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# Turbine T05 ACOUSTIC REPORT

# Grand Bend Wind Farm

# Grand Bend, Ontario

Report Number: 02.0031.002

Project Number: 02.0031

Prepared for:

Grand Bend Wind Limited Partnership
c/o Northland Power Inc.
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November 29, 2016



*Template* QF 510-01 V05

# VERSION CONTROL

| Version | Date | Version Description |
|---|---|---|
| 01 | November 29, 2016 | Original Report |

# EXECUTIVE SUMMARY

Howe Gastmeier Chapnik Limited ("HGC Engineering") was retained by Northland Power Inc., on behalf of Grand Bend Wind Limited Partnership, to complete an Acoustic Noise test in accordance with IEC 61400-11 of Wind Turbine Generator ("WTG") T05, part of the Grand Bend Wind Farm near Grand Bend, Ontario. The measurements were completed on October 13, 2016.

HGC Engineering has assessed the acoustic emissions of WTG T05, a Siemens SWT 3.0-113 wind turbine rated at 2483 kW, in accordance with CAN/CSA-C61400-11:13 (IEC 61400-11:2012). A summary of the acoustic results are provided in the following table:

| **Hub Height Wind Speed [m/s]** | **7.5** | **8** | **8.5** | **9** | **9.5** | **10** | **10.5** | **11** | **11.5** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|
| Sound Power Level $L_{WA,k}$ in dB(A): | **100.3** | **100.5** | **100.8** | **100.8** | **101.1** | **101.0** | **100.9** | **101.2** | **101.0** | **100.7** |
| Tonal Audibility, $\Delta L_{ak}$ in dB: | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | -2.8 | -2.5 | -2.9 | -1.5 |
| Total Uncertainty $u_{LWA,k}$ in dB: | 0.8 | 0.9 | 0.8 | 0.9 | 0.9 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 |

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# 1 INTRODUCTION

Howe Gastmeier Chapnik Limited ("HGC Engineering") was retained by Northland Power Inc., on behalf of Grand Bend Wind Limited Partnership, to complete sound level measurements (Emission Audit) of Wind Turbine Generator ("WTG") T05 in order to determine the sound power level of the turbine. The turbine is part of the Grand Bend Wind Farm which includes 40 Siemens turbines, with an overall project nameplate capacity of 100 MW. Measurements were completed on October 13, 2016 between 10:00 and 14:30. Figure 1 shows the location of WTG T05.

This report summarizes measurements that were completed in accordance with IEC Standard 61400-11 "Wind turbine generator systems – Part 11: Acoustic Noise Measurement Techniques". The CAN/CSA-C61400-11:13 standard is an adoption without modification of the identically titled IEC Standard IEC 61400-11:2012 [1].

## 1.1 DEVIATIONS FROM IEC 61400-11

Data for the turbine electrical power, nacelle wind speed, rotor RPM and azimuth position were obtained from the data collection system of the wind turbine. The calibration status of the nacelle anemometer and the electrical power transducer are unknown.

# 2 WIND TURBINE GENERATOR

The wind turbine generator is manufactured by Siemens and is a SWT 3.0-113 model, rated at 2483 kW with a rotor diameter of 113 metres and a hub height of 99.5 metres. This turbine is an upwind, pitch controlled, horizontal axis wind turbine with three blades. Specific details of the wind turbine generator are included in Table 1.

**Table 1: Wind Turbine Generator Characteristics**

| | |
|---|---|
| **Wind Turbine** | |
| Manufacturer | Siemens |
| Model Number | SWT 3.0-113 |
| Serial Number | 3000950 |
| Hub Height | 99.5 m |
| Tower Type (lattice or tube) | Tubular |
| Horizontal Distance from Rotor Centre to Tower Axis | 5.5 m |
| Rotor Diameter | 113 m |
| Speed (constant or variable) | Variable |
| Pitch Angle | Confidential |
| Rotational Speed | Max speed, 12 rpm |
| Rated Power Output | 2483 kW |
| Control Software Version | 128.2.0.1 |
| **Rotor Details** | |
| Rotor Control Devices | Pitch control |
| Presence of Vortex Generators, Stall Strips Trailing Edges | Vortex generators and Dino Tails |
| Blade Type | B55 |
| Serial Number | Blade A: 550245101<br>Blade B: 550245701<br>Blade C: 550244601 |
| **Gearbox** | |
| Manufacturer | N/A Direct drive |
| Model Number | N/A Direct drive |
| Serial Number | N/A Direct drive |
| **Generator** | |
| Manufacturer | Siemens |
| Model Number | DD22_02 |
| Serial Number | 5100138628 |

The power curve utilized for the sound level measurements is shown in Figure 2. From the supplied power curve, 85% of maximum electrical power is reached at 2111 kW or at a hub height wind speed of 9.3 m/s. The required minimum wind speeds for reporting is from 0.8 to 1.3 times the wind speed

at 85% electrical power which is from 7.5 to 12 m/s for this wind turbine. The sound level specifications for this turbine indicates a maximum sound power level of 101.5 dBA.

# 3 TEST ENVIRONMENT

WTG T05 is part of the Grand Bend Wind Farm located near Grand Bend, Ontario. Figure 1 shows the specific location of WTG T05. The surrounding land is used mainly for agricultural crops and includes gently rolling terrain. The sound level measurement location was in a grass field.

There are a number of additional wind turbine generators located in the vicinity of the test turbine. WTG T06 is located approximately 300 m to the southwest, with additional turbines located further away. The surrounding wind turbine (WTG T06), part of the Grand Bend Wind Farm, was parked during the testing of WTG T05.

The sound level measurement location was established at 140 m from the base of the turbine. This distance was determined utilizing the reference distance calculation provided in IEC 61400; $R_0 = H + D/2 \pm 20\%$ where H is the hub height and D is the rotor diameter. An R1 distance of 178 m was determined for this test. Photos of the sound level measurement location, the test turbine and wind mast location are included under Appendix A.

# 4 INSTRUMENTATION AND SETUP

A Wolfel RoBin measurement system was utilized to complete the IEC measurements. Sound pressure level measurements and recordings were completed utilizing a 01 dB DUO Smart Noise Monitor. The microphone was mounted on a one metre diameter board with a primary and secondary windscreen. A standard Bruel & Kjaer 3” wind screen (half) was used on the microphone as well as a secondary Bruel & Kjaer UA-2133 wind screen. The influence of the secondary windscreen is shown in Table 2. The measured sound levels have been adjusted for the acoustic influence of the secondary windscreen which contributes less than 0.2 dBA to the overall sound level.

**Table 2: Frequency Dependent Influence for UA-2133 Windscreen**

| Frequency [Hz] | SPL Influence [dB] | Frequency [Hz] | SPL Influence [dB] |
|---|---|---|---|
| 100 | -0.07 | 1600 | -0.3 |
| 125 | 0.06 | 2000 | -0.03 |
| 160 | 0.01 | 2500 | -0.12 |
| 200 | 0.18 | 3150 | -0.25 |
| 250 | -0.03 | 4000 | -0.73 |
| 315 | -0.25 | 5000 | -0.5 |
| 400 | -0.26 | 6300 | -0.03 |
| 500 | -0.18 | 8000 | -0.99 |
| 630 | 0.04 | 10000 | -0.77 |
| 800 | -0.14 | 12500 | -0.75 |
| 1000 | -0.44 | 16000 | -1.23 |
| 1250 | -0.14 | 20000 | -0.59 |

The RoBin and DUO systems were time synchronized with the data collection of the wind turbine generator prior to the start of the measurements (within 1 second).

For the measurements, the electrical power, hub height wind speeds, rotor RPM, and nacelle azimuth were provided by the customer as analogue signals and were directly connected to the RoBin system.

Wind speed and direction at 10 m height were measured utilizing a Vaisala ultrasonic anemometer, while a Reinhardt DFT485 sensor was utilized to measure air pressure, temperature and air humidity. Table 3 shows the weather conditions during the measurement period.

**Table 3: Weather Conditions**

| | Beginning of Test | End of Test |
|---|---|---|
| **Air Temperature (°C)** | 10 | 11 |
| **Air Pressure (hPa)** | 995 | 998 |
| **Sky Condition** | Cloudy | Partly Cloudy |
| **Range of Wind Direction (°)** | 315 to 325 | |

Table 4 shows the measurement equipment and the relevant calibration information for the test date.

**Table 4: Instrumentation, October 13, 2016**

| Instrumentation | Manufacturer / Model / Serial Number | Calibration Date |
|---|---|---|
| Measurement System | Wolfel / RoBin / ROBIN.00.0003 | NA |
| Sound Level Meter | 01 dB-Metravib / DUO / 10815 | 29-Feb-2016 |
| Microphone | GRAS / 40CD / 154426 | 29-Feb-2016 |
| Temperature/Pressure | Reinhardt / DFT 485 / 1027951V1.13 | 16-Sep-2015 |
| Ultrasonic Wind Sensor | Vaisala / WMT701 / J390012 | 30-Sep-2015 |
| Acoustic Calibrator | Bruel & Kjaer / 4231 / 3010241 | 23-Feb-2016 |
| Primary Wind Screen | Bruel & Kjaer | NA |
| Secondary Wind Screen | Bruel & Kjaer / UA 2133 | NA |
| Noisy Software | Wolfel / Noisy Version 2015-2 / S007/00062 | NA |
| Laser Range Finder | TruPulse / 200 / 75117 | 24-Nov-2014 |

Correct calibration of the acoustic instrumentation was verified using an acoustic calibrator manufactured by Brüel & Kjær. Verification of calibration status was carried out at the start and end of the measurement period and when the microphone was disconnected from the sound level meter. Calibration certificates for the test equipment can be provided upon request. Unless indicated otherwise, the same equipment was utilized during the entire test period.

For testing on October 13, 2016, the anemometer was located 140 m southwest of the turbine at 10 m above grade. The standard roughness length applicable for this site is 0.05 given the surrounding farmland with some vegetation.

Sound level measurements were completed with the turbine operational (on) and with the turbine parked (off). Significant interfering sound from road traffic, aircraft, bird calls, local agricultural activity, etc. was not included in the analyzed data for either the turbine on or off condition. Additionally, sound level measurements from when the nacelle direction deviated more than +/- 15° from the downwind direction for the reference microphone position was not included in the analysis. Downwind direction ranged between 315 and 325 degrees.

## 4.1 TYPE B UNCERTAINTIES

The uncertainty components of Type B are provided in Table 5. Additional one-third octave Type B uncertainty components for the instrument and wind screen insertion loss can be provided upon request. These uncertainty components are provided by the instrument manufacturers.

**Table 5: Type B Uncertainty Components**

| Component | Value [dB] |
|---|---|
| Calibration, $u_{B1}$ | 0.2 |
| Instrument, $u_{B2}$ | 0.2 - 0.5 |
| Board, $u_{B3}$ | 0.3 |
| Wind screen insertion loss, $u_{B4}$ | 0.1 - 0.5 |
| Distance and Direction, $u_{B5}$ | 0.1 |
| Air Absorption, $u_{B6}$ | 0.2 |
| Weather Conditions, $u_{B7}$ | 0.5 |
| Wind Speed, Measured, $u_{B8}$ | 0.7 |
| Wind Speed Derived, $u_{B8}$ | 0.2 |
| Wind Speed, Power Curve, $u_{B9}$ | 0.2 |

# 5 MEASUREMENTS AND RESULTS

Sound level measurements were conducted of WTG T05 on October 13, 2016 between 10:00 and 14:30. Temperature and other weather characteristics are reported in Table 3 above.

The data points where the turbine was operating at or below the allowed power curve range are identified as the allowed range (intervals on the electrical power curve where no duplicated values exist and the slope of the power curve including the uncertainty is positive). For data within the allowed range of the electrical power curve the wind speed is determined from the power curve, while data points outside the allowed range are determined utilizing the nacelle anemometer method. The reference electrical power curve is provided as Figure 2.

Figure 3 shows the sound pressure level at the measurement location versus the hub height wind speed. Blue circles represent sound level data points collected with the turbine operating in the

allowed range, above this point the sound levels are shown as black squares. Magenta triangles indicate data points of the background sound level (turbine off).

Figure 4 shows the measured total sound versus electrical power, while Figure 5 shows the wind speed derived from the power curve relative to the nacelle wind speed and 10 m height wind speed.

Observations in the vicinity of the measurement location indicated that the wind turbine was not tonal and aerodynamic noise from the rotating blades dominated the sound levels.

Table 6 summarizes the analysis of the measured results with and without the turbine operational.

**Table 6: Sound Level Data of WTG T05**

| Hub Height Wind Speed [m/s] | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Collected Data Points, Total | 22 | 44 | 84 | 90 | 83 | 63 | 61 | 65 | 61 | 49 |
| Collected Data Points, Background | 40 | 42 | 37 | 48 | 43 | 27 | 34 | 29 | 22 | 20 |
| Average Wind Speed, $V_K$ [m/s] | 7.6 | 8.0 | 8.5 | 9.0 | 9.5 | 9.9 | 10.5 | 11.0 | 11.5 | 12.0 |
| Total Noise, $L_{V,T,}$ in dB(A) | 51.2 | 51.4 | 51.5 | 51.8 | 51.9 | 52.0 | 52.0 | 52.1 | 52.0 | 52.0 |
| Background Noise, $L_{V,B}$ in dB(A) | 43.6 | 44.1 | 43.4 | 44.8 | 44.2 | 45.0 | 45.1 | 45.0 | 45.3 | 45.9 |
| Difference T-B, dB(A) | 7.6 | 7.3 | 8.1 | 7.0 | 7.7 | 7.0 | 6.9 | 7.1 | 6.7 | 6.1 |
| Corrected $L_{Aeq}$, in dB(A) | 50.4 | 50.5 | 50.8 | 50.8 | 51.1 | 51.0 | 51.0 | 51.2 | 51.0 | 50.8 |

Table 6 shows that at least 180 measurements were collected for both total noise and background noise and at least 10 measurements are included in the analysis for each wind speed bin for both total noise and background noise, as required by IEC 61400-11.

Table 7 shows the calculated sound level data, the resulting sound power levels, tonality and measurement uncertainty at hub height, while Table 8 shows the apparent sound power levels at a reference height of 10 m. Figure 6 presents the apparent sound power level at hub height wind speeds.

**Table 7: Apparent Sound Power Level of WTG T05 at Hub Height**

| Hub Height Wind Speed [m/s] | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Corrected $L_{Aeq}$, in dB(A) | 50.4 | 50.5 | 50.8 | 50.8 | 51.1 | 51.0 | 51.0 | 51.2 | 51.0 | 50.8 |
| Sound Power Level $L_{WA,K}$ in dB(A) | **100.3** | **100.5** | **100.8** | **100.8** | **101.1** | **101.0** | **100.9** | **101.2** | **101.0** | **100.7** |
| Tonal Audibility, $\Delta L_{ak}$ in dB: | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | -2.8 | -2.5 | -2.9 | -1.5 |
| Total Uncertainty $u_{LWA,k}$ in dB: | 0.8 | 0.9 | 0.8 | 0.9 | 0.9 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 |

**Table 8: Apparent Sound Power Level of WTG T05 at 10m Height**

| 10m Height Wind Speed [m/s] | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| Theoretical active power in kW: | 2482 | 2483 | 2483 | 2483 |
| Sound Power Level $L_{WA,k}$ in dB(A): | 100.9 | 101.1 | 101.0 | 100.6 |
| Total Uncertainty $u_{LWA,k}$ in dB: | 0.7 | 0.8 | 0.9 | 1.3 |

A table and plot of the sound power spectrum in one-third octaves for each hub height wind speed bin are included under Appendix B.

The tonality assessment indicates tonal audibility greater than -3 dB at hub height wind speeds greater than 10.5 m/s. Tonality assessment details for all wind speed bins are included under Appendix C.

# 6 CONCLUSIONS

The measurements and analysis, performed in accordance with the methods prescribed in IEC Standard 61400-11:2012 indicate that the sound power level of WTG T05, a Siemens SWT 3.0-113 wind turbine, rated at 2483 kW, has the following sound power levels:

| **Hub Height Wind Speed [m/s]** | **7.5** | **8** | **8.5** | **9** | **9.5** | **10** | **10.5** | **11** | **11.5** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|
| Sound Power Level $L_{WA,k}$ in dB(A): | **100.3** | **100.5** | **100.8** | **100.8** | **101.1** | **101.0** | **100.9** | **101.2** | **101.0** | **100.7** |
| Tonal Audibility, $\Delta L_{ak}$ in dB: | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | <-3.0 | -2.8 | -2.5 | -2.9 | -1.5 |
| Total Uncertainty $u_{LWA,k}$ in dB: | 0.8 | 0.9 | 0.8 | 0.9 | 0.9 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 |

The sound levels presented above are relevant for WTG T05 given the environmental conditions and the operating parameters of the turbine during the testing periods.

# 7 RECOMMENDATIONS / OPINIONS

The results of the acoustic measurements and analysis indicate that, for all measured wind speeds, Wind Turbine Generator T05, part of the Grand Bend Wind Farm, does not exceed the specified maximum sound power level of 101.5 dBA.

# REFERENCES

1. International Electrotechnical Commission, 61400-11:2012 *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques.*
2. Google Maps Aerial Imagery, Internet Application: *maps.google.com*

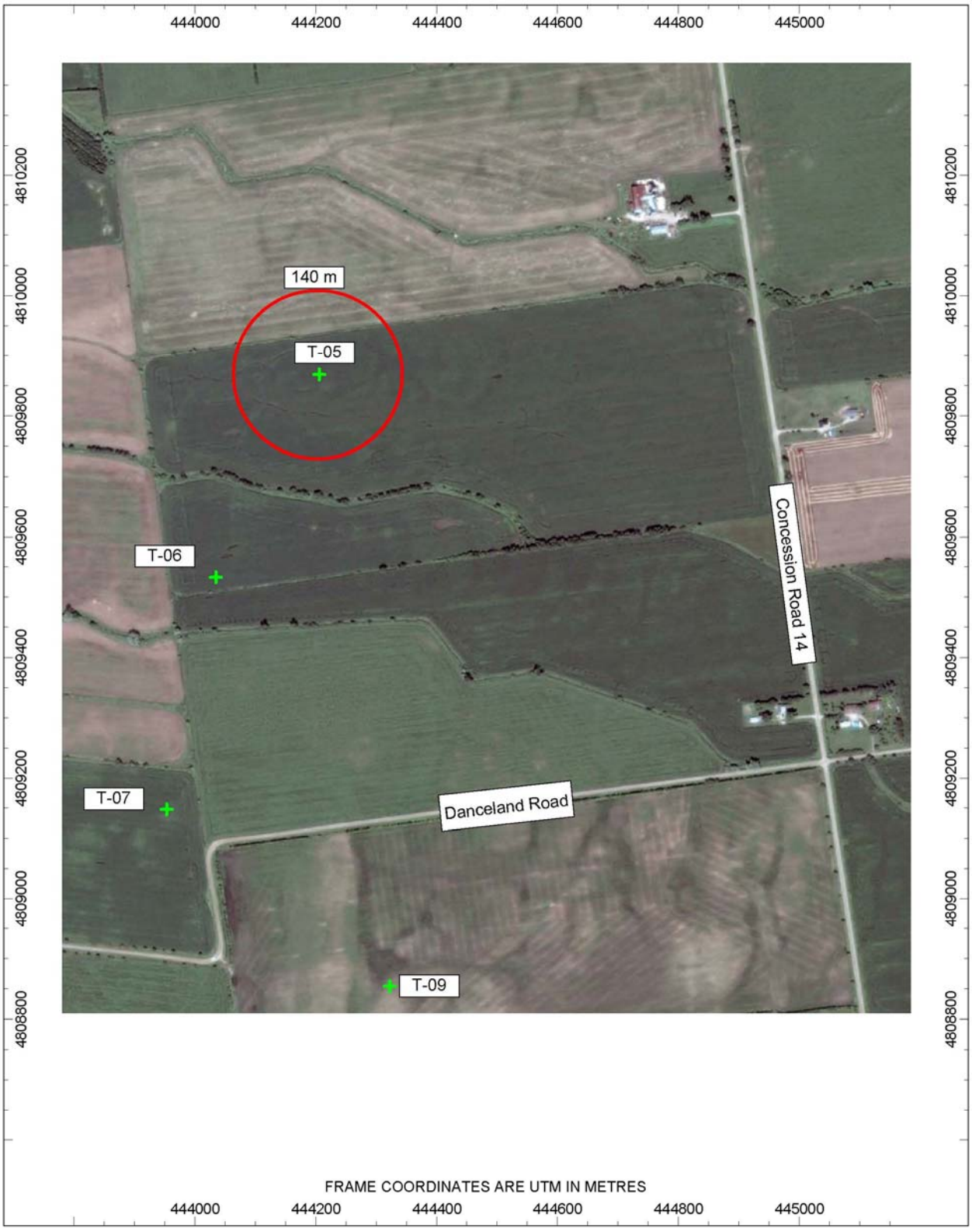



Figure 1: Location of Test Turbine

Figure 2: Reference Electrical Power Curve, WTG T05, 2483 kW
Grand Bend Wind Farm

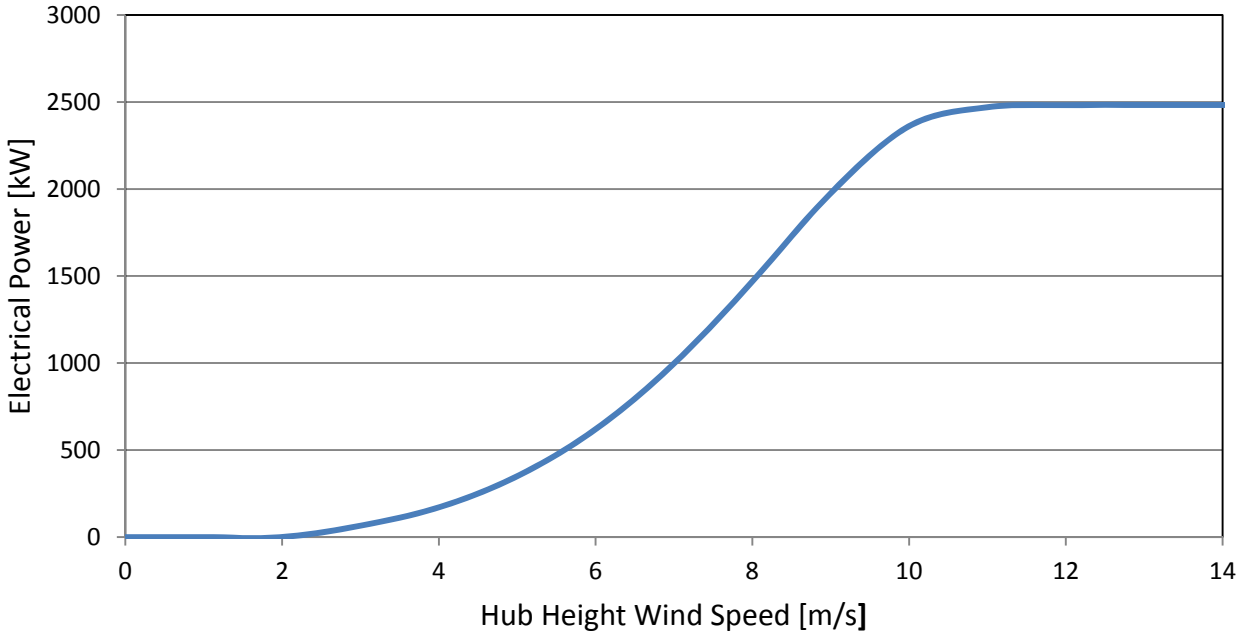


Figure 3: Acoustic Noise Measurements of Wind Turbine
WTG T05, 2483 kW, Grand Bend Wind Farm

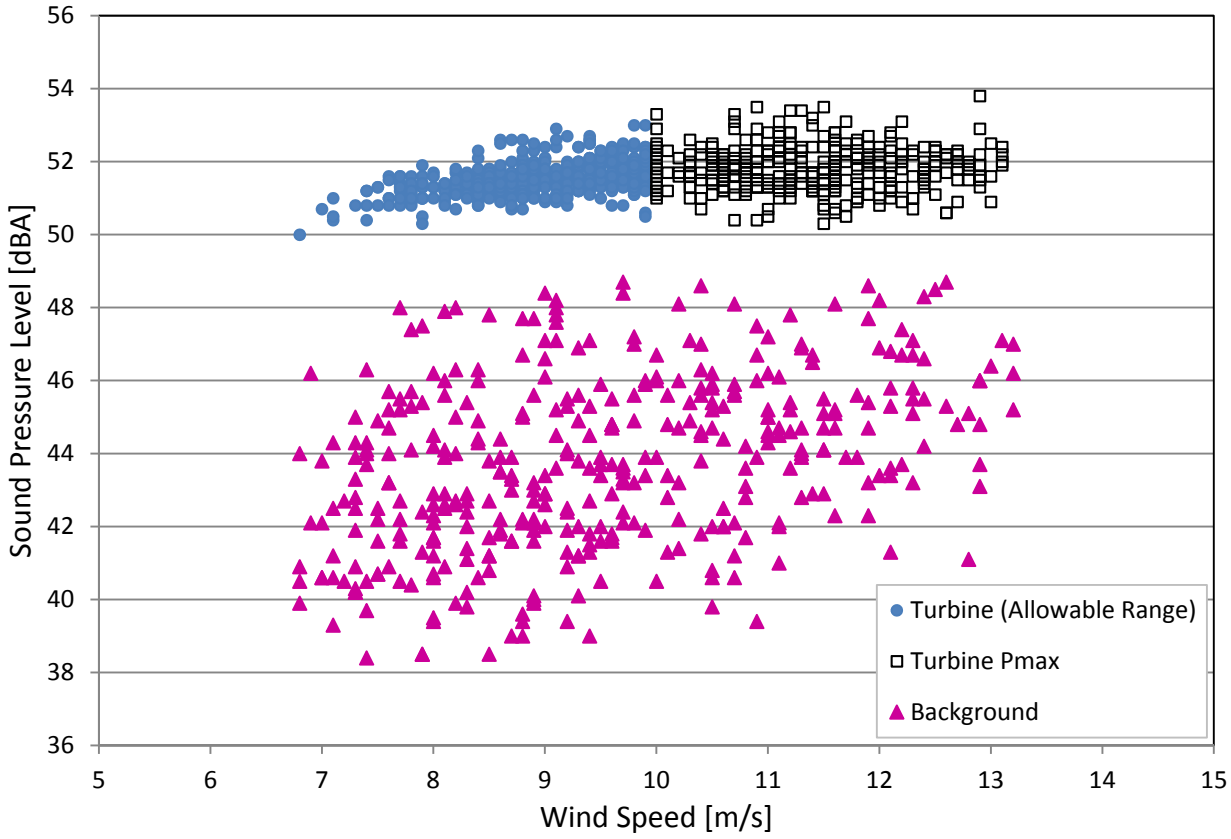


Figure 4: Total Sound Level [dBA] versus Electrical Power [kW]
Grand Bend Wind Farm WTG T05, 2483 kW

