Non-Sterile Pharmacy Compounding Documentation using MS Excel

Version 3
Dave Andersen, RPh, MPA
andersen-computing.com
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Non-Sterile Pharmacy Compounding in Hospital Pharmacies Overview

This MS Excel Workbook was designed to facilitate documentation of the record keeping requirements listed in USP 795 (Revision Bulletin, January 1, 2014) Pharmaceutical Compounding - Nonsterile Preparations in Hospital Pharmacies.


These workbooks do not address the compounding process (see bulletin and state pharmacy regulations for definitions, training requirements, facility and equipment requirements, storage and handling, etc.). They are designed to meet the required documentation for the Master Formulation Record and Compounding Record. Only two compound formulas are entered into the workbook; the user will be required to add local formulas in use. The process is detailed later in the mini-manual.

Detailed training documentation is done separately, but the workbook does have a method to enter staff, noting compounding training and hazardous materials handling documentation (as per USP-795, compounding hazardous drugs, such as Tacrolimus oral suspension, requires special training before preparation). The user documents whether the training and annual review is complete or required.

Before we review the workbook functions; a word about Beyond Use Dating (BUD). This workbook does not recommend BUD, but it will use each product's expiration date to determine if the compounded product's expiration is not later than the expiration on the container of any component. In other words, if making a suspension with a BUD of 30 days (the expiration is taken from references, if given), but one of the ingredients expires in 15 days, the expiration of the compound will be changed to 15 days from the date of preparation. USP-795 also addresses BUD for water containing formulas: 14 days, refrigerated, for oral liquids and 30 days for topical/dermal or mucosal formulations (e.g. Magic Mouthwash).

These workbooks are distributed free of charge and simple registration is required. I am also constantly looking to improve the function of the product, so feel free to send me a note for suggestions: mailto:andersendav@gmail.com

Use of Macros

Next, let’s discuss what constitutes a Macro Enabled workbook. Unlike regular, non-macro enabled spreadsheets, these workbooks contain macros (Visual Basic code) that allow some complex functions to manipulate data with just a click of a button. You will know macro enabled workbooks by their extension, .xlsm. For these macros to work, the user must configure MS Excel to allow their use.

Set the Macro Security Settings to Medium. This allows you to pick and choose which macro to run. Depending on the Windows Version (sorry Mac users, but I don’t know if this will work on an Apple product), choose Options, Trust / Center, and choose Trust Center Settings from the menu. Click on Macro Settings and set to Disable w/Notification.

The first time this workbook is opened, you may also see a warning dialog box and/or warning buttons at the top of the Excel page. Each informs you that these workbooks contain Macros (Figure 1). Please enable the Macros and any buttons (Figure 2) referring to enabling data/content. The workbook does not function properly otherwise. Subsequent use of this workbook should not have the same warnings. This does, however, need to be repeated for each new user.
This version was developed with Office 365-Excel (on Windows 10), but has been tested on Windows 7 and 8 systems. Computer requirements are simple: a system with MS Office/Excel and a printer (see below).

**Required Equipment**

A report printer, either Laser or Ink Jet, is required for report and some label printing. I also recommend a separate label printer for small batches and one time compounds. Here are some recommendations:

The cost of color printing has dropped dramatically over the last few years. Color laser printers are available for less than the black and white lasers were 5 years ago. HP and Brother have several printers that I have tried:

Hewlet-Packard Website: [HP MFP M277 Color LaserJet](#). A great, inexpensive way to put color into your reports. (I use this at home and for the business.) This printer scans and copies.

Brother Website: [They have a large variety of inexpensive color laser options](#).

Paper may not seem that important, but buy at least one ream of high quality paper for report covers.
Labels may be produced using a variety of Avery Shipping Label 4X2 inch formats:

For Color or Black and White labels:
Avery 5163 Labels (10/sheet) for laser or inkjet printers are used for large batches of bottles.
Avery 2163 Labels (4/sheet) also for laser or inkjet printers are useful for small batches. You can print 1 to 4 labels. Use the sheet to print one label and reuse the sheet for a second label, the program will allow for the printing to begin on the second label. If 2 to three labels have been used, turn the sheet over and start from the top. When printing, the label placement within the printer is different for Ink Jet printers. You must move the paper guide to the far right for printing. Laser printers require the labels be centered on the paper guides. Select the Labels tab and click the green Adjust Margins button if printing on the labels require adjustment. This is a very useful label, but may be hard to find. Amazon has the best selection.

Avery Website: Avery.com
Amazon: Search Results for 2163 Labels

For Black and White printing only:
I have long been a fan of the DYMO LabelWriter printers. These inexpensive thermal printers with expensive labels can be found at almost any office supply store. I prefer the 30256 label, also a 4X2+ inch label, the DYMO 30323/30573 (a slightly smaller shipping label) will also work well and might be easier to purchase. With the with the introduction of Windows 10, I originally had some difficulty getting satisfactory printing. Newer drivers seemed to fix the problem. I have used them successfully for years in Windows 8 and earlier environments. DYMO printer settings are discussed on page 31.

