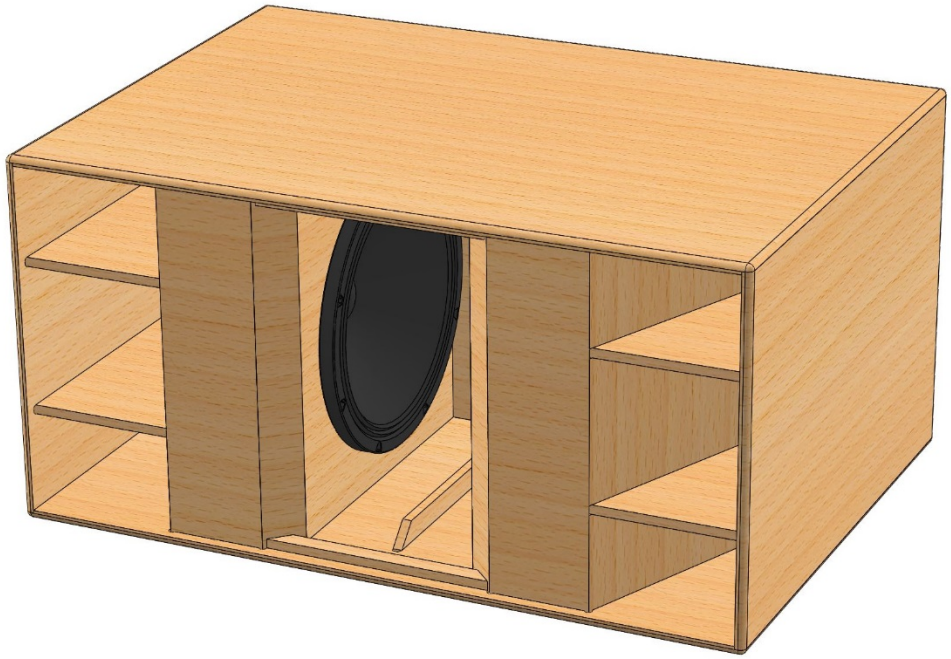
218ID – IPAL Subwoofer System



DOUBLE 18'' MANIFOLDED BAND-PASS ACTIVE SUBWOOFER

COMPONENTS & SPECIFICATIONS

- 2 x 18ID – iPAL compatible subwoofer
- 1 x Powersoft IPALMOD with DSP4 2CH
- 1 x Pressure Sensor

18iD

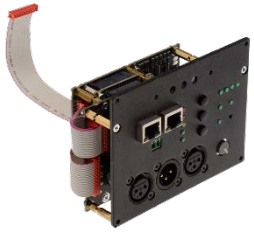
General Specifications

Nominal Diameter	460mm (18 in)
Rated Impedance	2 Ohm
AES Power	1800W
Program Power	3600W
Peak Power	10000W
Sensitivity	95 dB
Frequency Range	30 - 2500 Hz
Power Compression @-10dB	0,7 dB
Power Compression @-3dB	1,5 dB
Power Compression @Full Power	2,2 dB
Max Recomm. Frequency	200 Hz
Recomm. Enclosure Volume	110 - 350 lt. (3,89 - 12,36 cuft)
Minimum Impedance	2 Ohm at 25°C
Max Peak To Peak Excursion	70 mm (2,76 in)
Voice Coil Diameter	135 mm (5,31 in)
Voice Coil winding material	Copper wire
Suspension	Triple Roll, Heavy Polycotton
Cone	Straight ribbed carbon fiber loaded cellulose

Thiele Small Parameters

Fs	40 Hz
Re	1,5 Ohm
Sd	0,113 sq.mt. (175.15 sq.in.)
Qms	5,5
Qes	0,27
Qts	0,26
Vas	67 lt. (2,36 cuft)
Mms	420 gr. (0,92 lb)
BL	24 Tm
Linear Mathematical Xmax	±15,5 mm (±0,6 in)
Le (1kHz)	1,22 mH
Ref. Efficiency 1W@1m (half space)	94,2 dB

IPALMOD



DSP4

AC Mains Power	
Power supply	Universal regulated, switch mode, with PFC
Nominal power requirement	AC 100 V - 240 V, 50/60Hz
Operating range	80 - 278 V_{rms}
Power consumption	
IDLE (energy save)	21 W
Average	400 VA
Efficiency @ 1/4 max power	81%
Inrush current	34.5 A_{peak} (7 A_{peak} after 5 s)

Audio	
Number of output channels	1
Gain	32 dB
Dynamic Range (A-Weighted @ 8 Ω)	65 dB
Output Noise (A-Weighted @ 8 Ω)	-44 dB
Frequency Response (-3 dB , 1 W @ 4 Ω)	10 Hz - 620 Hz
THD+N (from 0.1 W to Full Power)	< 0.6% (typical < 0.4%)
DIM (from 0.1 W to Full Power)	< 1.6% (typical < 0.8%)

Output Stage	
Maximum output power	8500 W
Maximum unclipped output voltage	195 V_{peak}
Maximum output current	120 A_{peak}

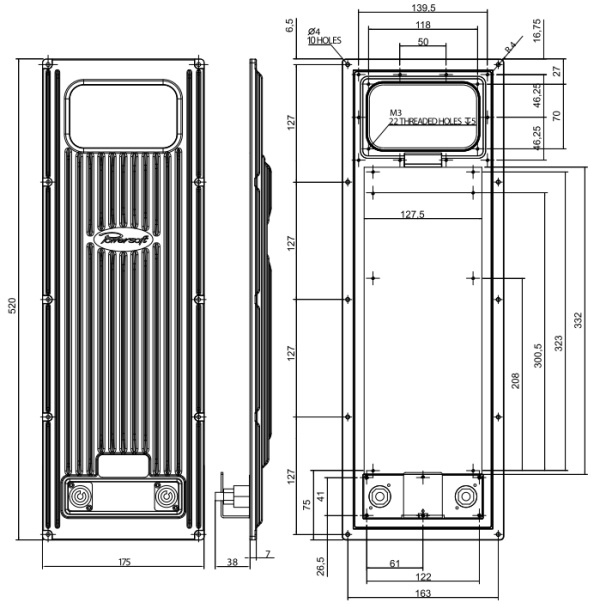
Virtual speaker® mode	
Thiele-Small paramters	Qes - Qms - Vas - Sd - Fs - Re
Electromechanical model parameters	Qes - Qms - Vas - Sd - Fs - Re

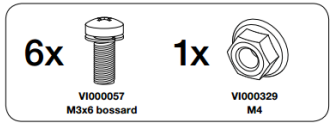
Differential Pressure Control® Mode	
Impedance control parameters	Bandwidth, added Re
Pressure control parameters	Bandwidth, slope, gain

DSP	
Equalizer	Raised-cosine, custom FIR, parametric IIR: peaking, hi/lo-shelving, all-pass, band-pass, band-stop, hi/lo-pass
Crossover	linear phase (FIR), hybrid (FIR-IIR), Butterworth, Linkwitz-Riley, Bessel: 6 dB/oct to 48 dB/oct (IIR)
Limiters	TruePower™, RMS voltage, RMS current, Peak limiter, Excursion limiter, Current clamp, Brownout limiter, thermal
Metering	Input & output voltage, pressure, peak & average current, peak & average power, excursion, temperature

