Eighteen Sound
a AEB S.r.l. Company

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Application Note #10:

Building an effective high power horn loaded 18” subwoofer

Eighteen Sound Technical Department
December, 2010

Rev. 1.0

18” Horn Subwoofer kit

•High performance 1 x 18” subwoofer system

•Multiple driver choice is possible: 18LW2400 or 18NLW9400

•**18LW2400** woofer key features:

4” interleaved sandwiched voice coil (ISV)

Double silicon spider (DSS)

1200W AES power handling

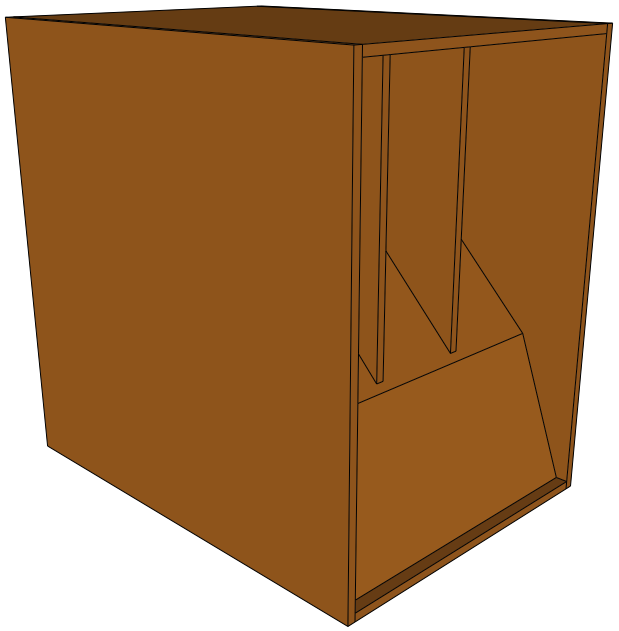
•**18NLW9400** woofer key features:

4” interleaved sandwiched voice coil (ISV)

Double silicon spider (DSS)

Neodymium magnet

1200W AES power handling



18LW2400 Data

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	460 mm (18 in)
RATED IMPEDANCE	8 Ohm
AES POWER	1200 W
PROGRAM POWER (1)	2400 W
PEAK POWER (2)	7000 W
SENSITIVITY (3)	98 dB
FREQUENCY RANGE (4)	31 - 2500 Hz
POWER COMPRESSION @-10DB (5)	0,7 dB
POWER COMPRESSION @-3DB	1,5 dB
POWER COMPRESSION @FULL POWER	2,2 dB
MAX RECOMM. FREQUENCY	500 Hz
RECOMM. ENCLOSURE VOLUME	130 ÷ 350 lt. (4,59 ÷ 12,36 cuft)
MINIMUM IMPEDANCE	6,3 Ohm at 25°C
MAX PEAK TO PEAK EXCURSION	50 mm (1,97 in)
VOICE COIL DIAMETER	100 mm (4 in)
VOICE COIL WINDING MATERIAL	copper
SUSPENSION	Triple roll, Polycotton
CONE	Straight Ribbed, Treated paper

THIELE SMALL PARAMETERS (6)

Fs	35 Hz
Re	5 Ohm
Sd	0,1225 sq. mt. (189,88 sq. in.)
Qms	7,2
Qes	0,32
Qts	0,31
Vas	230 lt. (8.12 cuft)
Mms	192 gr. (0,42 lb)
BL	25,6 Tm
Linear Mathematical Xmax (7)	± 9,5 mm (± 0,38 in)
Le (1kHz)	1,35 mH
Ref. Efficiency 1W@1m (half space)	96,7 dB

18NLW9400 Data

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	460mm (18 in)
RATED IMPEDANCE	8 ohm
AES POWER	1200W
PROGRAM POWER (1)	2400W
PEAK POWER (2)	7000W
SENSITIVITY (3)	98 dB
FREQUENCY RANGE (4)	30 - 2500 Hz
POWER COMPRESSION @ -10 DB (5)	0,7 dB
POWER COMPRESSION @ -3 DB	1,5 dB
POWER COMPRESSION @ FULL POWER	2,2 dB
MAX RECOMM. FREQUENCY	500 Hz
RECOMM. ENCLOSURE VOLUME	110 ÷ 350 lt. (3.9 ÷ 12.36 cuft)
MINIMUM IMPEDANCE	6,1 ohm at 25°C
MAX PEAK TO PEAK EXCURSION	50 mm (2 in)
VOICE COIL DIAMETER	100 mm (4 in)
VOICE COIL WINDING MATERIAL	Copper round wire
SUSPENSION	Triple roll, Treated Polycotton
CONE	Straight ribbed, Fiberglass reinforced cellulose

THIELE SMALL PARAMETERS (6)

Fs	33 Hz
Re	5 ohm
Sd	0,1225 sq.mt. (189,88 sq.in.)
Qms	6,10
Qes	0,28
Qts	0,26
Vas	268 lt. (9.47 cuft)
Mms	180 gr. (0.40 lb)
BL	26 Tm
Linear Mathematical Xmax (7)	±9,5 mm (±0,37 in)
Le (1kHz)	1,90 mH
Ref. Efficiency 1W@1m (half space)	97,4 dB

18” Horn Subwoofer kit

•The enclosure should be made of Baltic birch plywood (15mm thickness)

•Bolts are M6x35mm

•M6 T-Nuts are recommended

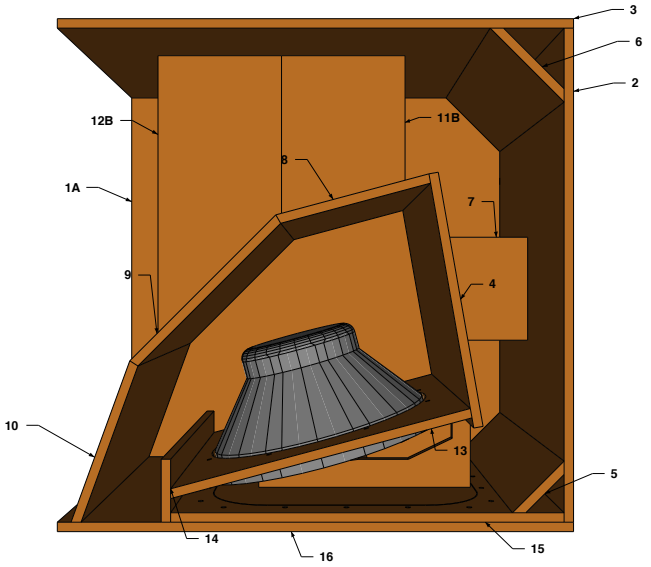
•Handling, rigging and connectors are user’s choice

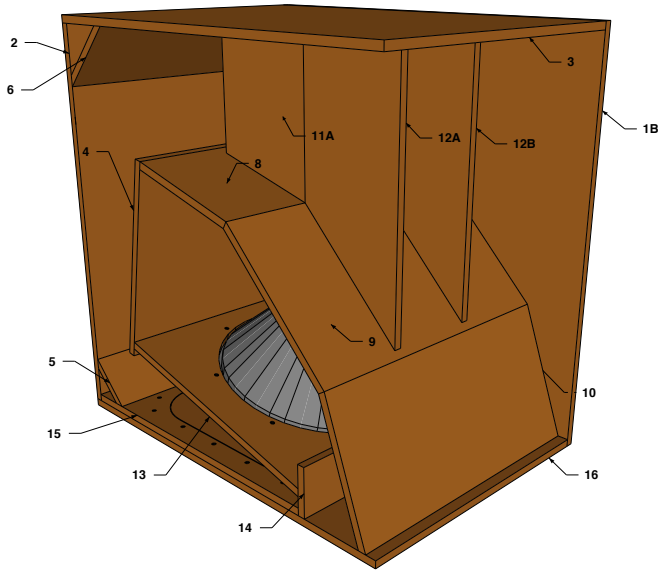
•It’s recommended to well damping the cabinet interior

•You should see an example of the required dampening on the image on the next page

