



Fasteners for Cabinet Making

2006
26 minutes

Program Synopsis

This program is an excellent introduction to the use of the various fasteners to join timber and manufactured boards in the construction of cabinets and furniture. The features and properties for screws, nails and pins, assembly fittings and biscuit joinery are explained. Trade teachers provide demonstrations and advice on when and how to use a particular fastener. This is an invaluable resource for all beginners in the trade.



Related Programs

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Fasteners for Cabinet Making

Teacher Notes:

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Introduction

Cabinet makers use a range of fasteners to join timber and manufactured boards together in the construction of cabinets and furniture.

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DVD Timeline

00:00:00	Introduction
00:00:47	Wood screws
00:03:53	Wood screws – the correct use
00:09:50	Nails pins and staples
00:11:41	Assembly fittings
00:16:07	Woodworking glues
00:20:43	Biscuit joinery
00:25:25	Ending and credits

Internet Resources:

Types of Screws:

- <http://www.wisageek.com/what-are-the-different-types-of-screws.htm>
- <http://www.technologystudent.com/joints/screws2.htm>

Selecting and Using Screws and Nails:

- <http://www.millardlumber.com/HowTo/nails/screws.htm>
- http://www.ohiorod.com/bolt_types.htm



Background Information

Screws, Nails, Bolts and Brackets

Screws can come in a larger range of sizes than nails and for a range of functions. They provide a more positive fixing than nails and are generally more useful for strong construction work. The size of the screw is determined by the size of the shank or the diameter of the gauge. All screws should be long enough to pass through the piece to be screwed and penetrate approximately three quarters of the depth of the second component.

The Wood Screw

The standard wood screw with a single slotted head and tapered shank requires a clearance hole of the correct size, counter sunk to accommodate the head.

The Roundhead Screw

These are intended to be seen, the flat underside of the screw provides grip.

Raised and Countersunk Wood Screw

This has a shallow domed head, which projects slightly above the surface and looks quite decorative.

Posidriv Head

This is a more modern and very popular form of wood screw with a cross head for extra grip. It is countersunk with a cross head slot and zinc plated for rust resistance. The shank is parallel rather than tapered, making it suitable for driving into manufactured boards, using a suitably sized pilot hole without splitting.

Black Japanned

These and roundhead screws are commonly used with black iron fittings for decorative purposes.

Brass Screws

These are less strong than steel screws of the same gauge, but have the great advantage that they will not rust or bind in the wood. Brass countersunk screws are perfectly acceptable in cabinet making – they look neat when they are sunk flush with the surface. In hardwood, first drive a steel screw of the same diameter as the brass screw, then drive in the brass screw.



Fasteners for Cabinet Making

Surface Screws

- Brass cup and washer
- Security screws
- Mirror screws and cups
- Recessed cup and washer

Nails and Pins

- Standard wire Nail - used mainly for structural work.
- Bullet or Lost Head - punched beneath the surface of the timber.
- Oval Nails - oval section making them less likely to split timber.
- Annular or ring nails, which have small rings or grooves formed in the shank in order to grip the wood.
- Panel Pins (brads) for fixing small sizes of wood and delicate moldings.
- Upholstery pins provide a decorative means of securing upholstery work and have wide, flat bottomed heads to grip the fabric.

Assembly Fittings

- Panel Connector- a device used for connecting two panels.
- Corner Brackets- designed for attaching table legs and strengthening the corner joints at the same time.
- Expansion or shrinkage plate –an angled bracket designed to attach a table top or counter top made of solid boards. Slotted holes allows for some movement between boards.
- Corner bracket – Ideal for attaching work surface or table top.
- Cam fitting –This fastener allows two boards to be joined at right angles.
- Confirmat screw- Designed for fixing into the edge of chipboard.
- Workshop Connector- Sometimes called a handrail connector. It uses a positive bolt action to draw the two components together.
- Cross Dowel Connector - The small steel dowel, threaded to receive the bolt, is inserted into a hole drilled in the face of a panel. The bolt that connects the second component passes through a hole drilled in the edge of the first panel that intercepts the dowel hole.



Woodworking Glues

There are virtually hundreds of different brand names of glues suitable for woodworking applications. There is no single glue that is perfect for every situation in woodworking. While most glues form an adequate bond that is stronger than the wood itself, each glue has working characteristics that make a specific glue better than others for certain applications.

There are two kinds of forces involved in a glue joint. One is adhesion – the molecular force which makes the glue stick to the wood. The second force involved in a glue joint is the solid glue *'line'* in a joint. It is strongest when the two pieces to be joined are machined so they mate as closely as possible.

