

**AVE GmbH**

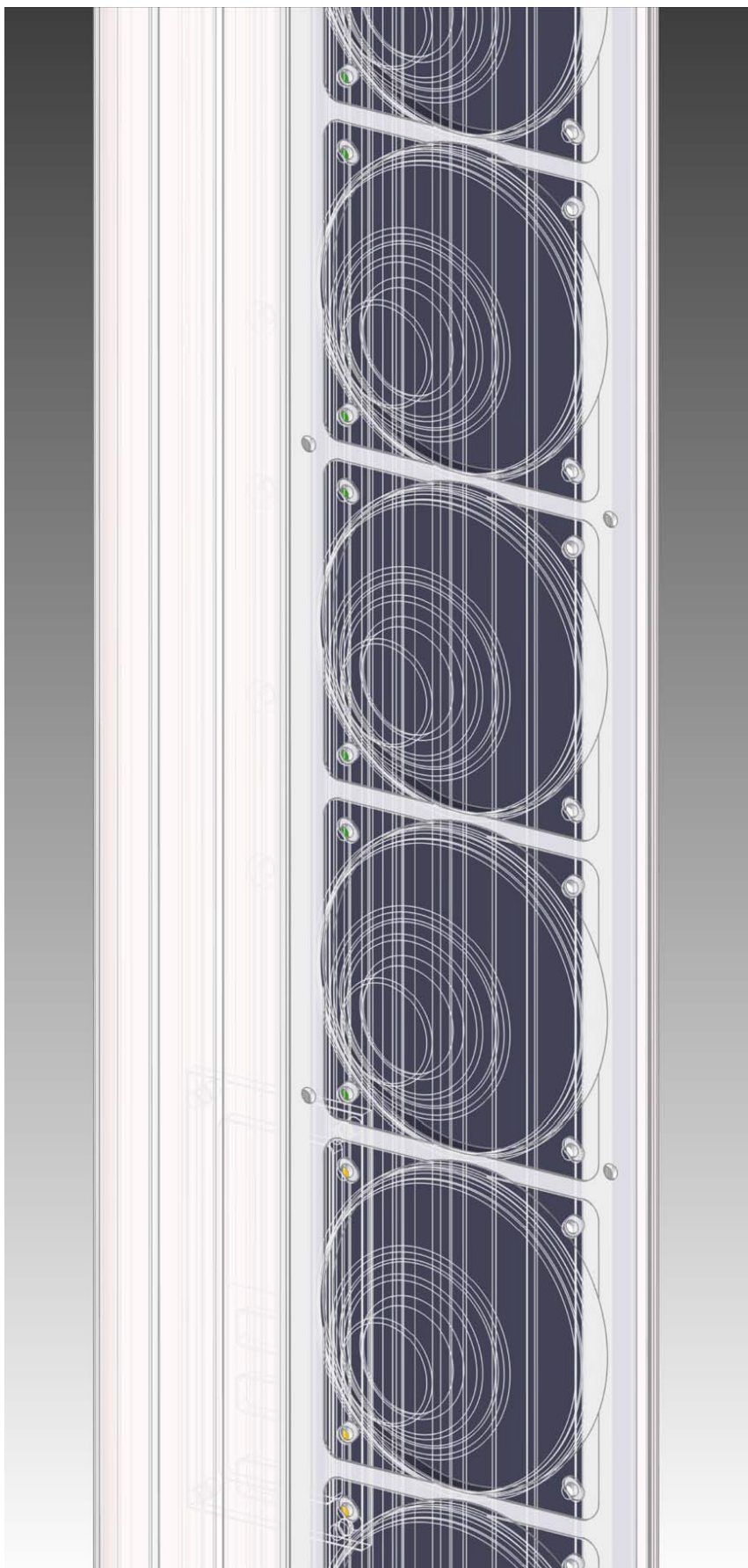
Digitally Steerable Column Speaker  
**Ascolto**



**A.V.E. GmbH**

**Audio Vertriebs-  
Entwicklungsgesellschaft**

**Germany**



**Digitally  
Steerable  
Column  
Speaker**

**Ascolto**

**FF0870**

**Datasheet**

# Table of Contents

- 1. Acoustic Specifications**
- 2. Electrical Specifications**
- 3. Electromagnetic compatibility**
- 4. General Specifications**
- 5. Vertical Beam Pattern**
- 6. Vertical Beam Width**
- 7. Horizontal Beam Width**

## 1.0 – Acoustic Specifications

### Frequency Bandwidth

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

### Maximal SPL

125 dB (A-Weighted at 1 m)