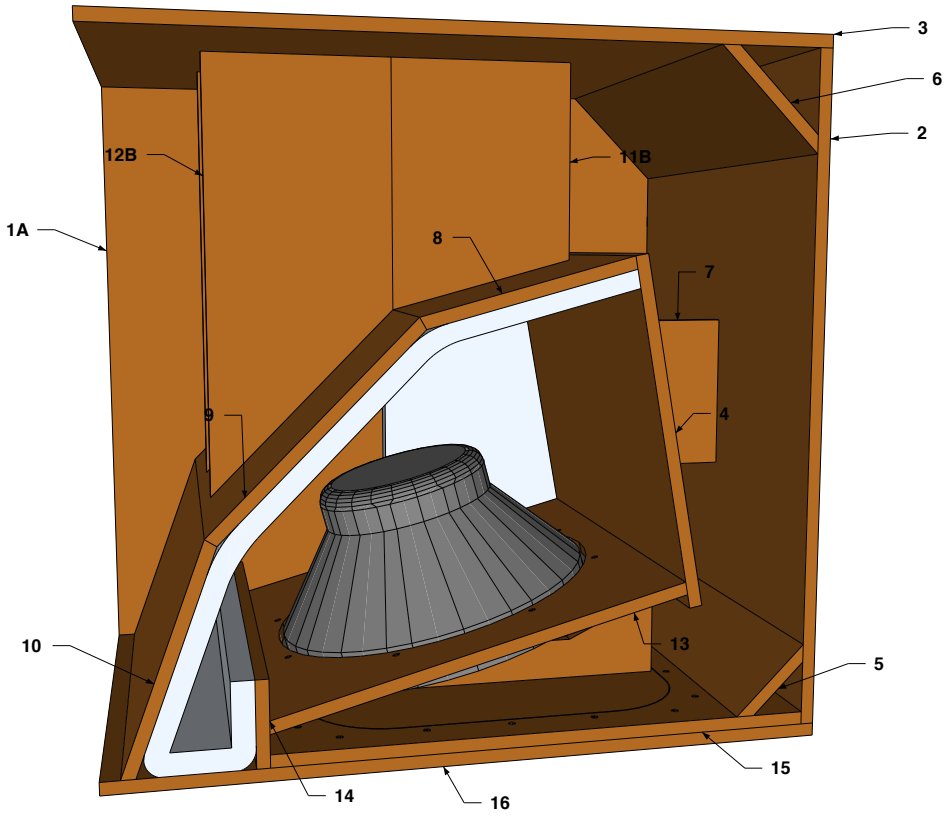
•An high density dampening material, such as Dacron or other synthetic fibers, is required for better performance

