



**Sound Power Compliance
Boggabri Coal Mobile Fleet
2023
Revision 0**

Prepared By:	Michael Thearle
Date:	15 January 2024
Telephone:	0437 345 297
Email:	michael@thearle.net.au
Address:	Branxton NSW 2335

Report - Sound Power Compliance - 2023

This report has been prepared within the specific requirements agreed upon between Thearle Engineering and Boggabri Coal. This report was prepared with background information, terms of reference and assumptions agreed with the Boggabri Coal. The report is not intended for use by any other individual or organisation. Thearle Engineering will not accept liability for use of the information contained in this report, other than that which was intended at the time of writing.

Introduction:

Thearle Engineering has prepared this report at the request of Boggabri Coal. This report details the results of the annual requirement of sound power testing of 1/3 of the attenuated HME fleet as required by the current Boggabri Coal Noise Management Plan. The testing has been conducted and reported to maintain consistency with previous sound power testing conducted onsite. The machines were tested utilising methodologies consistent with current testing methods employed onsite and throughout the NSW Coal Industry.

In accordance with the Noise Management Plan, the equipment has been assessed such that when a piece of equipment measures greater than 3 dB against the operational specification, the equipment is regarded as non-compliant and recommended courses of action are provided below.

6.5 Mobile plant monitoring

In accordance with Condition 9 of Schedule 3, equipment and noise control measures used at BCM will have their Sound Power Levels quantified once every three years. BCOPL will test a third of the

equipment each year to achieve a representative sample. The result of this monitoring will be assessed annually against the Sound Power Levels used in the EA (Hansen Bailey, 2010). Any plant found to be exceeding its required Sound Power Level by 3 dB or more will, within the next 12 month period, either be modified via reasonable and feasible attenuation methods or other means (if appropriate), or taken out of service. The exceeding machine will then be re-tested during the next round of monitoring. Where required, the level of acoustic attenuation supplied on new mobile mining equipment will be reviewed against the EA to determine if repairs are required to any existing attenuation.

This annual monitoring program of attenuated plant will aim to assess the effectiveness of the attenuation. Equipment and noise control measures will be maintained to deliver sound power levels that are equal to or better than the sound power levels identified in the EA.

The results of the monitoring and attenuation program will be included in the BCOPL Annual Review, which will be made publically available on the BCM website ([Idemitsu Approvals, Plans & Reports - Idemitsu](#))

Extract from Boggabri Coal Noise Management Plan

Referenced Standards:

ISO 3744:2010	Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane
AS ISO 6393:2019	Earth-moving machinery – Determination of sound power level Stationary test conditions
AS ISO 6395:2020	Earth-moving machinery – Determination of sound power level Dynamic test conditions
MDG15	Guideline for mobile and transportable equipment for use in mines
Noise-Management-Rev13-April-2019-Final	Boggabri Coal Operations Pty Ltd Noise Management Plan April 2019, Revision No. 13
J0130-30-R2	Boggabri Coal Pty Limited Acoustic Impact Assessment Continuation of Boggabri Coal Mine Environmental Assessment 12 October 2010

Test Configuration:

In accordance with previous years of Annual Sound Testing, testing has been conducted using the methods described in AS ISO 6393 and AS ISO 6395. Haul Truck dynamic testing has been adjusted to Uphill Loaded and Downhill Unloaded. Water Cart and Service Cart dynamic testing has been adjusted to Uphill and Downhill Loaded. The methodology utilised is noted in the test results.

Note: Where the Acoustic Impact Assessment reports values to 1 significant figure, these have been rounded to the nearest integer to align with the requirements of ISO 3744:2010.

Testing Equipment:

Class I Sound Meters Pattern Approved to IEC 61672:2013 and IEC 61260:2014.

	Serial Number	Microphone and Preamp Serial Number	Calibration Date	Calibration Expiry
NTI XL2-TA	A2A-18907-E0	A20339 / 9696	11/08/2023	11/08/2025
NTI XL2-TA	A2A-18699-E0	A20326 / 9691	11/08/2023	11/08/2025
NTI XL2-TA	A2A-18906-E0	A19781 / 9601	11/08/2023	11/08/2025
NTI XL2-TA	A2A-15022-E0	A16148 / 7762	16/01/2023	16/01/2025
NTI XL2-TA	A2A-15297-E0	A16173 / 9954	13/01/2023	13/01/2025
NTI XL2-TA	A2A-14999-E0	A16149 / 1888	10/01/2023	10/01/2025
NTI XL2-TA	A2A-15111-E0	A15916 / 7633	20/09/2021	20/09/2023
NTI XL2-TA	A2A-14826-E0	A17538 / 8479	14/10/2021	14/10/2023
NTI XL2-TA	A2A-14797-E0	A15893 / 7656	20/09/2021	20/09/2023
Precision Calibrator CAL200	16048		22/12/2022	22/12/2023
Precision Calibrator CAL200	15642		22/12/2022	22/12/2023

Calibration Certificates are supplied separately on request.

Atmospheric Conditions:

Test Date:	Temperature	Wind Speed	Barometric Pressure	Relative Humidity
11/07/2023	16 °C	< 10KPH	1025 hPa	45 %
27/09/2023	30 °C	< 20KPH	1018 hPa	20 %
28/09/2023	31 °C	< 20KPH	1022 hPa	25 %
18/10/2023	28 °C	< 30KPH	1024 hPa	30 %
19/10/2023	29 °C	< 20KPH	1020 hPa	30 %
16/11/2023	37 °C	< 30KPH	1007 hPa	20 %
17/11/2023	31 °C	< 30KPH	1012 hPa	25 %
23/11/2023	25 °C	< 20KPH	1019 hPa	70 %
24/11/2023	25 °C	< 20KPH	1017 hPa	80 %
04/12/2023	31 °C	< 20KPH	1014 hPa	25 %
05/12/2023	30 °C	< 20KPH	1017 hPa	30 %
12/12/2023	35 °C	< 20KPH	1012 hPa	27 %
13/12/2023	32 °C	< 20KPH	1013 hPa	35 %

Results:

Unit Number	Model	Test Date	Stationary	Forwards	Reverse	Boggabri Coal Target	Exceedance	Compliant
TD02	D475A	16/11/2023	104 dBA / 117 dB	108 dBA / 119 dB	109 dBA / 119 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD04	D475A	16/11/2023	104 dBA / 117 dB	110 dBA / 119 dB	112 dBA / 120 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD11	D11T	05/12/2023	109 dBA / 120 dB	112 dBA / 121 dB	115 dBA / 122 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD074	D475A	17/11/2023	105 dBA / 115 dB	111 dBA / 118 dB	114 dBA / 119 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD079	D475A	17/11/2023	105 dBA / 116 dB	110 dBA / 119 dB	113 dBA / 120 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD081	D475A	17/11/2023	106 dBA / 116 dB	115 dBA / 120 dB	115 dBA / 121 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD090	D375A	13/12/2023	108 dBA / 116 dB	111 dBA / 117 dB	113 dBA / 118 dB	116 dBA / 126 dB	- dBA / - dB	Yes
TD093	D375A	13/12/2023	108 dBA / 116 dB	111 dBA / 118 dB	114 dBA / 119 dB	116 dBA / 126 dB	- dBA / - dB	Yes
GR060	16M	17/11/2023	106 dBA / 114 dB	105 dBA / 114 dB	Not Applicable	115 dBA / 126 dB	- dBA / - dB	Yes
GR063	24M	17/11/2023	108 dBA / 117 dB	108 dBA / 117 dB	Not Applicable	115 dBA / 126 dB	- dBA / - dB	Yes
WL02	992K	05/12/2023	110 dBA / 121 dB	110 dBA / 119 dB	111 dBA / 120 dB	117 dBA / 126 dB	- dBA / - dB	Yes
WL03	992K	05/12/2023	109 dBA / 118 dB	111 dBA / 119 dB	112 dBA / 120 dB	117 dBA / 126 dB	- dBA / - dB	Yes
WL189	WA320	16/11/2023	101 dBA / 115 dB	101 dBA / 117 dB	111 dBA / 117 dB	117 dBA / 126 dB	- dBA / - dB	Yes

Unit Number	Model	Test Date	Stationary	Uphill	Downhill	Boggabri Coal Target	Exceedance	Compliant
WC042	730E	04/12/2023	112 dBA / 121 dB	113 dBA / 125 dB	116 dBA / 121 dB	117 dBA / 128 dB	- dBA / - dB	Yes
WC043	730E	04/12/2023	114 dBA / 123 dB	115 dBA / 125 dB	117 dBA / 123 dB	117 dBA / 128 dB	- dBA / - dB	Yes
WC044	730E	04/12/2023	114 dBA / 122 dB	115 dBA / 125 dB	116 dBA / 121 dB	117 dBA / 128 dB	- dBA / - dB	Yes
WC691	777D	04/12/2023	113 dBA / 118 dB	115 dBA / 120 dB	113 dBA / 118 dB	117 dBA / 128 dB	- dBA / - dB	Yes
ST4090	740B	12/12/2023	111 dBA / 118 dB	116 dBA / 122 dB	115 dBA / 120 dB	117 dBA / 128 dB	- dBA / - dB	Yes
DT178	HD1500	28/09/2023	114 dBA / 120 dB	115 dBA / 120 dB	114 dBA / 119 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT180	HD1500	28/09/2023	114 dBA / 121 dB	116 dBA / 124 dB	115 dBA / 119 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT181	HD1500	19/10/2023	115 dBA / 119 dB	114 dBA / 120 dB	113 dBA / 119 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT268	730E	19/10/2023	113 dBA / 123 dB	114 dBA / 124 dB	116 dBA / 121 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT310	EH3500	11/07/2023	111 dBA / 121 dB	114 dBA / 124 dB	113 dBA / 123 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT325	EH3500	11/07/2023	112 dBA / 118 dB	113 dBA / 120 dB	115 dBA / 120 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT326	EH3500	11/07/2023	117 dBA / 121 dB	117 dBA / 122 dB	116 dBA / 120 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT327	EH3500	11/07/2023	111 dBA / 117 dB	113 dBA / 120 dB	115 dBA / 120 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes



Unit Number	Model	Test Date	Stationary	Uphill	Downhill	Boggabri Coal Target	Exceedance	Compliant
DT364	789C	28/07/2023	113 dBA / 120 dB	115 dBA / 121 dB	112 dBA / 119 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT365	789C	18/10/2023	113 dBA / 119 dB	115 dBA / 122 dB	114 dBA / 122 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT366	789C	27/09/2023	114 dBA / 120 dB	116 dBA / 121 dB	113 dBA / 120 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes
DT367	789C	12/12/2023	114 dBA / 120 dB	116 dBA / 122 dB	113 dBA / 120 dB	117 dBA / 126 dB Flat Ground 119 dBA / 125 dB Uphill	- dBA / - dB	Yes

Unit Number	Model	Test Date	Stationary	Dynamic	Boggabri Coal Target	Exceedance	Compliant
EX125	9400	23/11/2023	113 dBA / 119 dB	115 dBA / 121 dB	120 dBA / 130 dB	- dBA / - dB	Yes
EX129	9400	23/11/2023	113 dBA / 119 dB	115 dBA / 120 dB	120 dBA / 130 dB	- dBA / - dB	Yes
EX258	EX1900	24/11/2023	120 dBA / 125 dB	120 dBA / 127 dB	120 dBA / 130 dB	- dBA / - dB	Yes
EX259	EX2600	24/11/2023	120 dBA / 124 dB	120 dBA / 124 dB	120 dBA / 130 dB	- dBA / - dB	Yes