### Nominal SPL (1 W/Loudspeaker)

109 dB (A-Weighted at 1 m),  
 103 dB (A-Weighted at 10 m),  
 100 dB (A-Weighted at 20 m),  
 98 dB (A-Weighted at 30 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<br>Opening Angle: 20° to 40° in 0.1° intervals |
| Typical Throw         | 20 m  |
| Maximum Throw         | 25 m  |

### Dynamic Range

102 dB (f=1 kHz, AES17 filter)

### Transducers Type

|                       |                                |
|-----------------------|--------------------------------|
| Number of Transducers | 8 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        | 8 × 70 W <sub>rms</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<br>76-bit Internal Accumulator<br>145 MHz   |
| Sample Rate       | 48 kHz   |
| A/D Conversion    | Resolution: 24 bit Linear PCM<br>Conversion: 1-bit delta-sigma 512×<br>Sample Rate: 48 kHz<br>SNR: 112 dB (A-Weighted)   |
| D/A Conversion    | Resolution: 24 bit Linear PCM<br>Conversion: upsampling 128×<br>Sample Rate: 48 kHz<br>SNR: 105 dB (A-Weighted)  |
| Signal Processing | Beam Forming Filtering<br>Input Equalization (10 Biquad)<br>Volume (-120 dB <sub>FS</sub> to 0 dB <sub>FS</sub> )<br>Delay (0 m to 50 m, step 0.1 m)<br>Dynamic Compressor 2-Bands<br>Input Signal Activity Detector |

**Control Module**

|                         |   |
|-------------------------|---|
| Processor               | 32 bit ARM-Cortex M3<br>RISC<br>50 MHz  |
| Setup Network Interface | RS485, Half Duplex, 115200 baud/s<br>120 Ω Parallel Termination (recommended for long distance) |

|                         |   |
|-------------------------|---|
|                         | This network interface is used by AVE Line Array User Control software to manage beam setup and other audio features.   |
| Dante Network Interface | Ethernet, 100 Mbit/s (available only in Ascolto – Dante Series).  |
| Processor Activities    | <p>DSP Firmware Booting</p> <p>DSP Status Monitoring</p> <p>PWM Power Amplifier Functions Controlling</p> <p>PWM Power Amplifier Status Monitoring</p> <p>Audio Input Channel Functions Controlling</p> <p>Dante-Chip Ultimo XXT Control (in Ascolto – Dante Series)</p> <p>Auto Stand-By Controlling</p> <p>RS485 Communication</p> <p>Infrared Communication</p> <p>Panel LEDs Controlling</p> <p>Firmware Updating</p> |

## Connectors

|                         |  |
|-------------------------|--|
| Audio Inputs Connector  | 3-pole, 3.81 mm-pitch  |
| Audio Inputs Pinout     | <p>pin 1: hot signal (+)</p> <p>pin 2: cold signal (-)</p> <p>pin 3: earth (chassis ground)</p>                        |
| RS485 Network Connector | 3-pole, 3.81 mm-pitch  |
| RS485 Network Pinout    | <p>pin 1: data +</p> <p>pin 2: data -</p> <p>pin 3: digital ground</p>   |
| 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 | 4.0 A typ at 115 VAC<br>2.0 A typ at 230 VAC  |
| Power Consumption          | Continuous: 360 VA<br>Peak: 468 VA<br>Idle: 12 VA<br>Stand-By: 4 VA                                 |
| Protection                 | Thermal Protection<br>Short Circuit Protection<br>Output Current Limiting<br>Under-Voltage Lock Out |
| Main Fuse                  | 1 × 6.3 A (slow blow)   |



### 3.0 – Electromagnetic compatibility

#### Electromagnetic Interference (EMI)

|                                    |   |
|------------------------------------|---|
| Complete System                    | EN 55032  |
| Switched-Mode<br>Power Supply Unit | EN 55024<br>EN 60601-1-2 (Medical Devices)<br>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<br>EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-11  |
| Switched-Mode<br>Power Supply Unit | EN 60601-1-2 (Medical Devices)<br>EN 55011 class A, B<br>EN 55032 class A, B<br>EN 61000-3-2, class A, D<br>EN 61000-3-3 |

## 4.0 – General Specifications

### Mechanical

|                |                                     |
|----------------|-------------------------------------|
| Height         | 1174 mm                             |
| Width          | 122 mm                              |
| Depth          | 120 mm                              |
| Weight         | 10.3 Kg (22.7 lbs)                  |
| Cabinet        | Powder Coated<br>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

