

## Poly Panels:

How to build a poly-cylindrical diffusor:

Materials:

1. TEMPERED MASONITE or plywood, usually 3mm (1/8 inch) as thicker is more difficult to handle and requires more strength in frame construction. Not Pegboard.

2. 2X4 AND 2X2 inch lumber for an open mount **or** 6x1 inch finish and 2x2s for a shadow-box. The lumber needs be reasonably straight, otherwise select for appearance.



3. 100mm (4") thick Owens-Corning 703 or similar (48kg/m<sup>3</sup>) density.

The purpose of the unit is to provide high end dispersion and low end absorption in one device.

These ends are accomplished by suspending a sheet of Masonite by it's **vertical edges** (only), bowed

out about 15cm (6 inches) between the vertical sides of the mount, and free to vibrate at all points except the vertical edges.



When the sheet is compressed between side boards at 118cm (46-1/2 inches), it takes the shape of an ellipse, reflecting medium to high frequency sound at all possible angles from 0 to 30 degrees, as an ellipse is made up of parts of an infinite number of circles, as with the edge of a football. This works with any width of panel - make the inside of the vertical mounts **3% less** than the width of the panel.

While 15cm (6") is not the only possible build-out, is a rational

design as it is reasonably inconspicuous, forms a good ellipse, and exerts manageable side forces on the mount. These forces become



excessive at lower figures, although they lessen as the plywood or Masonite warps to form, and at about 30cm (one foot) the panel starts to become a semi-circle, which yields poorer diffusion, and probably less bass absorption.

PLACEMENT, MOUNTING, APPEARANCE: Although polys will work as dispersers in any location and size, both are important to bass absorption.

Defining a corner as two walls at 90 degrees, bass collects in corners as it compresses into

them, so polys in or across corners yields maximum absorption. Additionally, corners reflect multi phase comb filtered top end, which sounds bad, and polys cure that as well as killing excess bass. So you get a bonus.



Still further, polys in corners appear to work at lower frequencies than when wall mounted, provided only that the walls forming the corner be (at least) as long as the polys' maximum diagonal, which makes ceiling to wall installation attractive as short polys can be mounted over the length of a wall at the ceiling line.

Mounting as such can be done by simply beveling one edge of the 2x2s, screwing them onto a wall and squeezing plywood or Masonite between them. It is very important to keep the panel clear bottom and top, and allow generous air flow behind it, as either done wrong will partially cripple bass absorption.

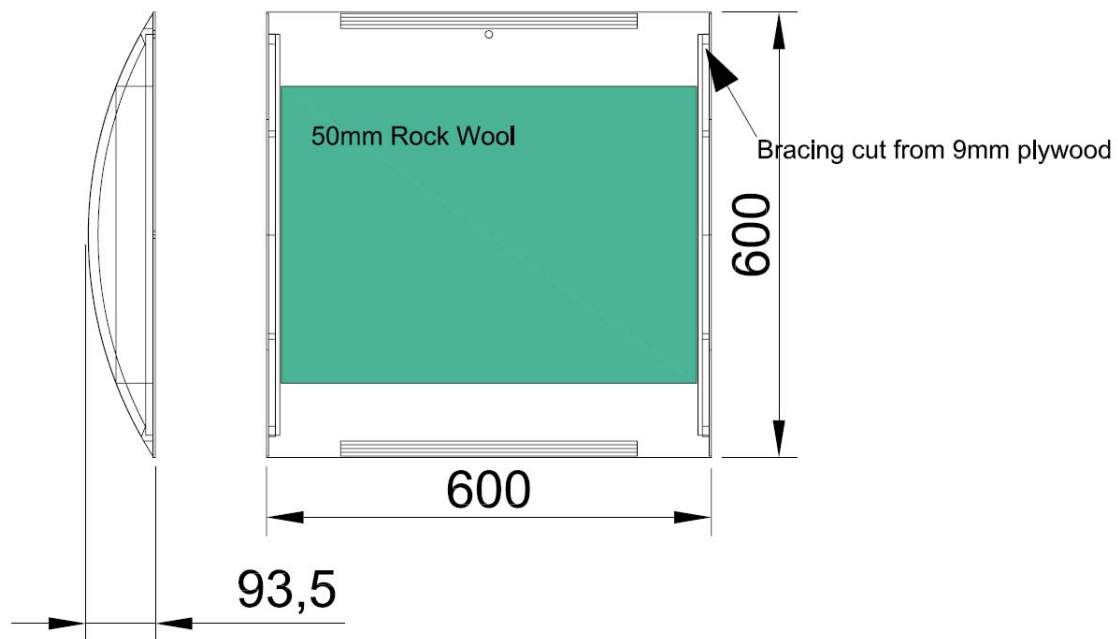
Before you pop the sheet between the verticals, glue or fasten the OC 703 to the wall. You may need to layer the 703 if you are putting the poly in a corner. Be sure to put a net, screen or trapping over the 703



to keep it from touching the Masonite if you want it to work as a panel absorber. About a 2 - 3 cm (1") space is good. These are very good if your LF decay is problematic below 100Hz. If you want broader LF absorption, go ahead and let it touch.

Plywood / Masonite sheets in polys can be painted, wallpapered, cloth covered, and so forth, as long as you do not add serious weight or thickness.

Below is a drawing for a mini-poly which can be placed on walls as needed or on the ceiling, if the ceiling is above 2.75 meters (9ft.).



Some more photo examples:

