be quiet!

be quiet! Silent Loop 3 420mm

Serial Number 026V4480000036

Lab ID BQCLR00084

Type Liquid

Testing Dates: Feb 11, 2025 to Feb 25, 2025

Scheme: THETA

AMD AM5





Intel LGA1851



Aristeidis Bitziopoulos, Certification Body General Manager

THETA Cooler Performance

THETA is a Cybenetics performance rating. It is not part of our ISO/IEC 17065 certification schemes and is outside our accreditation.

Overall Performance (OP) = W × F / T, where W is the average CPU power at the EPS connectors (W), F the average CPU frequency (MHz) and T the average CPU temperature (°C). A cooler is rated on its measured OP at 30 dB(A) normalized noise output; a cooler that cannot reach 30 dB(A) is rated on its own measured 25 dB(A) point. Air and AIO coolers have separate ladders on each test platform.

Evaluated before Revision 2.0 of the Cooling Solutions Test Protocol: the THETA level was assigned from the published results measured under Revision 1.8 (20 minutes per noise level, 10-minute cool-down). The cooler was not measured again, and the earlier procedure is not identical to the procedure of Revision 2.0.

Platform	THETA level	Test CPU	Mount	Rated at	Overall Performance (OP)
AMD AM5	**THETA Gold · AIO · AMD AM5**	AMD Ryzen 9 7900X (AM5)	Default	30 dB(A)	11,283
Intel LGA1851	**THETA Silver · AIO · Intel LGA1851**	Intel Core Ultra 9 285K (LGA1851)	Default	30 dB(A)	14,127

General Information

Test Equipment

Noise Test Environment	Hemi Anechoic Chamber with 6dB(A) noise floor
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Climate Chamber	Giant Force GTH-800-20-CP-AR
Testing Methodology	Cybenetics Cooling Solutions Test Protocol

DUT Information

Brand	be quiet!
Model	Silent Loop 3 420mm
Serial Number	026V4480000036
Lab ID	BQCLR00084
Testing Dates	Feb 11, 2025 to Feb 25, 2025
Engineer	Aris Bitziopoulos

Climate Chamber

Noise Test Environment	Hemi Anechoic Chamber with 6dB(A) noise floor
Manufacturer	Giant Force
Model Number	GTH-800-20-CP-AR

Temperature Range	-20℃ ~ +100℃
Humidity Range	20% ~ 98% RH
Temperature/Humidity Constancy	±0.2℃; ±2.5%RH
Temperature/Humidity Uniformity at center	±0.5℃; ±4%RH
Internal Dimensions (WHD)	100 x 100 x 80 cm
External Dimensions (WHD)	145 x 190 x 135 cm
Net Weight (approximately)	450 Kg
Heat-up Time (No load, no linear)	(from 20°C to +100°C) 30min
Pull-down Time (No load, no linear)	(from 20°C to -20°C) 50min
Cooling System	Airtight compressor + evaporator fins + air-cooling condenser
Power Source	3Φ AC 380V ±5%, 50Hz±1% 10KW
Based on Standards	ISO 5801-2007, AMCA 210-0, ASHRAE 51-2007, IEC 61591-2005, GB/T 1236-200

AMD Test System

Mainboard	Asus TUF GAMING X670E-PLUS
CPU	AMD Ryzen 9 7900x
GPU	Embedded
NVMe	XPG GAMMIX S50 Lite 1TB
RAM	XPG Lancer DDR5 (2 x 16GB) 6000MHz
Power Supply	Seasonic Vertex 1200W (Cybenetics Platinum)
CPU Cooler	Device Under Test
Case	Cooler Master Test Bench

Intel Test System

Mainboard	ASRock Z890 Taichi [BIOS: 2.09.AS01 - Nov 4, 2024]
CPU	Intel Core Ultra 9 285K
GPU	Embedded
NVMe	XPG GAMMIX S50 Lite 1TB
RAM	Gskill Ripjaws S5 DDR5 (2 x 16GB) 6000MHz
Power Supply	Seasonic Vertex 1200W (Cybenetics Platinum)

CPU Cooler	Device Under Test
Case	DimasTech Bench

Technical Specifications

Manufacturer (OEM)	be quiet!
Model	Silent Loop 3 420mm
Number of Fans	3
Fan #1	be quiet! Silent Wings 4 120mm High-Speed
Type	Liquid
Radiator Size	420mm
Radiator Thickness	27mm
Radiator Material	Aluminium
Pump Speed	3500RPM
Tube Length	400mm
Tube Diameter	10.06mm
Cold Plate Dimensions	93.5 x 80mm
Weight	2010g
AMD Processors Support	AM5, AM4, TR5, TR4
Intel Processors Support	LGA1851/1700/1200/1150/1151/1155

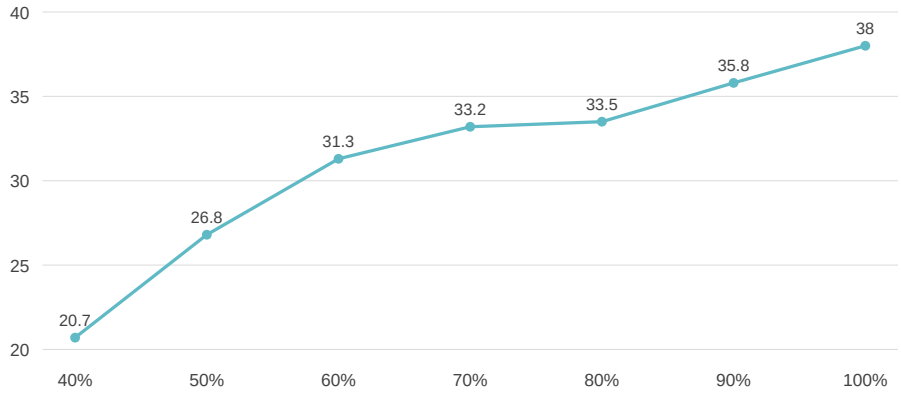
Noise Output and Fan Speed

Table

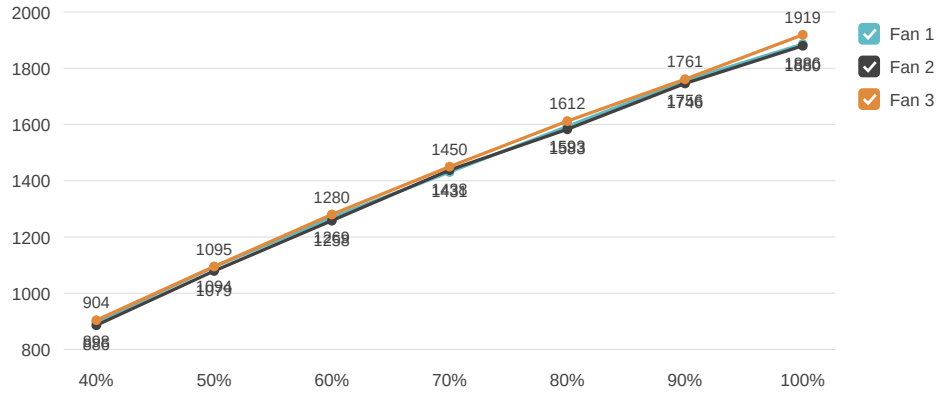
Fan Setting	Noise (dB(A))	Fan 1 (RPM)	Fan 2 (RPM)	Fan 3 (RPM)
40%	20.7	898	886	904
50%	26.8	1094	1079	1095
60%	31.3	1269	1258	1280
70%	33.2	1431	1438	1450
80%	33.5	1593	1583	1612
90%	35.8	1756	1746	1761
100%	38.0	1886	1880	1919

Graphs

Noise



Fan Speed



Fan Speed at Fixed Noise Levels

Noise Level	Fan 1 (RPM)	Fan 2 (RPM)	Fan 3 (RPM)
15 dB(A)	745	745	745
20 dB(A)	865	865	865
25 dB(A)	1020	1020	1020
30 dB(A)	1200	1200	1200
35 dB(A)	1700	1700	1700

