

Plan Your Storage for

By Jim Burke

When setting up a production floor plan, the first and most important requirements to be considered are storage of bulk goods and the movement of these materials throughout the plant. Too often the first priority is for the saws and joiners and other equipment. These are only important if the 210-220 Volt electrical demands must be kept is one certain area of the building. Otherwise, equipment is secondary.

If you could start off with a new building or clean space and design your production floor from scratch with the knowledge you have today, life might be easier. Usually, you need to rearrange your floor plan while still occupying your workspace.

Why are storage and material movement important? Because setting it up correctly can almost always increase your production efficiency immensely. It is like the difference between an Interstate highway and a two-lane road through the center of town. Moving materials in a layout designed to be more efficient helps you bypass the congested parts of your facility.

Most production facilities start small and grow over time. As sales grow, so do the amount of materials on hand needed to meet future orders, for orders already in house, and extra goods left over from prior jobs. The amount of space that needs to be set aside for storage will depend on the type of framing you do and the total quantity of frames you produce. If all your jobs are large runs of the same frame and moulding, storage can be relatively simple. If you use many different moulding styles and widths, your moulding storage will be more complex when it comes to tracking and locating materials. It will also require more space. Your storage and movement of



A central storage area tends to work most effectively for facilities less than 5,000 square feet and would normally be near the shipping area to facilitate movement of materials into a plant.

materials also depends on the size and layout of your current building or any new space you plan to occupy in the future.

There are three basic types of layouts you can use for setting up your floor plan. Each of the designs has an advantage

when based on the total factory floor space being used.

- Design One is to have a single central storage location for all bulk materials. This is usually near the receiving door for quick stacking and ease of movement. This design works best with small locations (less than 5,000 square feet). Having all materials stored in one location is simple, and the distance to any process isn't very far. You need to allow proper aisle space for the flow from storage to process throughout the day or at the start of the day.
- Design Two is to store each type of bulk material near the work area or in the cell where the material will be used. This design works well for buildings with 12,000 square feet or more and where there is sufficient space to allow for 4' wide aisles to each work cell or process area. Unloading material and moving it to a work cell immediately saves time later during production. It also allows you to take a quick visual inventory for materials needed in each area. If you don't have the matboard needed, you can see it isn't there.
- Design Three is a combination of the first two. New-order bulk materials are typically stored near the shipping door and materials for in-house orders near work cells. This design works well with spaces between 5,000 and 12,000 square feet where there is enough produc-

Optimum Material Flow

Setting up your materials storage correctly can improve your production efficiency immensely

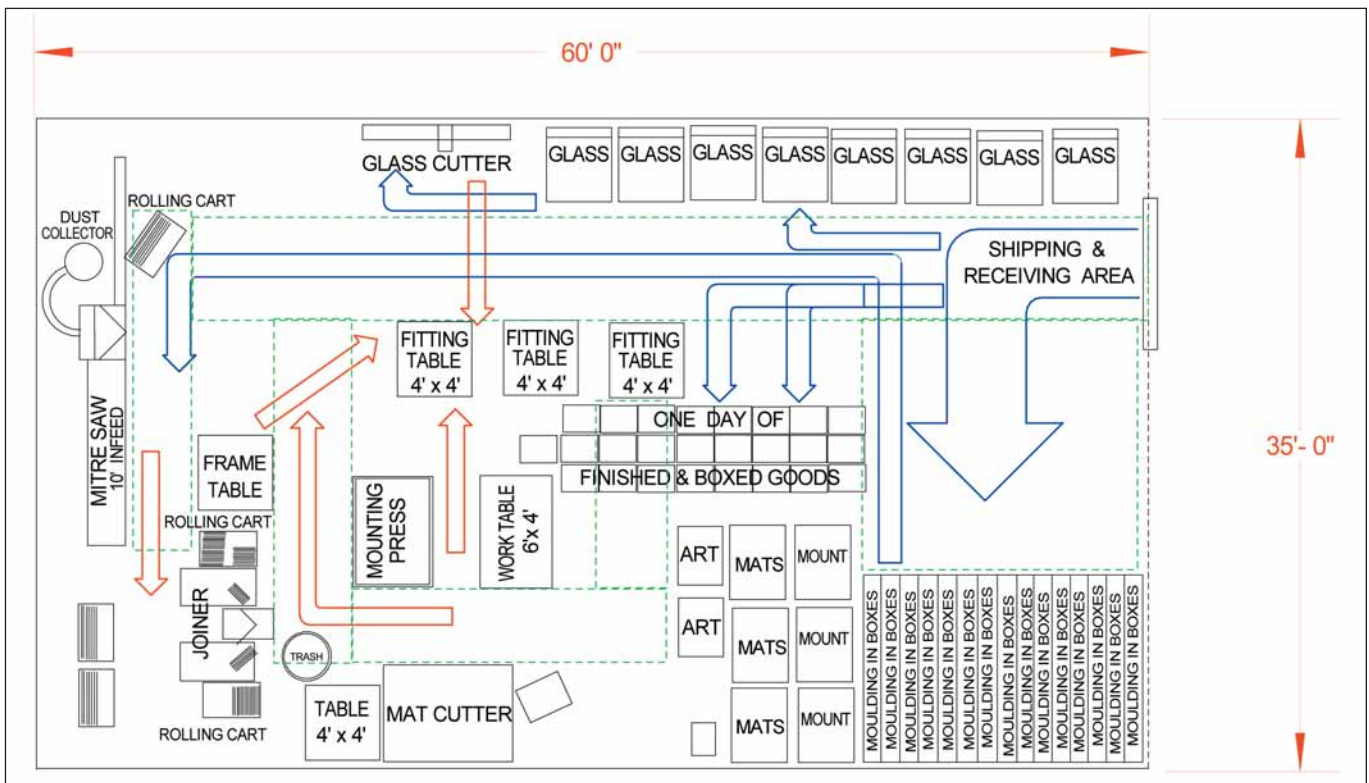
tion to warrant it. It also works well for very large buildings of more than 50,000 square feet with a good inventory system in place. The combination storage allows for multiple production lines in a tighter area, since bulk storage doesn't take up space between processes.