Appendix A

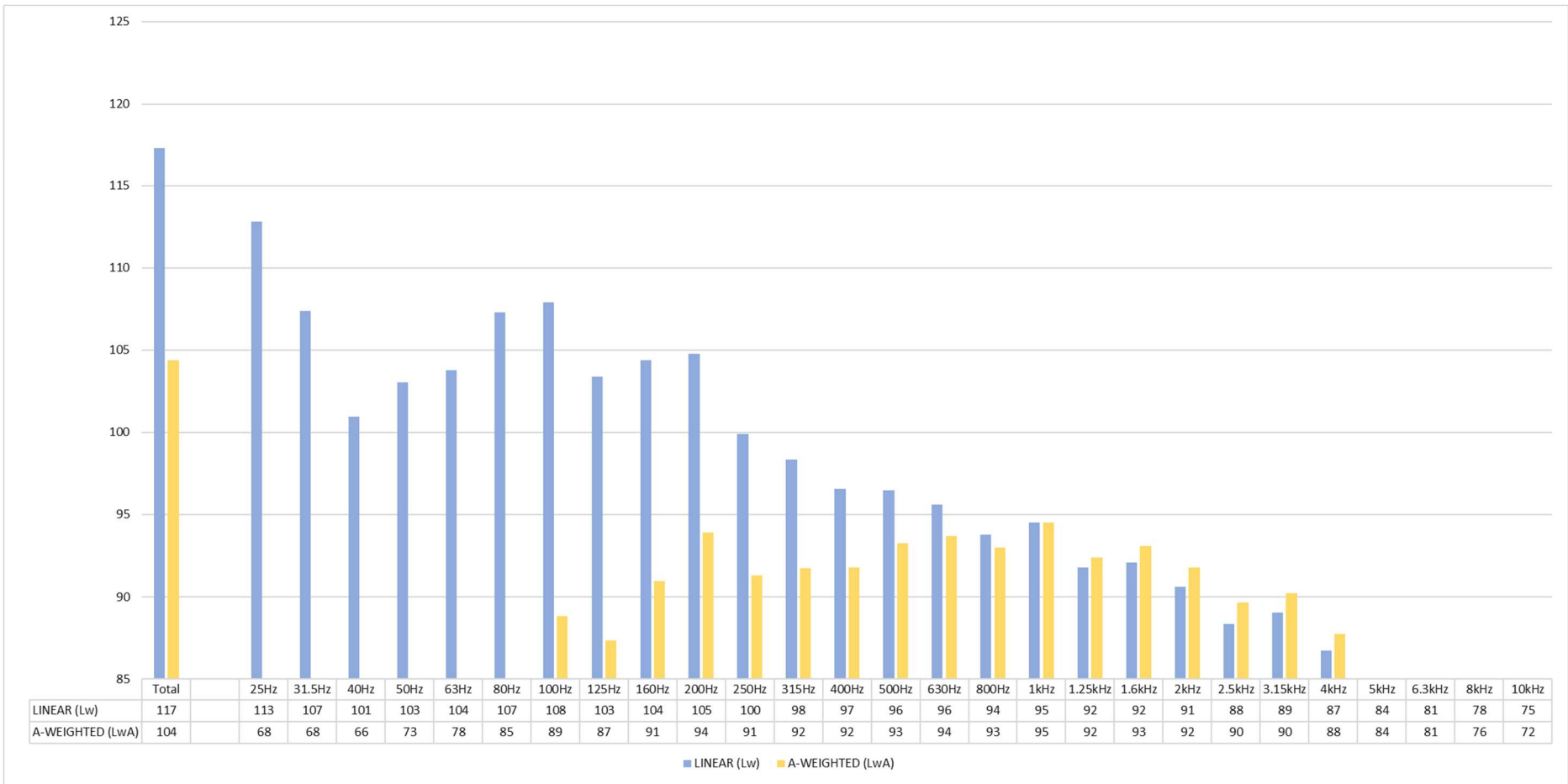


Figure I: TD02 Stationary

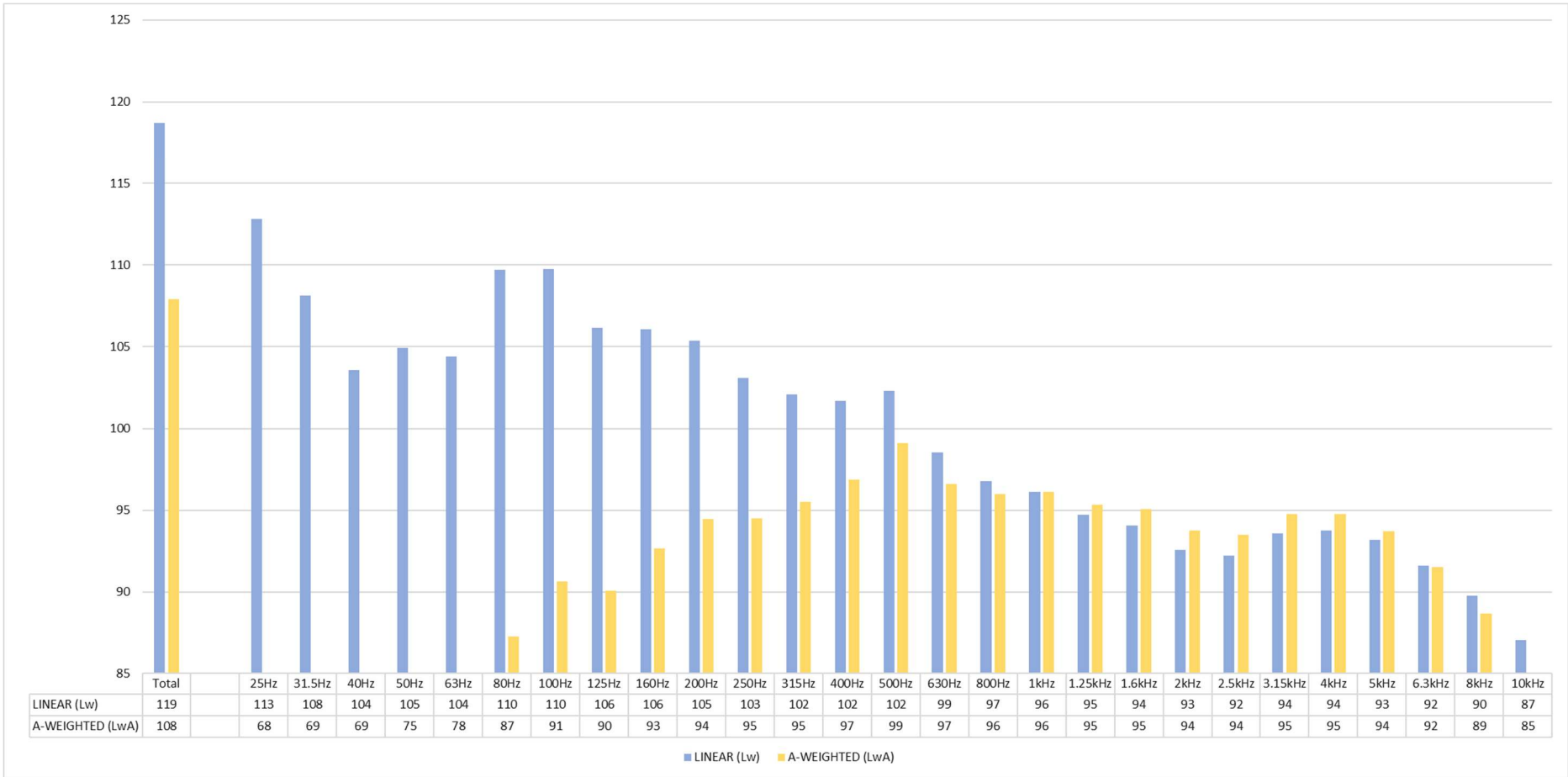


