



# FreeSpace® DS 40SE Loudspeaker

## Product Overview

The Bose® FreeSpace® DS 40SE loudspeaker is a high-performance, surface-mount loudspeaker designed for foreground and background music and speech reproduction in a wide range of commercial applications including retail, restaurant and hospitality establishments.

This 40-watt loudspeaker can provide coverage both indoors and outdoors. Horizontal or vertical mounting options offer installation flexibility. The DS 40SE loudspeaker meets numerous standards for combination music and evacuation systems around the world when used with optional Bose junction boxes.

## Product Information

The FreeSpace DS 40SE surface-mount loudspeaker is engineered for installation on walls and ceilings with simple 1-2-3 installation: (1) Wire and attach the bracket (2) Secure the loudspeaker to bracket with one screw (3) Snap the wire connector into the bracket. The included bracket allows for horizontal or vertical mounting positions with either pitch or yaw adjustment.

The DS 40SE loudspeaker can be used as an 8-ohm, 40-watt loudspeaker or as a 70/100V loudspeaker. An easy-to-access thumb wheel allows taps to be set quickly and simply without the use of tools.

Performance of the FreeSpace DS 40SE loudspeaker can be maximized through the use of the recommended Bose loudspeaker equalization resident in select Bose electronics, or by using other equipment with parametric equalization. The loudspeaker can be used out of the box with a 70-Hz high-pass filter when recommended loudspeaker equalization is not used.

The DS 40SE loudspeaker is acoustically compatible with the DS 40F flush-mount loudspeaker. They can be integrated on the same loudspeaker line.

The contemporary styling of the DS 40SE easily blends with a wide variety of décors.



## Key Features

- Maximum SPL of 103 dB-SPL (109 dB-SPL peak)
- Full-range performance from 80 Hz to 16 kHz
- 125°H x 125°V coverage pattern
- Single 4.5" (114mm) full-range HVC (Helical Voice Coil) driver
- Simple 1-2-3 installation
- Pitch or yaw adjustment options:  
Horizontal mount: maximum pitch 45° or maximum yaw 30°  
Vertical mount: maximum pitch 30° or maximum yaw 45°
- Integrated multi-tap transformer provides easy-to-change tap settings without tools:  
70V – 2.5W, 5W, 10W, 20W, 40W  
100V – 5W, 10W, 20W, 40W
- Can be used as an 8Ω, 40W loudspeaker
- Can be combined with the FreeSpace DS 40F flush-mount loudspeaker on the same loudspeaker line
- Can be used indoors and outdoors
- Contemporary styling; available in black or white and can be painted
- Listed to ANSI/UL 1480-2005

## Applications

The FreeSpace DS 40SE loudspeaker is well-suited for permanent installations in:

- Retail stores
- Transportation facilities
- Hospitality venues
- Concourses
- Restaurants
- Houses of worship

# FreeSpace® DS 40SE Loudspeaker



## Detailed Product Specifications

|   |                                 |
|---|---------------------------------|
| Power handling <sup>1</sup>                                 | 40W                             |
| Nominal Impedance (transformer bypass)                      | 8Ω                              |
| Sensitivity <sup>2</sup> (at 1W @ 1m)                       | 87 dB-SPL                       |
| Maximum SPL <sup>3</sup><br>(pink noise @ 1m @ rated power) | 103 dB-SPL<br>109 dB-SPL (Peak) |
| Frequency range <sup>4</sup> (-3 dB)                        | 80 Hz – 16 kHz                  |
| Beamwidth (-6 dB point, average 1–4 kHz)                    | 125°H x 125°V                   |

<sup>1-4</sup> See "How our Loudspeakers are Measured" on page 8.

