Chemical Inventory Module (EE-CHEM-E-v0.7.6) Manual

Preliminaries

ForwardPhase Technologies has built a simple, easy-to-use chemical inventory solution called EE-CHEM-E. This document covers version v0.7.6 of the software. The solution is hosted at the limsexpert.com website so you will not need to install anything. Simply log onto the system with your assigned user accounts and start using the system.

Brief History

EE-CHEM-E is a module of LabTools, a web-based system geared toward making useful but often missing laboratory informatics functionality available via the web at low cost (or free). In order to access EE-CHEM-E you will need to log into LabTools first and then go to the Modules page. LabTools is made available under the Software as a Service (SaaS) model. This allows us to provide a comprehensive offering while keeping the service costs down. SaaS is different from other software in that you are relieved from many of the burdens associated with maintaining the solution. Just log in and start using it via your web browser.

Logging In

EE-CHEM-E is supported on Internet Explorer, Chrome, and Firefox browsers. Simply go to http://www.limsexpert.com and log in:
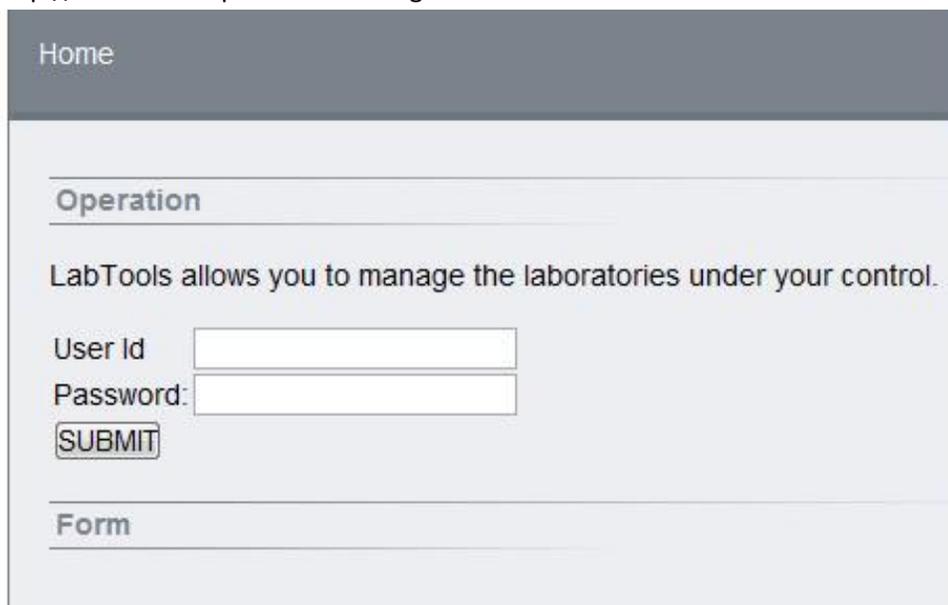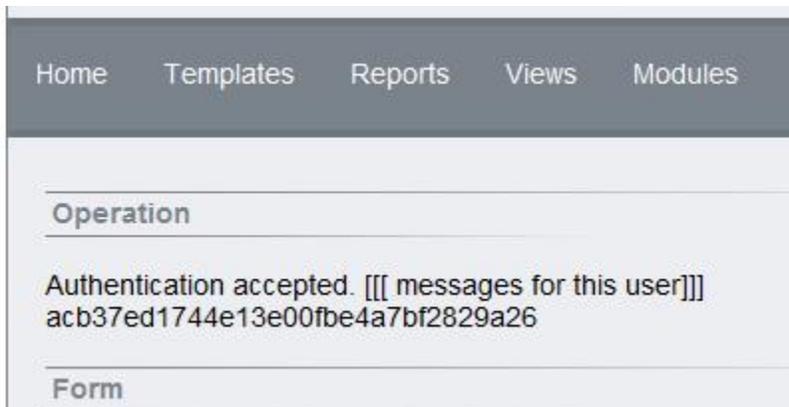

Type in your user name and password (issued to you by ForwardPhase).

If you typed in the wrong username or password you will not be authenticated and will have to try again.

When you successfully log in you will be given a session token on the server (shown in the screen print below). This session is typically only good for about thirty minutes. After that you will typically be asked to log in again by the system.