DYMO Website: LabelWriter 450

My new favorite in the Label Printer category is the Zebra printer. This printer may already be available in many hospital pharmacies, but if you wish to purchase a single printer, I heartily recommend the HIPPO Deals Website. You can pick up a refurbished Zebra 420 for a fraction of the new Zebra prices. I picked up a Zebra ZP 450 (once used at a UPS location) for ~$200.00. This printer is much more durable and faster than the DYMO and your facility may already be using the 4X2 inch thermal labels. They can print labels all day long. Get the direct thermal versions. On page 28 of the manual, I will discuss the Zebra Print Settings.

ULINE Website: Zebra GK420D Direct Thermal Printer

HIPPO Deals: Same printer as above but refurbished.
Installation Instructions

To get the latest version, visit the Andersen-Computing.com website. Simple registration is required, a form from the site asks only for your name and a valid e-mail address. Support will only be provided to those with valid e-mail addresses on file.

One zip file is required:

AC_NSCompounding.zip (This file includes this manual, three workbooks (Bulk Compounding-Master, Bulk Compounding Template and Bulk Compounding_Blank), and some sample images in a separate folder, see page 21). Each of the three files will be available as a single download, though all three are required.

Updates for the Template and Report Blank will also be available (in Zipped format) within the same location as they are produced.

This manual is also available to download from site individually (it's also a great way to get more information about the workbook’s function before its used).

Unzip these files to the location of your choice. Each zip file contains an installation routine. This routine requires a password that is provided upon registration on the Andersen-Computing.com website (Registration Form for Unlock Code ). You can choose a different folder name and location. If these workbooks are to be used in health care organizations on a network, have your IT department install it to a shared location. Ideally it will be placed in a Pharmacy folder that each of the pharmacists could access (a shortcut on every pharmacist’s desktop would be ideal). Same for this PDF manual.

Two caveats: You MUST place these workbooks into the same folder. That is the only way you can update or create new compounds. You MUST have another sub-folder located within the compounding folder. Name the folder Backup, which describes its function. All completed products that are checked by the pharmacist will be copied to the 'Blank' workbook, saved using the local lot#, and a backup file will be placed into the Backup folder. I would also suggest the Information Management staff of the facility place shortcuts on each user's desktop for the Master workbook and this manual. These workbooks may not be used by more than one user at a time, but that should not be a problem for most facilities.

To make the forms easier to navigate, set the Excel Advanced Options such that the zero values are not displayed and the default direction in unlocked cells goes from left to right and not down (Options; Advanced; Editing Options; After pressing Enter, move selection Right)

Updates to the templates may be provided time to time for download, usually to improve the function of various macros. The Update function will be discussed in detail later in the manual.
Printing Report Cover and Spine for View Window D Ring Binders

One way to store the paper reports generated by this program is to use three ring D binders with view windows for a cover and printed spine image. Staples has these for just a few bucks. A 1 ½ inch D-Ring binder can hold up to 300 pages, less if you use some of the clear document covers. On the Title page you have the option of printing a report cover and color spine for the binder. Use good quality 90+ pound paper and try and print in color. The spine image will require a paper cutter, but it makes it easy to find on the shelf and is much more attractive than using a magic marker. I have started color coding the workbooks I develop and have found white and green binders acceptable for this particular program's reports.

First click the Select Printer to make sure you are not printing using one of the label printers. Next click on the respective buttons, one for the report and one for the spine image.

Figure 6-Report Cover

Setting Up the Workbooks

Pages 5 and 6 of the USP 795 bulletin detail the record keeping requirements. Those requirements become the basis for the creation of these workbooks. Master Formulation Records are accessed from the main workbook (Bulk Compounding-Master). The compounding records will be placed within a workbook that can be accessed from the Local Lot # worksheet within the Bulk Compounding workbook via the menu option. Each Master Formulation Record is given an index reference number based on the Facility Prefix that the user must create. This index number is created each time a new compound is entered into the system.

For the most part, I will go over the functions of the workbook by the buttons found on each worksheet. Visual Basic macros are attached to each of the buttons and these macros are only accessible via the buttons. The Excel menu bar is not used, except to close Microsoft Excel when all the worksheets have been closed.

Generally, the only cells that may be populated are those with yellow background shading. However, many times the “unlock” buttons on the page must be clicked to unlock the cells. Cells with white background are usually unavailable for data entry/editing. When the batch sheets are created and/or edited, certain cells with a light blue (cyan) background may have data entered. These are generally locked as part of the master formula for calculation purposes.
Changing the Master Password

Upon opening this workbook, the user is directed to the Compound Index. From there, the user will select the product of choice by using the VCR button/menu. Before we can add a product, the facility (hospital) and inpatient pharmacy information must be entered. If desired, a Title Image may be placed over the hospital information. The reports shown later in this manual have an image from a fictitious hospital in Kansas. The workbooks as downloaded will have a transparent image as the title image. Instructions as to how to replace the images on the Formula Template and the Blank Report workbooks are found later in the manual.