Glues cure in two general ways. One is by evaporation of a solvent which results in hardened glue molecules formed within the structure of the wood. White, yellow and animal hide glues cure in this way. Other glues, like two part epoxy urea formaldehyde and super glues cure when a chemical reaction takes place and the glue molecules undergo a chemical transformation called polymerization, resulting in a hard rigid structure of more complex molecules.

Open assembly time is the period of time you have between spreading the glue on the surface and the point at which it starts to set. White glues such as PVA have a longer open assembly time than their yellow counterparts. Closed assembly time is the amount of time needed for the glue to set under clamping. Clamps can generally be removed after the glue has set enough for the clamp removal to not disturb the joint.

Biscuit Joinery

In the past, wood structure joints have traditionally been constructed using mortise and tenon joinery methods. Within the last ten years cabinetmakers have adopted plate or 'biscuit' reinforcement for joinery, resulting in large savings on working space, tooling, materials waste disposal, and time.

Until the second half of this century craftsmen lacked adhesives which could make wood to wood joints as strong as the wood itself. They relied on variations of interlocking wood joinery especially the mortise and tenon.

Modern adhesives can glue long or side grain areas of wood together making a joint stronger than the wood itself. Gluing the end grain of wood to another section of end grain or to side grain of another board results in a weak joint. The difference occurs because of the disproportionate expansion and contraction across the grain of the wood as well as the nature of the wood itself. Without overlapping fibers, un-reinforced end grain makes weak glue joints. Post WWII European cabinetmakers invented a method of substituting an inserted wafer in place of a tenon. The football shaped wafers fit into two slots cut into the edges of the material to be joined. Horizontal slots are cut into the two mating surfaces with a motorized tool called a 'biscuit joiner'. The biscuits become the reinforcing overlapping fibers. When a water based adhesive is applied, the compressed wood fibers expand to firmly contact the sides of the slot.



Program Worksheet

After the Program

Find these words in the following Word Search:

ASSEMBLY
BISCUIT
BOLT
BRACKET
BRASS
CABINET
COUNTERSUNK

FASTENERS
GLUE
JAPANNED
JOINERY
NAIL
POSIDRIV
RECESSED

ROUNDHEAD
SCREW
SLOTTED
SURFACE
TAPERED
WASHER
WOOD

J A S N A I L V D D K D E S S E C E R R
T S C B T L U U E N N D F Q D X S E O R
I S R D O U X T R X U E S S A R B U M X
U E E Q D L T O X H S R J L Q J N A L G
C M W H A O T L X X R E D N F D Z P Z M
S B K D L K K H O Z E P K O H I P V E G
I L B S E U L G J J T A X E O E I C S D
B Y D R N P P F W O N T A D P W R R C E
L S C L A H U F L I U D O P J K E V A N
U B X C Z C Q T R N O V R Q N N A A B N
U R C T E A K S W E C U L A E O F Y I A
S U R F A C E E N R M N E T S M F H N P
S K T Y H J Y K T Y A A S W I R G X E A
G A B C V T S V Z S C A K K F J I L T J
X Y O Z T N E T Z K F A X U K Y R R Z L
C N W X M F N Y T O E B J A A C E W U A
J N A H Y Y K J L N V B U K M H H M H E
K W E R O U M P K Q I M B F S C V J L H
W H R T F P Y Q V X S L K A U P J T G W
V I R D I S O P W S M H W O Z T J B Q Q



Suggested Student Responses

After the Program

Find these words in the following Word Search:

(Over, Down, Direction)

ASSEMBLY (12, 9, SE)	FASTENERS (19, 1, SW)	ROUNDHEAD (9, 1, SW)
BISCUIT (8, 9, NW)	GLUE (3, 19, NE)	SCREW (1, 16, E)
BOLT (7, 4, NW)	JAPANNED (10, 8, N)	SLOTTED (1, 11, E)
BRACKET (17, 16, W)	JOINERY (7, 10, W)	SURFACE (20, 10, S)
BRASS (2, 9, E)	NAIL (16, 12, N)	TAPERED (1, 20, E)
CABINET (17, 4, S)	POSIDRIV (20, 8, N)	WASHER (10, 12, NW)
COUNTERSUNK (5, 14, NE)	RECESSED (6, 6, SE)	WOOD (11, 17, SW)

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+ + + T + + + + R D + + + + + + + + F V
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+ T + + + O U + + N + + + + + + S + + R
+ + I + + N B + + N + + + + K T C + + D
+ + + U D + + + + A + + + N E + A + + I
+ + + H C R + + + P + + U N + + B + + S
+ + E + R S E + + A + S E + + + I + + O
+ A + + + E I C + J R R + + + + N + + P
D B R A S S H B E E S A + + + L E + + +
Y R E N I O J S T S + + S + + I T + + S
S L O T T E D N A + S + + S + A + + + U
+ + + + + U + + W + E + + E N + + + R
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