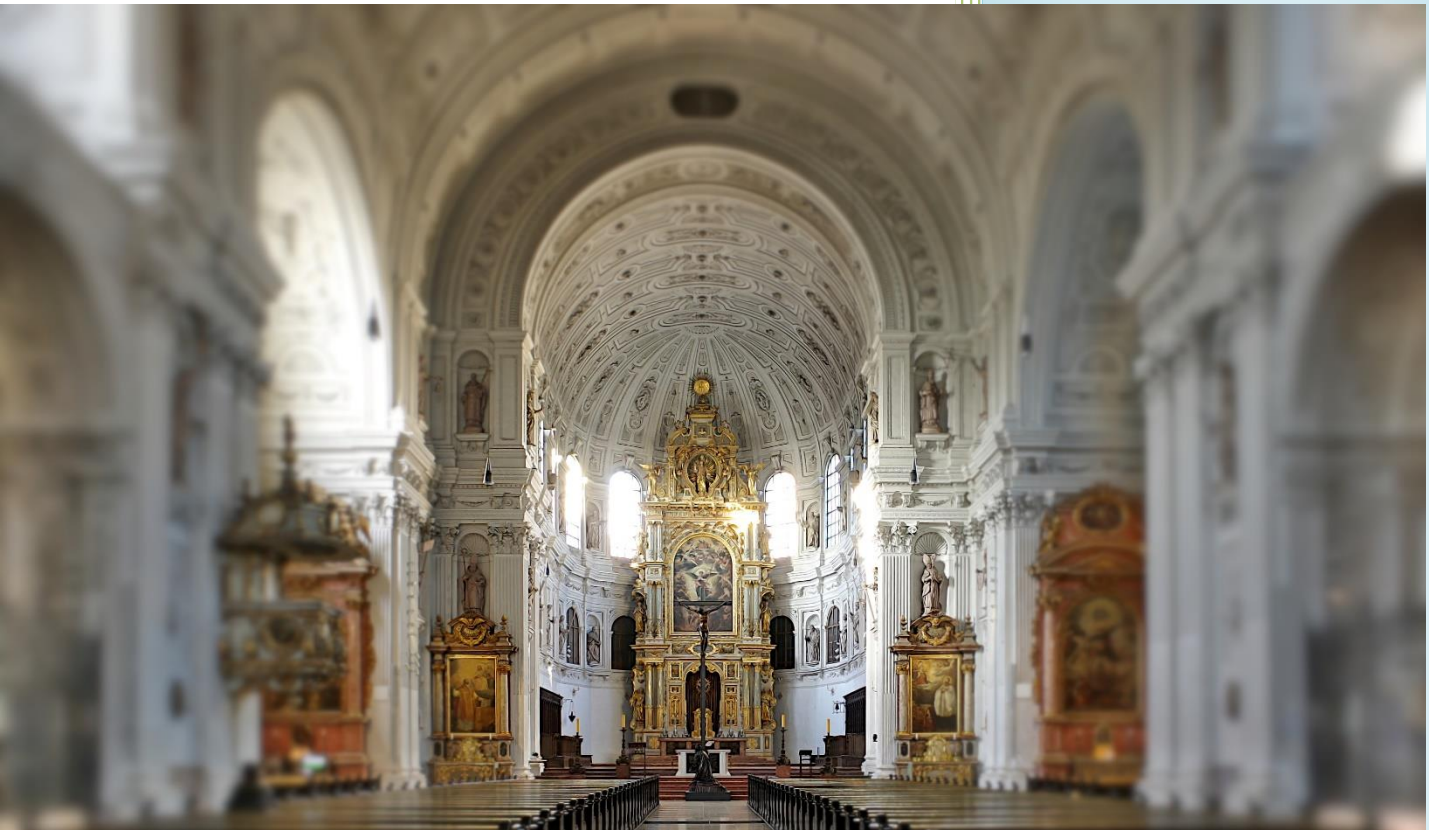


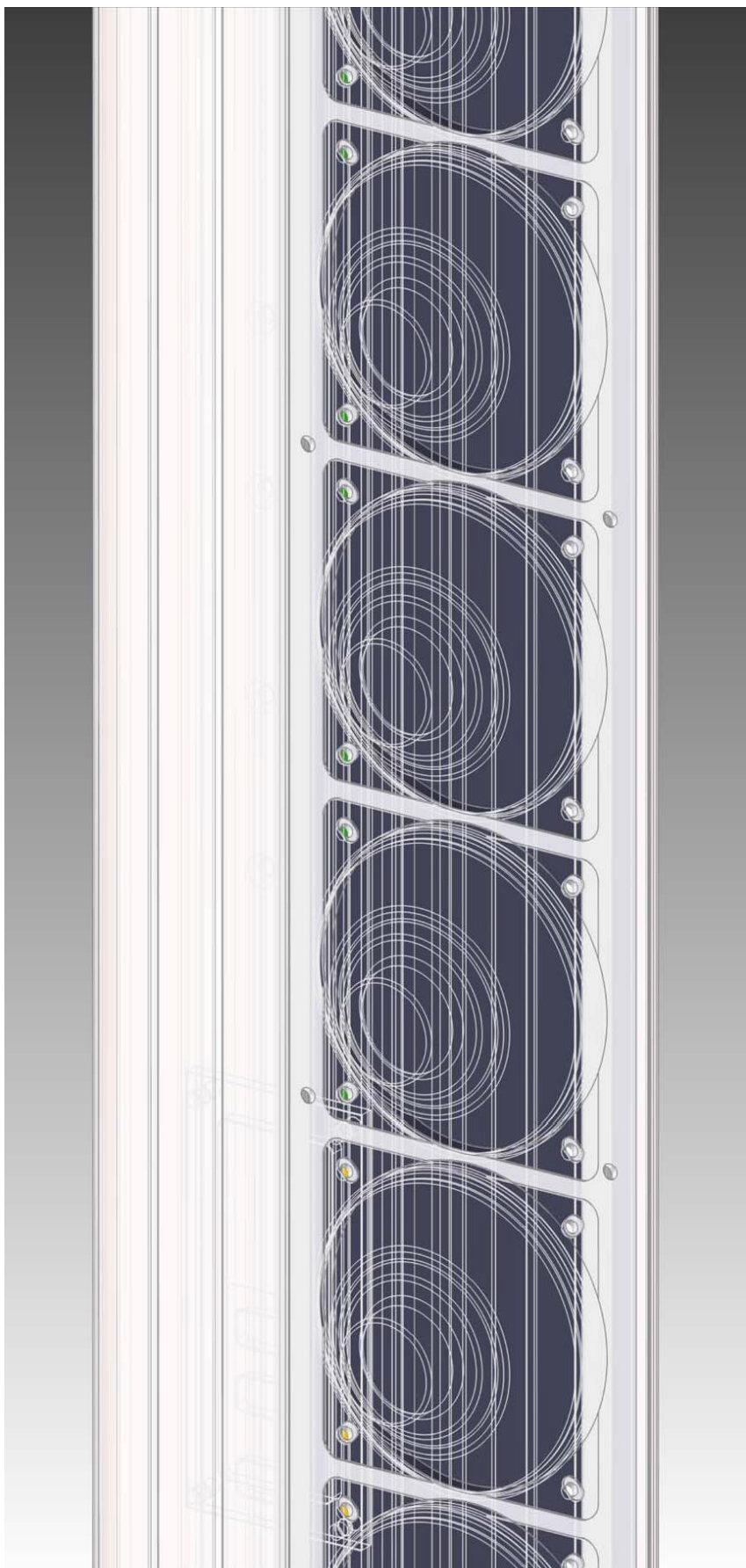
**AVE Audio**

Digitally Steerable Column Speaker  
**Ascolto**



**A.V.E. GmbH  
Audio Vertriebs-  
Entwicklungsgesellschaft**

**Germany**



**Digitally  
Steerable  
Column  
Speaker**

**Ascolto**

**FF2470**

**Datasheet**

# Table of Contents

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## 1.0 – Acoustic Specifications