There's also a fourth "design" in which materials are stored anywhere they fit. Needless to say, this is the most inefficient design and usually creates chaos when new materials arrive or when you're looking for materials for a particular job. Moulding might be in four different places around the building and so may be the glass, matboard, and other materials. Which of the designs is best for you?

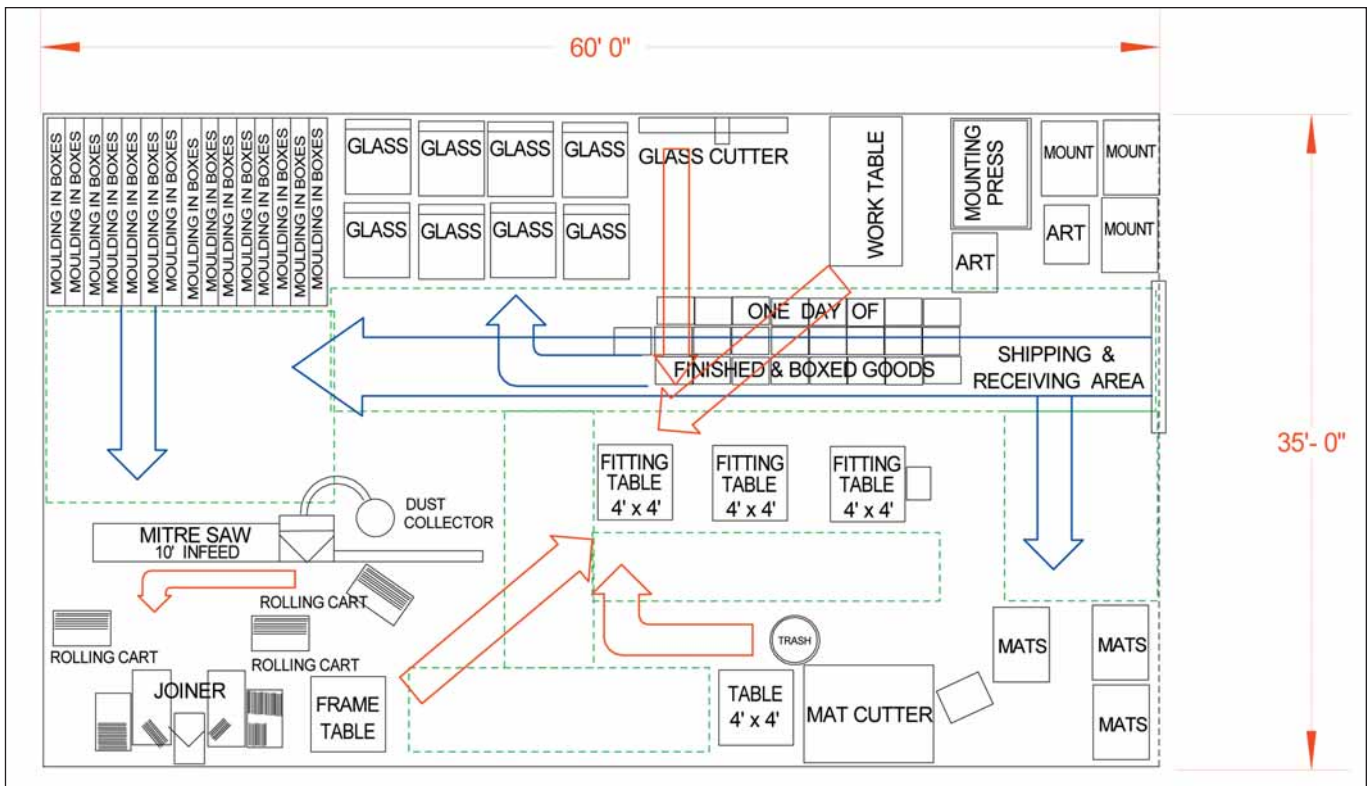
How much storage space do you actually need for a particular volume of orders? The simplest way to approach this is to look at a sample production facility layout. This example can be multiplied for larger facilities or divided for smaller ones.

