

Computational Design + Fabrication: 2D Design

Jonathan Bachrach

EECS UC Berkeley

September 17, 2015

- News
- 2D CNC
- 2D Joinery
- Lab 2 Review



- lab out today due next thursday
- reading 3 out question due next tuesday
- section tomorrow 11a-12p in jacobs 220
- please do jacobs online training
- please do invention lab training

- cutters – all or nothing cuts
- mills – z axis

Laser Cutter

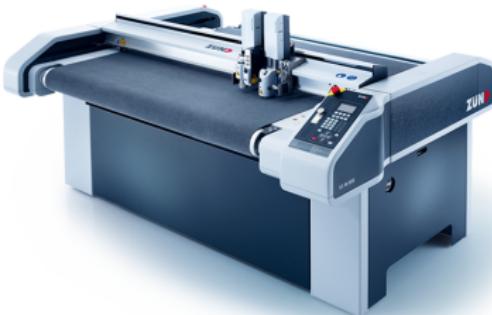
4

- takes in SVG files
- control power / speed through line colors
- burns materials
- thin kerf
- wood + cardboard + textiles + leather + composites + vinyl* + metal*



UniversalLaser Cutter

- takes in SVG files
- cardboard + textiles + leather + composites + vinyl
- expensive



Zund Cutter

Vinyl Cutter

- takes in SVG files
- limited to vinyl
- inexpensive



Roland Vinyl Cutter

- can print and cut
- limited to thin vinyl



Roland CamJet Pro II

- thick hard materials
- hard to automate motion planning
- lead-in lead-outs



OMax Water Jet Cutter

3 Axis Mill

9

- controlled depth
- wood / plastics / metal
- multipass
- bigger kerf
- multiple bits



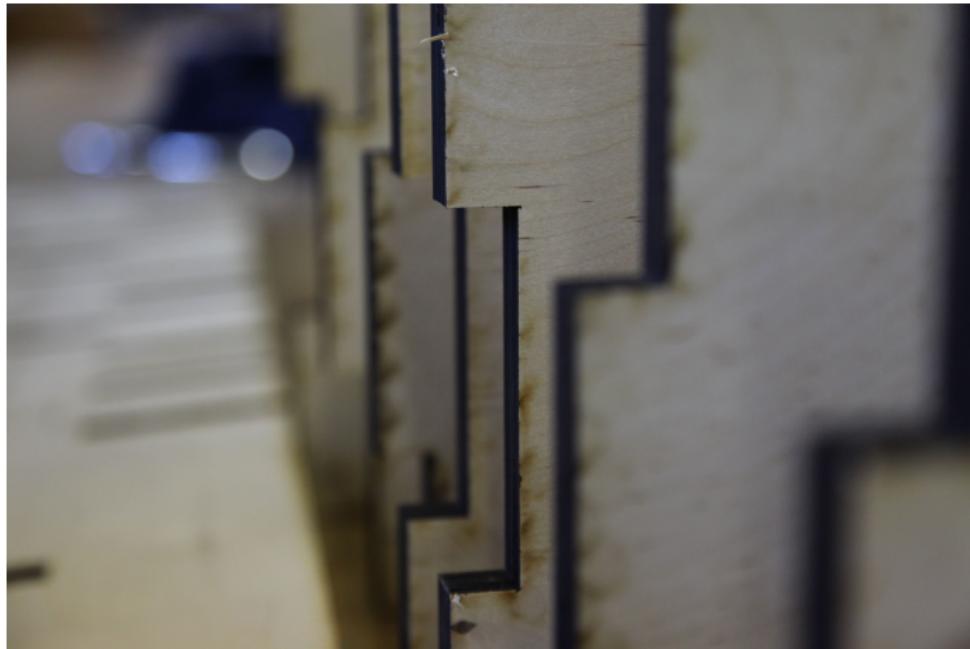
ShopBot

- circuit boards
- inexpensive



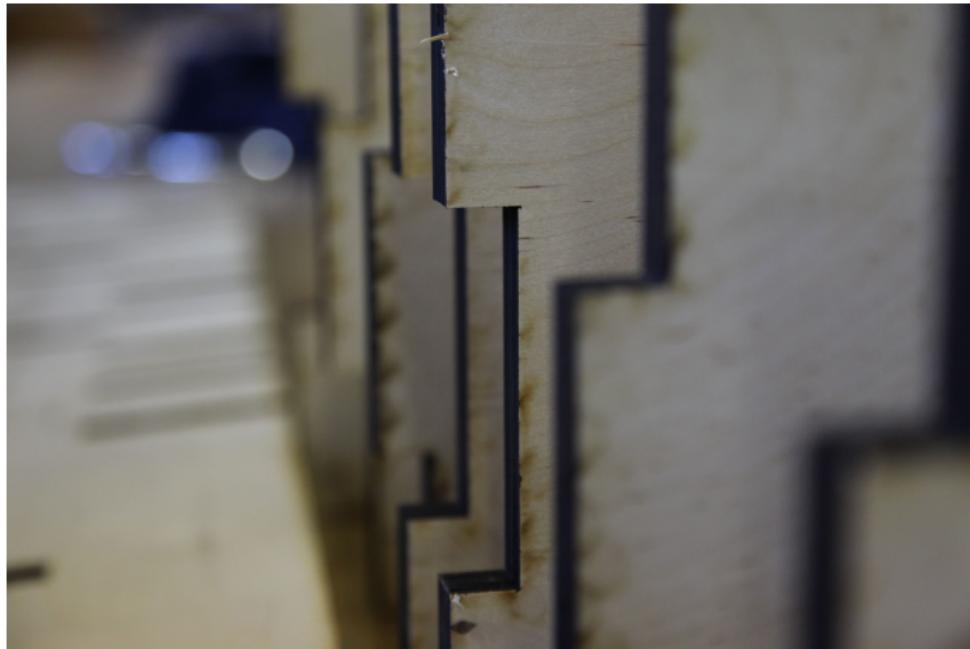
OtherMill

- simple connectors for simple parts
- seams for bending part



Other Lab

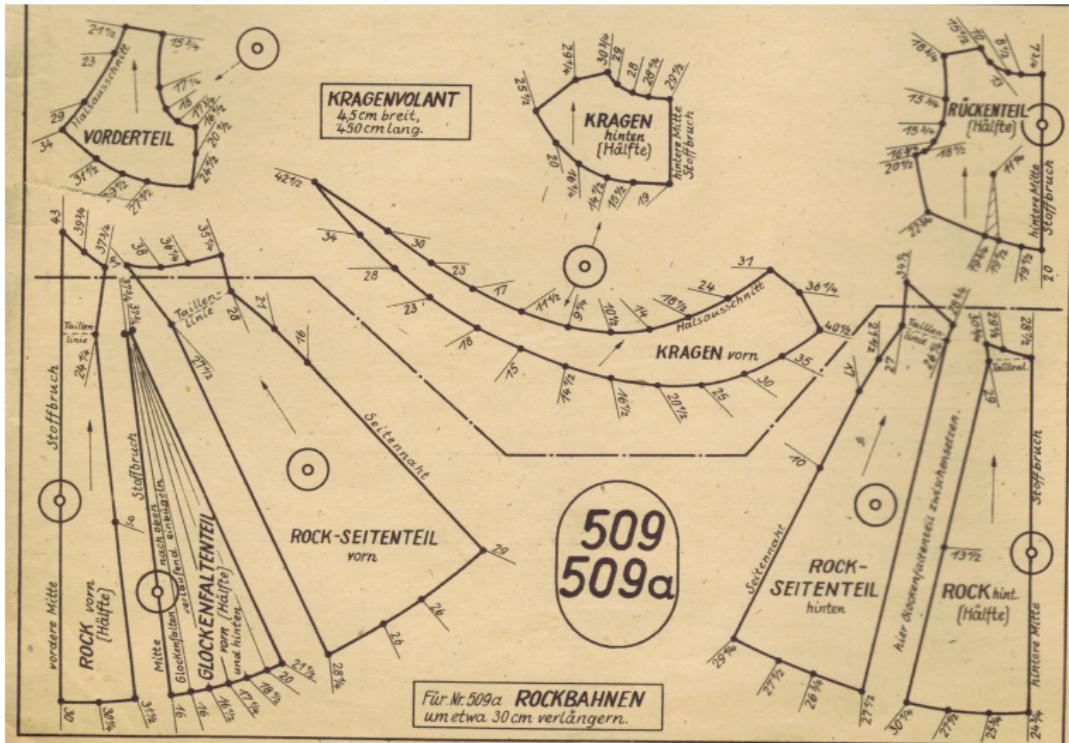
- simple connectors for simple parts
- seams for bending part



Other Lab

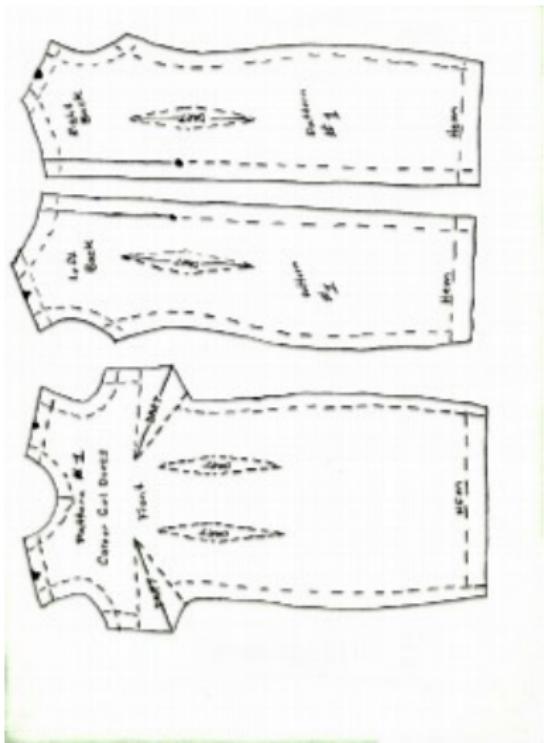
- 1 D
- 2 D
- 2.5 D
- 3 axis
- 3 D

- unobtrusive / fidelity
- beauty
- strength
- simplicity
- cost
- number of parts
- fool proof assembly
- reassembly
- reconfiguration
- hardware
- alignment