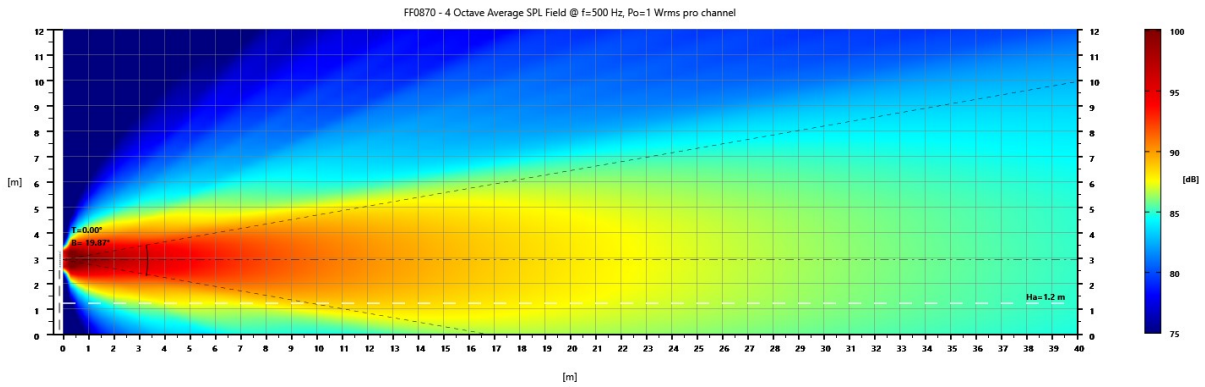
IEC 61140 - Class 1

### Certificates

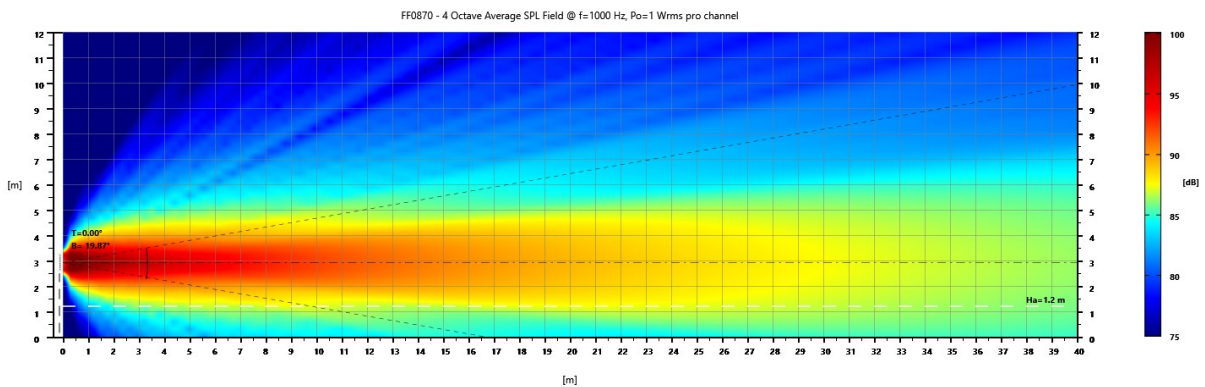
CE

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

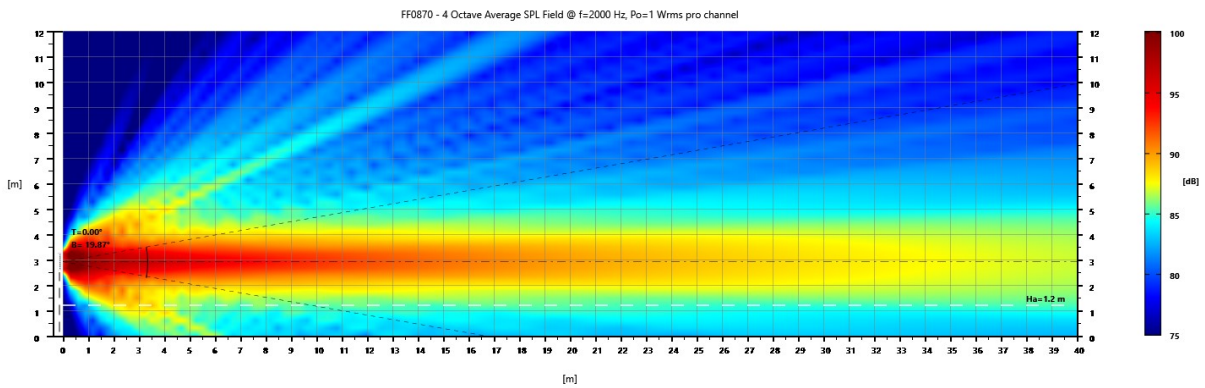
## 5.0 – Vertical Beam Pattern



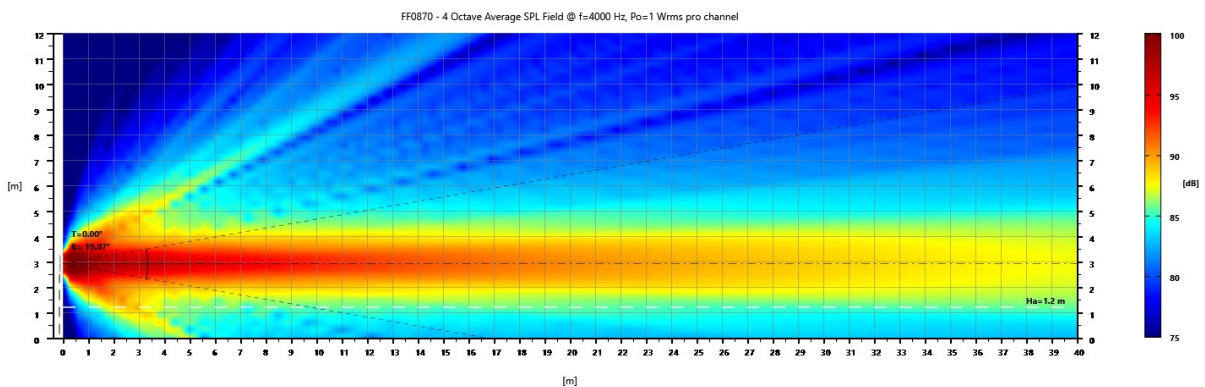