Figure 2: TD02 Forwards

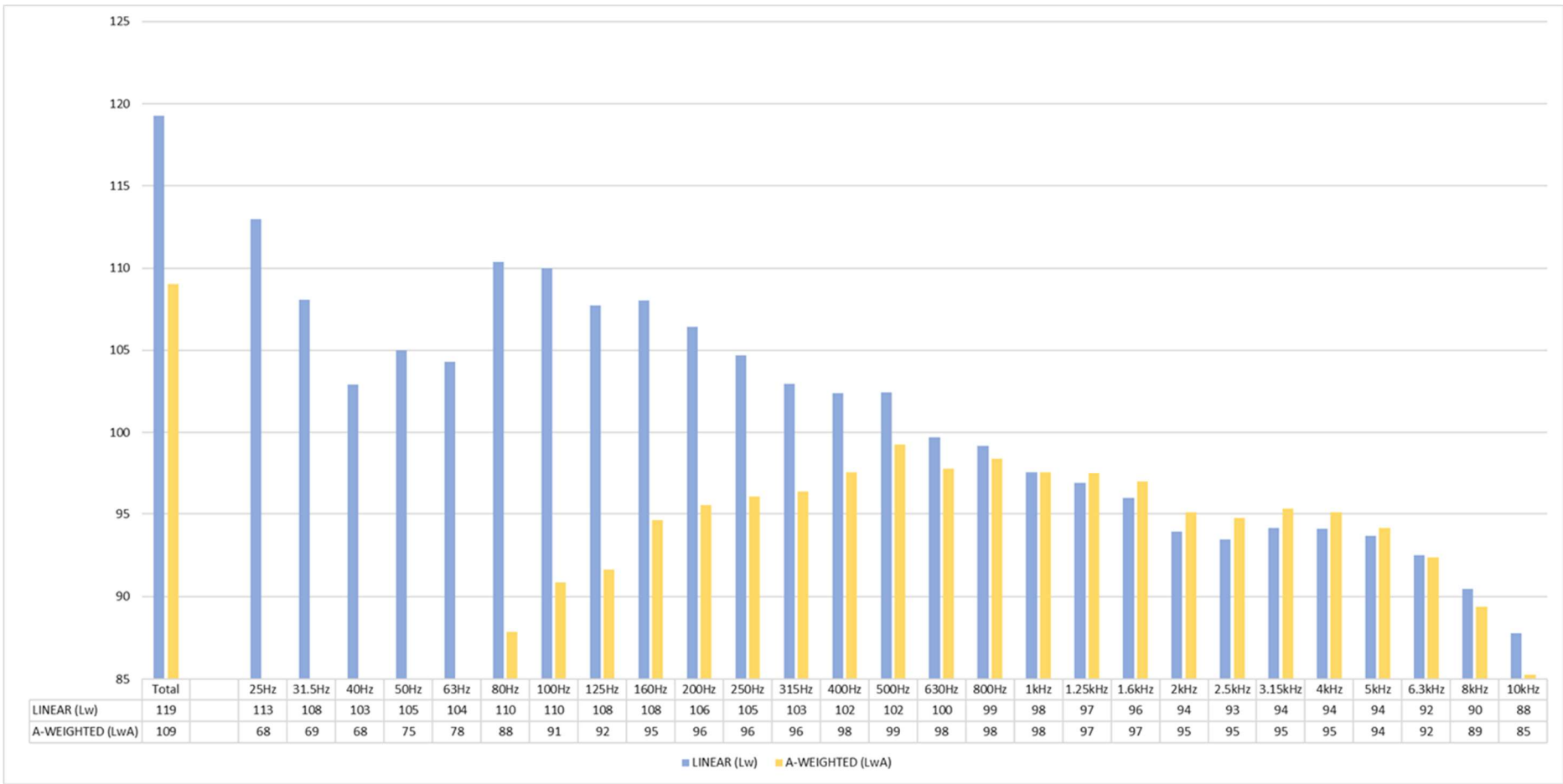


Figure 3: TD02 Reverse