Sample Production & Floor Plan

Overall: A total of 500 frames a day in sizes from 8"x10" to 16"x20" with single mats. All are fitted, glazed, and packaged with corner protectors and some form of hanging device. This would total 2,500 frames/week. Material could be bought for a weekly, bi-weekly, or monthly supply. Since a month is 4.33



Design One: Central Storage



Design Two: In-Cell Storage

weeks long, the monthly volume would be 10,800 frames.

Matboard: For 16"x20" mats, this production would require 2,500 cut mats or 625 full sheets per week (less than a pallet). For a month it would require about 2,700 full sheets or at least three pallets. For 8"x10" matboards, it would be a quarter as much. For in-between sizes, around two pallets would do. Storage for this material would occupy an area about 4' deep x 3' wide for one pallet up to 4' deep x 9' wide for three pallets. Boxed matboard could require more space than the 12 to 36 square feet shown in Drawing 1. Backing or mounting board would take up the same floor space as the matboard, which would add another 12 to 36 square feet to the storage.

Moulding: Using 1"-wide moulding, a 16"x20" frame would average 7' per frame, including waste. That

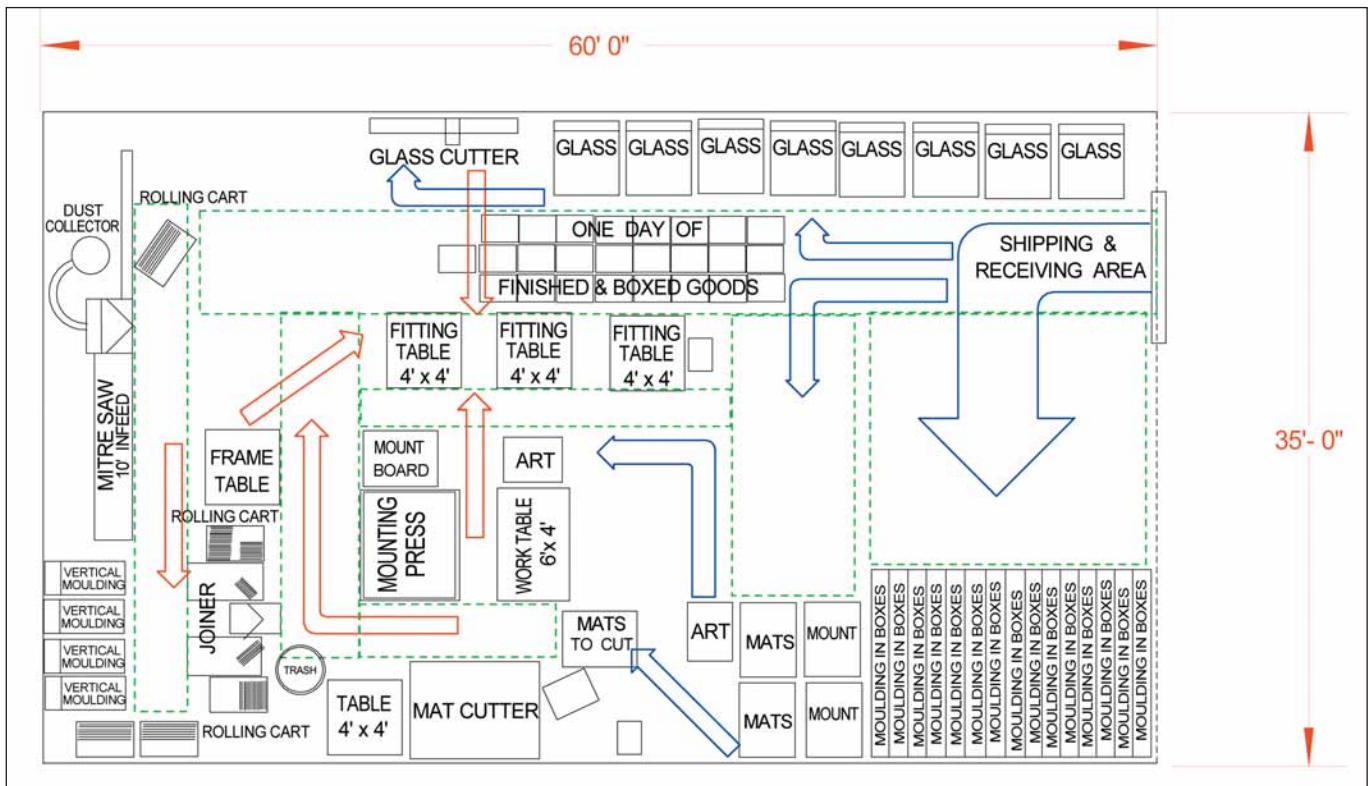
comes to 17,500' per week or 75,750' per month. Storing that amount of moulding would require a space of about 10' deep x 15' wide x 5' high if stacked horizontally or about 150 square feet.

