CELESTION DUAL SUBWOOFER BOX

(CF1840JD)

Driver **:** Celestion CF1840JD

Vas : 113.9

Qts : 0.44

Fs : 44.20

SPL : 98.00

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Project by **:** Enrique

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Number of drivers : 2

Box type **:** Vented

Box size **:** 350.0 l

Tuning frequency **:** 40.00 Hz

Vent **:** 1 vent(s)

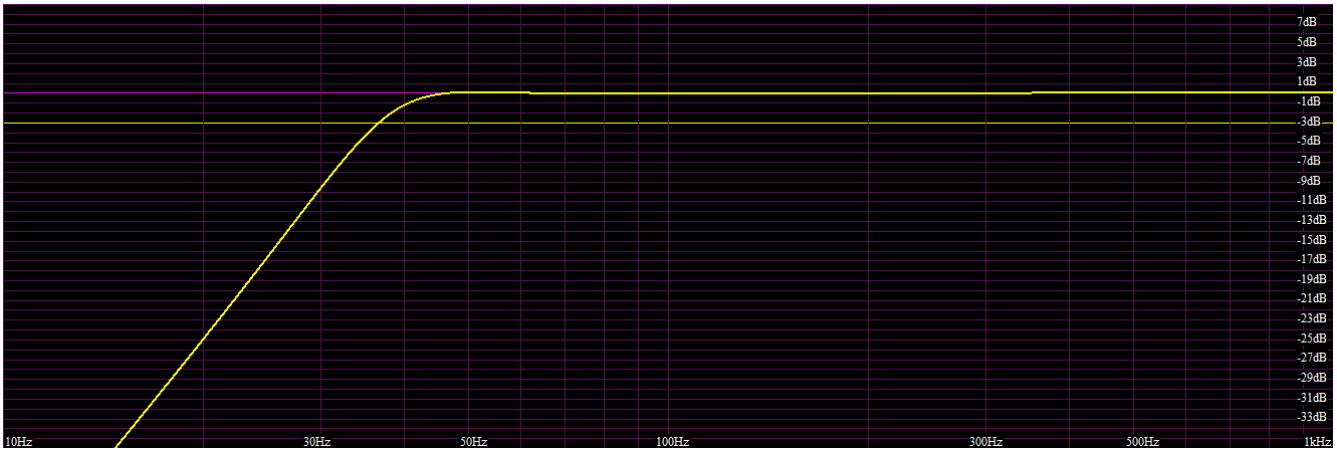
0.195 m length for each

12.00 x 90.00 cm rectangle

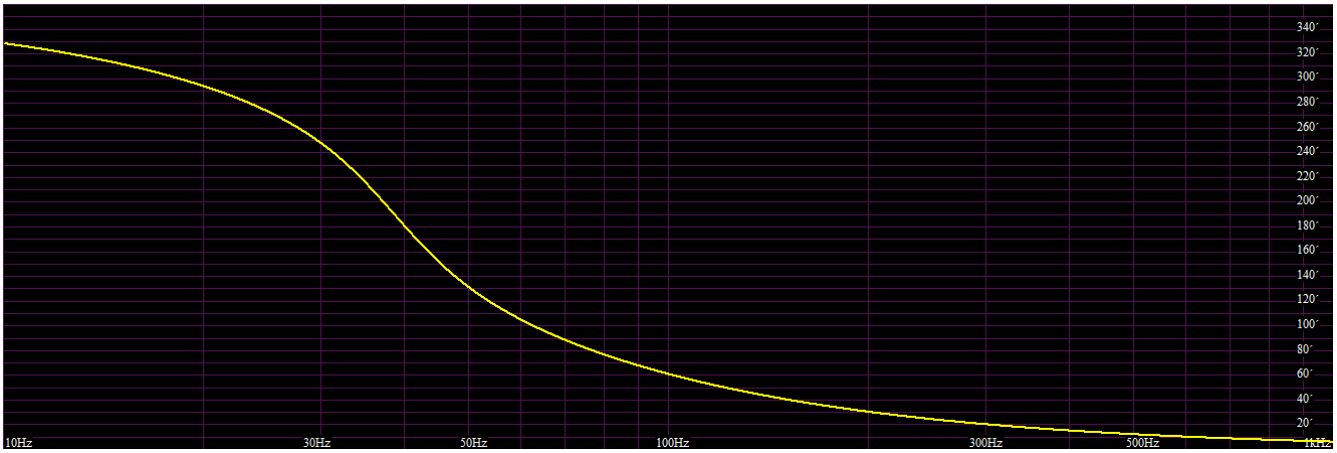
Frecuency	***Gain***	***Phase***	***SPL***
20	-24.87	293.73	76.14
25	-16.53	273.17	84.48
30	-9.67	247.97	91.40
35	-4.28	216.24	96.73
40	-1.22	181.57	99.79
45	-0.14	152.53	100.87
50	0.08	131.56	101.09
55	0.06	116.47	101.07
60	0.07	104.92	101.02
65	-0.03	95.87	100.98
70	-0.06	88.3	100.95
75	-0.08	82.04	100.93
80	-0.09	76.64	100.92
85	-0.09	71.94	100.92
90	-0.09	67.81	100.92
95	-0.09	64.14	100.92
100	-0.09	60.86	100.92