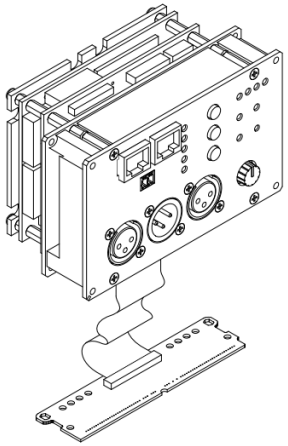
IPALMOD COMPONENTS

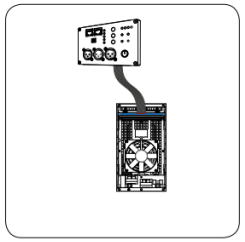
HEATSINK LARGE HS000L01

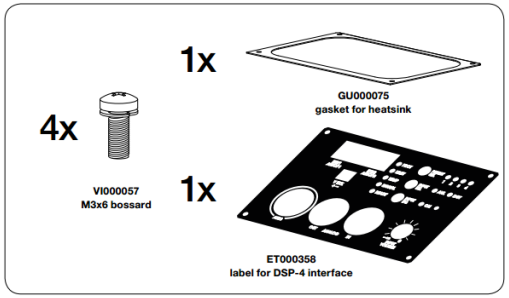




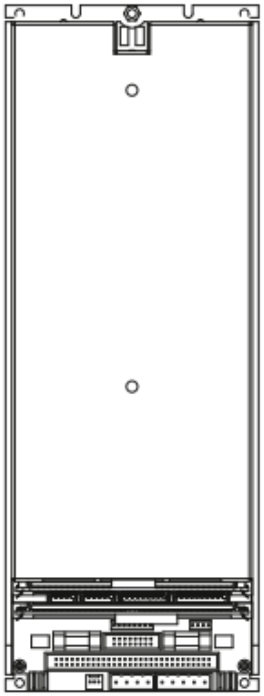
DSP4 2CH DSP40001





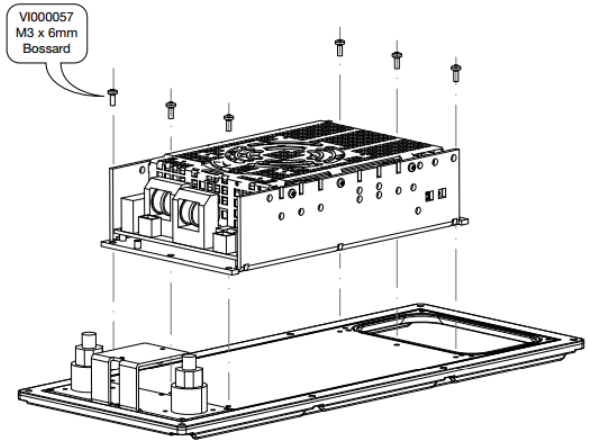


IPALMOD PF000193



IPALMOD ASSEMBLY- I

1



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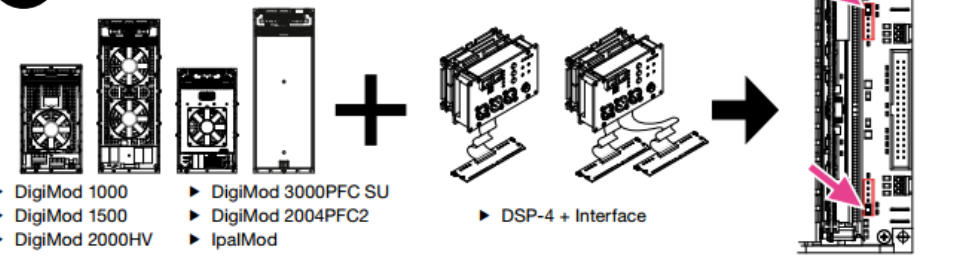
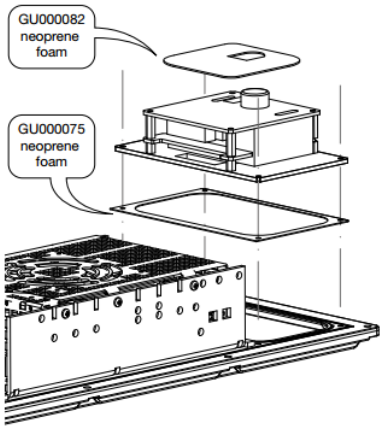
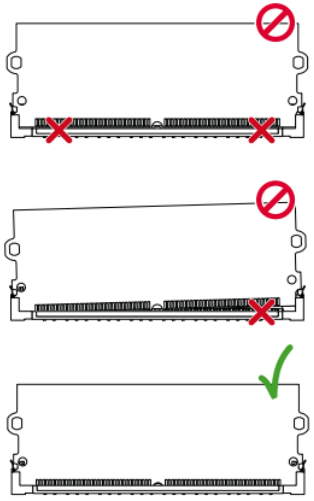


- DigiMod 1000
- DigiMod 1500
- DigiMod 2000HV
- DigiMod 3000PFC SU
- DigiMod 2004PFC2
- IpalMod
- DSP-4 + Interface

3





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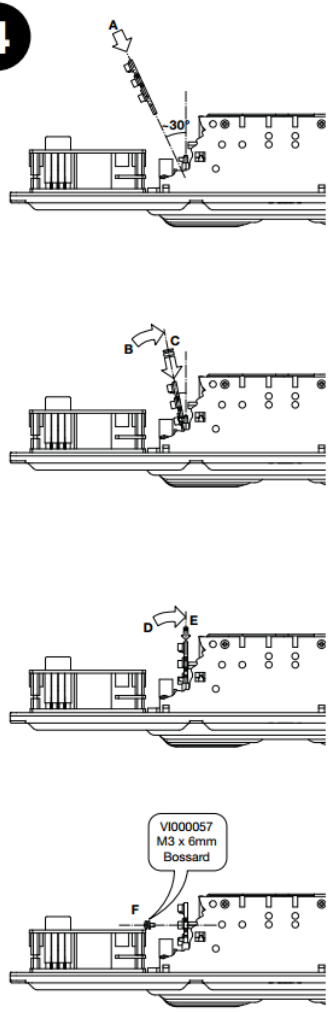

IPALMOD ASSEMBLY- II

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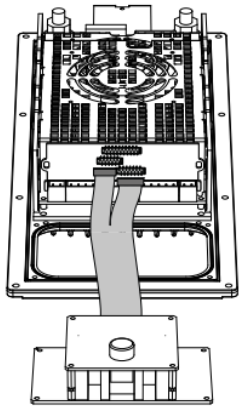

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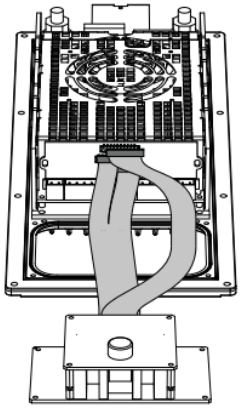

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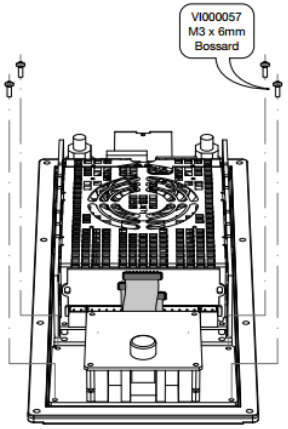
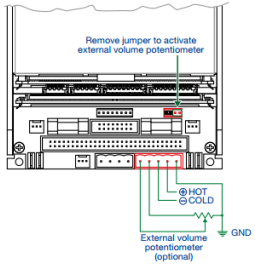
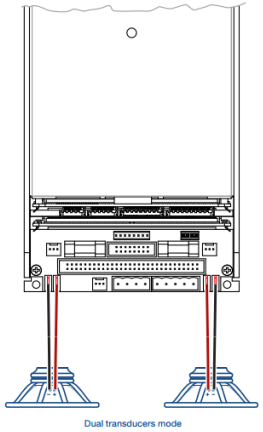
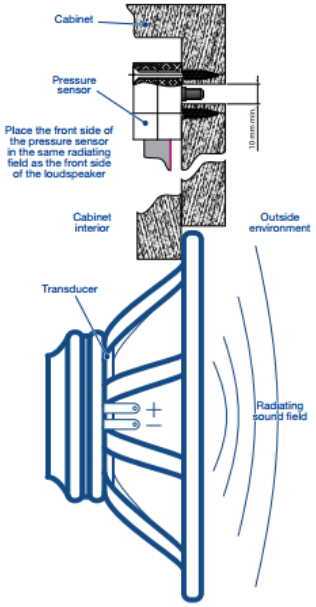






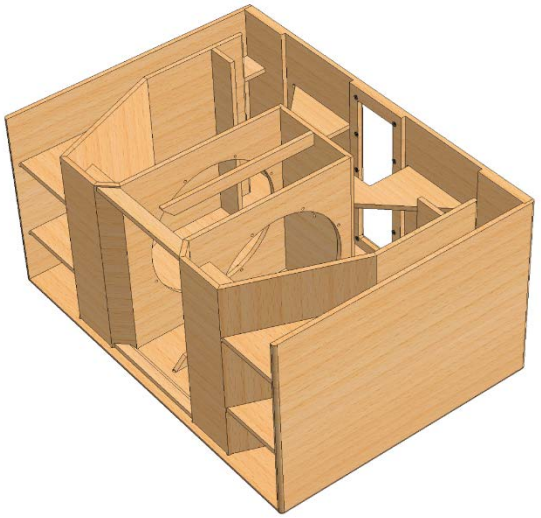


Please refer to Powersoft manuals for more detailed information and schematics about the iPAL system, Integration Kit assembly and DSP4:

http://www.powersoft-audio.com/en/docman/658-ipalmod-user-guide/file
http://www.powersoft-audio.com/en/docman/1102-digimod-ik-user-guide-1/file
http://www.powersoft-audio.com/en/docman/648-dsp-4-user-guide/file

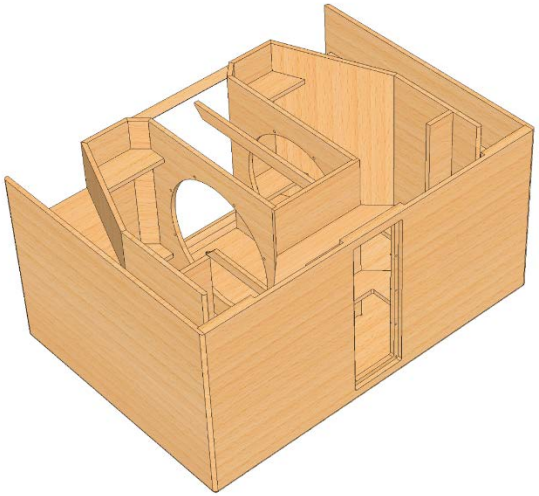
KEY FEATURES

- The enclosure should be made of Baltic birch plywood (18mm thickness)
- Bolts are M6x35mm (M6 T-Nuts recommended)
- Handling and rigging are user's choice