### Frequency Bandwidth

80 Hz to 20 kHz ( $\pm 2$  dB)

### Maximal SPL

135 dB (A-Weighted at 1 m)

### Nominal SPL (1 W/Loudspeaker)

119 dB (A-Weighted at 1 m),  
 108 dB (A-Weighted at 10 m),  
 105 dB (A-Weighted at 20 m),  
 103 dB (A-Weighted at 30 m),  
 98 dB (A-Weighted at 40 m)

### Coverage

Horizontal (fixed)	110° (-6 dB average 500 Hz to 8 kHz)
Vertical (adjustable)	Tilting Up/Down Angle: -60° to 60° in 0.1° intervals Opening Angle: 8° to 40° in 0.1° intervals
Typical Throw	40 m
Maximum Throw	50 m

### Dynamic Range

102 dB (f=1 kHz, AES17 filter)

### Transducers Type

Number of Transducers	24 Coaxial Loudspeakers
Diameter	4.0" Woofer + 1.0 Dome Tweeter
Magnets Material	Neodymium

## 2.0 – Electrical Specifications

### Audio Input 1: Line 0 dBu

Input Level Nominal	0 dBu (2.19 Vpp)
Input Level Maximum	10 dBu (6.92 Vpp)
Type	Balanced
Impedance	20 k $\Omega$ at 1 kHz

### Audio Input 2: 100 V (not available in Ascolto – Dante Series)

Input Level Nominal	39.2 dBu (200 Vpp)
Type	Balanced with Transformer
Impedance	20 k $\Omega$ at 1 kHz

### Audio Input 3: Dante Audio Networking (available only in Ascolto – Dante Series)

Network	Dante Audio over IP
Transport Layer	Ethernet
Dante Latency	1, 2, or 5 ms (configurable using Dante Controller)
Support for AES67	Yes
Sample Rates	48 kHz
Bit Depths	24

### Power Amplifiers

Type	PWM (Class D)
Output Power	24 × 140 W <sub>max</sub>
Power Efficiency	92%
THD+N	0.025% at 10 W <sub>rms/channel</sub> , 1 kHz
Input Signal	Balanced
Channel Protections	Thermal Shutdown (T <sub>junction</sub> >150°C)

## Output Short Circuit

**DSP Module**

DSP Processors	48 bit Fixed Point DSP 76-bit Internal Accumulator 145 MHz
Sample Rate	48 kHz
A/D Conversion	Resolution: 24 bit Linear PCM Conversion: 1-bit delta-sigma 512× Sample Rate: 48 kHz SNR: 112 dB (A-Weighted)
D/A Conversion	Resolution: 24 bit Linear PCM Conversion: upsampling 128× Sample Rate: 48 kHz SNR: 105 dB (A-Weighted)
Signal Processing	Beam Forming Filtering Input Equalization (10 Biquad) Volume (-120 dB <sub>FS</sub> to 0 dB <sub>FS</sub> ) Delay (0 m to 30 m, step 0.1 m) Dynamic Compressor 2-Bands Input Signal Activity Detector

**Control Module**

Processor	32 bit ARM-Cortex M3 RISC 50 MHz
AVE Network Interface	RS485, Half Duplex, 115200 baud/s