Note: Depending upon your access level you may not see menu options other than the Modules link at the top of the form.
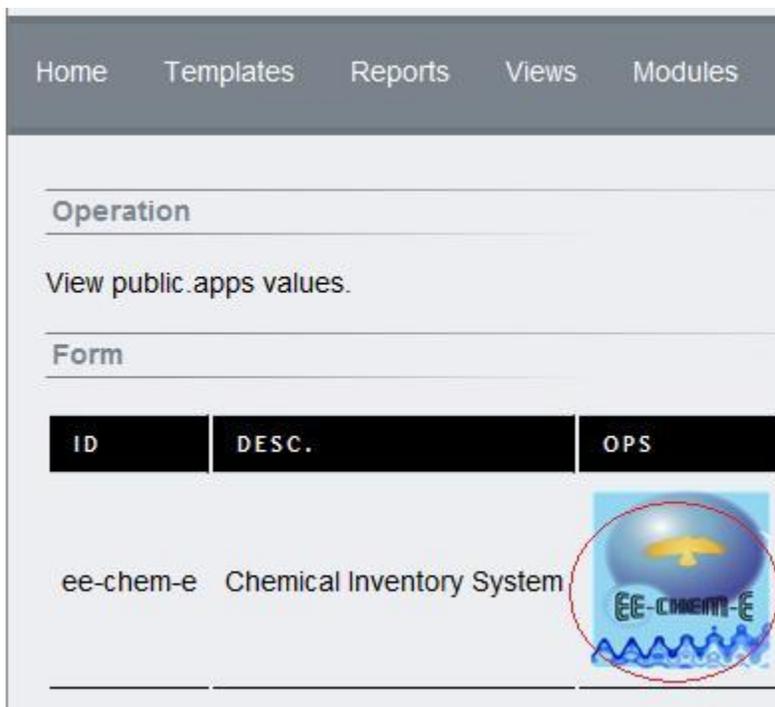
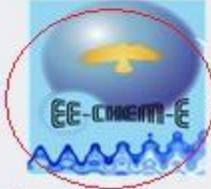Clicking on the Modules link opens a form with the current modules available for your account. By default all accounts contain the EE-CHEM-E Chemical Inventory System module. Click on the image under 'OPS'.

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The first thing you should notice in the module is the header and the version number at the top right. Pay special attention this when reporting problems with EE-CHEM-E. New software versions are updated automatically so this number will change periodically.

Standard Navigation

After a successful login you will see the menu bar at the top of the application change. Options like Reports, Views, Setup, and Inventory will appear. For default accounts only the Setup and Inventory links will work. Reports and Views are for premium accounts.


Inventory records will appear in the area below. Here is an example:

PRODUCT	CHEMICAL	TRACK #	CAS#	LOCATION	VENDOR
CLEANUP	Clorox Bleach	8		ROOM27	SUPERVEN
CLEANUP	Clorox Bleach	9		ROOMX	SUPERVEN
UNKNOWN	Acetone	7	67-64-1	ONORDER	NEWVEND
UNKNOWN	Silica Gel	10	63231-67-4	ONORDER	ROCHE

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Inventory records have dependencies that require 'setting up' beforehand. These items include Color Codes, Vendors, Products, and Storage Locations, and other elements that will be explained further in this document.
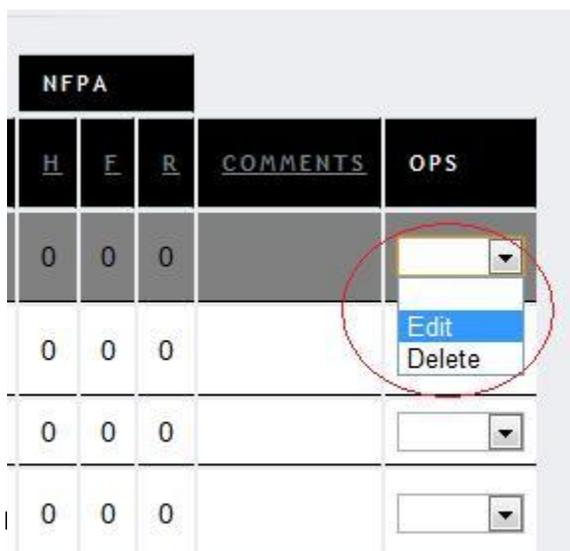
Editing and Deleting Records

Records in EE-CHEM-E appear in tables that look like grids. They are, however, not editable cells. Each row has an Ops (short for operations) column with drop down controls like the ones shown below:

If there are a great number of columns in the table you will need to scroll to the right to find the controls. In these instances the row will change color to make it easier to locate the operation controls. Single

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clicking on the column will change the background color to gray until you click on it again, thus making it easy to scroll using the scrollbar while identifying the correct operational controls.