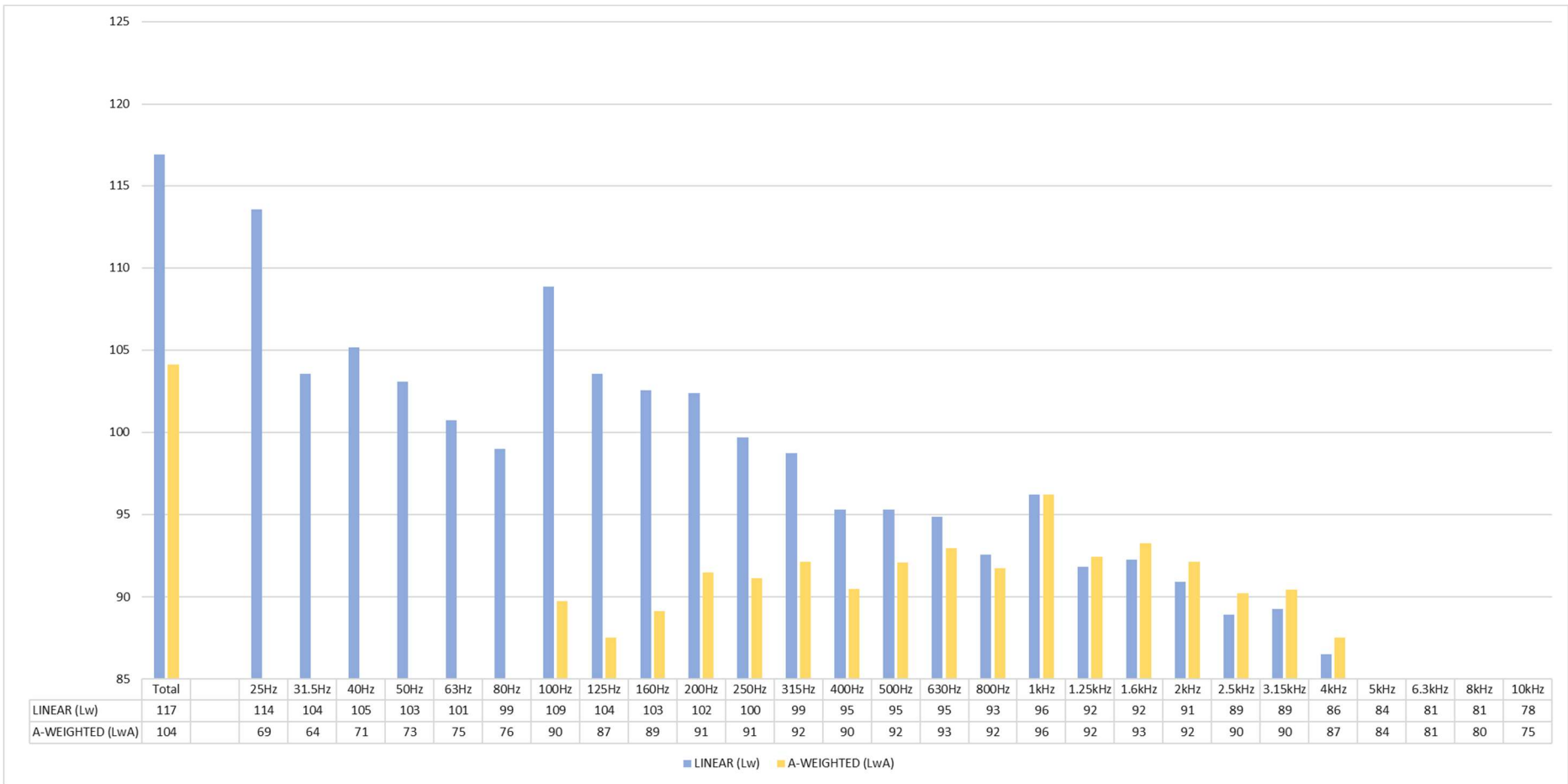


Figure 4: TD04 Stationary

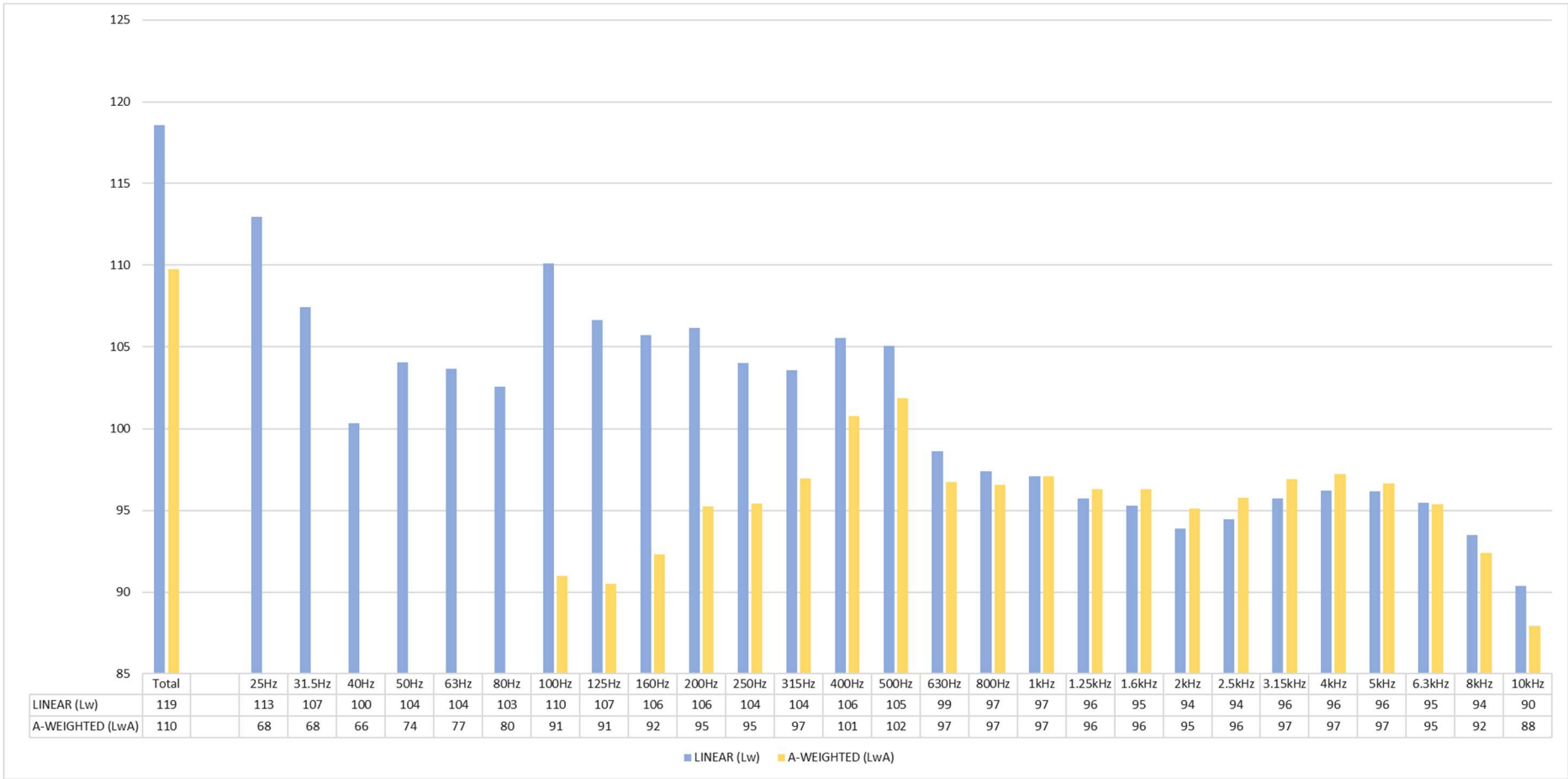


Figure 5: 524 TD04 Forwards