	120 $\Omega$ Parallel Termination (recommended for long distance)
Dante Network Interface	Ethernet, 100 Mbit/s (available only in Ascolto – Dante Series).
Processor Activities	DSP Firmware Booting DSP Status Monitoring PWM Power Amplifier Functions Controlling PWM Power Amplifier Status Monitoring Audio Input Channel Functions Controlling Dante-Chip Ultimo XXT Control (in Ascolto – Dante Series) Auto Stand-By Controlling RS485 Communication Infrared Communication Panel LEDs Controlling Firmware Updating

## Connectors

Audio Inputs Connector	3-pole, 3.81 mm-pitch
Audio Inputs Pinout	pin 1: hot signal (+) pin 2: cold signal (-) pin 3: earth (chassis ground)
RS485 Network Connector	3-pole, 3.81 mm-pitch
RS485 Network Pinout	pin 1: data + pin 2: data - pin 3: digital ground
Dante Network Connector	8 pin Ethernet RJ45, female connector
Mains Connector	Strain relief housing Wago cod. 770-503, 3-pole, 4,00 mm <sup>2</sup> , ratings 250 VAC, 25 A, IEC/EN 60664-1, UL 1977

**Switched-Mode Power Supply Unit**

AC Range	90 VAC to 264 VAC (Universal Input)
Input Frequency	47 Hz to 67 Hz
Efficiency	91% typ at 230 VAC
Power Factor Correction	Yes
Input Current at Full Load	12.0 A typ at 115 VAC 6.0 A typ at 230 VAC
Power Consumption	Continuous: 1080 VA Peak: 1404 VA Idle: 36 VA Stand-By: 12 VA
Protection	Thermal Protection Short Circuit Protection Output Current Limiting Under-Voltage Lock Out
Main Fuse	1 × 10 A (slow blow)



### 3.0 – Electromagnetic compatibility

#### Electromagnetic Interference (EMI)

Complete System	EN 55032
Switched-Mode Power Supply Unit	EN 55024 EN 60601-1-2 (Medical Devices) EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11

#### Electromagnetic Susceptibility (EMS)

Complete System	EN 61000-3-2, -3-3 EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-11
Switched-Mode Power Supply Unit	EN 60601-1-2 (Medical Devices) EN 55011 class A, B EN 55032 class A, B EN 61000-3-2, class A, D EN 61000-3-3

## 4.0 – General Specifications

### Mechanical

Height	3044 mm
Width	122 mm
Depth	120 mm
Weight	28.7 Kg (63.2 lbs)
Cabinet	Powder Coated Aluminum Extrusion
Colour	RAL 9010
Special colour	Available for an additional charge

### Temperature Range

0°C to 40°C (32°F to 102°F)