The second worksheet page is labeled Pharmacy Information. Click on the tab, moving to the top of the page, if necessary.

Create your new Super-User Password: Click the Change Password button.

The initial password is **57Chevy** (case sensitive).

Password button) if desired. You will validate the password by entering the dialog boxes. If they match, you will have created a new Super User password. Obviously, this should be shared with a few other individuals. There is another master password for recovery of a lost password. Email me (andersendav@gmail.com) for information.

Changing the Hospital Information

Click the Unlock Page button and enter the master password. Only the areas with a light yellow background may be edited. The first line is for the Facility Name, second for the facility's
street, city and state address. The third line displays the Inpatient Pharmacy and Phone # (these items are used as headers for some reports). In cell E6, enter the template prefix (used to create the index number for each product). I suggest the Facility initials, i.e. Smallville Medical Center could have the prefix SMC- (the dash makes the number easier to find). The local lot # prefix (Cell E7) should be slightly different, such as SMC-IP-, to help differentiate from the index numbers. When complete, click the button to Lock the Page. Remember that with Excel, you must finish the work within the cell before any of the buttons/macros will function. If the button will not click, hit the Enter key. Note that the cells are now without color background and are locked.

This same function may be used to change the facility name, address, prefix numbers or any other information on future documents. Workbooks that have already passed the final check by the pharmacist will retain the old information, whereas all new compounding documents will contain the updated data. This may be especially useful in your facility undergoes a name change. Changing the prefix will also mean that new template files will be renamed based on the new prefix.

Adding/Editing Compounding Staff

Next, add at least some of your staff. Add technicians and pharmacists as they are trained. The edit function will make the changes throughout the workbook (the staff information is copied to each Master Formulation Batch Sheet and the Blank Template). Likewise, any staff additions, will be sent the same worksheets. For smaller resolution screens, the screens are 'frozen' so that the user can continue to user the VCR control in case of larger numbers of staff. The menu option highlights a staff member for editing purposes. Adding/Editing Staff requires the Super-User password (see previous page).
Add Rx Staff: Clicking this button will bring up a dialog box called Staff Training Status. This form has data entry cells for the Pharmacy Member’s ID (try use the same ID as your facility computer system if possible). Ideally, keep this ID to 7 or fewer characters (usually capitalized). Enter the first and last name, select compounding training as either complete or pending (such as in a technician training program) and whether or not the individual has had training in hazardous materials handling. Next, note whether the individual is a Technician, Intern or Pharmacist. Only Pharmacists may check finished products (usually a state board requirement) with this workbook. First, a dialog box displays a training date (defaults to the current date). Either accept or edit the date. Enter the review date manually to correspond to the individual’s training completion date. Click Accept.

Figure 12-Adding Compounding Staff

Editing Compounding Staff: Click the Edit Rx Staff button to edit each of the fields. You can highlight the staff member before clicking the button to bring up a specific individual or select the Edit Multiple Staff Members checkbox to prevent closing and opening the form multiple times. Use the VCR button next to the Update button to scroll through the staff, click Update for each staff member being edited. If you do not wish to change the training date, de-select the check box for Changing Training Date. The form will close when the Accept button is clicked only if the Multiple Staff checkbox is not selected. Use the Close button (caption changes with changes in the Edit Multiple Staff checkbox) to close the form if no changes are to be made or when multiple edits are complete.
Sort Rx Staff button: This function does not require a password. Once all new members have been added, you can choose to sort by the initials column or by Last, First name. This table is accessed when compounds are mixed and checked.

VCR button functions: Click the VCR button to highlight staff members as discussed above. The function repeats in similar ways in other areas of the workbook. On this table, it also causes the worksheet to lock the windows in case of large numbers of staff.

Click the Return to Top button to unfreeze the panes and move to the top of the sheet.

Figure 14-Sort Function

Compound Index-Adding New Compounds to the Master File

This page is the first page displayed when the file is opened. It is a menu program that allows the user to edit that formula, open the formula to Mix a Compound or prepare a master formula (the Add button at the top of the page).

Figure 15-Master Batch Sheet Index, Add Compound Formula
**Add a New Master Formula:** Regardless of where the Index is pointed, clicking on the Add Compound formula creates a blank batch sheet from the Batch Template file. A dialog box is displayed with the next Compound number with the standard template prefix created above.

Enter a short name for the template (it should fit within the text box displayed). Next, select whether this is considered a hazardous substance (USP 795 requires special training in producing these products). Check the box for any hazardous substances, such as Prograf suspension or a chemotherapy compound.