BILL OF MATERIALS

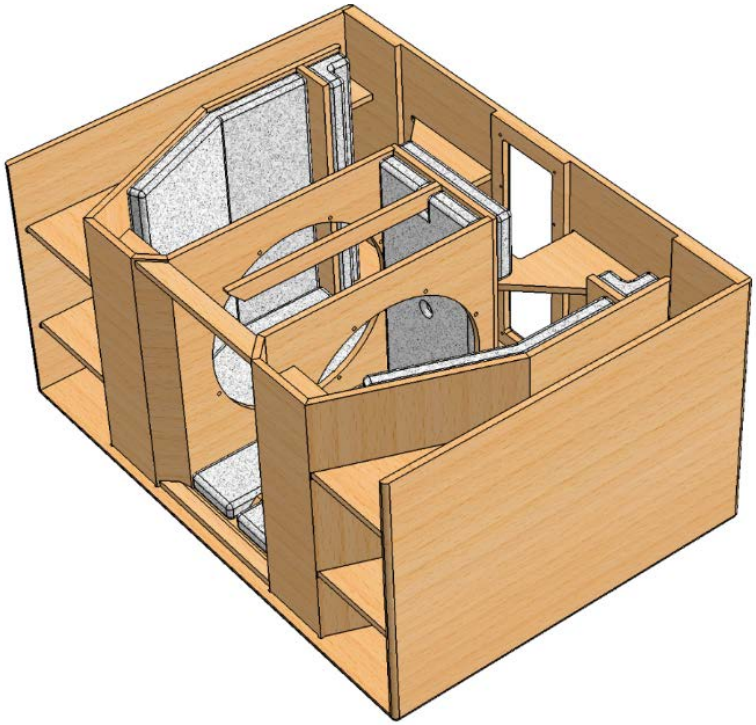
Name	QTY
18iD (022182N01B)	2
iPALMOD (PF000193)	1
DSP4 2CH + Interface (DSP40001)	1
Heatsink Large (HS000L01)	1
Socket Head Cap Screw M6x35mm Hex Key	16
Socket Head Cap Screw M4x40mm Hex Key	10
M6 T-Nuts	16
M4 T-Nuts	10

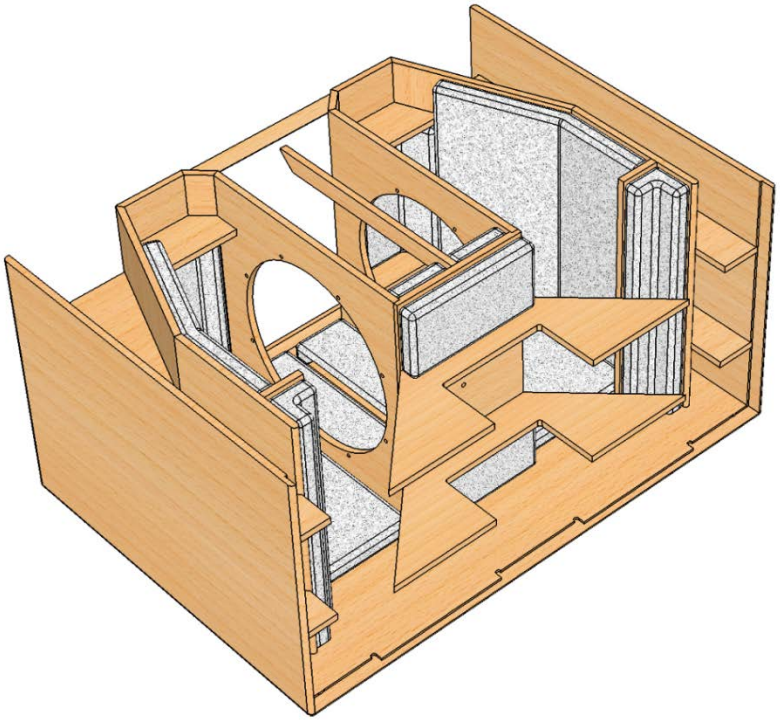


Type of wood and thickness:

- Birch Plywood 15mm;
- Birch Plywood 30mm (Back Panel)

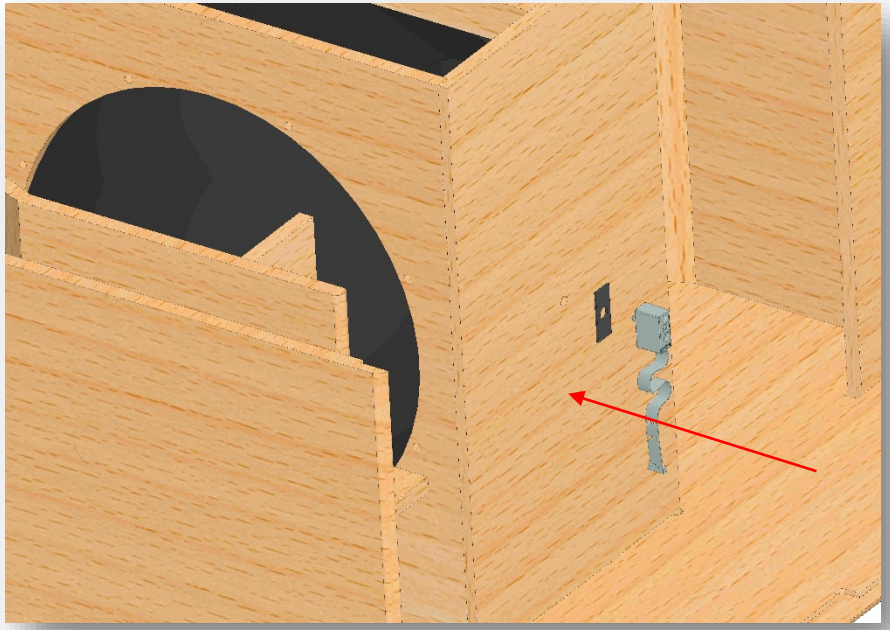
DAMPENING MATERIAL





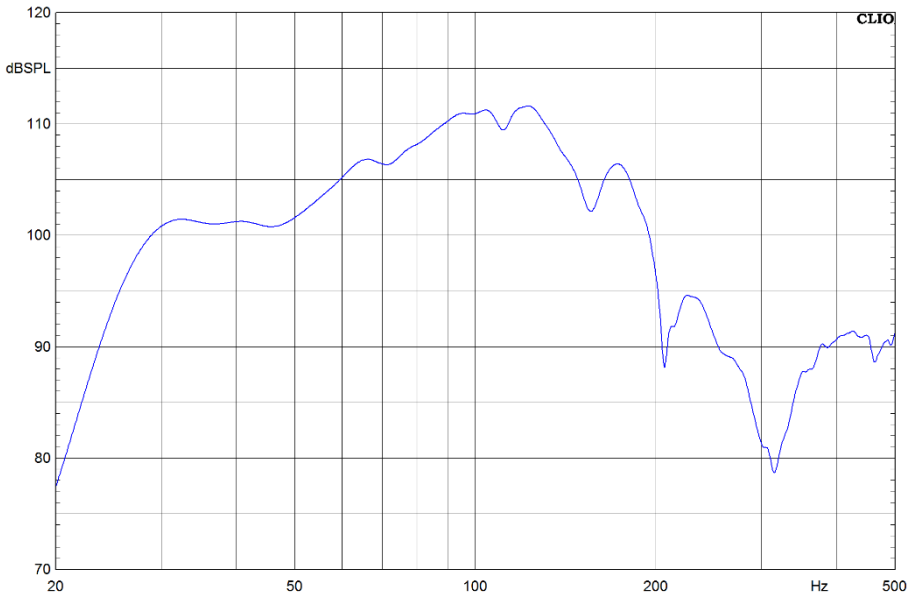
- An high density dampening material, such as Dacron or other synthetic fibers, is required for better performance;
- Please refer to the drawing as a guide

PRESSURE SENSOR POSITIONING

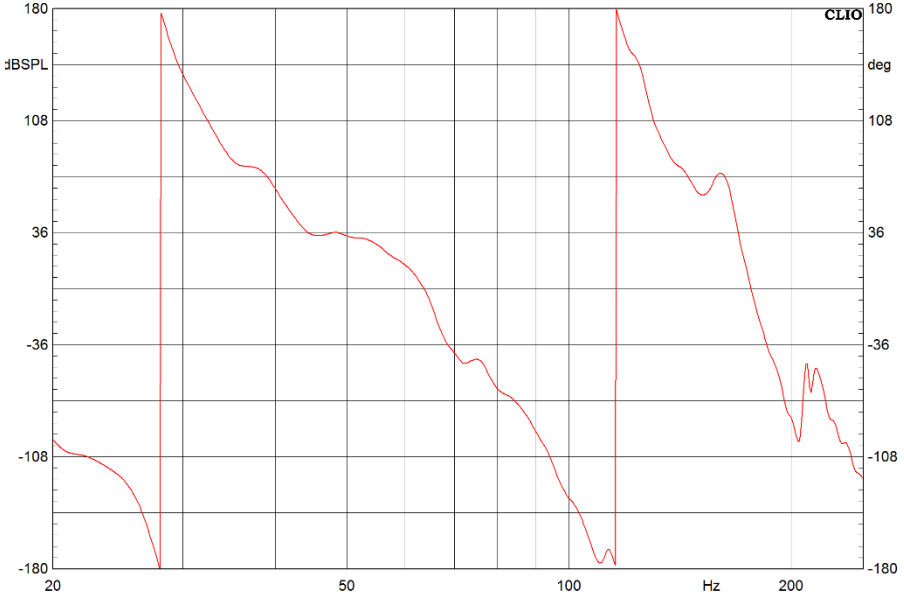


- As show in the example the sensor should be fixed in the 10mm diameter hole with a neoprene (or other expanded rubber) gasket to avoid air-leakage;
- Be careful when fixing the sensor, an excessive screwing could damage the housing;
- Sensor's hole position is specified in the Front chamber panel drawing;