### Dust and Water Protection Class

IP 54

### Electrical Protection Class

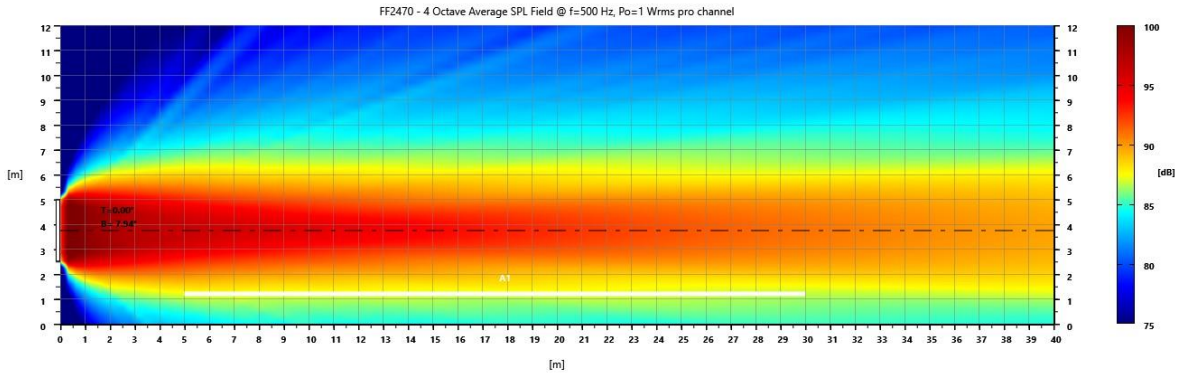
IEC 61140 - Class 1

### Certificates

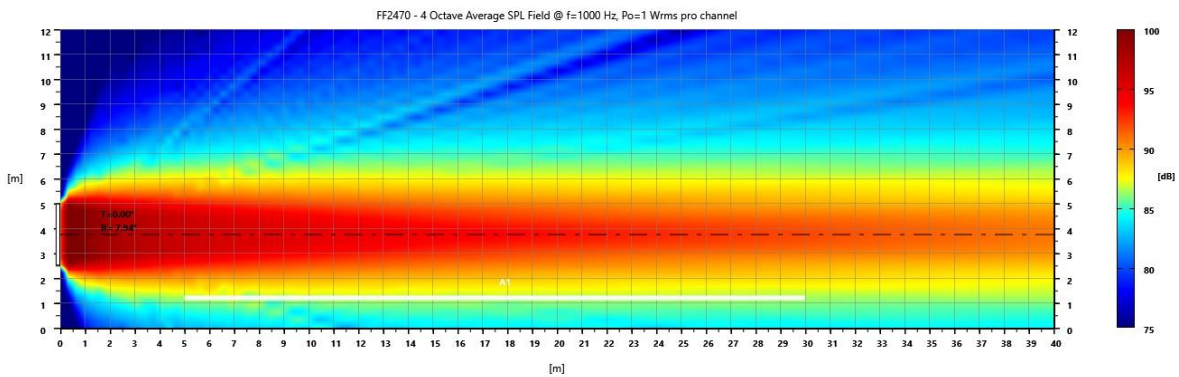
CE

- 1) Rated power measured with pink noise signal, 6 dB crest factor.
- 2) Polare response: -6 dB average 500 Hz to 8 kHz.