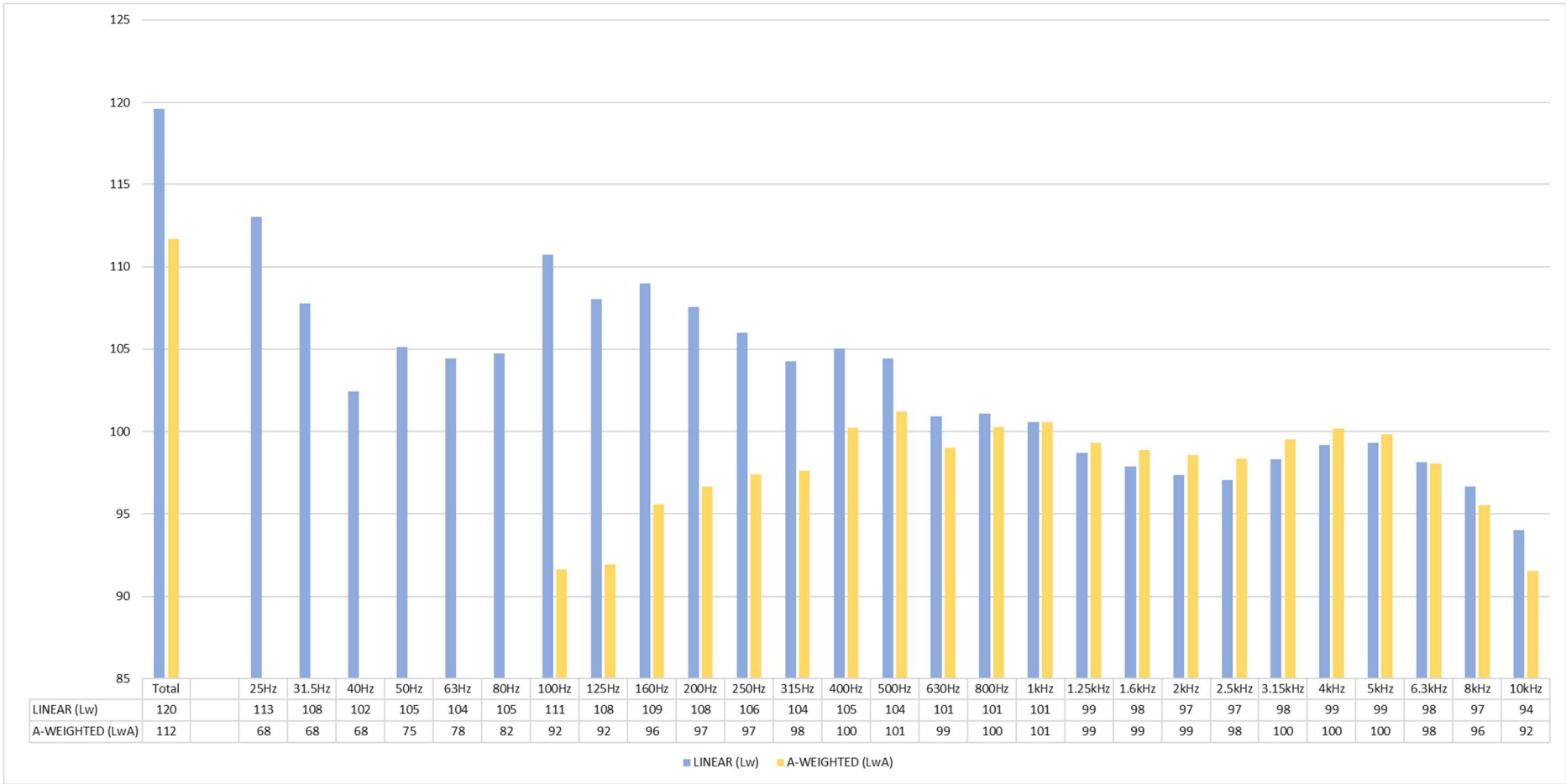


Figure 6: TD04 Reverse

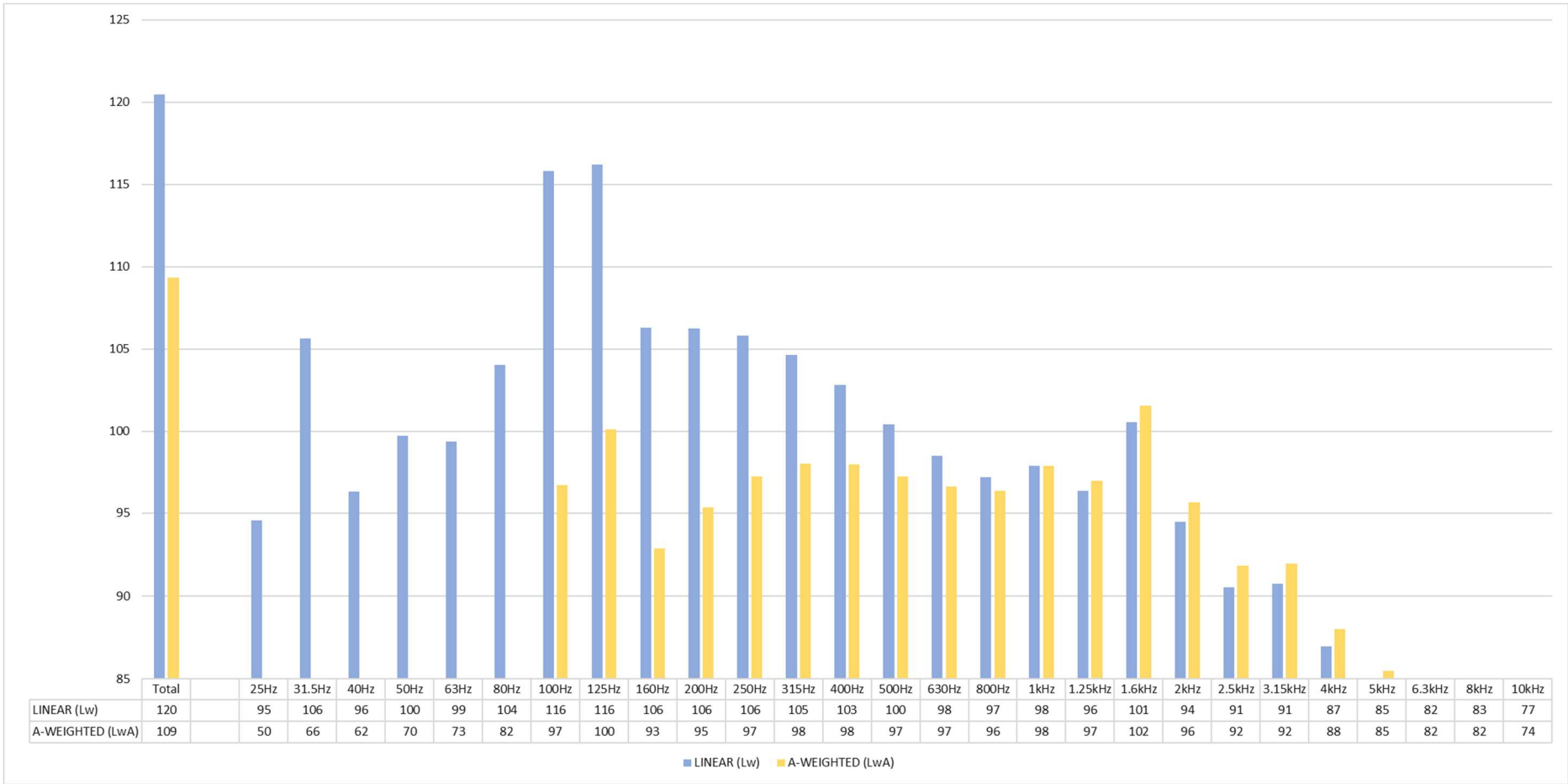