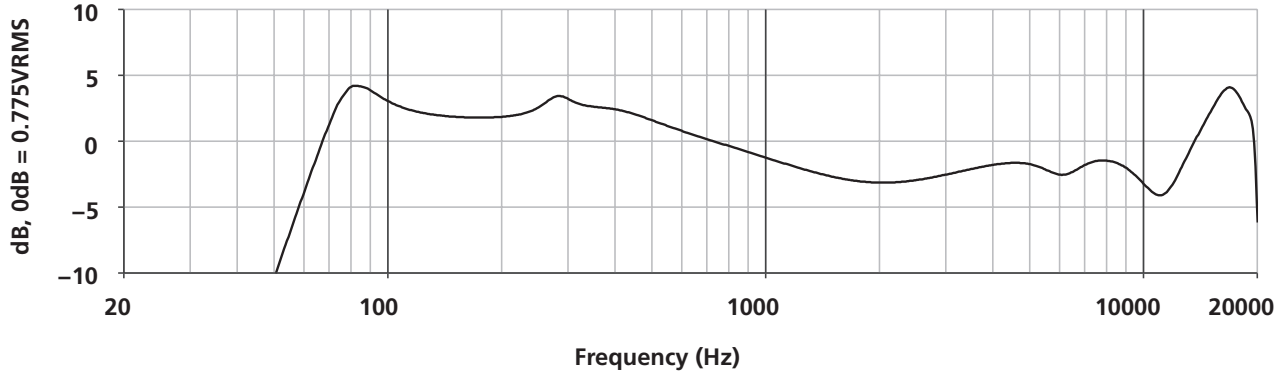
## Additional Product Information

Performance of the FreeSpace® DS 40SE loudspeaker can be maximized through the use of the recommended Bose® loudspeaker equalization resident in select Bose electronics or by using other equipment with parametric equalization.

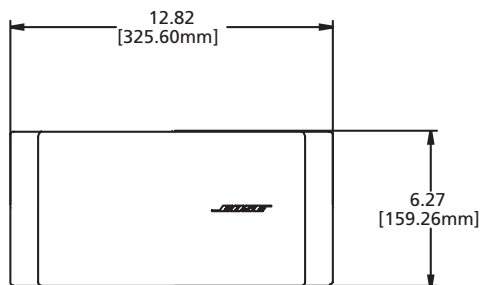
The loudspeakers can be used out of the box with a 70-Hz high-pass filter when recommended loudspeaker equalization is not used.

TECHNICAL DATA SHEET

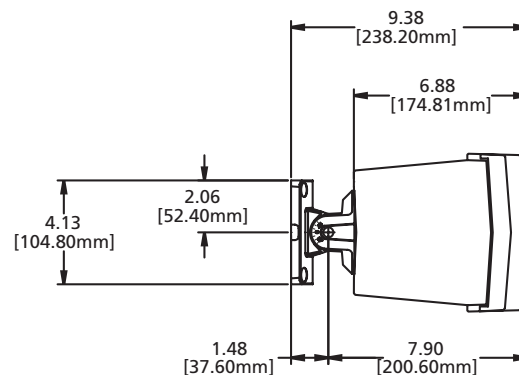
## Recommended Loudspeaker Equalization Curve



## Mechanical Diagrams:



Front View



Side View

# FreeSpace® DS 40SE Loudspeaker



## Driver complement:

One 4.5" (114mm) full-range HVC (Helical Voice Coil) driver

## Construction features:

Enclosure: PC/ABS

Grille: Powder-coated steel

## Dimensions:

Loudspeaker only:

6.9"D x 12.8"W x 6.3"H

(175mm x 326mm x 159mm)

Loudspeaker with wall-mount bracket:

9.4"D x 12.8"W x 6.3"H

(238mm x 326mm x 159mm)

## Weight:

Product: 8.5lb (3.9kg)

Shipping: 10.8lb (4.9kg)

## Package contents:

Loudspeaker, mounting bracket and installation guide.

## Finish:

Textured black or white finish with a contoured, powder-coated steel grille. Both the enclosure and grille can be painted.

## Connectors:

The included mounting bracket features a three-terminal barrier strip. Optional junction boxes include a ceramic connector and a thermal fuse for use when required.

## Design Recommendations

When creating a design with FreeSpace DS 40SE loudspeakers, consider the following:

- FreeSpace DS 40SE loudspeakers are ideally suited to background and foreground music and paging applications. If your customer's requirement is for a foreground music system, consider the FreeSpace DS 100SE loudspeaker. For background music systems, consider the FreeSpace DS 16SE loudspeaker.
- Recommended mounting height for the FreeSpace DS 40SE loudspeaker is between 8 and 26ft (2.4 and 8m).
- Maximum SPL for a typical application is between 90 and 97 dB-SPL.
- Always add 25% headroom to your amplifier to accommodate various types of program material.