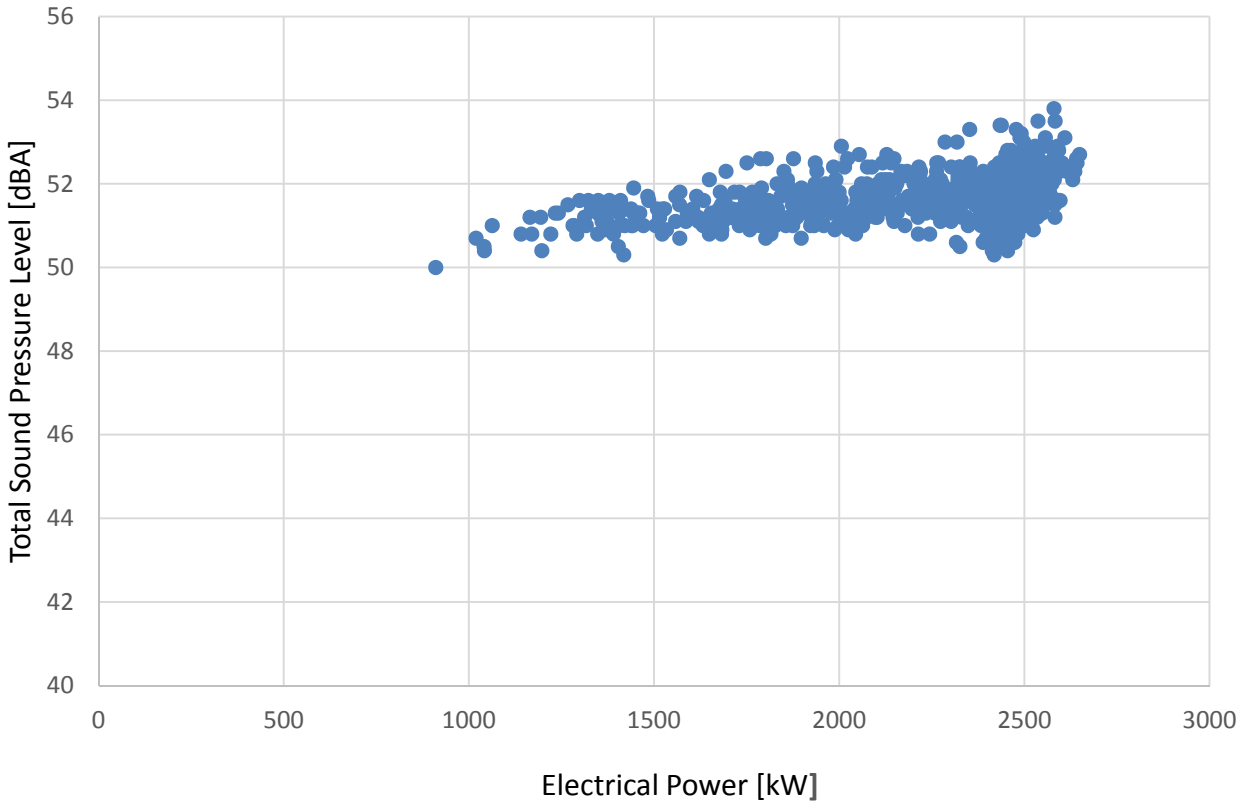


Figure 5: Measured Wind Speed vs Derived Wind Speed
Grand Bend Wind Farm WTG T05, 2483 kW

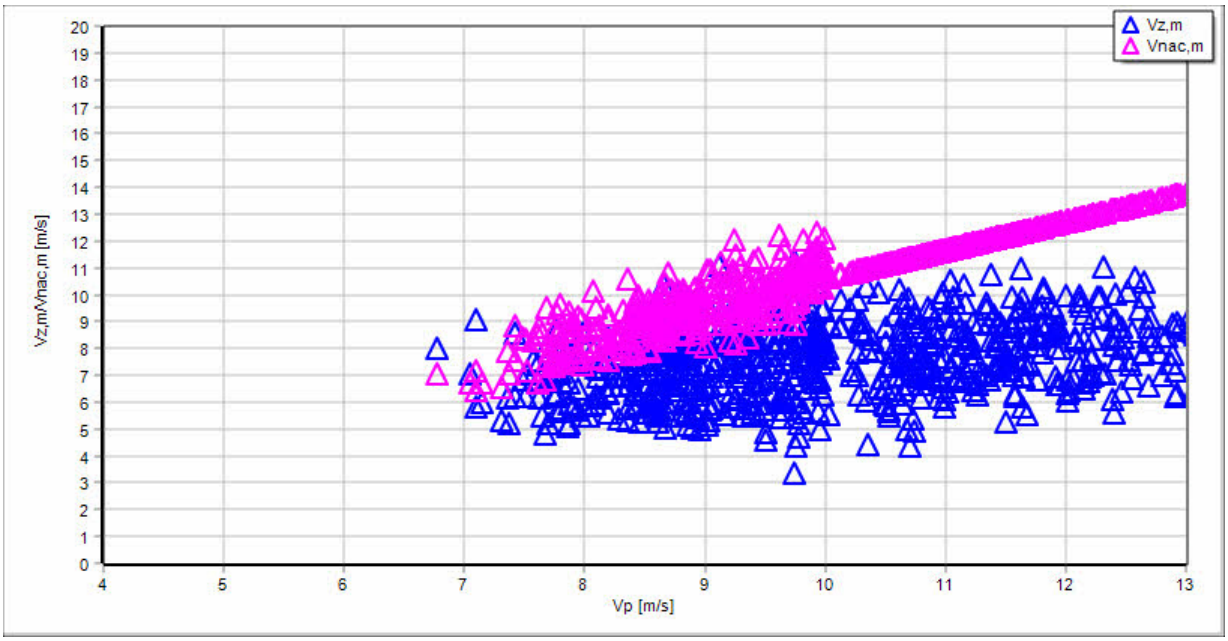
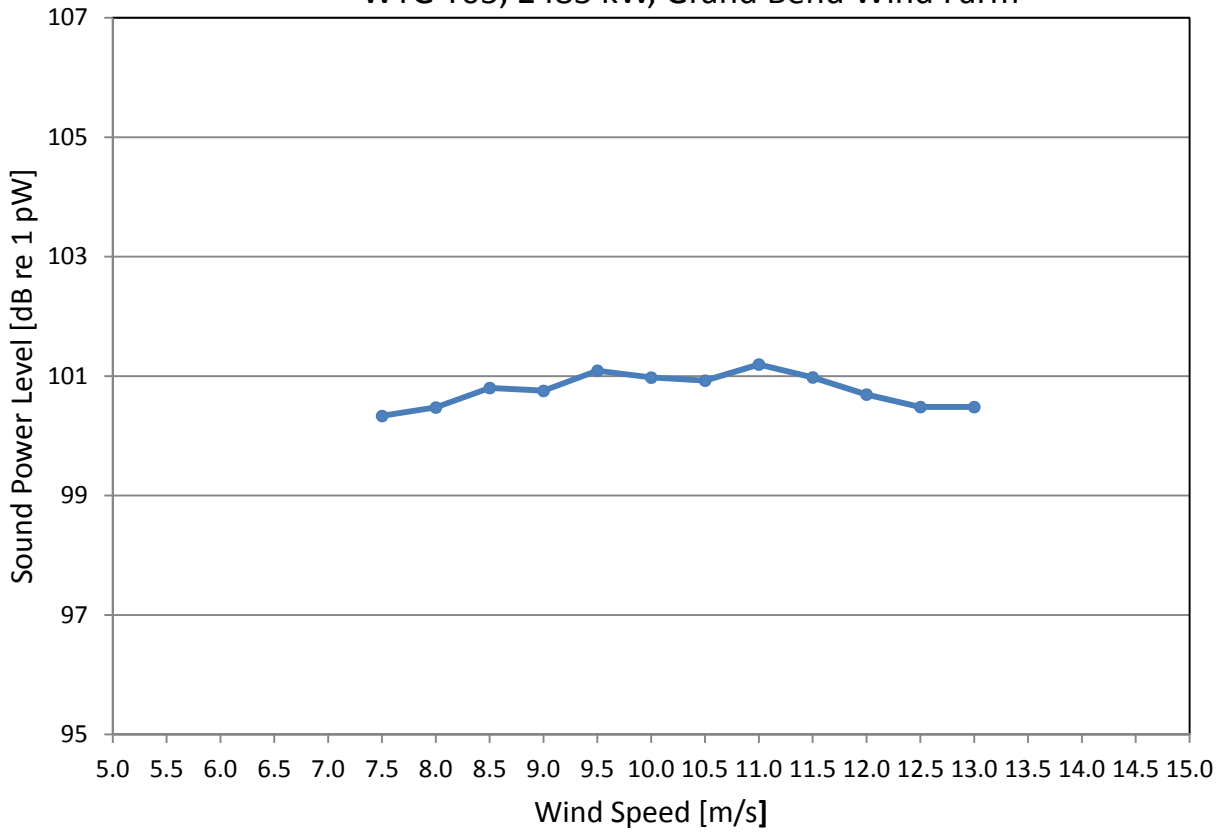
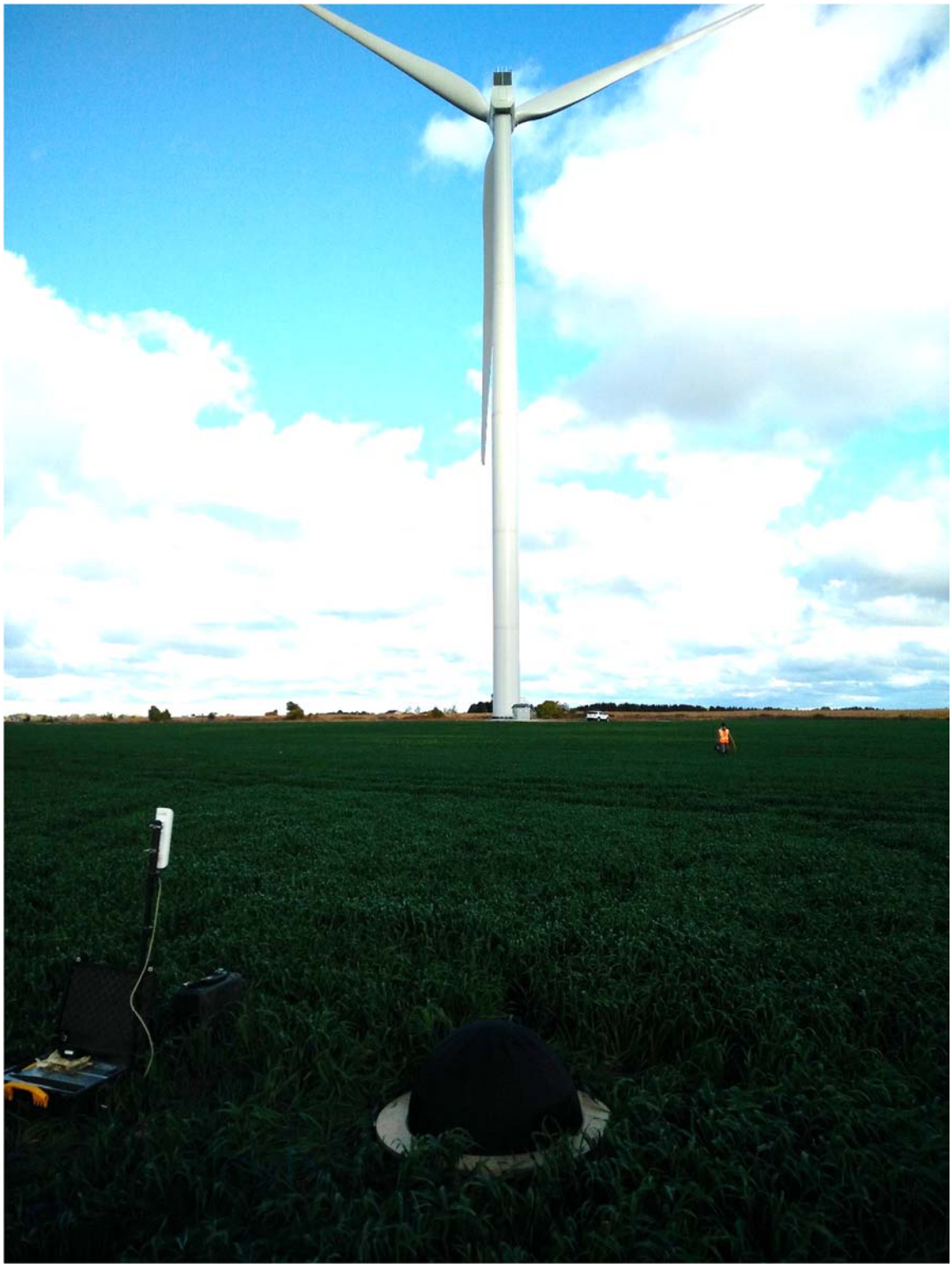


Figure 6: Apparent Sound Power Level at Hub Height Wind Speeds
WTG T05, 2483 kW, Grand Bend Wind Farm



# APPENDIX A:
# LOCATION PHOTOS

Wind Mast Location, October 13, 2016

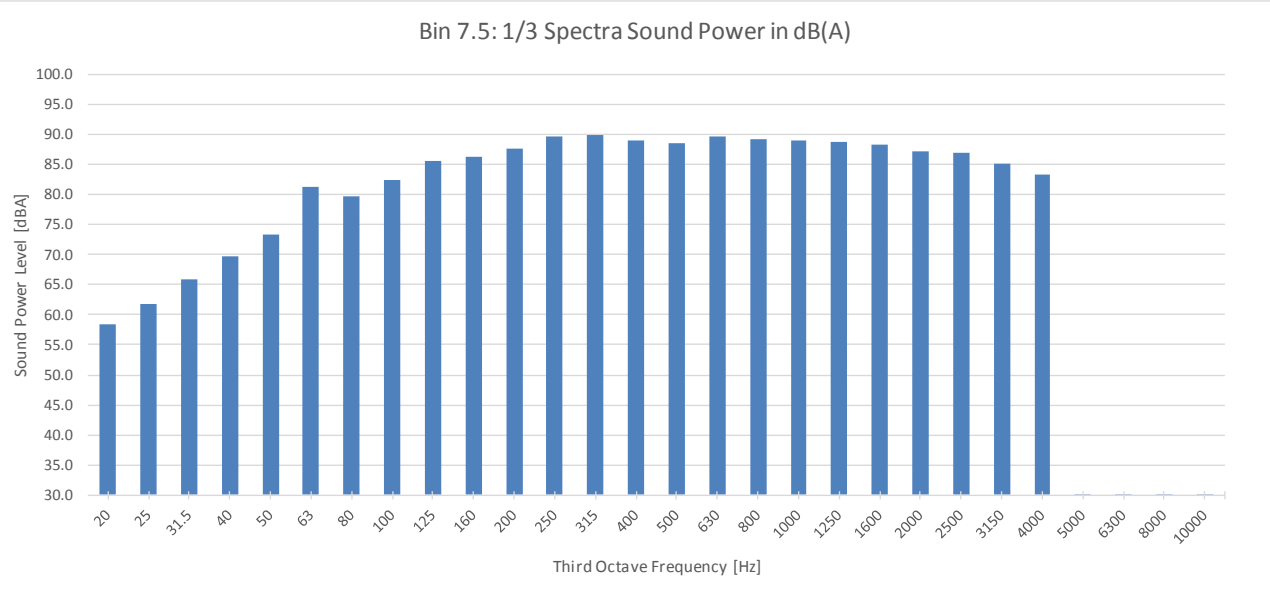


Sound Level Measurement Location, October 13, 2016

Sound Level Microphone on Board, October 13, 2016

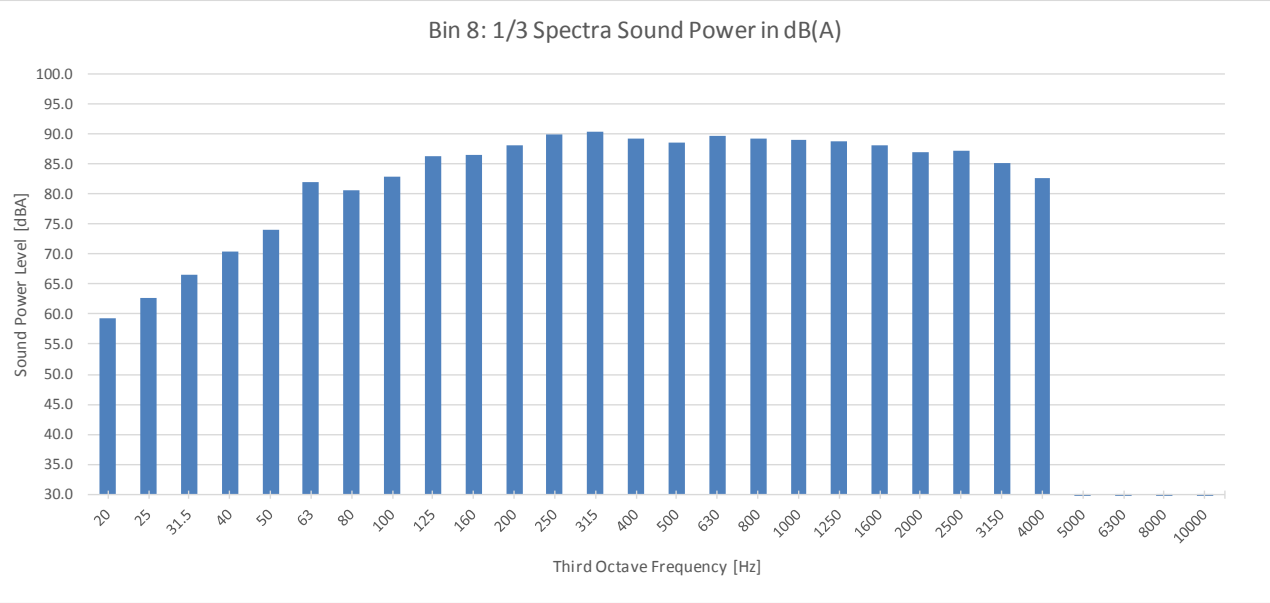
# APPENDIX B:

# OCTAVE BAND SOUND LEVEL RESULTS



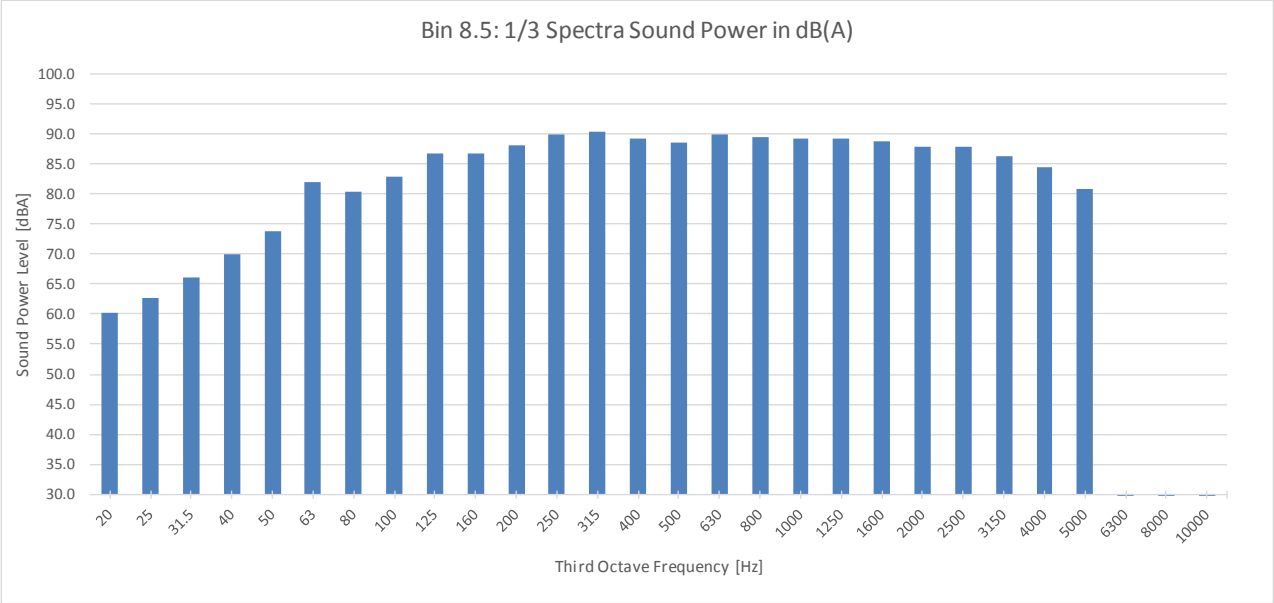

| Bin 7.5: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 58.3 | 61.9 | 65.8 | 69.7 | 73.4 | 81.3 | 79.7 | 82.4 | 85.7 | 86.3 | 87.7 | 89.6 | 89.9 | 89.1 |
| $U_C$ | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.8 | 0.9 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.5 | 89.7 | 89.2 | 89.0 | 88.8 | 88.3 | 87.2 | 87.0 | 85.2 | 83.3 | [79.8] | [78.3] | [76.7] | [73.6] |
| $U_C$ | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.9 | 1.1 | 2.2 | 2.4 | 2.6 | 2.6 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



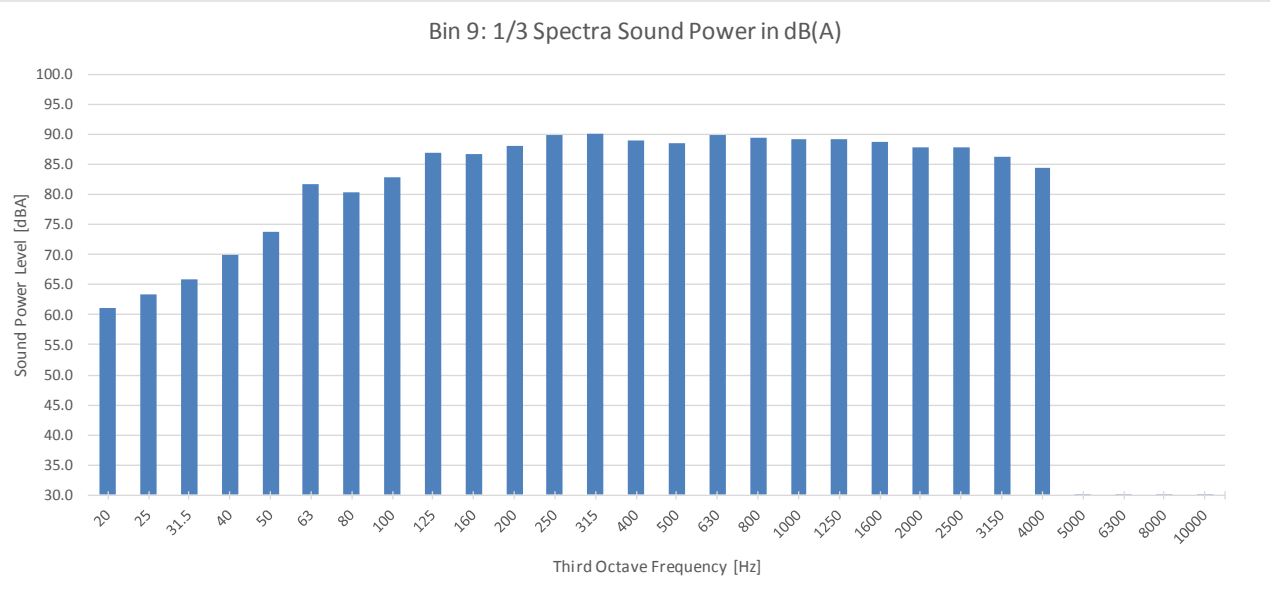

| Bin 8: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 59.4 | 62.8 | 66.5 | 70.4 | 74.0 | 82.0 | 80.6 | 82.8 | 86.3 | 86.6 | 88.0 | 89.9 | 90.4 | 89.2 |
| $U_C$ | 0.9 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.7 | 0.8 | 0.7 | 0.8 | 0.7 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.6 | 89.8 | 89.2 | 88.9 | 88.7 | 88.2 | 87.0 | 87.2 | 85.2 | 82.7 | [79.3] | [77.3] | [75.5] | [72.5] |
| $U_C$ | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 1.0 | 0.9 | 1.0 | 1.5 | 2.2 | 2.4 | 2.5 | 2.5 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



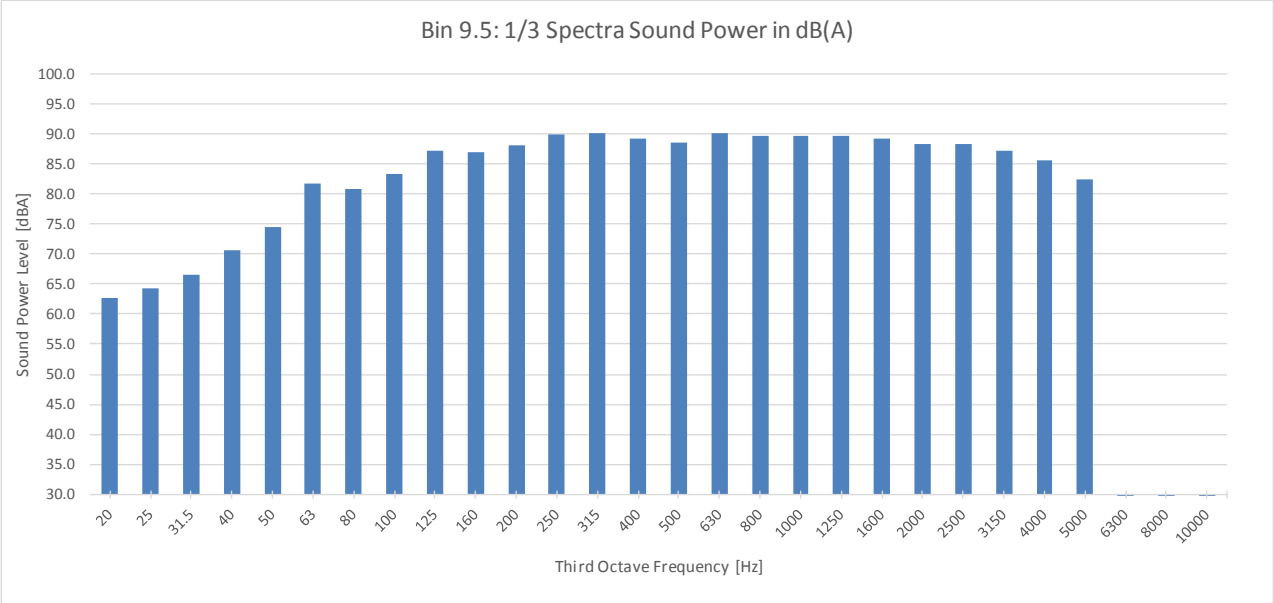

| Bin 8.5: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 60.1 | 62.7 | 66.0 | 70.0 | 73.9 | 81.9 | 80.5 | 82.8 | 86.7 | 86.7 | 88.1 | 90.0 | 90.3 | 89.3 |
| $U_C$ | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.8 | 0.9 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.8 | 0.7 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.6 | 89.9 | 89.4 | 89.2 | 89.2 | 88.8 | 87.8 | 87.9 | 86.2 | 84.4 | 80.8 | [78.7] | [77] | [74] |
| $U_C$ | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.8 | 0.9 | 1.1 | 1.9 | 2.3 | 2.3 | 2.2 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



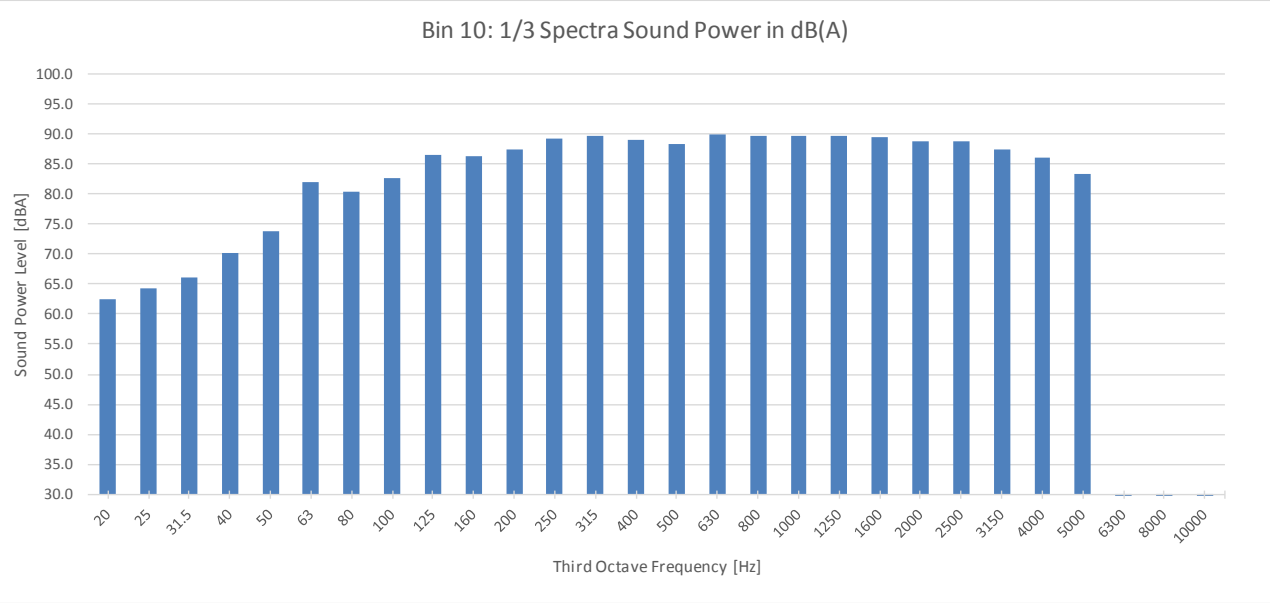

| Bin 9: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 61.1 | 63.4 | 65.9 | 70.0 | 73.8 | 81.7 | 80.4 | 82.9 | 86.9 | 86.8 | 88.0 | 89.9 | 90.2 | 89.1 |
| $U_C$ | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.8 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.6 | 89.9 | 89.4 | 89.3 | 89.3 | 88.8 | 87.9 | 87.9 | 86.3 | 84.4 | [81.1] | [79.4] | [77.6] | [74.5] |
| $U_C$ | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 1.0 | 0.9 | 1.0 | 1.3 | 2.2 | 2.3 | 2.2 | 2.1 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