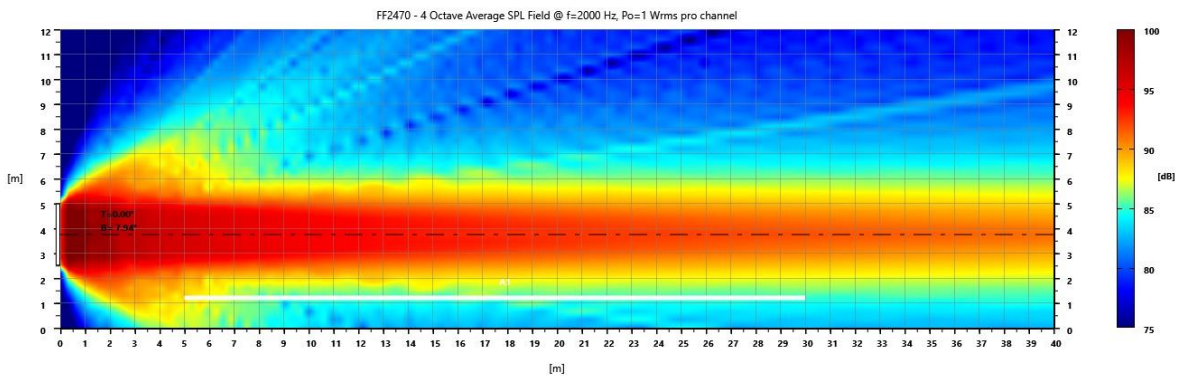
## 5.0 – Vertical Beam Pattern



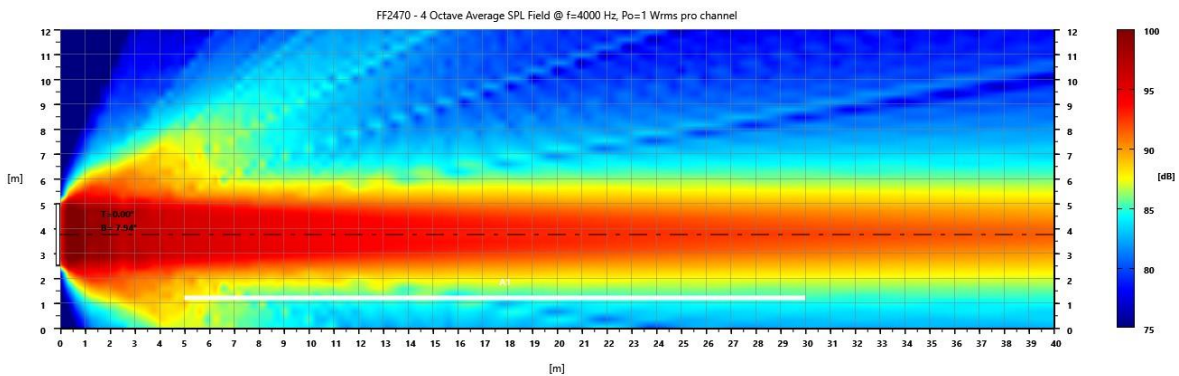
**FF2470 – Vertical Beam Shape at 500 Hz, 4 Octaves average**



**FF2470 – Vertical Beam Shape at 1000 Hz, 4 Octaves average**



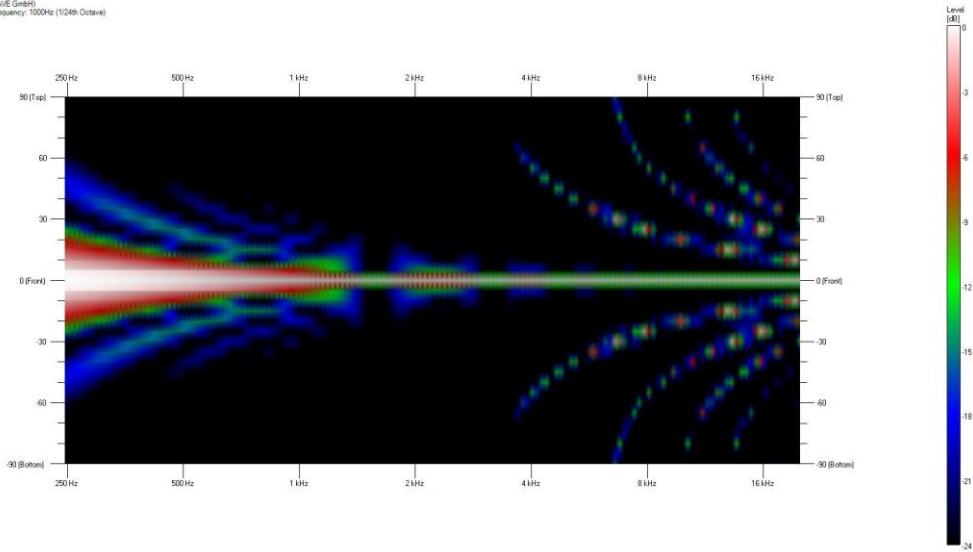
**FF2470 – Vertical Beam Shape at 2000 Hz, 4 Octaves average**