Click the Add Compound button on the dialog box.

**Filling in the blanks:** The workbook is created from the blank template and named based on the template name (e.g. SMC-1.xlsx). The message displayed reminds the user that certain fields must be completed.

In the first cell, enter a more complete product name, to include strength if possible. Enter the standard volume in cell E19 and M17. The standard expiration (taken from the reference used) and storage conditions (refrigerated or room temp).

Next you must decide if the quantity produced will be for a single container or to be broken down into smaller containers. In the case of Magic Mouthwash, we might make enough to fill ten 240 ml bottles. The label will depict the ingredients per bottle.

Enter each of the ingredients and units (mg, ml, caps, tabs, etc.) in the blue cells from the "K" column. Quantities are entered into the blue cells from the "M" column. When the product is prepared the volume (weight) is entered into the cell "E9". If the standard product volume is 60 ml, and the prepared volume is 240 ml, then the ingredients used column displays the calculated amounts (in this case 4 times the standard quantities). Likewise, smaller quantities will yield ingredients in the same ratio.
Compounding Instructions: Starting on line 49, enter the preparation steps, in order of mixing. This should follow the directions taken from the reference material used. The directions should be detailed, but concise, fitting within the space allotted. Include required equipment.

Auxiliary labels required should be listed, such as Shake Well, Refrigerate, etc. The appearance of the product must also be noted to ensure minimal variability. The Label Sample should contain the product name, local lot number and product expiration (automatically entered). Additional details may be entered in the yellow shaded cells. All active ingredients in the compound must be on the label; e.g., Magic Mouthwash (Diphenhydramine, Lidocaine, and Liquid Antacid). Include the strength (or amount) of each active ingredient.

Enter the reference used for your formula source into the cell "C73".

Enter any special quality control notes or procedures in the cell "L48". A generic comment is placed as the default comment. You may also place a comment or special note into the cell “B20”. Each of these cells may be edited. Click the Lock Sheet button.

A pharmacist must check the formula, preferably with a copy of the reference material in hand. When satisfied, click the Check Compound button. A dialog box is generated (Figure 20) to enter the identity of the pharmacist (note: only a pharmacist is allowed to check the master formula). The initials will be placed in the cell H17 and the approval noted at the bottom of the page on line 78. Subsequent edits will also be noted on successive lines. Each time the product is prepared, another line of data will be appended to the sheet. The Cancel button will close the dialog box without "approving" the batch sheet.

If the formula requires editing, click the Edit Compound button, make the necessary changes and Lock the Sheet. Click Check Compound as noted above.

Click the Return to Index button to return to the Master workbook and Compound Index worksheet. This function also locks the and saves the data automatically.
**Figure 20** - Pharmacist Batch Sheet Check Dialog Box
Mix a Compound

This function must always be initiated by selecting the product from the Compound Index and clicking the Mix Compound button (note: the menu highlight will not proceed past the last item).

Figure 21-Mix a New Compound-Step 1
Use the VCR button to move to the desired product. Click the Mix Compound button. A Message for required data and the order steps are to be performed are then displayed. The workbook also marks that entry as requiring a pharmacist’s final check of the compound (an uppercase C is located within the “F” column). Until this product has passed the final check by the pharmacist, the Master Formula Batch sheet may not be edited, nor may the Mix Compound button function for that product. Upon opening the workbook from the Index the next time, the user is reminded that the product still requires that final check.

1. Edit the mix date and time (default date is the current date, current time). Occasionally it is easier to print several copies of the batch sheets, have them filled out by hand, then enter the date later, so the fill date may have to be adjusted. If this is the case, staple the form used with the actual report entered into the system.
a. Click the Lot# button, creating a unique local lot # based on the Lot# Prefix, mix date, and the number of the product (starts with 1001).

![Figure 24 - Create Local Lot #]

b. Next, from another dialog box, choose the individual preparing the product (Please ensure the individual has been entered into the staff field on the Pharmacy Information Page before proceeding). Data lookup is either by initials or by last name, first.

![Figure 25 - Select Individual Preparing Compound]

c. Yellow shaded cells are then unlocked for data input. Up to 2 different lot numbers of the same item may be used per product. Enter the quantity of the second item into the yellow shaded cell under column J. This will automatically calculate the quantity required for the first item (locked from editing) used for that component.

d. When entering the manufacturer’s lot numbers, use capital O (O) for any leading zeros. Sometimes the program truncates the zeros to the left of the first digit.
2. After the data are entered and the Lot# created, Lock the Sheet. This helps prevent accidental entry errors and calculates the product’s expiration date based on stability data and the expiration of ingredients used.