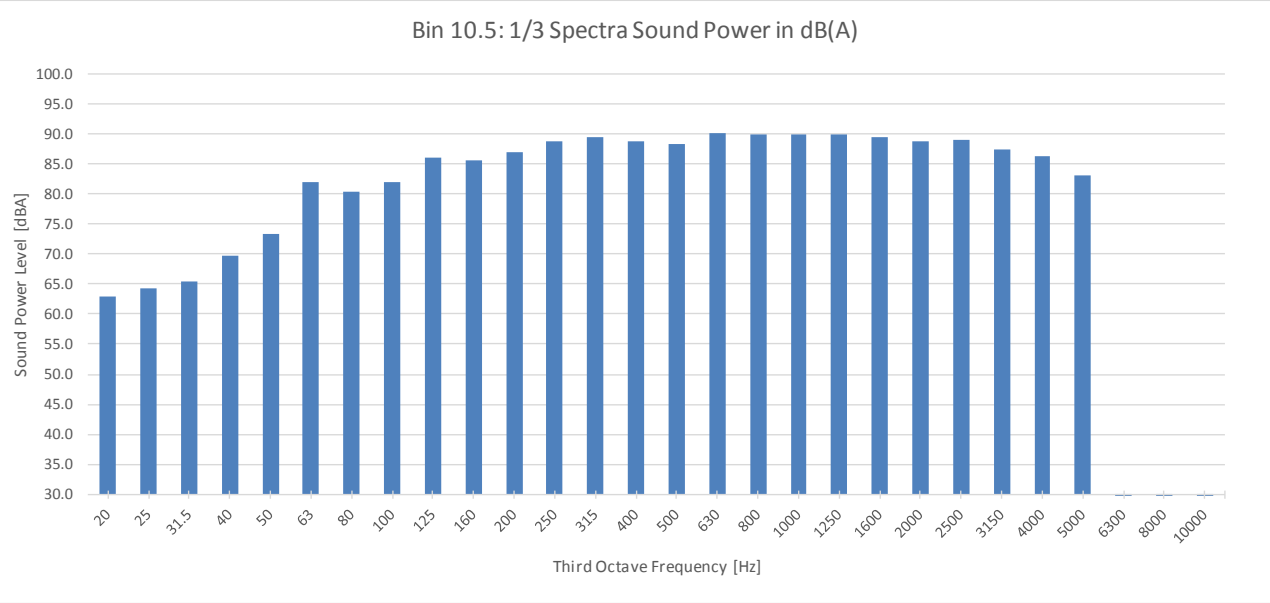

| Bin 9.5: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 62.7 | 64.4 | 66.6 | 70.6 | 74.4 | 81.8 | 80.8 | 83.3 | 87.2 | 87.0 | 88.1 | 89.9 | 90.1 | 89.2 |
| $U_C$ | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 1.0 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.6 | 90.1 | 89.8 | 89.7 | 89.6 | 89.2 | 88.4 | 88.4 | 87.1 | 85.6 | 82.5 | [80.4] | [78.7] | [75.7] |
| $U_C$ | 0.9 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.1 | 1.9 | 2.3 | 2.3 | 2.2 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



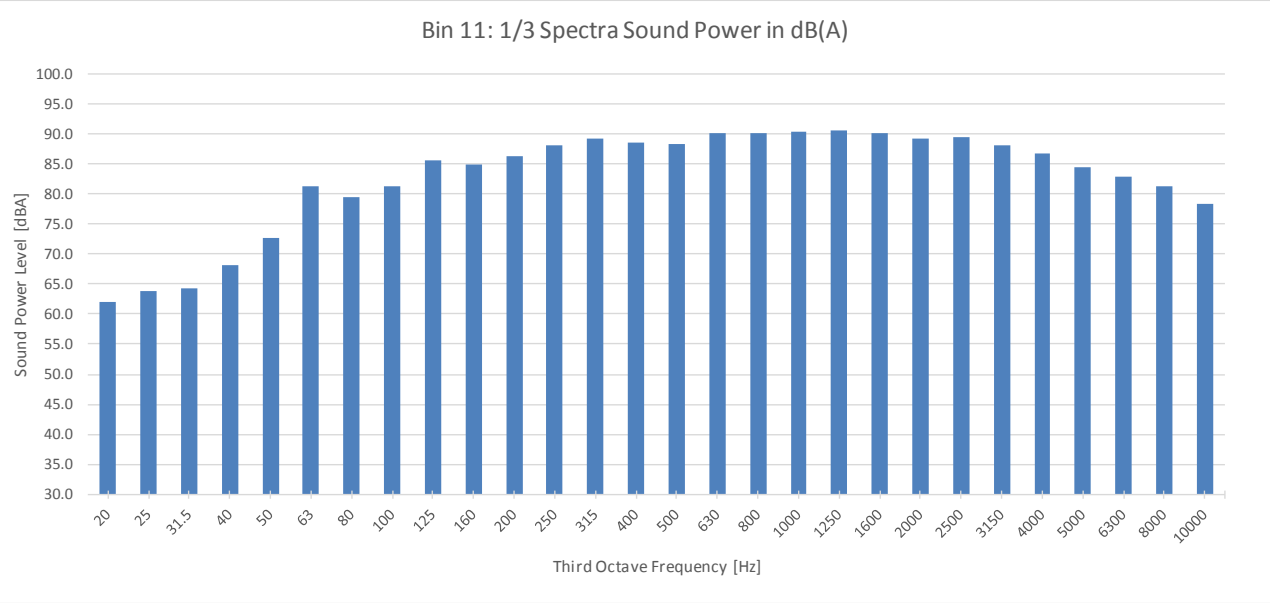

| Bin 10: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 62.5 | 64.2 | 66.1 | 70.3 | 73.8 | 82.0 | 80.5 | 82.7 | 86.5 | 86.2 | 87.4 | 89.3 | 89.6 | 88.9 |
| $U_C$ | 0.8 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.9 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.8 | 0.7 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.4 | 90.0 | 89.8 | 89.8 | 89.7 | 89.4 | 88.7 | 88.7 | 87.5 | 86.1 | 83.3 | [81.5] | [79.9] | [76.9] |
| $U_C$ | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.8 | 0.9 | 1.1 | 1.8 | 2.2 | 2.1 | 2.0 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



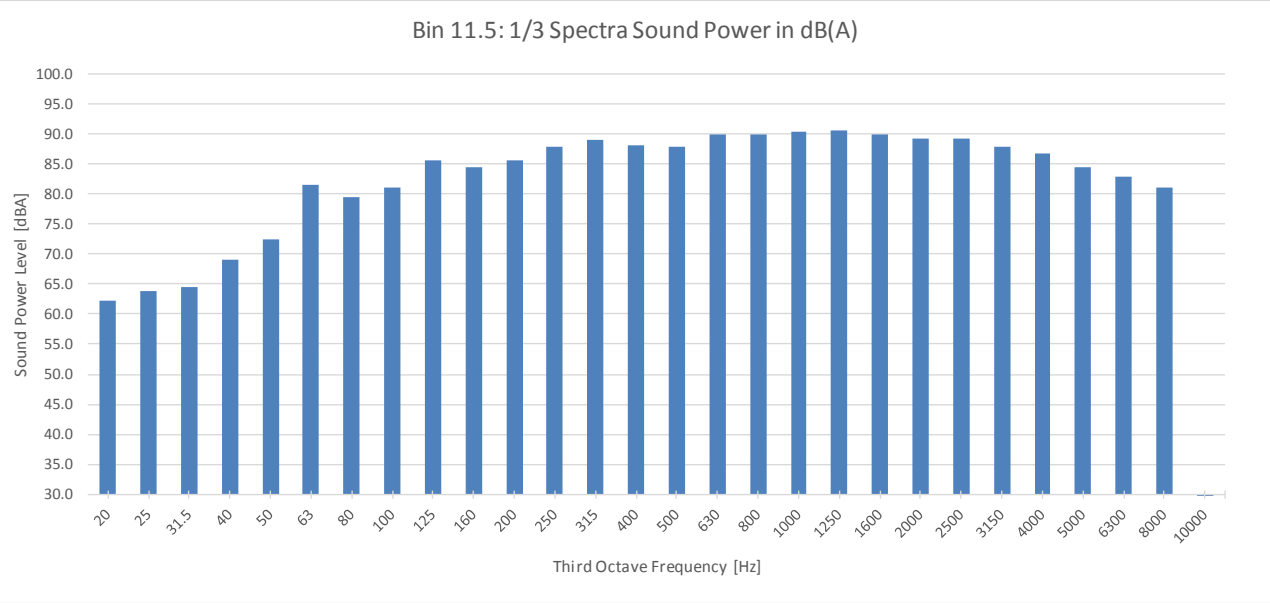

| Bin 10.5: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 62.9 | 64.4 | 65.5 | 69.8 | 73.3 | 82.0 | 80.4 | 82.0 | 86.0 | 85.7 | 86.9 | 88.8 | 89.4 | 88.8 |
| $U_C$ | 0.9 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.4 | 90.1 | 89.9 | 90.0 | 89.9 | 89.5 | 88.8 | 88.9 | 87.4 | 86.2 | 83.0 | [81.4] | [79.8] | [76.8] |
| $U_C$ | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 1.1 | 2.0 | 2.3 | 2.3 | 2.3 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).



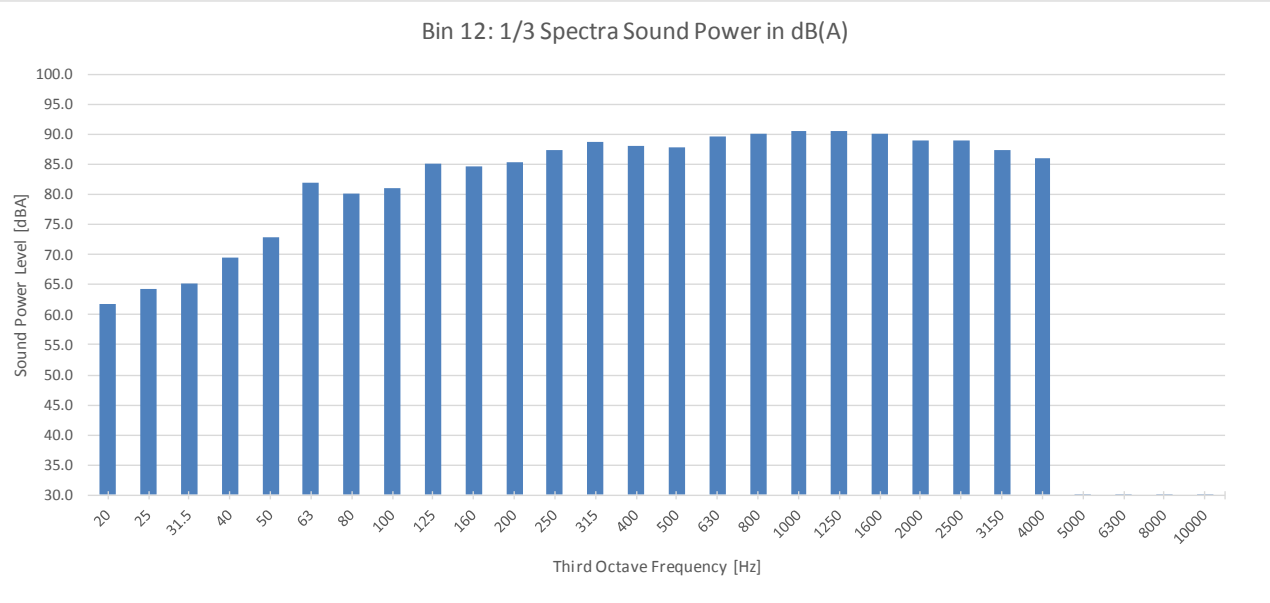

| Bin 11: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 62.1 | 63.8 | 64.3 | 68.2 | 72.6 | 81.4 | 79.4 | 81.2 | 85.6 | 85.0 | 86.2 | 88.2 | 89.2 | 88.5 |
| $U_C$ | 0.9 | 1.0 | 1.3 | 1.3 | 1.0 | 0.9 | 1.1 | 0.8 | 0.8 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 88.3 | 90.1 | 90.2 | 90.4 | 90.5 | 90.1 | 89.2 | 89.4 | 88.0 | 86.8 | 84.5 | 82.9 | 81.4 | 78.4 |
| $U_C$ | 0.9 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.1 | 1.6 | 2.1 | 2.2 | 2.1 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).




| Bin 11.5: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 62.2 | 63.8 | 64.6 | 69.0 | 72.4 | 81.6 | 79.4 | 81.1 | 85.5 | 84.5 | 85.7 | 87.8 | 88.9 | 88.1 |
| $U_C$ | 0.9 | 1.0 | 1.1 | 1.0 | 1.0 | 0.9 | 1.0 | 0.8 | 0.8 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 87.9 | 89.9 | 89.9 | 90.3 | 90.5 | 90.0 | 89.2 | 89.2 | 87.8 | 86.7 | 84.5 | 82.9 | 81.1 | [78.2] |
| $U_C$ | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 0.9 | 1.0 | 1.1 | 1.7 | 2.2 | 2.4 | 2.3 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).




| Bin 12: 1/3 Spectra Sound Power in dB(A) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency[Hz] | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| $L_{WA}$ | 61.7 | 64.4 | 65.1 | 69.4 | 73.0 | 81.9 | 80.1 | 81.0 | 85.2 | 84.6 | 85.4 | 87.5 | 88.7 | 88.0 |
| $U_C$ | 1.0 | 1.0 | 1.1 | 1.0 | 1.0 | 0.9 | 1.0 | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 0.8 |
| Frequency[Hz] | 500 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
| $L_{WA}$ | 87.9 | 89.8 | 90.1 | 90.5 | 90.5 | 90.1 | 89.1 | 88.9 | 87.4 | 86.1 | [83] | [81.8] | [80.3] | [77.3] |
| $U_C$ | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1.3 | 2.3 | 2.4 | 2.5 | 2.4 |

[ ] Total Noise less than 3 dB greater than background (3 dB correction applied).

# APPENDIX C:

# TONALITY ASSESSMENT

| **BIN 7.5: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 8: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 8.5: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 9: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 9.5: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 10: Detected tones** |
| --- |
| No relevant tones. |

| **BIN 10.5: Detected tones** |
| --- |
| See below. |

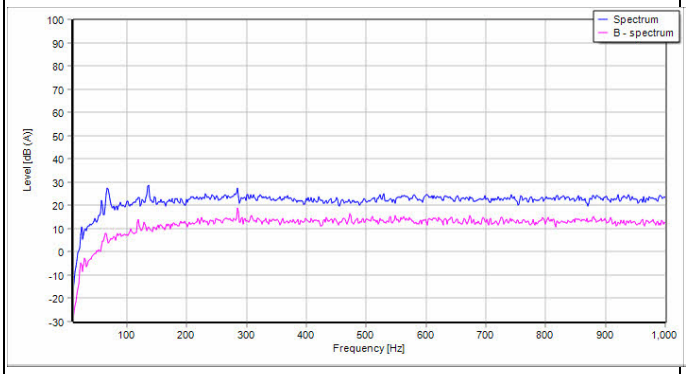
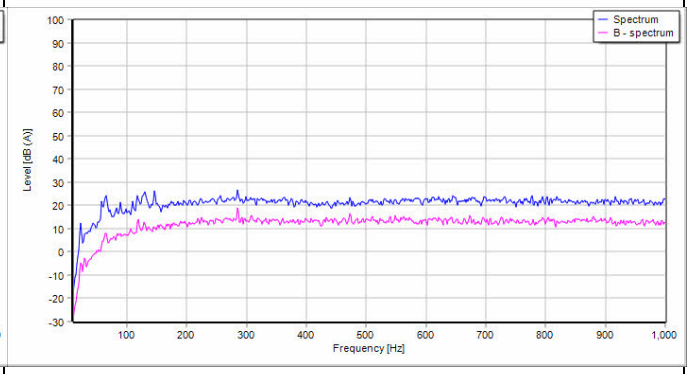
| **BIN 11: Detected tones** |
| --- |
| See below. |

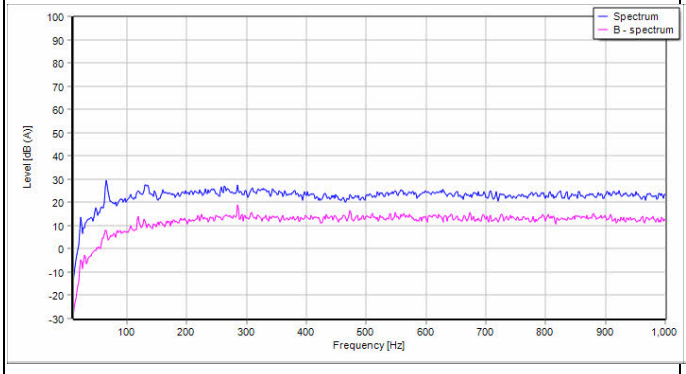
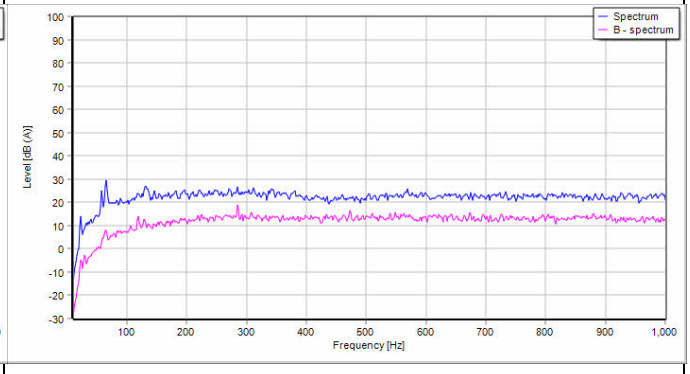
| **BIN 11.5: Detected tones** |
| --- |
| See below. |

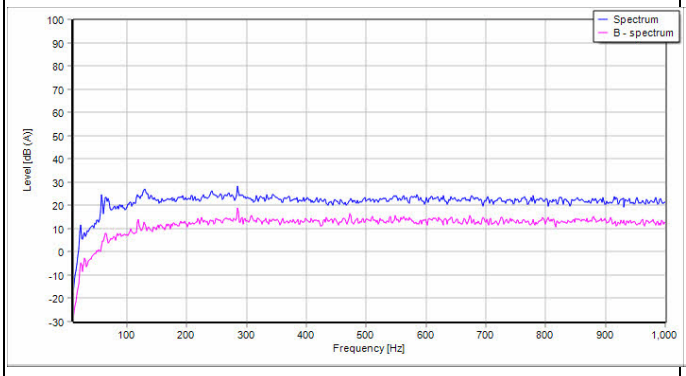
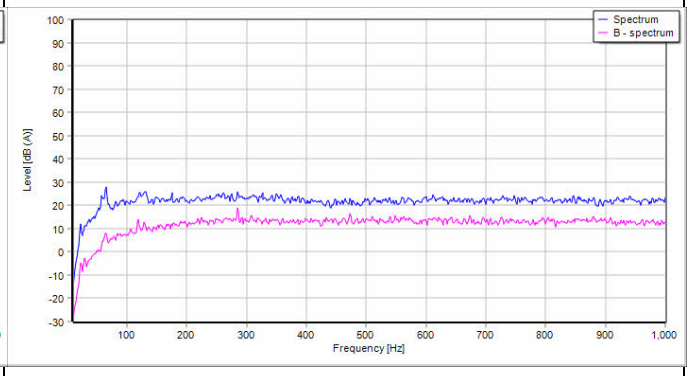
| **BIN 12: Detected tones** |
| --- |
| See below. |

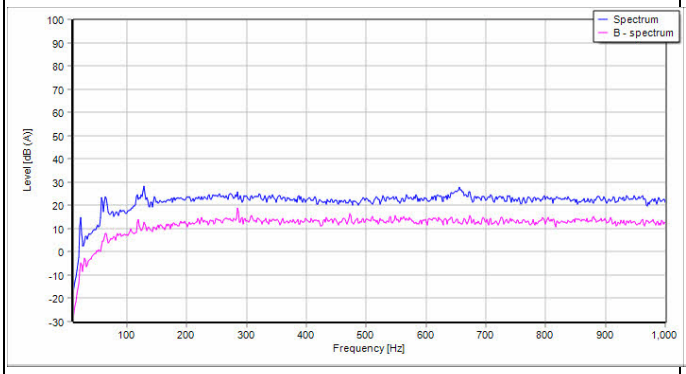
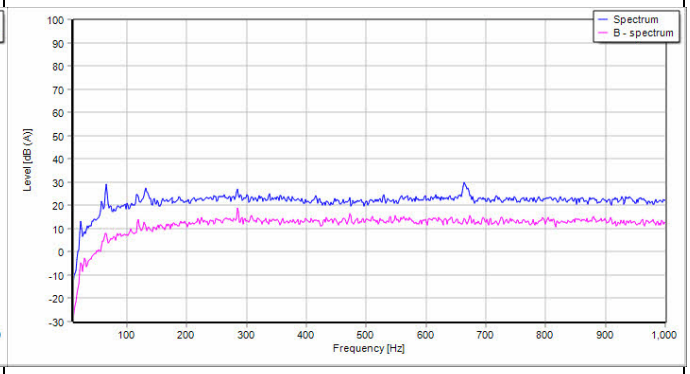
| BIN 10.5: Detected tones | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | delta f | $L_{pn,avg,j,k}$ | $L_{pt,j,k}$ | $L_{pn,j,k}$ | $dL_{tn,j,k}$ | $L_a$ | $dL_{a,j,k}$ |
| | [Hz] | [Hz] | [dB] | [dB] | [dB] | [dB] | [dB] | [dB] |
| $dL_{t1,1,10.5}$: | 67.2 | 1.56 | 18.5 | 30.5 | 34.8 | -4.3 | -2.0 | -2.3 |
| $dL_{t1,2,10.5}$: | 65.6 | 1.56 | 15.6 | 29.6 | 31.9 | -2.3 | -2.0 | -0.3 |
| $dL_{t1,3,10.5}$: | 65.6 | 1.56 | 18.9 | 30.9 | 35.1 | -4.2 | -2.0 | -2.2 |
| $dL_{t1,4,10.5}$: | 65.6 | 1.56 | 18.7 | 31.5 | 34.9 | -3.5 | -2.0 | -1.5 |
| $dL_{t1,6,10.5}$: | 65.6 | 1.56 | 19.8 | 28.6 | 36.1 | -7.5 | -2.0 | -5.5 |
| $dL_{t1,8,10.5}$: | 65.6 | 1.56 | 17.9 | 31.5 | 34.1 | -2.7 | -2.0 | -0.7 |
| $dL_{t1,13,10.5}$: | 68.8 | 1.56 | 20.4 | 31.7 | 36.6 | -4.9 | -2.0 | -2.9 |
| $dL_{t1,14,10.5}$: | 65.6 | 1.56 | 20.1 | 28.9 | 36.3 | -7.4 | -2.0 | -5.4 |
| $dL_{t1,15,10.5}$: | 60.9 | 1.56 | 19.3 | 30.0 | 35.5 | -5.5 | -2.0 | -3.5 |
| $dL_{t1,16,10.5}$: | 65.6 | 1.56 | 18.8 | 25.3 | 35.0 | -9.7 | -2.0 | -7.7 |
| $dL_{t1,17,10.5}$: | 65.6 | 1.56 | 19.0 | 27.7 | 35.3 | -7.5 | -2.0 | -5.5 |
| $dL_{t1,18,10.5}$: | 65.6 | 1.56 | 20.1 | 28.4 | 36.4 | -8.0 | -2.0 | -6.0 |
| $dL_{t1,19,10.5}$: | 65.6 | 1.56 | 18.1 | 30.4 | 34.4 | -3.9 | -2.0 | -1.9 |
| $dL_{t1,20,10.5}$: | 62.5 | 1.56 | 15.6 | 31.8 | 31.8 | 0.0 | -2.0 | 2.0 |
| $dL_{t1,21,10.5}$: | 65.6 | 1.56 | 17.4 | 29.7 | 33.6 | -4.0 | -2.0 | -2.0 |
| $dL_{t1,22,10.5}$: | 65.6 | 1.56 | 16.7 | 31.9 | 33.0 | -1.1 | -2.0 | 0.9 |
| $dL_{t1,23,10.5}$: | 64.1 | 1.56 | 16.8 | 30.6 | 33.0 | -2.4 | -2.0 | -0.4 |
| $dL_{t1,24,10.5}$: | 64.1 | 1.56 | 18.5 | 30.7 | 34.7 | -4.0 | -2.0 | -2.0 |
| $dL_{t1,25,10.5}$: | 64.1 | 1.56 | 17.1 | 29.4 | 33.3 | -3.9 | -2.0 | -1.9 |
| $dL_{t1,26,10.5}$: | 65.6 | 1.56 | 18.9 | 29.3 | 35.1 | -5.8 | -2.0 | -3.8 |
| $dL_{t1,27,10.5}$: | 65.6 | 1.56 | 18.8 | 30.7 | 35.0 | -4.3 | -2.0 | -2.3 |
| $dL_{t1,28,10.5}$: | 65.6 | 1.56 | 18.3 | 31.3 | 34.5 | -3.2 | -2.0 | -1.2 |
| $dL_{t1,29,10.5}$: | 70.3 | 1.56 | 20.1 | 35.5 | 36.4 | -0.9 | -2.0 | 1.1 |
| $dL_{t1,30,10.5}$: | 64.1 | 1.56 | 18.0 | 27.9 | 34.3 | -6.4 | -2.0 | -4.4 |
| $dL_{t2,7,10.5}$: | 117.2 | 1.56 | 15.5 | 30.4 | 31.7 | -1.3 | -2.0 | 0.7 |
| $dL_{t2,11,10.5}$: | 98.4 | 1.56 | 19.3 | 31.4 | 35.5 | -4.1 | -2.0 | -2.1 |
| $dL_{t3,1,10.5}$: | 135.9 | 1.56 | 21.7 | 29.8 | 38.0 | -8.2 | -2.0 | -6.2 |
| $dL_{t3,7,10.5}$: | 117.2 | 1.56 | 15.5 | 30.4 | 31.7 | -1.3 | -2.0 | 0.7 |
| $dL_{t3,23,10.5}$: | 128.1 | 1.56 | 21.6 | 29.9 | 37.9 | -8.0 | -2.0 | -6.0 |
| $dL_{t3,24,10.5}$: | 128.1 | 1.56 | 22.8 | 28.9 | 39.1 | -10.2 | -2.0 | -8.2 |
| $dL_{t3,25,10.5}$: | 129.7 | 1.56 | 21.2 | 29.7 | 37.5 | -7.9 | -2.0 | -5.9 |
| $dL_{t3,30,10.5}$: | 128.1 | 1.56 | 21.9 | 27.9 | 38.2 | -10.2 | -2.0 | -8.2 |
| $dL_{t4,8,10.5}$: | 664.1 | 1.56 | 23.5 | 29.9 | 40.9 | -11.0 | -2.5 | -8.6 |

