Fire-Retardant Finishing Cabinet

In this plan you will be getting:

• Step by Step construction instruction.
• A complete bill of materials.
• Exploded view and elevation drawings.
• How-to photos with instructive captions.
• Tips to help you complete the project and become a better woodworker.

To download these plans, you will need Adobe Reader installed on your computer. If you want to get a free copy, you can get it at: Adobe Reader.

Having trouble downloading the plans?
• If you’re using Microsoft Internet Explorer, right click on the download link and select “Save Target As” to download to your local drive.
• If you’re using Netscape, right click on the download link and select “Save Link As” to download to your local drive.

Published in Woodworker’s Journal “Woodworking Secrets: Essential Methods and Projects for Fine-Tuning Your Shop Skills”
One by-product of a serious woodworking hobby is a collection of partially used finishes and solvents. While they may seem safe enough sitting on a shelf, they're actually a fire waiting to happen unless you store them properly. This cabinet will do the job conveniently and safely, and the top forms a useful workspace for finishing.

Somewhere in your shop, garage or basement, do you have a shelf full of old stains, varnishes, oils, strippers, and solvents (mineral spirits, turpentine, lacquer thinner and alcohol)? Most of us do. The accumulation of flammable finishing supplies and solvents is a common circumstance for nearly every shop, and often the situation comes on so gradually that it goes completely unnoticed. This leads to the problem of storing these chemicals in a safe way.

We squared off with this problem a few years ago and designed a flame-retardant cabinet that even a fire marshal would love. Before you jump into the Materials List on page 17, be sure to read the next section first.

What to do?

Your first task should be to find out the proper method for storing flammable liquids in your area. Our search quickly led to the State Fire Marshal’s Office where we obtained the codes for a flammable liquid storage cabinet. You should be aware that these codes apply to Minnesota, and there is no unified national code. Check with your State Fire Marshal to see if you have additional codes to comply with before building this cabinet.

On the whole, the codes are straightforward (see tint box at right), although two of the requirements may be unfamiliar to woodworkers. The first is intumescent paint. This is a special paint that swells and chars in the presence of heat, forming an insulating fire-retardant barrier between the wood and the flame. Normal paints burn or slough away when exposed to high heat. You can find intumescent paint at a paint supply store, and it’s a common product for the building trades.

The other unusual requirement is sealing the bottom of the cabinet. At first blush this seems easy; just use caulk. But common caulks are petroleum-based, as are most of the liquids in the cabinet. This means that a spill inside the cabinet of mineral spirits, for instance, would soften the caulk and render the cabinet unsealed. The leak could then cause a fire in the shop. One solution is to use epoxy caulk. Epoxy is resistant to chemicals, and even strippers have a difficult time removing epoxy finishes. The product we used is called Epoxy Caulking Compound from Pittsburgh Paints.

It’s important to note that a flammable liquid storage cabinet only delays a fire from reaching the finishing supplies. It cannot prevent the materials from catching fire altogether. The delay, however, allows time for fire fighters to extinguish the flame before it reaches the finishing supplies.

**FLAMMABLE STORAGE CODES**

1. Use 1"-thick exterior plywood.
2. All joints must be rabbeted.
3. All joints must be screwed from two directions.
4. Doors must be self-closing and equipped with strong hinges and a catch.
5. The bottom of the cabinet must be liquid tight for a height of at least 2".
6. Doors must be well fitted and, if two doors are used, they must have a rabbeted overlap of at least 1".
7. Cabinets must be covered with an intumescent-type paint.
### MATERIAL LIST

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>T x W x L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sides</td>
<td>Top (2)</td>
<td>1&quot; x 23(\frac{3}{4})&quot; x 23(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>2 Top</td>
<td>Top (1)</td>
<td>1&quot; x 23(\frac{3}{4})&quot; x 23(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>3 Bottom</td>
<td>Top (1)</td>
<td>1&quot; x 23(\frac{3}{4})&quot; x 23(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>4 Back</td>
<td>Back (1)</td>
<td>1&quot; x 23(\frac{3}{4})&quot; x 22(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>5 Sill Plate</td>
<td>Sill Plate (1)</td>
<td>1&quot; x 4(\frac{3}{4})&quot; x 23(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>6 Slates</td>
<td>Stiles (2)</td>
<td>1&quot; x 1(\frac{1}{4})&quot; x 19(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>7 Shelf</td>
<td>Shelf (1)</td>
<td>1&quot; x 12&quot; x 23(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>8 Retaining Wall</td>
<td>Retaining Wall (1)</td>
<td>1&quot; x 4&quot; x 22(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>9 Left Door</td>
<td>Left Door (1)</td>
<td>1&quot; x 10(\frac{3}{4})&quot; x 19(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>10 Right Door</td>
<td>Right Door (1)</td>
<td>1&quot; x 11(\frac{3}{4})&quot; x 19(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>11 Lazy Susan Platform</td>
<td>Lazy Susan Platform (1)</td>
<td>3/4&quot; x 21(\frac{3}{4})&quot; x 21(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>12 Lazy Susan Platform</td>
<td>Lazy Susan Platform (1)</td>
<td>1&quot; x 21(\frac{3}{4})&quot; x 21(\frac{3}{4})&quot;</td>
</tr>
<tr>
<td>13 Lazy Susans (2)*</td>
<td>Lazy Susans (2)*</td>
<td>6&quot; x 6&quot; Ball-bearing type</td>
</tr>
<tr>
<td>14 Hinges</td>
<td>Hinges (6)*</td>
<td>Spring closing (brass finish)</td>
</tr>
<tr>
<td>15 Lock</td>
<td>Lock (1)*</td>
<td>Disk tumbler cam type</td>
</tr>
<tr>
<td>16 Casters</td>
<td>Casters (4)*</td>
<td>2(\frac{1}{2})&quot; Dia. (locking type)</td>
</tr>
<tr>
<td>17 Handles</td>
<td>Handles (2)*</td>
<td>3&quot; Boring (brass finish)</td>
</tr>
</tbody>
</table>
**Technical Drawings**