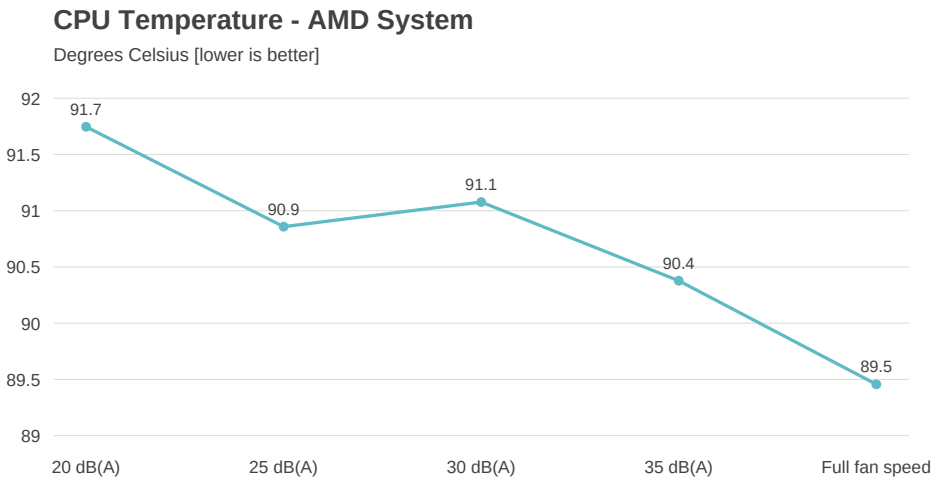
AMD System Test Results

Table

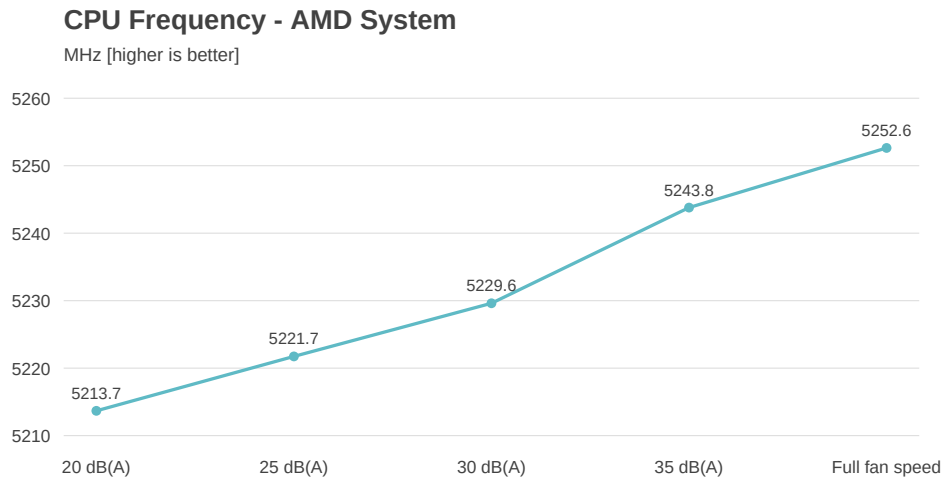
Condition	CPU Temperature (°C)	CPU Frequency (MHz)	CPU Power (W)	Overall Performance
20 dB(A)	91.7	5214	197.1	11199
25 dB(A)	90.9	5222	198.7	11421
30 dB(A)	91.1	5230	196.5	11283
35 dB(A)	90.4	5244	198.9	11538
Full fan speed	89.5	5253	199.1	11692

