



CHEMICAL PLANT ASSEMBLY GUIDE

Version 1.0

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Contains instructions for the assembly of printed terrain from the following Products:

- ▶ [Chemical Plant Bundle I](#)
- ▶ [Chemical Tank \(130mm\)](#)
- ▶ [Chemical Tank \(80mm\)](#)
- ▶ [Mixing Vat \(130mm\)](#)
- ▶ [Mixing Vat \(80mm\)](#)
- ▶ [Tank Catwalks](#)
- ▶ [Tank Lift](#)
- ▶ [Tank Platform](#)

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GENERAL ASSEMBLY

This guide will assist with the specific assembly of the associated files and cannot possibly address all issues that an individual may possibly encounter during printer. Individual results may vary according to printer, settings, software, and material used, so familiarity with your own printer is paramount.

PRINTING TIPS AND SETTINGS

- ▶ **Orientation:** All files are already arranged in the ideal position for printing.
- ▶ **Supports:** Designed to be printed without extra supports. Some files include built in supports that are easily removed with a hobby knife or clippers.
- ▶ **Layer Height:** 0.2mm except where mentioned.
- ▶ **Infil:** 10%. Some parts, such as the Beams, are better printed with 100% infil for sturdiness.
- ▶ **Thickness:** 0.8mm for bottom, top, and wall should work, but based on results consider 1.0mm or 1.2mm for the top for more consistent detail.
- ▶ **Adhesion:** A simple skirt should suffice, but in the event of adhesion issues for files with multiple small points and bridges, brim may be required.
- ▶ **Retraction Calibration:** These designs use complex shapes to include cylinders and the patterns for catwalk floors. It is recommended that you calibrate the retraction and flow rate settings for your particular printer to find the ideal results before attempting to print the files.
- ▶ **Elephant's Foot:** If the Initial Layer Horizontal Expansion, or "Elephant's Foot" causes a problem with assembly, try setting the first layer to -0.1mm or -0.15mm.

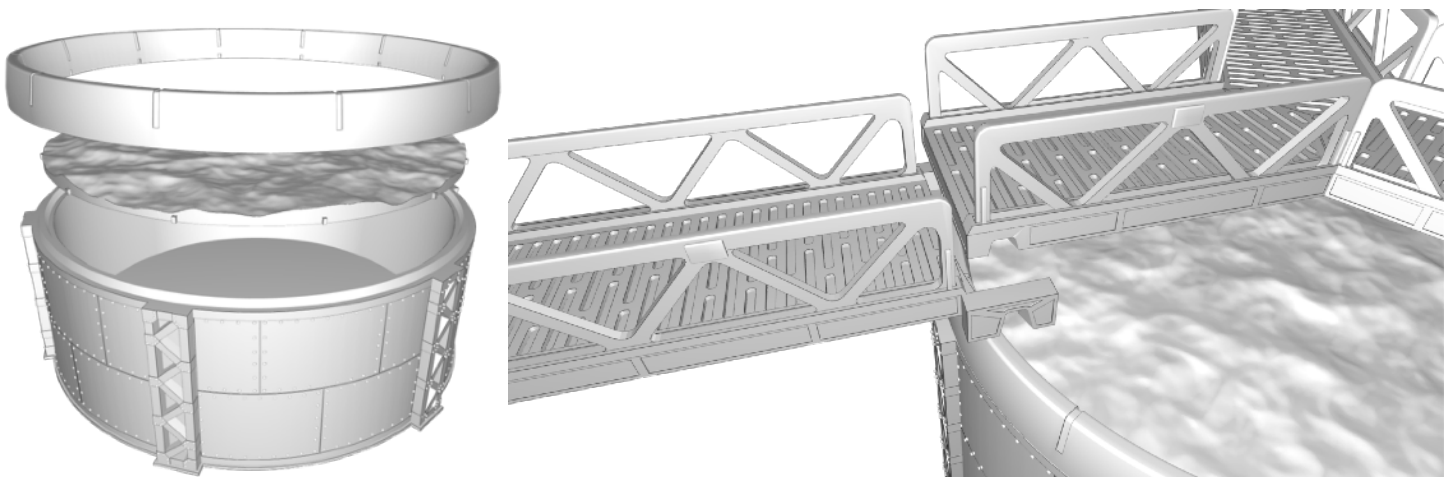
PREPARATION OF PARTS

- ▶ **Dry Fitting:** All files are designed with tolerances to allow for assembly with minimal sanding. Parts may be snug, so sanding and filing may be necessary. Always dry fit all parts before gluing or painting, and clean parts with some light soap and water to remove dust after sanding.
- ▶ **Painting:** Acrylic paints—whether applied by brush, airbrush, or aerosol spray can—are recommended with a matte sealer applied after painting. Avoid over over painting.
- ▶ **Gluing:** A small amount of cyanoacrylate (CA) glue is recommended—any brand should work.