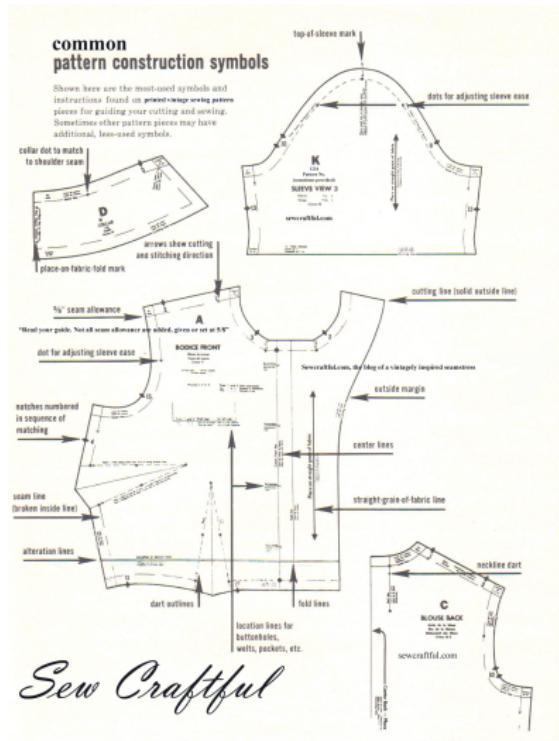
Barbie Doll Clothes Sewing Pattern

17

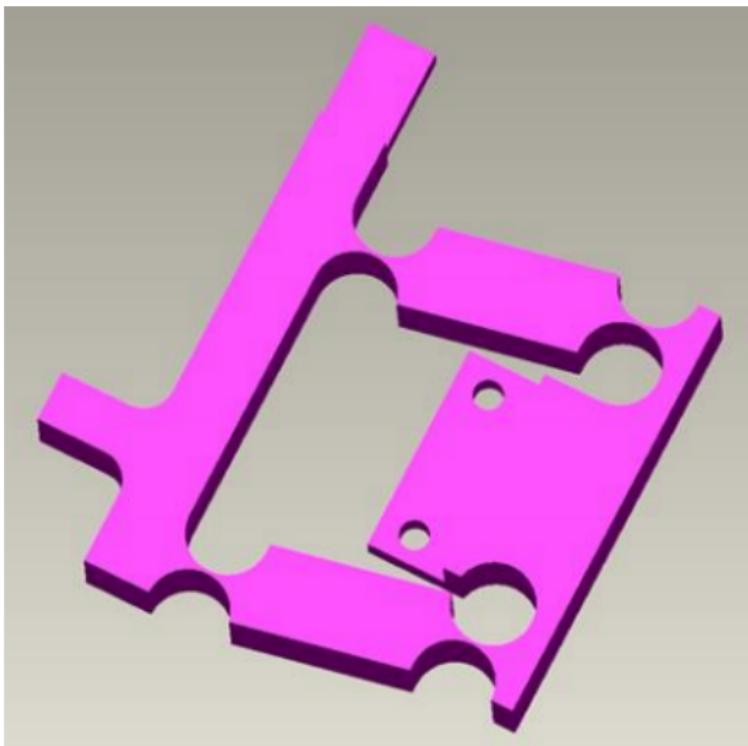


Sewing Construction Marks

18







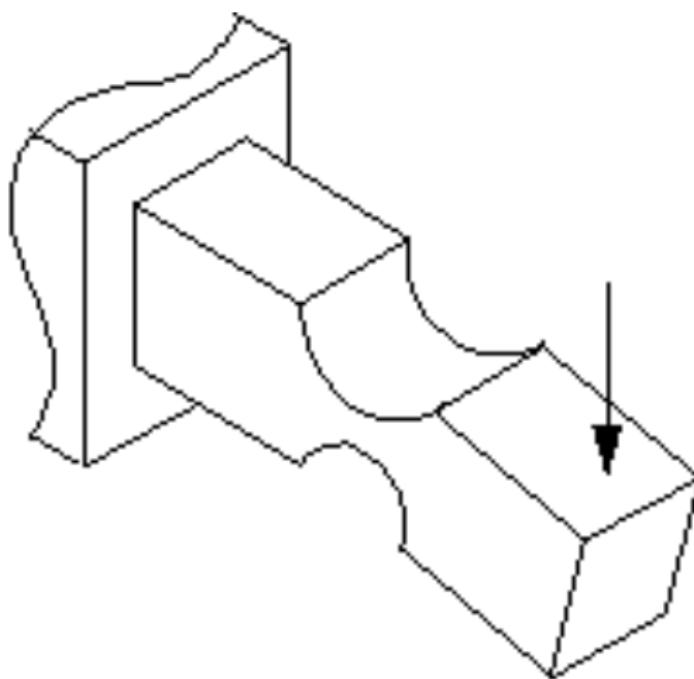
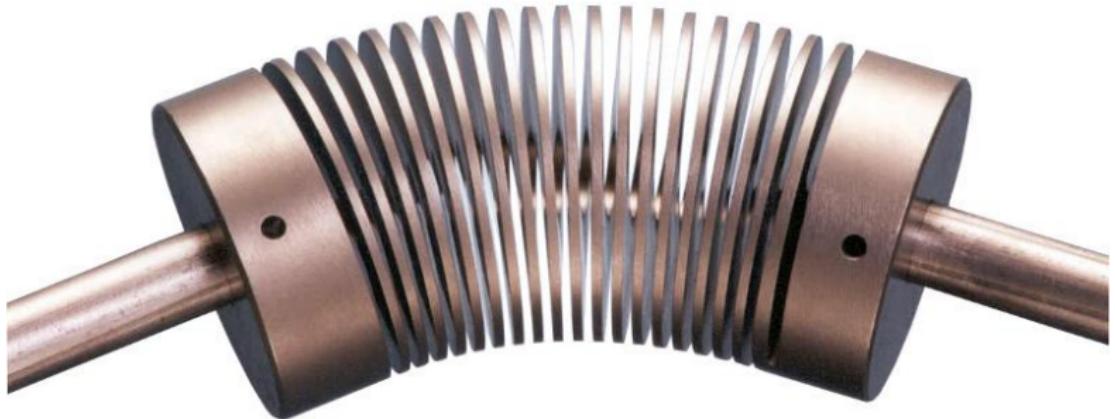


図 円弧切欠きを持つ弾性ヒンジ





Hippo + Elephant

24



Elephant Pieces

25

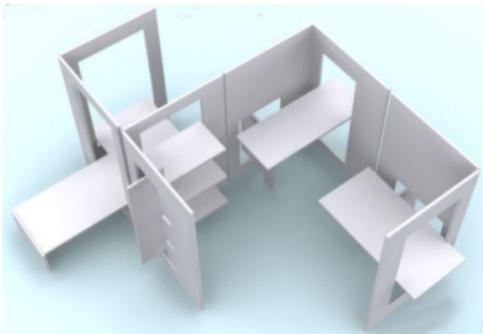


Electrabrake Manual Folder
Press & Shear

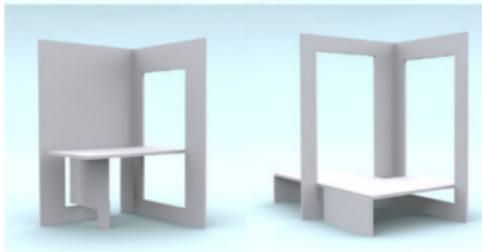


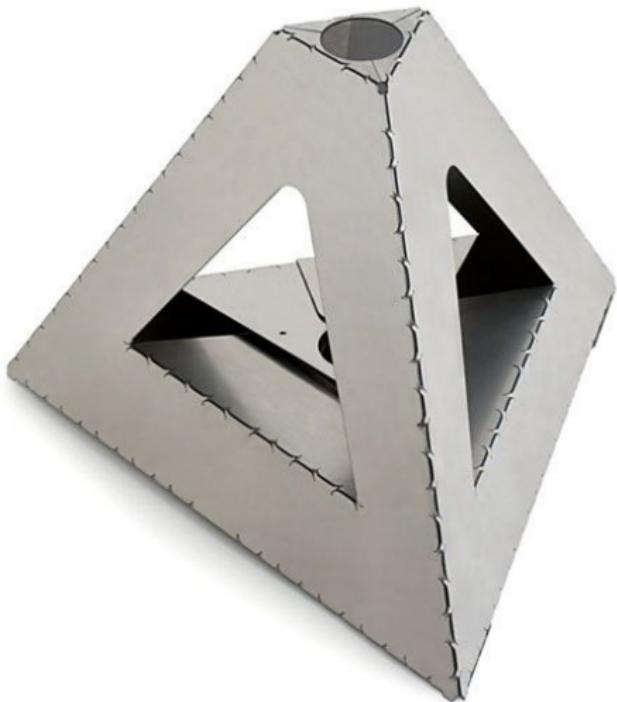
Luxury and Elegant
Home Design In
The World /
designinteriorart.com
July 2011