Graphs

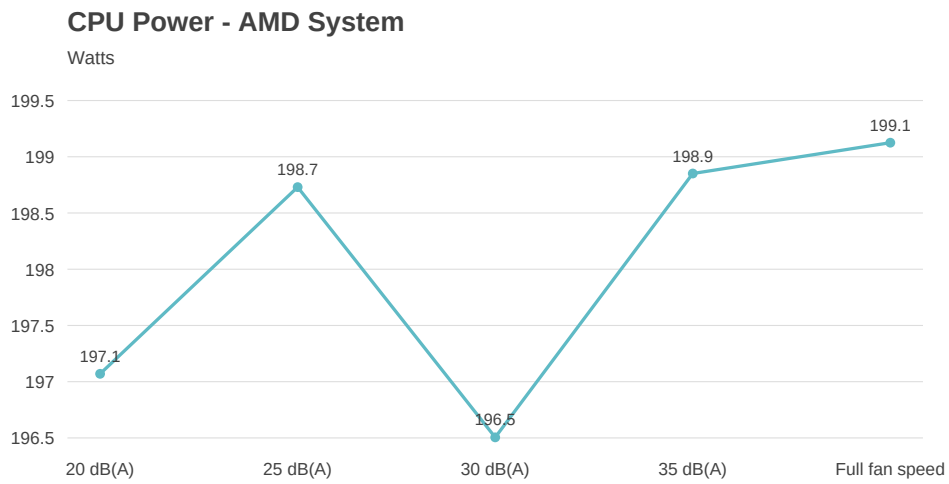
CPU Temperature



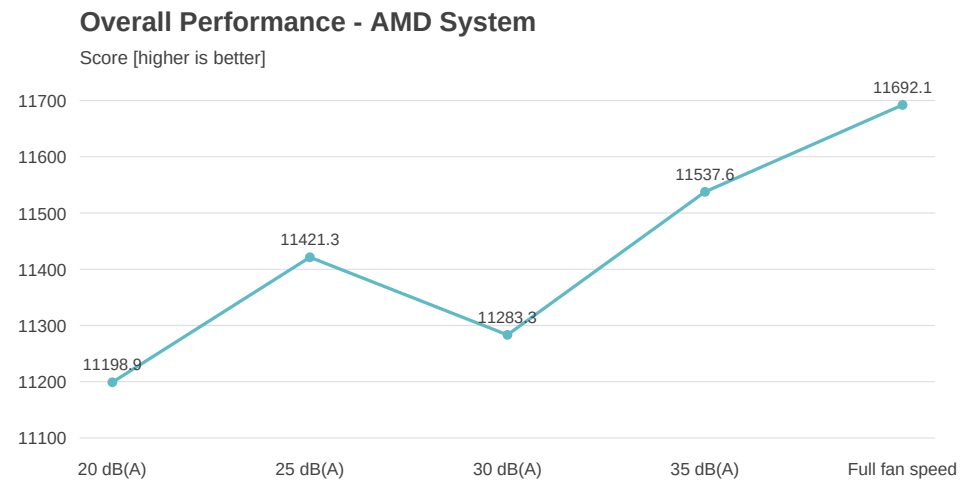
CPU Frequency



CPU Power



Overall Performance



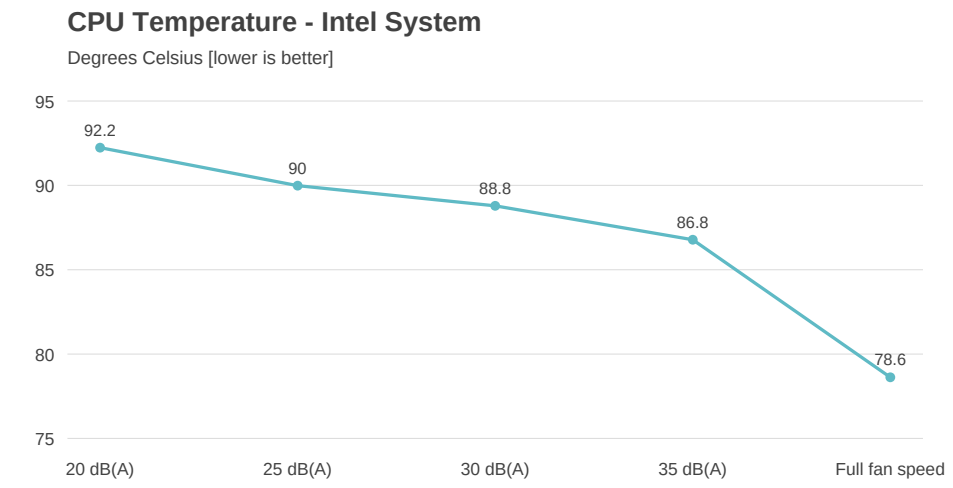
Intel System Test Results

Table

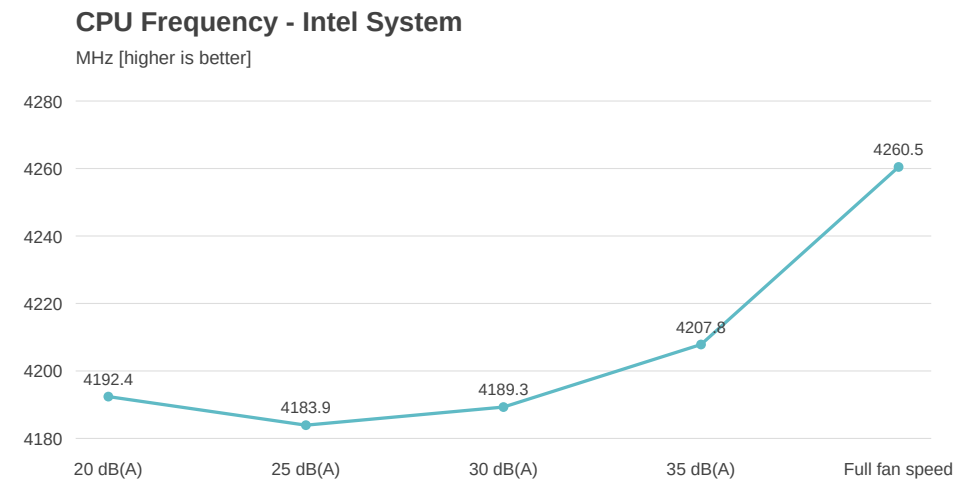
Condition	CPU Temperature (°C)	CPU Frequency (MHz)	CPU Power (W)	Overall Performance
20 dB(A)	92.2	4192	299.6	13615
25 dB(A)	90.0	4184	300.5	13972
30 dB(A)	88.8	4189	299.4	14127
35 dB(A)	86.8	4208	298.3	14464
Full fan speed	78.6	4260	298.5	16174