Figure 7: TDII Stationary

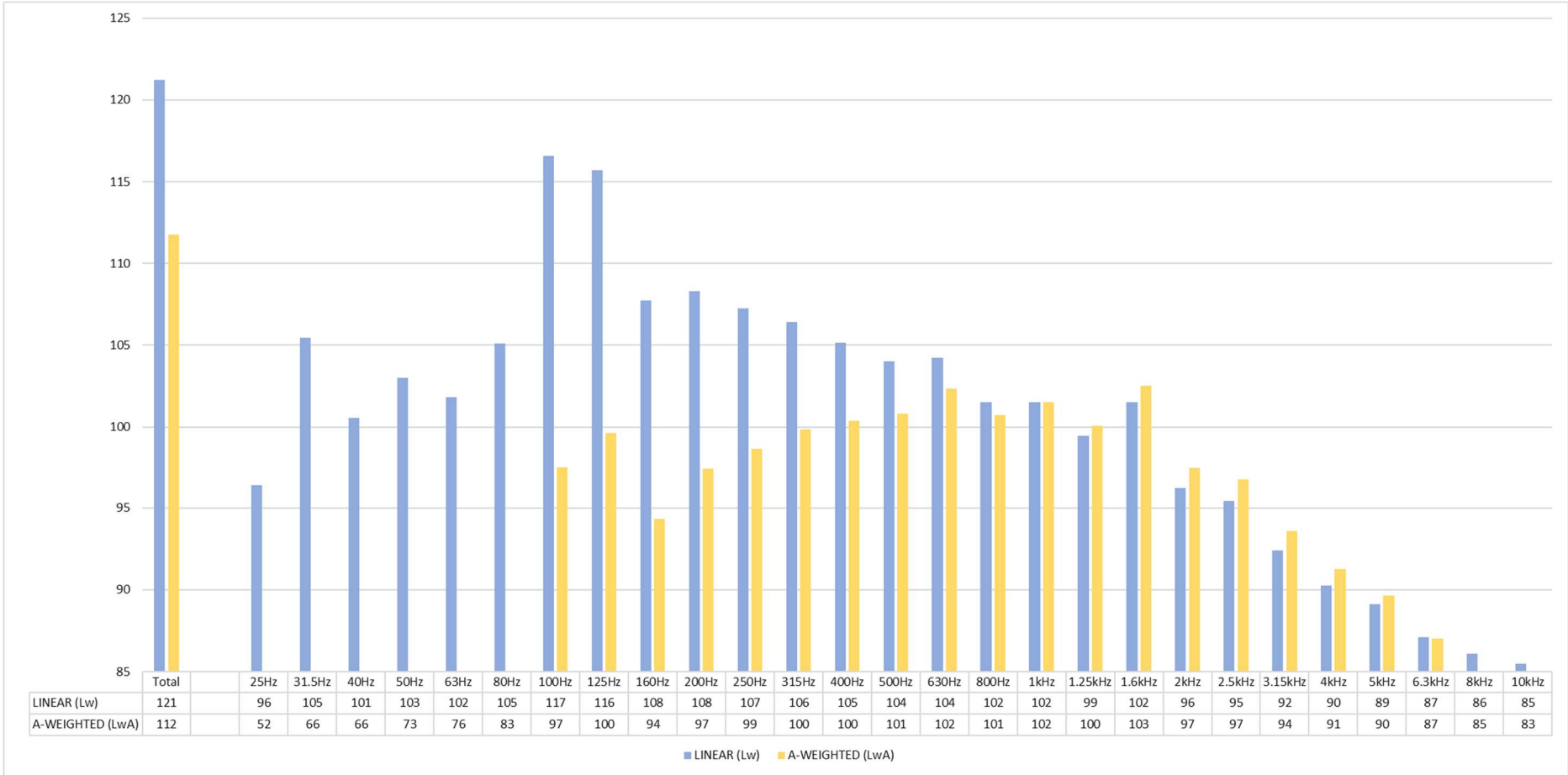


Figure 8: TDI I Forwards

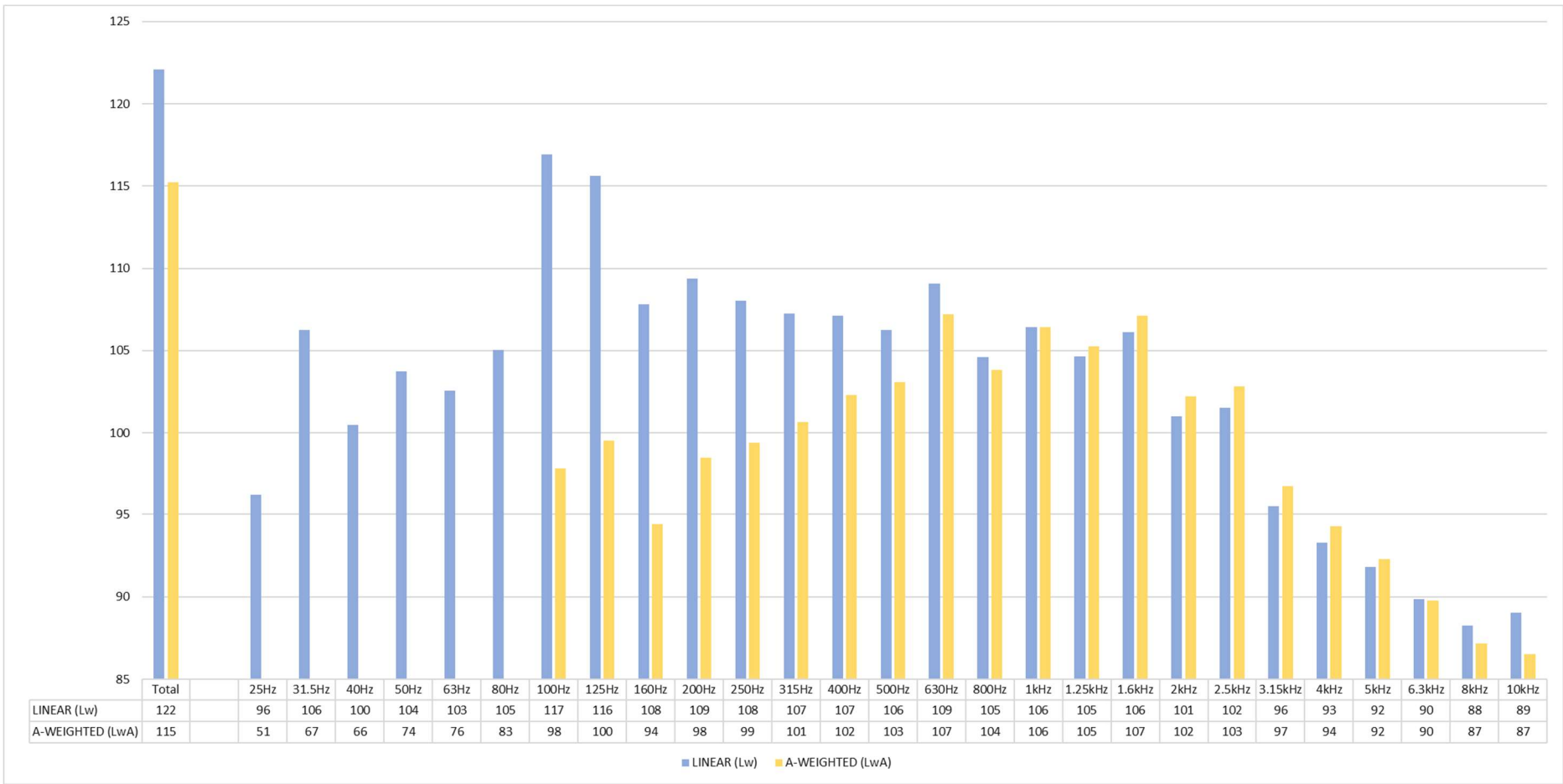