**FF0870 – Vertical Beam Shape at 500 Hz, 4 Octaves average**



**FF0870 – Vertical Beam Shape at 1000 Hz, 4 Octaves average**



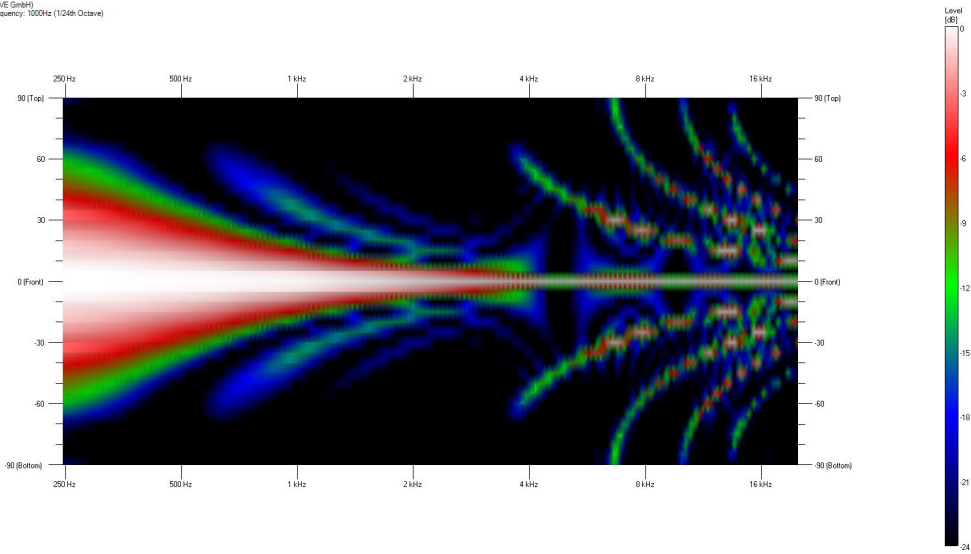
**FF0870 – Vertical Beam Shape at 2000 Hz, 4 Octaves average**



