What happened to this? No sign of it anywhere?

CPeter

Cliff Rohrabacher 09-09-2008, 4:17 PM

http://www.tritonwoodworking.com/catalog/Catalog.pdf
Pages 14 - 15
They call it a "dowler"

CPeter James 09-09-2008, 11:02 PM

Not available until 2009

http://www.tritonwoodworking.com/ddowlingmachine.htm

CPeter

Rick Fisher 09-09-2008, 11:07 PM

I have been waiting for this to come out. I dont own a Domino.. If this tool comes out before Festool sets up a dealer within 50 miles of me, (current dealer is 400 miles by plane away. Closest city over 100,000 is 40 minutes away) I will likely never buy a Domino.

To clarify... Festool treats Canada like a "Red headed step child". One dealer, with two store fronts, for the country. The closest one is in Alberta. We have a city of 2 million (Vancouver) 60 miles away, but Festool expects us to order from Calgary, without actually getting to see the tool first.

So because of this, I dont buy any Festool product. I actually dont know anyone who owns any Festool product (in my town). I dont think I have ever actually seen a real Festool product.

So I looked forward to the Triton doweller. I can get dowels anywhere.

I figure if Festool takes an interest in Canada, I will take an interest in Festool.

Gary Curtis 09-09-2008, 11:31 PM

Rick, I own a whole raft of Festool equipment, and also a Lamello Biscuit Jointer. A few years ago I did research on the Maffell Dual Dowel driller.

What I am about to say here might start a religious war. But in the FWW book on Joinery, there is a quite technical article explaining the scientific reasons for dowels being inherently weaker than many other joints. You certainly wouldn't want to fabricate a chair using only dowels.

Biscuits do a great job. And without spending big bucks on a Lamello, you'll do just as good with a DeWalt, Makita, Porter Cable. Just buy the biscuits made by Lamello because they are hands down the best.

I use Dominos all the time and love them. Loose tenons, though a little weaker than a traditional M&T, are the 800 pound Gorilla of wood joints.
And since I have this oddball machine called a WoodRat, I saved $800+ by not buying the genuine Festool Domino tool. I get the same result, in any case.

Because I live in California, I have to pay an 8.25% tax on all purchases, so I buy my Festool equipment from one of their agents. He happens to live in Georgia, so there is no tax. You need expert advice when discussing Festool equipment. It is sort of tricky. This guy teaches furniture making at the college level, is savvy, and for us here in the states, the Festool gear he sells is shipped free of charge. A real gentleman. You know of course, all Festool dealers charge exactly the same price. He is:
Donald Cope
dgcope@mac.com (http://by111w.bay111.mail.live.com/mail/ContactMainLight.aspx?n=1399704872#)
tel 706 207-5086

I can send you a Xerox of that Fine Woodworking essay on Dowel Strength if you send me a PM message.

Gary Curtis

Sincerely,
Gary Curtis

Rick Fisher 09-10-2008, 12:31 AM

See, that is the problem. He isnt allowed to ship to Canada. Festool doesnt allow US dealers to ship to Canada.

So we can travel accross the line and buy something but what about warranty? I didnt worry about warranty until the Kapex came out. The Kapex was a reminder that warranty happens.

Cliff Rohrabacher 09-10-2008, 10:01 AM

To clarify... Festool treats Canada like a "Red headed step child".

HA HA HA That's the first time I heard that expression and I like it.

Festool expects [...]

Yes they do.

So because of this, I dont buy any Festool product.

HA HA HA Festool lost my attention at a show when their rep treated me as if I were something disgusting he just discovered adhering to the bottom of his shoe.

I had the uppity temerity, and insubordinate attitude as to actually inquire whether they had a show discount.

How dare I?

Well the guy's response was so over the top insulting I just walked away in the middle of his display of vast, unassailable, galactic, teutonic superiority.

Sadly (and I really mean sadly) Porter Cable is tanking it's line of decent tools to go chase after the people who buy Black and Decker. YAh weird B&D ownd PC and wants the PC line to be B&D's soulmate.

That may leave no one else at the top of the heap but Festool.

Mike Robbins 09-10-2008, 11:11 AM

Well... if anyone wants to try a dual doweler before 2009 there is always this:

http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=97427

(do not have one, will likely not buy one, not endorsing this or admitting to owning anything from HF)

Justin Leiwig 09-10-2008, 11:46 AM

I can send you a Xerox of that Fine Woodworking essay on Dowel Strength if you send me a PM message.