PUTTING IT ALL TOGETHER

The Chemical Tank and Mixing Vat with an assembled Rim form the basis of all layouts in the Chemical Plant Bundle. They are designated as "Tank Type A" to differentiate from future products that may connect in different ways. Layouts are created by simply placing the grooves on the bottom of the components. Start by selecting a tank and rim of your choice. Components that connect tanks (ex. bridges) are placed first, followed by components that span a tank (ex. catwalks). It is often easier to put pieces together before placing on the rim.

Figure 1: General Assembly



RIMS AND INSERTS

Detailed Rims are best printed with 0.1mm-0.12mm layer height for crisper features. Options are included for one-piece prints as well as a version that uses slots to allow easier painting and even printing the parts in two different materials (ie. a solid rim and a transparent insert).

Figure 2: Rim and Insert Assembly

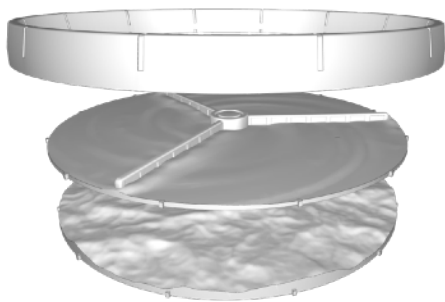
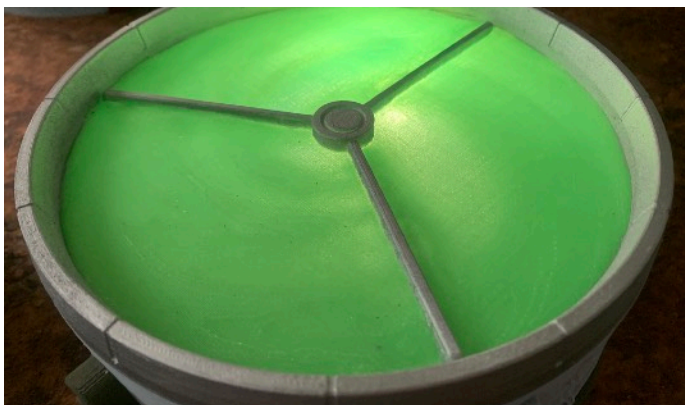


Figure 3: Mixing Rim in Translucent Green



Modeling Tip: Print with translucent filament and put a light inside the tank to make "glowing" liquid.

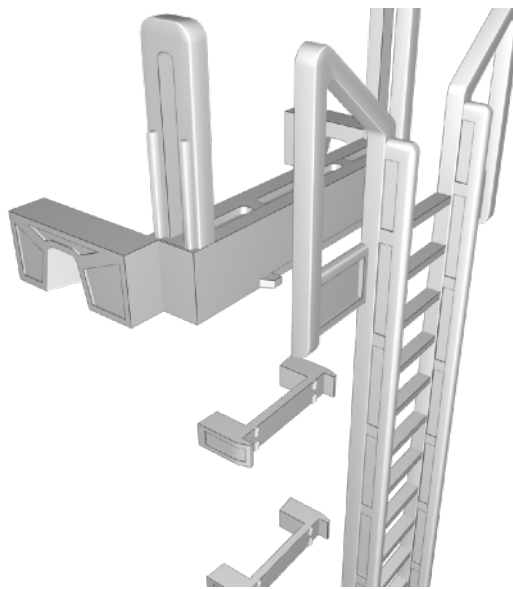
Figure 5: Railing Assembly Table

Component	A	B or C	D	E	F	G	H	I	J	K	L	M	N
<i>Junction</i>	1-2	1											
<i>Straight Catwalk</i>			2										
<i>"T" Catwalks</i>				1	2								
<i>"X" Catwalk</i>				3									
<i>"Y" Catwalk</i>						6							
<i>60-Degree Catwalk</i>						2	2						
<i>90-Degree Catwalk</i>				2	2								
<i>Qtr Catwalk A</i>								1	2				
<i>Qtr Catwalk B,C</i>									2				
<i>Catwalk Ends (A,B,C)</i>										1			
<i>125mm Bridge</i>											2		
<i>70mm Bridge</i>												2	
<i>Platforms</i>													8

