



FABRICATION AND ASSEMBLY INSTRUCTIONS

A Verdevis™ growing unit is easy to make and assemble. The parts include:

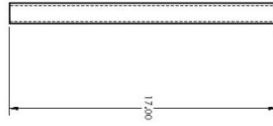
- Four poles
- Two shelves
- A holder for the light socket and light.
- An LED light and a socket with electrical cord.
- O-Rings
- Four feet
- Four optional caps, which finish off the unit.

The fully assembled unit looks like this:



FABRICATION AND/OR SOURCE OF UNIT COMPONENTS

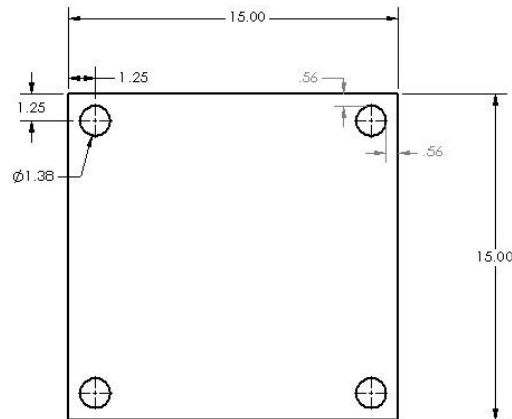
Four Poles



The 17" long poles can be easily created out of various materials. We use 1 inch Schedule 40 Polyvinyl Chloride (PVC) pipe, which has an outside diameter of 1-5/16" (1.315 in.). The pipes do not come in the desired length so we cut them into 17" long pieces using a hand saw and miter box. The PVC pipes can be ordered from a vendor such as formufit.com where they come in clear, white, and various colors. Plain white PVC is also typically available off the shelf from hardware stores.

Different materials can be used for the poles, such as wooden dowels or even bamboo.

Two Shelves for the Top and Base



The two shelves are 15" x 15" square, and can be made from a variety of materials. We use 1/4" thick high-density polyethylene (HDPE) smooth plastic from our local plastics shop (Tap Plastics: www.tapplastics.com) and have the squares cut there. The 1/4" thickness provides optimal rigidity and the white color reflects light, aiding plant growth. HDPE is also food safe and is water resistant.

LED Light and Light Socket with Cord

The unit uses an LED light and a socket with an electrical cord. We tested many lights and chose the Mudder E27 (shown below) because of its high luminous efficiency, color distribution, energy efficiency, longevity, and low cost. It is readily available and works with a standard light socket. Different lights can be used.



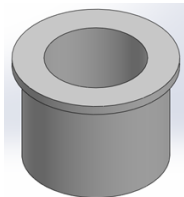
Mudder E27 5W LED Grow Light

The light socket and cord we use is the “IKEA Hemma Ceiling Pendant Lamp Light Cord Set with Bulb Socket.” It has a 15 foot cord, which offers flexibility in placing the unit. (Note: The cords can become somewhat unwieldy when a multi-unit system is created, but tying up any excess cord with twisty ties solves this issue.)



Feet

Four feet, which are placed at the end of each pole below the bottom shelf, stabilize the unit and give it a clean look. We use 1.5 in by 1 in Schedule 40 PVC pipe fittings. These can be purchased on-line or at most hardware stores.



Caps

Four caps can be placed on the tops of the poles to give the unit an even cleaner look. We use “1 in. Furniture Grade PVC Internal Domed End Caps” caps from formufit.com.



O-Rings

O-Rings are placed on the poles to hold up the light holder (2 rings), to hold up the top shelf (4 rings), and to support the bottom shelf (4 rings). For the poles we use, standard O-Rings of the following size work well: 1 ¼” inner diameter, 1 7/16” outer diameter by 3/32” wall.



Couplings for Multi-Unit Systems

When multiple systems are joined to create a second level, couplings are placed on the tops of the poles to allow another pole to be added. We use PVC couplings, specifically a 1 in. Schedule 40 PVC coupling, and insert a pole into either end.



Note that when creating a multi-unit system, horizontally adjacent units share poles to the side, and vertically adjacent units share shelves (the upper shelf on the lower unit is the bottom shelf of the upper unit.) This saves material.

STEPS FOR ASSEMBLING THE UNIT

- (1) Place the four feet on a flat surface.
- (2) Place a pole in each of the feet.
- (3) Using the holes as guides, place one shelf on top of the feet.
- (4) Place O-Rings on top of this lower shelf on each pole to stabilize the shelf.
- (5) Place an O-Ring on *two opposite poles*, 3” to 4” from the top of the poles.
- (6) Place the HDPE light holder on top of the O-Rings.
- (7) Place an O-Ring *above* the light holder on *each of the four poles*, 1 to 2” from the top of the unit. Place additional O-Rings above the shelf on each pole.
- (8) Unscrew the “band” around the light socket, and place the part with the cord on top of the center hole in the light holder, and then secure it in place by using the band on the bottom of the light holder (i.e., screw it back into the socket).
- (9) Screw in the LED bulb.
- (10) Place the top shelf on the four O-Rings, and adjust as needed to accommodate the light cord.
- (11) Place the caps on the top of each pole.

Note – additional O-Rings can be used to stabilize the unit, but this is usually not necessary.

STEPS FOR ASSEMBLING A MULTI-UNIT SYSTEM

Multi-unit systems are assembled by joining individual units horizontally or vertically. In a multi-unit system, poles are shared, as are shelves. For example, a three unit system (as shown below) requires: 10 poles; 5 shelves; 6 feet, 6 end caps; and 4 connectors. If these three units were set-up individually, 12 poles, 6 shelves, 12 feet, 12 end caps, and no connectors would be required.