Gary Curtis

Sincerely,
Gary Curtis

An evaluation of loose tenon joint strength.

by Aman, Ronald L.^West, Harvey A.^Cormier, Denis R. Forest Products Journal (http://www.entrepreneur.com/tradejournals/pub/0ISV.html) • March, 2008 •

Abstract
The mortise and tenon (M&T) joint has been used in the furniture industry in joints requiring high strength for many years. Dowel joints are popular as well for their ease of manufacture. The loose tenon joint incorporates a separate tenon component that is inserted into mortises machined into both pieces to be joined. Its ease of manufacture is comparable with that of the dowel joint, however, the strength of the joint has not yet been methodically studied. This paper describes results from a series of experiments aimed at comparing the loose tenon joint with the conventional M&T and dowel joints for three wood species. Experimental results indicated that the loose tenon joint's strength falls somewhere between that of the dowel joint and the conventional mortise and tenon joint. The added strength combined with increased wood utilization makes this joint an attractive alternative to mortise and tenon construction.
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Mortise and tenon joints and dowel joints are widely used in furniture construction to join chair posts with side rails and to join parting rails with end panels in case goods. The mortise and tenon (M&T) joint is strong and proven. However, it can be slightly complicated to machine on angled joints, and it reduces the overall utilization of lumber due to the added length of the tenons on the ends of the rails. Dowel construction overcomes the material utilization reduction by machining holes into each side of the joint; however joint strength is somewhat compromised because of the end grain gluing orientation. The loose tenon is a relatively new joint type that incorporates the size of the mortise and tenon with the material utilization of dowel construction.
In loose tenon construction, a mortise is cut on each of the mating parts. A separate (i.e., loose) tenon is then inserted into the pair of mortises to join the two parts. The mortise and tenon can be any shape, but should be of the same cross section, with a minimal clearance gap. Glue is applied to the tenon and mortise to form a tight joint. Loose tenons eliminate the need to cut a tenon on the rail as in conventional mortise and tenon construction.
Commercially available loose tenon systems exist such that the mortises can be made with simple drilling or routing operations. The mortises can be machine drilled, or even hand drilled using a drill jig. The tenon takes the shape pictured in Figure 1 through moulding or shaping, and can be purchased from retail or commercial sources. This joint can be manufactured with no complex setups or special tools. Although the joint has widespread applicability, it is particularly attractive for use in developing countries where expensive equipment is generally not available. For instance, Haviarova et al. (2001) and Eckelman et al. (2003) show how school chairs for developing countries can be fabricated with simple tools using round mortise and tenon construction. The withdrawal capacity of round M&T construction joints, both pinned and unpinned, was described by Eckelman et.al (2004). Eckelman et al. (2001) also designed a desk constructed of round M&T joints for developing countries.
While the loose tenon joint is simple to machine, an added benefit is that the elimination of tenons in traditional M&T constructed furniture can improve material utilization. In order to obtain a rough estimate of how much material saving could potentially be achieved by reducing the length of rail stock with tenons on each end, blueprints for several commercial furniture product lines were studied to compare hardwood utilization based on loose tenon vs. M&T construction. The product lines included two bedroom suites made using M&T construction. The first set, which included a night stand, chest on chest unit, and a 10 drawer dresser, required 61.28 BF (finished) of lumber for the mortise and tenon construction as compared to 60.26 BF for the loose tenon. The resulting savings was 1.66 percent. The second suite included a night stand, a door chest, and a seven-drawer dresser and required 99.32 BE of finished lumber for M&T as compared to 98.43 BF for loose tenon. The resulting savings in this case was 0.90 percent. While the potential increase in lumber yields is relatively small, hardwood lumber costs represent an increasingly significant portion of the cost of making a piece of furniture. Increased lumber utilizations of just a few tenths of a percentage translate in significant annual savings in an industry characterized by extremely small profit margins.

Erdil et al. (2005) cite research conducted by Paulenkova (1984) that concludes that M&T construction is stronger than dowel construction for similar sized joints. Erdil et al. (2005 also cite the work of Sparkes (1968) which determined that rectangular and rounded M&T joints were similar in strength and that round mortises with rectangular tenons were substantially weaker. The optimum strength of a glue joint was achieved by application of glue to both surfaces (Dupont 1963, Erdil et al. 2005).
In the present study, a comparison of loose tenon, mortise and tenon, and dowel joint strength is made. Several popular wood species were used to quantify the joint strengths of each.
Background--joint construction

The traditional mortise is a rectangular cavity in which a similarly shaped protrusion (tenon) on the mating component is inserted. Mortises may be cut in the receiving part by use of a hollow chisel mortiser, an oscillating chisel mortiser, a router, a chain mortiser, or other device. The size of the mortise is controlled by the size of the tool making the mortise.
The tenon is cut at the end of the mating part by cutting away excess material leaving the properly shaped protrusion by use of a tenoning machine, a router, a saw with a tenoning jig, or other such device as shown in Figure 2. Yang and Lin (1986a, 1986b; Erdil et al. 2005) showed that the maximum bending moment strength was obtained with clearance between the mortise and tenon of +0.012 and -0.008 inch.

