop-down menu next to the **[P]rint** button.

23. About units of measure

When you specify volume-based units for an ingredient or for the batch itself, the program attempts to convert between volume-based and mass-based units. This conversion is needed because **mass is conserved** when mixing ingredients into a batch, but not necessarily volume.

The **Phys-chem props** tab of the Substance record associated with an ingredient or with the batch itself contains information for the conversion. To edit this information for an ingredient, you can right click on the ingredient row, and select **Show Substance for this item**. For the batch itself, select **Show Substance for batch** from the pop-up menu of the **Sbs Ink** button.

For **solids and liquids**, the program will look for a specific gravity value (**Relative density/Sg** in the Substance record). In the case of **divided solids** (beads, granules, powders, etc.), the program will look

for a **bulk density**, or (if none is available) fall back on specific gravity. For **gases**, it will verify that the Substance physical **state** is "gas", and read the **molecular weight**.

For an ingredient row in the upper list of the batch form, the specific gravity, bulk density, or molecular weight information should appear in the **Physical** column.

If the specific gravity for a solid or liquid ingredient (or for the batch) is not available, then the program will fall back on a default specific gravity (**Sg default** in Preferences). This fallback value may not be accurate for the particular ingredient or for the batch itself, and thus the calculations may not be accurate.

In the absence of both the specific gravity for the individual Substance, and the default specific gravity, the program will present one or more error messages.

For batch items that are parts rather than ingredients, the unit of measure is always "each", and cannot be changed by clicking the mouse into the Units column.