Graphs

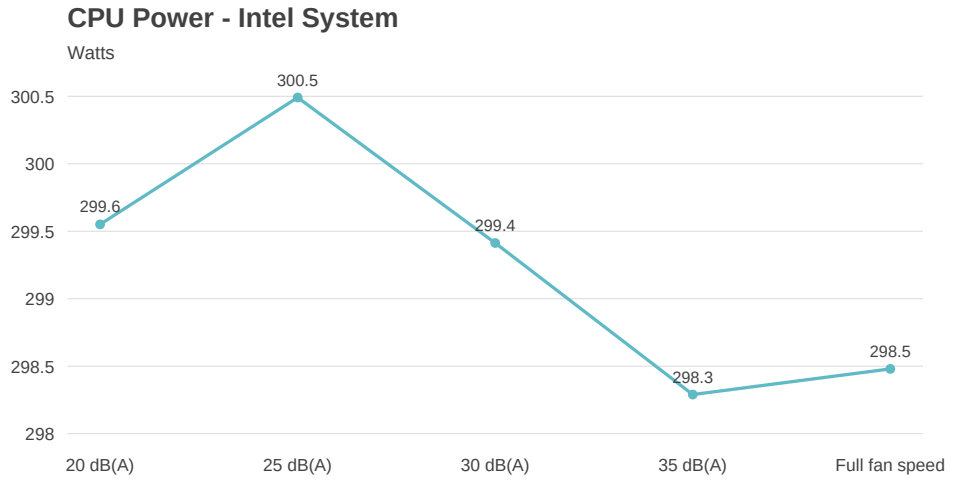
CPU Temperature



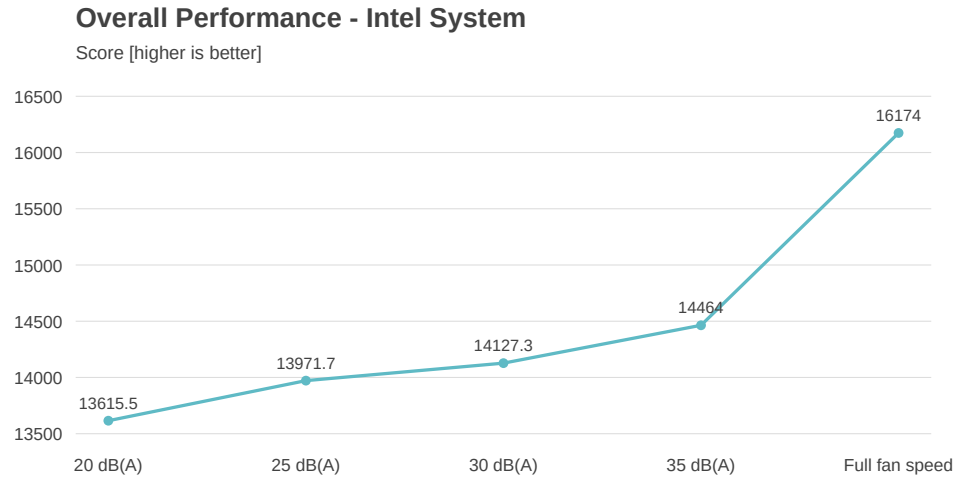
CPU Frequency



CPU Power

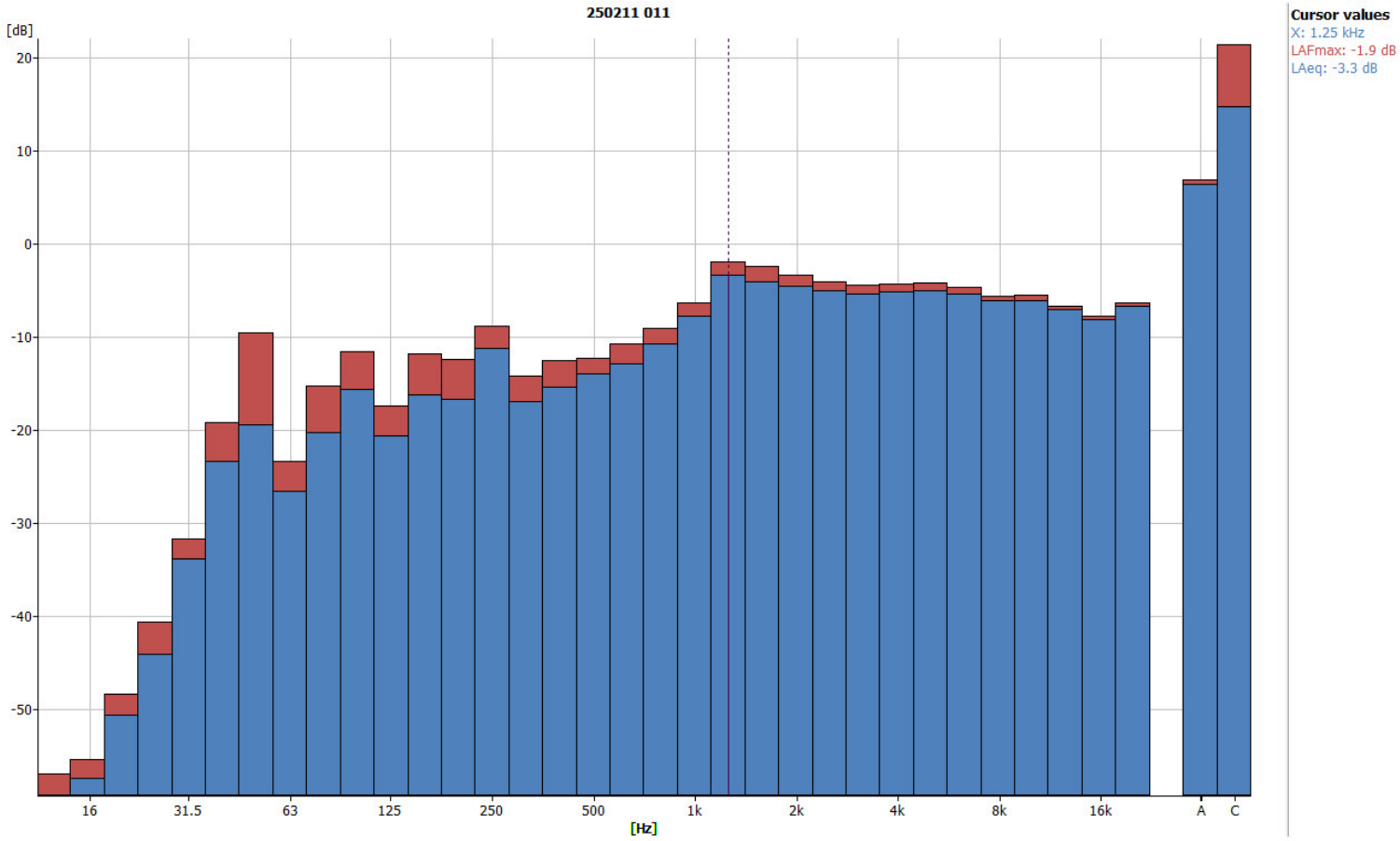


Overall Performance