LADDERS

Ladders are available for both the "80mm" and "130mm" versions of the tanks, that use some parts in common. When using the optional Ladder Brackets with the Mixing Vat, be sure to check placement before gluing to ensure that the detail on the side of the tank does not interfere with use.

Figure 4: Ladder Assembly



BRIDGES & CATWALKS

Some components share railings in common, but for the sake of organization and ease of use, catwalks and their required railings are grouped together in the folder hierarchy. For an additional reference, consult the Rail Assembly Table below for the types and quantities of railing required for each component.

The bridges and most catwalks only require gluing the proper railings into the slots. The 60- and 90-degree bend catwalks also require gluing a support beam (*SupportBeamB.stl*) to the bottom.

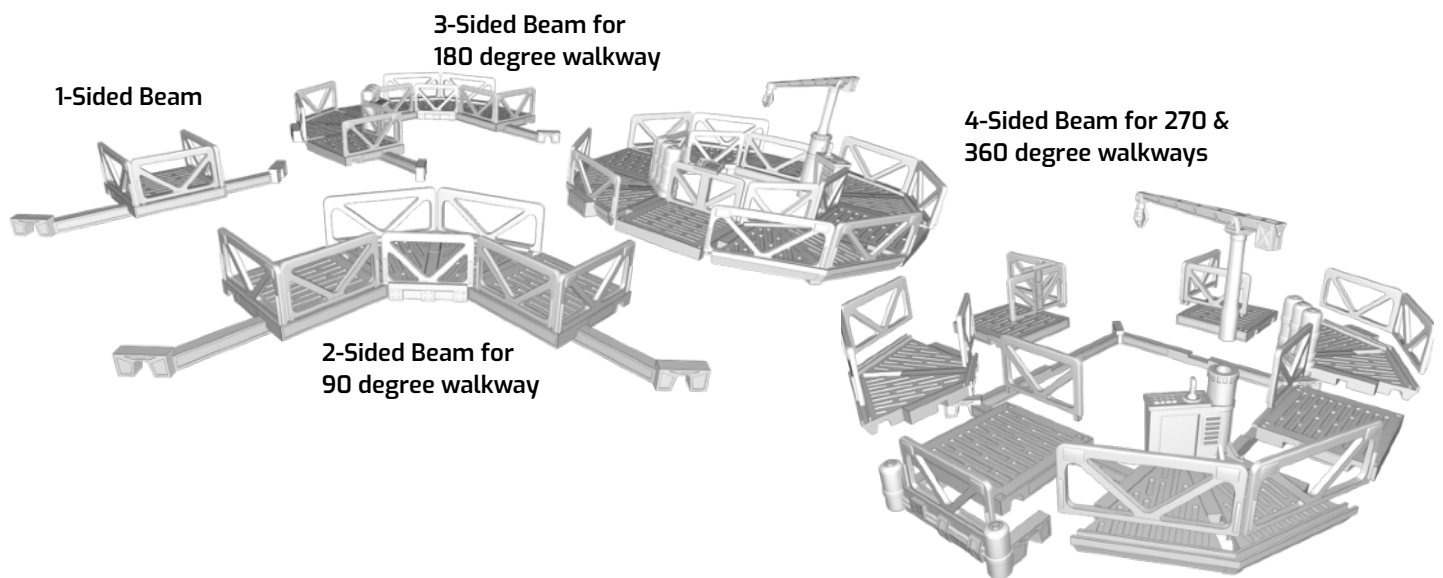
“QUARTER” CATWALKS

The “Quarter” Catwalks system creates more options for topping the tanks. Assembly is accomplished by using a support beam and placing the Junction and Quarter walkways on top using the slots on their bottoms. Junction railings use pegs instead of slots to allow for changes between use. The pegs should be

snug but may require some sanding. All Parts will fit tightly and will not require glue to keep the catwalk assembled, even during play. The number of Junctions and Quarter walkways used depends on the number of sides of the support beam. Other components such as catwalk ends, bridges, and stairs connect to the outer side of the Junction as in the General Assembly.