Product-Based Inventory System

EE-CHEM-E is designed to be a product-based inventory system. This means that all inventory records stored in the system should be associated with products. It does not mean that you can only use the system in manufacturing environments. Instead, it means that all chemicals in the system are in your facilities for a purpose and that purpose is indicated by the product identity.

Product names have a wide variety of uses. They can be used to differentiate chemicals that were purchased for different reasons. For instance, if you purchase ammonia to produce one product and some more ammonia for a different product these can be differentiated in the system.

If you do not produce anything, as is the case with school laboratories, you can use class names instead of products. Product records are really just identities in the system and be any ten-character string. If you go to Setup->Products you will see that a product is composed of an identity, a description, and an optional CAS number.

The default product in the system for any new inventory item is UNKNOWN. However, you should seldom, if ever, specify this as your product because product, vendor, and chemical name are the keys for the record and cannot be changed for that inventory item.
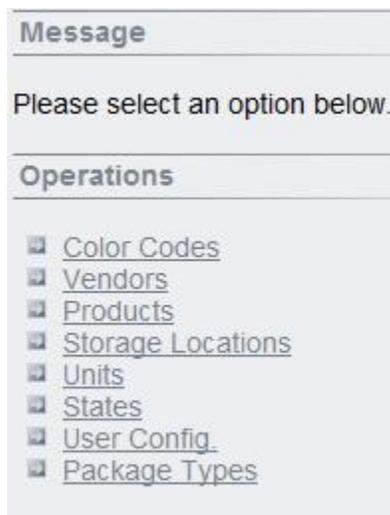
Setup Data

An inventory record is made up of the following fields:

- *Product*
- Chemical Name
- Tracking Number (system generated)
- CAS Number
- *Location*
- *Vendor*
- *Physical State*
- Number of Units
- *Unit*
- Quantity
- *Container Type*
- HMIS Fields (H,F,R,P)
- PPE (Personal Protective Equipment) code
- NFPA Fields (H,F,R)
- Comments

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In the above list, the elements in *italics* are all dependent upon setup data. The setup data should be available in the system *before* you enter inventory records so you can pick them from lists. Clicking on the Setup link in the menu bar will open the following list of setup links:

Message

Please select an option below.

Operations

- Color Codes
- Vendors
- Products
- Storage Locations
- Units
- States
- User Config.
- Package Types

Colors and Color Codes

One of the main advantages of using the chemical inventory system is the ability to color code inventory items. Inventory item color codes are flexible and can be configured to have meanings that make sense for your organization. The color codes screen appears as follows:

Color codes have a name, a description, a background color and a foreground color. The form shows how the inventory row will look when the particular color combination is chosen. Obviously some color combinations will result in unreadable text, like white text on a white background, so be careful when creating such combinations.

Form

NAME	DESC.	COLOR	TEXT	OPS
Black	Black	#000000	#ffffff	
DEFAULT	Default color	#ffffff	#000000	
Pink	Pink Description	#CC0099	#CC9933	
ltyellow	Missing MSDS	#99CCFF	#000000	

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Color Code Usage Scenario

Here's an example of using color codes to repair your inventory: The laboratory manager performs an inventory audit to identify chemicals that either have a missing MSDS or ones that are out of date. Two color codes are created, one for missing MSDS records (colored yellow) and another (red) for ones with

the incorrect date. The laboratory manager can then go about the process of identifying chemicals with missing or out of date MSDS files and flagging them in the inventory system. While she moves from storage location to storage location another laboratory operator looks for red records and calls the vendors (hopefully their vendor contact information is correct) to request a fax/e-mail copy of the latest MSDS. When the fax is received the second operator can go ahead and change the color code back to the DEFAULT color as there is no longer a problem. The process repeats for chemicals with missing MSDS records.

Note: Color codes should be accompanied by a modification of the comments for the inventory record. In other words, when you assign a color code you should add a comment, and when you remove the color code you should either remove the trouble comment or add some keyword that indicates that it is no longer a problem.