"Flat-Pack Furniture" dornob

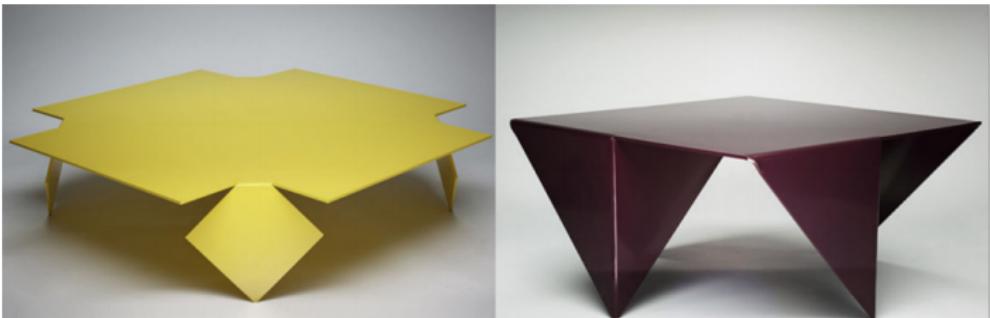






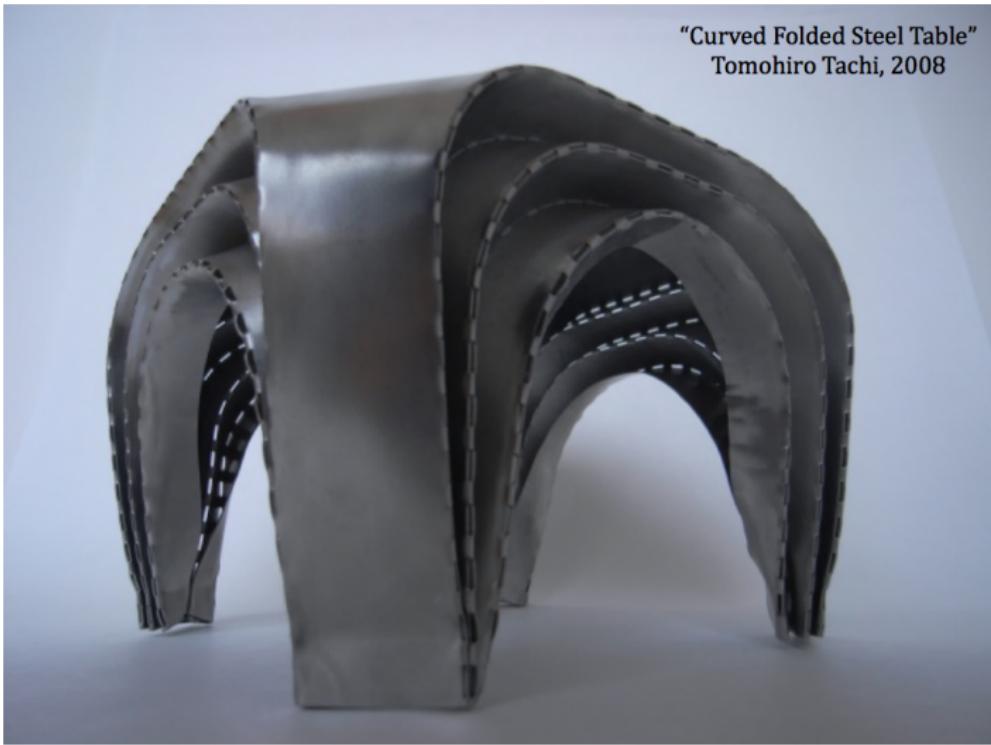


"Sheetseat"
Ufuk Keskin & Efecem Kutuk
2009



"Folded Steel Design Furniture Ideas: Unique Coffee Table"
Home Gallery Design
October 2010





"Curved Folded Steel Table"
Tomohiro Tachi, 2008

Metal Elephant

34



Metal Elephant Closeup

35



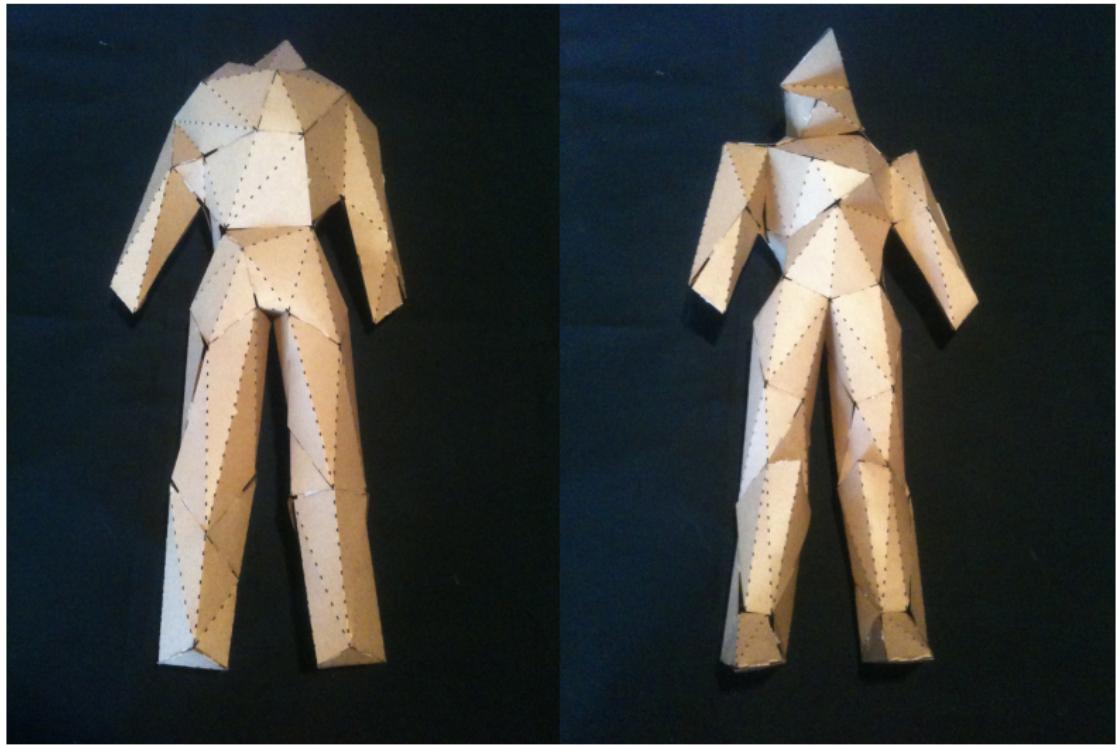
Inside Metal Elephant

36



Cheaper Attachments

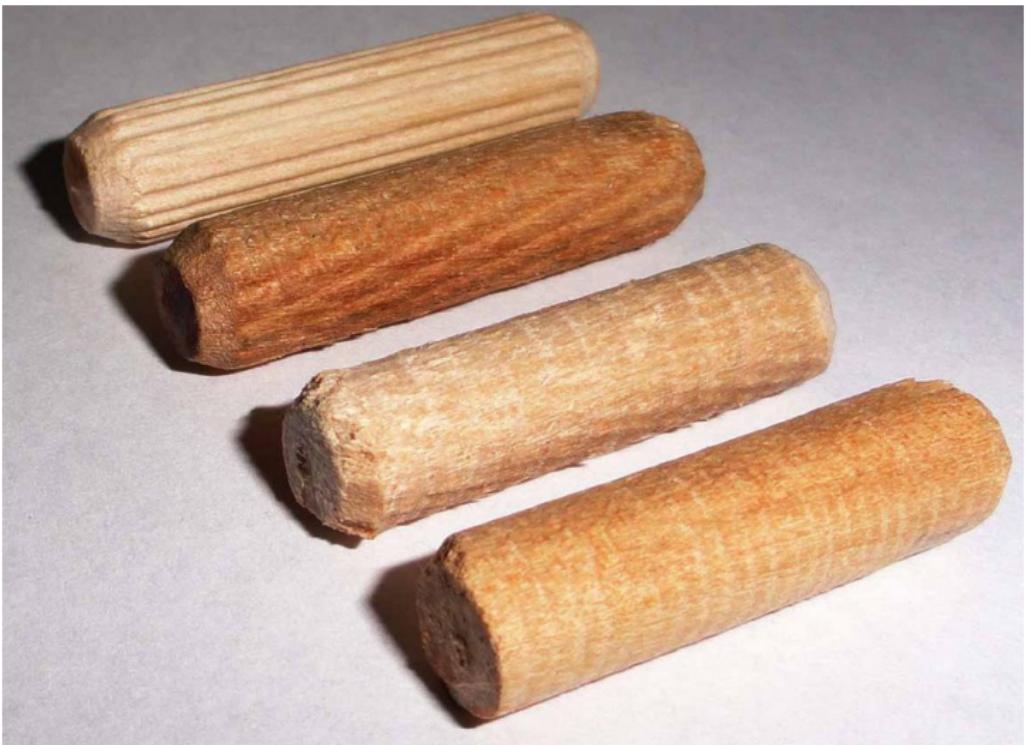
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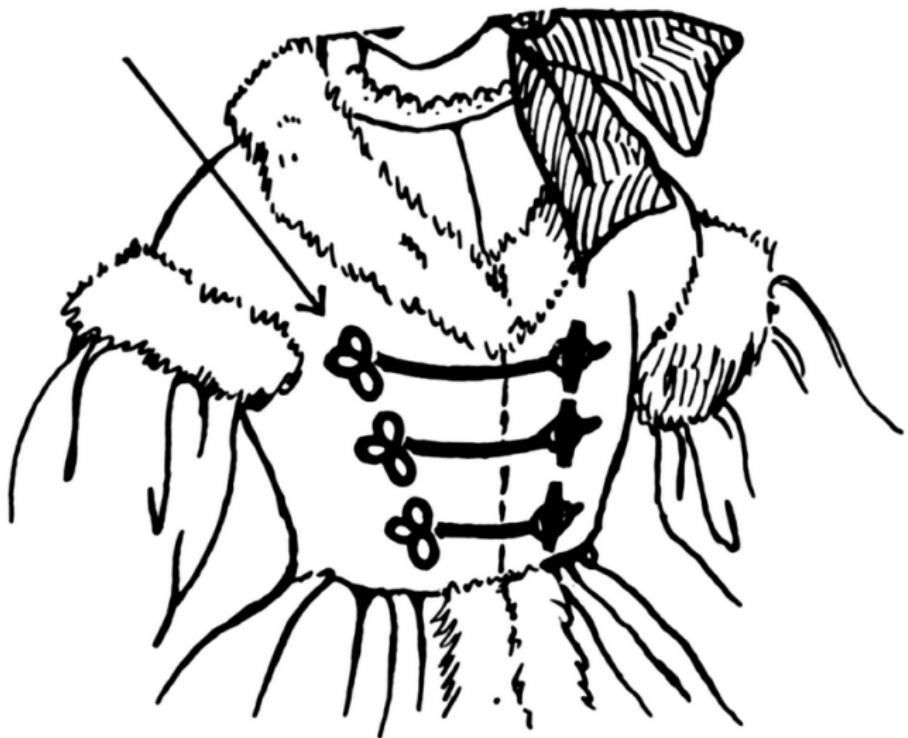