Printer Recommendation: Print *QtrWalkB.stl*, *QtrWalkC.stl*, and *QtrWalkCBoom.stl* with 0.1-0.12mm layer height for better detail. Print all Support Beams with a solid Infil for durability and to prevent sagging.

Figure 6: Quarter Catwalk Assembly



STAIRS

All required files to assemble the stairs are located in the *Stair* folder. The main building block of most stairs is the *StairJointA.stl* file. This piece is affixed to the top of the regular 15mm and 80mm Stair variants. *StairJointA* is also used on the top and bottom of the 80-130mm Stairs, which connect the 80mm and 130mm tanks. While the slot is tight enough that glue may not be necessary, it is recommended to use glue for better adhesion of the railings on the sides of the stairs. The same slot is found on landing pieces and the Bridge-Stairs, so assembly of these components is similar.

Assembly Option: Use *Stair80.stl* on one side of the Bridge-Stairs and *Stair80-130.stl* on the other to link a pair of 80mm tanks to a 130mm tank.

Figure 7: General Stair Assembly

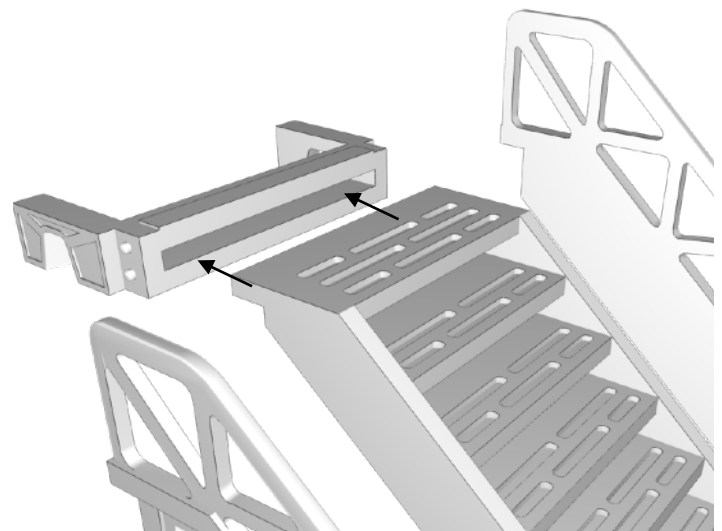
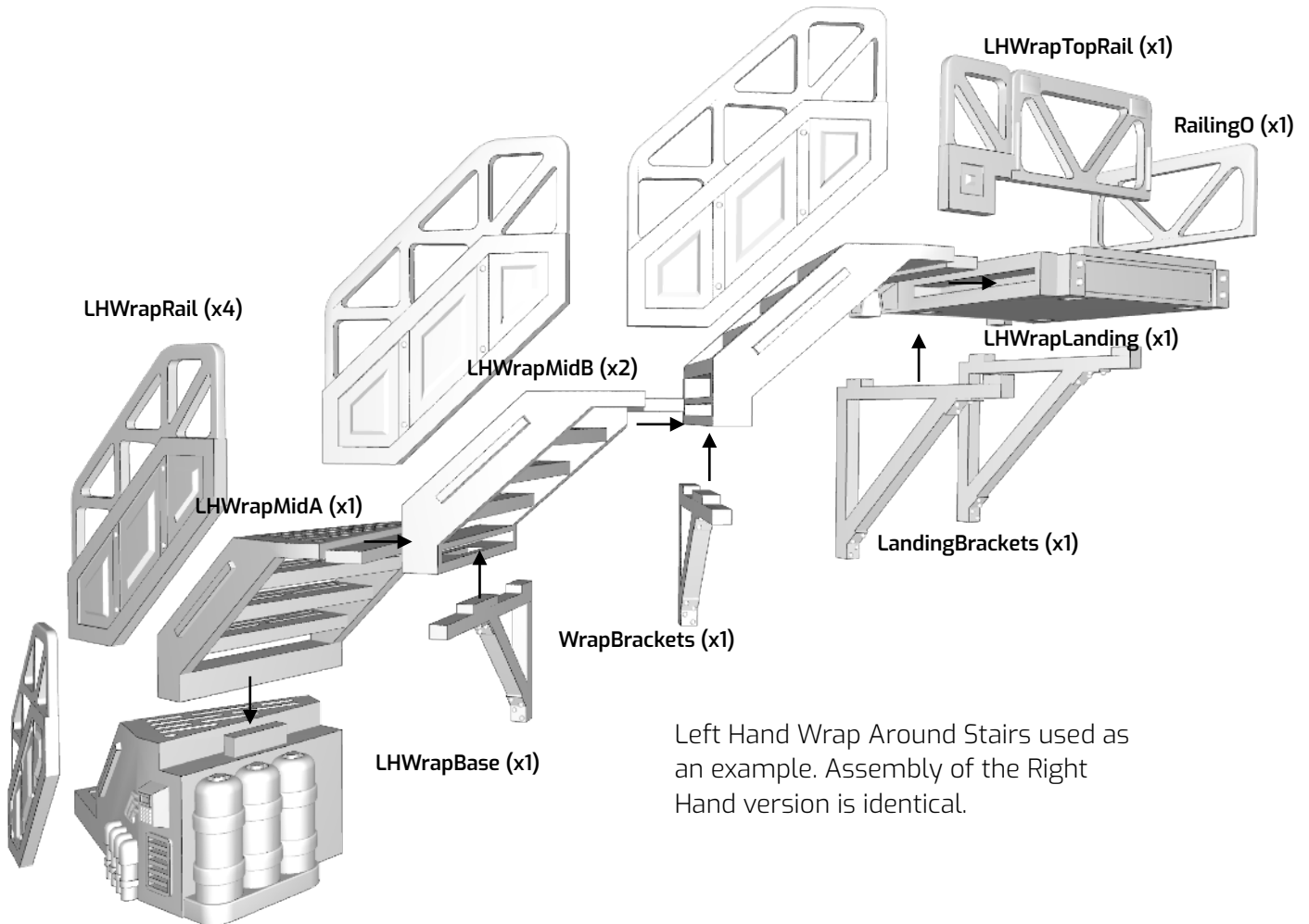