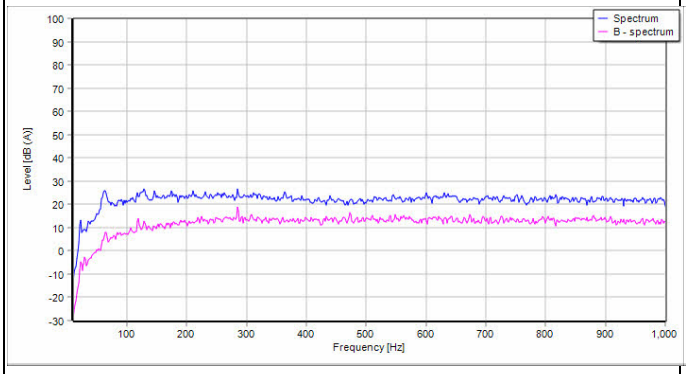
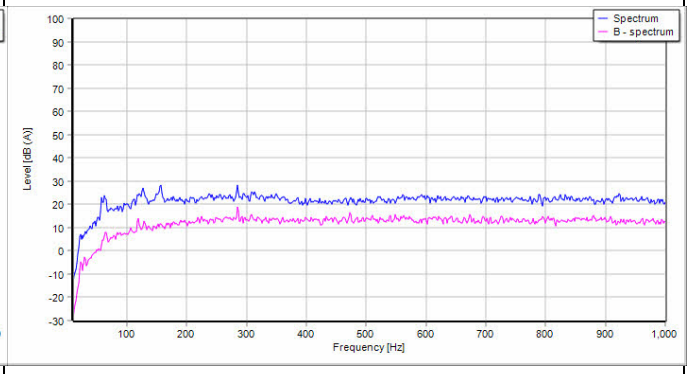
| BIN 10.5: Detected tones - Compact | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spectrum** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | | | | |
| **##** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | | | | |
| **1** | 67.2 | -4.3 | --- | --- | 135.9 | -8.2 | --- | --- | | | | |
| **2** | 65.6 | -2.3 | --- | --- | --- | --- | --- | --- | | | | |
| **3** | 65.6 | -4.2 | --- | --- | --- | --- | --- | --- | | | | |
| **4** | 65.6 | -3.5 | --- | --- | --- | --- | --- | --- | | | | |
| **5** | --- | --- | --- | --- | --- | --- | --- | --- | | | | |
| **6** | 65.6 | -7.5 | --- | --- | --- | --- | --- | --- | | | | |
| **7** | --- | --- | 117.2 | -1.3 | 117.2 | -1.3 | --- | --- | | | | |
| **8** | 65.6 | -2.7 | --- | --- | --- | --- | 664.1 | -11.0 | | | | |
| **9** | --- | --- | --- | --- | --- | --- | --- | --- | | | | |
| **10** | --- | --- | --- | --- | --- | --- | --- | --- | | | | |
| **11** | --- | --- | 98.4 | -4.1 | --- | --- | --- | --- | | | | |
| **12** | --- | --- | --- | --- | --- | --- | --- | --- | | | | |
| **13** | 68.8 | -4.9 | --- | --- | --- | --- | --- | --- | | | | |
| **14** | 65.6 | -7.4 | --- | --- | --- | --- | --- | --- | | | | |
| **15** | 60.9 | -5.5 | --- | --- | --- | --- | --- | --- | | | | |
| **16** | 65.6 | -9.7 | --- | --- | --- | --- | --- | --- | | | | |
| **17** | 65.6 | -7.5 | --- | --- | --- | --- | --- | --- | | | | |
| **18** | 65.6 | -8.0 | --- | --- | --- | --- | --- | --- | | | | |
| **19** | 65.6 | -3.9 | --- | --- | --- | --- | --- | --- | | | | |
| **20** | 62.5 | 0.0 | --- | --- | --- | --- | --- | --- | | | | |
| **21** | 65.6 | -4.0 | --- | --- | --- | --- | --- | --- | | | | |
| **22** | 65.6 | -1.1 | --- | --- | --- | --- | --- | --- | | | | |
| **23** | 64.1 | -2.4 | --- | --- | 128.1 | -8.0 | --- | --- | | | | |
| **24** | 64.1 | -4.0 | --- | --- | 128.1 | -10.2 | --- | --- | | | | |
| **25** | 64.1 | -3.9 | --- | --- | 129.7 | -7.9 | --- | --- | | | | |
| **26** | 65.6 | -5.8 | --- | --- | --- | --- | --- | --- | | | | |
| **27** | 65.6 | -4.3 | --- | --- | --- | --- | --- | --- | | | | |
| **28** | 65.6 | -3.2 | --- | --- | --- | --- | --- | --- | | | | |
| **29** | 70.3 | -0.9 | --- | --- | --- | --- | --- | --- | | | | |
| **30** | 64.1 | -6.4 | --- | --- | 128.1 | -10.2 | --- | --- | | | | |
| **$f_t$[Hz] \| $dL_k$[dB]** | 65.8 | -4.8 | 99.1 | -12.3 | 134.3 | -11.8 | 664.1 | -17.0 | | | | |
| **$L_a$[dB]** | | -2.0 | | -2.0 | | -2.0 | | -2.5 | | | | |
| **$dL_{a,k}$[dB]** | | -2.8 | | -10.3 | | -9.8 | | -14.5 | | | | |

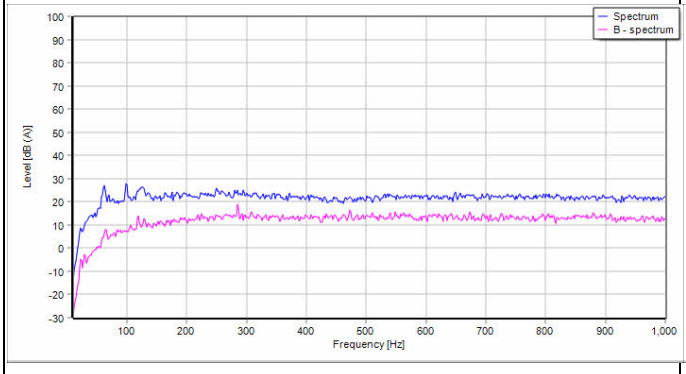
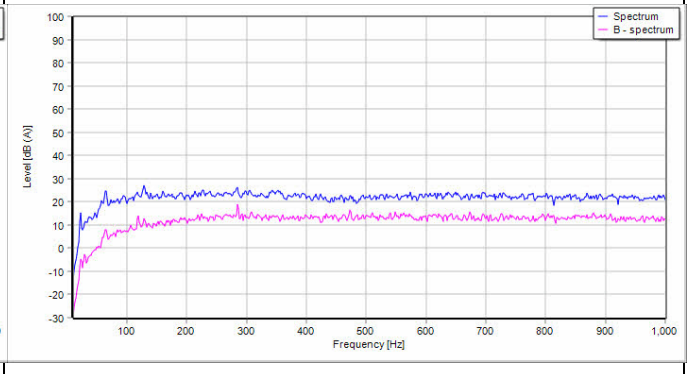
| BIN 10.5: Narrow band spectrum #1 | BIN 10.5: Narrow band spectrum #2 |
|---|---|
|  |  |

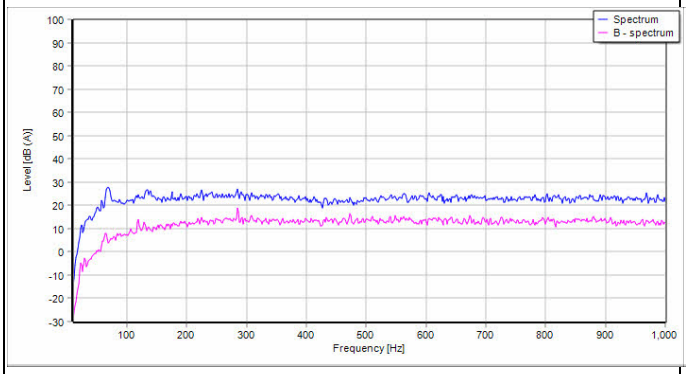
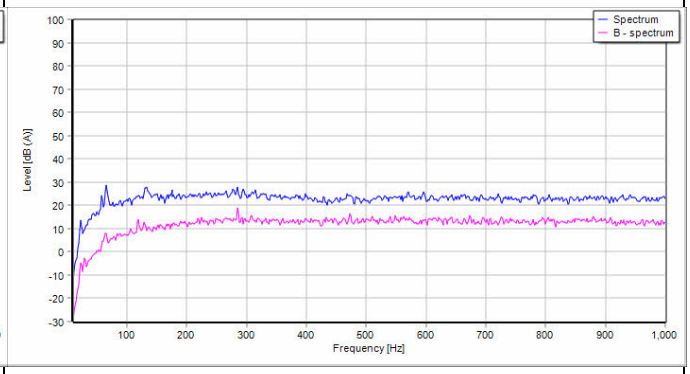
| BIN 10.5: Narrow band spectrum #3 | BIN 10.5: Narrow band spectrum #4 |
|---|---|
|  |  |

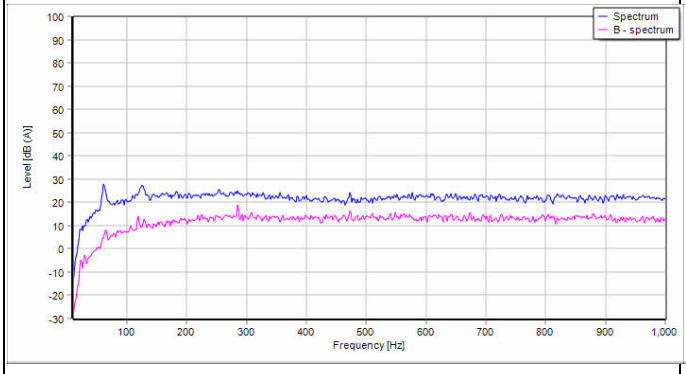
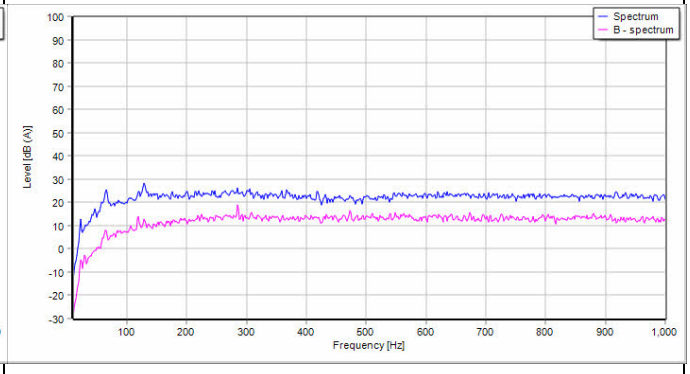
| BIN 10.5: Narrow band spectrum #5 | BIN 10.5: Narrow band spectrum #6 |
|---|---|
|  |  |

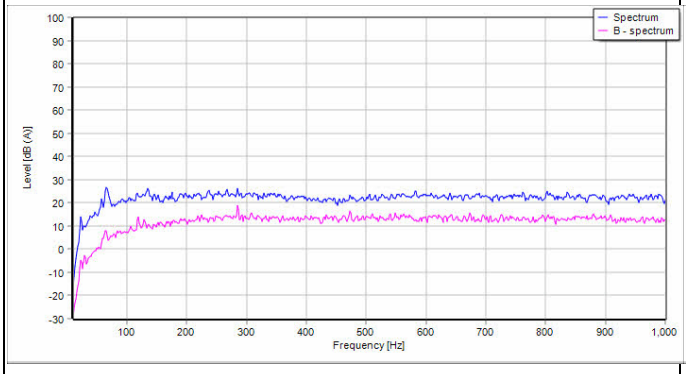
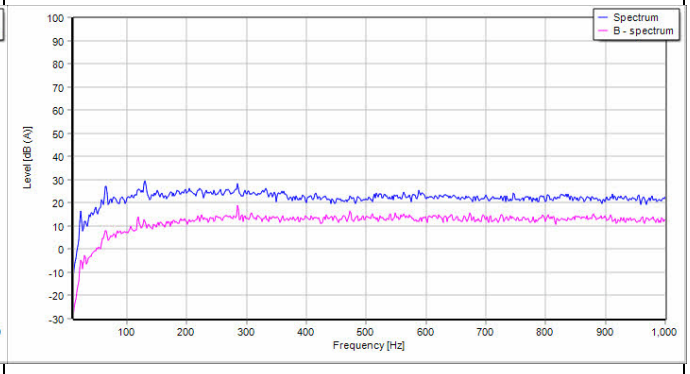
| BIN 10.5: Narrow band spectrum #7 | BIN 10.5: Narrow band spectrum #8 |
|---|---|
|  |  |

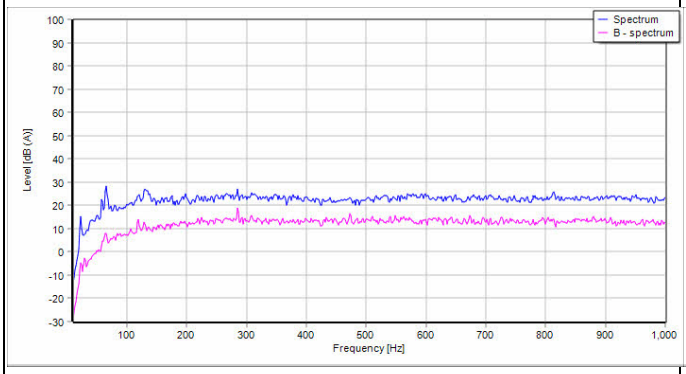
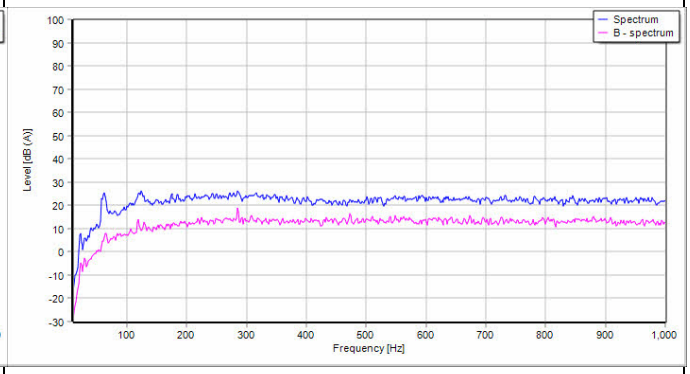
| BIN 10.5: Narrow band spectrum #9 | BIN 10.5: Narrow band spectrum #10 |
|---|---|
|  |  |

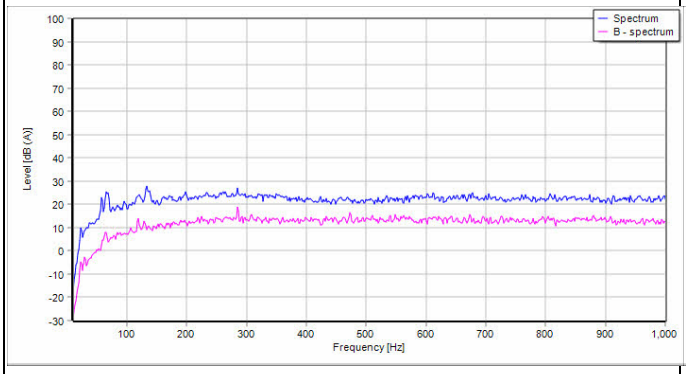
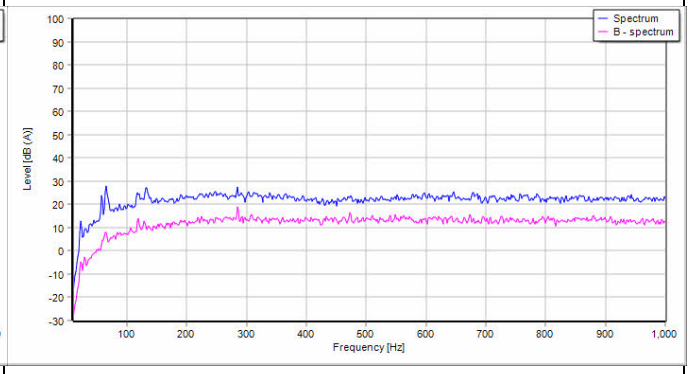
| BIN 10.5: Narrow band spectrum #11 | BIN 10.5: Narrow band spectrum #12 |
|---|---|
|  |  |

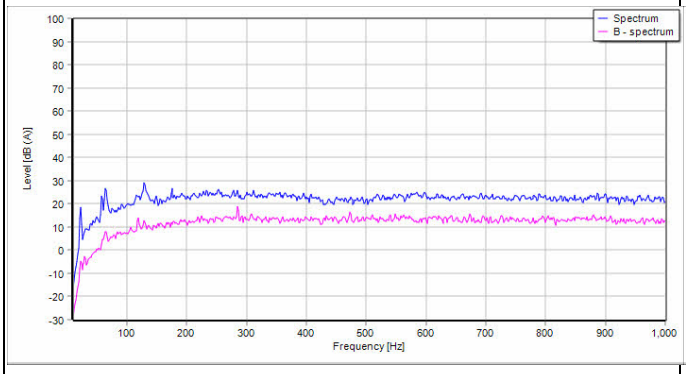
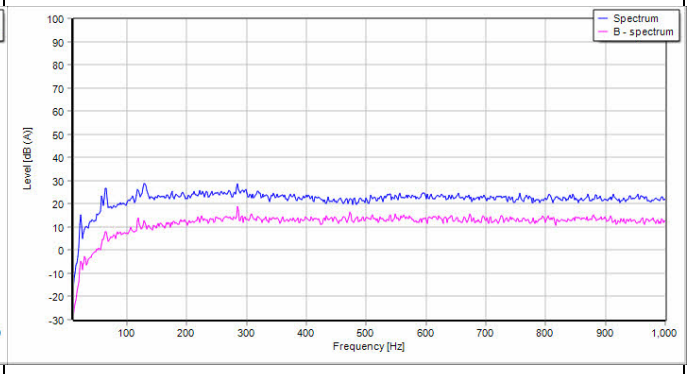
| BIN 10.5: Narrow band spectrum #13 | BIN 10.5: Narrow band spectrum #14 |
|---|---|
|  |  |

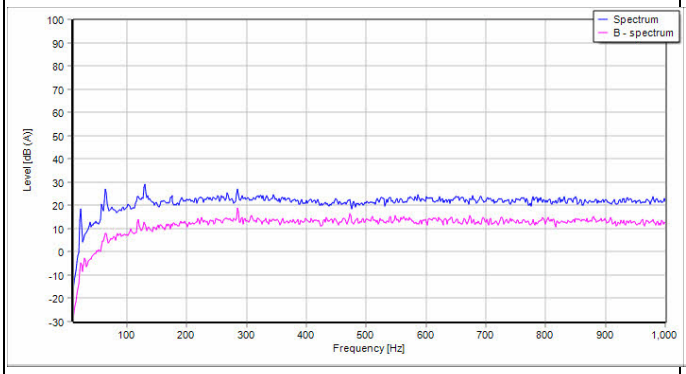
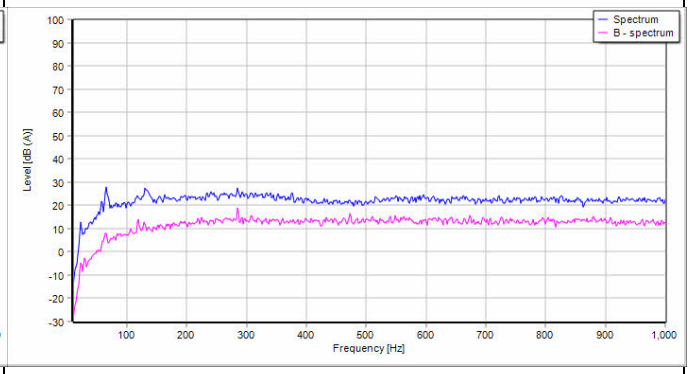
| BIN 10.5: Narrow band spectrum #15 | BIN 10.5: Narrow band spectrum #16 |
|---|---|
|  |  |

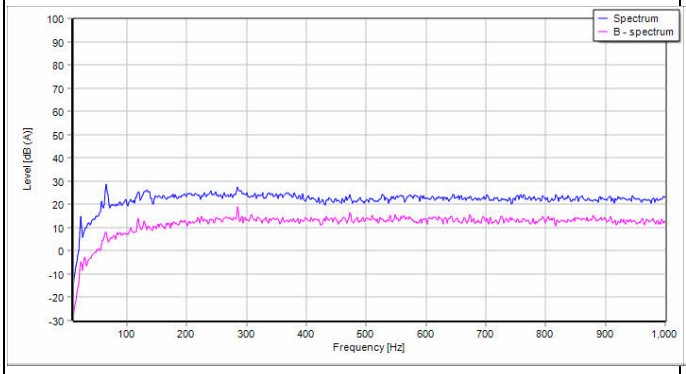
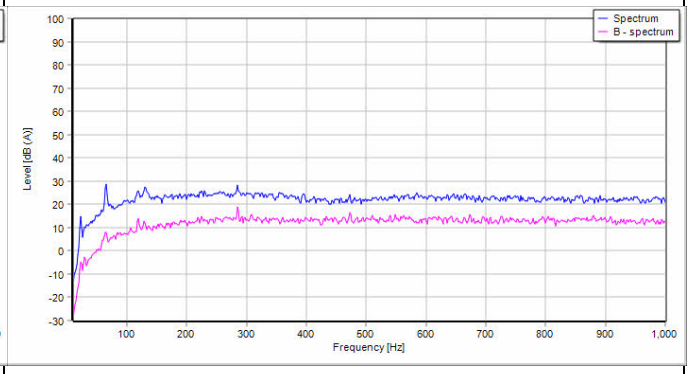
| BIN 10.5: Narrow band spectrum #17 | BIN 10.5: Narrow band spectrum #18 |
|---|---|
|  |  |

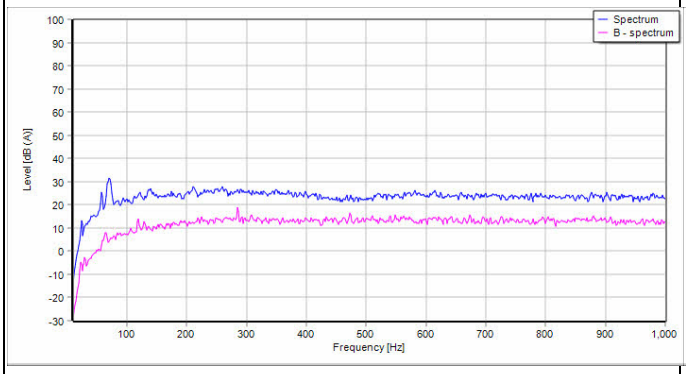
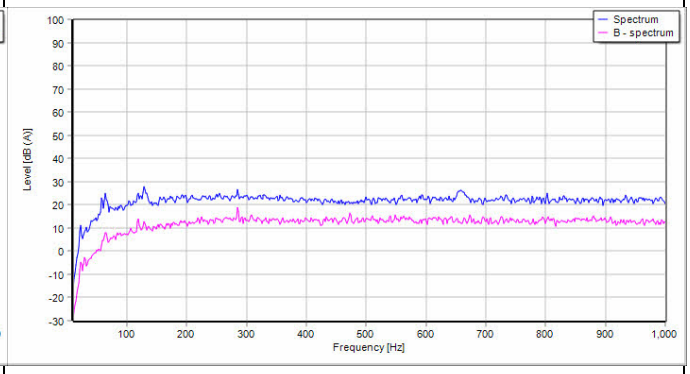
| BIN 10.5: Narrow band spectrum #19 | BIN 10.5: Narrow band spectrum #20 |
|---|---|
|  |  |

| BIN 10.5: Narrow band spectrum #21 | BIN 10.5: Narrow band spectrum #22 |
|---|---|
|  |  |

| BIN 10.5: Narrow band spectrum #23 | BIN 10.5: Narrow band spectrum #24 |
|---|---|
|  |  |

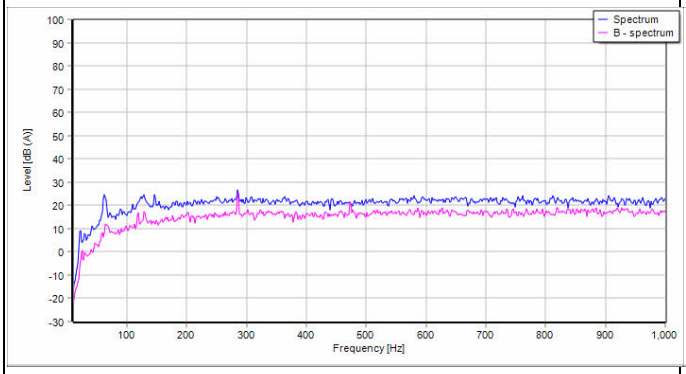
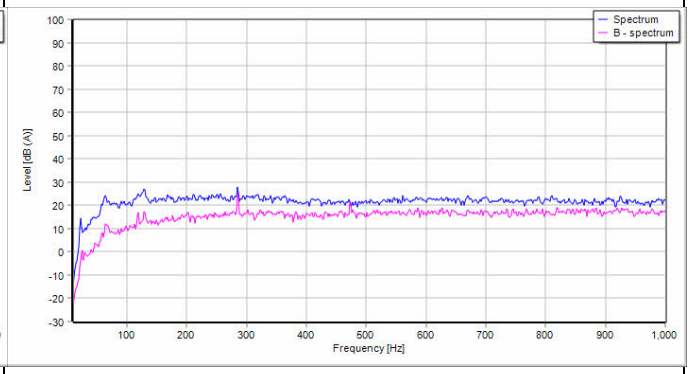
| BIN 10.5: Narrow band spectrum #25 | BIN 10.5: Narrow band spectrum #26 |
|---|---|
|  |  |

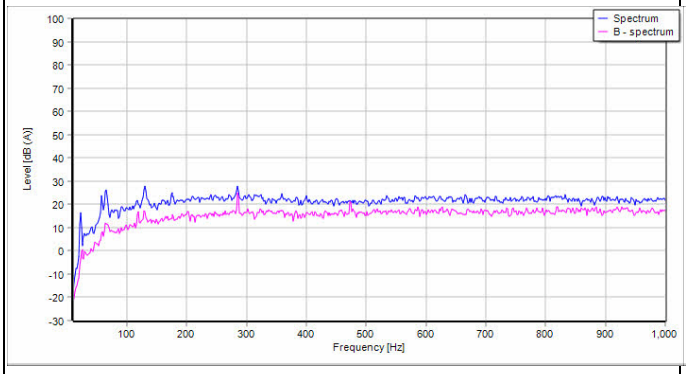
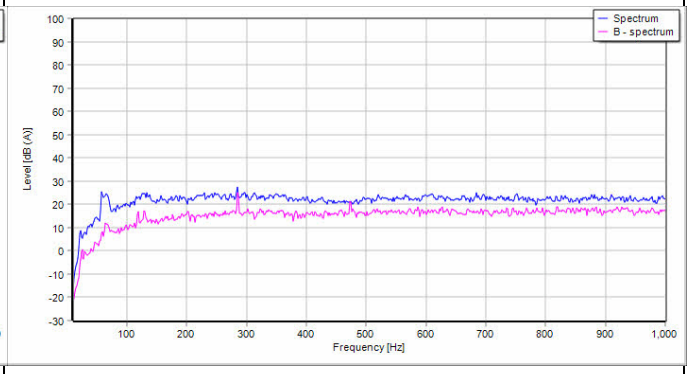
| BIN 10.5: Narrow band spectrum #27 | BIN 10.5: Narrow band spectrum #28 |
|---|---|
|  |  |