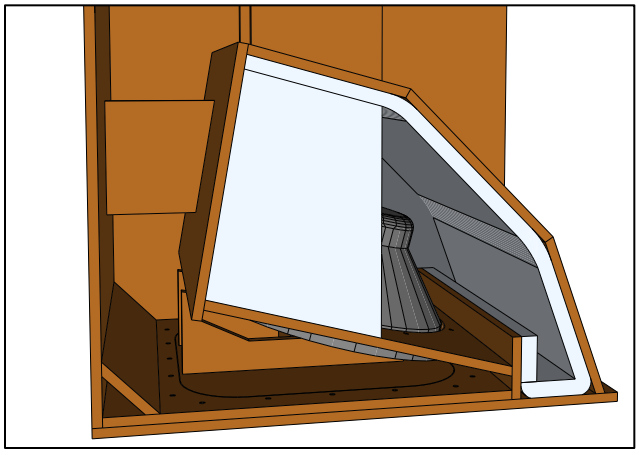
Internal view

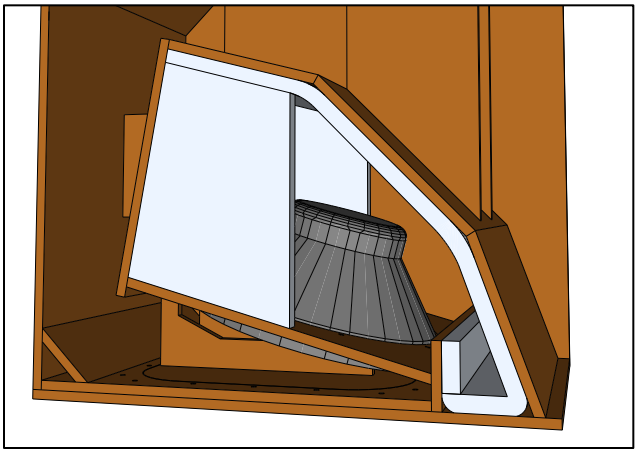




Internal view and damping material

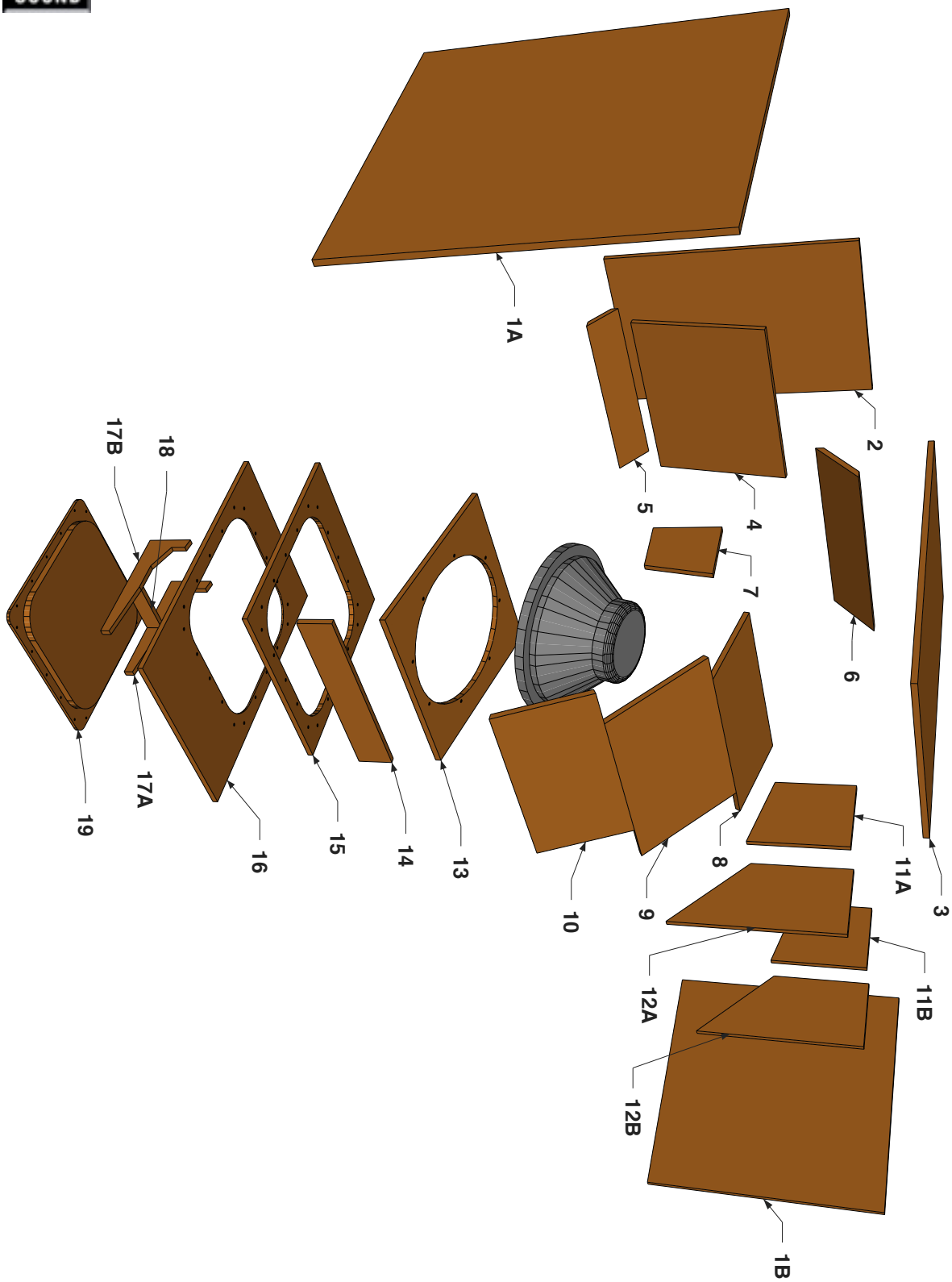






18” Horn Subwoofer kit

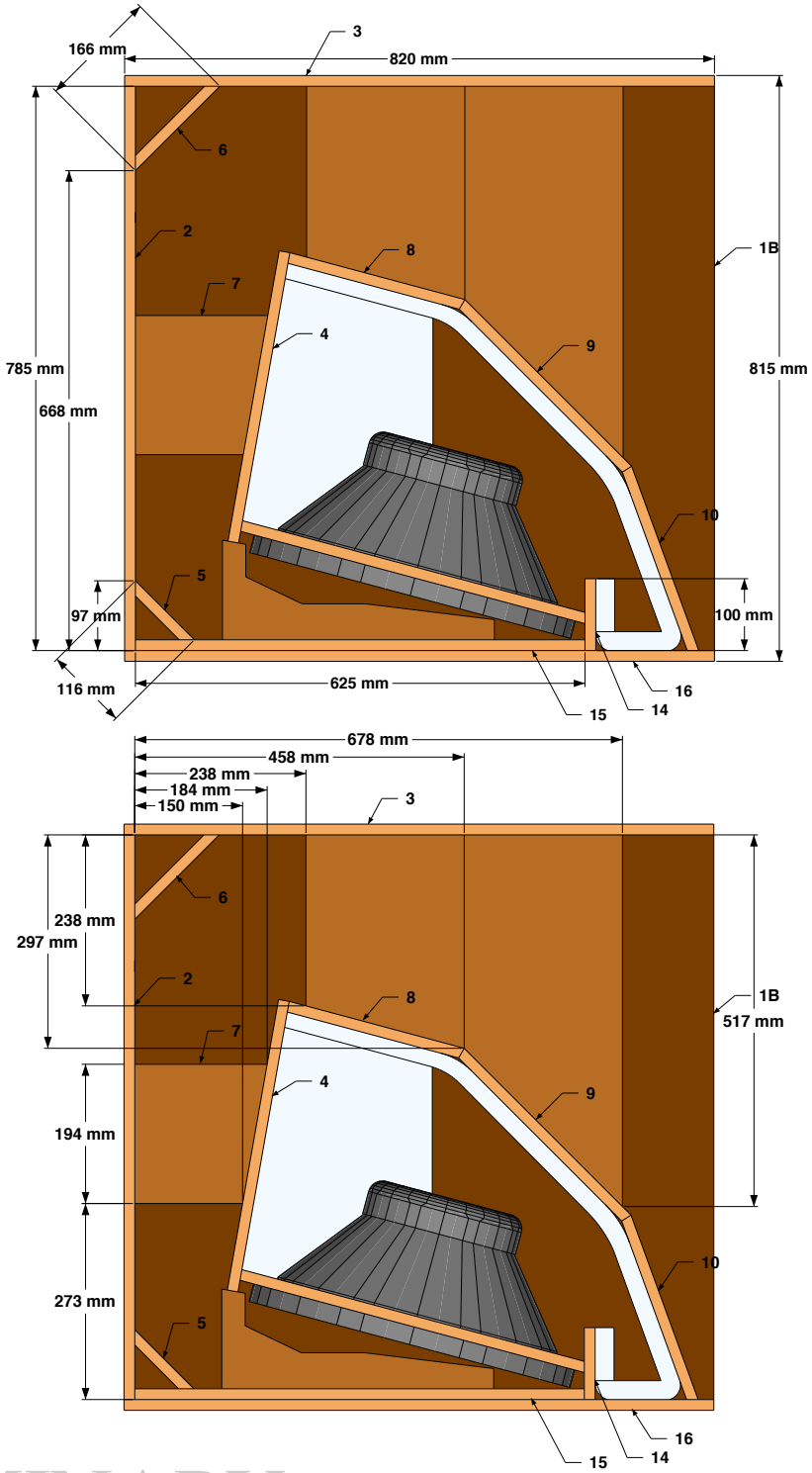
Exploded view