Figure 8: Wrap Around Assembly



LIFTS

There are two versions of the Lift—one with vertical beams with “single-sided” details and one with “double-sided” details. Both versions use the same platform, top, and base, and assembly is nearly identical. Line up all side pieces in the appropriate slots to check fit before gluing. The platform slides up and down on the assembled side beams, so painting (at least base coating) is recommended before assembly. Note that the entrances on the base and top of the lift face opposite directions. To lock the platform in place when raised, slide it forward into the notch. Dry-fitting and sanding before painting is critical to ensure smooth operation of the lift.

Modeling Tip: Place bridal mesh or lace between 2-sided beams and sand edges for a wire mesh look. Use left over 3D printing skirt material near the ends of the beams to help with gluing the mesh in place.

Figure 9: Lift Assembly

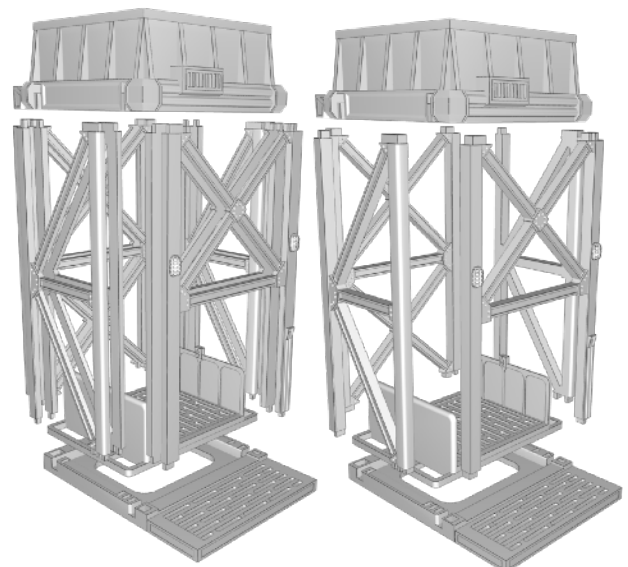


Figure 10: Raised Lift

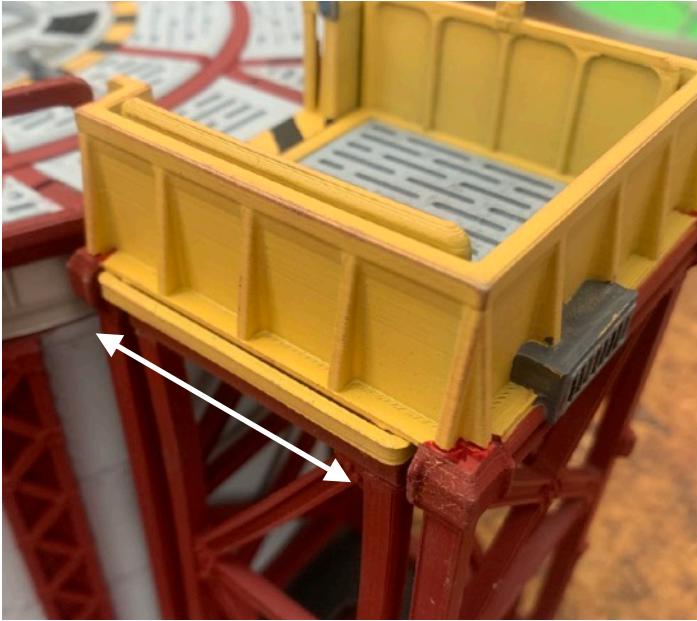


Figure 11: Lift with "Wire" Mesh

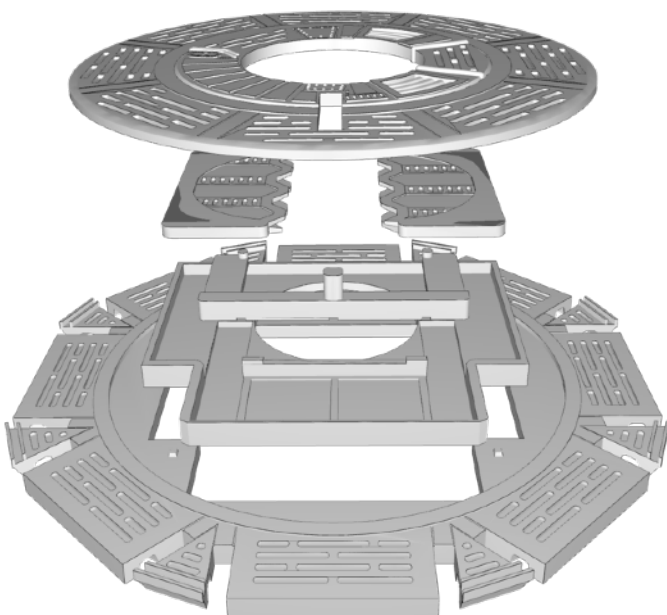


PLATFORMS

The Tank Platform has 8 openings for attaching bridges, stairs, ladders, and catwalk ends. Position the desired components, and then place the entire assembly on the Rim of your choice. Platforms use eight (x8) of *RailingN.stl*.

Dry-fitting and testing of the mechanisms is extremely important when assembling the working versions of the Tank Platform. Base coating, at a

Figure 12: Sliding Hatch Assembly



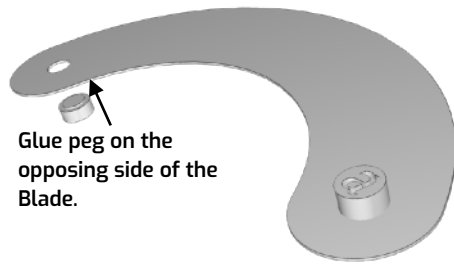
minimum, should be done before final assembly to ensure smooth operation. Avoid overpainting. Always ensure that the mechanism is functioning properly before gluing. When assembling the Sliding Hatch and Iris platforms, the casing for the assembled mechanism will extend below platform. This is normal and should not interfere with placing the platform on the rim.