- additional hardware to join pieces together

dowel

39





rivet

41



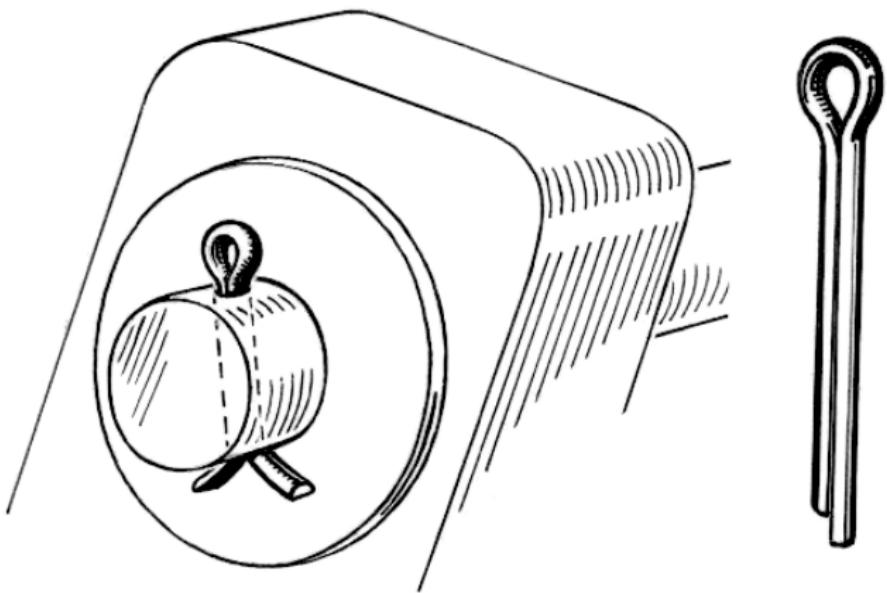
split pins

42



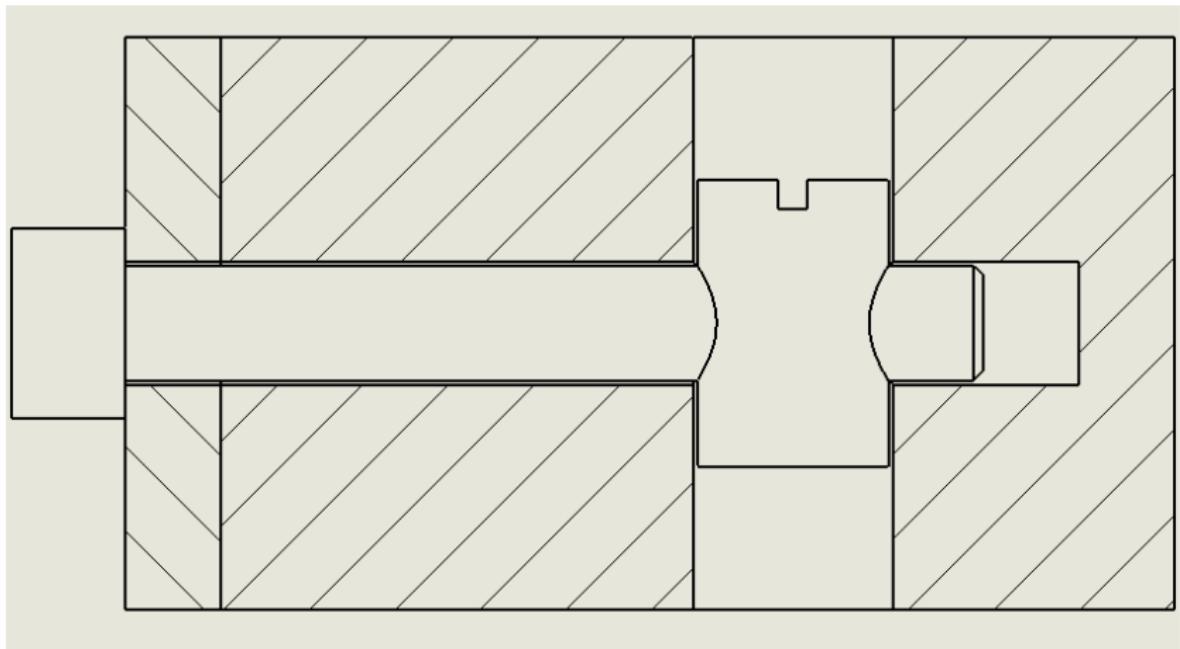
cotter pin

43



cross dowel

44



twist tie

45



zip tie

46



zipper

47



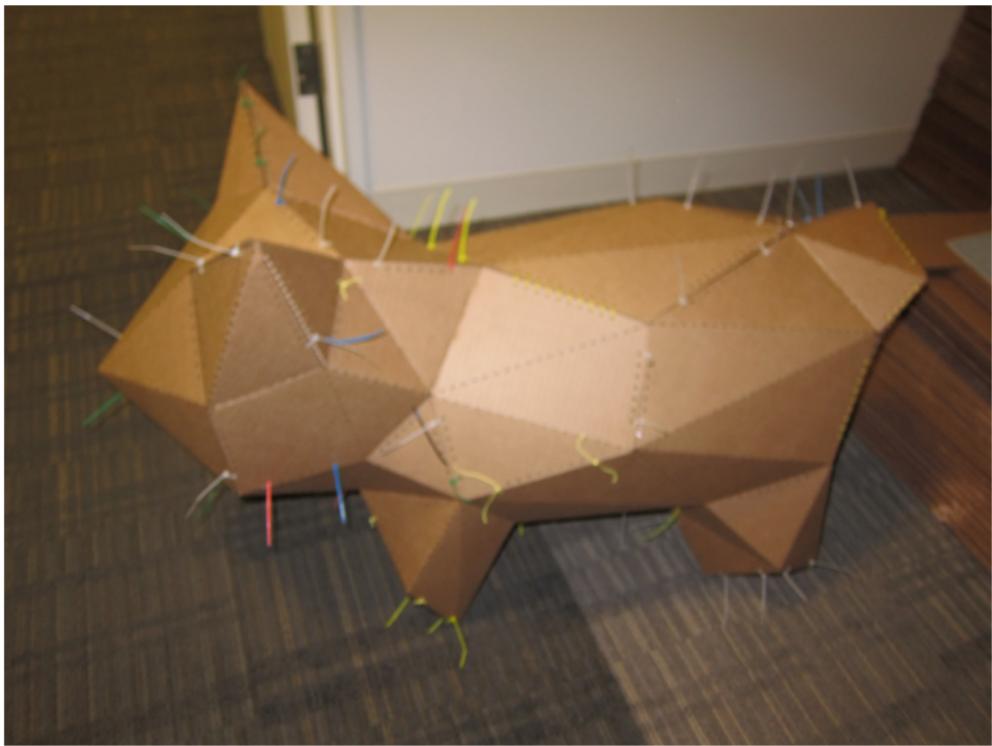
Stacking with Pegs

48



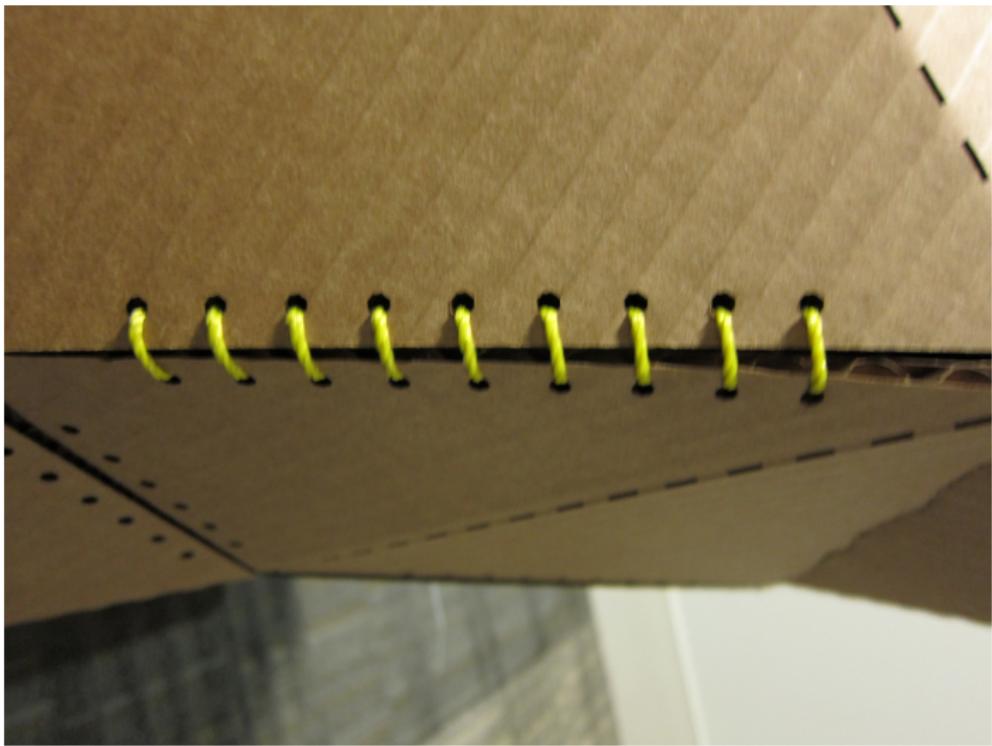
Lacing and Zip Ties

49



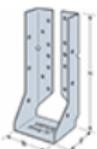
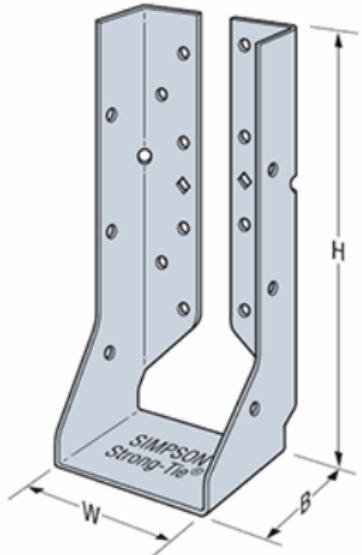
Lacing Close Up

50

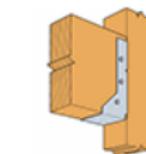




roll over images below to see larger image



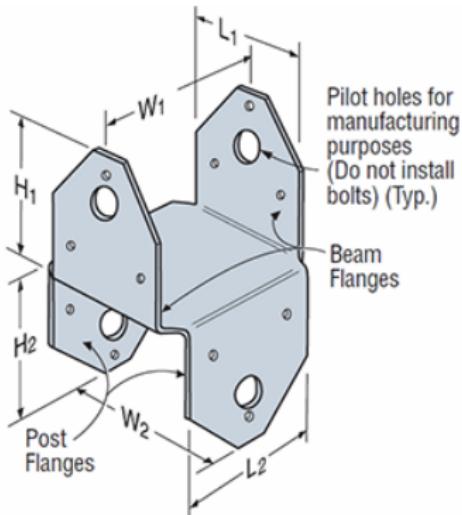
HUCQ410



Typical HUCQ
Installation on a Post



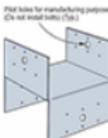
Typical HUCQ Installation
on a Beam



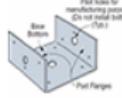
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BC4 Cap/Base
(BC6 similar)



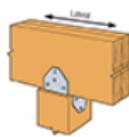
BC8 Cap/ Base



BC60 Half Base
(other similar)



BCS2-2/4



Typical BCS
Installation

tie

55



Rigid Tie® Connectors

RTC2Z Rigid Tie® Connector



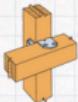
The new RTC2Z Rigid Tie® corner connector connects a 2x2, 2x3 or 2x4 vertical member to two 2x3 or greater horizontal members, forming a 90° corner.