**FF2470 – Vertical Beam Shape at 4000 Hz, 4 Octaves average**

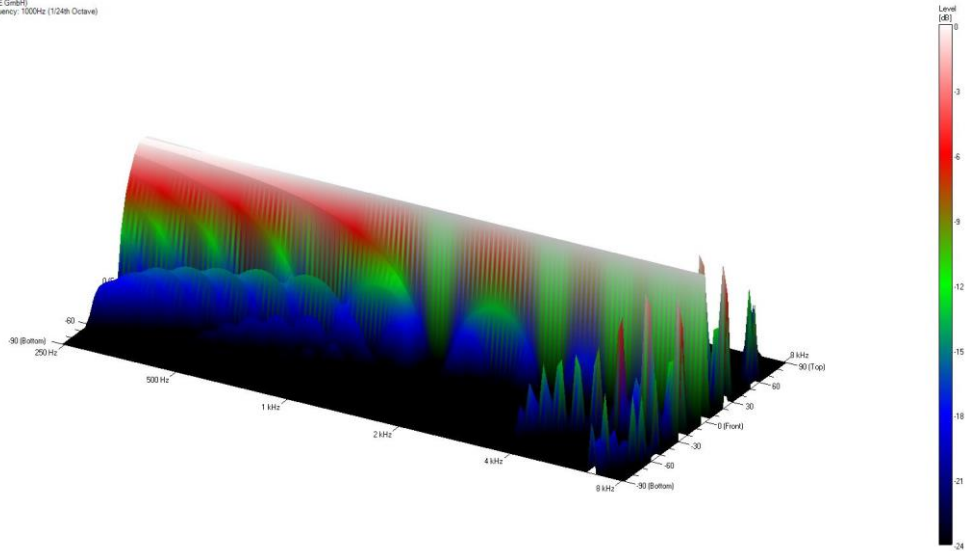
## 6.0 - Vertical Beam Width

Data Shown: FF2470 (A.V.E GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)

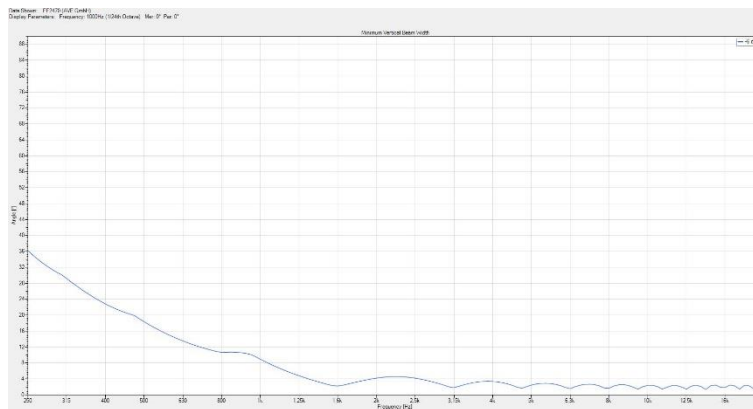


**FF2470 – 2D Vertical Beam Width vs Frequency**

Data Shown: FF2470 (A.V.E GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)