![Excel spreadsheet image]

**Figure 26- Data Entry, Manufacturer, Lot#, Expiration Dates, Quantity**

a. Note Figure 26 above. The earliest expiration of the ingredients is 12/01/16, but since the stability is 30 days, the expiration is calculated to 30 days past the day of mixing, or 11/11/2016. Theoretically, if the expiration of one of the ingredients was less than thirty days from mixing, the expiration would be the shorter expiration date of the ingredient. Ingredients with an expiration less than 30 days from mixing will not be accepted.

b. Note also that the standard quantity was 240 ml. This batch made 2400 ml and the amounts used were adjusted by a factor of 10.

3. Print the compounding report (optional). A preview screen of the report is displayed, choose the desired printer, and click on the printer icon. (A report printer must be selected.) Present the report and the finished product for inspection. Four different label formats may also be printed from this location, using the DYMO or Zebra printer or Avery Labels (laser or inkjet). It is advisable to print one sample label to check before printing a sheet of 10 labels. Once the product is checked by the pharmacist, print the final labels.
If you wish to start completely over, click the Clear and Close button at this time. This will return the values to those shown upon opening the sheet, closes the sheet, and changes the status of the Compound Index back to “ready to fill”. Then repeat the process from the Index.

![Image of Clear & Close button](image)

**Figure 27 - Cancel Fill**

4. The checking pharmacist, once the product is approved, clicks the Check Compound button, entering their initials and entering/editing QC note. Close the dialog box.
   a. If the product is rejected, use the dialog box to edit the rejection note (also noted at the bottom of the batch sheet). Close the dialog box. Click the Edit Compound button. Correct any errors, lock the page, and Check again.
   b. The approving pharmacist’s name is placed below the "checked" line. This last process also creates a new completed Batch Sheet (filename based on local lot#) and places the file name into the Local Lot# Index for retrieval, if desired (see below). In addition, a backup of the digital batch sheet is placed in the backup folder. This final report should be printed and signed by the preparer and the checking pharmacist. Labels may also be printed from this form. A copy of the final product's label should be placed on the back of the form.
   c. Follow the directions below to print labels:
      1. Select the label printer (Select Printer button)
      2. Click the Labels button
         a. Select the label format and quantity of labels. For each of the Avery products you are limited to the label/sheet quantity.
         b. Click the Print button.
         c. You can change the sheet quantity for Avery products either in the printer options or just click Print again.
         d. Cancel to close the dialog box.
      3. Margins for both the Avery 2163 and the Zebra Labels may be adjusted with the Adjust Margins button. This may be necessary if printer models/brands are changed.
         a. Use the option button to select the margin you wish to change.
         b. Use the VCR button to modify the settings (changes only the option selected).
         c. Three buttons are available for changes
            i. Change Margins-Uses the new values
            ii. Cancel-Closes the dialog box without making any changes
            iii. Return to the Original Values-Values return to those of the original program.
         d. Print a label again to verify settings.
e. If you had to make changes at this time, note the settings values, open the Template Blank sheet, Select Printer and Adjust (printer) Margins to these values. Saves time and effort for the next fill.
f. Return to Check takes you to the first page, where the form may be closed.

d. This report should then be placed in a safe place and stored with other pharmacy documents (preferably in the 3-Ring Binder discussed earlier).
e. Note, that at this time, the product template is still open, as well as the new completed batch sheet. Both will close when the final report is closed.
f. If at this time, you feel the need to start over, print the form. Write void over the top of the report after printing. Close and file the report.
g. After the report closes, the template closes and the Index is displayed, with the product lot number, product name, template name, date of manufacture, quantity, pharmacist’s initials, and the QC note.
h. Entering QC notes after this point is discussed later
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Retrieval of Archived Compound Batch Sheet

Retrieval of the completed batch sheet is done by using the Local Lot # Index menu. Use the VCR button to select the completed product. Click Open File to access the archived batch sheet. This is identical to the Master Formula batch sheet, with the exception that only the last data entered is displayed. This data is locked and may not be changed (except Quality Control issues, which may be edited at any time, see below), but the report may be reprinted.

Quality control (QC) issues that come up after the compound is mixed and used, may be addressed and noted on the Batch Sheet and on the Local Lot # Index. Select the desired product using the VCR button, click the Edit QC Issues button from the Local Lot# Index. The subsequent dialog box is used to make notes that are placed into the Index and the completed Batch Sheet. This note includes the Pharmacist’s initials and the date of the note.

![Figure 28: Local Lot# Index of Completed Compounds](image)

Report Printing using the Compound Index and the Local Lot # Index

Several different reports may be printed from the Master workbook. As discusses earlier in the manual, the report cover and spine image may be printed from the Title page (click the respective buttons).

Click the Select Printer button to select a ‘report’ printer, laser or ink jet. If you have a label printer selected, the program will prompt you to change printers.
From the Compound Index, you can print (click Print Index) the index of Master Formulas. It should be reprinted each time a new item is added. It prints in portrait orientation. I keep an updated copy at the front of the 3-ring binder and use it as a table of contents of approved Master Formulas.