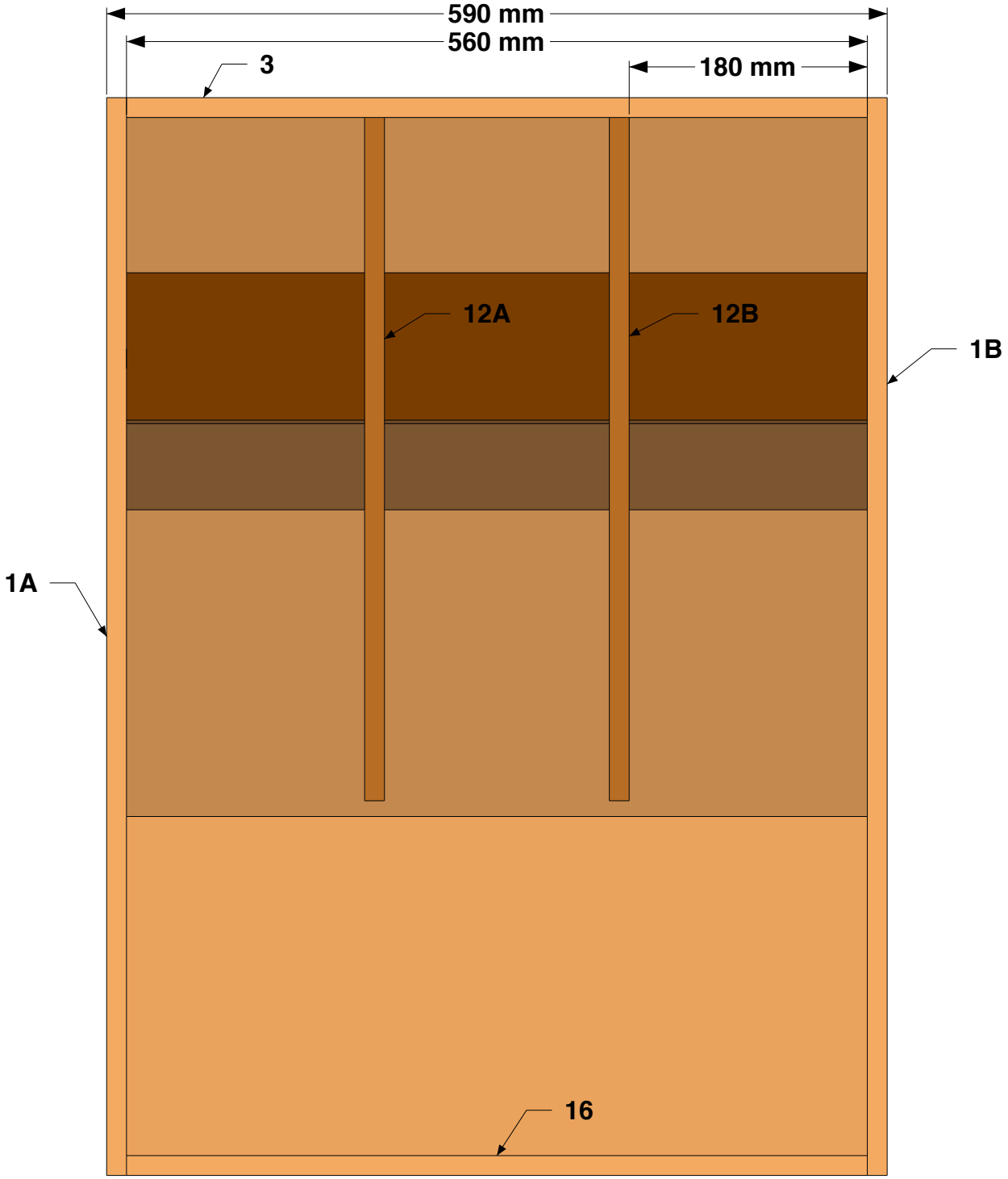
PRELIMINARY

Rev. 1.0

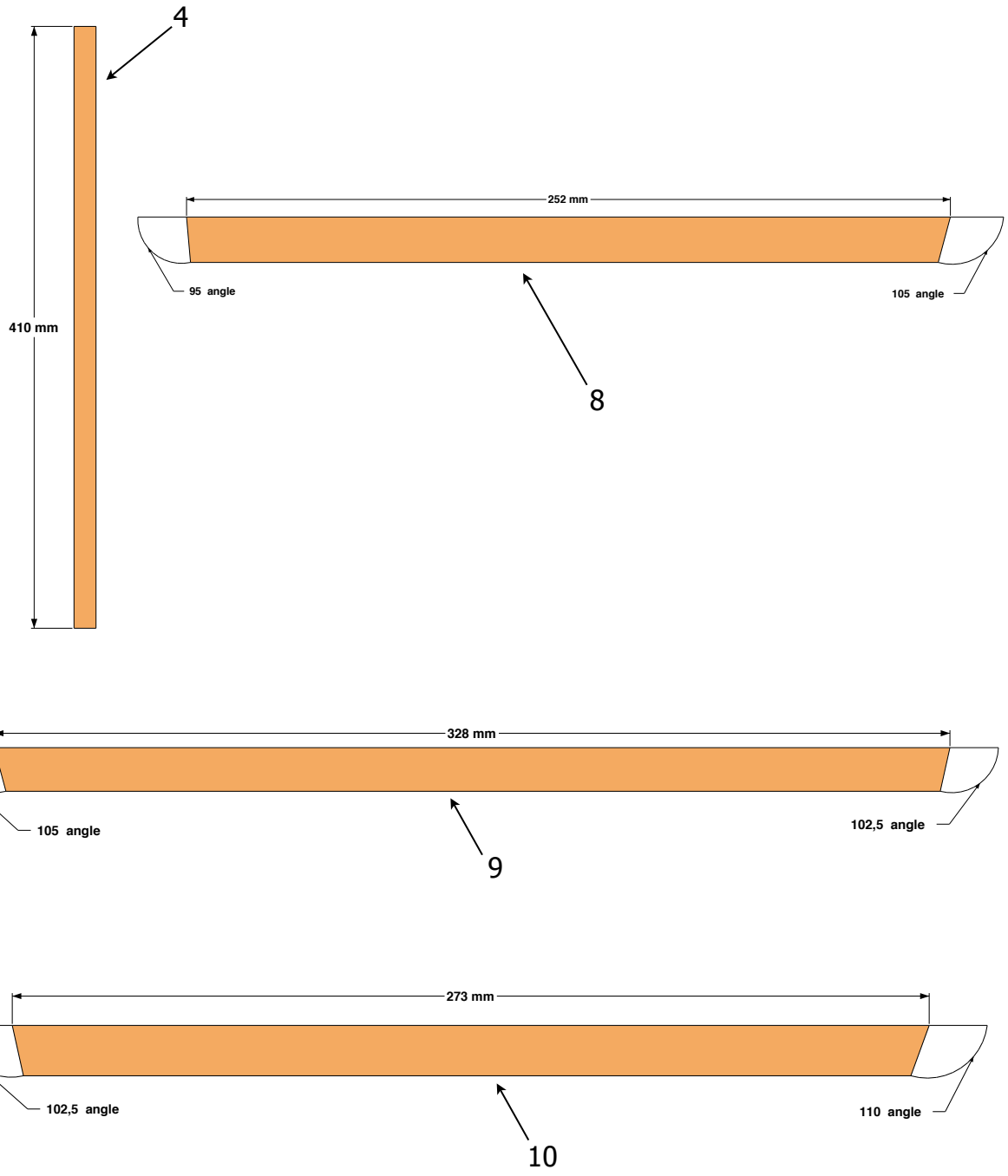
Side wiew



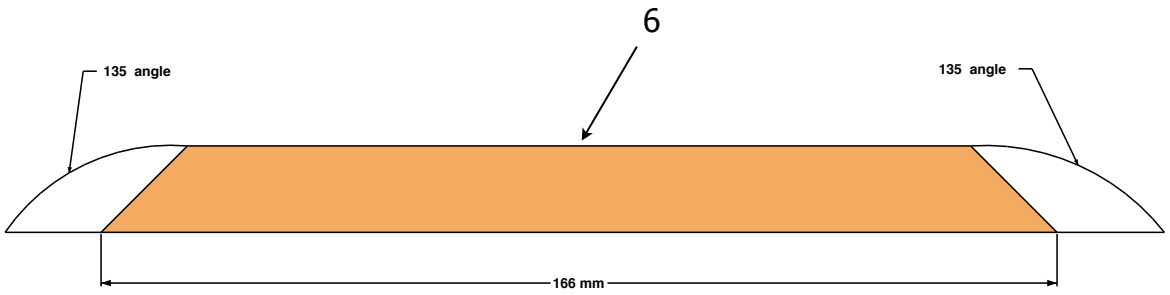
Front Side

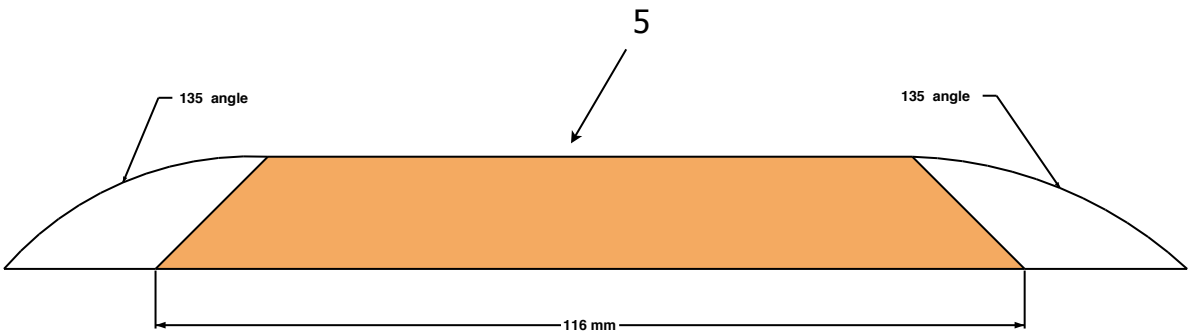


Horn Details

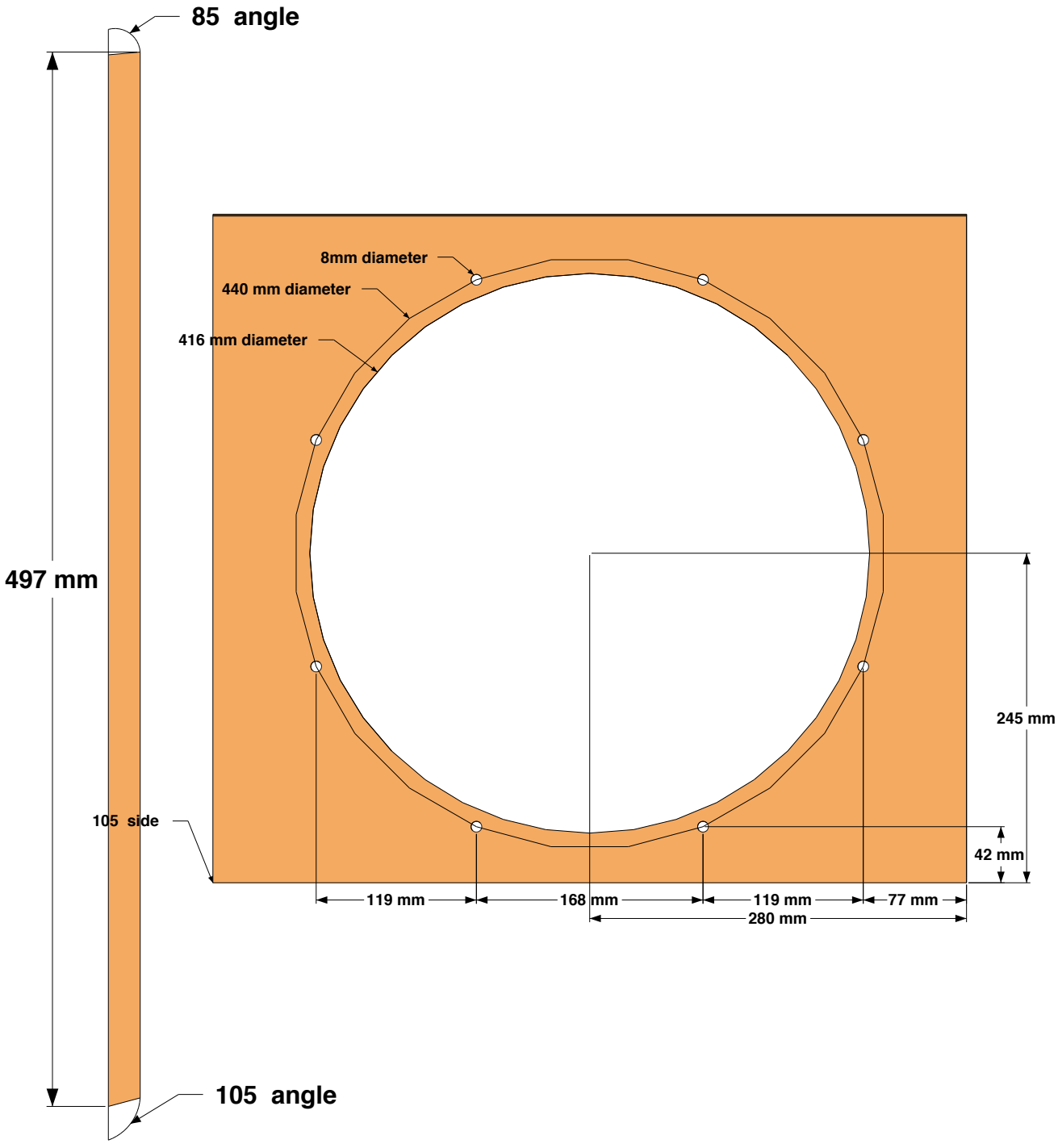


Rear Details





Woofer details