**Elevation Drawings**

(Deve screws from both sides of all rabbeted joints at 3" intervals.)

**Figure 1:** To install the lazy susan, first drill a 1/2" access hole 3 15/16" from the center of the platform. Secure the lazy susan to the platform and use the access hole to screw the assembly to the base.

**Cabinet Features**

You can build this cabinet from a single sheet of 1"-thick plywood. It helps to put the cabinet on casters so you can roll it right to your workbench when it’s needed. In addition, we installed a lazy susan shelf on top of the cabinet to use as a finishing stand. You can set a project on the shelf and brush on a finish while having full access to all sides. Another lazy susan shelf in the bottom of the cabinet makes the inside space fully accessible. This way, any can of material can be brought right to the front where it’s easy to reach. Since there’s plenty of vertical space in the cabinet, add an upper shelf to store quart and pint containers. This shelf is only 12" deep so you won’t have to reach too far for cans in the back. The addition of a retaining wall keeps the cans from falling off the shelf.

One important point the fire marshal made was to avoid hanging paint brushes or other objects on the outside of the cabinet. They will catch fire right next to the paint and ruin its effectiveness.

**Building the Cabinet**

Begin building your cabinet by cutting the plywood to size following the cutting diagram at right. Next, install a 1/2" dado blade in your table saw and raise it...
1/2" to cut rabbets on all edges of the sides (pieces 1), top (piece 2), bottom (piece 3), back (piece 4), the sill plate (piece 5) and stiles (pieces 6). For pieces 1-4, the rabbets are all on the inside face of the plywood, but for pieces 5 and 6 three edges are rabbeted on the inside face and one long edge should be rabbeted on the outside face. Once you’ve rabbeted the sides, rout the 1/2"-deep stopped dadoes for the shelf (piece 7) with a 1"-diameter straight bit.

Center and screw the retaining wall (piece 8) to the back edge of the shelf, then dry-assemble the cabinet. With everything clamped together, drill 3/8" counterbores and 5/32" pilot holes from both directions along every rabbet joint, and drill several holes into each side of the shelf joint. Now take apart the pieces, spread glue in the rabbets and dadoes, and reassemble the cabinet. Drive #6-2 1/2” screws in all the pilot holes, then cover the screws with 3/8” wood plugs.

The doors (pieces 9 and 10), which you’ve already cut to size, must be rabbeted on three edges to fit into the cabinet as well as the fourth edge for the 1" overlap. (Note: The 1" rabbet on the right door (piece 10) should be cut on the front face, while all other door rabbets should be cut on the back face.) Complete these rabbets, then use a jigsaw to cut the round lazy susan platforms (pieces 11 and 12). You won’t have enough plywood left over to cut both platforms out of the same sheet, so use some scrap 3/4" plywood for making the inside lazy susan.

Now install all the hardware on the cabinet, starting with the lazy susans (pieces 13) and the platforms (see Figure 1, facing page). Three hinges (pieces 14) on each door provide more than enough support, and, for peace of mind, install a disc tumbler lock (piece 15) in the left door to keep the cabinet secure. Since the lock works on doors up to 7/8" thick, drill a 1/8"-deep mortise to recess the face plate before drilling the through hole. The last bits of hardware to mount are the casters (pieces 16) and the handles (pieces 17).

Finishing Up

Remove all the hardware so you can paint the cabinet thoroughly. Use a nylon brush to spread the paint, making sure to cover all the wood parts. As an extra precaution, coat both the outside and inside of the cabinet with the intumescent paint.

Once the paint dries, apply the epoxy caulk to all the inside seams that are within 4" of the bottom cabinet panel. Your goal is to make the bottom area completely leakproof. Mix the epoxy carefully, then apply it with a tongue depressor. Wear latex gloves to keep the epoxy off your hands.

Now screw all the hardware back into place and find a safe spot to store the key to the lock. Not only will the cabinet provide a safe place for organizing your finishing supplies, but the addition of the lazy susan platform will also come in handy for working on small projects. However, a word of caution is due here. Don’t use the platform for spray finishing because the overspray will land on the cabinet and reduce the effectiveness of the intumescent paint. If you do spray your projects routinely, consider leaving the top lazy susan off altogether as an extra measure of safety.

The cost of this project will run you about $200. The major expense will be the specialized paint and caulk, and you’ll only use about half of this material. If you can interest a friend in this project you could split the cost of these materials, saving each of you about $50 overall. The cost might deter some woodworkers from building the cabinet, but when you consider the risks of storing flammable liquids improperly, it seems minimal, and it’s far less than buying a commercially available fire-rated cabinet or worse—replacing your entire shop after a fire.