UNFILTERED MAGNITUDE RESPONSE 1W/1M AND RELATIVE PHASE RESPONSE

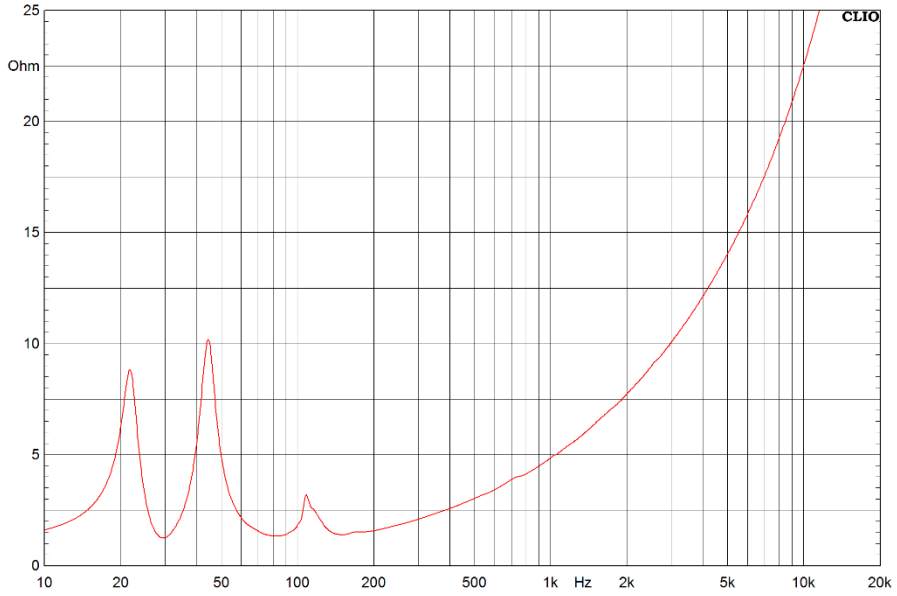


MAGNITUDE RESPONSE

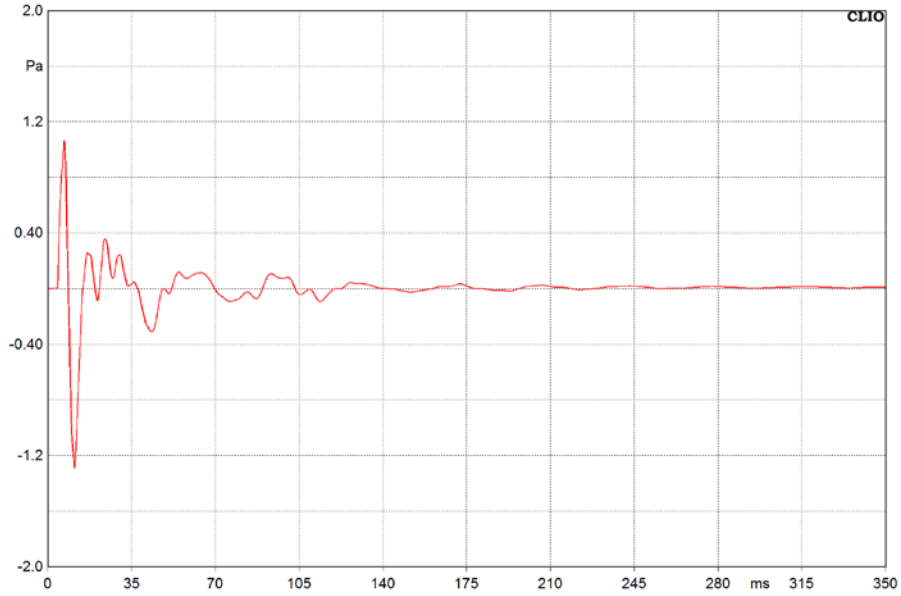


PHASE RESPONSE

IMPEDANCE AND STEP RESPONSE

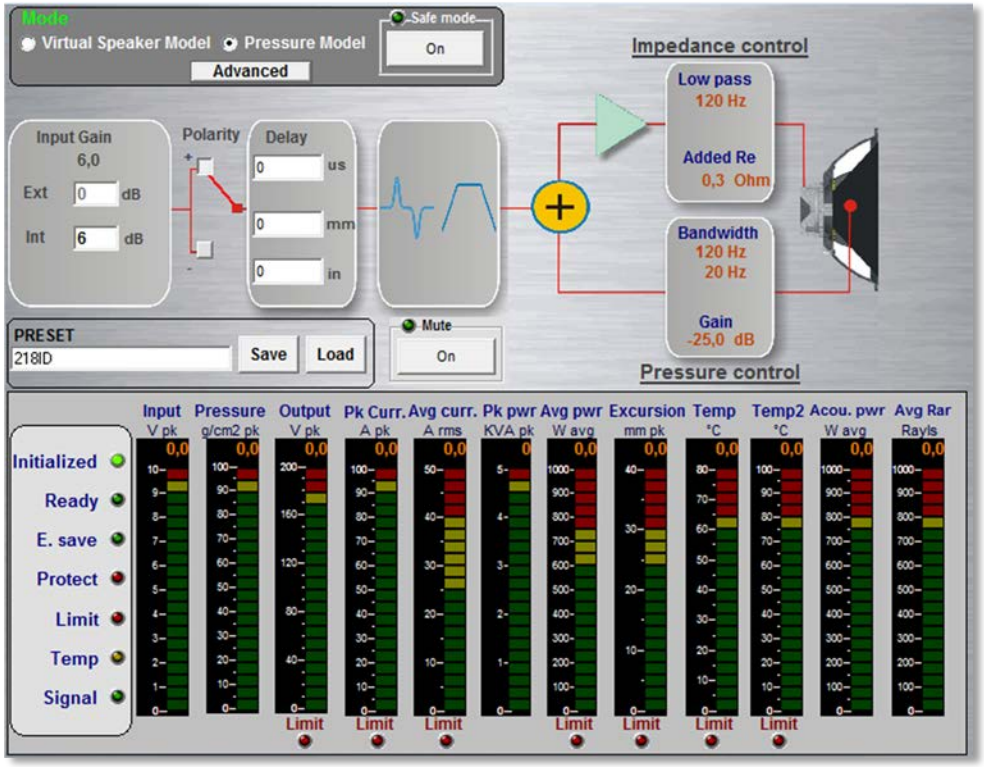


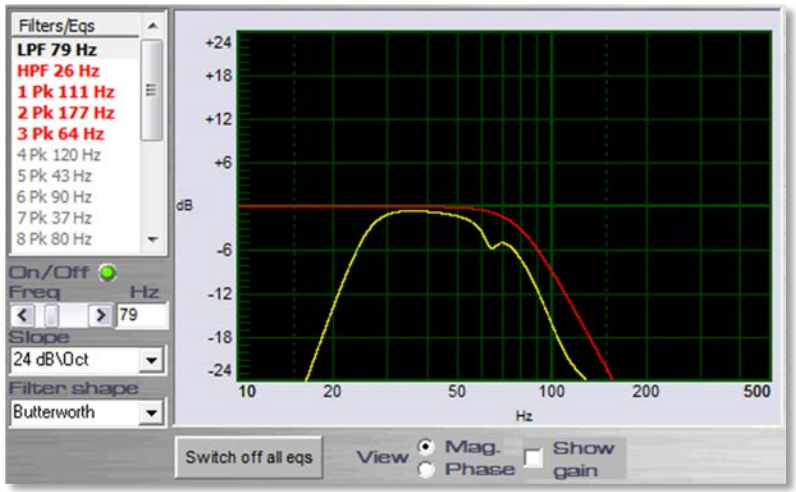
IMPEDANCE



STEP RESPONSE

POWER CONTROL MANAGER SETUP





NECESSARY PROCESSOR SETTINGS:

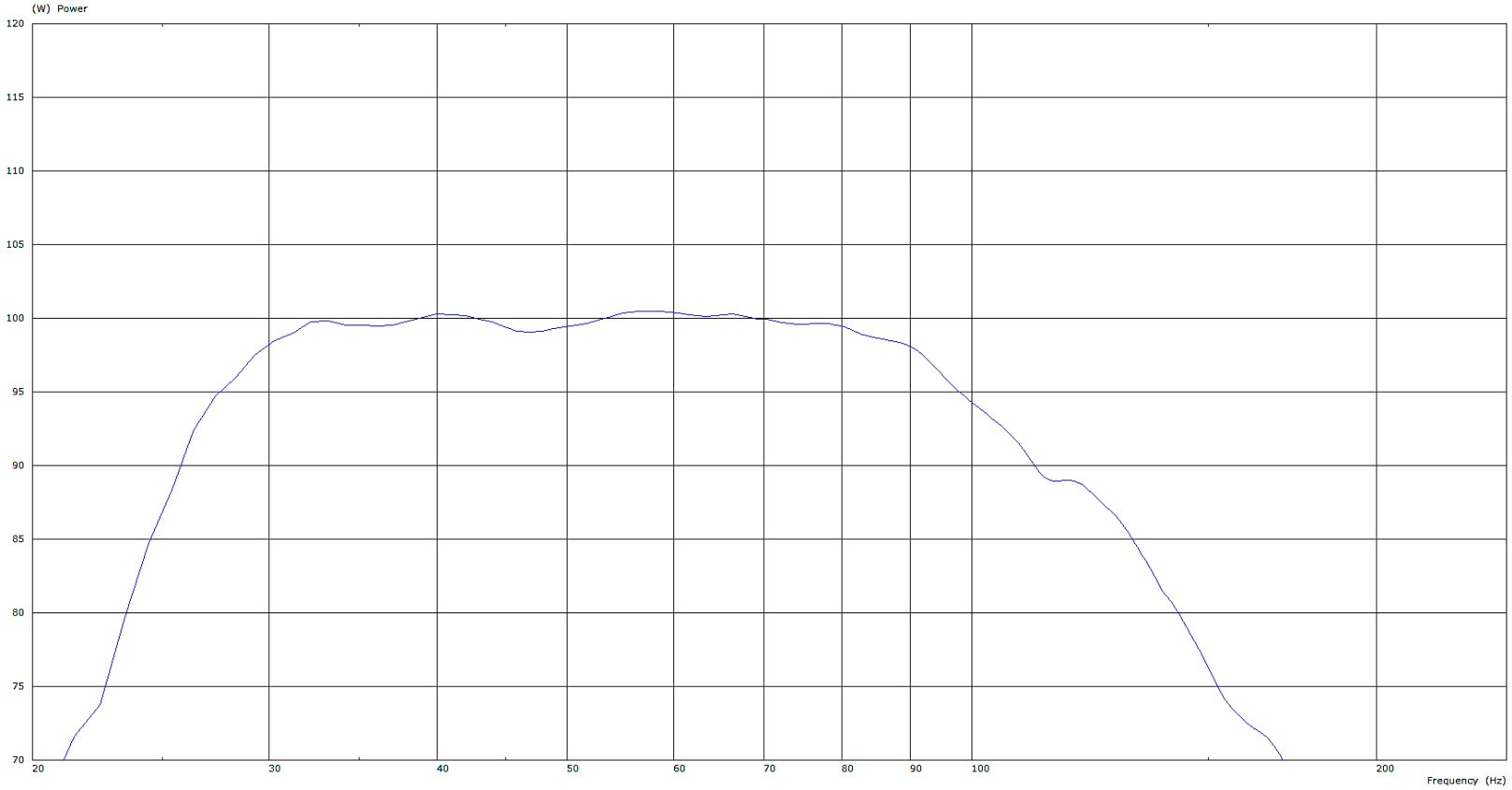
LPF: 79Hz BTW 24dB/OCT
HPF: 26Hz BTW 36dB/OCT
Pk: 111Hz -8dB Q: 1.6
Pk: 177Hz -9dB Q: 7.6
Pk: 64 -3dB Q: 7.5

PRESSURE MODEL

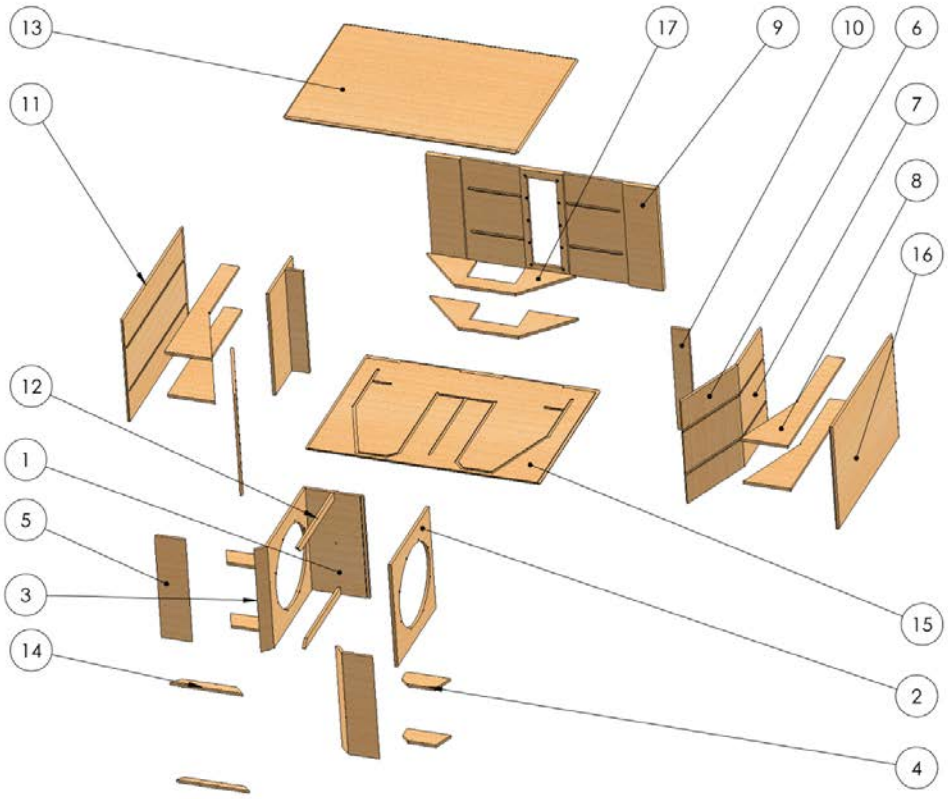
Impedance control:
Low pass: 120Hz
Added Re: 0,3 Ohm