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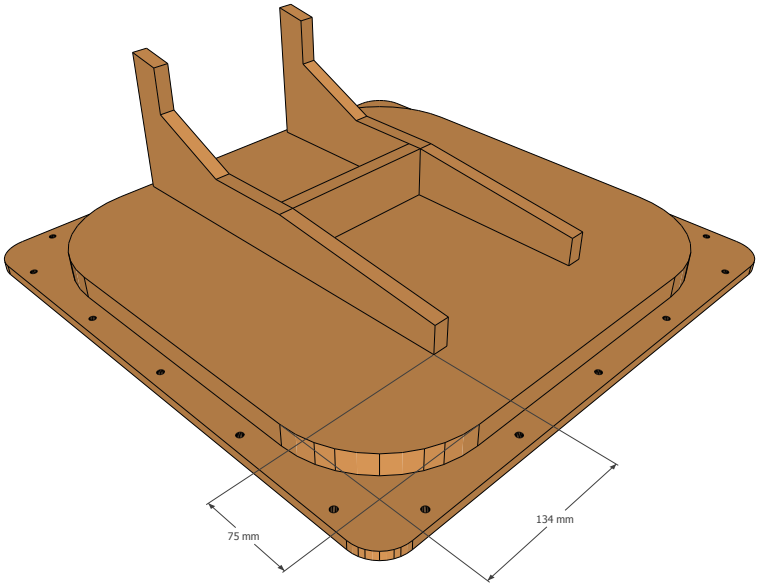

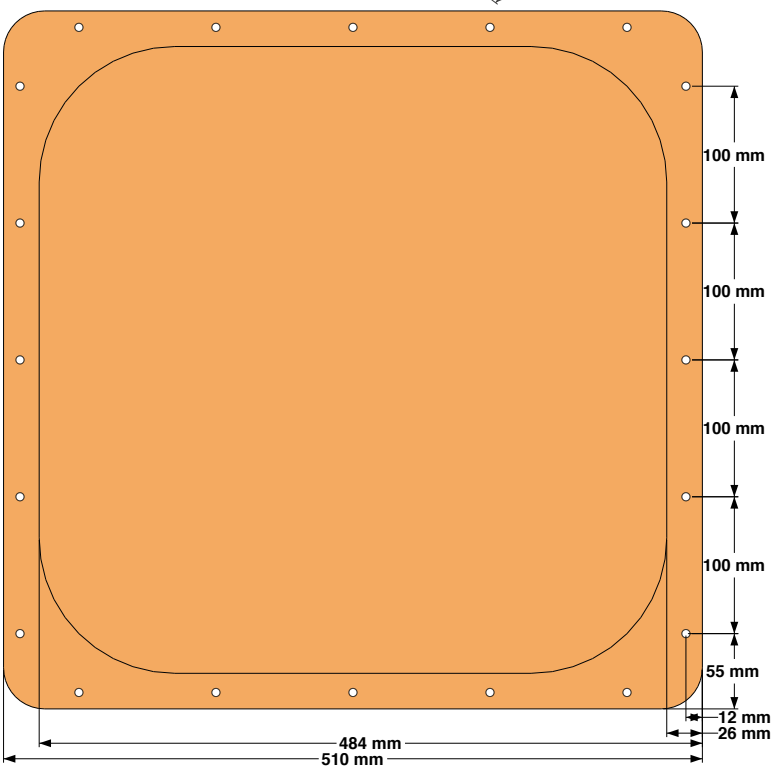

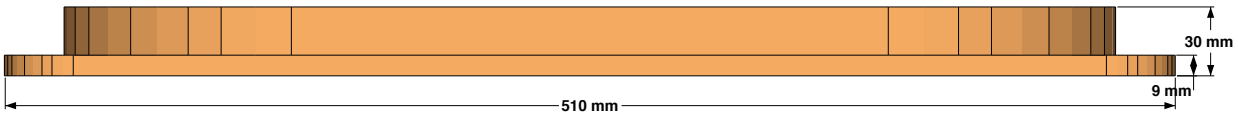

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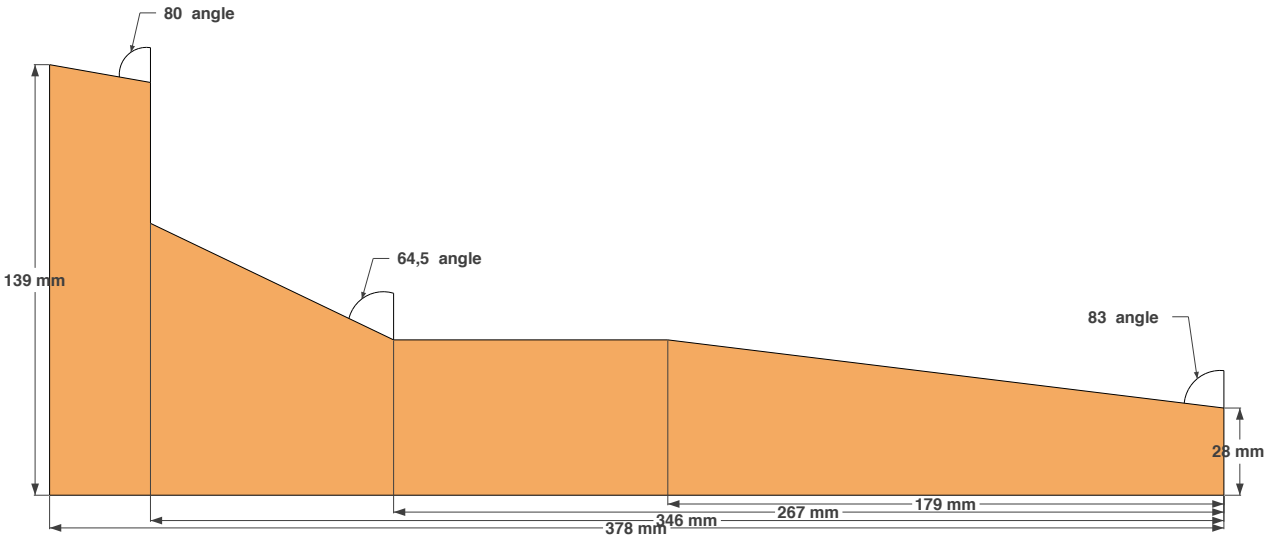