The M&T joint strength depends on several key parameters including the length, width, and thickness of the tenon as well as the clearance between mortise and tenon. The strongest M&T joints incorporate a shoulder on the tenon.

Because the tenon is machined from the rail, joint strength is not compromised by the addition of different materials and joints. In dowel construction, holes are drilled into both mating pieces, such as the side rail and backpost shown in Figure 3, and a dowel is inserted into the two machined holes. This results in one joint oriented in an end grain orientation which is prone to pullout failure.

The loose tenon consists of two mortises, one drilled into each mating part with the tenon inserted into each mortise as shown in Figure 4. The tenon is solid wood and is shaped similarly to the mortise.
Experimental procedure

A simulated chair seat joint was chosen to compare the strength of the loose tenon joint with more traditional seat joints. The T-joint is a common failure point in chairs and is often made using either mortise and tenon construction or dowel construction. Three commonly used wood species were used in the testing;cherry (Prunus serotina), red oak (Quercus Spp.) and hard maple (Acer saccharum). The simulated chair seat joint was constructed from 8-1/4-in by 2-1/4-in by 3/4-in wood blocks cut from hardwood lumber. The blanks were ripped, cut to length, and stored in an environmental chamber prior to machining the joints. A total of 10 M&T, 20 loose tenon, and 10 dowel joints in each species were constructed.

M&T joints, dowel joints, and loose tenon joints were machined in the three wood species on a CNC router. The M&T joints were manufactured using a 1/4-in router bit to make the mortise. Comers of the mortises were then chiseled to remove rounded comers. The tenon was machined from the mating part using a 3/4-in router bit on a CNC router. Mortise depths and tenon lengths were machined to 1-1/16 in and 31/32 in respectively.

Dowel holes and loose tenon holes were manufactured on the CNC router using a 3/8-in brad point drill bit. The three dowel holes were spaced 1/2 in apart in each of the mating pieces. The five loose tenon holes were drilled at 1/4-in intervals resulting in overlapped material being removed (see Fig. 4). The mortises for the loose tenons measured 1-3/8 in by 3/8 in by 1-1/16 in. All holes were drilled to a depth of 1-1/16 in.
Dowels and loose tenons were purchased. The hardwood dowel pins were nominally 2 in long by 3/8-in diameter and included spiral grooves. The American birch loose tenons were purchased from Beadlock prepackaged in 12-in lengths and were subsequently cut to 2-in lengths on a cutoff saw.
All of the rail stock, dowels, and loose tenons were conditioned and maintained in an environmental chamber at 20 [degrees]C and 50 percent RH for 48 hours prior to machining. Immediately after machining, the wood was returned to the environmental chamber. Mating wood pieces were removed from the chamber, marked, measured, glued, and clamped, and returned to the chamber for drying. Each of the prepared samples remained in the environmental chamber until removed for testing.

Each test joint was assembled and glued in the same way. Cross-linking Poly-Vinyl Acetate (PVA) glue was applied to the mortise, glue was applied to the tenon, a wax paper barrier was inserted to isolate the shoulder, and the joint was assembled. Excess glue was wiped clear by a wet towel after clamping. Joints were then clamped for 1 hour while the glue dried.
The joints were tested on an Applied Test Systems (ATS) Model 1605C universal testing machine. The joints were held in place using a vice mounted on the base with a groove machined to hold the specimens in a vertical, centered orientation (Fig. 5). The set up was constructed such that the moment length was a constant 6 inches. The crosshead pushed the horizontal member down at a rate of 0.05 in/min until failure.
Failure was determined by one of two events; catastrophic failure resulting in a load of 50 percent of maximum, or constant force over a displacement of 0.1 inches of the crosshead indicating pullout failure of the joint. In either case, the maximum load was recorded.
Results

The resulting average bending moment (in-lbs) required for joint failure for each species and each joint are displayed in Table 1. Several interesting observations can be made from this data. The traditional mortise and tenon joints outperformed the dowel joints for all three wood species. This result is in good agreement with previously published research. With the exception of oak, the loose tenon joints performed better than the dowel joints as well.

It is hypothesized that the poor performance of the oak loose tenon joints was due to excessive clearance between the tenon and the mortise. All mortises were precisely CNC machined according to the manufacturer's instructions (Beadlock[R]) using a 3/8-in drill bit. Post examination of the joints revealed that the commercially purchased Beadlock[R] tenon stock used with the oak joints was smaller than the tenons used for the cherry and maple joints. This can be plainly seen in Figure 6. Visual examination of the cherry specimen on the left of Figure 6 reveals a tight fit between the loose tenon and the mortise. Conversely, a significant gap is visible between the loose tenon and the mortise in the oak specimen shown on the right of Figure 6. This suggests that if loose tenons are to be used, attention must be given to dimensional quality control in the tenon stock.