WBSK Workbench and Shelving Hardware Kit



Hardware Kit contains complete hardware, fasteners and plans to build a workbench or shelving unit.

RTB22 Rigid Tie® Bracket



Provides a strong 90° connection between 2x2 members. Stronger than angled nailing or screw fastening. Ideal for home projects and repair.

RTC Rigid Tie® Corner Connectors



Provides a strong 90° connection between two 2x2s and a 2x2 post, forming a corner. Allows the fastening of smaller lumber without angled cuts or angled fastening that can split the wood. Ideal for the construction of workbenches and storage shelving units.

RTF Rigid Tie® Connectors



Provides a strong 90° connection between a 2x4 post and 2x cross-members. Eliminates angled fastening. Grips the cross-members on three sides for a sturdy connection.

Make:



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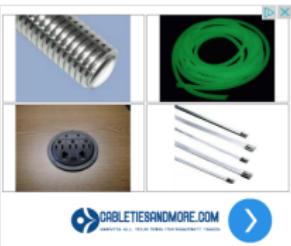
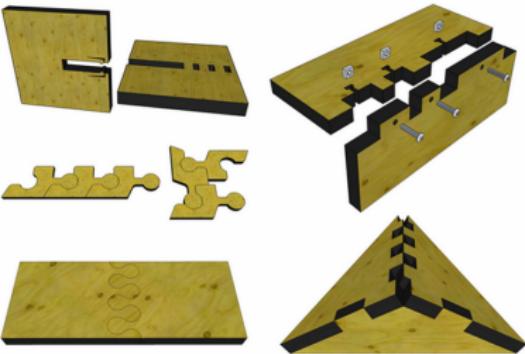


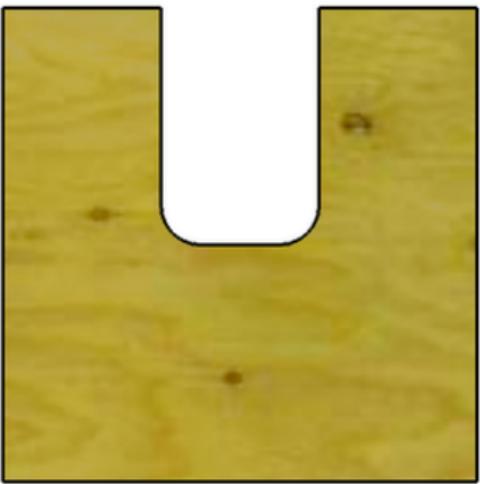
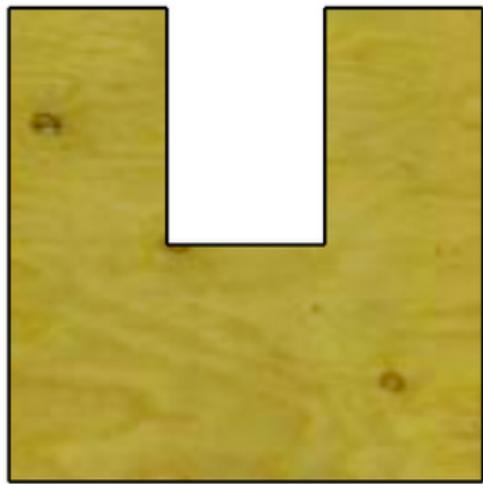
SHOP NOW

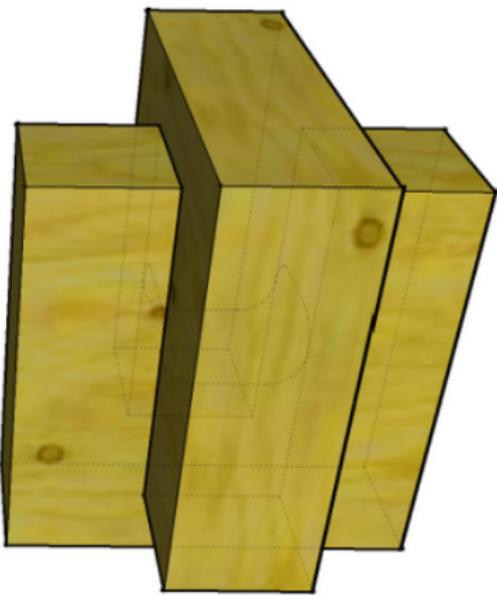
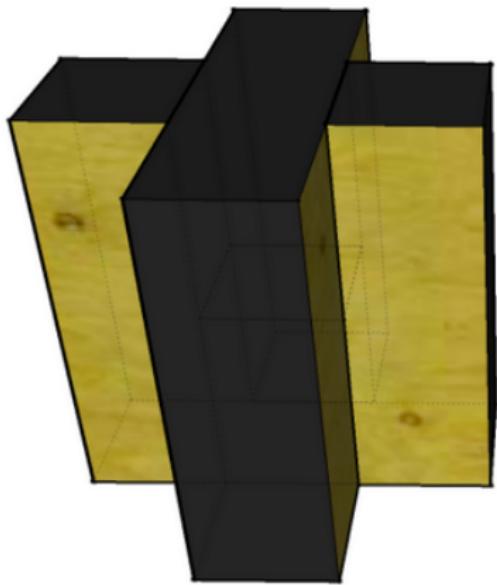
CNC Panel Joinery Notebook

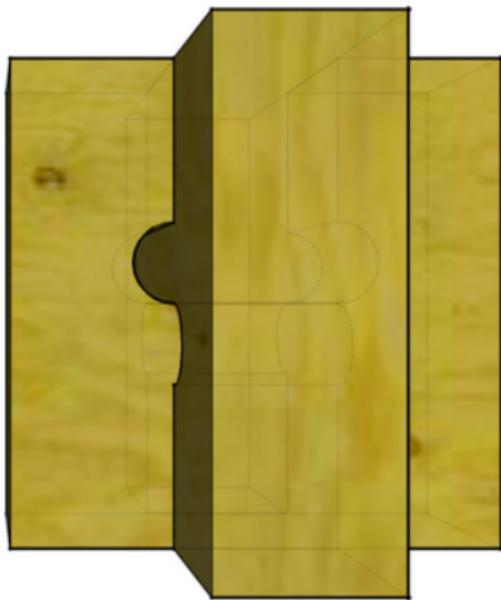
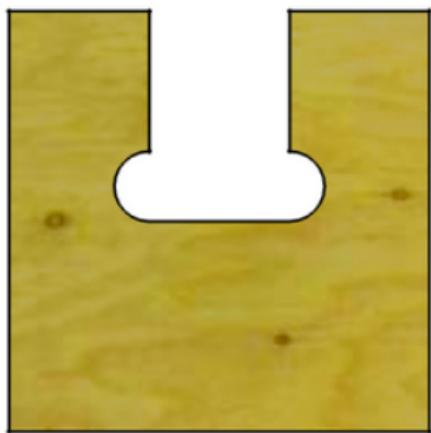
By Sean Michael Ragan April 13th, 2012 9:00 am Category 3D Printing, Woodworking, Workshop

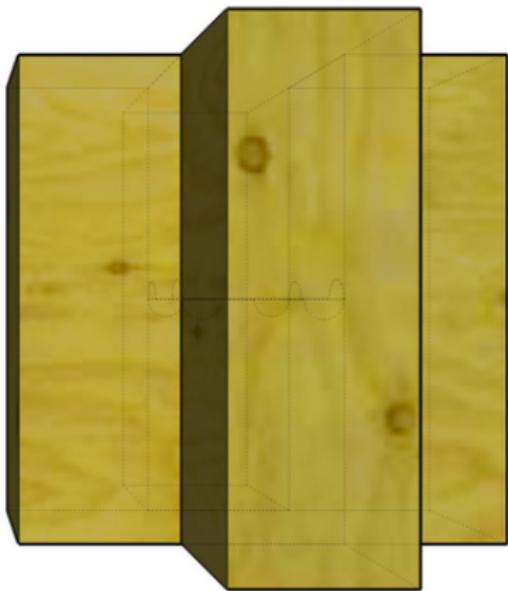
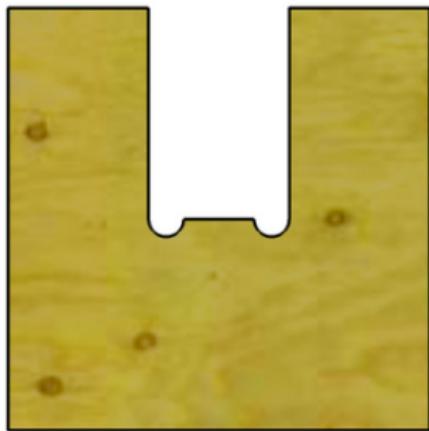
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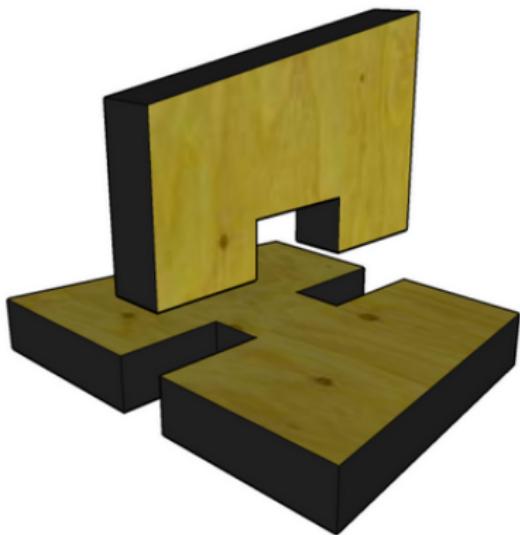




