What Is the 32mm Cabinet System?

Following World War II, Europe had to face the mass number of houses that had been destroyed. Because solid lumber was not abundantly available, European engineers devised an integrated system of hardware, materials, and machinery to use the particleboard sheets that were available. The result of their innovation has come to be known as the European cabinet system, or 32mm cabinet system.

This new system more than modified former systems. It represented a new direction in philosophy, hardware, fasteners, materials, joinery, and construction techniques. The European system maximized the efficient use of materials, time, equipment, and labor in producing residential and commercial cabinets that were both functional and attractive. As a result of the 32mm system, Europe's cabinet industry could manufacture thousands of well-built cabinets that met universal specifications (Levine, 1988).

Several fundamental differences separate European-style cabinets from traditional American cabinets. The European-style cabinet has no face frame and is often referred to as “frame-less.” The box is generally constructed of 5/8”- or 3/4”-thick melamine-coated particleboard joined by butt joints and Confirmat screws (Fig. 1).

The particleboard’s exposed edges are generally edged-banded with wood or plastic (Photo 1). The toe kick is usually a separate frame, built independent of the cabinet and joined to the cabinet during installation. European-style door hinges are adjustable on three axes, which makes door alignment very simple and quick.

The most fundamental difference, and from where the term “32mm system” derives, is the fact that European cabinet design and construction is based on a grid of 5mm holes drilled on 32mm centers. A line boring machine drills these holes (Photo 2), drilling several holes at once.
and easily indexing for another set to be drilled in perfect alignment. The holes are used for quick and accurate alignment during assembly and when workers attach door hinges, drawer glides, and adjustable shelf pins.

**Streamlined construction procedures,** efficient use of materials, and the look of the finished product have all contributed to the popularization of the European style in the United States. Since World War II, many American cabinet manufacturers have implemented the concepts of the 32mm cabinet system.

The results of a survey given to exhibitors at the 1997 Kitchen/Bath Industry Show in Chicago showed that approximately one fourth of the custom cabinets that the presenters produced were in the European style (Moss, 1997). The ratio of European-style cabinets to traditional cabinets is likely to be even higher in commercial applications.

**The Making of a Curriculum**

With the cabinet industry widely using the European system, it is somewhat surprising that few of today’s high school woodworking teachers offer instruction in European cabinet design and construction. Furthermore, those high school cabinetmaking teachers who do teach the European system apparently do not use a standard curriculum.

One of us (Lundgren), a woodworking instructor at Skyline High School in Salt Lake City, completed a thorough review of the literature in search of a published curriculum or textbook designed for classroom instruction using the European cabinet system. Unable to find any available, he determined to develop his own. What began as a few instructional handouts developed into a comprehensive curriculum supporting a popular and well-attended high school cabinetmaking program.

**Some fundamental concepts** and critical dimensions that Lundgren uses as he teaches high school students about 32mm cabinet design and construction follow below. Note that some adjustments to the European system must be made for the cabinets to fit standard American appliance and cabinet size specifications.

Lundgren’s cabinet design embodies the European philosophy and components while incorporating customary American measurements whenever possible. Calculating or memorizing conversion factors is unnecessary. Metric measurements are necessary only when using specialized metric equipment, such as the line boring and hinge machines.

**For a standard American kitchen,** base kitchen cabinets should stand 36” high, including the countertop and the toe kick. A standard toe kick is 4” high and a standard counter top is 1-1/2” thick. This leaves 30-1/2” for the height of the base cabinet itself. Base cabinets are generally 24” deep. A standard size upper cabinet is generally 12” deep and 30” high with 18” of space between the bottom of the upper cabinet and the countertop (Fig. 2).

**Basics of the European Cabinet System**

The basic European cabinet consists of two sides (also called standards), a top (usually not included in American cabinets), a bottom, and a back. (All of these pieces are made of 3/4” cabinet-grade particleboard coated with fused melamine, also called MCP (melamine-coated panel).)

For the two sides, top, and bottom, the length of the piece equals the dimension parallel to the cabinet’s exposed front edge. The length of the sides equals the cabinet’s full height, top to bottom (not including the countertop or toe kick). The length of the cabinet’s top and bottom pieces equals the cabinet’s width minus 1-1/2”, or the thickness of the sides.

The width of the sides, top, and bottom equals the cabinet’s depth minus 3/4”, or the back’s thickness. The back of the cabinet covers the back of the whole box, so its dimensions equal the overall width and height of the cabinet (Fig. 3).

**The base cabinet with one drawer** is the simplest of base cabinets. It is the basic European box with a piece called a stretcher added. The stretcher separates the drawer and door areas and strengthens the cabinet.

For discussion purposes an 18”-wide cabinet will be used. As noted earlier, the basic cabinet consists of a top and bottom, two sides, and back; a standard kitchen cabinet should stand 30-1/2”; the side standards equal the cabinet’s height; and the side’s width should equal the cabinet’s depth of 24”, minus the 3/4” back. This results in a side or standard of 23-1/4”×30-1/2”—the size for all standard kitchen base cabinet sides.
The top and bottom share the 23-1/4" dimension in common with the sides. The other dimension is based on the cabinet’s width, in this case 18". The remaining dimension for the top and bottom equals 18" minus 1-1/2" (the thickness of two 3/4" sides), or 16-1/2". The back covers the whole cabinet so that its size measures 18" x 30-1/2". The stretcher piece is 4" to 5" wide and 16-1/2" long, the same as the variable dimension of the top and bottom. Table 1 lists these pieces.