IRIS HATCH

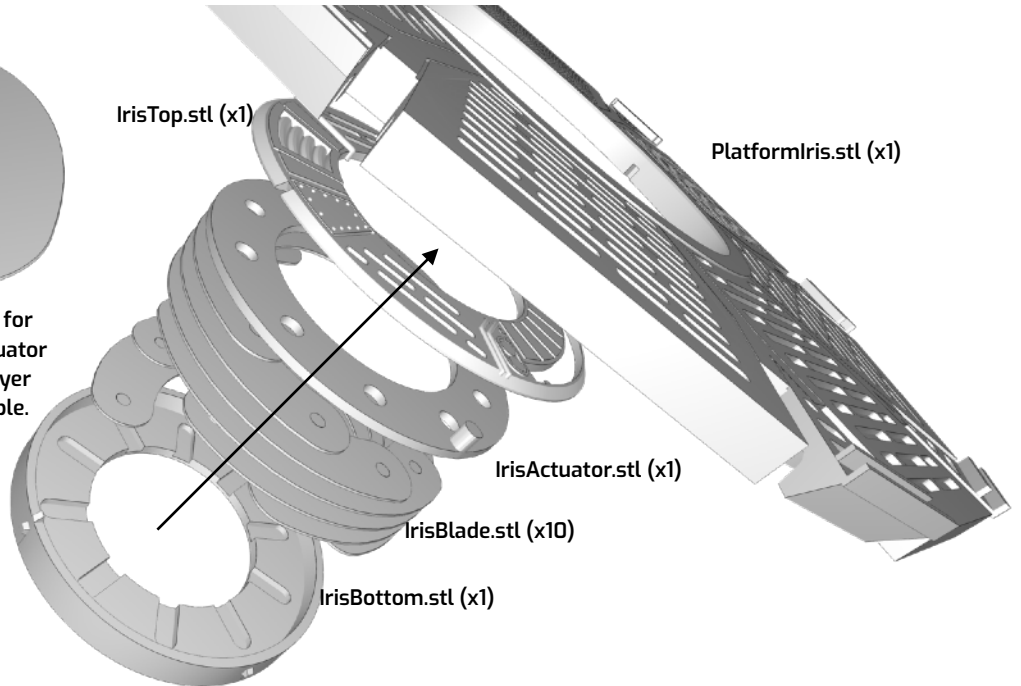
The notch that holds the iris closed is printed to be tight, but may require sanding or trimming with a knife for just the right tension. Note that when closed, the iris will still have about a 1mm gap. This is intentional as a negative closing or "light-tight" iris requires a double blade design which does not have the same look as a standard iris.

Printer Recommendation: The Iris blades are only 0.3mm thick, so they should be printed at a 0.1mm layer height if at all possible.

Figure 13: Iris Hatch Assembly



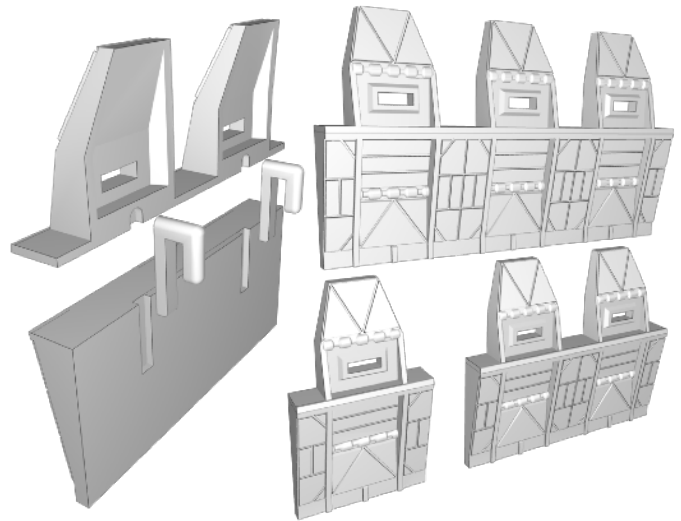
"a" Peg is marked for insertion into actuator to keep the top layer of the blades visible.



BARRICADES

Align and glue part A and B together along with the clips on the reverse side of the barricade. The 25mm wide barricade uses one clip; the 50mm, two; and the 75mm, three. With the repeating pattern, barricades of different sizes can be placed next to each other and combined to make larger obstacles.

Figure 14: Barricade Assembly



FILE DIRECTORY

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Barricade50mmB.stl	✓					✓		
Barricade75mmA.stl	✓					✓		
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WalkQtrCBoom.stl	✓					✓		
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LadderPlatform.stl	✓	✓	✓	✓	✓			
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RimFullFlat.stl	✓	✓	✓					✓
RimMixingDetail.stl	✓			✓	✓			✓
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Stair80.stl	✓		✓		✓	✓		
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MixingVat130mm.stl	✓			✓				