- Provide at least 25ft (7.5m) of space between adjacent loudspeakers for typical applications. And for alternate coverage requirements, use the following table.

| Coverage | Loudspeaker Spacing Distance |
|----------|------------------------------|
| Premium  | 25ft   7.5m                  |
| Standard | 30ft   9.0m                  |
| Minimum  | 35ft   10.5m                 |

- The FreeSpace DS 40SE should be pitched down according to its mounting height as shown in the following table.

| Pitch | Mounting Height          |
|-------|--------------------------|
| -45°  | 20' (8.0m) to 26' (7.9m) |
| -30°  | 16' (4.7m) to 20' (8.0m) |
| -30°  | 12' (3.6m) to 16' (4.7m) |
| 0°    | 8' (2.4m) to 12' (3.6m)  |

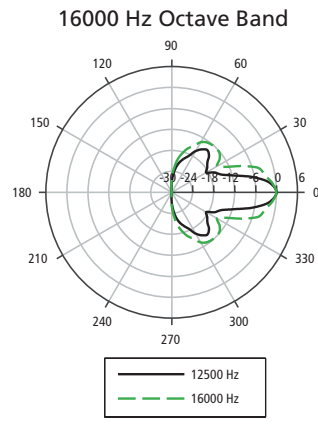
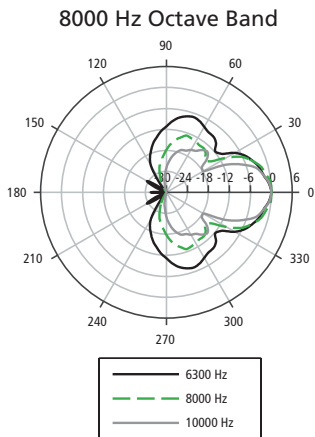
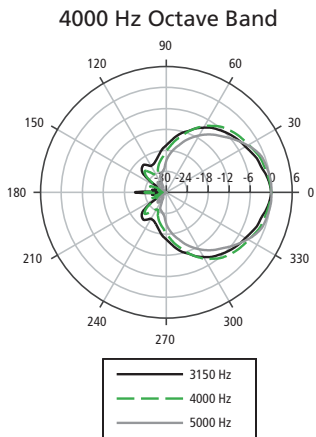
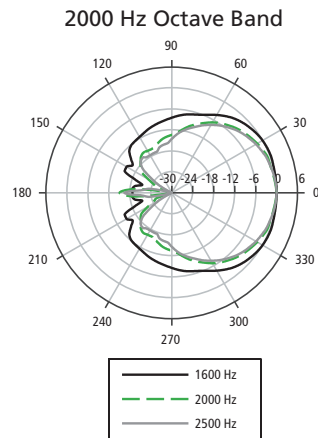
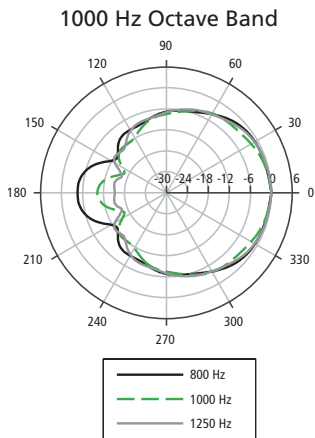
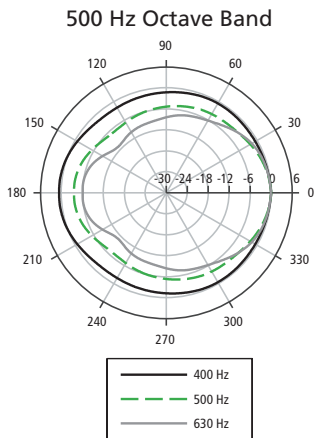
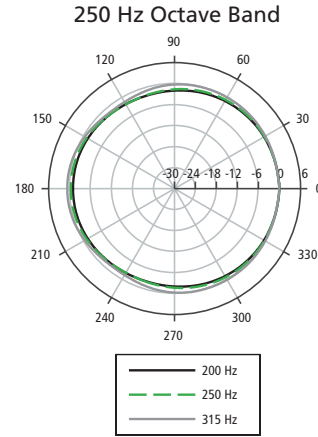
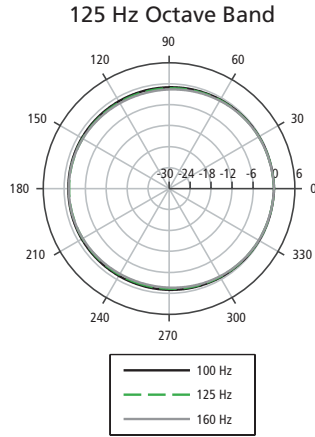
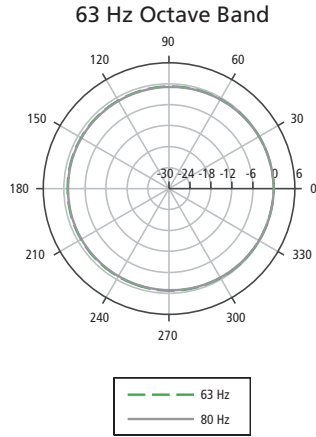
Total system sound pressure level varies by mounting height, loudspeaker tap and room acoustics. For typical applications, use the chart below to determine the total sound pressure level attainable for a system using DS 40SE loudspeakers.