**FF0870 – Vertical Beam Shape at 4000 Hz, 4 Octaves average**

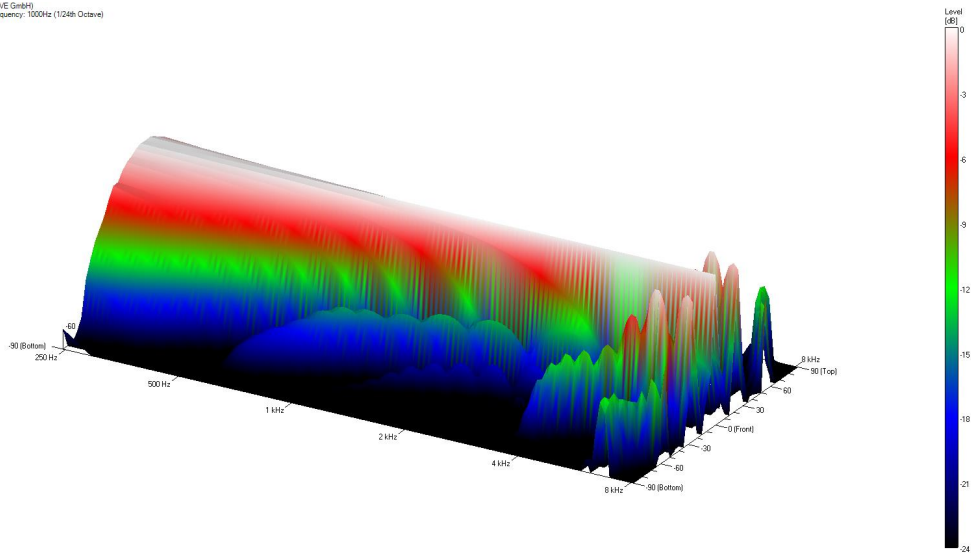
## 6.0 - Vertical Beam Width

Data Shown: FF0870 (AVE GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)

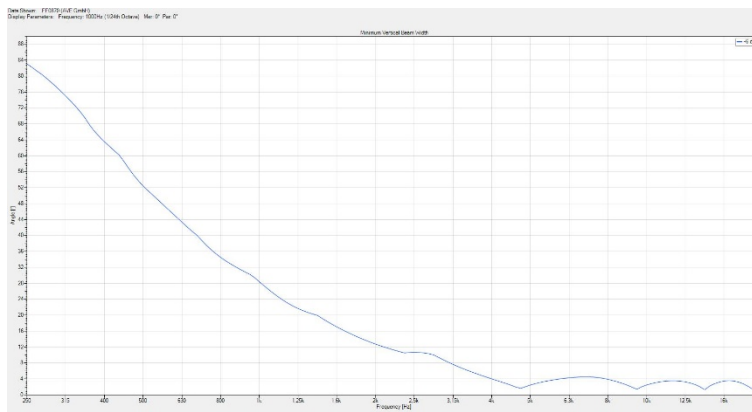


**FF0870 – 2D Vertical Beam Width vs Frequency**

Data Shown: FF0870 (AVE GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)



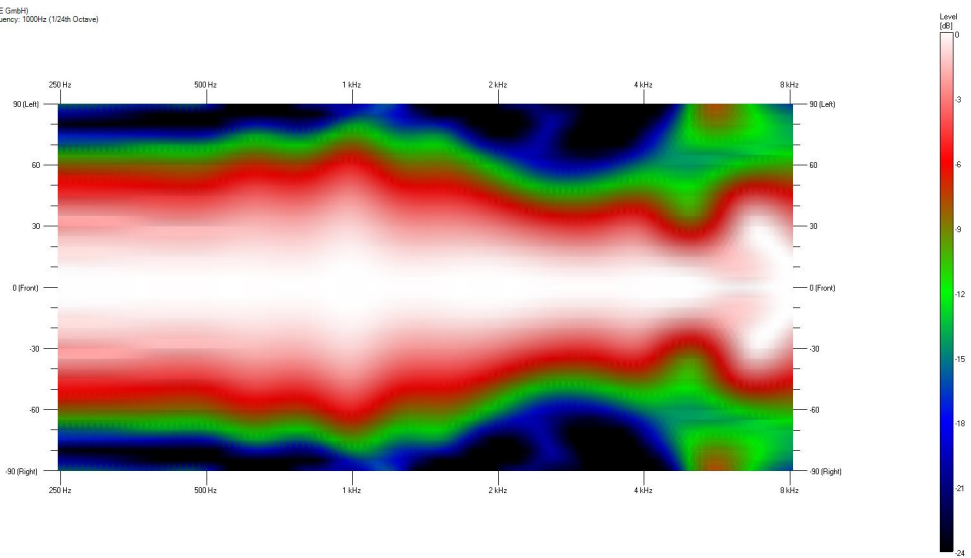
**FF0870 – 3D Vertical Beam Width vs Frequency**



