

Pro: Shelving that does not Sag

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Everything you thought you already knew about shelving before they started to sag.

Whether it is shelving for your own shop or for your clients, do you really know what material will hold how much weight over the long run? We all have sagging storage shelves in our shops, but wouldn't dare put them into a customer's kitchen, maybe in the garage. The reality is that there are a lot of variables and complications in deciding how to build shelves.

We know that shelves in a highly humid environment must be solid wood, or plywood, but not MDF or particleboard because high humidity over time will change all the laws of gravity with certain materials. So particleboard is ruled out in the boathouse and the musty basement.

No one wants a shelf to break, but what is our tolerance for deflections? A highly visible finished piece of furniture should not have noticeable sag, but a utilitarian closet shelf could dip a bit without a complaint.

What we are talking about here is the balance between looks and costs. We could make everything bulky and super supported, or we could go for both visual streamlining and cost reduction. For this article I had to look beyond my own rules of thumb developed over years of propping up sagging shelves. I finally located two understandable references for shelving span tables. Of course, they come from two competing associations and force us to do a little bit of comparing apples to oranges. A quick look at the table gives plywood an amazing advantage over the other two materials. It has an advantage, but not that much.

The difference is essentially in how much deflection is considered to be acceptable for a shelf. The particleboard and MDF people say that slightly more than 1/8" deflection in a 36" span is the limit (1/240), what they call "visibly noticeable". The plywood people base their calculations on 3/16" deflection in a 36" span (1/180). Actually they are 25 per cent apart. This variation in recommendations is probably due to the tendency to use particleboard and MDF for more finished shelving and plywood for more utilitarian shelving where a slight visual deflection will be tolerated. If you are using plywood and want to follow minimum visual deflections, although I have not done the precise mathematics, a safe bet would be to reduce the plywood spans in this table by about 25 per cent. As expected, plywood still spans farther than the other two, but costs more.

Here are some very practical things that were included in the particleboard and MDF specifications that are generally true for plywood as well:

-- For shelves 12 inches or less in depth with continuous support along the back edge of the shelf, the allowable span can be doubled.

-- A maximum overhang beyond bracket or support not to exceed 6 inches may be added to these spans.

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