| DS 40SE      |      |     |     |     |     |     |     |     |     |     |     |        |
|--------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| Mount Height | m    | 2.4 | 3.0 | 3.6 | 4.2 | 4.8 | 5.5 | 6.1 | 6.7 | 7.3 | 8.0 |        |
|              | ft   | 8   | 10  | 12  | 14  | 16  | 18  | 20  | 22  | 24  | 26  |        |
| TAP (W)      | 2.5* | 85  | 84  | 84  | 83  | 82  | 81  | 80  | 79  | 79  | 78  | dB-SPL |
|              | 5    | 88  | 87  | 87  | 86  | 85  | 84  | 83  | 82  | 82  | 81  |        |
|              | 10   | 91  | 90  | 90  | 89  | 88  | 87  | 86  | 85  | 85  | 84  |        |
|              | 20   | 94  | 93  | 93  | 92  | 91  | 90  | 89  | 88  | 88  | 87  |        |
|              | 40   | 97  | 96  | 96  | 95  | 94  | 93  | 92  | 91  | 91  | 90  |        |

\*2.5-watt tap available only in 70V mode.

For more detailed information, refer to the FreeSpace DS 40SE loudspeaker Design Guide.

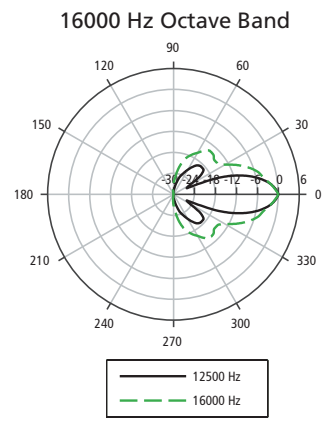
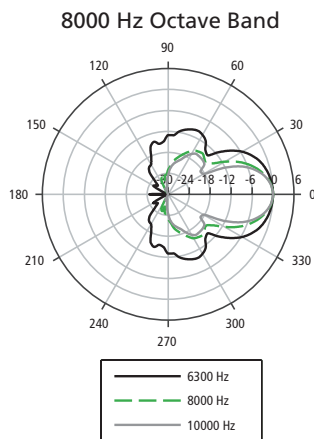
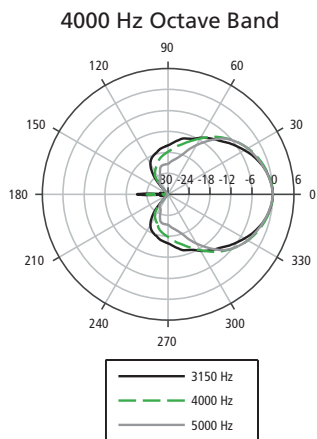
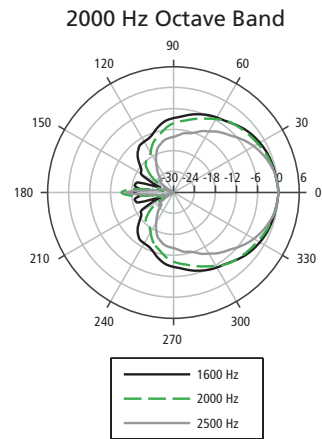
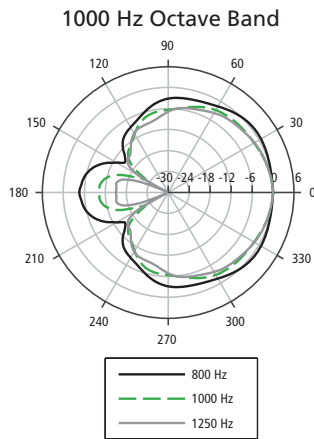
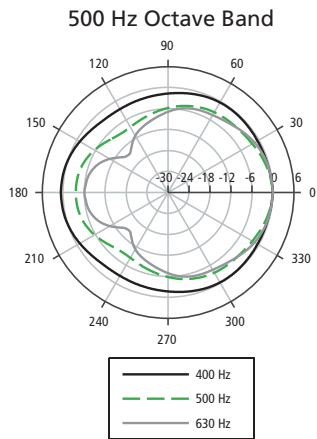
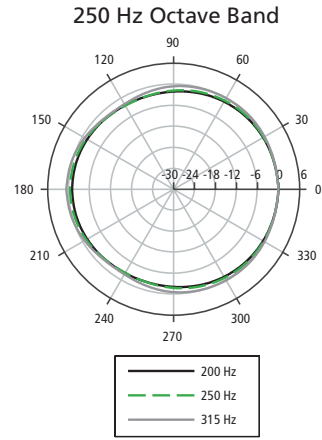
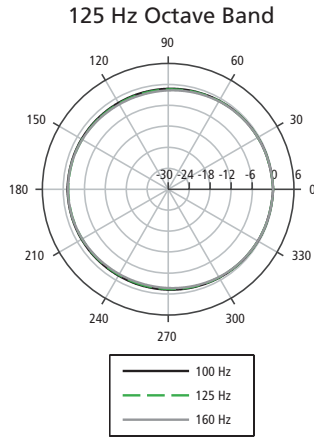
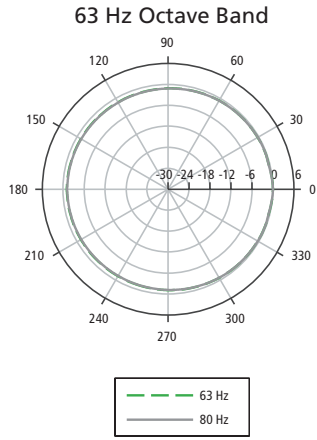
### Polar Plots 1/3 Octave Horizontal



# FreeSpace® DS 40SE Loudspeaker



## Polar Plots 1/3 Octave Vertical



# FreeSpace® DS 40SE

## Loudspeaker



### Engineers' and Architects' Specifications

Each loudspeaker shall be a 40-watt, ported loudspeaker system utilizing one 4.5" (114mm) full-range HVC (Helical Voice Coil) driver. The loudspeaker shall be used for installation on walls, ceilings, and other flat, solid surfaces.