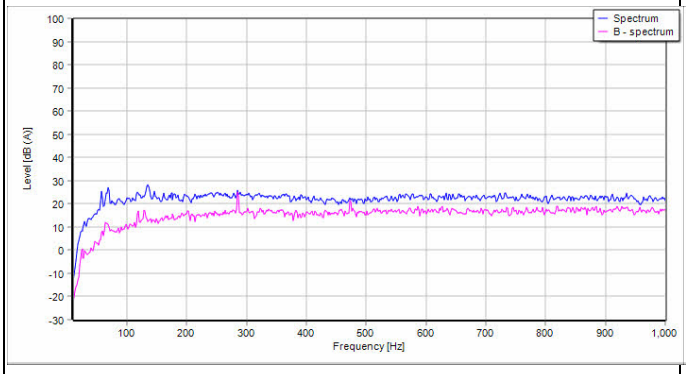
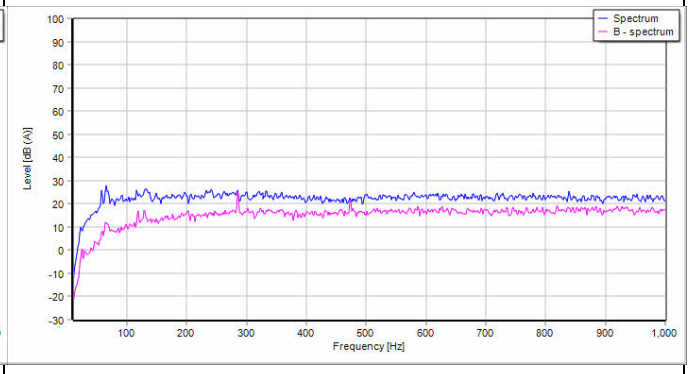
| BIN 10.5: Narrow band spectrum #29 | BIN 10.5: Narrow band spectrum #30 |
|---|---|
|  |  |

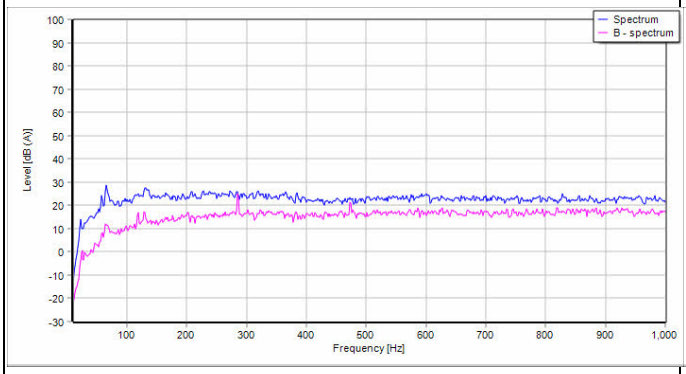
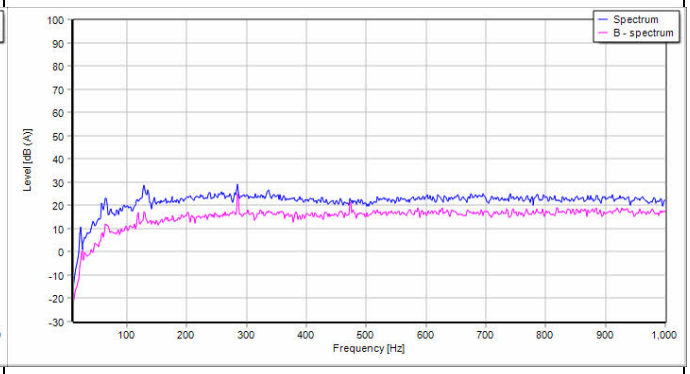
| BIN 11: Detected tones | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | delta f | $L_{pn,avg,j,k}$ | $L_{pt,j,k}$ | $L_{pn,j,k}$ | $dL_{tn,j,k}$ | $L_a$ | $dL_{a,j,k}$ |
| | [Hz] | [Hz] | [dB] | [dB] | [dB] | [dB] | [dB] | [dB] |
| $dL_{t1,1,11}$: | 62.5 | 1.56 | 14.9 | 28.8 | 31.1 | -2.3 | -2.0 | -0.3 |
| $dL_{t1,3,11}$: | 65.6 | 1.56 | 16.2 | 29.1 | 32.4 | -3.3 | -2.0 | -1.3 |
| $dL_{t1,4,11}$: | 57.8 | 1.56 | 17.5 | 30.3 | 33.7 | -3.4 | -2.0 | -1.4 |
| $dL_{t1,5,11}$: | 68.8 | 1.56 | 19.4 | 27.8 | 35.7 | -7.9 | -2.0 | -5.9 |
| $dL_{t1,6,11}$: | 65.6 | 1.56 | 20.3 | 28.0 | 36.5 | -8.5 | -2.0 | -6.5 |
| $dL_{t1,7,11}$: | 65.6 | 1.56 | 20.4 | 29.1 | 36.7 | -7.6 | -2.0 | -5.6 |
| $dL_{t1,9,11}$: | 65.6 | 1.56 | 16.8 | 31.3 | 33.1 | -1.8 | -2.0 | 0.2 |
| $dL_{t1,10,11}$: | 65.6 | 1.56 | 17.7 | 26.5 | 33.9 | -7.4 | -2.0 | -5.4 |
| $dL_{t1,11,11}$: | 65.6 | 1.56 | 18.3 | 30.4 | 34.6 | -4.2 | -2.0 | -2.2 |
| $dL_{t1,13,11}$: | 60.9 | 1.56 | 17.5 | 30.9 | 33.7 | -2.8 | -2.0 | -0.8 |
| $dL_{t1,14,11}$: | 70.3 | 1.56 | 20.9 | 34.4 | 37.2 | -2.8 | -2.0 | -0.8 |
| $dL_{t1,15,11}$: | 65.6 | 1.56 | 18.0 | 31.2 | 34.2 | -3.0 | -2.0 | -1.0 |
| $dL_{t1,16,11}$: | 65.6 | 1.56 | 17.3 | 31.0 | 33.6 | -2.6 | -2.0 | -0.6 |
| $dL_{t1,17,11}$: | 65.6 | 1.56 | 15.5 | 30.5 | 31.7 | -1.2 | -2.0 | 0.8 |
| $dL_{t1,18,11}$: | 65.6 | 1.56 | 21.4 | 29.2 | 37.7 | -8.5 | -2.0 | -6.5 |
| $dL_{t1,19,11}$: | 65.6 | 1.56 | 18.0 | 28.6 | 34.2 | -5.6 | -2.0 | -3.6 |
| $dL_{t1,20,11}$: | 62.5 | 1.56 | 16.0 | 31.5 | 32.2 | -0.7 | -2.0 | 1.3 |
| $dL_{t1,21,11}$: | 64.1 | 1.56 | 15.8 | 28.3 | 32.0 | -3.7 | -2.0 | -1.7 |
| $dL_{t1,22,11}$: | 65.6 | 1.56 | 18.9 | 30.8 | 35.1 | -4.3 | -2.0 | -2.3 |
| $dL_{t1,24,11}$: | 67.2 | 1.56 | 20.1 | 30.6 | 36.3 | -5.7 | -2.0 | -3.7 |
| $dL_{t1,25,11}$: | 64.1 | 1.56 | 15.4 | 27.5 | 31.6 | -4.1 | -2.0 | -2.1 |
| $dL_{t1,26,11}$: | 62.5 | 1.56 | 15.3 | 26.6 | 31.6 | -5.0 | -2.0 | -2.9 |
| $dL_{t1,27,11}$: | 68.8 | 1.56 | 19.0 | 32.6 | 35.2 | -2.6 | -2.0 | -0.6 |
| $dL_{t1,28,11}$: | 64.1 | 1.56 | 15.6 | 29.8 | 31.9 | -2.1 | -2.0 | -0.1 |
| $dL_{t1,29,11}$: | 65.6 | 1.56 | 18.6 | 28.7 | 34.8 | -6.1 | -2.0 | -4.1 |
| $dL_{t1,30,11}$: | 64.1 | 1.56 | 21.4 | 27.7 | 37.6 | -9.9 | -2.0 | -7.9 |
| $dL_{t2,3,11}$: | 129.7 | 1.56 | 20.2 | 27.8 | 36.5 | -8.7 | -2.0 | -6.7 |
| $dL_{t2,8,11}$: | 128.1 | 1.56 | 21.1 | 29.2 | 37.4 | -8.2 | -2.0 | -6.2 |
| $dL_{t2,15,11}$: | 131.3 | 1.56 | 22.4 | 31.1 | 38.7 | -7.6 | -2.0 | -5.6 |
| $dL_{t2,16,11}$: | 131.3 | 1.56 | 21.9 | 29.9 | 38.2 | -8.3 | -2.0 | -6.3 |
| $dL_{t2,17,11}$: | 129.7 | 1.56 | 20.5 | 31.1 | 36.8 | -5.7 | -2.0 | -3.7 |
| $dL_{t2,23,11}$: | 126.6 | 1.56 | 22.2 | 29.7 | 38.5 | -8.8 | -2.0 | -6.8 |
| $dL_{t2,25,11}$: | 128.1 | 1.56 | 19.7 | 28.2 | 36.0 | -7.8 | -2.0 | -5.8 |
| $dL_{t2,28,11}$: | 128.1 | 1.56 | 19.3 | 30.6 | 35.6 | -5.0 | -2.0 | -3.0 |
| $dL_{t3,25,11}$: | 470.3 | 1.56 | 21.6 | 29.4 | 38.4 | -9.0 | -2.3 | -6.7 |

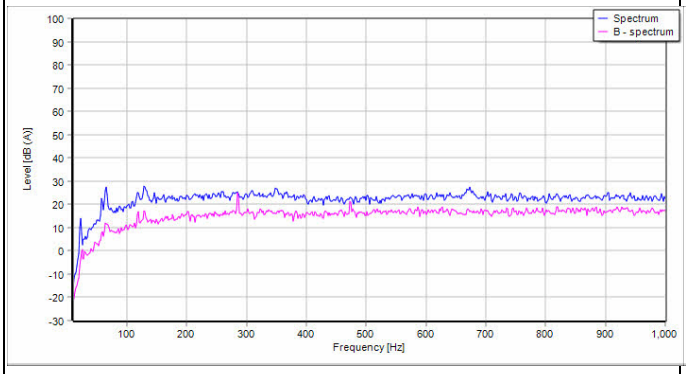
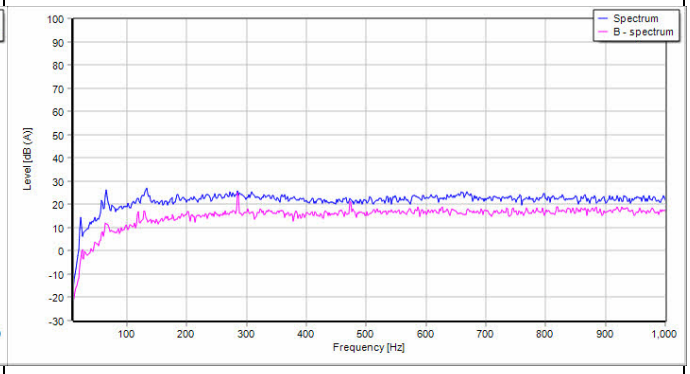
| BIN 11: Detected tones - Compact | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spectrum** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | | | | | | |
| **##** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | | | | | | |
| **1** | 62.5 | -2.3 | --- | --- | --- | --- | | | | | | |
| **2** | --- | --- | --- | --- | --- | --- | | | | | | |
| **3** | 65.6 | -3.3 | 129.7 | -8.7 | --- | --- | | | | | | |
| **4** | 57.8 | -3.4 | --- | --- | --- | --- | | | | | | |
| **5** | 68.8 | -7.9 | --- | --- | --- | --- | | | | | | |
| **6** | 65.6 | -8.5 | --- | --- | --- | --- | | | | | | |
| **7** | 65.6 | -7.6 | --- | --- | --- | --- | | | | | | |
| **8** | --- | --- | 128.1 | -8.2 | --- | --- | | | | | | |
| **9** | 65.6 | -1.8 | --- | --- | --- | --- | | | | | | |
| **10** | 65.6 | -7.4 | --- | --- | --- | --- | | | | | | |
| **11** | 65.6 | -4.2 | --- | --- | --- | --- | | | | | | |
| **12** | --- | --- | --- | --- | --- | --- | | | | | | |
| **13** | 60.9 | -2.8 | --- | --- | --- | --- | | | | | | |
| **14** | 70.3 | -2.8 | --- | --- | --- | --- | | | | | | |
| **15** | 65.6 | -3.0 | 131.3 | -7.6 | --- | --- | | | | | | |
| **16** | 65.6 | -2.6 | 131.3 | -8.3 | --- | --- | | | | | | |
| **17** | 65.6 | -1.2 | 129.7 | -5.7 | --- | --- | | | | | | |
| **18** | 65.6 | -8.5 | --- | --- | --- | --- | | | | | | |
| **19** | 65.6 | -5.6 | --- | --- | --- | --- | | | | | | |
| **20** | 62.5 | -0.7 | --- | --- | --- | --- | | | | | | |
| **21** | 64.1 | -3.7 | --- | --- | --- | --- | | | | | | |
| **22** | 65.6 | -4.3 | --- | --- | --- | --- | | | | | | |
| **23** | --- | --- | 126.6 | -8.8 | --- | --- | | | | | | |
| **24** | 67.2 | -5.7 | --- | --- | --- | --- | | | | | | |
| **25** | 64.1 | -4.1 | 128.1 | -7.8 | 470.3 | -9.0 | | | | | | |
| **26** | 62.5 | -5.0 | --- | --- | --- | --- | | | | | | |
| **27** | 68.8 | -2.6 | --- | --- | --- | --- | | | | | | |
| **28** | 64.1 | -2.1 | 128.1 | -5.0 | --- | --- | | | | | | |
| **29** | 65.6 | -6.1 | --- | --- | --- | --- | | | | | | |
| **30** | 64.1 | -9.9 | --- | --- | --- | --- | | | | | | |
| **$f_t$[Hz] \| $dL_k$[dB]** | 64.7 | -4.5 | 129.5 | -11.8 | 470.3 | -16.2 | | | | | | |
| **$L_a$[dB]** | | -2.0 | | -2.0 | | -2.3 | | | | | | |
| **$dL_{a,k}$[dB]** | | -2.5 | | -9.8 | | -14.0 | | | | | | |

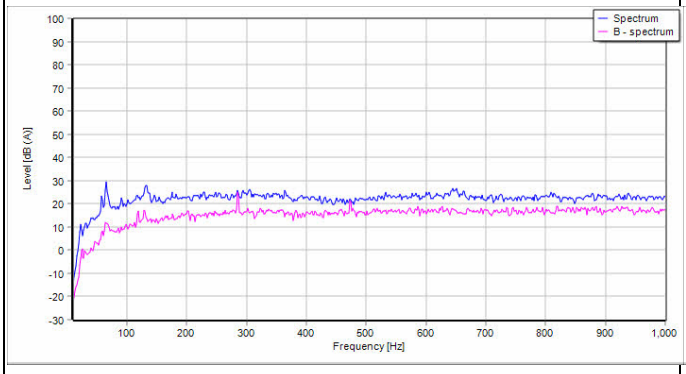
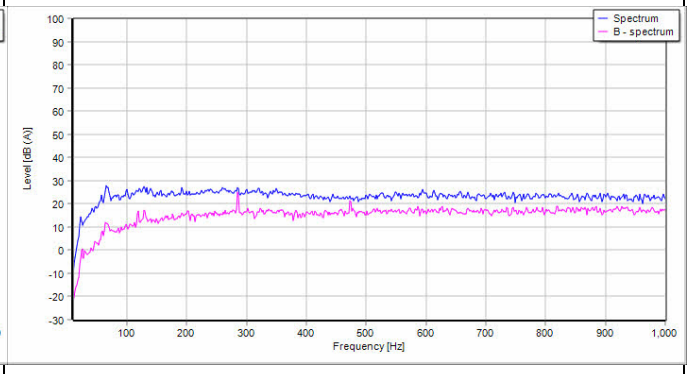
| BIN 11: Narrow band spectrum #1 | BIN 11: Narrow band spectrum #2 |
|---|---|
|  |  |

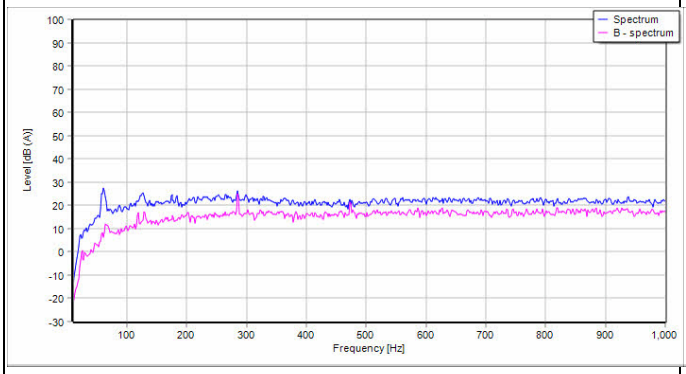
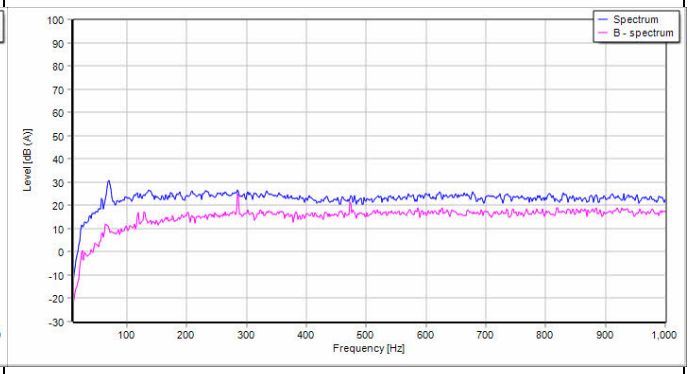
| BIN 11: Narrow band spectrum #3 | BIN 11: Narrow band spectrum #4 |
|---|---|
|  |  |

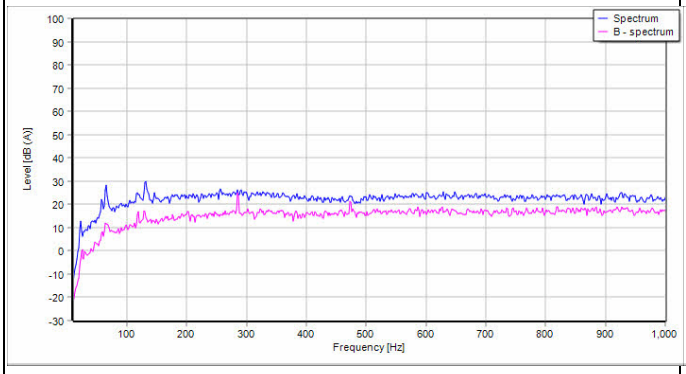
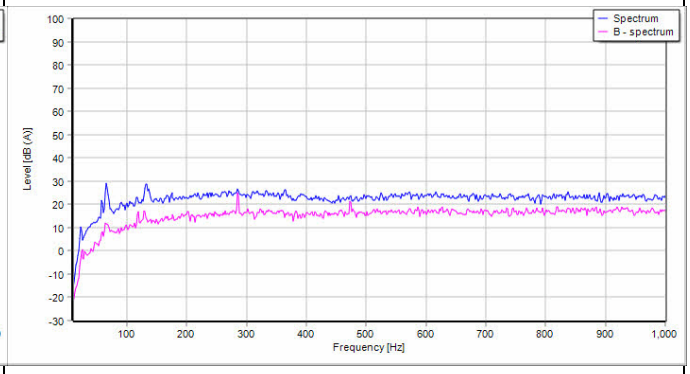
| BIN 11: Narrow band spectrum #5 | BIN 11: Narrow band spectrum #6 |
|---|---|
|  |  |

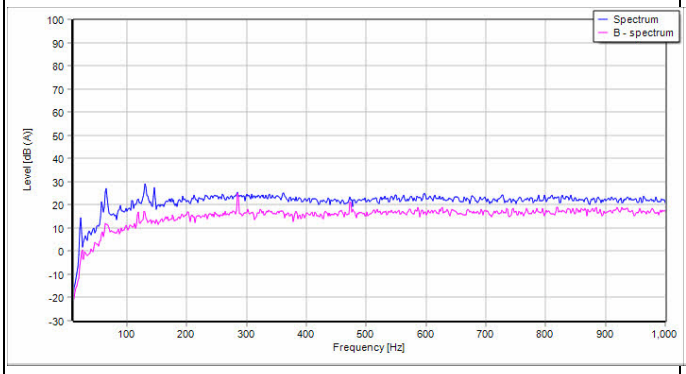
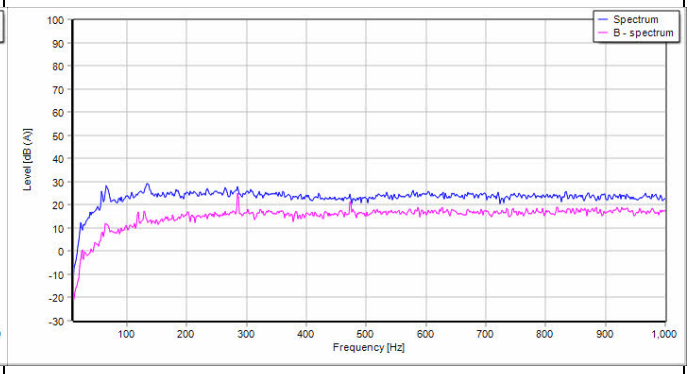
| BIN 11: Narrow band spectrum #7 | BIN 11: Narrow band spectrum #8 |
|---|---|
|  |  |

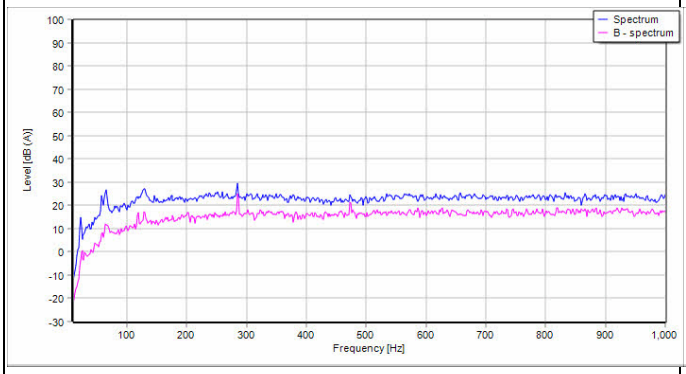
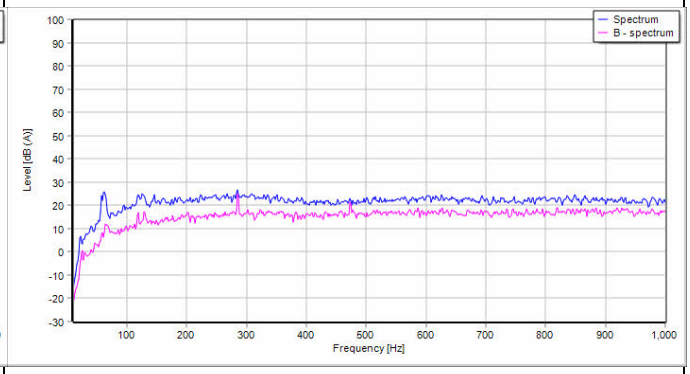
| BIN 11: Narrow band spectrum #9 | BIN 11: Narrow band spectrum #10 |
|---|---|
|  |  |

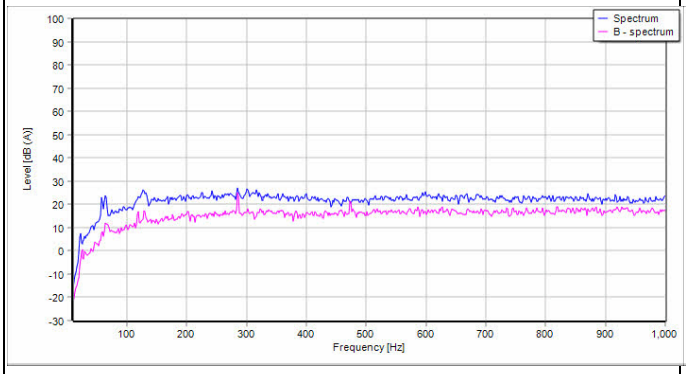
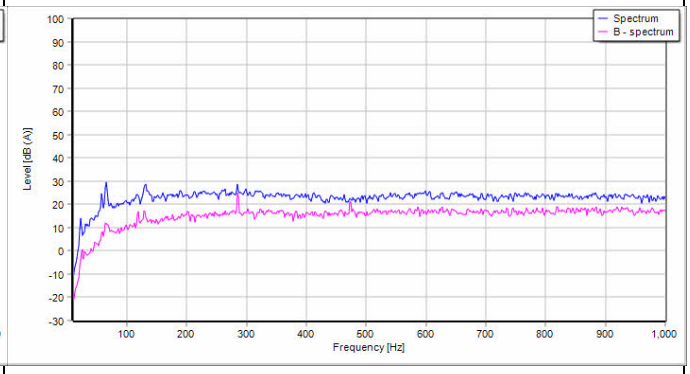
| BIN 11: Narrow band spectrum #11 | BIN 11: Narrow band spectrum #12 |
|---|---|
|  |  |

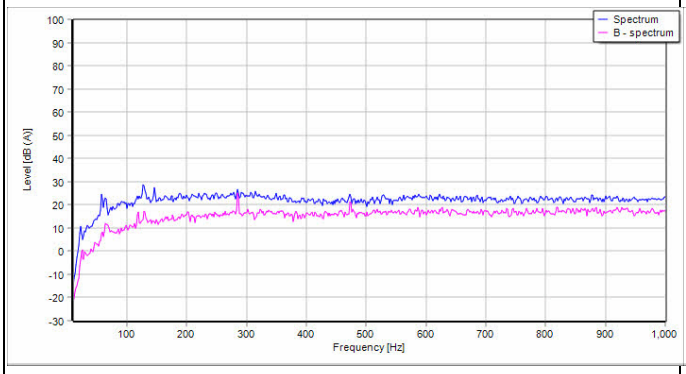
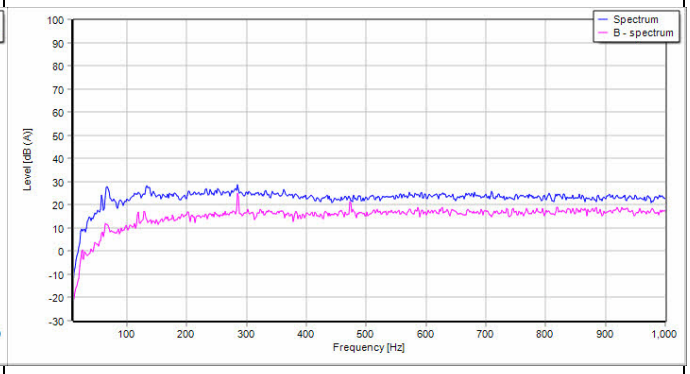
| BIN 11: Narrow band spectrum #13 | BIN 11: Narrow band spectrum #14 |
|---|---|
|  |  |

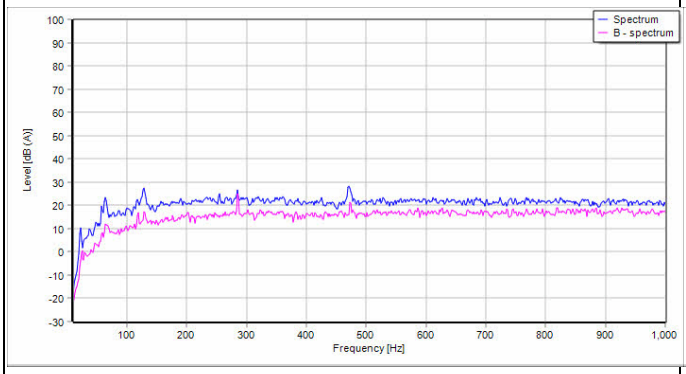
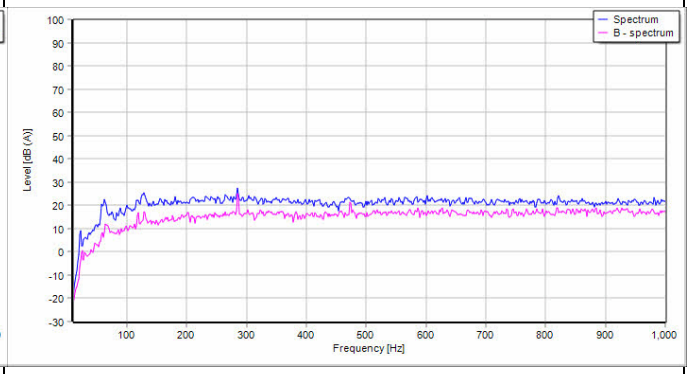
| BIN 11: Narrow band spectrum #15 | BIN 11: Narrow band spectrum #16 |
|---|---|
|  |  |