Y	TYPE	H	F	R	PPE	H	F	R	COMMENTS	OPS
	Bottle	0	0	0	A	0	0	0		
	UNKNOWN	0	0	0	A	0	0	0		
	UNKNOWN	0	0	0	A	0	0	0		
0	Bottle	0	0	0	A	0	0	0	Missing MSDS record (10/1/2009)	

Vendors

Chemicals are either purchased or made in-house from other chemicals. A vendor not only tells you where a particular substance came from – it can tell you who to contact in case a problem arises. Therefore it is vitally important that vendor information be edited on a regular basis and checked for accuracy. The default vendor is always UNKNOWN for new inventory items.

The Description field on the Vendor record holds the long name for the vendor. The identity for the vendor record is the unique, 10-key ID, not the Description. Short, unique names for identities are easy for the system to manage and reduce confusion. Companies typically merge or split up, so their names can change often. Your data is preserved in EE-CHEM-E however when this happens because you are free to change the Description of a vendor freely without affecting any of the inventory records that are referring to it.

Once a vendor has been chosen for an inventory item you cannot replace it for a different vendor. The vendor name becomes a part of the unique key for that inventory record like the chemical name and product.

Quantities, Units, and Package Types

The inventory system captures quantities, units, and package types for each inventory item record.

A single inventory record will have a quantity of packages containing items with the specified unit of measure. The way to read quantities is as follows: Package Quant->Package No->Package Unit->Package Type. So a given record with 4 ('Package Quant') 12 ('Package No') liter ('Package Unit') bottles ('Package Type') each would have a total of 48 liters of material represented in that record.

As you can see, it does not make much sense to delay adding units and package types to a record. Leaving the default 'UNKNOWN' types in here makes the inventory record harder to understand.

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Storage Locations

Storage locations represent the physical storage for your material and should be as specific as possible.

For instance, a good storage location would be 'Room 121 Chemical Storage Bin No. 2'. An acceptable location would be 'Room 2'.

By using locations it is possible to flag items as being 'on order' versus physically being located on site. The storage location can be changed for an inventory record after it has been created.

Physical State

Physical States are normally limited to gas, liquid, or solid, but in EE-CHEM-E they are configurable.

Allowing configurable states means you can add states that are one thing but should be another. For instance, if a material has turned to a solid but is *supposed* to be liquid, a good idea would be to create a new state. This state can be filtered for in the future in order to decide what to do with the material (for instance, discard it or store it in a different location in the future).

User Configuration Items

User configuration items are items that are referred to by the system to configure the Graphical User Interface or other elements of the software.

For instance, the Page number at the bottom of the Inventory table shows how many pages worth of data are available for viewing. A configuration item in the system controls how many records can appear in the grids on the system.

The particular user configuration item that controls this aspect of the user interface is the RECCHUNK configuration item. RECCHUNK determines how many records to show per page when populating the grid. If there are more records than the RECCHUNK allows then an additional page will be offered at the bottom of each grid. The user will have to select the other page to see the remaining records.

RECCHUNK is set via Setup->User Config.

| SECTOR	PHRASE	VALUE	OPS
READER	1234567890	99	
SYSWIDE	RECCHUNK	75	

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DO NOT DELETE THIS CONFIGURATION ITEM! Deleting this configuration item will cause your screens to stop operating correctly. You can change it to a different numeric value, but do not delete it.

A New Inventory Record

Inventory records can be viewed by selecting the Inventory button in the top navigation bar. Every inventory item in the system is uniquely identified by three things -- a product, a chemical name, and a vendor -- you must be familiar with products and vendors before you can create any new inventory records.
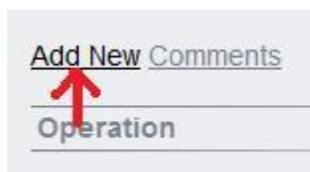
In order to create a new Inventory record you must select the Add New link on the page above the Operation area.

This will load a long form with many of the entries filled out with default values. The most important are product, chemical, and vendor. These are NOT defaulted for you. You must choose these values before prior clicking on the Submit button. If you fail to enter all three values and you select Submit you will get a strange error message informing you that the 'Insert failed for some unexpected reason…' and further details of the failure will appear.

An inventory item is defined in the system as a record with a unique combination of product, chemical name, and vendor. This means you can have the same chemical in the system for the same product that comes from different vendors, for instance. Likewise, you can have some chemical purchased from the same vendor but allocated to different products. The choice of arrangement is yours.