Each loudspeaker shall have a nominal rated impedance of 8 ohms and shall be wired in parallel with a line voltage matching (step-down) transformer with an accessible, front-mounted level selector appropriate for setting various output taps. The loudspeaker input connections will allow for direct connection to 70V, 100V or low-impedance amplifiers.

The loudspeaker shall have a protection circuit to protect the product from occasionally being overdriven.

Each loudspeaker shall have a bandwidth of 80 Hz – 16 kHz and a maximum acoustic output of 103 dB-SPL referenced to a full bandwidth pink noise input at 1 meter at the loudspeaker's rated power. The input connection shall consist of a three-position barrier connector on the included mounting bracket. Each loudspeaker shall be wired to the mounting bracket via a 4-pin, pre-wired connector.

Power settings available shall be: 2.5W, 5W, 10W, 20W, 40W @ 70V; 5W, 10W, 20W, 40W @ 100V; and 40W @ 8Ω (when referenced to IEC noise for 100 hours). The nominal dispersion shall be 125° H x 125° V coverage pattern at -6 dB (average 1 – 4 kHz).

When used with optional junction boxes (wall-mount bracket variant only), ceramic terminals and thermal fuse, the loudspeaker shall meet numerous standards for combination music and evacuation systems around the world.

Exposed cosmetic surfaces of the loudspeaker shall be paintable, and the acoustically transparent grille component shall be formed of powder-coated steel.

The loudspeaker shall be the Bose® FreeSpace® DS 40SE loudspeaker.

