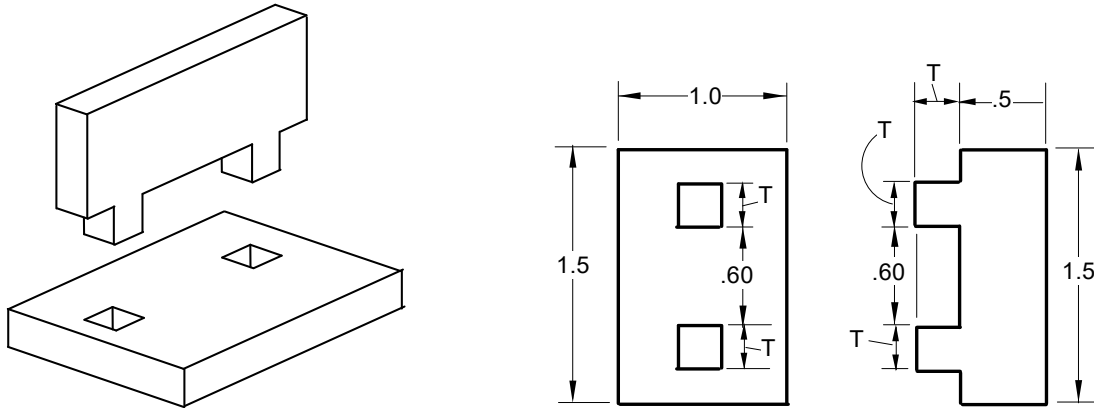


LAB 8 - SOLIDWORKS & MATING PARTS



ITEM LIST:

1. Laser cutter/engraver equipment; fume extractor
2. EngraveLab software, computer, USB flash drive
3. Wood
4. Solidworks

BACKGROUND

REFER to SOLIDWORKS GUIDE (Chap 1, 2, 3.2, part dimensioning)

REFER to wood medallion video (ignore the raster portion)

REFER to LASER handout (section 5.2 on Vector Cutting from SW)

Solidworks (SW) is a popular MCAD (mechanical CAD) program. We will create a couple of parts in SW that will assemble into an ASSEMBLY. We will then export that part geometry as DXF files and process those in Engrave Lab. Then we will cut the parts from wood on the laser and assemble them.

EXERCISE

First obtain a piece of wood. Measure its thickness (use thickness gage provided or a mechanical caliper). This dimension is the PLATE THICKNESS. This is the dimension labeled "T" in the given drawing.

In Solidworks create the following 2 parts which will be joined by a basic MORTISE hole and TENON tongue protrusion. We may simply call this TAB and SLOT joinery. We will use this basic type of joinery for making simple mechanisms (like a solar tracker!). For parts to be cut on the laser, we generally need to create geometry in Solidworks using EXTRUDES.

After creating the 2 parts in SW, create an assembly in SW. This is an essential step as it ensures that the dimensions and spacing are matched so the parts will assemble. This is the power of 3D solid modeling.

These mating parts require that the slot is bigger than the tab. In SW we could adjust the dimensions to ensure this happens. However, because of "KERF" (refer to the Epilog laser guide) which is material that is

destroyed in the cutting process, we may not have to make dimensional adjustments in SW. Kerf will make the tab smaller and the slot bigger. This helps ensure a "clearance" fit.

In SW, export the 2 geometries as DXF. Then import the 2 DXF files into Engrave Lab and set up a project so that you can vector cuts these parts on the laser.

Cut the parts and verify they fit together.

SUBMISSION

Show the physical assembly to the instructor to obtain credit.