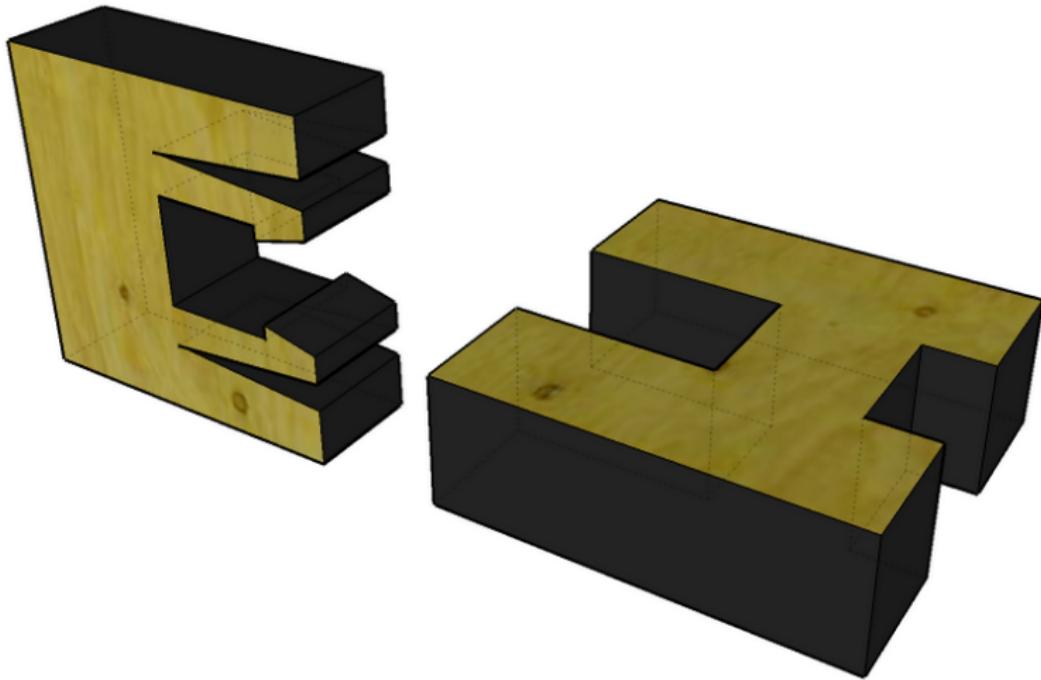


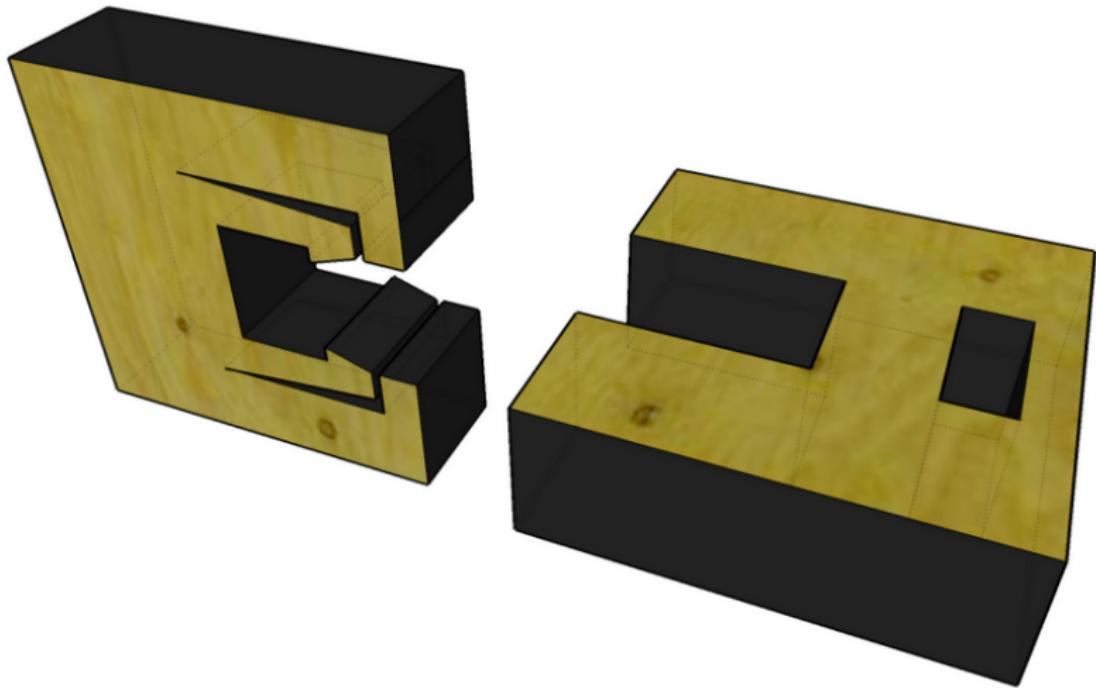


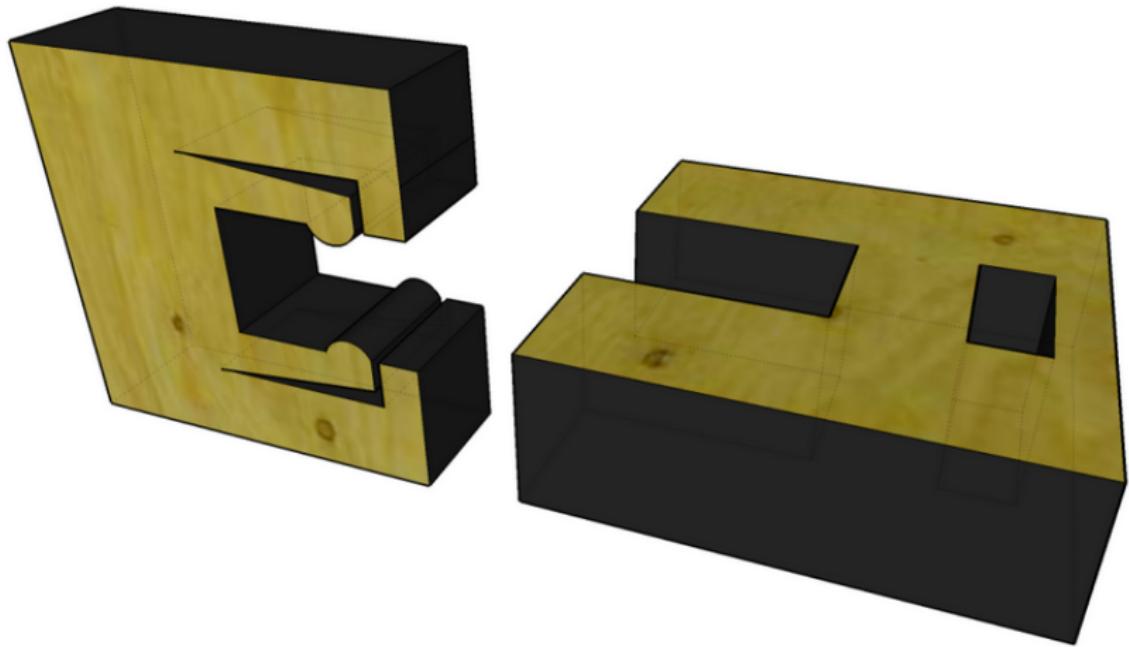


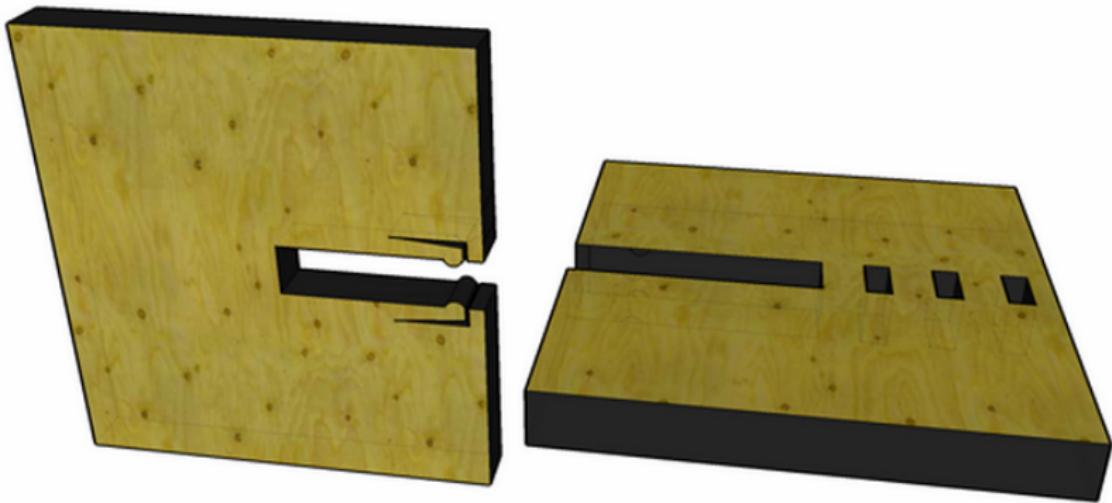




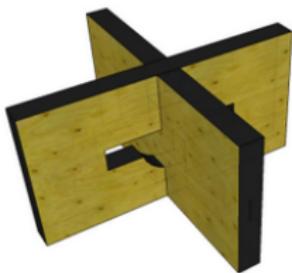
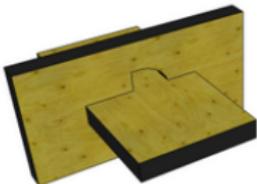
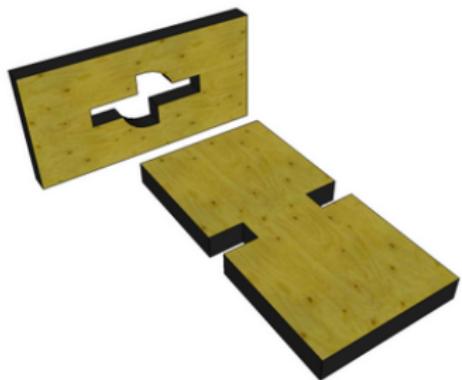