### Safety and Regulatory Compliance

The FreeSpace DS 40SE has passed extensive testing and complies with the following specifications and uses:

Listed to ANSI/UL 1480-2005

- Fire Protective Signaling Use – UL Category UUMW, File Number S 3241. Control Number 4259 when installed with a ceiling-mount bracket or a wall-mount bracket and junction box (on-wall or in-wall). Not for use with DC-supervised systems.
- General-Purpose Use – UL Category UEAY, File Number S 5591 Control Number 3N89.
- Suitable for use outdoors in wet locations.
- Suitable for installation using Class 1, Class 2 or Class 3 wiring methods in accordance with NFPA 70, National Electric Code, 2008, Article 640.
- Suitable for use with fire alarm circuit wiring methods in accordance with NFPA 70, National Electric Code, 2008, Article 760.

The DS 40SE loudspeaker has been designed to the requirements defined in the following European regulatory specification for combination systems:

- British Standard Code of Practice BS 5839, Part 8.

# FreeSpace® DS 40SE Loudspeaker



## Product Codes

|  |                |
|--|----------------|
| FreeSpace DS 40SE<br>loudspeaker – Blk | PC 321279-0110 |
| FreeSpace DS 40SE<br>loudspeaker – Wht | PC 321279-0210 |

## Accessories

|  |                |
|--|----------------|
| Wall-mount bracket – Blk                           | PC 315253-001  |
| Wall-mount bracket – Wht                           | PC 315253-002  |
| Ceiling-mount bracket<br>assembly – Blk            | PC 323206-0110 |
| Ceiling-mount bracket<br>assembly – Wht            | PC 323206-0210 |
| Pole-mount kit – Blk                               | PC 323208-0110 |
| Pole-mount kit – Wht                               | PC 323208-0210 |
| Trim plate kit – Blk                               | PC 315266-001  |
| Trim plate kit – Wht                               | PC 315266-002  |
| On-wall junction box<br>(6 pack) – Blk             | PC 041865      |
| On-wall junction box<br>(6 pack) – Wht             | PC 041866      |
| In-wall junction box<br>(6 pack) – Blk             | PC 041867      |
| In-wall junction box<br>(6 pack) – Wht             | PC 041868      |
| Ceramic terminal and<br>thermal fuse kit (10 pack) | PC 326668-0010 |

## Replacement Parts

|   |                |
|---|----------------|
| Grille w/fasteners – Blk  | PC 326912-0115 |
| Grille w/fasteners – Wht  | PC 326912-0215 |
| 4.5" (114mm) driver<br>w/gasket   | PC 324015-0015 |
| Logo assembly – Blk   | PC 303038-001  |
| Logo assembly – Wht   | PC 303038-002  |
| Grille endcap – Blk   | PC 324008-0115 |
| Grille endcap – Wht   | PC 324008-0215 |
| Wall-mount<br>bracket base – Blk  | PC 315824-0015 |
| Wall-mount<br>bracket base – Wht  | PC 315824-0025 |
| Wall-mount bracket<br>speaker arm w/screw – Blk   | PC 315821-0015 |
| Wall-mount bracket<br>speaker arm w/screw – Wht   | PC 315821-0025 |
| Wall-mount bracket<br>hardware kit (bracket<br>doors, strain relief<br>assembly, speaker<br>arm screws/washers) – Blk | PC 315827-0015 |
| Wall-mount bracket<br>hardware kit (bracket<br>doors, strain relief<br>assembly, speaker<br>arm screws/washers) – Wht | PC 315827-0025 |
| Wall-mount bracket<br>pivot screw – Blk   | PC 315829-0015 |
| Wall-mount bracket<br>pivot screw – Wht   | PC 315829-0025 |
| Wall-mount bracket<br>theft-deterrent<br>pivot screw – Blk  | PC 315831-0015 |
| Wall-mount bracket<br>theft-deterrent<br>pivot screw – Wht  | PC 315831-0025 |

# FreeSpace® DS 40SE

## Loudspeaker

### How our Loudspeakers are Measured

#### 1. Power handling

Full-bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full-bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 3. Maximum SPL

Full-bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 4. Frequency range

Sine waves are injected into the loudspeaker, and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1 meter. Resulting graph is smoothed by 0.05 octave band.