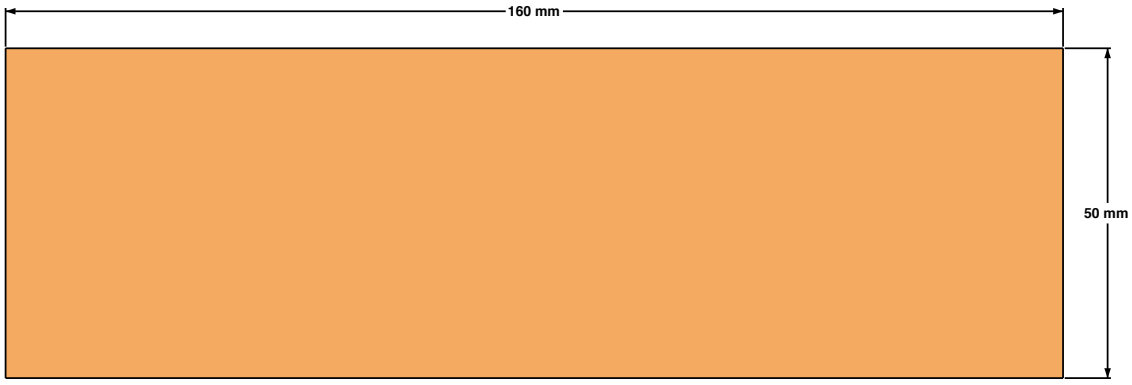

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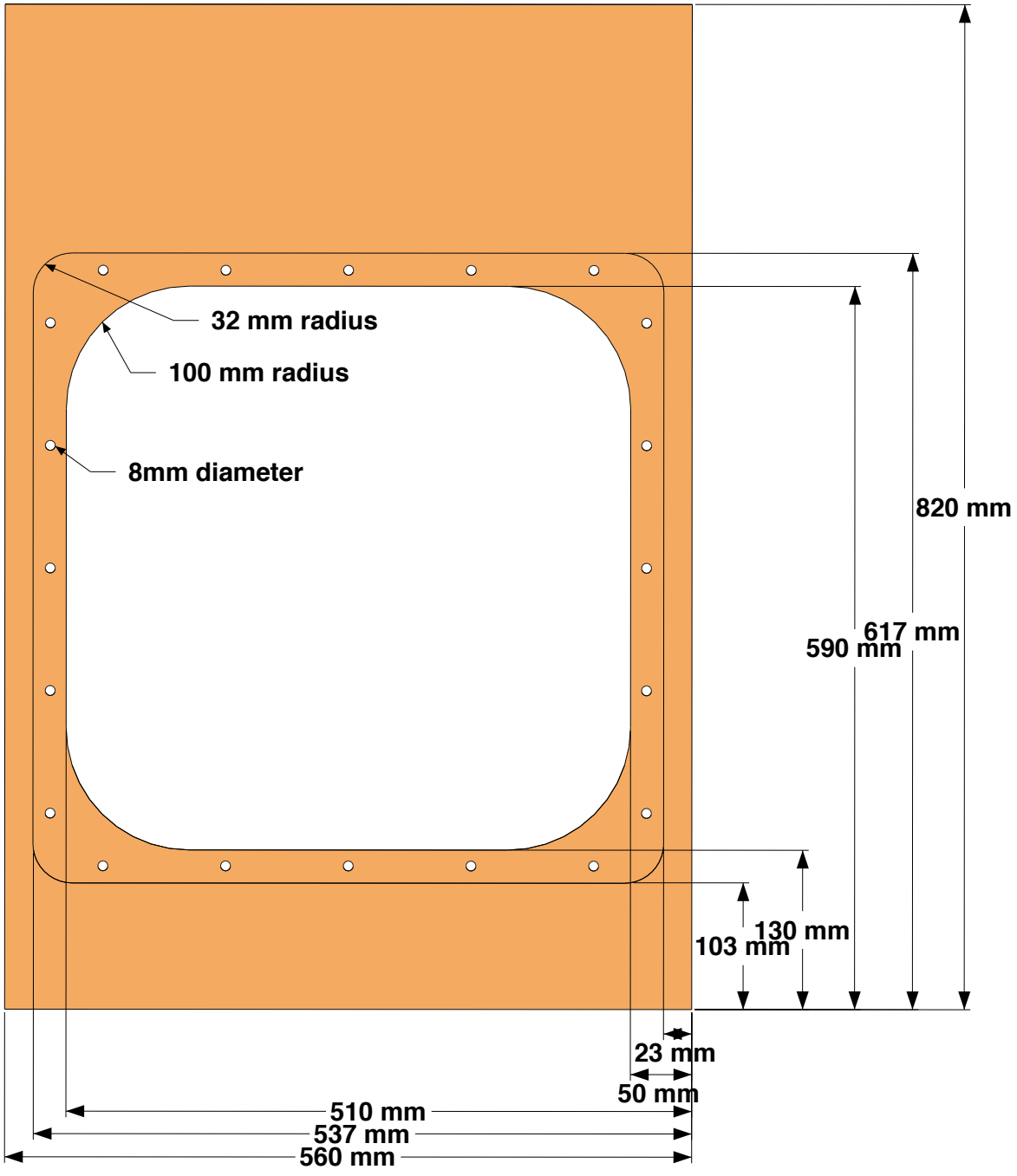

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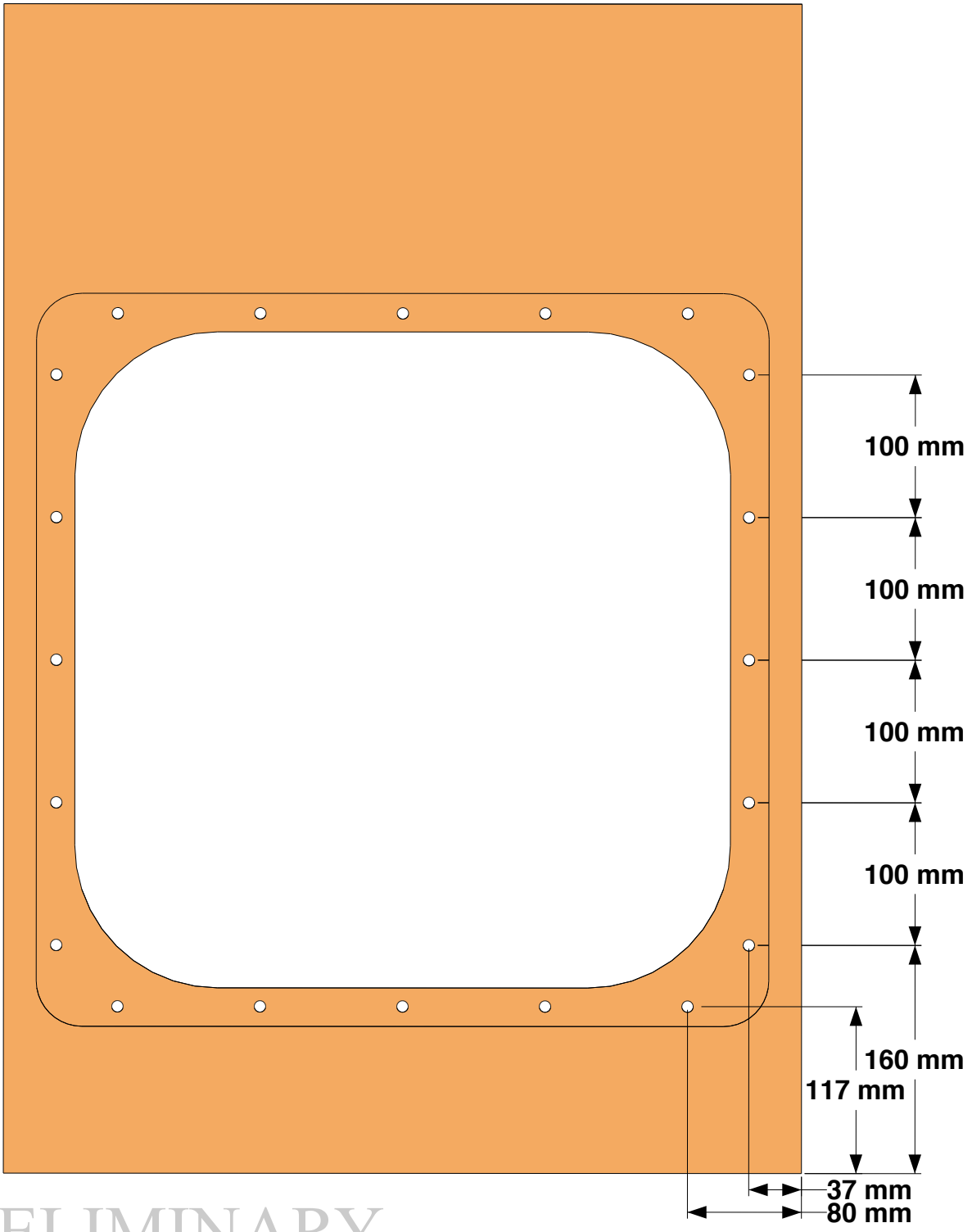