**Base Cabinet Layout and Design**

The simple method described below “Americanizes” the European system to fit standard American specifications while maintaining the European cabinet’s primary features.

Start the first hole at 4mm on center from the standard’s bottom inside face. On the top side, the holes end at some odd (and insignificant) increment. This is known as the float. The 4mm setting assures that the doors and drawer fronts mount properly to the cabinet, as shown in Fig. 3. This setting also provides for simple alignment of standard drawer heights, door heights, and drawer front heights.

Note that the base cabinet with four drawers has drawer fronts with widths of 6", 7-1/4", and 9". There is a 1/4" space between drawers and doors. The drawer glides and the hinges fit nicely between the stretchers. Hinges and drawer glides are designed to have a 37mm backset to the line-bored holes.

**Drawer glides for standard kitchen base cabinets** measure 550mm (22") long. The distance between the front and back mounting holes is 480mm. Adding the 37mm set back to the 480mm equals 517mm. Subtracting 517mm from 590mm (the width of the side panel) leaves 73mm. 73mm is the back set from the back of the side to the holes. Of course these holes are also referenced 4mm from the bottom.

**Instructional Outline:**

**European 32mm Cabinet Curriculum**

This is an outline of Lundgren’s curriculum. The complete 106-page curriculum, which he developed into a master’s project, is titled *A Curriculum Model in 32mm Cabinet Construction for Secondary Woodworking Students* (1998). It is available on the internet at [www.et.byu.edu/tte/32mm](http://www.et.byu.edu/tte/32mm) and on the Utah woodworking teachers website at [www.softcom.net\users\woodteacher\woodteacher\](http://www.softcom.net\users\woodteacher\woodteacher\).

1. Cabinet Case Planning  
   a. The American Kitchen  
   b. The Basic Box  
   i. Components of the Box  
   c. Base Cabinets  
   i. Base 1 Drawer  
   ii. Base 4 Drawer  
   iii. Sink Cabinet  
   iv. Lazy Susan  
   d. Upper Cabinets  
   i. Basic Upper Cabinet  
   ii. Corner Cabinet  
2. Cut Lists  
   a. Sheet Goods  
   i. Cabinet Case Cut List  
   ii. Drawers  
   iii. Shelves  
   b. lumber  
   i. Door Sizing  
   ii. Drawer Front Sizing  
3. Sheet Goods Layout and Optimization  
   a. The Planning Sheets  
4. Rough Cutting  
   a. Parts Labeling  
   b. Double-Sided Melamine  
5. Edge Banding  
   a. The Edge Bander  
   b. Trimming  
6. Finished Size Cutting  
   a. Cutting Lower Cabinets to Finished Size  
   b. Cutting Upper Cabinets to Finished Size  
7. Line Boring  
   a. Base Cabinets  
   b. Upper Cabinets  
   c. Machine Setup  
   d. Line Boring Operation  
8. Cabinet Assembly  
   a. Kits  
   b. Confirmat Screw  
   c. Order of Construction  
9. Drawer Construction  
   a. Cutting Drawer Sides  
   b. Cutting Drawer Bottoms  
   c. Drawer Kits  
   d. Assembly  
   e. Drawer Glides  
   f. Finish Cutting Shelves  
10. Door and Drawer Front Installation  
   a. Base Plates  
   b. Hinge Holes  
   c. Door Adjustment  
   d. Drawer Front Installation  
11. Toe Kicks  
   a. Layout  
   b. Assembly  
   c. Corner Braces

Once the sheet components are cut to size, use a special stepped drill bit to drill pilot holes to receive the Confirmat screws. Then edge-band the exposed front edges and assemble the box. A wide variety of door and drawer styles may be used.

The result is a custom cabinet produced with standard materials, equipment, and procedures.

Using the curriculum he has developed, Lundgren has worked with several groups of students at Skyline High School to successfully build custom cabinetwork in a number of new homes. All of these homes have had asking prices of over $300,000; one even sold for over $400,000 (See photo at beginning of article).

**References**


A Curriculum for Teaching 32mm Cabinet Construction

Fig. 1—Confirmat screws

Fig. 2—Standard American kitchen cabinet dimensions

Right side cross section

Fig. 3—European base cabinet design

Table 1—Cut list for base cabinet with four drawers

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<th>Qty.</th>
<th>Thickness</th>
<th>Width</th>
<th>Length</th>
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<tr>
<td>Side</td>
<td>2</td>
<td>3/4&quot;</td>
<td>23-1/4&quot;</td>
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<tr>
<td>Top and bottom</td>
<td>2</td>
<td>3/4&quot;</td>
<td>23-1/4&quot;</td>
</tr>
<tr>
<td>Back</td>
<td>1</td>
<td>3/4&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Stretcher</td>
<td>3</td>
<td>3/4&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
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Base cabinet with four drawers, right side

Base cabinet with one drawer, right side