For 1½"-wide moulding, the footage jumps to 81,200', and for 2"-wide moulding it would be closer to 86,000' per month. The storage space for 2" wide moulding would be about 300 square feet. For 8"x10" frames the quantities would be 43,300' for 1" wide moulding and 48,400' for 1½"-wide moulding. The storage requirements would be about 10' deep x 10' wide (100 square feet).

For all horizontally stacked moulding, you would also need a corresponding square footage in front of the material to load and unload the boxes, so the 150 square feet for 1" moulding becomes 300 square feet. If you routinely do large runs using the same moulding, it can be stacked sideways, which would eliminate the extra 10' in front for unloading. Side stacking can work with 4' to the side.



Storing materials in or near work cells tends to work most effectively for facilities of 12,000 square feet and more.



Design Three: Combination Storage

Glass: Glass for 8"x10" frames would occupy about 4' deep x 7' wide or 28 square feet. For 16"x20" frames, it would be four times that or 4' deep x 28' wide or some variation of 112 square feet of floor space. In-between sizes would fit between 28 and 112 square feet of floor space.

Corner Protectors: Corner protectors in flat sheets also occupy space. If you use about 5,400 sheets of die-cut corners a month, your storage would be 16"x20" stacked about 5' high (when bought in boxes of 1,000 corners). For more than a month's supply on pallets, allow for 3'x4' of pallet space.

Artwork: Any art that goes into the frames will also have to be stored. For 10,800 pieces of 11"x14" prints, reserve a space that is about 2'x3' and 3' high.

A simple floor plan is shown based on the above requirements, including aisle space, a double miter saw, a computerized joiner, a computerized mat cutter, a wall cutter for glass and board, and some fitting tables with space for shipping. Drawing 1 shows a layout for Design One, using a single storage area. Drawing 2 shows a layout for Design Two, with storage areas near the process or work cell. And Drawing 3 shows a layout for Design Three, a hybrid of central and cell storage.

This basic factory floor plan represents about 2,100 square feet when laid out as a 60'x35' rectangular space. The loading door is at the top right corner. The location of this door can change your layout quite a bit, and so will the shape of the floor space.

The flow of materials is shown on the three floor plan drawings by arrows. The blue arrows show how raw materials move to storage or to a process. The red arrows denote finished parts of a job moving to the final fitting area. The aisles are highlighted by green dashed lines. The major differences in flow are not always clear on such small floor plans, but an expanded storage area would show the difference immediately.

On a final note, at 500 frames a day, the saw and joiner are under-utilized. Production could actually be doubled or tripled with the same equipment, but storage requirements could easily double or triple as well. Mounting would not be as shown for 500 or more units a day. This space could work for smaller production set-ups but a laminator or roller glue system could also be squeezed into this space for higher production rates. As volume goes up, of course, so does the space needed to fit the frames and box the final product. The simple floor plan presented here is used to highlight one storage design versus another. ■

Jim Burke owns Machines Etc., a sales and consulting company based in New Bedford, MA. He started in the picture framing industry with Arquati Moulding in Cleveland as general manager. For the past 25 years he has sold and serviced all types of machinery for cutting and joining frames and cutting mats. He has also sold web control machinery to paper mills, tire cord manufacturing, textiles, plastic film extrusion, and paper converting companies throughout the Midwest.