Joint failure, in almost every case of loose tenon and dowel joints, was a result of tenon/dowel pullout of the horizontal rail. Disassembly of several of the joints revealed wood fibers adhering to the tenon or dowels, thus indicating failure of the wood fibers surrounding the glue joint. This corresponded to the joint failure indication on the machine, where an increase in displacement did not result in a change in load.
Summary and conclusions

Loose tenon joints can be made using simple machines and can even be constructed using hand drills if desired. This makes the joint attractive for use in developing nations. In mass production environments, the slight increase in material utilization associated with this joint is significant in light of razor thin profit margins in this industry. To date, the performance of loose tenons with respect to traditional dowel joints and M&T joints has not been documented.

Research detailed in this paper reaffirmed prior published reports indicating that M&T joints generally outperform dowel joints. For the three species studied, it can be generally said that loose tenon joint performance falls somewhere in between that of the traditional M&T joint and the dowel joint. It was observed, however, that dimensional tolerances on the loose tenon stock must be carefully maintained to ensure a suitable fit between the mating pieces.

Literature cited

Dupont, W. 1963. Rationalization of glued joints in the woodworking industry. Modem Holzverarbeitung, No. 30.
Eckelman, C., Y. Erdil, and E. Haviarova. 2003. School chairs for developing countries: Designing for strength and durability, simplicity and ease of construction. Forest Prod. J. 53(2):63-70.
--, E. Haviarova, H. Zui, and H. Gibson. 2001. Considerations in the design and development of school furniture for developing regions based on local resources. Forest Prod. J. 51(6):56-63.
Erdil Y., Z.A. Kasal, and C.A. Eckelman. 2005. Bending moment capacity &rectangular mortise and tenon furniture joints. Forest Prod. J. 55(12):209-213.
Haviarova, E., C. Eckelman, and Y. Erdil. 2001. Design and testing of environmentally friendly wood school chairs for developing countries. Forest Prod. J. 51(3):58-64.
Paulenkova, M. 1984. Evaluation of the strength properties of mortise and tenon and dowel joints on cabinet bottom frames. Drevarsky Vyskum 29(2):69-80. (in Slovak).
Sparkes, A.J. 1968. The Strength of Mortise and Tenon Joints. Furniture Industry Res. Assoc, Maxwell Road, Stevenage, Hertfordshire, Great Britain.
Yang, M.J. and T.Y. Lin. 1986a. Studies on the strength of mortise and tenon joints (l). Forest Prod. Ind. 5(2):41-48.
--and--. 1986b. Studies on the strength of mortise and tenon joints (11). Forest Prod. Ind. 5(2):21-30.
The authors are, respectively, Research Associate and Furniture Extension Specialist, North Carolina State Univ., Furniture Manufacturing and Management Center, Raleigh, North Carolina (ron_aman@ncsu.edu, hawest@ncsu.edu); and Associate Professor, North Carolina State Univ., Fitts Dept. of Industrial and Systems Engineering, Raleigh, North Carolina (cormier@ncsu.edu). The authors would like to thank David Jones for his assistance in performing the joint tests. This paper was received for publication in June 2007. Article No. 10376.

Table 1.--Comparison of average maximum bending moment (in-lbs) achieved for each joint type and species.
Oak Maple Cherry
Mortise and tenon Average 1681.2 1825.2 1575.6 Std. dev. 154.2 175.2 226.8
Loose tenon Average 1392.6 1663.2 267.6 Std. dev. 113.4 149.4 247.8
Dowel Average 1479.6 1564.2 1440.6 Std. dev. 141.0 127.2 168.6

That's the text of a real scientific study.

Gary Curtis 09-10-2008, 2:53 PM

The magic word here is Beadlock. They used that and referred to it as a tenon. Or Loose Tenon. A beadlock is a kind of a ganged dowel.

Here's the problem with both beadlocks and dowels. Almost all the contact between the dowel (or beadlock) and the hole is end grain to end grain. The only long grain contact is along a very narrow band on either side of the plug. Glue on long grain yields great strength. End grain glue ups or futile. So the round profile of these two types of joint prevents a solid bond.

A tenon, being flat, is kind of weird. I read a quite detailed (more than above) scientific treatise on how the ample long grain along the contact points between a mortise and tenon actually form a laminate. As in plywood. Now this is something entirely different than a simple glue bond. Look at the huge glue-lam rafters and joists used in commercial and home building. An 8x14 glue-lam is stronger than an equivalent 8x14.

The test cited above doesn't really apply because in no way is a beadlock equivalent to either a tenon or floating tenon. Any mortise made using a round drill exposes more than 90 % end grain which can't be glued very well. It's a matter of geometry.

Gary Curtis