Pressure control:
Bandwidth: 20 to 120Hz
Gain: -25dB

FILTERED MAGNITUDE RESPONSE 1W/1M

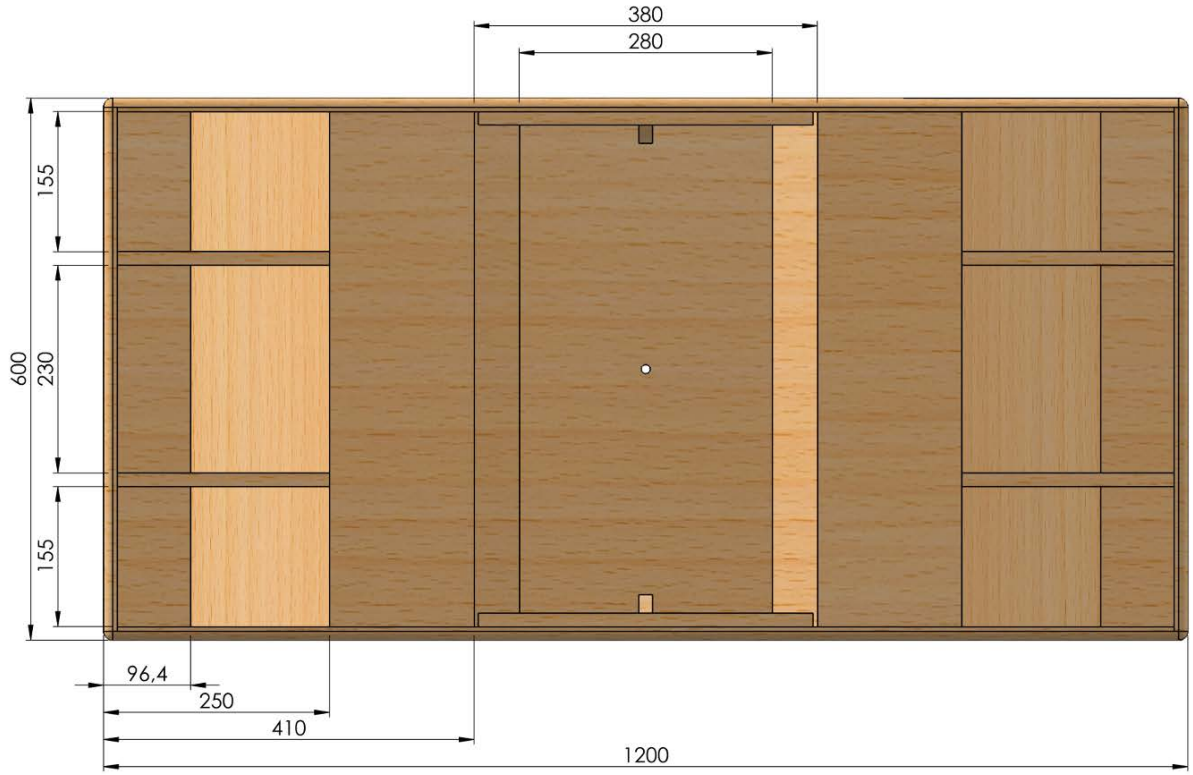


EXPLODED VIEW

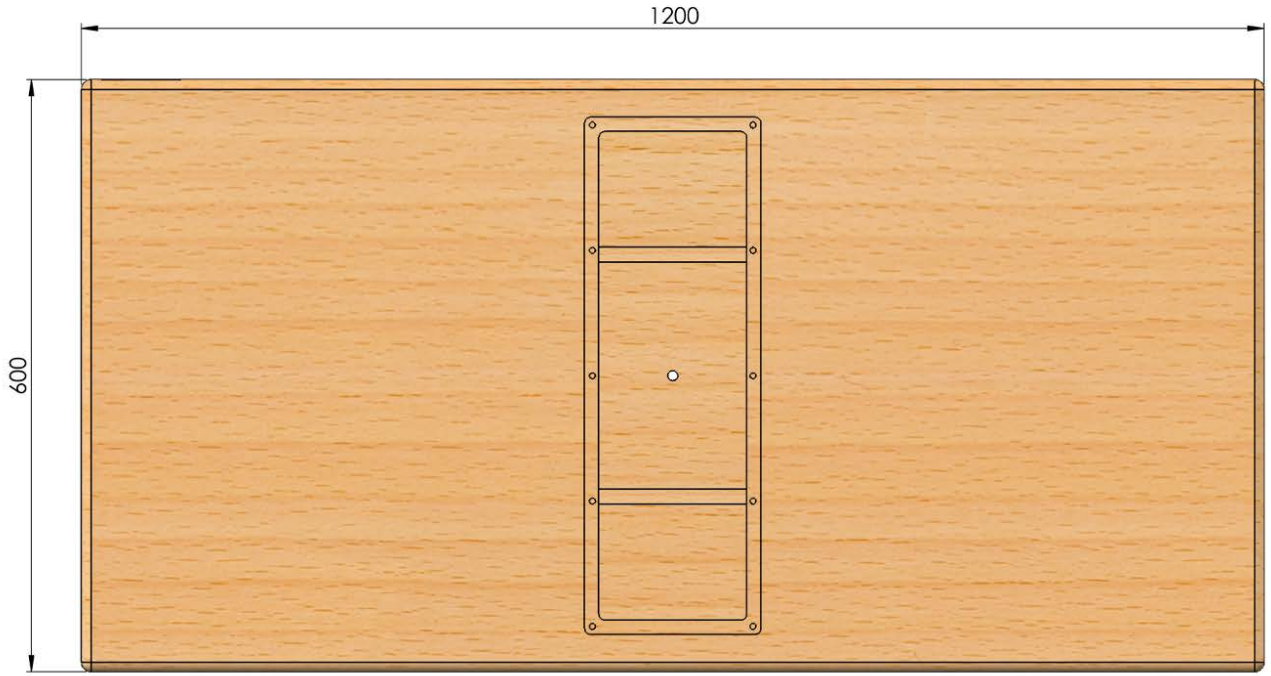


Cod.	Name	QTY
1	Front_chamber_panel	1
2	18_Baffle	2
3	Front_bend	2
4	Front_reinforcement	4
5	Front_Panel	2
6	Duct_2	2
7	Duct_1	2
8	Duct_reinforcement	4
9	Back_panel (30mm)	1
10	Vertical_reinforcement	2
11	Side_SX	1
12	Front_chamber_reinforcement	2
13	Top_panel	1
14	Front_grill_support	2
15	Bottom_panel	1
16	Side_DX	1
17	Back_reinforcement	2

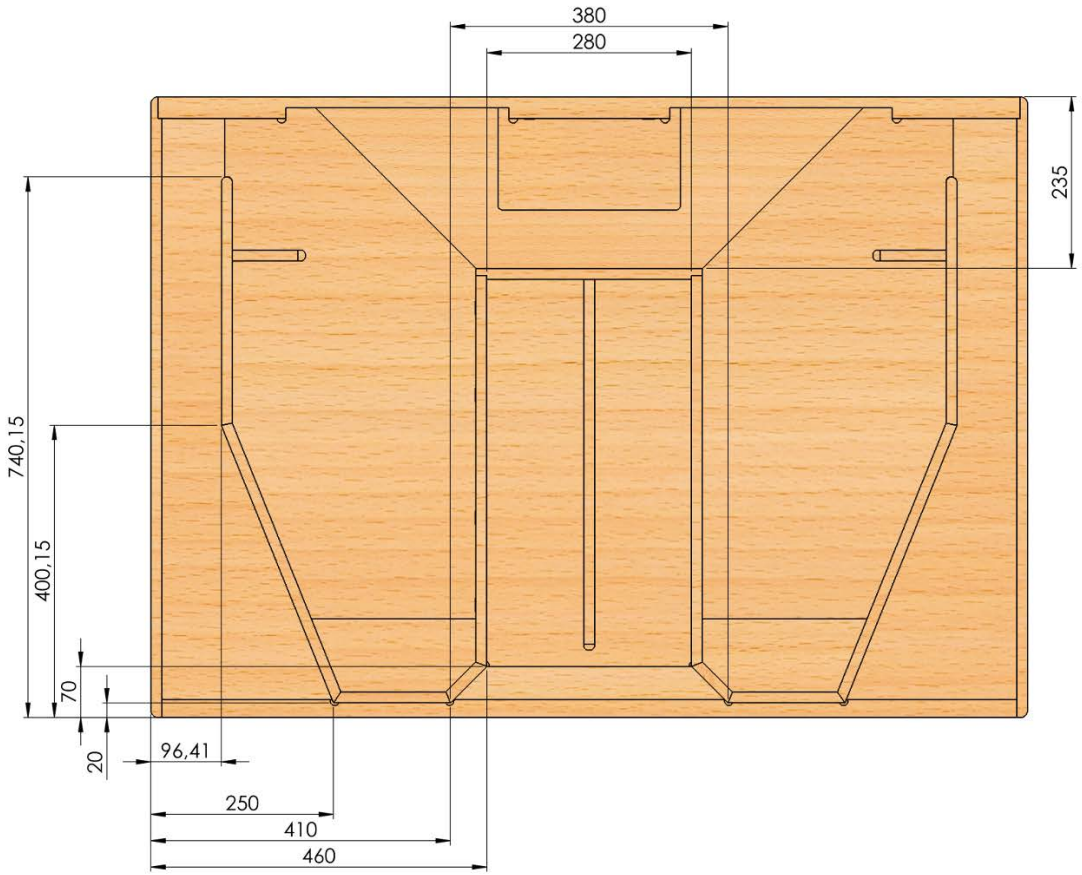
FRONT VIEW



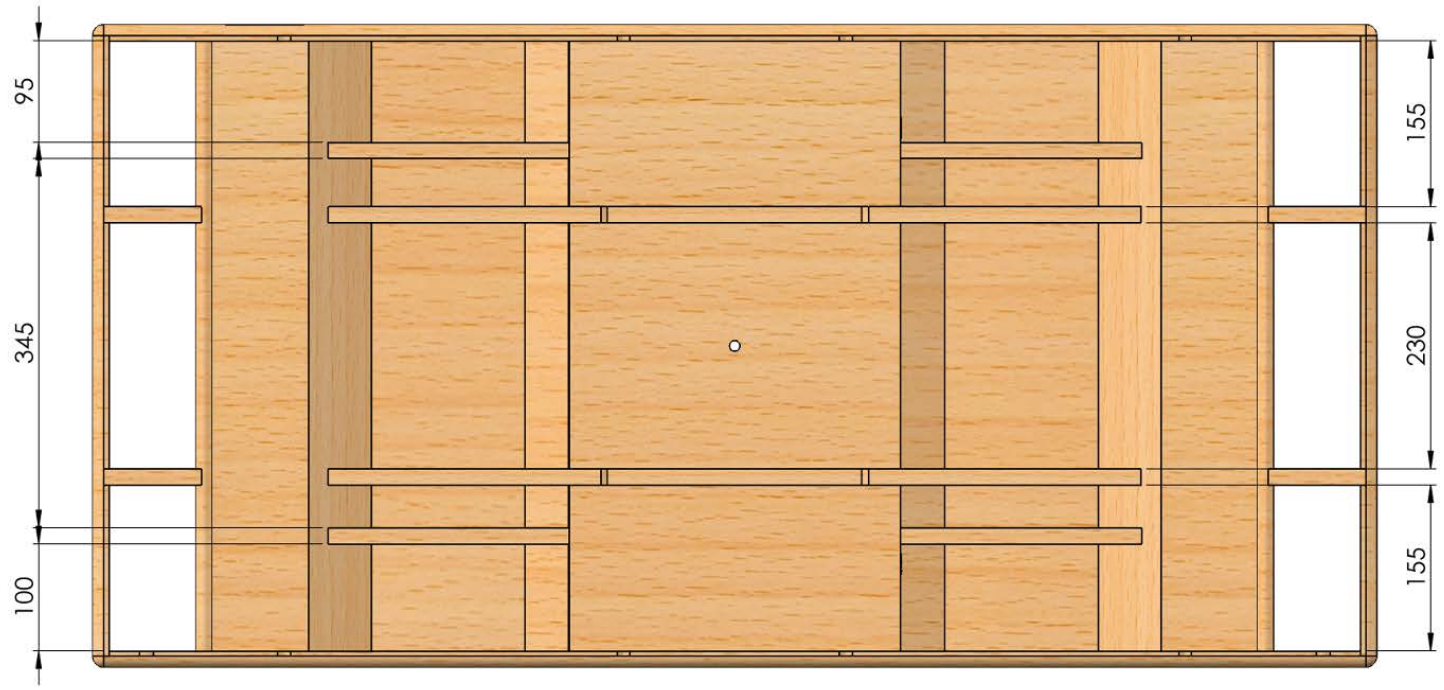
BACK VIEW



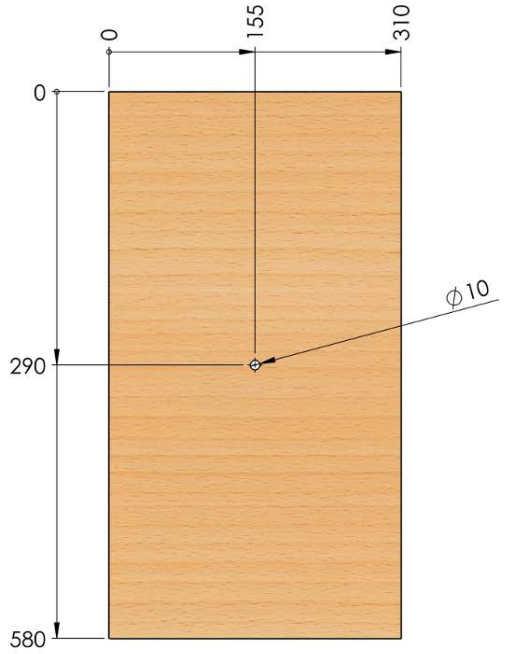
TOP SECTION VIEW

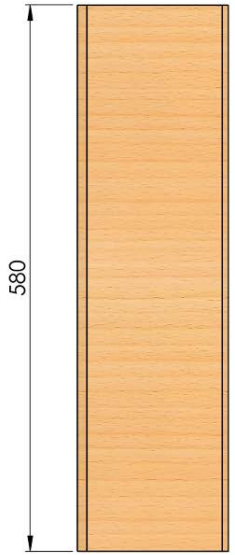


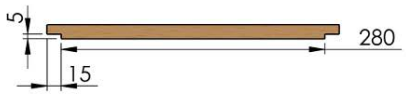
BACK SECTION



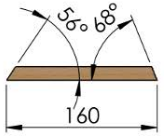
DETAILS: FRONT CHAMBER PANEL AND FRONT PANEL