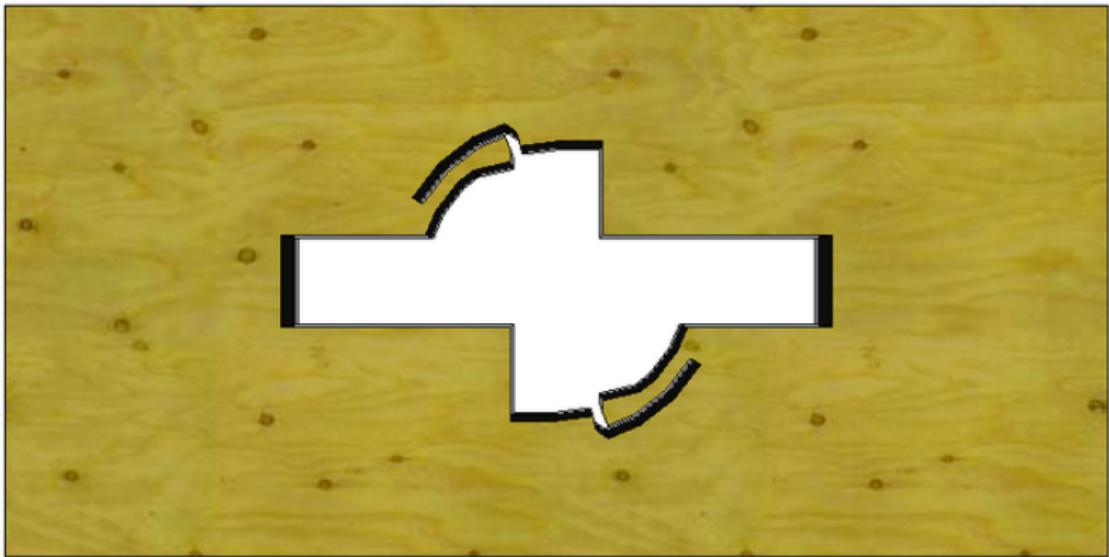






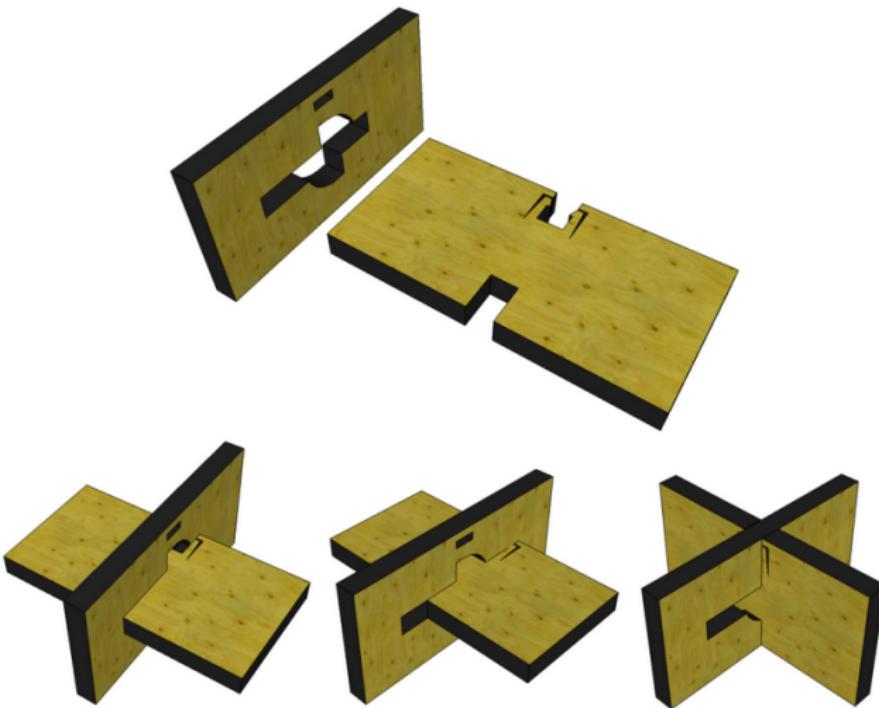
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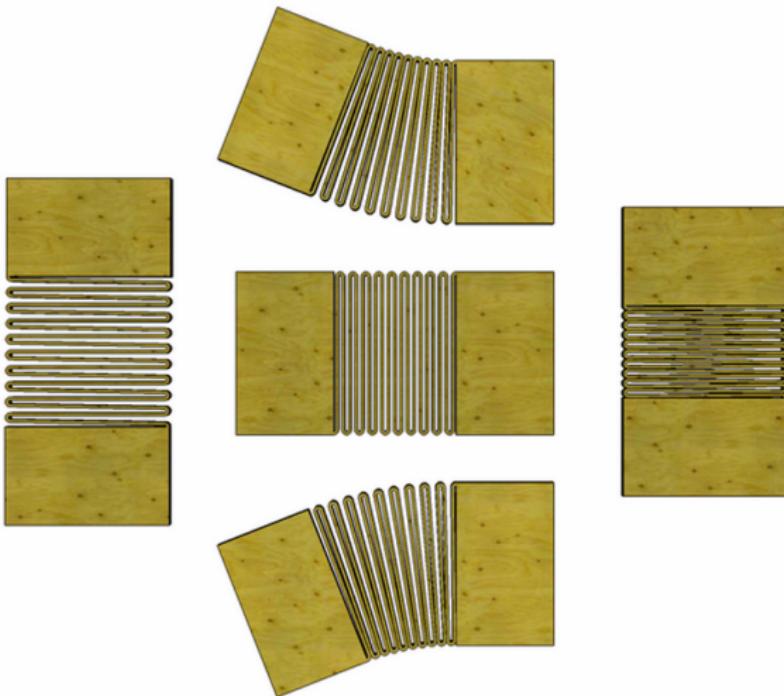