A successful addition of a new inventory record into the system occurs only when you see the 'Add operation requested…operation successful' message in the Operation area and the record in the Form area below it, as shown here:

The tracking number is system generated and will not be immediately visible on this screen although it does exist at this point. Click on the main inventory screen to see the actual inventory record.

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Filters

EE-CHEM-E differs from other chemical inventory systems in that it replaces single-field searches with filters. In order to see a subset of records you must use filters, but you can combine filters to zero in on a subset of records with multiple interesting properties.

Above every grid are column header links. These column headers can be clicked to launch a filter screen.

The filter screen allows you to use a logical operator, or Rule, and a Filter. Immediately above this is a 'Current filters' area. If there is more than one filter set then it will be shown in this area.
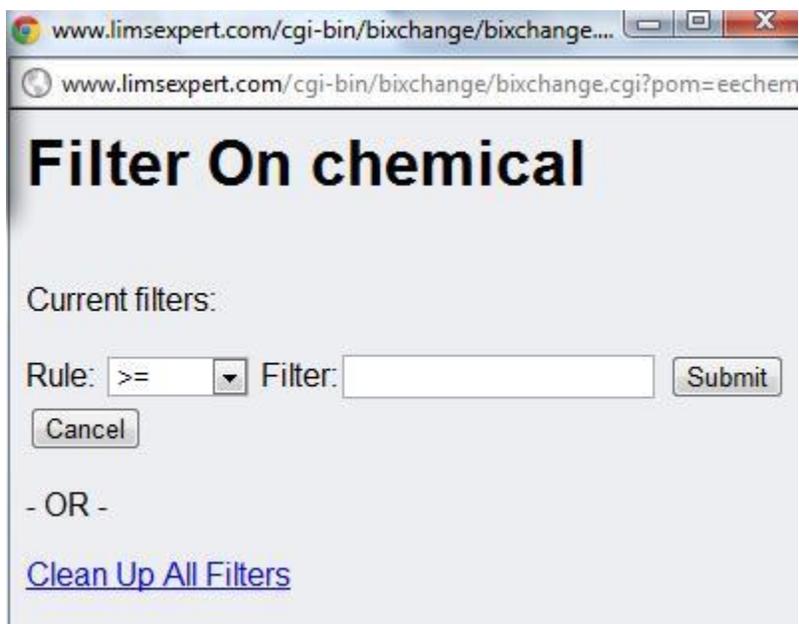
For instance, if you wanted to only see inventory records for a single room you could click on the Location column header, enter '=' for the Rule, and type in the room name in the filter. When you click on the Submit button the entire form will change to permit you to use the 'Close this window' button as shown below. Remember to use that button on the pop up form rather than clicking on the small 'x' at the top of the form as only the button will refresh the records on the screen.

After setting a filter you will notice that on the lower left hand side of the returned data the word '(Filtered')' will appear before the 'Page' numbers. This is your indication that the current recordset is filtered. This is important to always be on the lookout for this flag as you may not notice that you are looking at a filtered recordset as you move back and forth between screens. The filters survive until your session is over or

until you clear all of the filters, so even if you change screens and move around every time you reopen the screen it will continue to show you a filtered data set.

In order to remove filters, just choose any column header with a filter on it and click on the 'Clean Up All Filters' link at the bottom of the popup form. Then click on the Close this Window button to update the main screen. This will remove all of the currently set filters.

HMIS and NFPA Codes

HMIS (Hazardous Materials Identification System) and NFPA (National Fire Protection Association) codes represent the potential hazards the chemical presents in the laboratory. These codes are often located on the MSDS that should accompany the chemical from the vendor.

The benefit to translating this information into the chemical inventory system is numerous. End users can look for a particular chemical prior to handling in and identify what hazards it represents. You can also use filters to look for problem scenarios and flag them with colors. For instance, using filters you could filter for chemicals with a high HMIS Health ('H') number that are *not* in a particular room that contains appropriate eyewash and/or other emergency equipment, as shown below:

```
Current filters:
eecheme::inventory::storage_loc (storage_loc <>
'ROOM27')
eecheme::inventory::hmis_h (hmis_h > '2')
eecheme::inventory::chemical (chemical = 'Clorox
Bleach')
```

**Filter on storage location <> (does not equal) 'ROOM 27',
HMIS 'H' code > (is greater than) 2,
and chemical name = (is equal to) 'Clorox Bleach'**

Flashpoint, Imprecision, and Scale

The flash point, imprecision, and scale are all derived from the MSDS. As you know, the flash point represents the lowest temperature that a liquid can form an ignitable mixture in the air. A low flash point means that it is easier to ignite the material. Flash point is normally represented by three pieces of information, the flash point itself (represented as a number), a symbol telling you whether the flash point is greater than or less than the number, and the scale (either Celsius or Fahrenheit).