Graphs at 1W - 1m

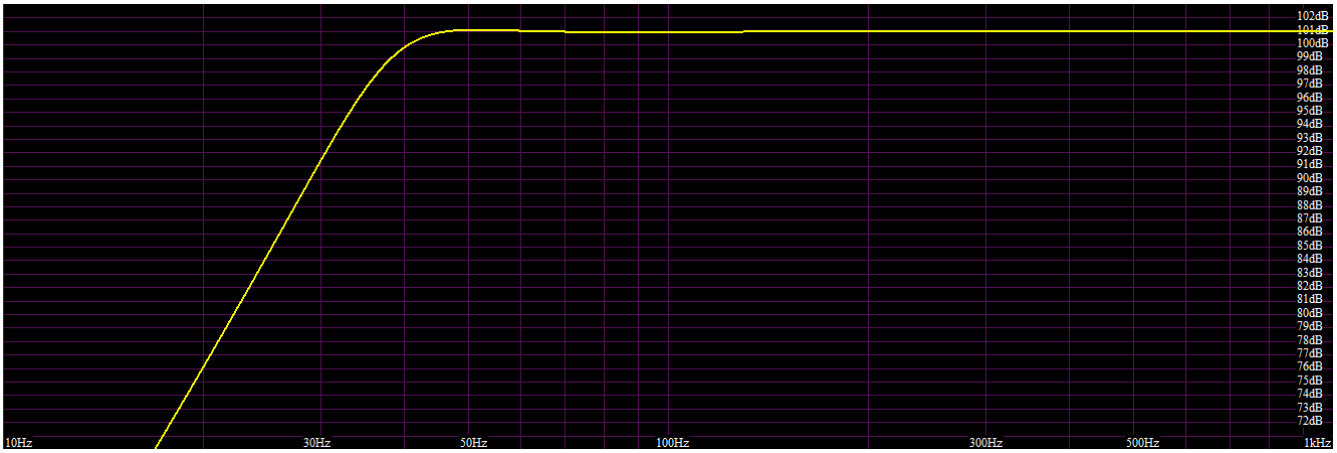
Gain



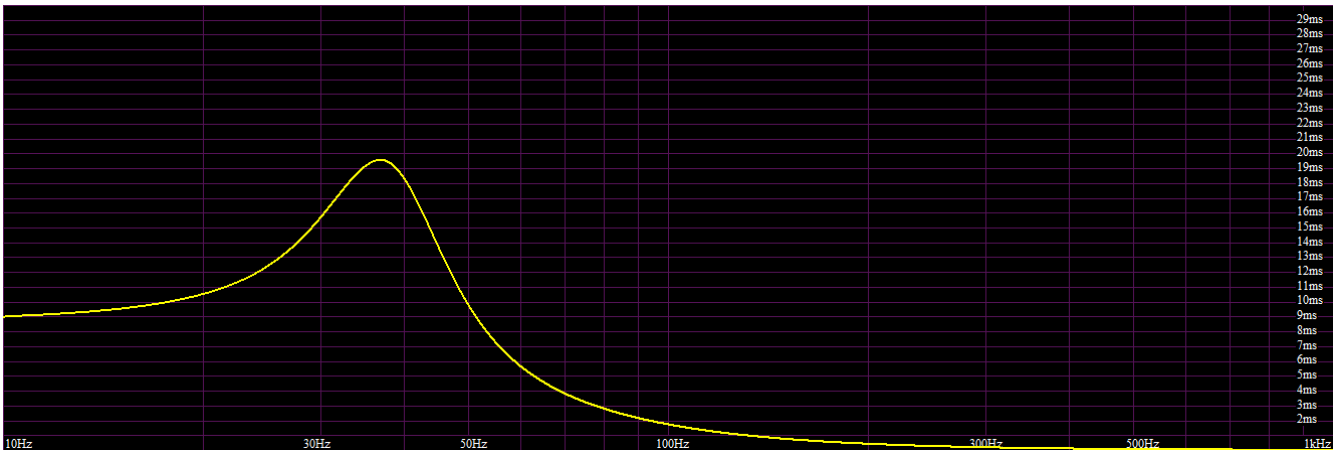
Phase



SPL



Group Delay



Wood Selection

Thickness Selected: 1.5 in for solid construction

SPL inside the box at 1000w (approximate): 131 Db

SPL selected: 135 Db (To keep a high security Factor)

Pressure in Pa (N/m^2):