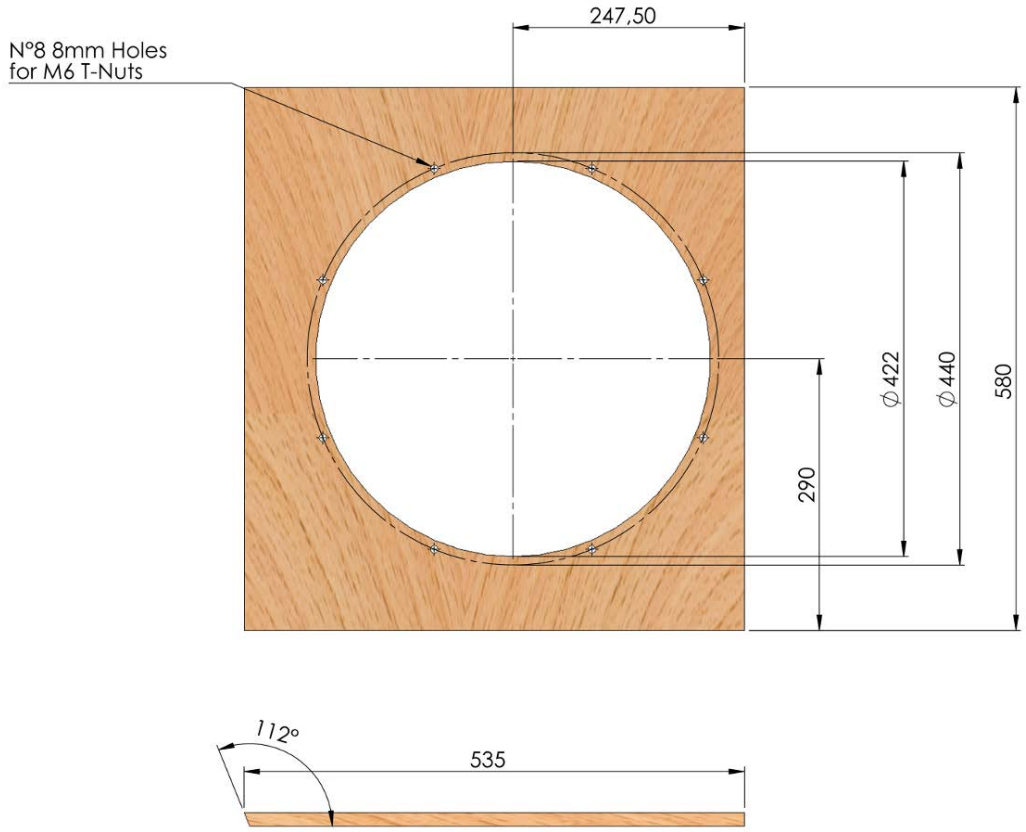


Front Chamber Panel

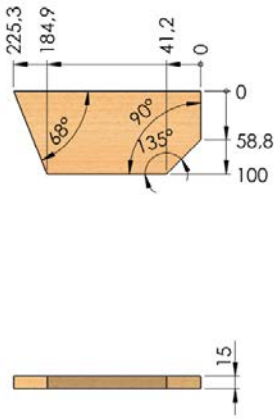


Front Panel

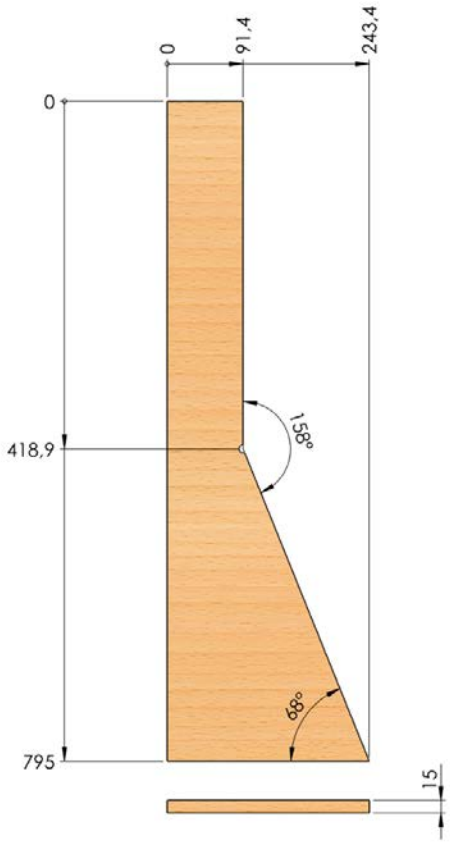
DETAILS: SPEAKER BAFFLE



DETAILS: FRONT PANEL AND DUCT REINFORCEMENTS

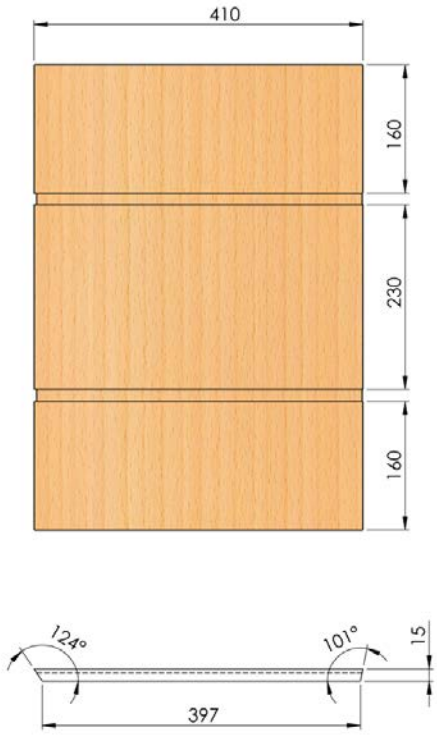


Front Panel Reinforcement

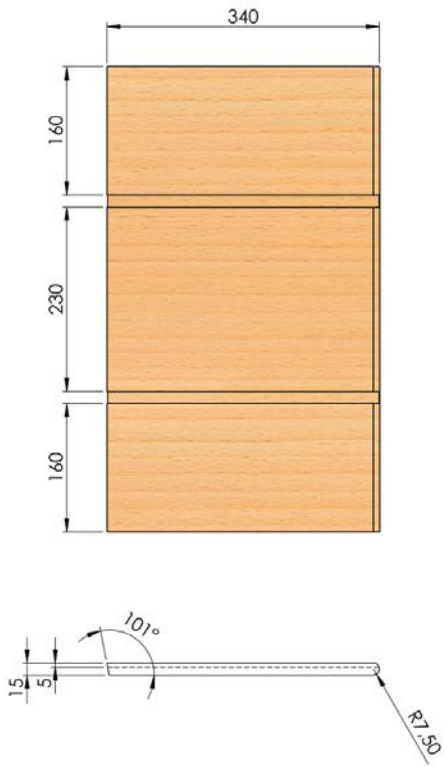


Duct Reinforcement

DETAILS: DUCT 1 AND DUCT 2