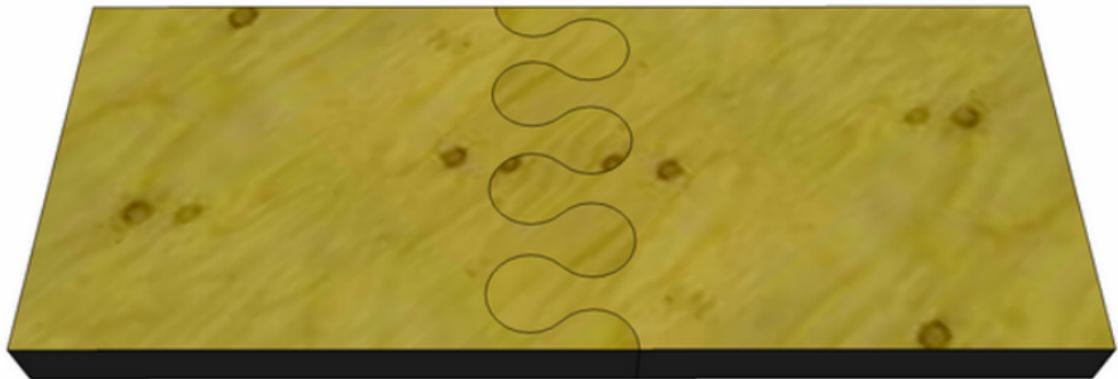
cross-x-joints-radial-snaps

73

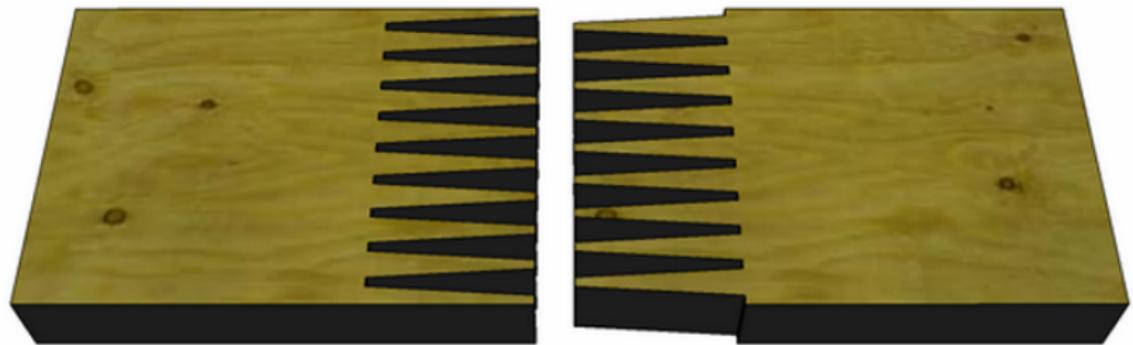




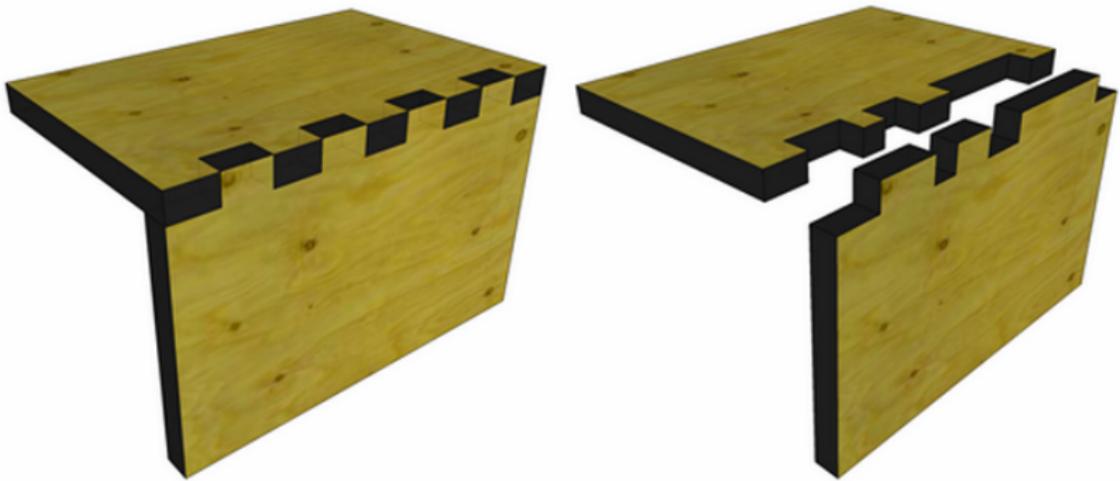




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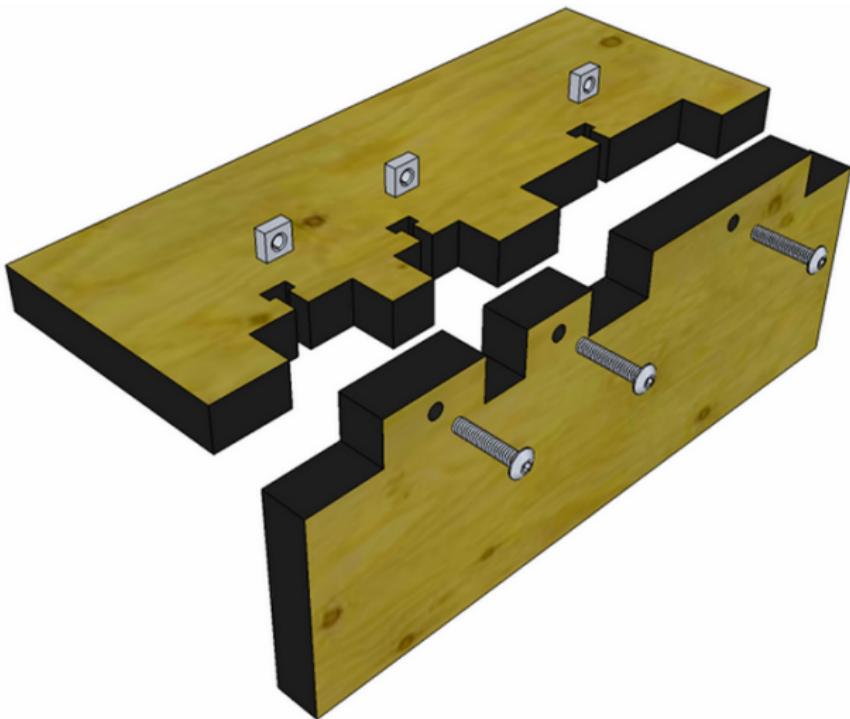
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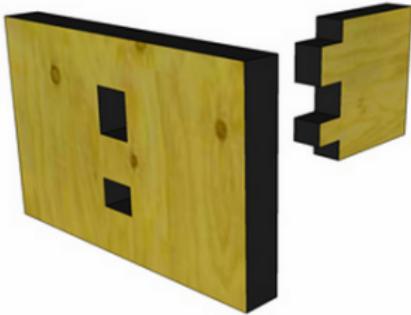
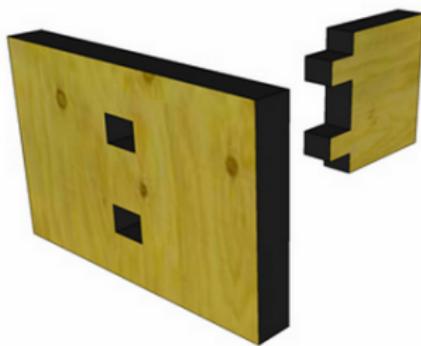


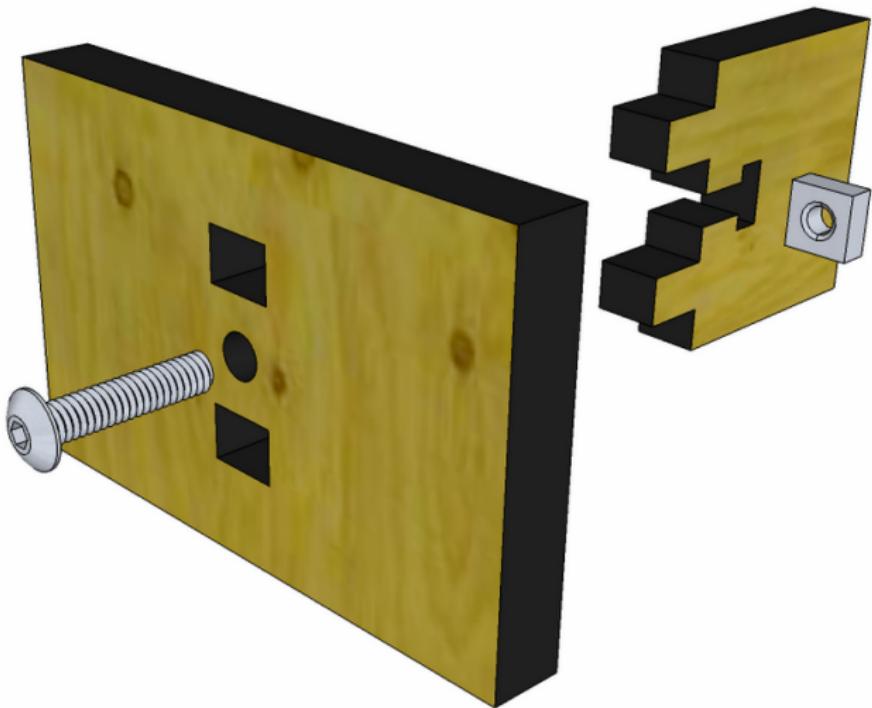
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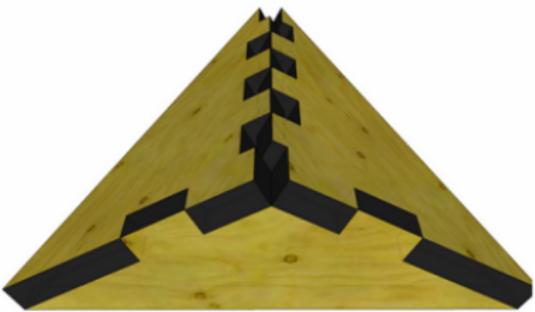
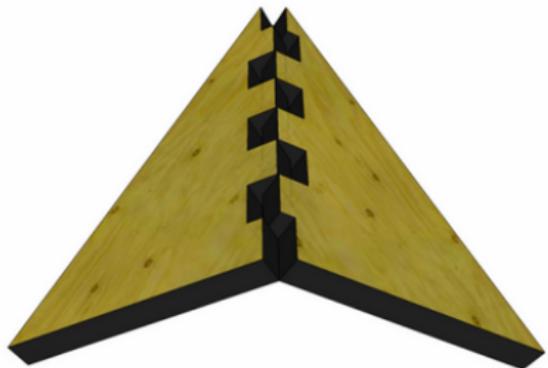
I-joints-box-captive-nut

79

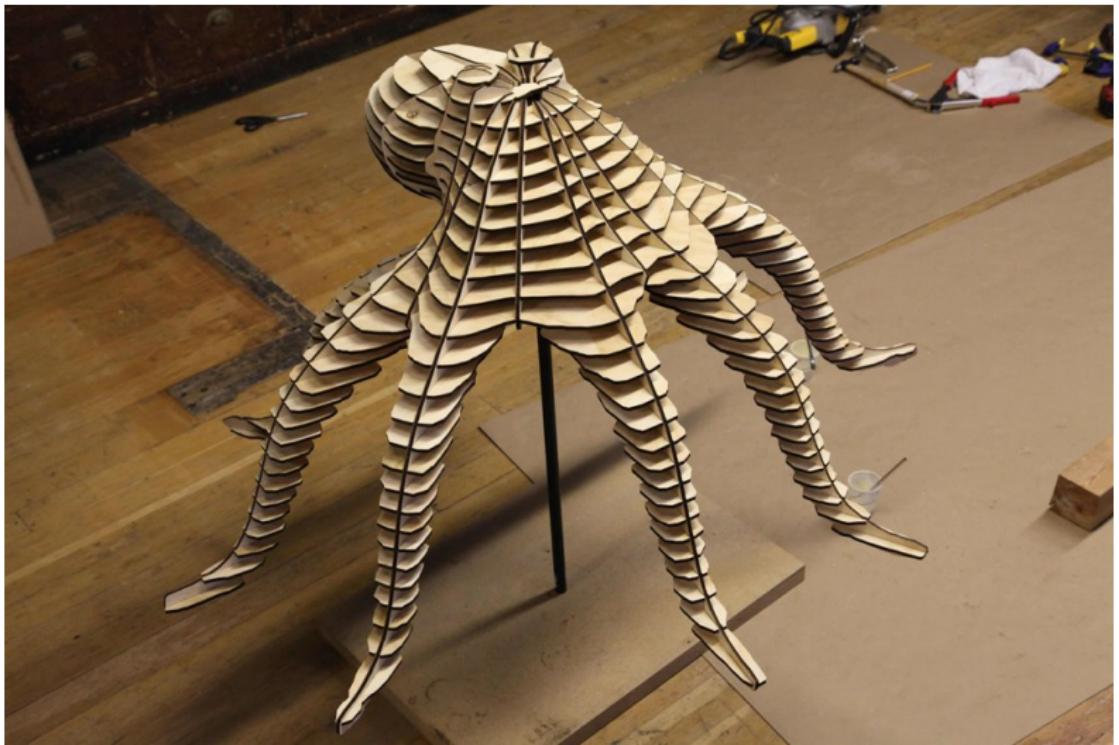








Sean Michael Ragan



- 2D Layout
- 3D Design and Geometry
- Review Reading 3

- *CNC Panel Joinery Notebook* by Sean Michael Ragan