

SDX10 Sealed Variations

24-april-2018

Sealed enclosures are tolerant of a wide range of box sizes. Sealed boxes have a 2nd order rolloff and do not unload, so are suited to LF EQ to extend the range.

As box size decreases, system Q increases. Qs of 0.5 to 1.0 are a good range. Q= 0.5 critically damped, Q= 0.58 Bessel, Q=0.707 Butterworth maximum flatness. Q= 1.0 underdamped (but small). The first graph illustrates the FR of each of these rolloffs. Room gain will bump up the bass so a shallow rolloff is often the best match with room gain.

The second graph shows the continuous increase in Q as box size decreases. Light blue with 20% effective damping.

Internal damping fill can be used to increase the apparant box volume by up to \sim 20%, decreasing the system Q.

A Butterworth to Bessel volume is a good target

Boxes may be made of any shape providing the target volume is maintained, although if one dimension is significantly stretched relative to the others, it will gradually transition toward a half-wave transmission-line behaviour

Looking at F6 or F10 gives a better indication of practical in-room bass extension than F3 (after Toole). Room modes will perturb the frequency response. Room issues are best remedied with multiple woofers (& their room placement) followed by the optional use of EQ.

This document contains a summary of box size range, a detailed drawing of a cubic Butterworth box, and two push-push designs in an elegant square prism. Tightly coupled push-push woofers have inherent active reactive force cancelation, dramatically reducing box loads. We had a successful build of the short one with 15mm baltic birch plywood -- no additional 18mm baffle. The tall box targets Butterworth alignment, the shorter using damping to shrink the box to a room friendlier size.







58 litre (2 ft3) cube (Bessel)



Sealed (butterworth) SDX10 Cube short v braces | plans (18mm) 22-spril-2018 | designed & drawn by dld © 2007-2018 planet_10 enterprises limited



Notes:

o/ drawn with 18mm material. Use quality plywood 1/ brace shape is only suggestive – prime purpose is to brace driver, it needs to be about 35-40% holes (ie if you have to mount a terminal cup in the middle, you'll want to make sure the brace allows clearance), intentionally just off centre.

Cut-out for magnet is at least slightly larger than the magnet to aid assembly, but when at rest the magnet is resting on the bottom of the cutout supporting it











Twin Sealed Push-Push SDX10 big version | plans (18mm) 24-april-2018 | designed & drawn by dld © 2007-2018 planet_10 enterprises limited

Notes: o/ drawn with 18mm material. Use quality plywood 1/ 2 SDX10 push-push 2/ brace shape is only suggestive – prime purpose is to brace driver, it needs to be about 35-40% holes (ie if you have to mount a terminal cup in the middle, you'll want to make sure the brace allows clearance), intentionally just off centre.











Twin Sealed Push-Push SDX10 big version braces | plans (18mm) 24-april-2018 | designed & drawn by dld © 2007-2018 planet_10 enterprises limited

Notes:

o/ drawn with 18mm material. Use quality plywood 1/ brace shape is only suggestive – prime purpose is to brace driver, it needs to be about 35-40% holes (ie if you have to mount a terminal cup in the middle, you'll want to make sure the brace allows clearance), intentionally just off centre.



Twin Sealed Push-Push SDX10 big version | 4x8' 18mm cut sheet 24-april-2018 | designed & drawn by dld © 2007-2018 planet_10 enterprises limited free for non-commercial use

Notes: o/18mm 1/ 5mm kerf & trim allowance 2/ room to increase kerf for CNC 3/ works for 1220x2440mm sheets











Notes:

o/ drawn with 18mm material. Use quality plywood 1/ brace shape is only suggestive – prime purpose is to brace driver, it needs to be about 35-40% holes (ie if you have to mount a terminal cup in the middle, you'll want to make sure the brace allows clearance), intentionally just off centre.



Twin Sealed Push-Push SDX10 short v braces | plans (18mm) 24-april-2018 | designed & drawn by dld © 2007-2018 planet_10 enterprises limited











CSS SDX10 Dimensions

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