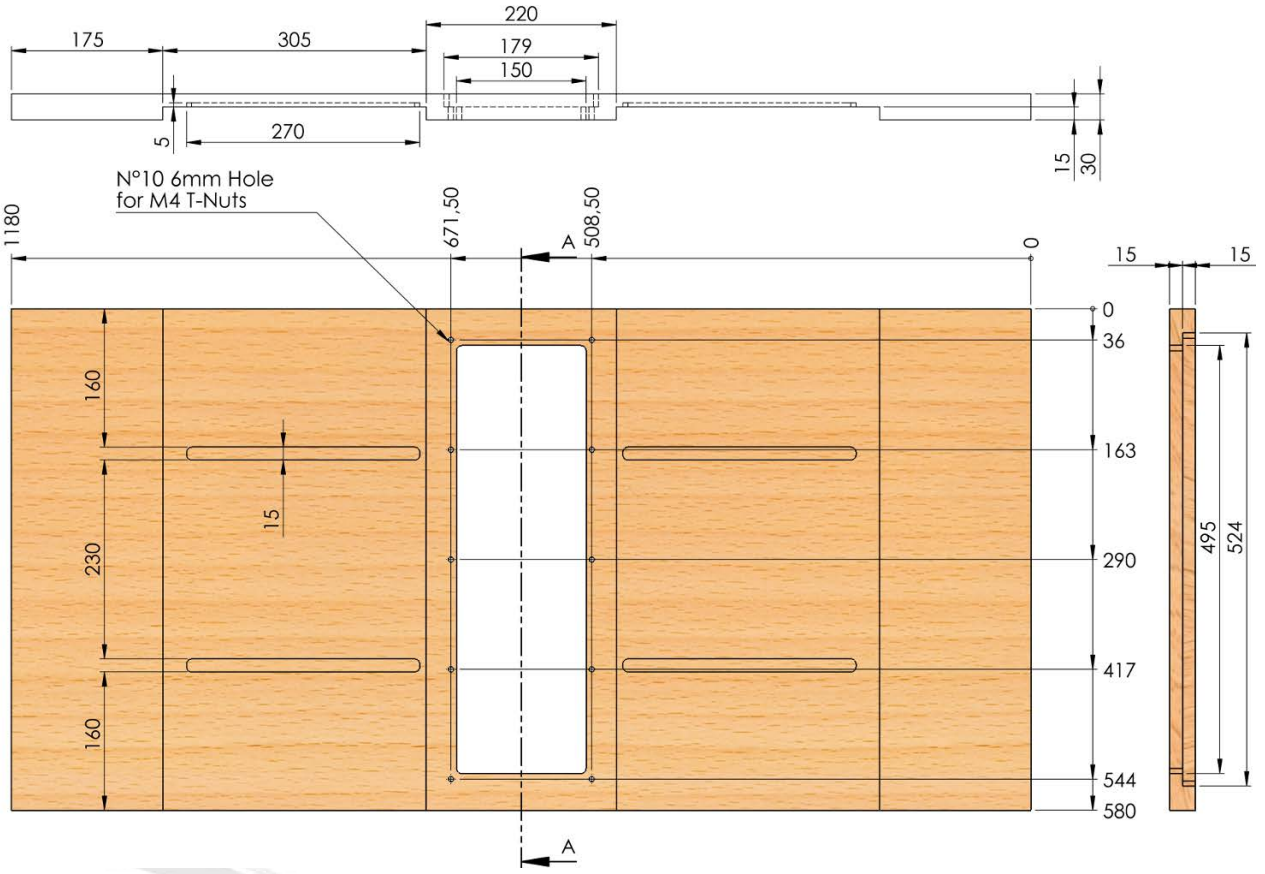


Duct2



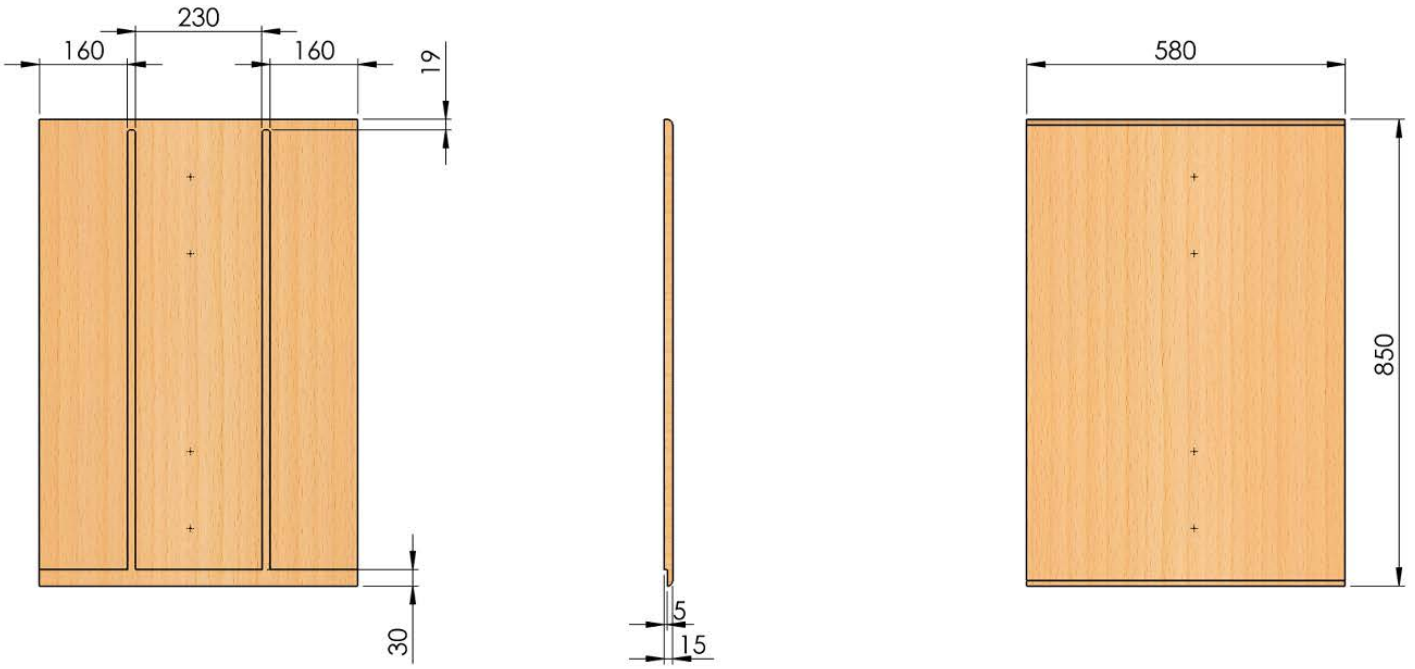
Duct1

DETAILS: BACK PANEL

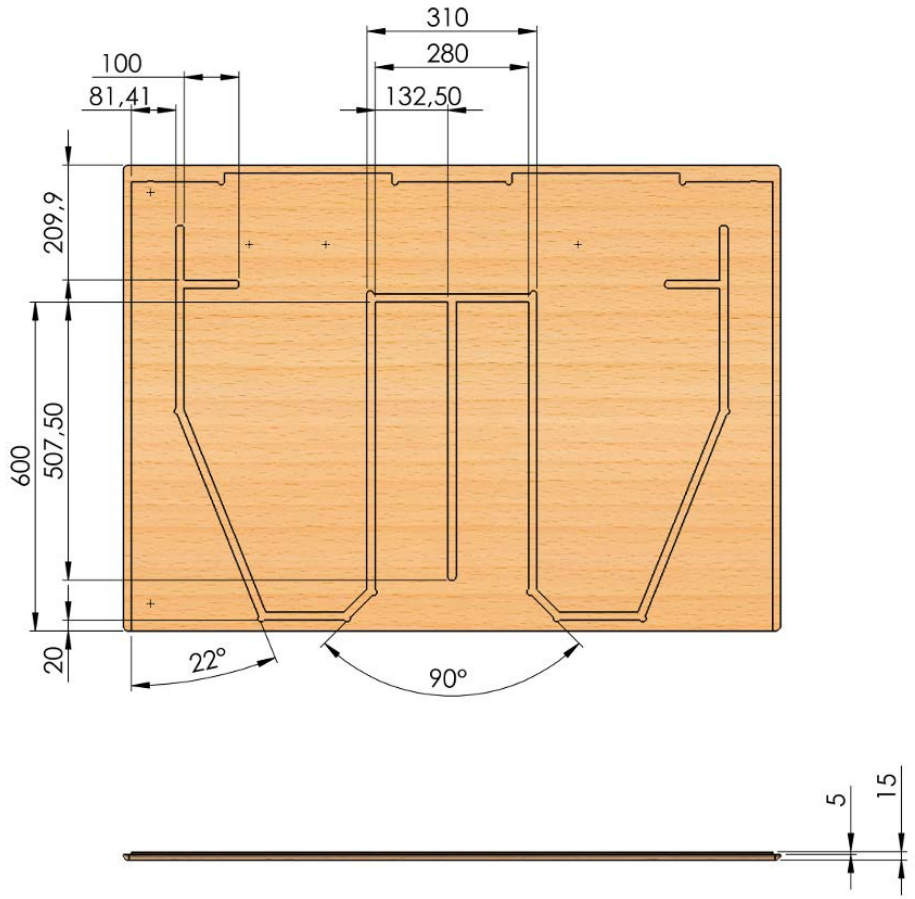


SECTION A-A

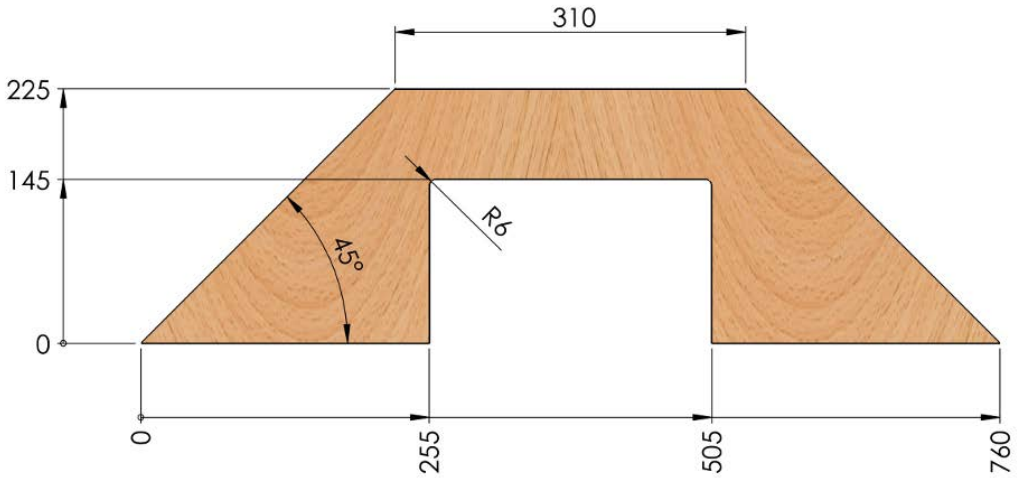
DETAILS: SIDE PANELS

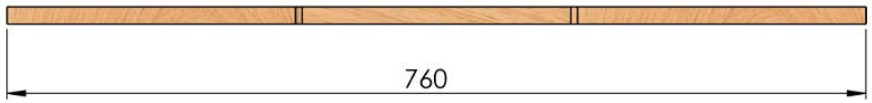


DETAILS: TOP AND BOTTOM PANELS



DETAILS: BACK REINFORCEMENT





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