**Figure 29 - Printing Index of Master Formulas**
I also like to print a clean copy of each Master Formula Batch Sheet to begin the binder. Click Print Master Formula. You have the option of printing up to 20 copies a single sheet that is highlighted (useful for working copies), or you can print one copy of each of the formulas listed. See Figure 29. When the first option is selected, the program prints only the current workbook selected (in this case Adult Magic Mouthwash).

**Figure 30 - Print Clean Master Formula Batch Sheets**
The second option will print one copy of each formula. You cannot change quantities, but you can repeat these steps for duplicates.

Next, you can print an index of completed products from the Local Lot # Index page. Again, select the Print Index button. This report contains a little more detail and must be printed in landscape format. I print this periodically to keep a relatively current index. In the three-ring binder, I like to use Dividers with Tab Sheets from Avery (#11409) or Staples #13516 (4 sets of 8 dividers). If you use other products from my site; this package contains 5 sets of dividers, so you can make at least 5 binders. Behind one of the binders, keep a copy with signatures of each completed product. The website has a workbook to print divider tabs for the Staples product and is included with the complete download (Divider Tabs.xlsm). Click the Edit button; set the background shading; edit cells; than lock the sheet and print.

The Print Final Formula button allows you to print a selection of completed batch sheets by date range. And, finally, you can open a single workbook and use the print option from the sheet to print a single copy of the completed product.

Search Function

New to version 3.15 and later is a search function. Rather than use the VCR button on the Local Lot # Index page, the user may click the Search button and locate the item based on product number, Compound ID, Short Name (description of product), and date filled.

Once the Search dialog box is opened, the search function defaults to search by product number, starting with 1001. Use the spin button to view one product at a time. The results are displayed at the bottom of the dialog box (See Figure 32).
Choose the Compound ID radio button to search by the Compound ID. A drop down menu may be used to search by number listed the compound ID prefix. For example, if the Compound ID is SMC-10, the prefix is the three characters followed by a dash. The program searches for the numerical portion after the dash. If your hospital changes ownership, you may have changed the prefix (the prefix must always be three characters), you can still locate the Compound ID by the numerical portion. The Search button will find the first product with the matching ID#. The caption changes to ‘Next’, but the function remains the same, looking for the next matching product (see Figure 33).
Searching by short name requires the user to enter only a few letters of the compound into the data entry box, or use the drop down menu function to locate the product (short names listed in alphabetical order, see Figure 34).

![Figure 34- Search by Compound ID](image)

Finally, the user may search by date (Figure 35). Since more than one product may be prepared on the same date, either change to search by product number at that time, or click on the Select Search option. The Select Search option closes the dialog box and moves the index highlight to record shown.

![Figure 35- Search by Date Filled](image)
Backup of the Master Workbook and Templates

Each time the Master Workbook closes, the user is asked whether the file should be backed up. You should create a backup file each time a formula is edited or a new formula added to the file. The backup file is named BC_Backup with a date and time stamp (numerical with 4 decimal places representing the time of day) at the end of the filename. All these files have the extension of .xlsm.

Each time a template is edited, a backup file is automatically created using the file name and date and time stamp as noted above.

It is always a good idea to make copies of these files on a regular basis and keep in a safe place. Either save the files to a local computer or, if allowed in your facility, place the files on an external drive. The best method is to copy the entire folder (w/backup folder) every time a major change is made or a new product produced. Again, a three ring binder with all of the printed templates, indexes, and final products is also suggested. If possible, include copies of the PDF manual, USP-795, and any state regulations in the binder. Print the report from the title page for a binder cover sheet.

Changing the Report Title Image

If you peeked ahead at the sample report generated, you will notice that the hospital header image was for a fictitious hospital in Kansas (another DC Comics reference).

Obviously this would be inappropriate for your facilities. You may use a readily available image for your reports if the image prints at greater than or equal to 300 dpi. However, this report works best with an image that is 500 X 100 pixels in size. You may have to resize your image using a graphics program such as Paint Shop Pro (my favorite).

Don’t have access to a quality report image? I have provided several blank colored images (we all have access to color printing these days, don’t we??) within a folder called Report Title Images. Use the graphics program, insert a color image of the facility in the middle (may have to resize the image) and text to the right and the left of the centered photo. Color background not right? Change the image color at the start and repeat the steps. Save to the Report Title Images folder.

To change the image for Final Reports, select the Title page, click the Replace Header button. If you answer in the affirmative, you will be prompted for the Master Password (the first of two passwords required: 57Chevy (unless you have changed the password). If the password is correct, the Report

![Figure 36 - Change Report Title Image - Step 1](image)
Blank page opens. This is the page where completed compound formulas are entered and from where the Final Report is Printed.

From the Report Blank, click the Replace Header button and enter the Replace Header password (this one cannot be edited): **56T-Bird**

![Figure 37](image)

**Figure 37-Click Replace Header button on Blank Report workbook. Note instructions in cell above Labels button.**

This password was designed not to be edited for several reasons. Chief among them is that if you accidentally change or delete the header image you can easily change it back, even if the master password you have selected is kept secret from the other users.

At this point, if you choose not to have a title image, click the Replace Header button again and Return to Index. This locks the current image in place.
If you choose to replace the image and the password is entered correctly, the following dialog box (Figure 39) appears:

![Image of Microsoft Excel dialog box]

**Figure 39 - Instructions on changing image**

Click ‘OK’. Follow the directions, Right click (once selected, you may have to click the image a few times to get the right dialog box) on the title image, or just below the title text (the default image is a transparent box). Select ‘Change Picture’.

![Image of right-click menu]

**Figure 40 - Right click image to 'Change Picture'**
Select ‘From a file’ to locate a new title image from a file location.

![Insert Pictures](image1)

**Figure 41 - Insert Pictures from a File Location**

The window below opens (Figure 42). Follow the files to your image folder (as noted above, I have included a folder with blank image backgrounds, where you should have placed your title image). Select the image from the file location and click **Insert**.

![Selecting Image](image2)

**Figure 42 - Selecting Image from File Location**
There is one transparent image available: Transparent.png. Select this image if you wish to continue to use a text header (hospital information is centered behind the image). This is the default image used in this workbook. If you designed or already have a suitable image, you should place it in this folder.

![Image](Transparent.png)

**Figure 43 - Title Images Folder**

If you have chosen to insert an image, the page should appear similar to Figure 44:

![Screenshot of Excel document](SMC.png)

**Figure 44 - Image changed and ready to align and lock.**

After the image is placed within the report, **click the Replace Header button a second time**. This will align and lock the image in place. It cannot be changed without going through the same steps as above. Click Close to return to the Bulk Compounding-Master file.
Zebra Printer Settings

Zebra printing setup can be accomplished by installing the Zebra drivers (available on the Zebra Website: Support and Downloads page). Enter the model of your printer, and download the printer driver.

This file is an executable zipped file. In other words, opening the file unzips the contents of the file to a specific location without the need for specific software. I suggest unzipping to a specific location you can find. I made a folder called Zebra on C:\ and extract the files to that location.

Run the Setup.exe application from the folder to install your printer into Windows. (Windows may ask you if you’re sure you want to run the software. Select Run.) Select Install New printer. Scroll down to your printer model and select Next. This should install the printer for Windows. Attach to a USP cable and turn on the printer.

Next open your Control Panel (Open File Explorer, Select This PC, and at the top of the screen. Choose Open Control Panel). Choose Devices and Printers). Select the Printer (Double Click).

![Figure 45: Opening the Control Panel](image-url)
Choose Printing Preferences. Set the label Width to 4.0 inches and Height to 2.0 inches. Select Portrait printing and Rotate 180°. Click Apply and OK. Print a test page.

If the green light is blinking, press the button on the front of the printer.

If the Compounding workbook is already installed, open one of the compound templates. Select either the Labels or Avery tabs. Select your Zebra printer (click the Green Select Printer button).
Make sure the label starts as shown below, with the perforation just at the upper lip of the label opening. You can advance to the next label by pressing the button next to the light.

![Image of Zebra ZP 450 printer printing a label]

**Figure 48-Starting Label Position and Completed Labels**

Click the Labels button, select the Zebra printer and print one label. If this prints correctly, print 3 labels. All three should have the same spacing. Margins may be adjusted using the red Adjust Margins button.

![Image of Excel spreadsheet showing compound labels]

**Figure 49-Print Compound Label with Zebra Printer Selected**
DYMO Printer Settings

Install the DYMO printer drivers (available at the DYMO Website Downloads: Software, Drivers & User Guides page or with the installation files that came with the printer) before attaching the DYMO LabelWriter. Before the DYMO drivers can be installed, the software will determine if Windows requires the .Net Framework 3.5 installation. This must be installed prior to the DYMO software and may have to be downloaded from Microsoft.

Attach the printer via a USP cable (I have heard of issues with using USB3 ports, but I have not found this to be the case). Open the Control Panel to printers, and set the printer preferences. Labels are printed on 4X2 inch labels, either the DYMO 30256 Shipping label or the 30323/30573. Set the printer settings to landscape printing, select the correct label# (and if using the LabelWriter Twin, select the correct roll location, left or right). You will be asked when printing a label if the setup should be checked. This is advisable when printing your first label on the DYMO.

Program Updates

As with any program or application you have on your computer, there are updates to be installed from time to time. I would like to say that this is the one and only, final version, but that will probably not be the case. As such, these updates will be available from the Andersen-Computing website in zipped format. Download and unzip the files to a location you can easily find.

Open the Bulk Compounding-Master.xlsm file, move to the Title page and click the Update Template button. Updates require two steps. First, this function will take the old template and report blank, rename them as backup files and place them in the Backup folder. You will be prompted to locate the files you have just downloaded.