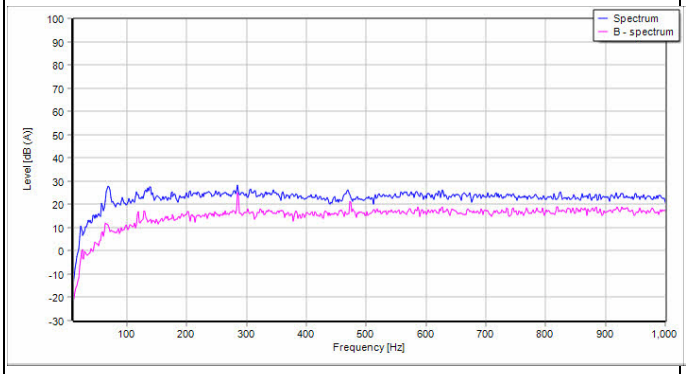
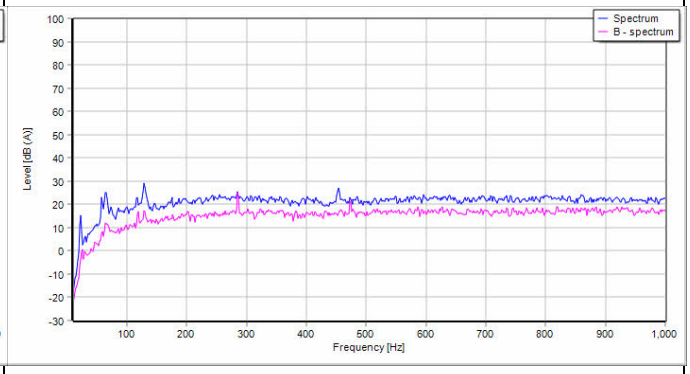
| BIN 11: Narrow band spectrum #17 | BIN 11: Narrow band spectrum #18 |
|---|---|
|  |  |

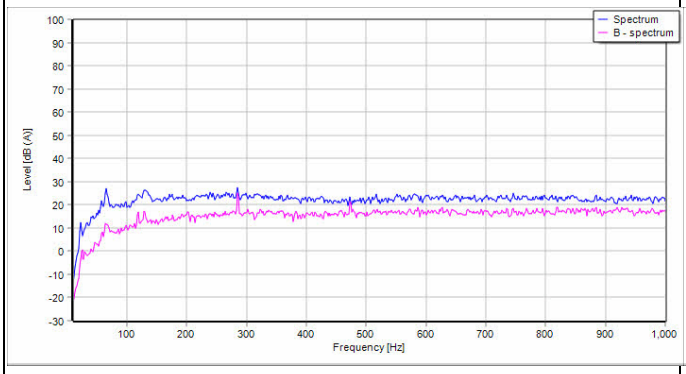
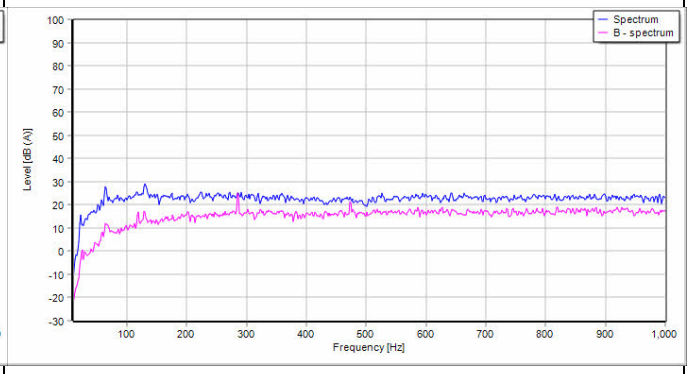
| BIN 11: Narrow band spectrum #19 | BIN 11: Narrow band spectrum #20 |
|---|---|
|  |  |

| BIN 11: Narrow band spectrum #21 | BIN 11: Narrow band spectrum #22 |
|---|---|
|  |  |

| BIN 11: Narrow band spectrum #23 | BIN 11: Narrow band spectrum #24 |
|---|---|
|  |  |

| BIN 11: Narrow band spectrum #25 | BIN 11: Narrow band spectrum #26 |
|---|---|
|  |  |

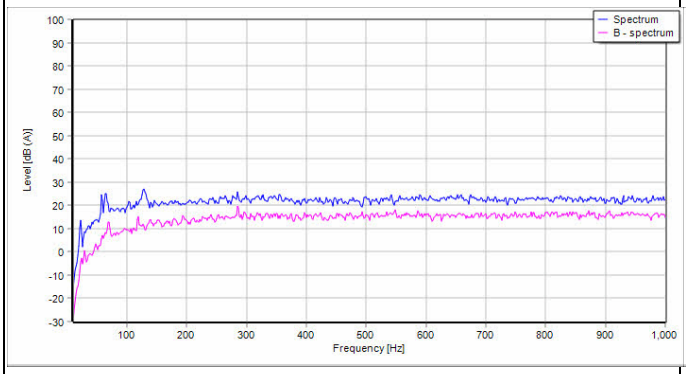
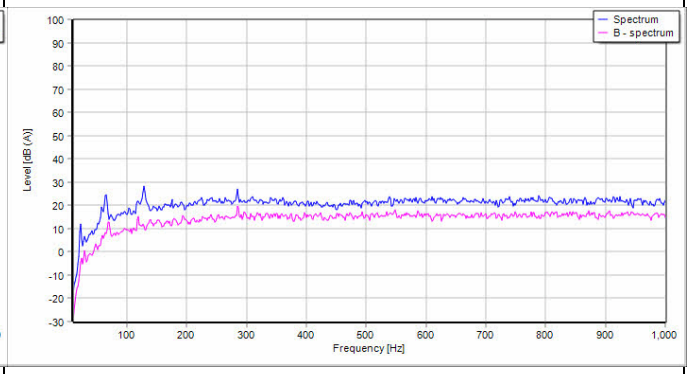
| BIN 11: Narrow band spectrum #27 | BIN 11: Narrow band spectrum #28 |
|---|---|
|  |  |

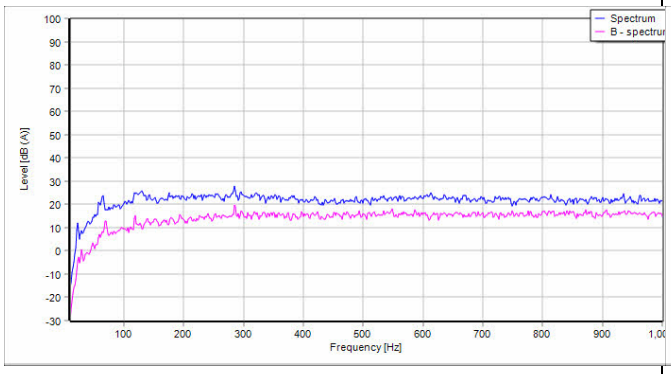
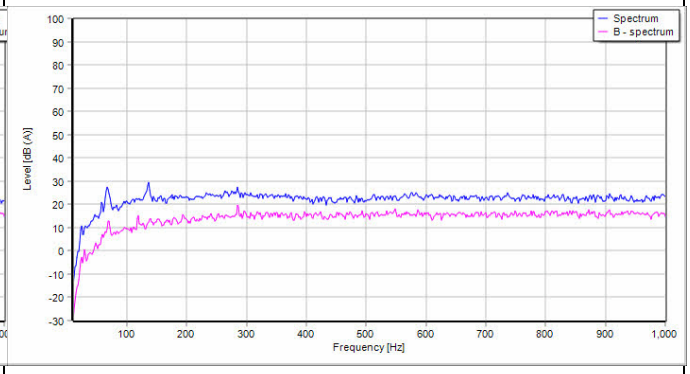
| BIN 11: Narrow band spectrum #29 | BIN 11: Narrow band spectrum #30 |
|---|---|
|  |  |

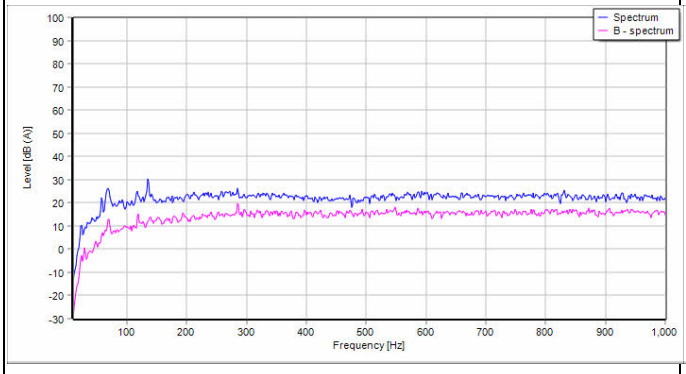
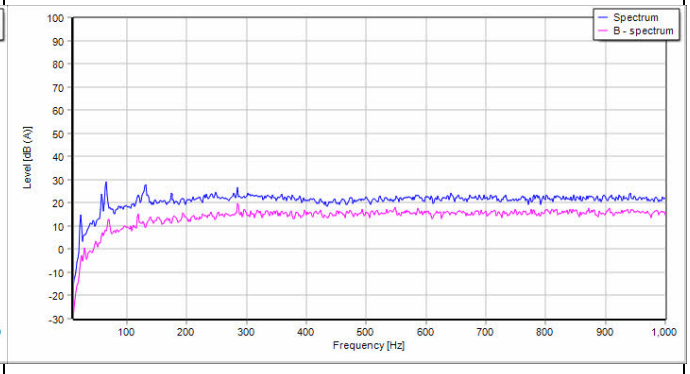
| BIN 11.5: Detected tones | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | delta f | $L_{pn,avg,j,k}$ | $L_{pt,j,k}$ | $L_{pn,j,k}$ | $dL_{tn,j,k}$ | $L_a$ | $dL_{a,j,k}$ |
| | [Hz] | [Hz] | [dB] | [dB] | [dB] | [dB] | [dB] | [dB] |
| $dL_{t1,1,11.5}$: | 65.6 | 1.56 | 17.5 | 27.9 | 33.7 | -5.8 | -2.0 | -3.8 |
| $dL_{t1,2,11.5}$: | 65.6 | 1.56 | 14.6 | 28.2 | 30.8 | -2.6 | -2.0 | -0.6 |
| $dL_{t1,4,11.5}$: | 67.2 | 1.56 | 18.5 | 30.6 | 34.8 | -4.2 | -2.0 | -2.2 |
| $dL_{t1,5,11.5}$: | 68.8 | 1.56 | 17.8 | 31.3 | 34.1 | -2.7 | -2.0 | -0.7 |
| $dL_{t1,6,11.5}$: | 65.6 | 1.56 | 16.5 | 31.6 | 32.8 | -1.2 | -2.0 | 0.8 |
| $dL_{t1,7,11.5}$: | 64.1 | 1.56 | 14.9 | 28.6 | 31.1 | -2.5 | -2.0 | -0.5 |
| $dL_{t1,8,11.5}$: | 65.6 | 1.56 | 17.0 | 30.2 | 33.2 | -3.0 | -2.0 | -1.0 |
| $dL_{t1,9,11.5}$: | 57.8 | 1.56 | 16.3 | 26.3 | 32.5 | -6.2 | -2.0 | -4.2 |
| $dL_{t1,11,11.5}$: | 65.6 | 1.56 | 18.9 | 27.8 | 35.1 | -7.2 | -2.0 | -5.2 |
| $dL_{t1,12,11.5}$: | 65.6 | 1.56 | 19.7 | 29.7 | 35.9 | -6.2 | -2.0 | -4.2 |
| $dL_{t1,14,11.5}$: | 65.6 | 1.56 | 18.5 | 27.6 | 34.7 | -7.1 | -2.0 | -5.1 |
| $dL_{t1,15,11.5}$: | 65.6 | 1.56 | 18.2 | 32.1 | 34.4 | -2.3 | -2.0 | -0.3 |
| $dL_{t1,16,11.5}$: | 65.6 | 1.56 | 17.2 | 30.2 | 33.4 | -3.2 | -2.0 | -1.2 |
| $dL_{t1,17,11.5}$: | 65.6 | 1.56 | 16.2 | 30.4 | 32.5 | -2.1 | -2.0 | -0.1 |
| $dL_{t1,20,11.5}$: | 65.6 | 1.56 | 19.3 | 25.6 | 35.5 | -9.9 | -2.0 | -7.9 |
| $dL_{t1,21,11.5}$: | 60.9 | 1.56 | 18.1 | 28.2 | 34.3 | -6.0 | -2.0 | -4.0 |
| $dL_{t1,22,11.5}$: | 62.5 | 1.56 | 20.6 | 28.2 | 36.8 | -8.6 | -2.0 | -6.6 |
| $dL_{t1,23,11.5}$: | 68.8 | 1.56 | 19.1 | 30.8 | 35.3 | -4.6 | -2.0 | -2.5 |
| $dL_{t1,24,11.5}$: | 65.6 | 1.56 | 19.4 | 30.5 | 35.7 | -5.1 | -2.0 | -3.1 |
| $dL_{t1,25,11.5}$: | 70.3 | 1.56 | 21.2 | 32.0 | 37.4 | -5.4 | -2.0 | -3.4 |
| $dL_{t1,26,11.5}$: | 57.8 | 1.56 | 16.9 | 26.7 | 33.1 | -6.3 | -2.0 | -4.3 |
| $dL_{t1,27,11.5}$: | 67.2 | 1.56 | 18.8 | 29.8 | 35.1 | -5.3 | -2.0 | -3.3 |
| $dL_{t1,28,11.5}$: | 67.2 | 1.56 | 16.3 | 29.9 | 32.5 | -2.6 | -2.0 | -0.6 |
| $dL_{t1,29,11.5}$: | 65.6 | 1.56 | 16.6 | 29.9 | 32.8 | -2.9 | -2.0 | -0.9 |
| $dL_{t1,30,11.5}$: | 64.1 | 1.56 | 15.5 | 29.1 | 31.7 | -2.6 | -2.0 | -0.6 |
| $dL_{t2,1,11.5}$: | 128.1 | 1.56 | 20.6 | 28.2 | 36.9 | -8.8 | -2.0 | -6.8 |
| $dL_{t2,2,11.5}$: | 128.1 | 1.56 | 19.1 | 29.8 | 35.4 | -5.6 | -2.0 | -3.6 |
| $dL_{t2,7,11.5}$: | 126.6 | 1.56 | 19.2 | 28.8 | 35.5 | -6.7 | -2.0 | -4.6 |
| $dL_{t2,9,11.5}$: | 125.0 | 1.56 | 19.9 | 26.4 | 36.2 | -9.8 | -2.0 | -7.8 |
| $dL_{t2,10,11.5}$: | 126.6 | 1.56 | 22.0 | 28.0 | 38.3 | -10.3 | -2.0 | -8.2 |
| $dL_{t2,13,11.5}$: | 128.1 | 1.56 | 22.0 | 29.1 | 38.3 | -9.2 | -2.0 | -7.2 |
| $dL_{t2,17,11.5}$: | 128.1 | 1.56 | 20.6 | 30.3 | 36.9 | -6.6 | -2.0 | -4.6 |
| $dL_{t2,18,11.5}$: | 118.8 | 1.56 | 18.9 | 36.2 | 35.1 | 1.1 | -2.0 | 3.1 |
| $dL_{t2,19,11.5}$: | 109.4 | 1.56 | 22.6 | 34.6 | 38.9 | -4.3 | -2.0 | -2.2 |
| $dL_{t2,26,11.5}$: | 126.6 | 1.56 | 20.7 | 26.8 | 37.0 | -10.2 | -2.0 | -8.2 |
| $dL_{t2,30,11.5}$: | 128.1 | 1.56 | 20.1 | 30.3 | 36.4 | -6.1 | -2.0 | -4.1 |
| $dL_{t3,1,11.5}$: | 128.1 | 1.56 | 20.6 | 28.2 | 36.9 | -8.8 | -2.0 | -6.8 |
| $dL_{t3,2,11.5}$: | 128.1 | 1.56 | 19.1 | 29.8 | 35.4 | -5.6 | -2.0 | -3.6 |
| $dL_{t3,4,11.5}$: | 135.9 | 1.56 | 22.4 | 29.5 | 38.7 | -9.2 | -2.0 | -7.2 |
| $dL_{t3,5,11.5}$: | 134.4 | 1.56 | 21.5 | 30.8 | 37.8 | -7.0 | -2.0 | -5.0 |
| $dL_{t3,6,11.5}$: | 131.3 | 1.56 | 20.7 | 28.9 | 37.0 | -8.1 | -2.0 | -6.1 |
| $dL_{t3,7,11.5}$: | 126.6 | 1.56 | 19.2 | 28.8 | 35.5 | -6.7 | -2.0 | -4.6 |

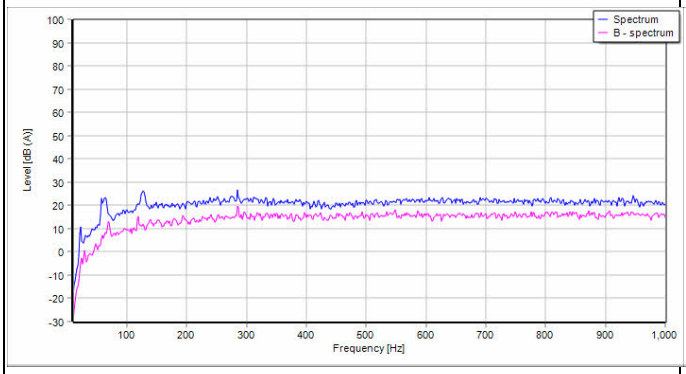
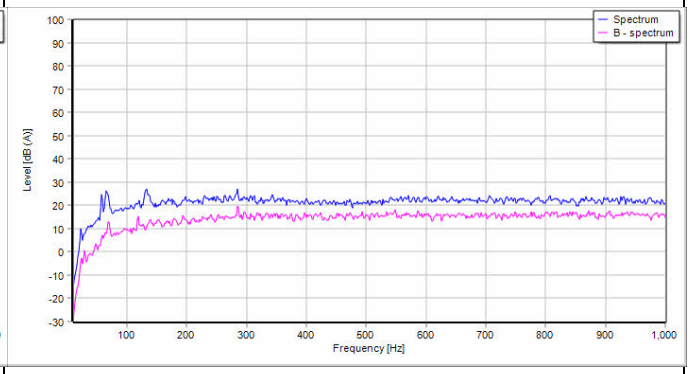
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $dL_{t3,8,11.5}$: | 132.8 | 1.56 | 20.9 | 26.9 | 37.2 | -10.3 | -2.0 | -8.3 |
| $dL_{t3,9,11.5}$: | 125.0 | 1.56 | 19.9 | 26.4 | 36.2 | -9.8 | -2.0 | -7.8 |
| $dL_{t3,10,11.5}$: | 126.6 | 1.56 | 22.0 | 28.0 | 38.3 | -10.3 | -2.0 | -8.2 |
| $dL_{t3,13,11.5}$: | 128.1 | 1.56 | 22.0 | 29.1 | 38.3 | -9.2 | -2.0 | -7.2 |
| $dL_{t3,16,11.5}$: | 134.4 | 1.56 | 20.9 | 35.3 | 37.2 | -1.9 | -2.0 | 0.1 |
| $dL_{t3,17,11.5}$: | 128.1 | 1.56 | 20.6 | 30.3 | 36.9 | -6.6 | -2.0 | -4.6 |
| $dL_{t3,18,11.5}$: | 118.8 | 1.56 | 18.9 | 36.2 | 35.1 | 1.1 | -2.0 | 3.1 |
| $dL_{t3,23,11.5}$: | 132.8 | 1.56 | 22.2 | 28.2 | 38.5 | -10.3 | -2.0 | -8.3 |
| $dL_{t3,24,11.5}$: | 131.3 | 1.56 | 22.3 | 29.3 | 38.6 | -9.3 | -2.0 | -7.2 |
| $dL_{t3,25,11.5}$: | 135.9 | 1.56 | 23.7 | 31.9 | 40.0 | -8.1 | -2.0 | -6.1 |
| $dL_{t3,26,11.5}$: | 126.6 | 1.56 | 20.7 | 26.8 | 37.0 | -10.2 | -2.0 | -8.2 |
| $dL_{t3,28,11.5}$: | 134.4 | 1.56 | 20.7 | 28.5 | 37.0 | -8.4 | -2.0 | -6.4 |
| $dL_{t3,29,11.5}$: | 129.7 | 1.56 | 20.5 | 26.9 | 36.8 | -9.8 | -2.0 | -7.8 |
| $dL_{t3,30,11.5}$: | 128.1 | 1.56 | 20.1 | 30.3 | 36.4 | -6.1 | -2.0 | -4.1 |
| $dL_{t4,16,11.5}$: | 337.5 | 1.56 | 23.7 | 30.7 | 40.3 | -9.5 | -2.1 | -7.4 |

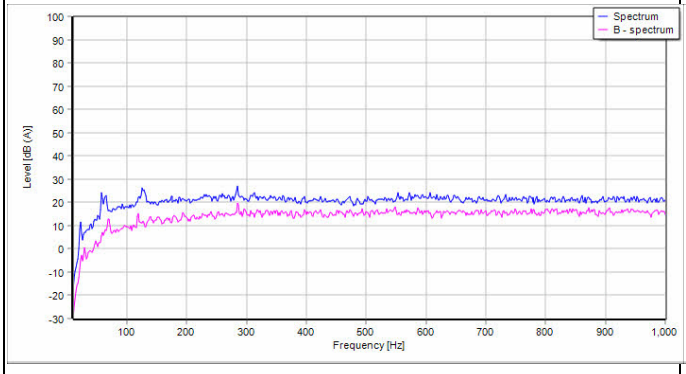
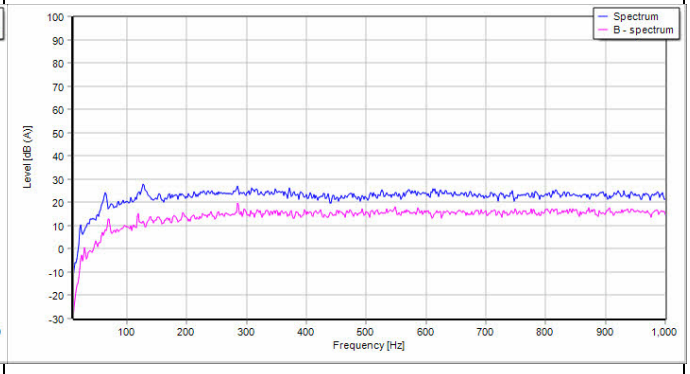
| BIN 11.5: Detected tones - Compact | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spectrum** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | | | | |
| **##** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | | | | |
| **1** | 65.6 | -5.8 | 128.1 | -8.8 | 128.1 | -8.8 | --- | --- | | | | |
| **2** | 65.6 | -2.6 | 128.1 | -5.6 | 128.1 | -5.6 | --- | --- | | | | |
| **3** | --- | --- | --- | --- | --- | --- | --- | --- | | | | |
| **4** | 67.2 | -4.2 | --- | --- | 135.9 | -9.2 | --- | --- | | | | |
| **5** | 68.8 | -2.7 | --- | --- | 134.4 | -7.0 | --- | --- | | | | |
| **6** | 65.6 | -1.2 | --- | --- | 131.3 | -8.1 | --- | --- | | | | |
| **7** | 64.1 | -2.5 | 126.6 | -6.7 | 126.6 | -6.7 | --- | --- | | | | |
| **8** | 65.6 | -3.0 | --- | --- | 132.8 | -10.3 | --- | --- | | | | |
| **9** | 57.8 | -6.2 | 125.0 | -9.8 | 125.0 | -9.8 | --- | --- | | | | |
| **10** | --- | --- | 126.6 | -10.3 | 126.6 | -10.3 | --- | --- | | | | |
| **11** | 65.6 | -7.2 | --- | --- | --- | --- | --- | --- | | | | |
| **12** | 65.6 | -6.2 | --- | --- | --- | --- | --- | --- | | | | |
| **13** | --- | --- | 128.1 | -9.2 | 128.1 | -9.2 | --- | --- | | | | |
| **14** | 65.6 | -7.1 | --- | --- | --- | --- | --- | --- | | | | |
| **15** | 65.6 | -2.3 | --- | --- | --- | --- | --- | --- | | | | |
| **16** | 65.6 | -3.2 | --- | --- | 134.4 | -1.9 | 337.5 | -9.5 | | | | |
| **17** | 65.6 | -2.1 | 128.1 | -6.6 | 128.1 | -6.6 | --- | --- | | | | |
| **18** | --- | --- | 118.8 | 1.1 | 118.8 | 1.1 | --- | --- | | | | |
| **19** | --- | --- | 109.4 | -4.3 | --- | --- | --- | --- | | | | |
| **20** | 65.6 | -9.9 | --- | --- | --- | --- | --- | --- | | | | |
| **21** | 60.9 | -6.0 | --- | --- | --- | --- | --- | --- | | | | |
| **22** | 62.5 | -8.6 | --- | --- | --- | --- | --- | --- | | | | |
| **23** | 68.8 | -4.6 | --- | --- | 132.8 | -10.3 | --- | --- | | | | |
| **24** | 65.6 | -5.1 | --- | --- | 131.3 | -9.3 | --- | --- | | | | |
| **25** | 70.3 | -5.4 | --- | --- | 135.9 | -8.1 | --- | --- | | | | |
| **26** | 57.8 | -6.3 | 126.6 | -10.2 | 126.6 | -10.2 | --- | --- | | | | |
| **27** | 67.2 | -5.3 | --- | --- | --- | --- | --- | --- | | | | |
| **28** | 67.2 | -2.6 | --- | --- | 134.4 | -8.4 | --- | --- | | | | |
| **29** | 65.6 | -2.9 | --- | --- | 129.7 | -9.8 | --- | --- | | | | |
| **30** | 64.1 | -2.6 | 128.1 | -6.1 | 128.1 | -6.1 | --- | --- | | | | |
| **$f_t$[Hz] \| $dL_k$[dB]** | 65.3 | -4.9 | 120.7 | -9.2 | 129.5 | -7.9 | 337.5 | -16.1 | | | | |
| **$L_a$[dB]** | | -2.0 | | -2.0 | | -2.0 | | -2.1 | | | | |
| **$dL_{a,k}$[dB]** | | -2.9 | | -7.2 | | -5.9 | | -13.9 | | | | |

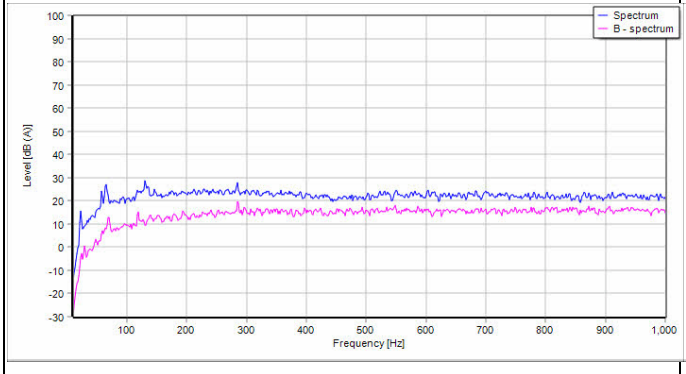
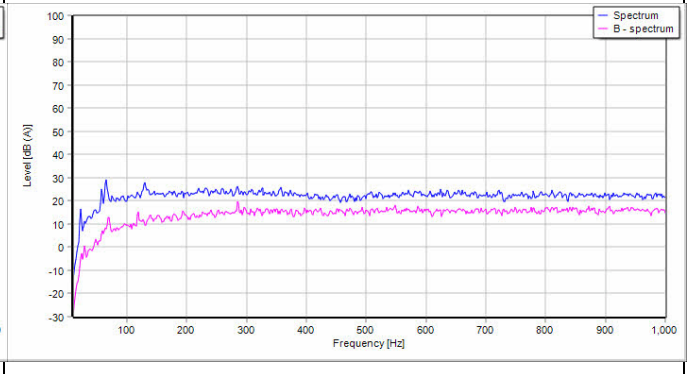
| BIN 11.5: Narrow band spectrum #1 | BIN 11.5: Narrow band spectrum #2 |
|---|---|
|  |  |