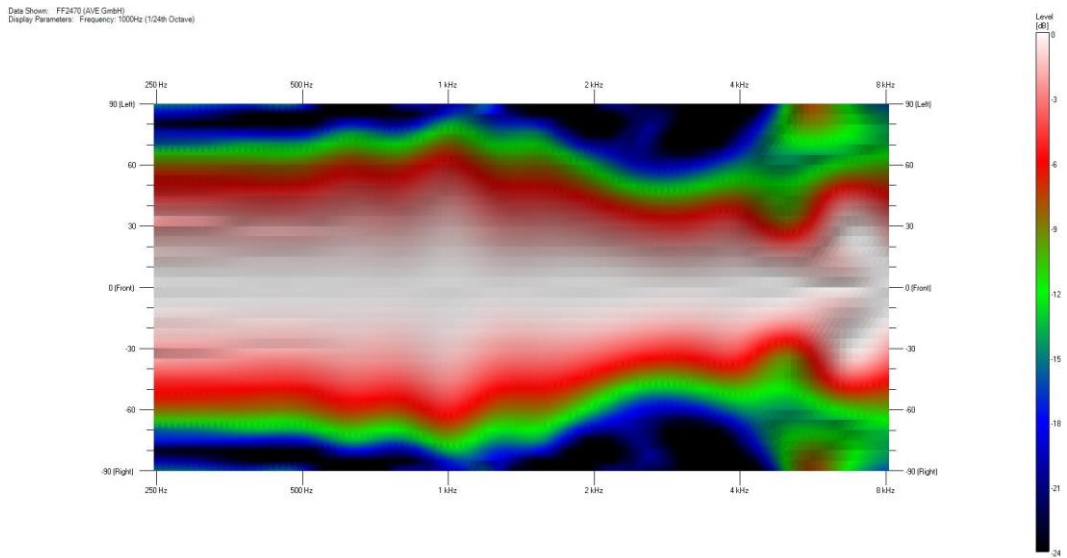


**FF2470 – 3D Vertical Beam Width vs Frequency**

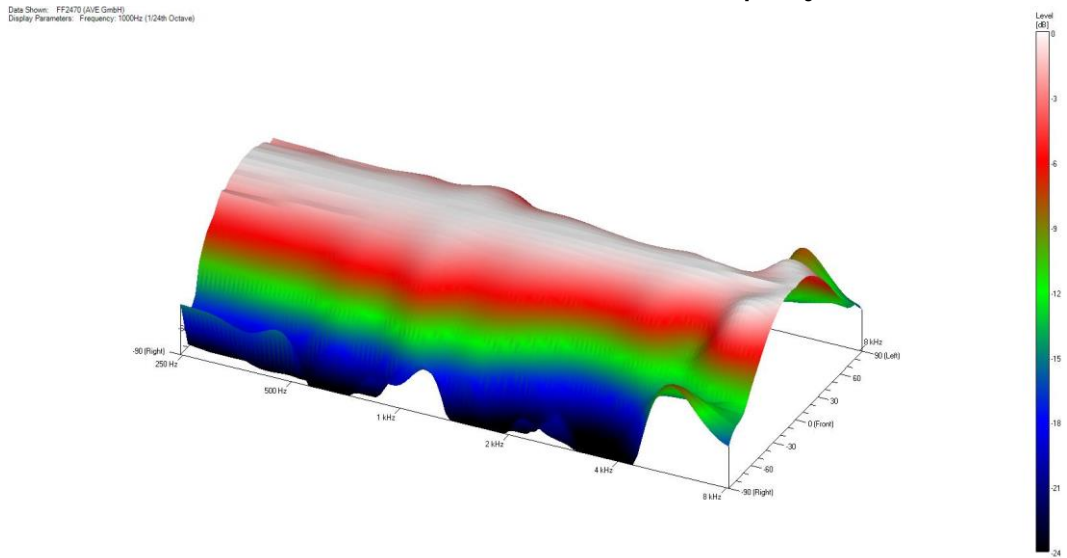


**FF2470 – Vertical Beam Width vs Frequency**

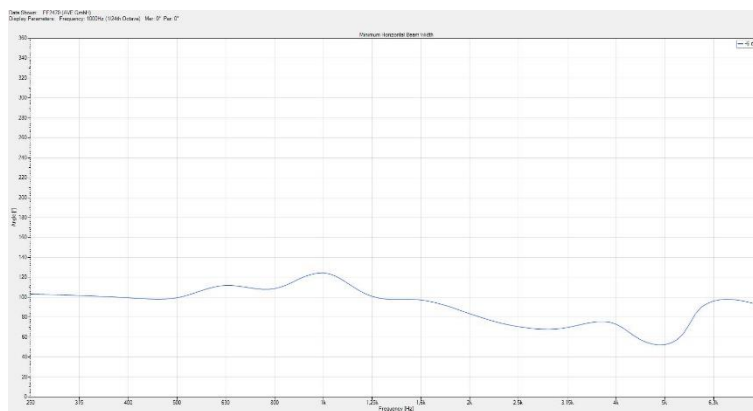
## 7.0 - Horizontal Beam Width



**FF2470 – 2D Horizontal Beam Width vs Frequency**



**FF2470 – 3D Horizontal Beam Width vs Frequency**



**FF2470 – Horizontal Beam Width vs Frequency**

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