$$NPS = 20log_{10}\frac{Press}{Press_{Ref}}$$

$Press_{Ref} = 2_E^{-5}$ Pa

$$135Db = 20log_{10}\frac{Press}{2e^{-5}\ Pa}$$

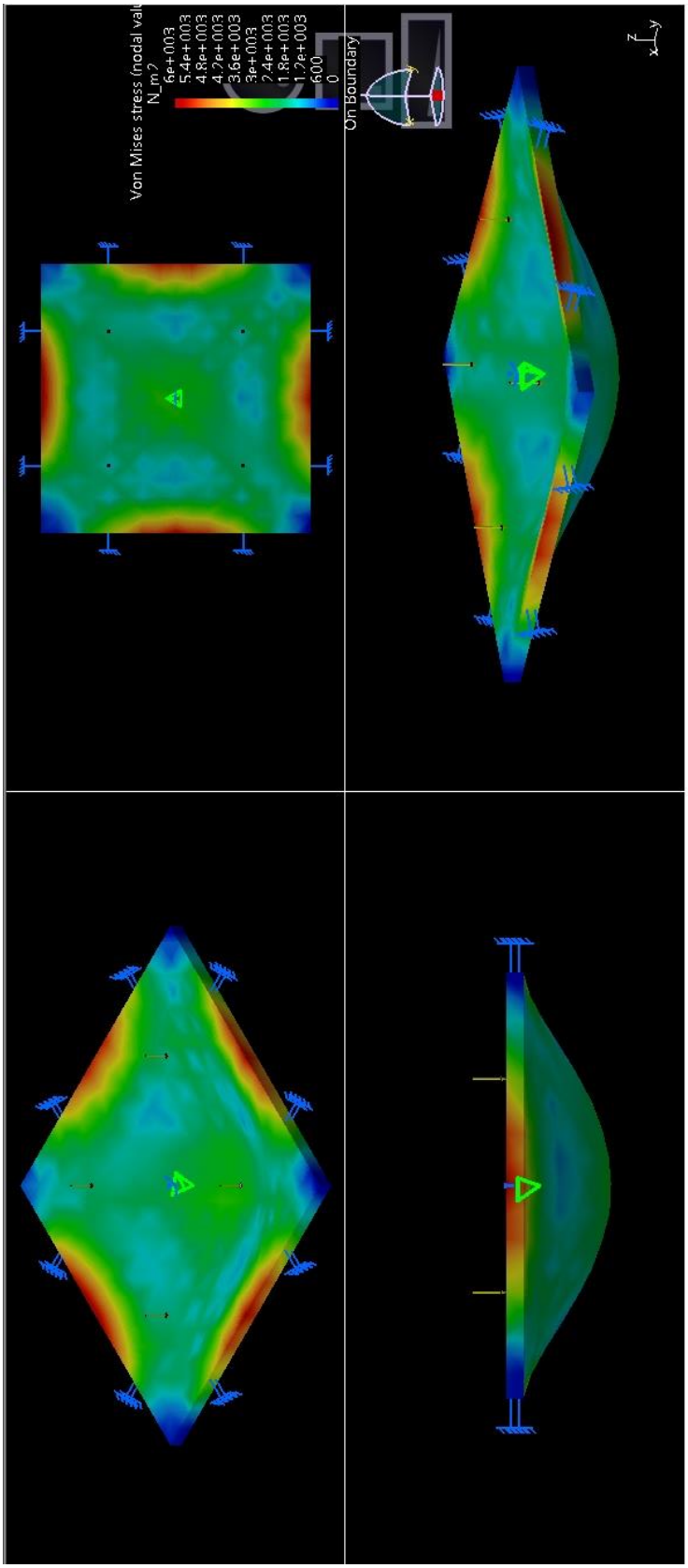
Press = **112.4682 Pa (N/m^2)**

Pressure Tested in $1m^2$ plate of wood

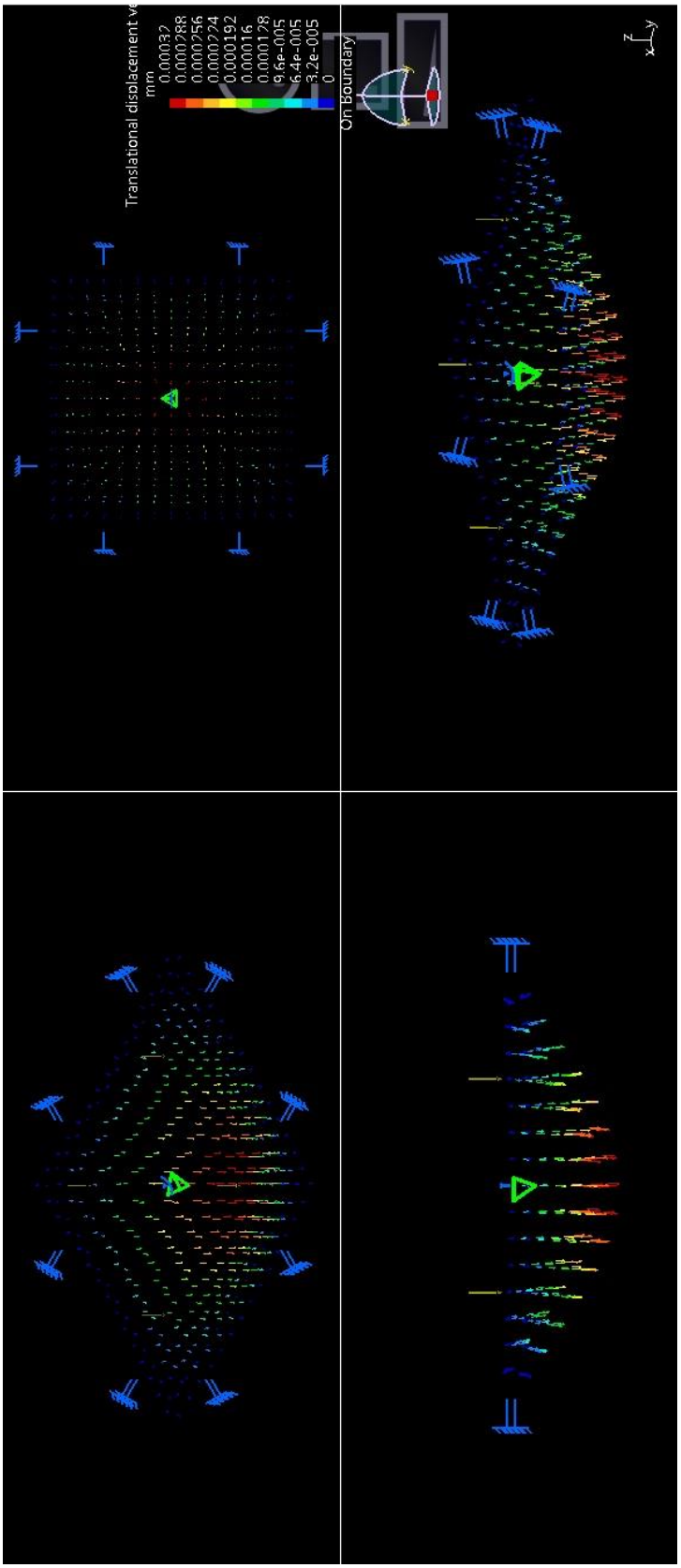
Tested woods: Cedar and Brigth Oak

Cedar:

Von-Mises Stress

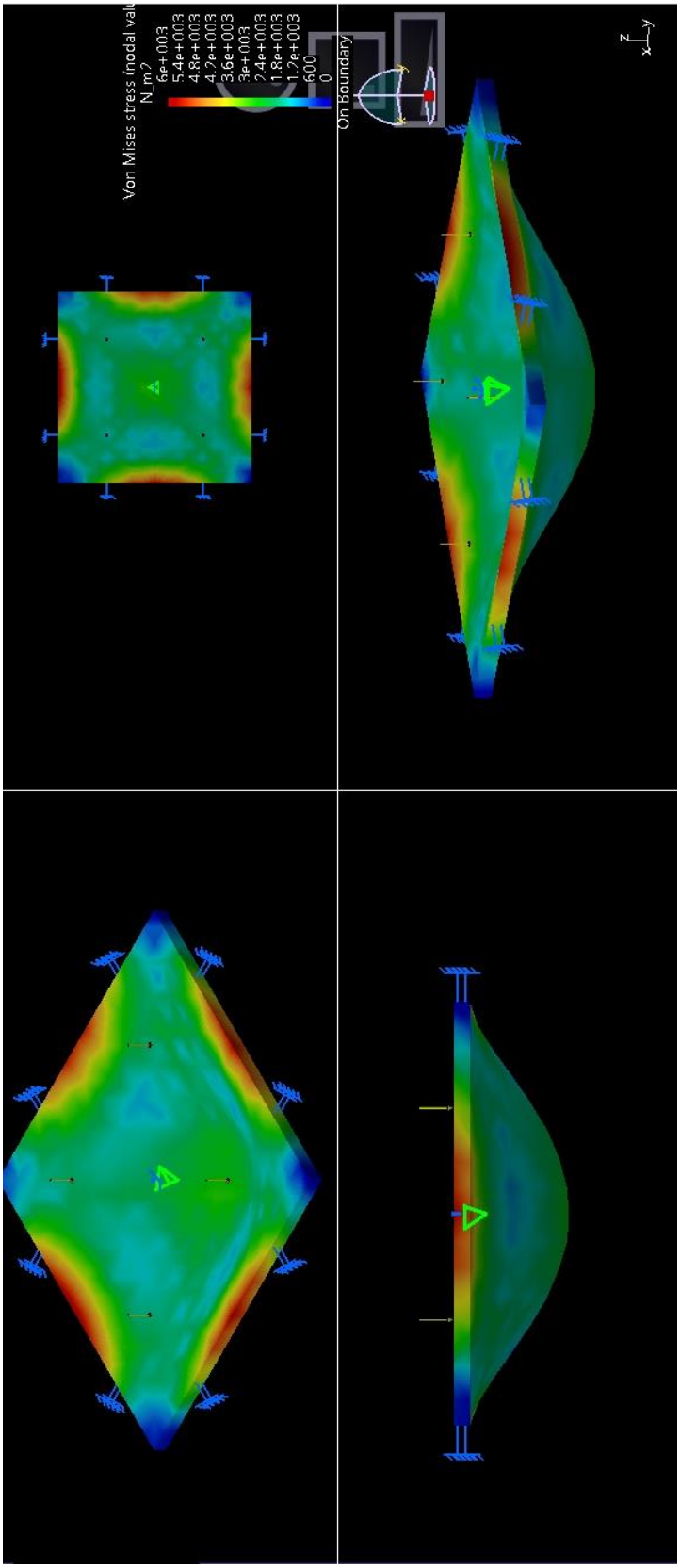


Translational Displacement:

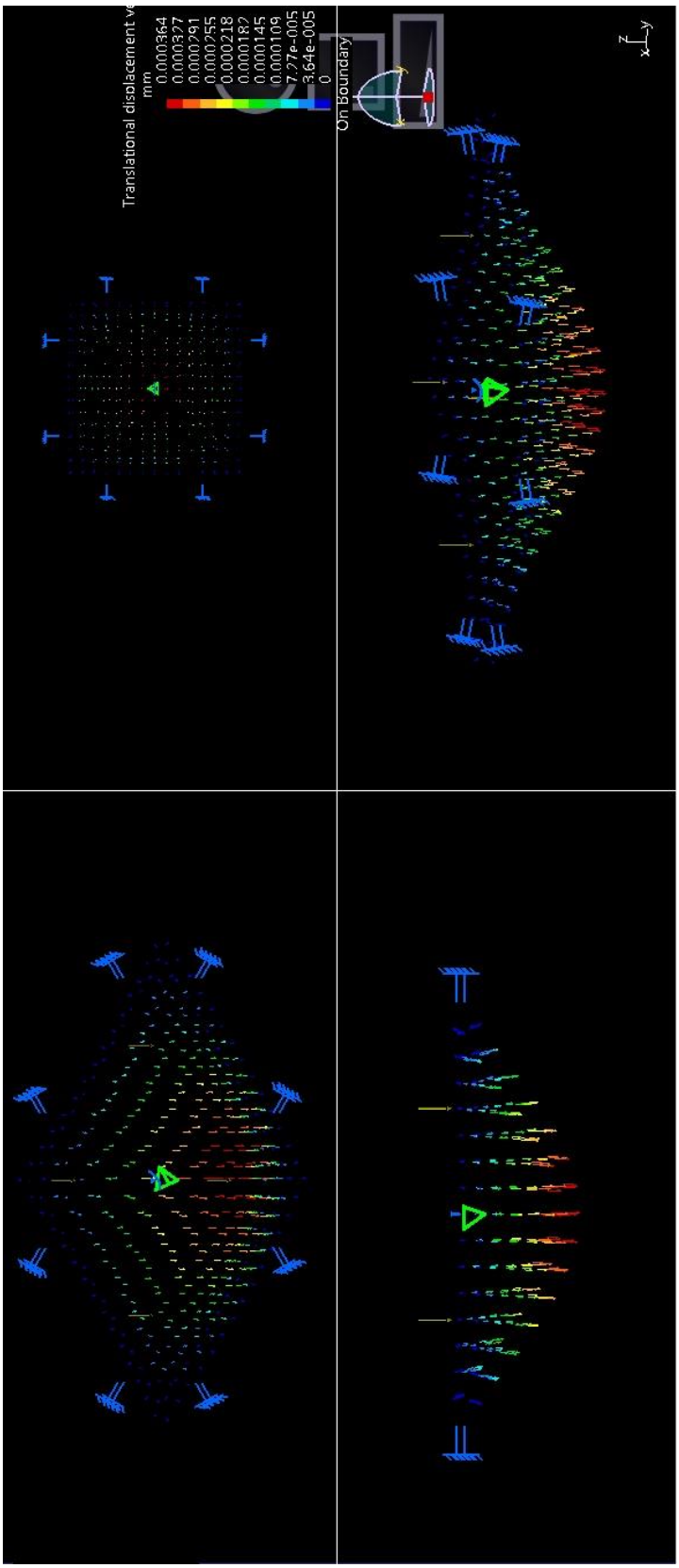


Bright oak:

Von-Mises Stress



Translational Displacement



With .00032 mm of displacement I choose: **Cedar**

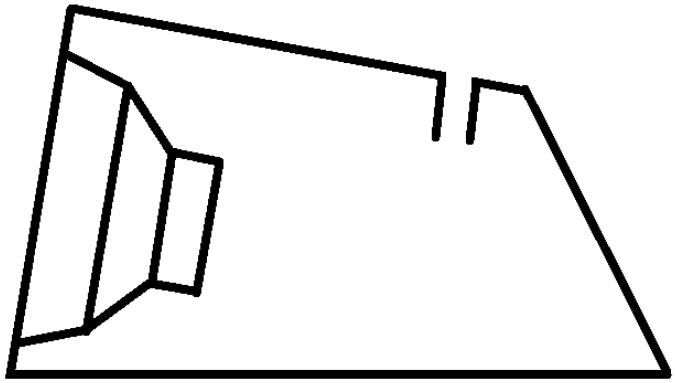
For The Von - Mises stress I took the value of the center of the plate.

Cabinet Design

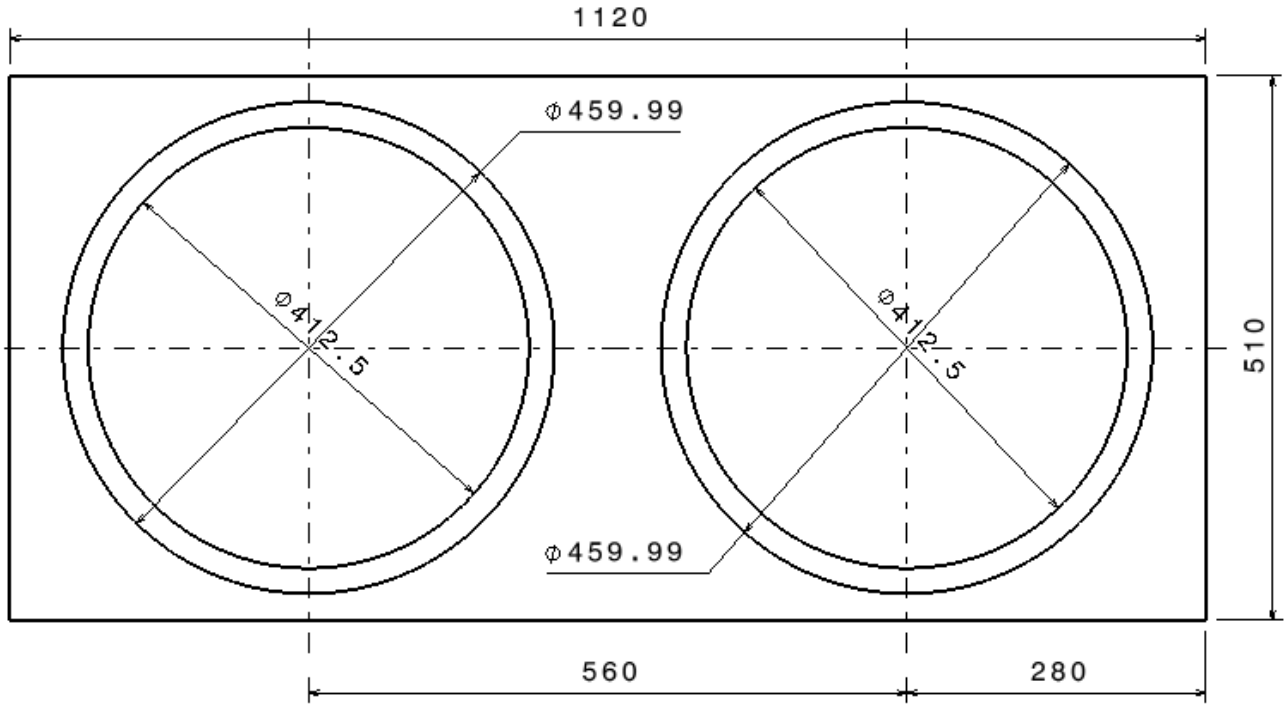
(All the dimensions given in this project are inner)