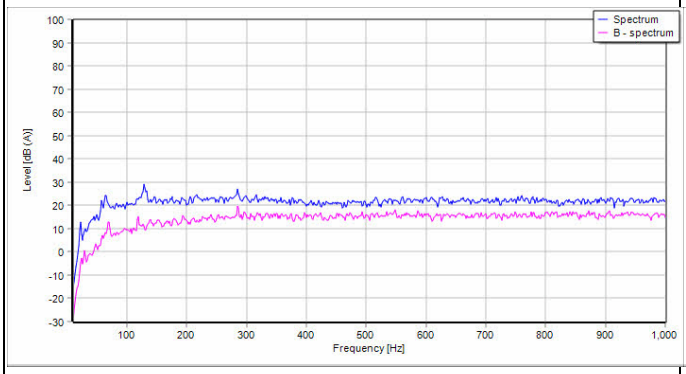
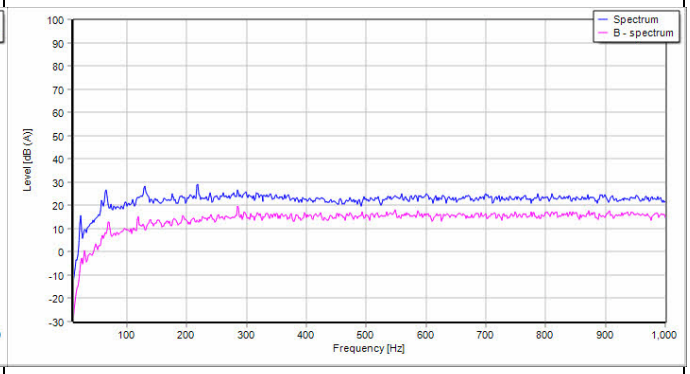
| BIN 11.5: Narrow band spectrum #3 | BIN 11.5: Narrow band spectrum #4 |
|---|---|
|  |  |

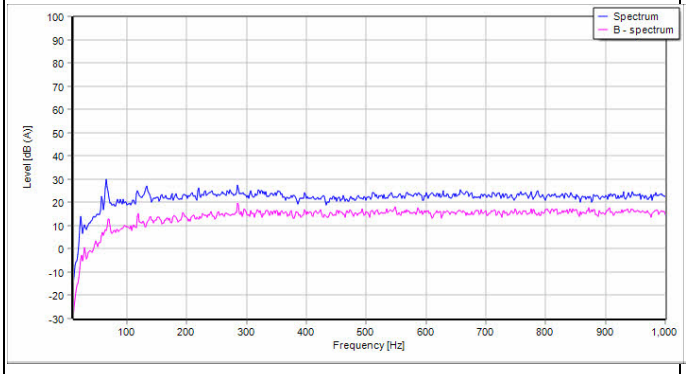
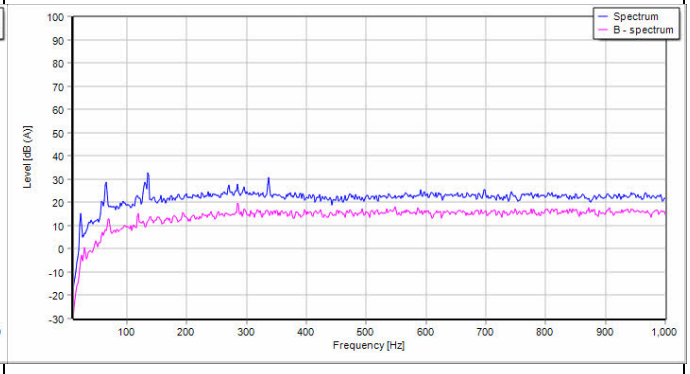
| BIN 11.5: Narrow band spectrum #5 | BIN 11.5: Narrow band spectrum #6 |
|---|---|
|  |  |

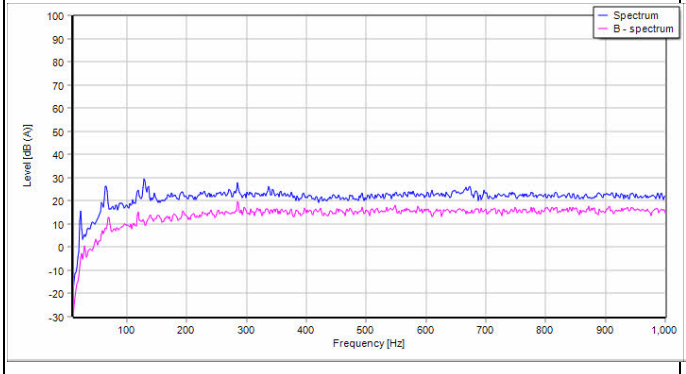
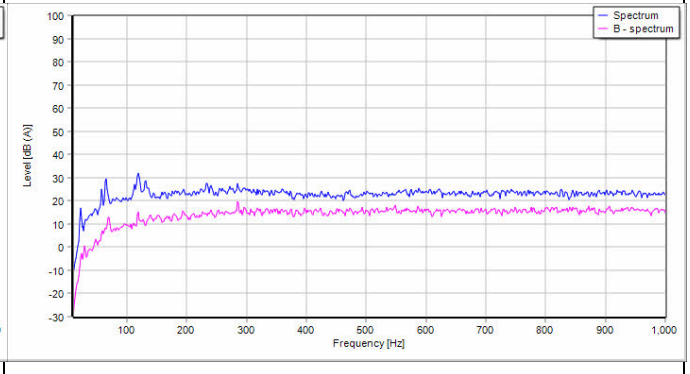
| BIN 11.5: Narrow band spectrum #7 | BIN 11.5: Narrow band spectrum #8 |
|---|---|
|  |  |

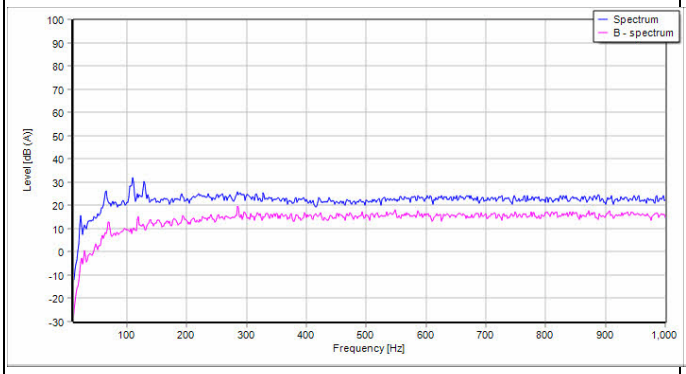
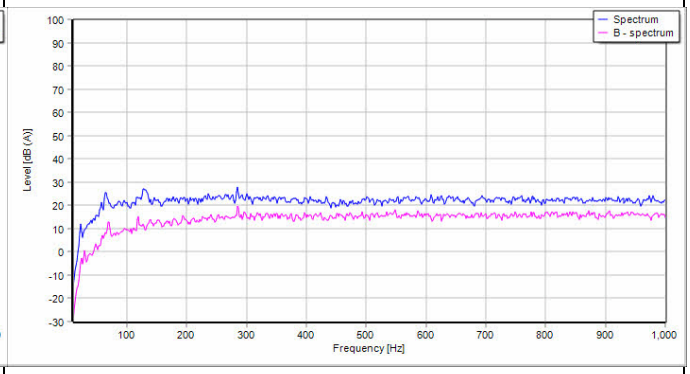
| BIN 11.5: Narrow band spectrum #9 | BIN 11.5: Narrow band spectrum #10 |
|---|---|
|  |  |

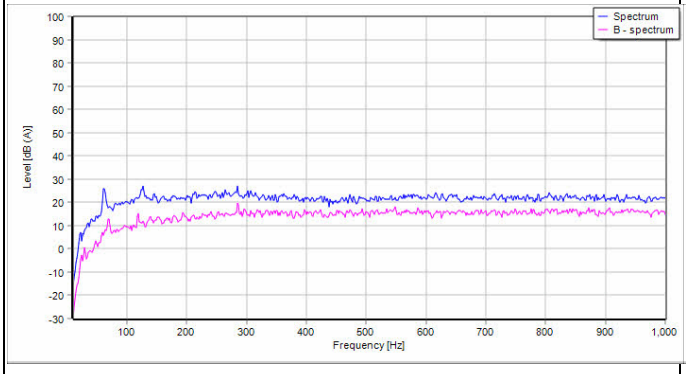
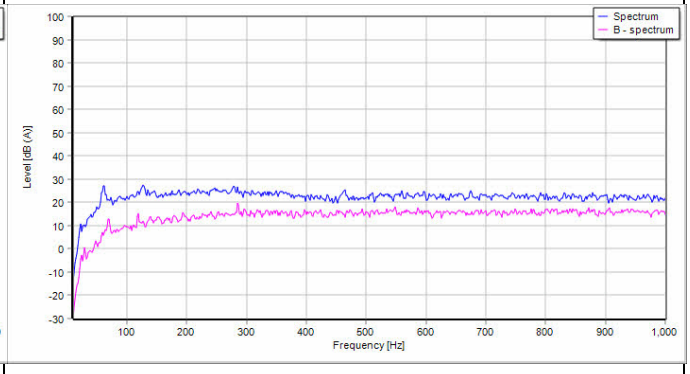
| BIN 11.5: Narrow band spectrum #11 | BIN 11.5: Narrow band spectrum #12 |
|---|---|
|  |  |

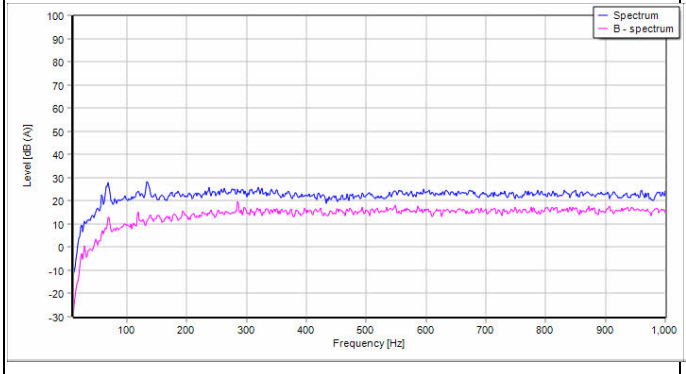
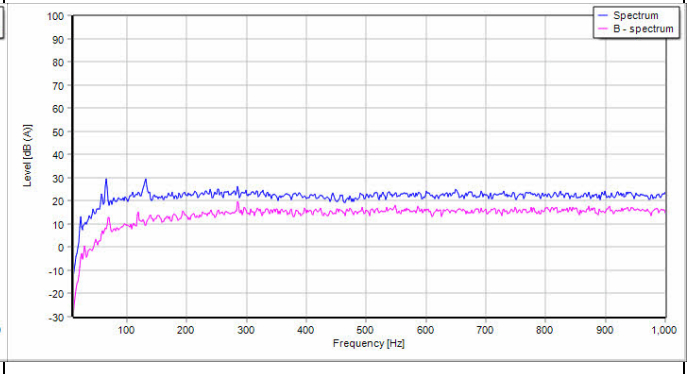
| BIN 11.5: Narrow band spectrum #13 | BIN 11.5: Narrow band spectrum #14 |
|---|---|
|  |  |

| BIN 11.5: Narrow band spectrum #15 | BIN 11.5: Narrow band spectrum #16 |
|---|---|
|  |  |

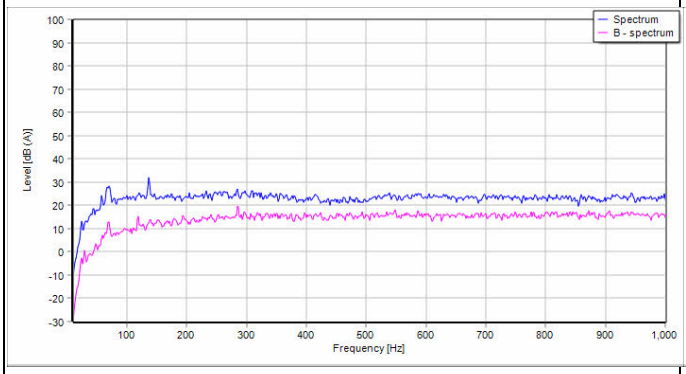
| BIN 11.5: Narrow band spectrum #17 | BIN 11.5: Narrow band spectrum #18 |
|---|---|
|  |  |

| BIN 11.5: Narrow band spectrum #19 | BIN 11.5: Narrow band spectrum #20 |
|---|---|
|  |  |

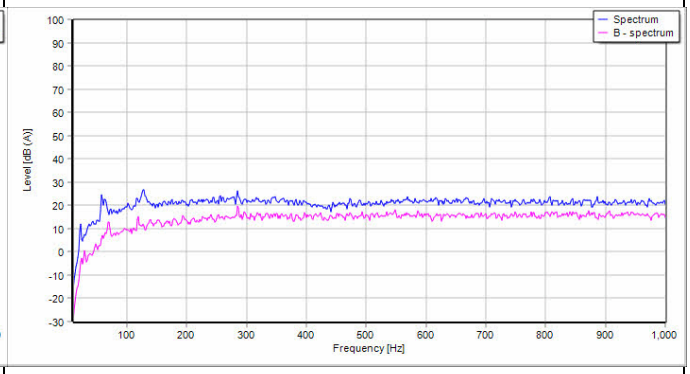
| BIN 11.5: Narrow band spectrum #21 | BIN 11.5: Narrow band spectrum #22 |
|---|---|
|  |  |

| BIN 11.5: Narrow band spectrum #23 | BIN 11.5: Narrow band spectrum #24 |
|---|---|
|  |  |

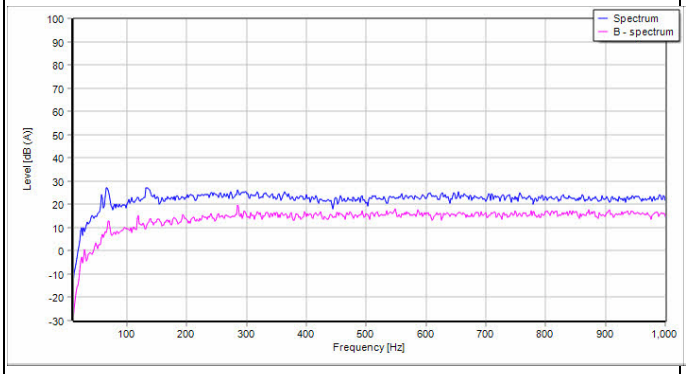
**BIN 11.5: Narrow band spectrum #25**



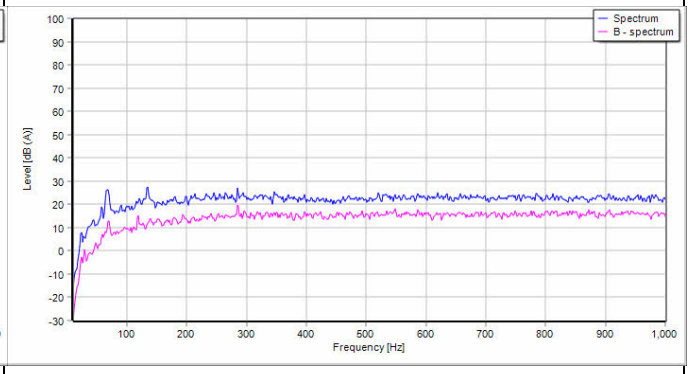

**BIN 11.5: Narrow band spectrum #26**



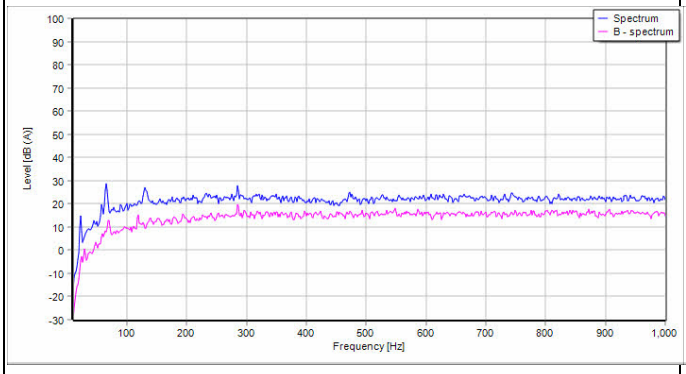

**BIN 11.5: Narrow band spectrum #27**



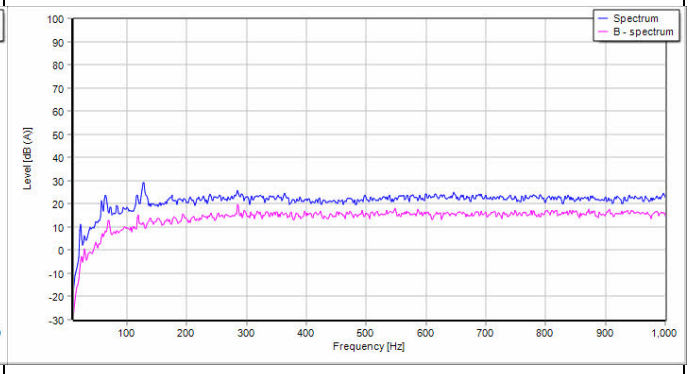

**BIN 11.5: Narrow band spectrum #28**




**BIN 11.5: Narrow band spectrum #29**



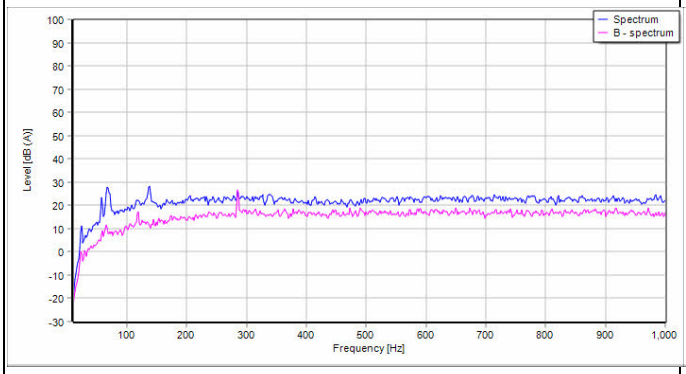
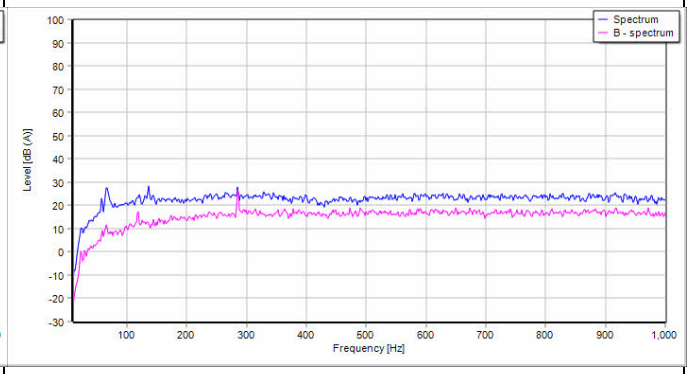

**BIN 11.5: Narrow band spectrum #30**

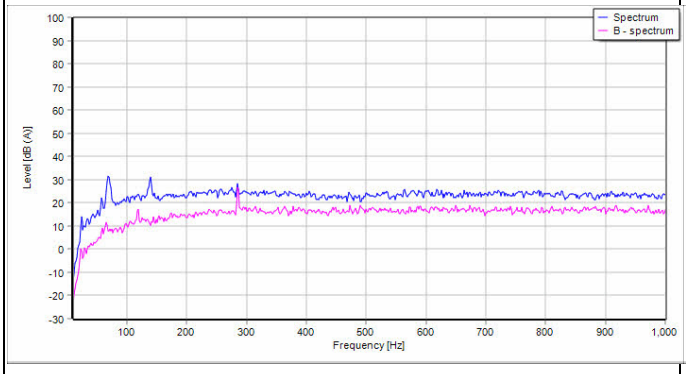
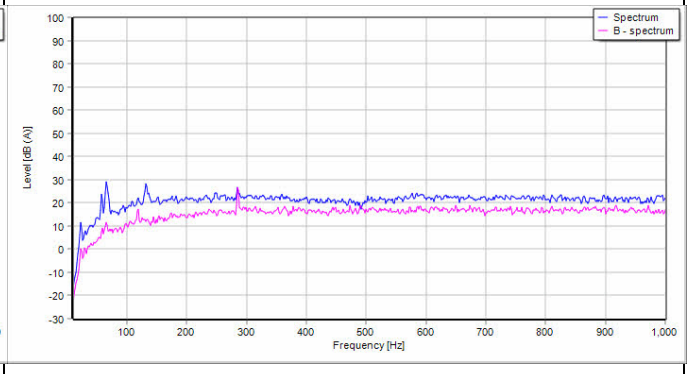


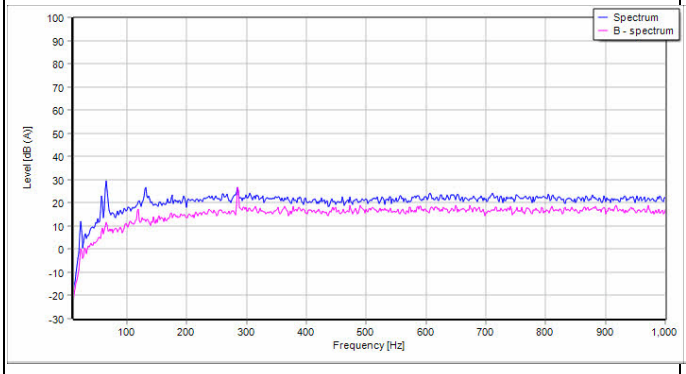
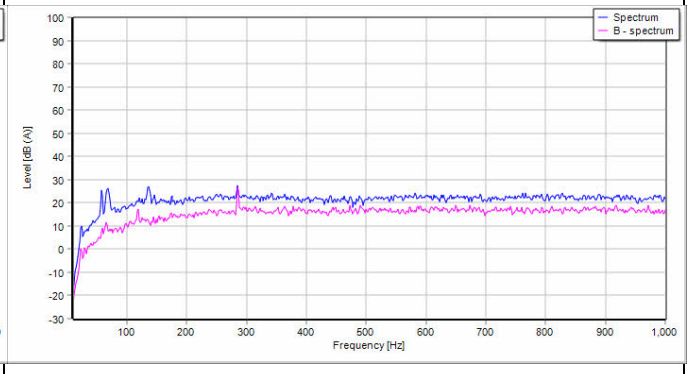
| BIN 12: Detected tones | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | delta f | $L_{pn,avg,j,k}$ | $L_{pt,j,k}$ | $L_{pn,j,k}$ | $dL_{tn,j,k}$ | $L_a$ | $dL_{a,j,k}$ |
| | [Hz] | [Hz] | [dB] | [dB] | [dB] | [dB] | [dB] | [dB] |
| $dL_{t1,1,12}$: | 67.2 | 1.56 | 16.3 | 32.1 | 32.6 | -0.5 | -2.0 | 1.5 |
| $dL_{t1,2,12}$: | 67.2 | 1.56 | 19.2 | 30.0 | 35.4 | -5.5 | -2.0 | -3.5 |
| $dL_{t1,3,12}$: | 68.8 | 1.56 | 19.3 | 34.9 | 35.6 | -0.7 | -2.0 | 1.4 |
| $dL_{t1,4,12}$: | 65.6 | 1.56 | 15.7 | 31.8 | 32.0 | -0.1 | -2.0 | 1.9 |
| $dL_{t1,5,12}$: | 65.6 | 1.56 | 15.0 | 30.8 | 31.2 | -0.4 | -2.0 | 1.6 |
| $dL_{t1,6,12}$: | 68.8 | 1.56 | 16.3 | 31.0 | 32.6 | -1.6 | -2.0 | 0.4 |
| $dL_{t1,7,12}$: | 57.8 | 1.56 | 17.0 | 24.1 | 33.2 | -9.1 | -2.0 | -7.1 |
| $dL_{t1,8,12}$: | 65.6 | 1.56 | 20.3 | 27.7 | 36.6 | -8.9 | -2.0 | -6.9 |
| $dL_{t1,10,12}$: | 68.8 | 1.56 | 20.2 | 29.7 | 36.4 | -6.7 | -2.0 | -4.7 |
| $dL_{t1,11,12}$: | 64.1 | 1.56 | 17.7 | 27.9 | 34.0 | -6.1 | -2.0 | -4.1 |
| $dL_{t1,12,12}$: | 65.6 | 1.56 | 15.9 | 29.9 | 32.1 | -2.2 | -2.0 | -0.2 |
| $dL_{t1,13,12}$: | 68.8 | 1.56 | 22.1 | 31.8 | 38.3 | -6.5 | -2.0 | -4.5 |
| $dL_{t1,14,12}$: | 68.8 | 1.56 | 22.3 | 33.2 | 38.6 | -5.3 | -2.0 | -3.3 |
| $dL_{t1,15,12}$: | 57.8 | 1.56 | 16.0 | 28.3 | 32.2 | -3.9 | -2.0 | -1.9 |
| $dL_{t1,16,12}$: | 65.6 | 1.56 | 19.0 | 28.3 | 35.3 | -6.9 | -2.0 | -4.9 |
| $dL_{t1,17,12}$: | 65.6 | 1.56 | 19.4 | 31.3 | 35.6 | -4.3 | -2.0 | -2.3 |
| $dL_{t1,18,12}$: | 65.6 | 1.56 | 14.9 | 32.8 | 31.2 | 1.7 | -2.0 | 3.7 |
| $dL_{t1,19,12}$: | 65.6 | 1.56 | 16.4 | 31.7 | 32.7 | -1.0 | -2.0 | 1.0 |
| $dL_{t1,20,12}$: | 65.6 | 1.56 | 17.9 | 29.1 | 34.1 | -4.9 | -2.0 | -2.9 |
| $dL_{t1,21,12}$: | 65.6 | 1.56 | 16.6 | 27.5 | 32.8 | -5.3 | -2.0 | -3.3 |
| $dL_{t1,22,12}$: | 65.6 | 1.56 | 17.1 | 27.9 | 33.3 | -5.4 | -2.0 | -3.4 |
| $dL_{t1,23,12}$: | 65.6 | 1.56 | 18.2 | 30.5 | 34.4 | -3.9 | -2.0 | -1.9 |
| $dL_{t1,24,12}$: | 65.6 | 1.56 | 16.0 | 30.0 | 32.2 | -2.2 | -2.0 | -0.2 |
| $dL_{t1,26,12}$: | 65.6 | 1.56 | 20.7 | 29.0 | 37.0 | -8.0 | -2.0 | -6.0 |
| $dL_{t1,27,12}$: | 65.6 | 1.56 | 19.5 | 28.2 | 35.8 | -7.6 | -2.0 | -5.6 |
| $dL_{t1,28,12}$: | 57.8 | 1.56 | 17.3 | 27.2 | 33.5 | -6.3 | -2.0 | -4.3 |
| $dL_{t1,29,12}$: | 65.6 | 1.56 | 17.2 | 32.0 | 33.4 | -1.4 | -2.0 | 0.6 |
| $dL_{t1,30,12}$: | 65.6 | 1.56 | 17.9 | 29.4 | 34.2 | -4.8 | -2.0 | -2.8 |
| $dL_{t2,1,12}$: | 137.5 | 1.56 | 20.8 | 29.4 | 37.1 | -7.7 | -2.0 | -5.7 |
| $dL_{t2,3,12}$: | 139.1 | 1.56 | 22.9 | 31.7 | 39.2 | -7.5 | -2.0 | -5.5 |
| $dL_{t2,4,12}$: | 131.3 | 1.56 | 20.5 | 29.0 | 36.8 | -7.9 | -2.0 | -5.9 |
| $dL_{t2,5,12}$: | 131.3 | 1.56 | 19.6 | 27.5 | 35.9 | -8.4 | -2.0 | -6.4 |
| $dL_{t2,6,12}$: | 135.9 | 1.56 | 20.5 | 28.0 | 36.8 | -8.8 | -2.0 | -6.8 |
| $dL_{t2,7,12}$: | 126.6 | 1.56 | 21.1 | 29.4 | 37.4 | -7.9 | -2.0 | -5.9 |
| $dL_{t2,9,12}$: | 135.9 | 1.56 | 23.3 | 31.9 | 39.6 | -7.8 | -2.0 | -5.8 |
| $dL_{t2,10,12}$: | 134.4 | 1.56 | 23.0 | 30.1 | 39.3 | -9.2 | -2.0 | -7.2 |
| $dL_{t2,11,12}$: | 129.7 | 1.56 | 21.5 | 28.9 | 37.8 | -8.8 | -2.0 | -6.8 |
| $dL_{t2,12,12}$: | 129.7 | 1.56 | 20.5 | 30.4 | 36.8 | -6.4 | -2.0 | -4.4 |
| $dL_{t2,18,12}$: | 131.3 | 1.56 | 20.8 | 31.5 | 37.1 | -5.6 | -2.0 | -3.5 |
| $dL_{t2,19,12}$: | 131.3 | 1.56 | 22.1 | 28.6 | 38.4 | -9.8 | -2.0 | -7.8 |
| $dL_{t2,20,12}$: | 129.7 | 1.56 | 21.1 | 27.3 | 37.4 | -10.1 | -2.0 | -8.1 |