Your template will be renamed based on the current version, e.g. Bulk Compounding-Template Version 2-9.xlsm, and place the file in the Backup folder. The new downloaded template version is then renamed Bulk Compounding-Template.xlsm.

Next click on the Replace Contents button. This button will only function if the template has been updated. Data is transferred the data from your ‘old’ Master Formulas to the new template. The old template containing the Master Formula will be renamed based on the version again, and also place in the Backup folder, e.g. Version 2-9_SMC_1.xlsm. Depending on the number of formulas you have
accumulated, this may take a few minutes. The data remains the same with some changes/improvements in the functions that I may come up with in the future.

Instructions for downloading and replacing the files will be placed on the website with the new files.

**Importing and Exporting Formulas**

Sites with more than one location may want to share formulas either with other institutions or with other pharmacies within the same hospital system. Formulas may be emailed to the website for posting or exported and sent directly to one or more sites.

Click the Import Formula button on the Compound Index worksheet. The Import Formula workbook opens. Click the Import Formula button on this workbook. The blank template is opened.

![Figure 5.1 - Importing Formula](image-url)
Next, find and select the file that is to be imported, select Open (Figure 52). Next is a verification box to make sure you have the right file. (The file will not import correctly if the import code on the Master Formula file is not found. This code is applied when posted to the website or when the Export function is used to create the Import File (filename: Import-Short Name). The new formula’s information is transferred to the blank template, given the next compound number from the Compound Index and saved. It can now be retrieved in the same method as other formulas, though the Compound ID will not be the same ID as given by the sending hospital pharmacy (all other information, to include the short name, remains the same, unless edited later).

**Figure 52-Select file to import**

**Export Formulas**
Select the formula to export from the Compound Index worksheet, Click the Export button. This will copy the file to a new filename based on the short name of the product, e.g. Import-Doxycycline Liquid.xlsm and it will be located in the Export folder located within the current Non-Sterile Compounding folder. Staff data and compound fill dates and information (located at the bottom of the formula page) are deleted and the Import code is placed in the workbook. You may then either E-Mail this file to another facility or send as an attachment to the Andersen-Computing website for posting (send via email to: andersendav@gmail.com). The receiving facility will then import the file as noted above.
Report and Label Examples:
Attached are examples of a final report generated with this program and three different label formats based on the printer and labels used.

Page 36: Sample Final Report
Page 37: Avery Labels, 5163 format (10/page, 2X4 inch ea.)
Page 38: Avery Labels, 2163 format (4/page, 2X4 inch ea.)
Page 38: Zebra (4X2 in), DYMO label, 30256 format (2 5/16 X 4 inch)

Final Notes

If your hospital pharmacy is anything like the last several that I have worked at or managed, the documentation of pharmaceutical compounding is a manual process, which means the deciphering of handwriting, incomplete records, and varying methods for compounding the same product.

With the introduction of USP 795, we now have a mandate to provide better record keeping, standardization of processes, and a process to document quality control issues. I have gone through the requirements of the State of South Carolina’s Board of Pharmacy’s guidelines and those of USP 795 and I feel confident that this program will meet those guidelines for documentation.

Again, feel free to email me at andersendav@gmail.com for comments, suggestions, and support.
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Non-Sterile Pharmacy Compounding Documentation using MS Excel

Report Sample

**Figure 47 - Sample Report (size reduced to 75% to fit)**
<table>
<thead>
<tr>
<th>Label Template 5163</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallville Medical Center</td>
</tr>
<tr>
<td>101 North Luther Lane, Smallville, KS 69150</td>
</tr>
<tr>
<td>Inpatient Pharmacy - 555-556-3764</td>
</tr>
<tr>
<td><strong>Luther's Adult Magic Mouthwash 2400ml</strong></td>
</tr>
<tr>
<td>Shake Well and Refrigerate, &quot;For Oral Use Only&quot;</td>
</tr>
<tr>
<td>Active Ingredients: Each 240 ml contains: Nystatin 15 million units, Diphtheria diphtheriae 75 mg, Lidocaine 600 mg and Gentamicin 30 ml</td>
</tr>
<tr>
<td>Smallville Medical Center</td>
</tr>
<tr>
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<tr>
<td>101 North Luther Lane, Smallville, KS 69150</td>
</tr>
<tr>
<td>Inpatient Pharmacy - 555-556-3764</td>
</tr>
</tbody>
</table>

**Figure 48-AVERY 5163 - TEN LABELS/SHEET (SIZE REDUCED TO 75% TO FIT)**

37
Avery 2163 Label Sample (4/sheet)

DYMO/Zebra Label Sample (in greyscale)

Figure 48-Avery 2163, 4/Sheet (Size reduced to 60% to fit)

Figure 49-DYMO 4X2 Inch (Actual Size) The Zebra has a slightly larger print area and larger text.