(All the measures are in mm)

To keep the sound reflections inside the cabinet to the minimum is selected an irregular shape profile

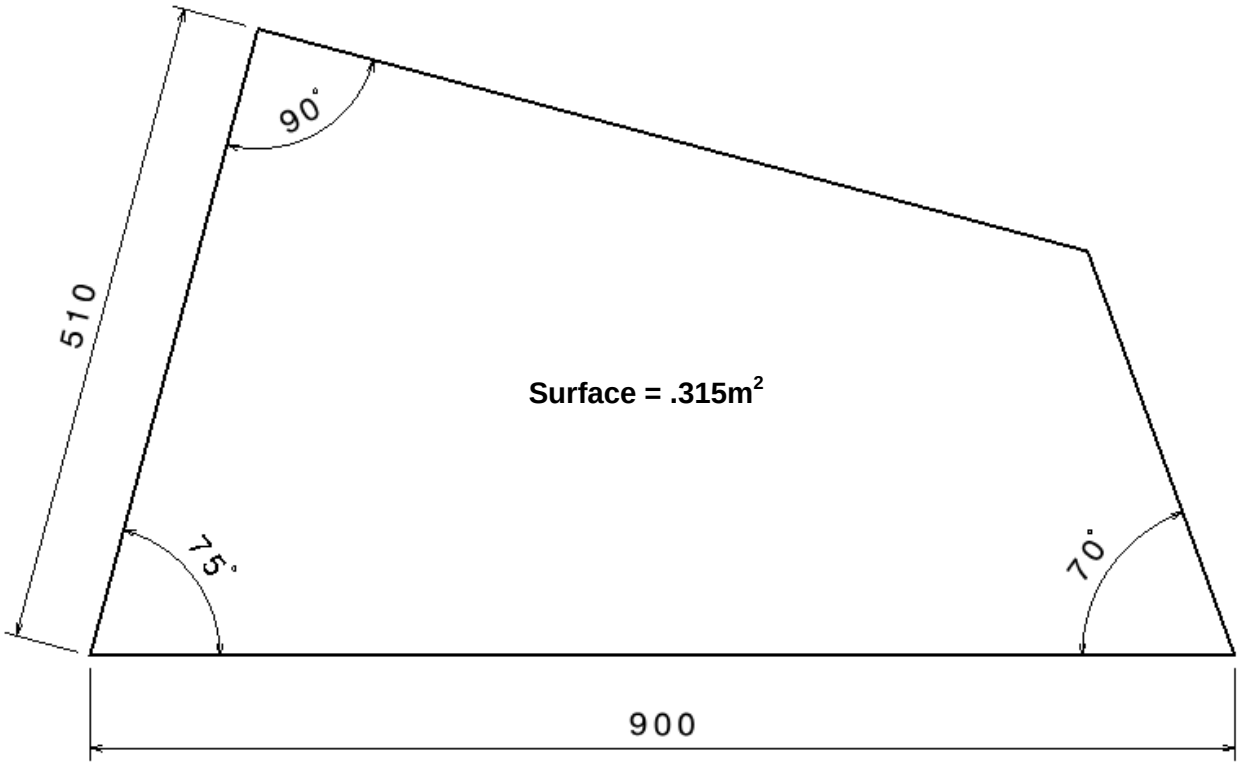


According to the dimensions of the speaker the mounting plate looks like this:

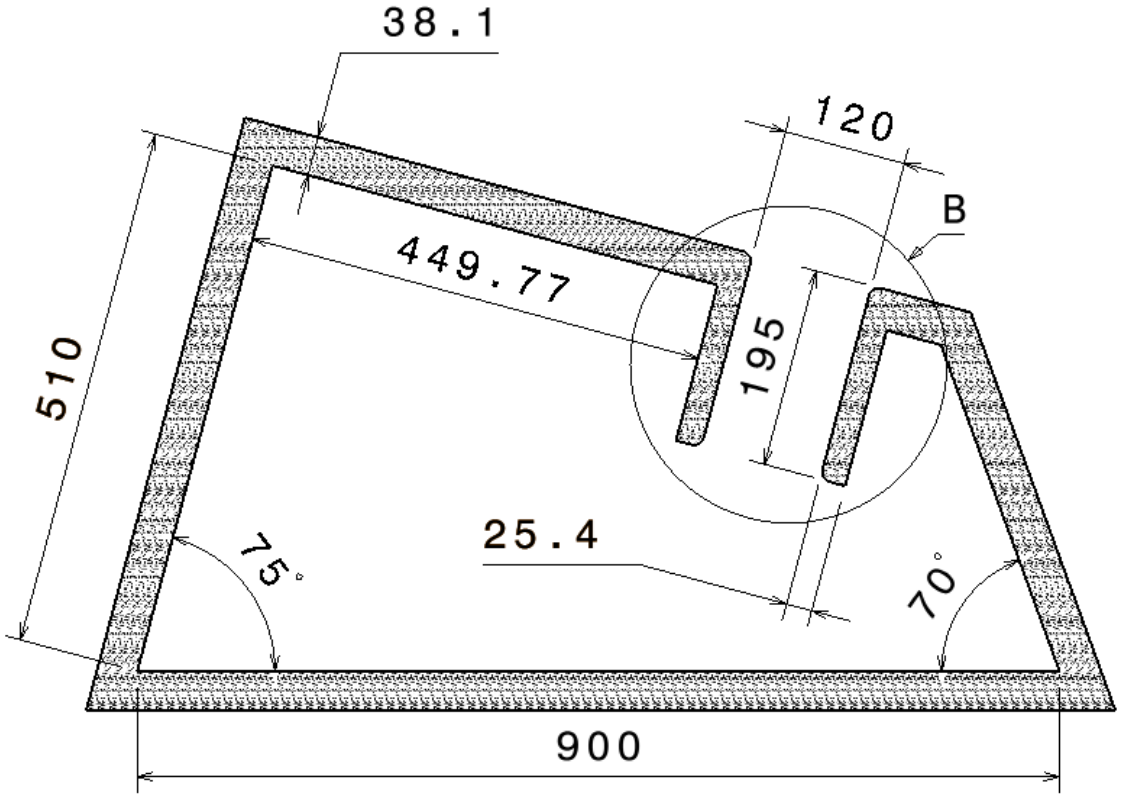


The measures of the irregular profile are chosen randomly except for the 510 mm.

Surface to get approximately 350 l : (.32 - .30) m^2



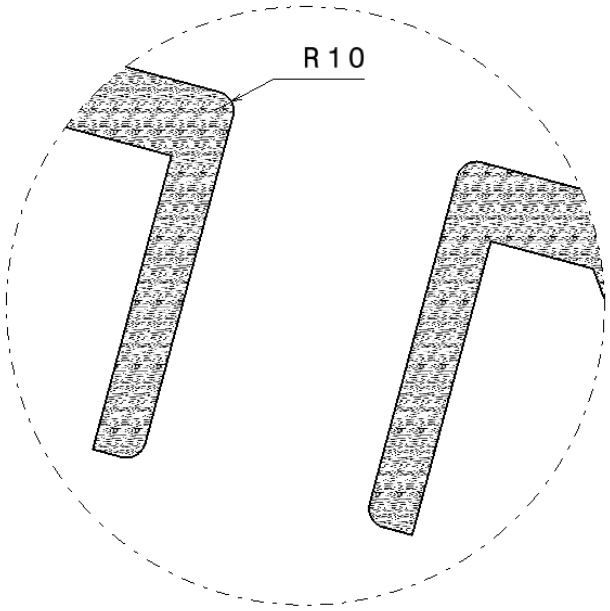
Position of the reflex port



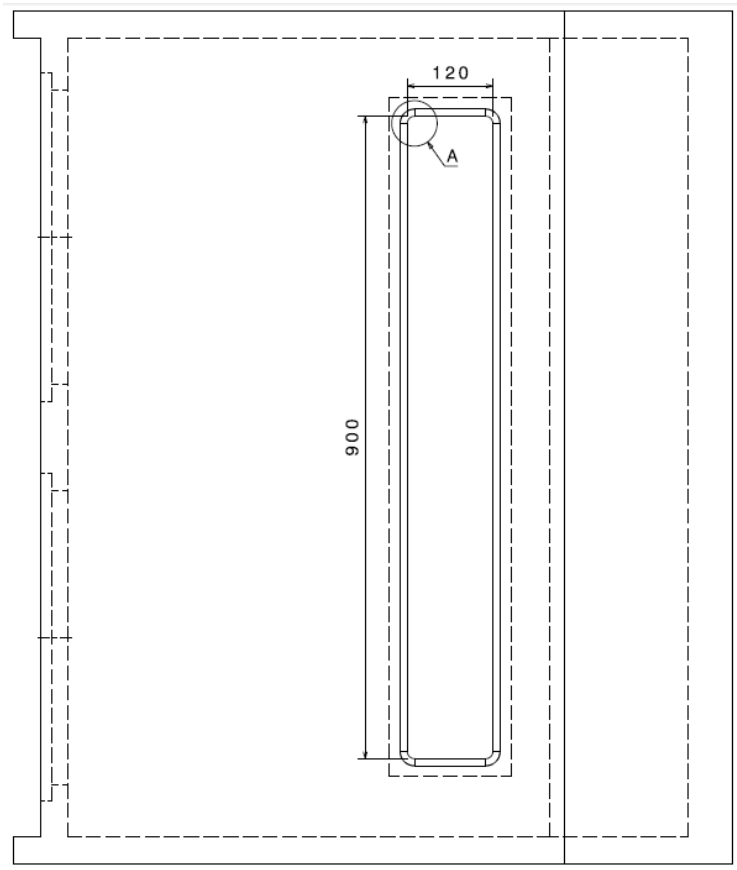
Edge fillet radius:

All the fillets have the same radius

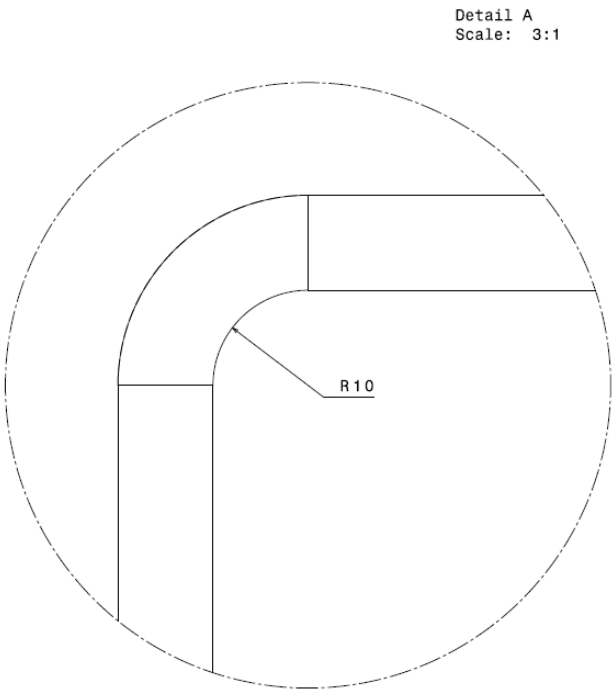
Detail **B**



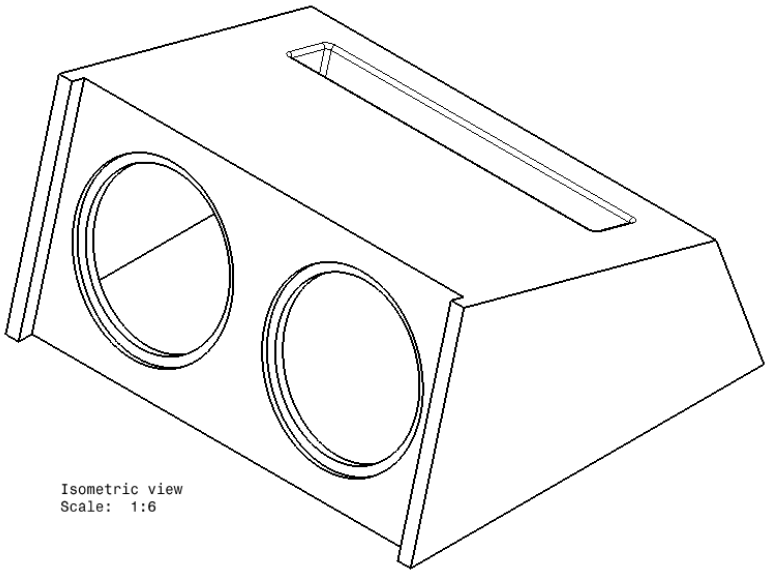
Top view

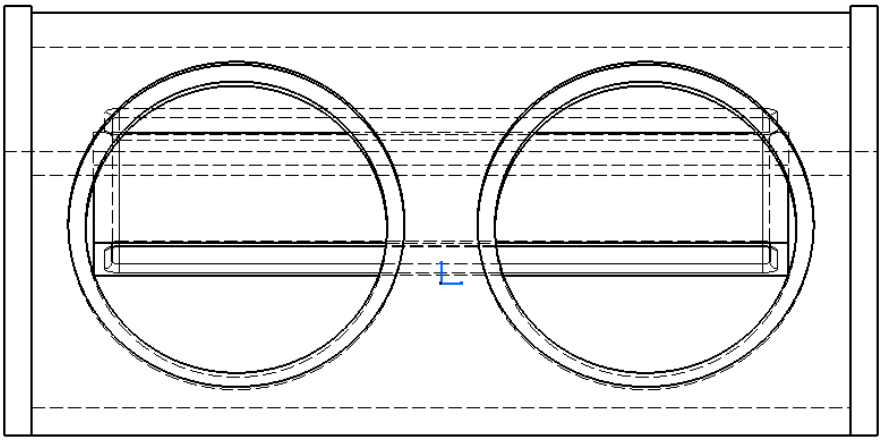


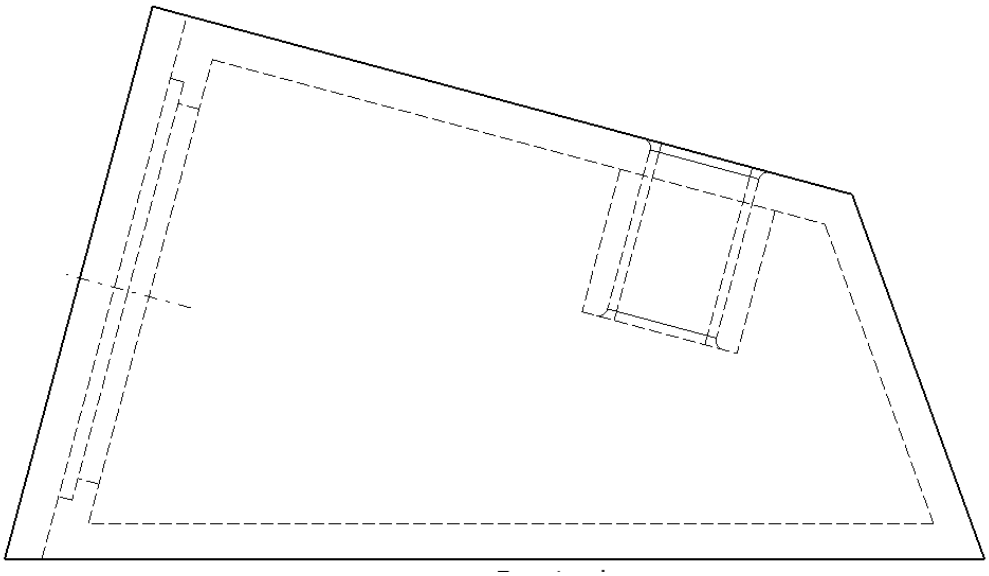
Detail:



With this measures the final design of the cabinet looks like this:







Electrical wiring:

Connection in parallel to obtain 4 ohms

6 AWG at 75°