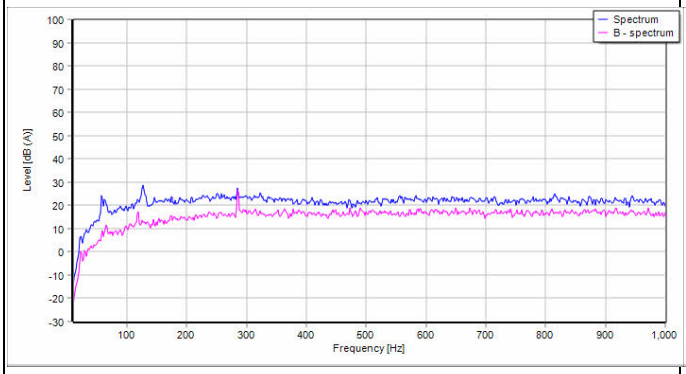
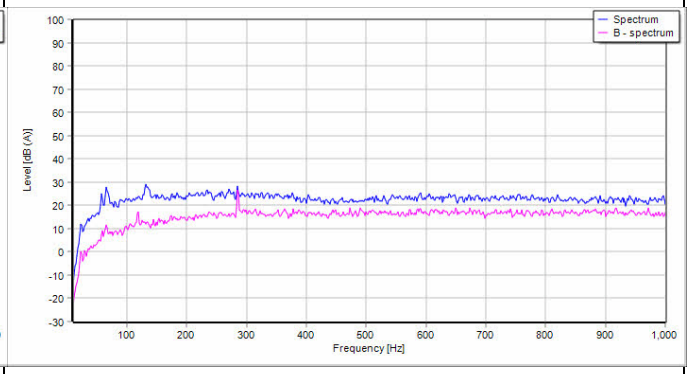
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $dL_{t2,21,12}$: | 128.1 | 1.56 | 20.3 | 27.9 | 36.6 | -8.7 | -2.0 | -6.7 |
| $dL_{t2,22,12}$: | 129.7 | 1.56 | 21.0 | 27.0 | 37.3 | -10.2 | -2.0 | -8.2 |
| $dL_{t2,24,12}$: | 131.3 | 1.56 | 20.3 | 27.5 | 36.6 | -9.1 | -2.0 | -7.1 |
| $dL_{t2,28,12}$: | 126.6 | 1.56 | 21.4 | 28.1 | 37.7 | -9.6 | -2.0 | -7.6 |
| $dL_{t3,24,12}$: | 454.7 | 1.56 | 22.0 | 33.2 | 38.8 | -5.6 | -2.3 | -3.3 |

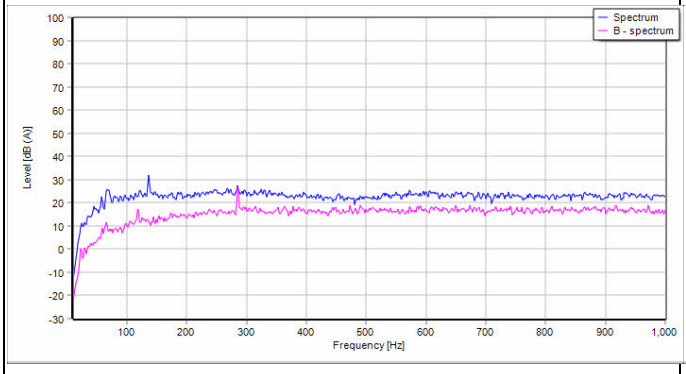
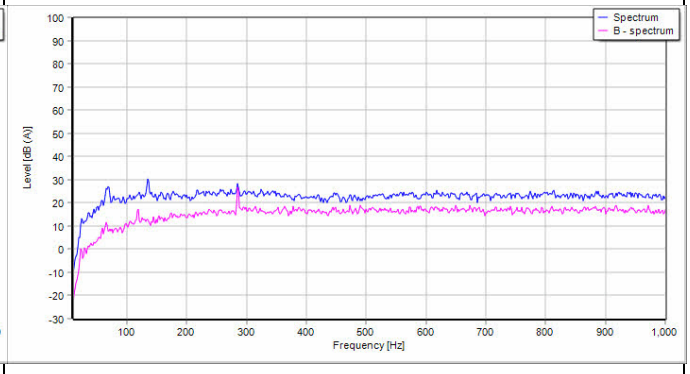
| BIN 12: Detected tones - Compact | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spectrum** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | **$f_T$** | **$dL_{tn,j,k}$** | | | | | | |
| **##** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | **[Hz]** | **[dB]** | | | | | | |
| **1** | 67.2 | -0.5 | 137.5 | -7.7 | --- | --- | | | | | | |
| **2** | 67.2 | -5.5 | --- | --- | --- | --- | | | | | | |
| **3** | 68.8 | -0.7 | 139.1 | -7.5 | --- | --- | | | | | | |
| **4** | 65.6 | -0.1 | 131.3 | -7.9 | --- | --- | | | | | | |
| **5** | 65.6 | -0.4 | 131.3 | -8.4 | --- | --- | | | | | | |
| **6** | 68.8 | -1.6 | 135.9 | -8.8 | --- | --- | | | | | | |
| **7** | 57.8 | -9.1 | 126.6 | -7.9 | --- | --- | | | | | | |
| **8** | 65.6 | -8.9 | --- | --- | --- | --- | | | | | | |
| **9** | --- | --- | 135.9 | -7.8 | --- | --- | | | | | | |
| **10** | 68.8 | -6.7 | 134.4 | -9.2 | --- | --- | | | | | | |
| **11** | 64.1 | -6.1 | 129.7 | -8.8 | --- | --- | | | | | | |
| **12** | 65.6 | -2.2 | 129.7 | -6.4 | --- | --- | | | | | | |
| **13** | 68.8 | -6.5 | --- | --- | --- | --- | | | | | | |
| **14** | 68.8 | -5.3 | --- | --- | --- | --- | | | | | | |
| **15** | 57.8 | -3.9 | --- | --- | --- | --- | | | | | | |
| **16** | 65.6 | -6.9 | --- | --- | --- | --- | | | | | | |
| **17** | 65.6 | -4.3 | --- | --- | --- | --- | | | | | | |
| **18** | 65.6 | 1.7 | 131.3 | -5.6 | --- | --- | | | | | | |
| **19** | 65.6 | -1.0 | 131.3 | -9.8 | --- | --- | | | | | | |
| **20** | 65.6 | -4.9 | 129.7 | -10.1 | --- | --- | | | | | | |
| **21** | 65.6 | -5.3 | 128.1 | -8.7 | --- | --- | | | | | | |
| **22** | 65.6 | -5.4 | 129.7 | -10.2 | --- | --- | | | | | | |
| **23** | 65.6 | -3.9 | --- | --- | --- | --- | | | | | | |
| **24** | 65.6 | -2.2 | 131.3 | -9.1 | 454.7 | -5.6 | | | | | | |
| **25** | --- | --- | --- | --- | --- | --- | | | | | | |
| **26** | 65.6 | -8.0 | --- | --- | --- | --- | | | | | | |
| **27** | 65.6 | -7.6 | --- | --- | --- | --- | | | | | | |
| **28** | 57.8 | -6.3 | 126.6 | -9.6 | --- | --- | | | | | | |
| **29** | 65.6 | -1.4 | --- | --- | --- | --- | | | | | | |
| **30** | 65.6 | -4.8 | --- | --- | --- | --- | | | | | | |
| **$f_t$[Hz] \| $dL_k$[dB]** | 65.5 | -3.5 | 134.2 | -10.2 | 454.7 | -15.4 | | | | | | |
| **$L_a$[dB]** | | -2.0 | | -2.0 | | -2.3 | | | | | | |
| **$dL_{a,k}$[dB]** | | -1.5 | | -8.2 | | -13.1 | | | | | | |

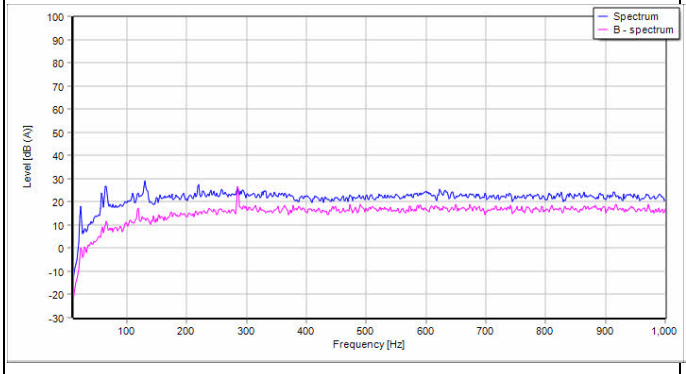
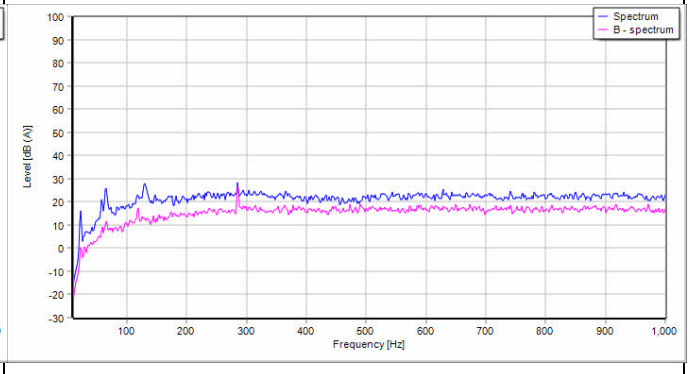
| BIN 12: Narrow band spectrum #1 | BIN 12: Narrow band spectrum #2 |
|---|---|
|  |  |

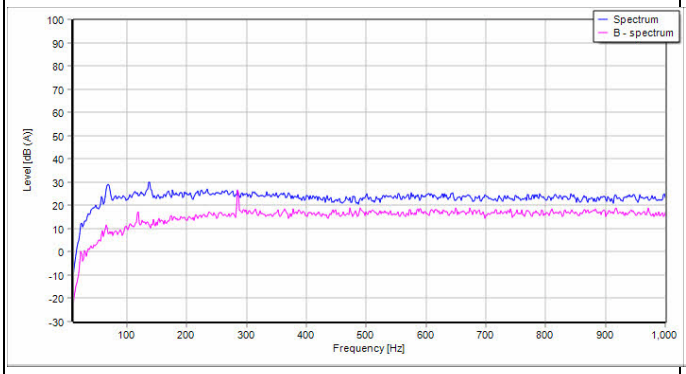
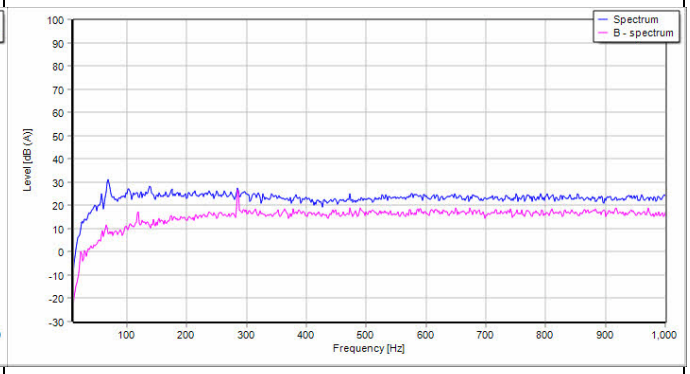
| BIN 12: Narrow band spectrum #3 | BIN 12: Narrow band spectrum #4 |
|---|---|
|  |  |

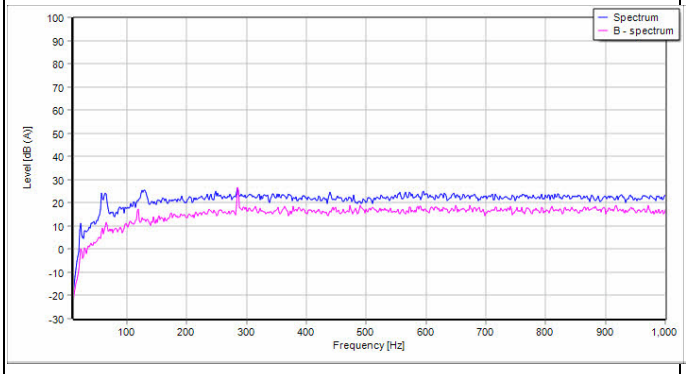
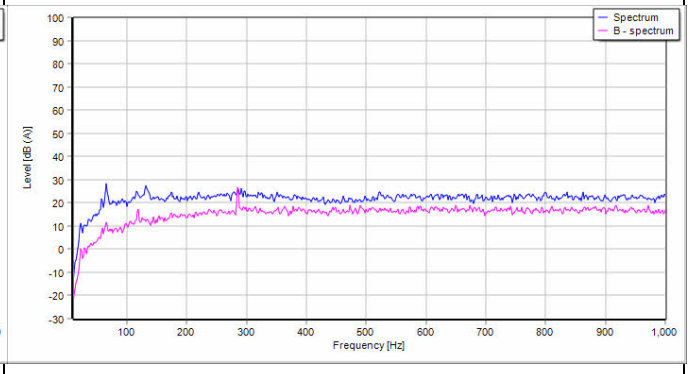
| BIN 12: Narrow band spectrum #5 | BIN 12: Narrow band spectrum #6 |
|---|---|
|  |  |

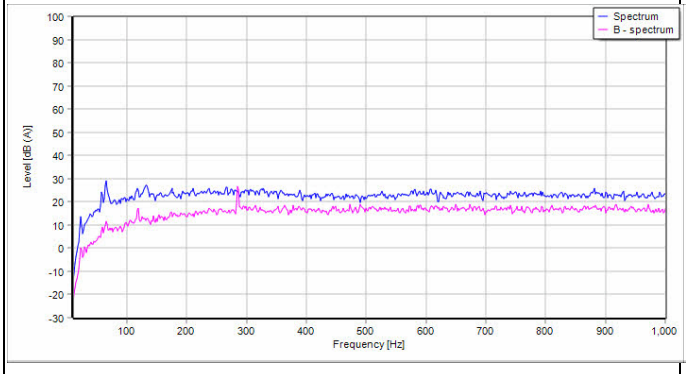
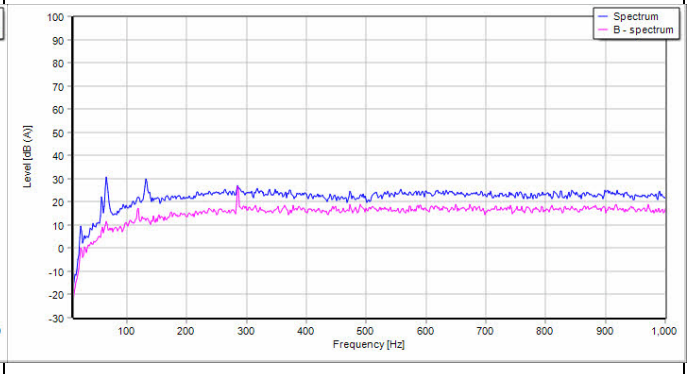
| BIN 12: Narrow band spectrum #7 | BIN 12: Narrow band spectrum #8 |
|---|---|
|  |  |

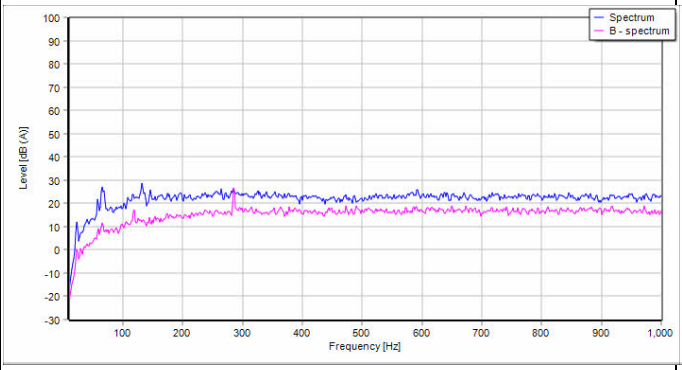
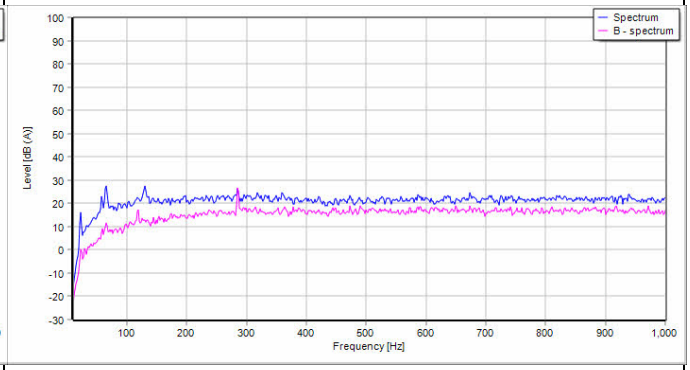
| BIN 12: Narrow band spectrum #9 | BIN 12: Narrow band spectrum #10 |
|---|---|
|  |  |

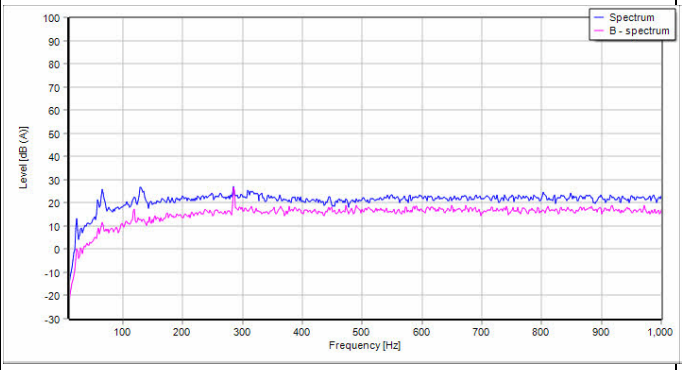
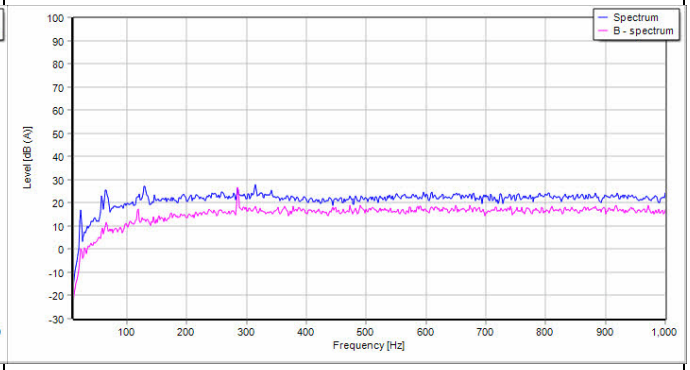
| BIN 12: Narrow band spectrum #11 | BIN 12: Narrow band spectrum #12 |
|---|---|
|  |  |

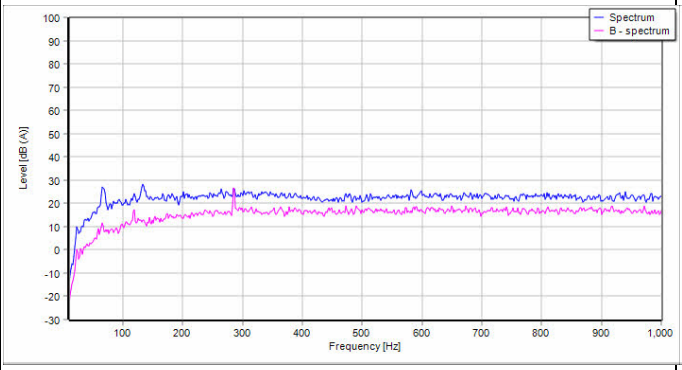
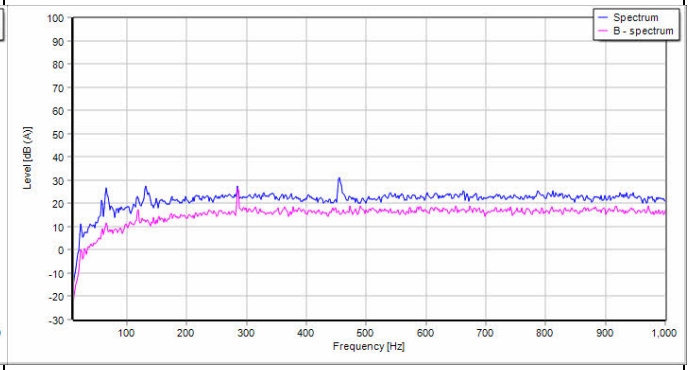
| BIN 12: Narrow band spectrum #13 | BIN 12: Narrow band spectrum #14 |
|---|---|
|  |  |

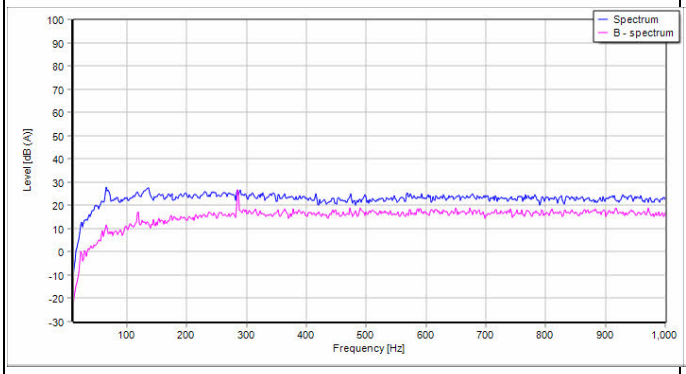
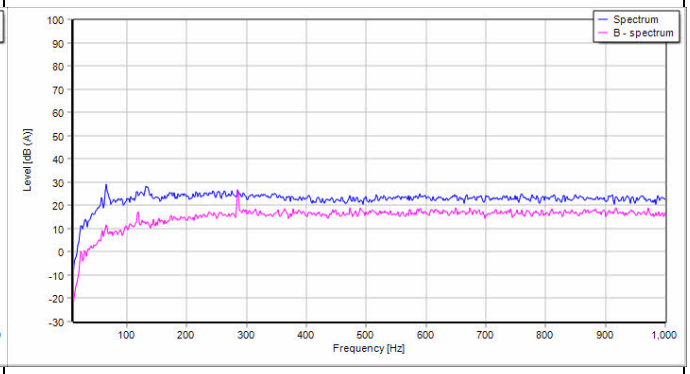
| BIN 12: Narrow band spectrum #15 | BIN 12: Narrow band spectrum #16 |
|---|---|
|  |  |

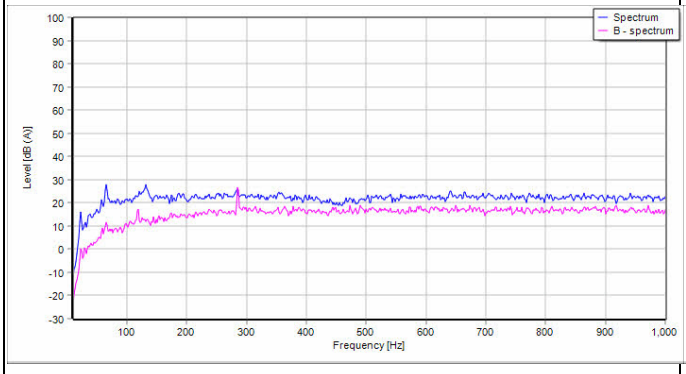
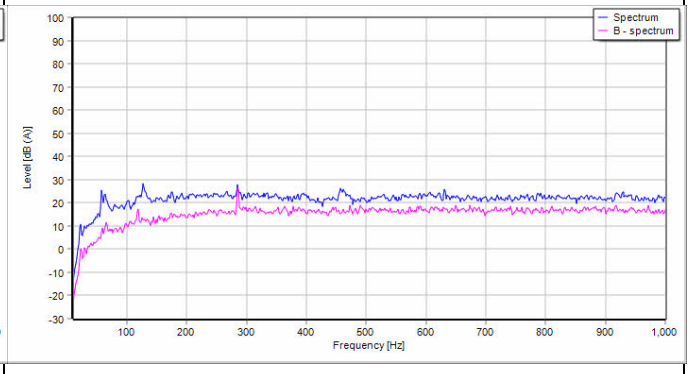
| BIN 12: Narrow band spectrum #17 | BIN 12: Narrow band spectrum #18 |
|---|---|
|  |  |

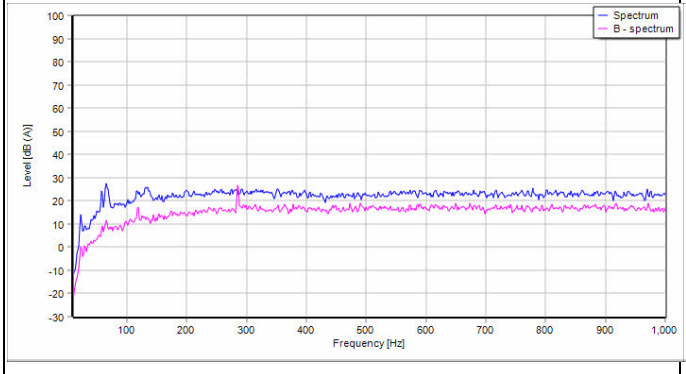
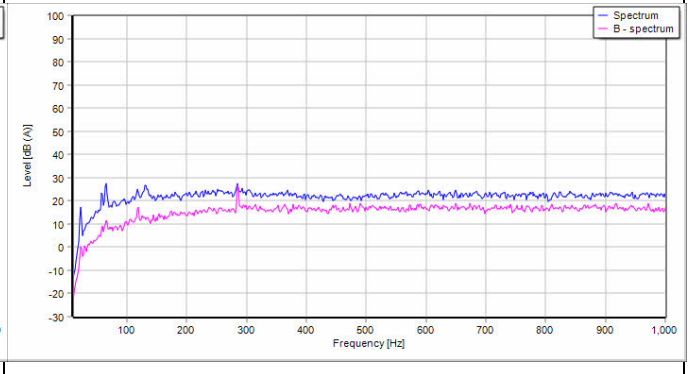
| BIN 12: Narrow band spectrum #19 | BIN 12: Narrow band spectrum #20 |
|---|---|
|  |  |

| BIN 12: Narrow band spectrum #21 | BIN 12: Narrow band spectrum #22 |
|---|---|
|  |  |

| BIN 12: Narrow band spectrum #23 | BIN 12: Narrow band spectrum #24 |
|---|---|
|  |  |

| BIN 12: Narrow band spectrum #25 | BIN 12: Narrow band spectrum #26 |
|---|---|
|  |  |

| BIN 12: Narrow band spectrum #27 | BIN 12: Narrow band spectrum #28 |
|---|---|
|  |  |

| BIN 12: Narrow band spectrum #29 | BIN 12: Narrow band spectrum #30 |
|---|---|
|  |  |

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