With this information readily available in the system it is easier for personnel to identify potential problems with flammable substances before accidents occur.

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CAS Number

A CAS, or Chemical Abstracts Number, is a unique numeric identifier assigned to a specific organic or inorganic substance. You will normally find the CAS number on the MSDS for the chemical. However, not all chemicals have a CAS number, so this value is not mandatory in this system.

Tracking Numbers

Each inventory record has a unique tracking number assigned automatically by the system when the record is first entered. You cannot change the tracking number of an inventory item once it has been assigned.

Personal Protective Equipment

PPE, or personal protective equipment, is a single-letter flag derived from the MSDS that indicates the recommended protective equipment that should be used when working with the chemical.

Note that personnel should be properly trained to use eye, face, respiratory, and hand protection devices prior to their use and that protective equipment should be in working and undamaged condition in order to be effective. It is recommended that personal protective equipment be regularly inspected and that personnel undergo periodic 'refresher' training in their use.

Misc. Inventory Fields

Some additional miscellaneous fields include the comments field on the inventory record and the NFPA other field. These fields will accept any alphanumeric character except for the single quote or question mark symbols. These symbols are reserved in the system and cannot be used.

Multiple-Users and Contention

EE-CHEM-E is a system meant to be utilized by multiple users simultaneously. This means that others may be trying to edit a record while you are viewing it and preparing to make a change yourself. Whenever you open a record the system assumes that you are trying to edit it and will issue you a unique key that the record itself maintains in the system. When you try to update the record you will send the system this key and it will compare it with the one stored in the record. If they do not match the system will tell you that another user has already modified the record before you and will show you which fields were modified. This, in our system, is called contention.

The following screen print shows the user identity of the user which edited the record and the fields that differ from yours are shown to the right along with a button with an arrow. In order to accept the other user's changes to your record you can click on the arrow button or ignore it. This way you can either accept or reject the other user's changes to the record.

Operation

Another user   has modified this record before you! Please review changes below. Updating nyu.inventory values.

Form

|		
Product	UNKNOWN	[...]
Chemical	Silica Gel	
Track No.	10	
CAS Number	63231-67-4	
Storage Loc.	ONORDER	[...]
Vendor	ROCHE	[...]
Phys. State	UNKNOWN	[...]
Package No.	1	
Package Unit	gm	[...]
Package Quant.	500	
Package Type	Bottle	[...]
Flash Point	N/A	
Imprecision	[▼]	
Scale	Fahrenheit [▼]	
HMIS H	0 [▼]	
HMIS F	0 [▼]	
HMIS R	0 [▼]	
PPE	A [▼]	
NFPA H	0 [▼]	
NFPA F	0 [▼]	
NFPA R	0 [▼]	
NFPA Other		
Color	Pink [...]	<-	ltyellow
Comments	Missing MSDS	<-	Missing MSDS

[Submit]

Contention issues should be relatively rare if you apportion work to teams. If you are running a full inventory it would be wise to assign different tasks to different individuals. Filters are particularly useful here. A user can set his or her filter to a particular storage location or for a particular product. Other users will only modify records with their assigned location or product and thereby avoid contention altogether.

Reporting Problems

On the right hand side of the forms in the system you will find a support phone number and a link:
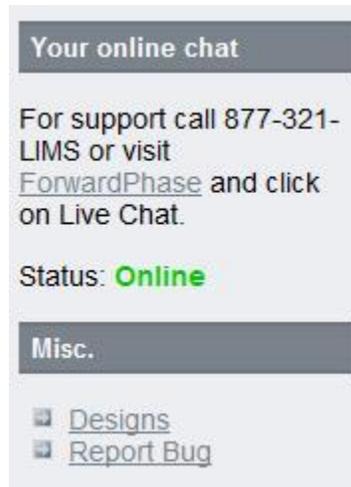
Please do not call the toll free number for minor problems with the software. Click on the 'Report Bug' link and report the issue via the web. This keeps our costs down and we will receive an e-mail notification when you submit your issue.