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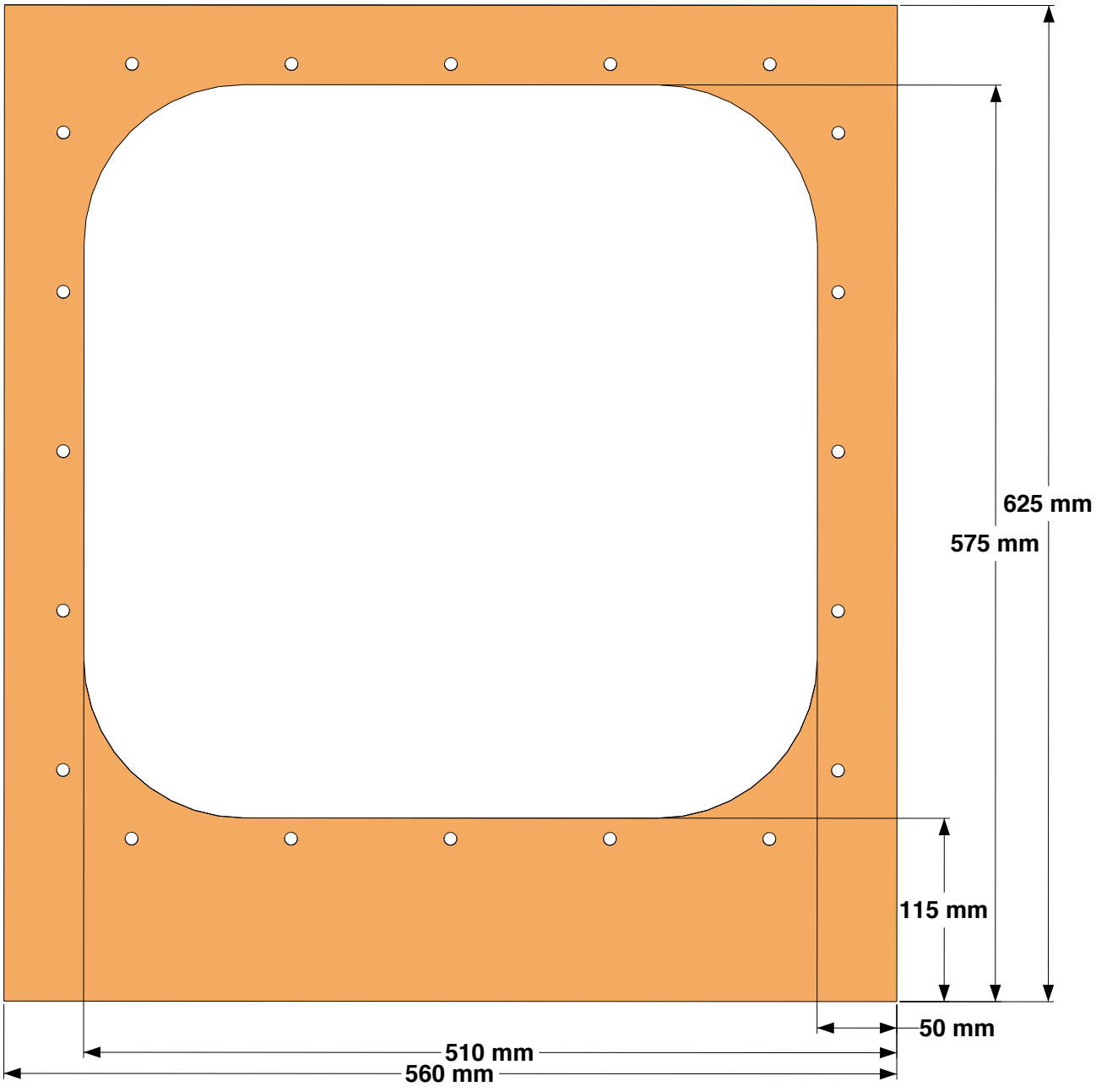

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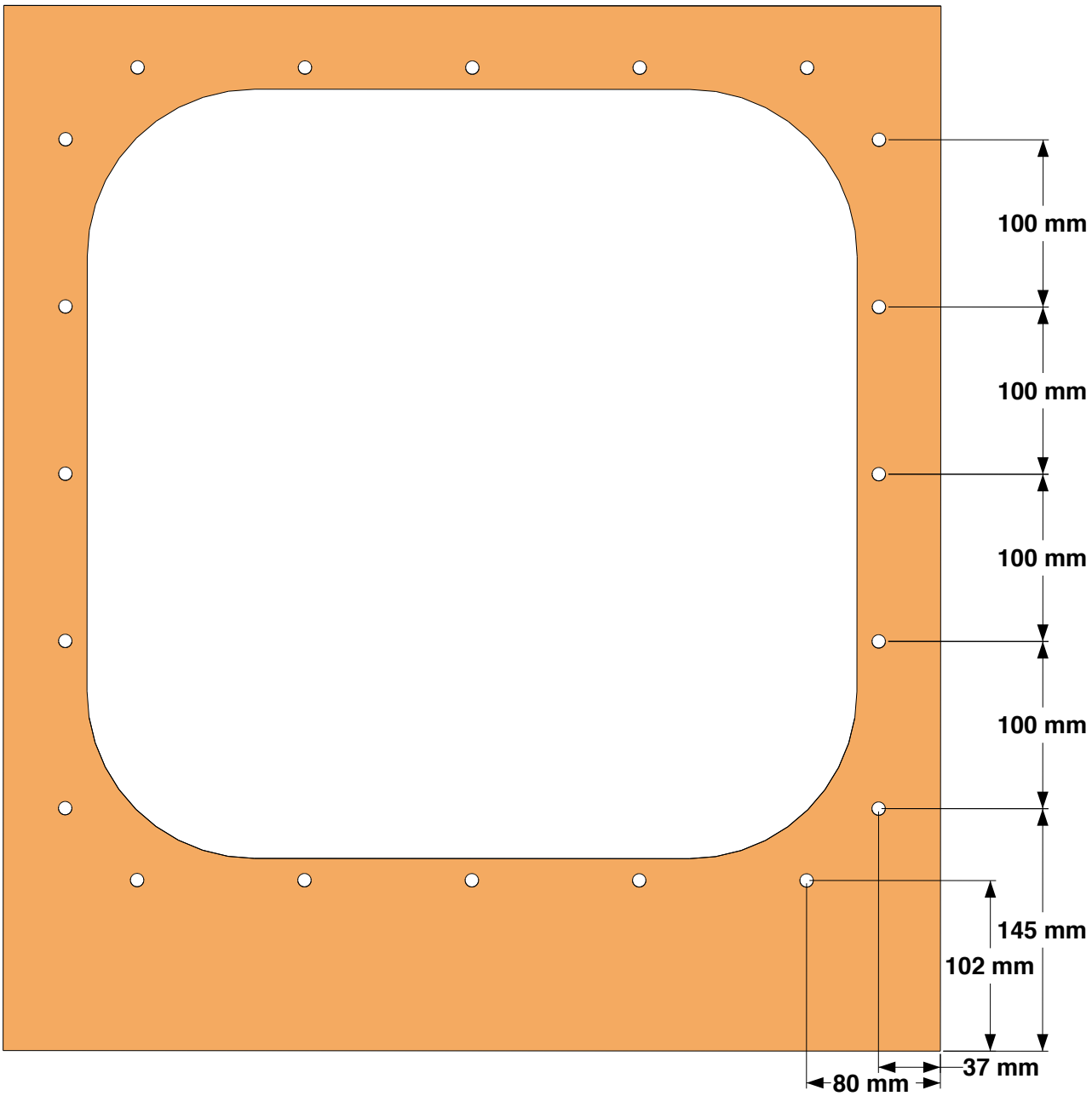
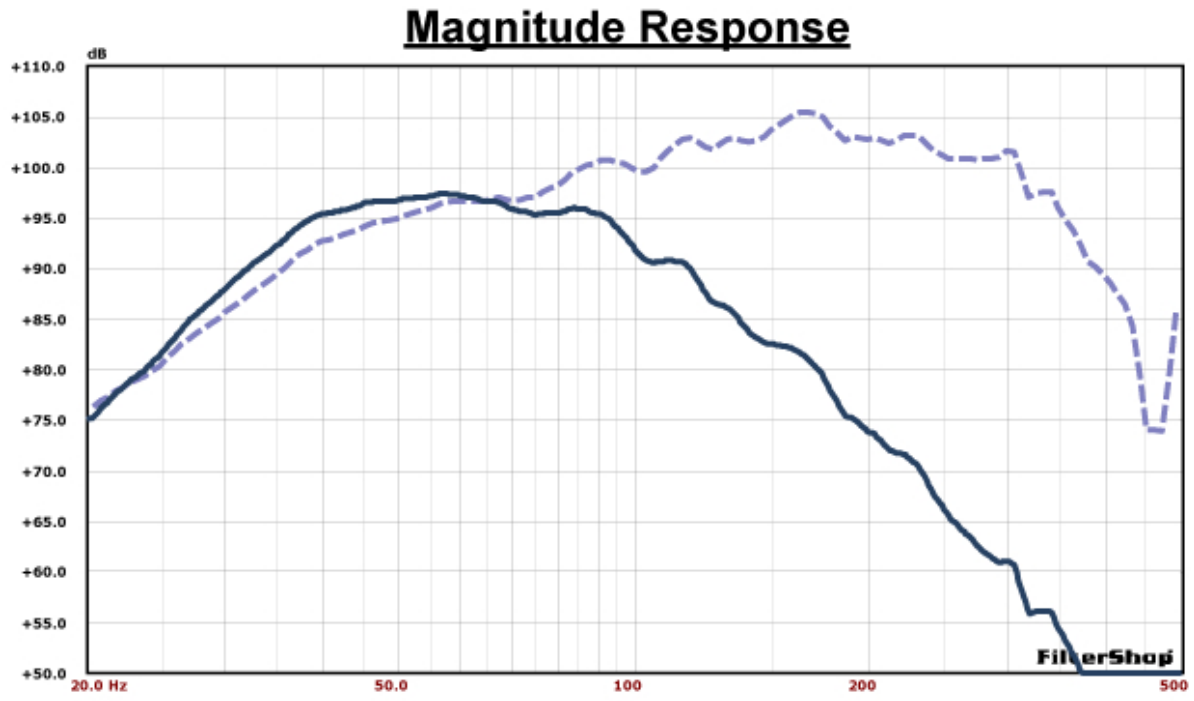
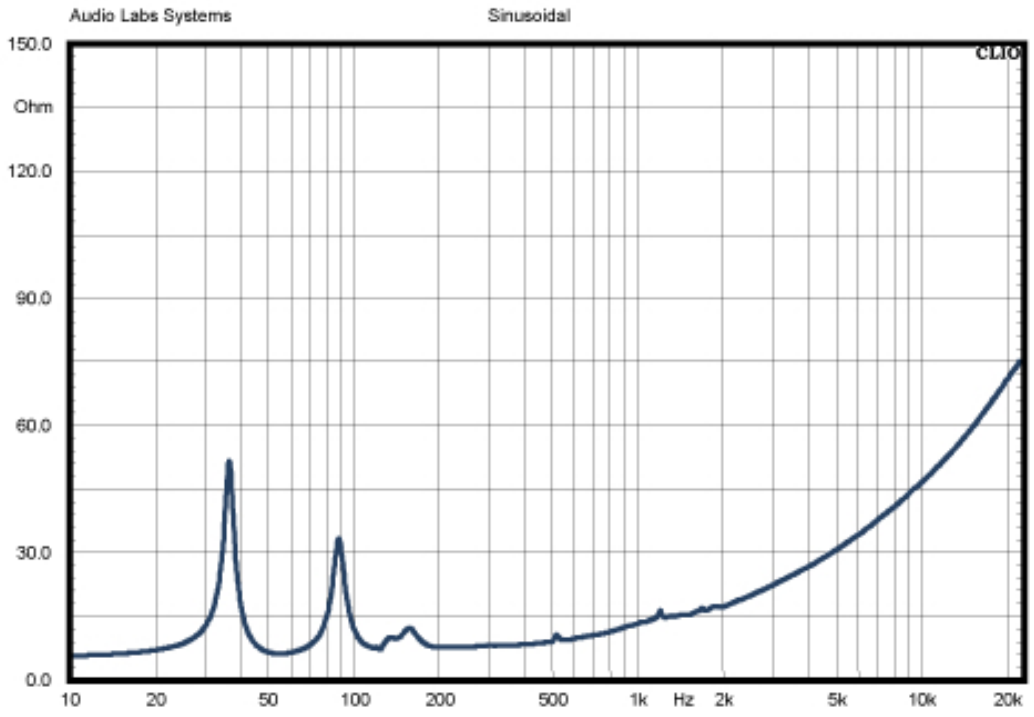


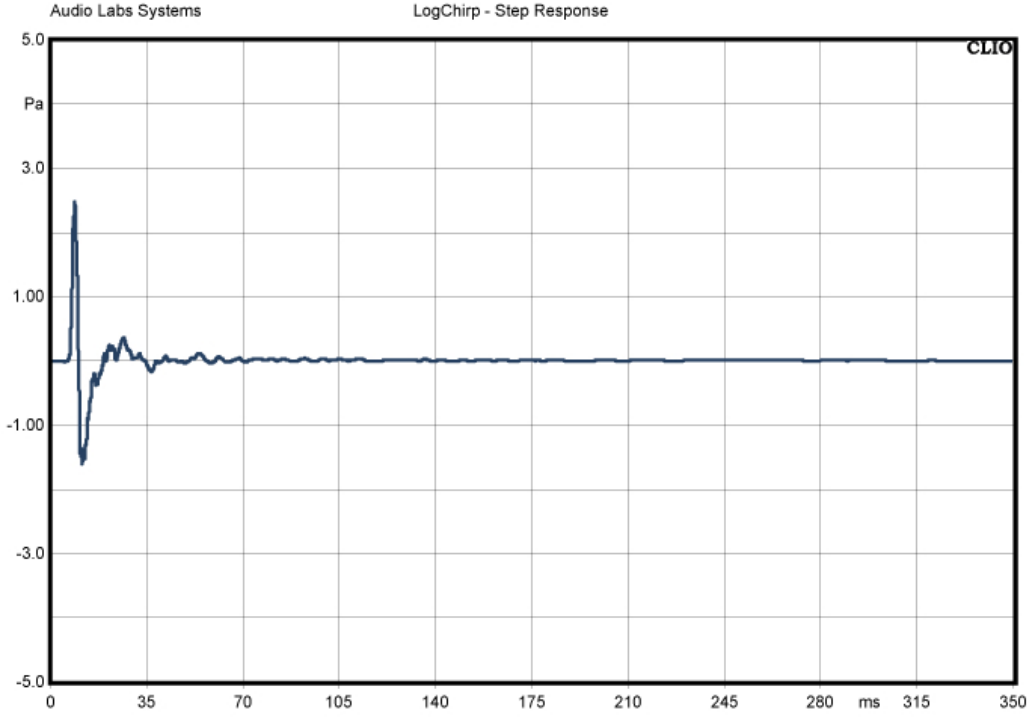
System Measurements and Suggested Settings with 18LW2400 and 18NLW9400

Unfiltered Magnitude Response, 2.83V/1m and relative Phase Response with 18LW2400

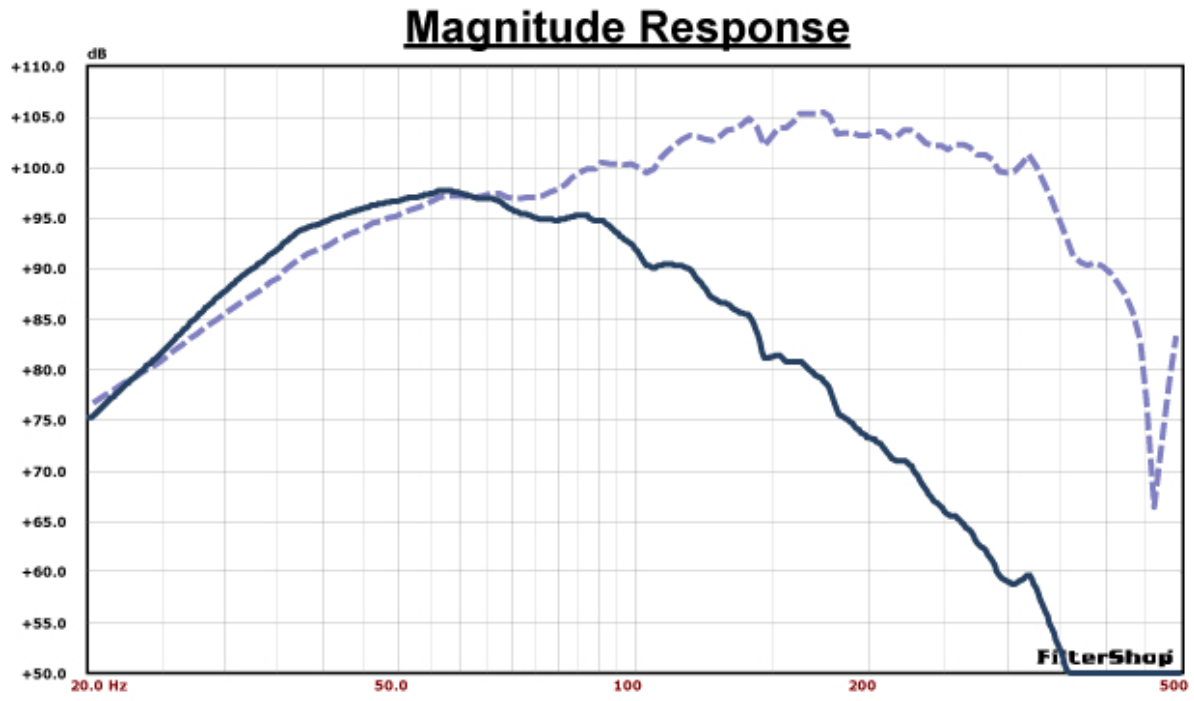


Impedance and Step Response with 18LW2400





Unfiltered Magnitude Response, 2.83V/1m and relative Phase Response with 18NLW9400



Impedance and Step Response with 18NLW9400