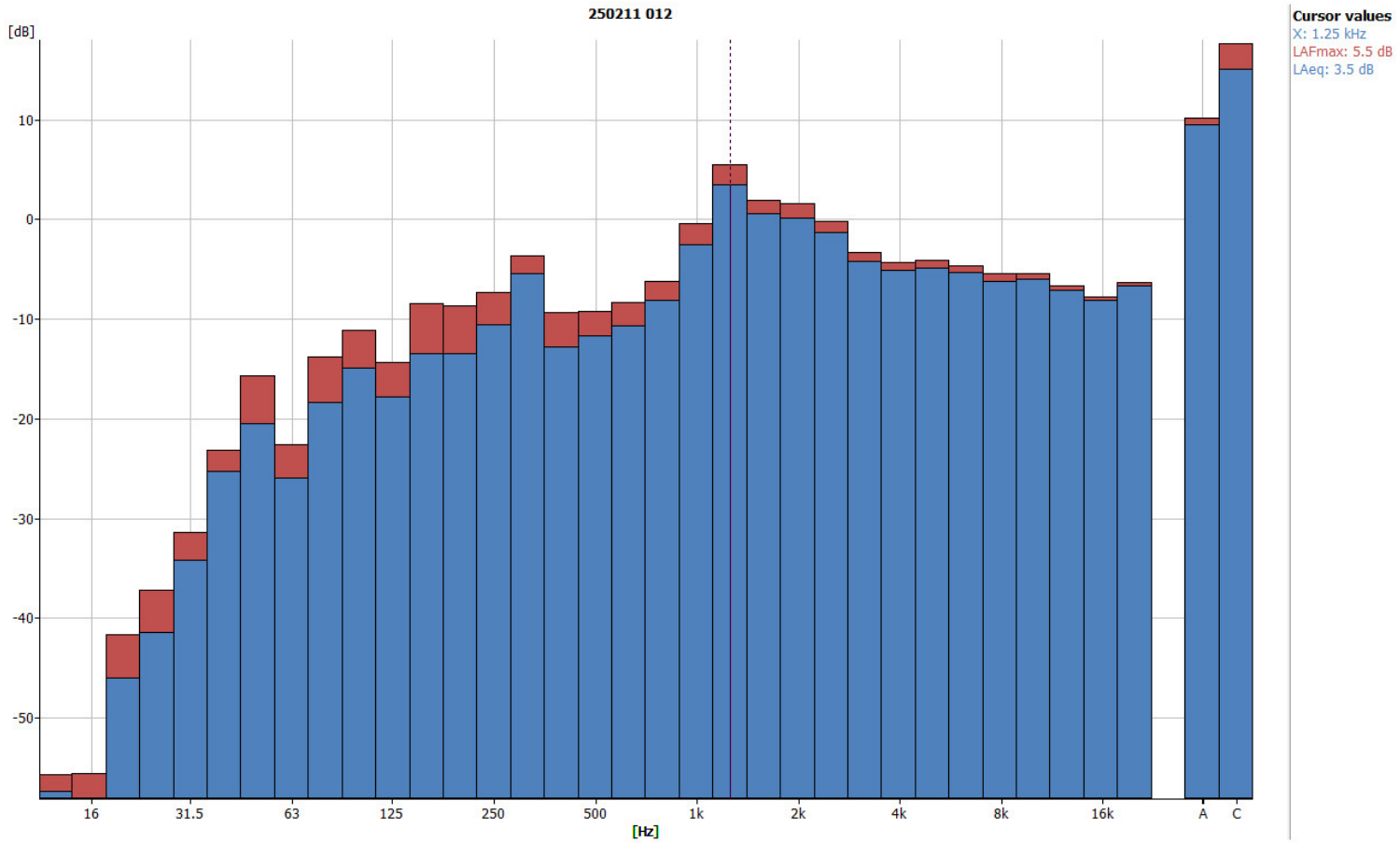


Frequency Plots

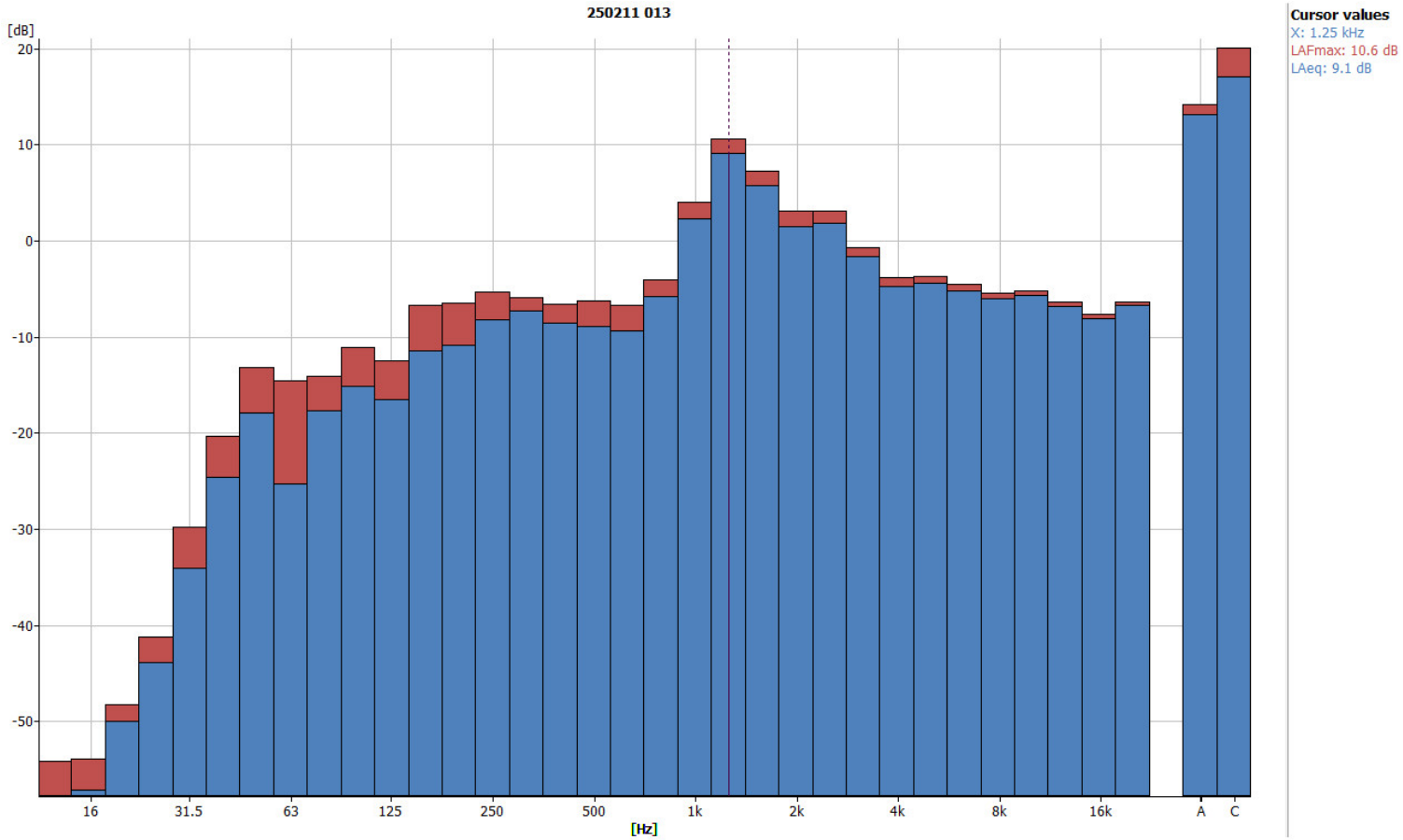
Pump 25%



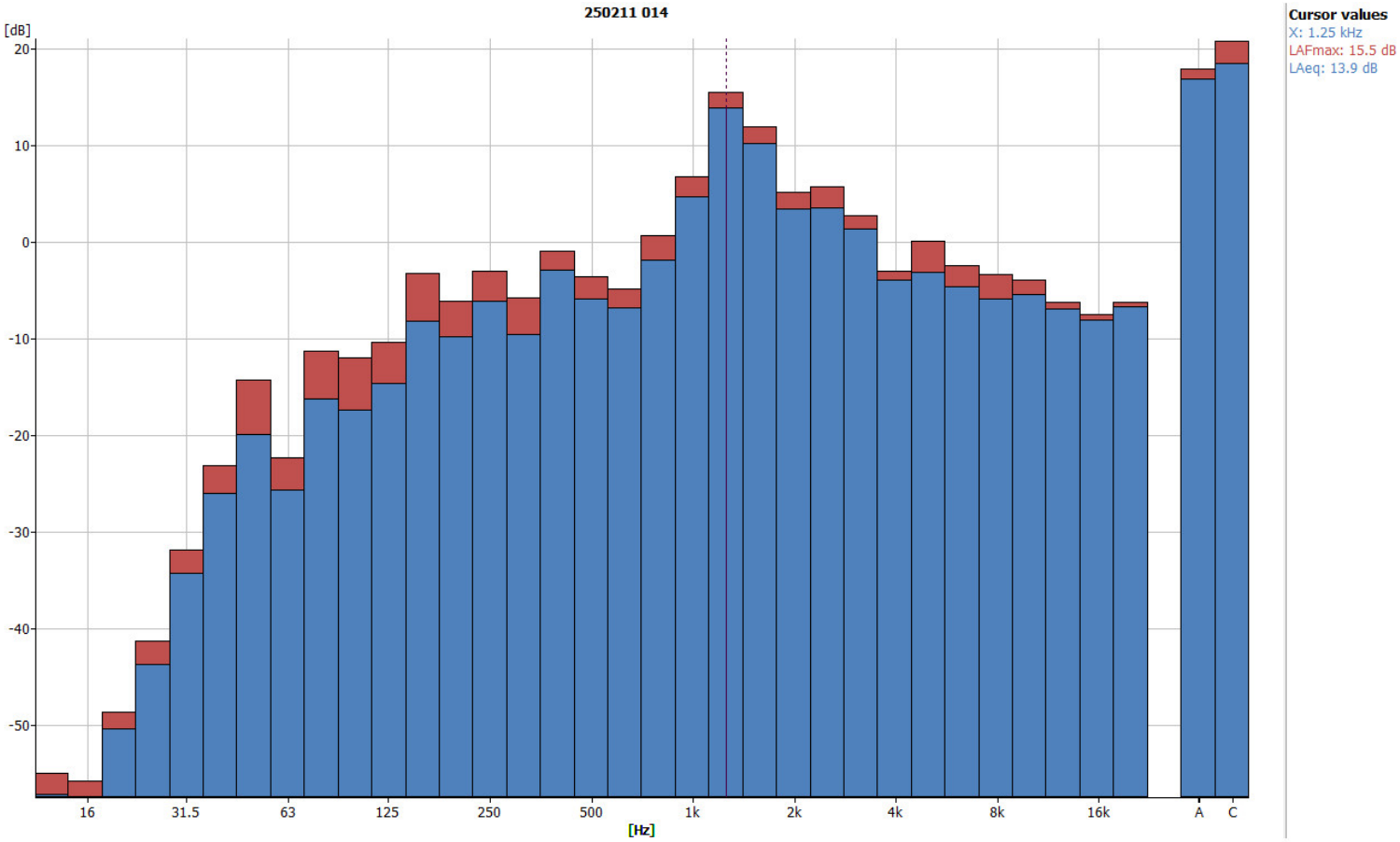
Pump 50%


250211 012
[dB]
10
0
-10
-20
-30
-40
-50
16
31.5
63
125
250
500
1k
2k
4k
8k
16k
A
C
[Hz]
Cursor values
X: 1.25 kHz
LAFmax: 5.5 dB
LAeq: 3.5 dB

Pump 75%


250211 013
[dB]
20
10
0
-10
-20
-30
-40
-50
16
31.5
63
125
250
500
1k
2k
4k
8k
16k
A
C
[Hz]
Cursor values
X: 1.25 kHz
LAFmax: 10.6 dB
LAeq: 9.1 dB

Pump 100%


250211 014
[dB]
20
10
0
-10
-20
-30
-40
-50
16
31.5
63
125
250
500
1k
2k
4k
8k
16k
A
C
[Hz]
Cursor values
X: 1.25 kHz
LAFmax: 15.5 dB
LAeq: 13.9 dB

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