**FF0870 – Vertical Beam Width vs Frequency**

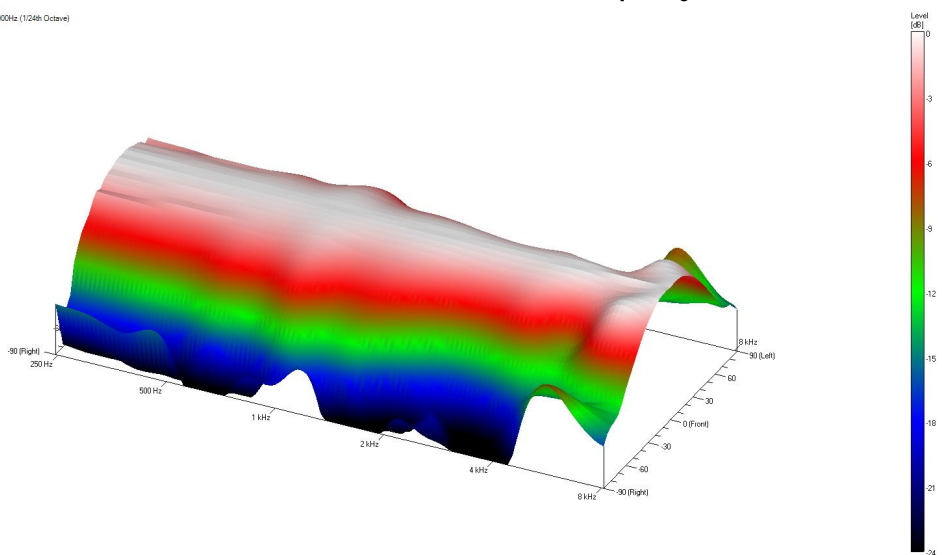
## 7.0 - Horizontal Beam Width

Data Shown: FF0870 (AVE GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)

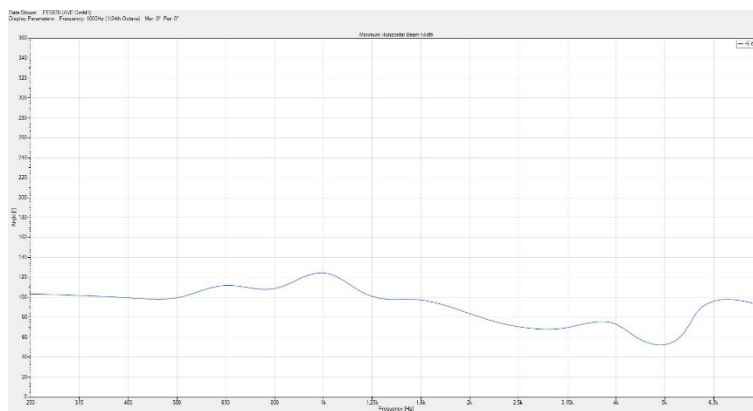


**FF0870 – 2D Horizontal Beam Width vs Frequency**

Data Shown: FF0870 (AVE GmbH)  
Display Parameters: Frequency: 1000Hz (1/24th Octave)



**FF0870 – 3D Horizontal Beam Width vs Frequency**



**FF0870 – Horizontal Beam Width vs Frequency**

## Notice

ALL AVE GmbH DESIGN SPECIFICATIONS, FILES, DRAWINGS, TABLES, LISTS, AND OTHER DOCUMENTS ARE BEING PROVIDED “AS IS.”

AVE GmbH MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE.

Information furnished is believed to be accurate and reliable. However, AVE GmbH assumes no responsibility for the consequences of use of such information or for any infringement of patents or other rights of third parties that may result from its use. No license is granted by implication or otherwise under any patent or patent rights of AVE GmbH. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. AVE GmbH products are not authorized for use as critical components in life support devices or systems without express written approval of AVE GmbH Corporation.

## Trademarks

AVE GmbH, “Ascolto” and the AVE logo are trademarks or registered trademarks of AVE GmbH in the Germany and other countries. Other company and product names may be trademarks of the respective companies with which they are associated.

Copyright

© 2025 AVE GmbH. All rights reserved.



**German Technology**

**Made in Germany**



**AVE GmbH**  
**Gustav-Rau-Straße, 6**  
**74321 - Bietigheim-Bissingen**  
**Germany**

**Telefon: +49 (0) 7142-78879-10**

**Fax: +49 (0) 7142-78879-18**

[www.ave-stuttgart.com](http://www.ave-stuttgart.com)

[info@ave-stuttgart.de](mailto:info@ave-stuttgart.de)