Figure 9: TDII Reverse

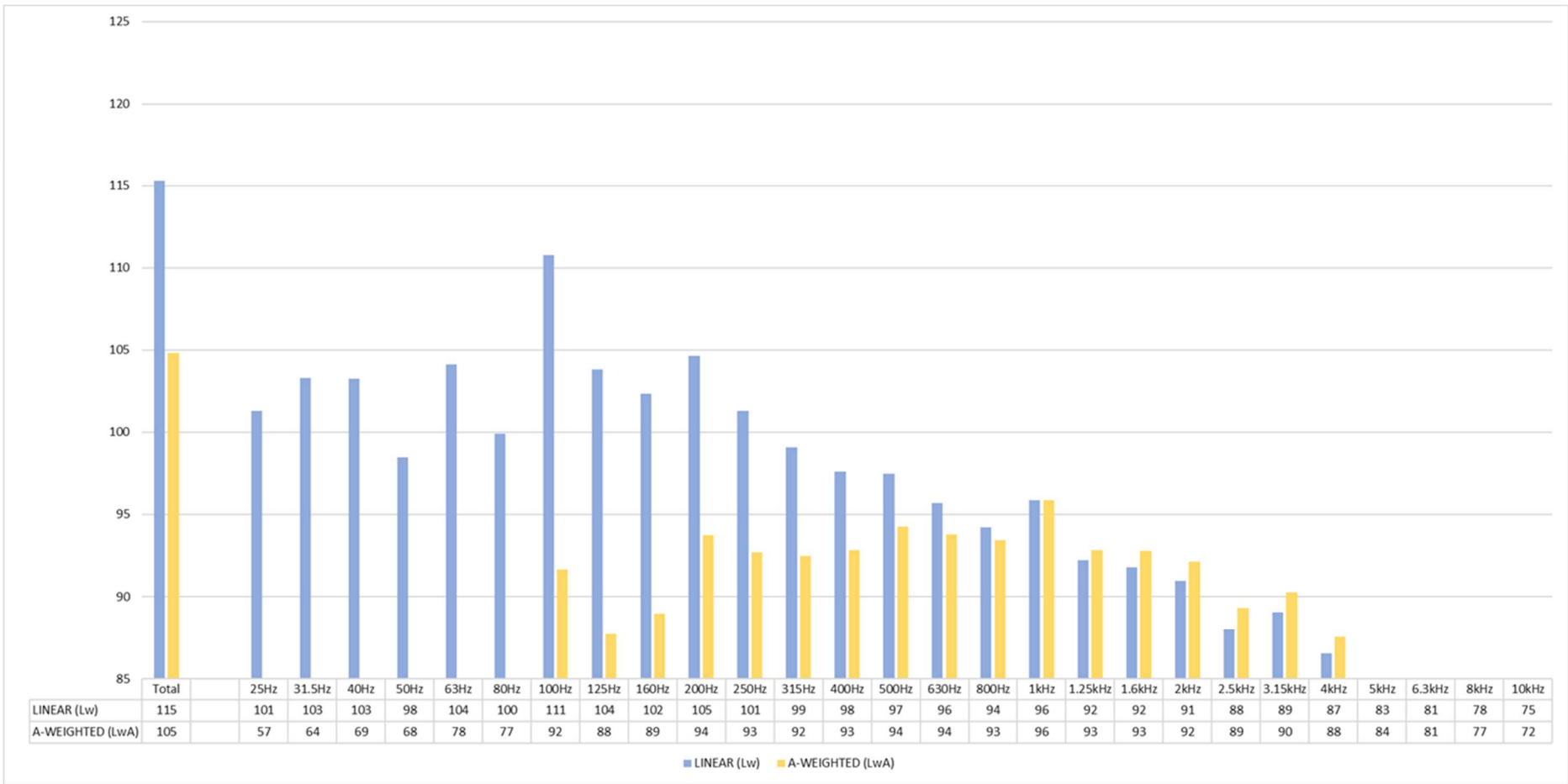


Figure 10: TD074 Stationary

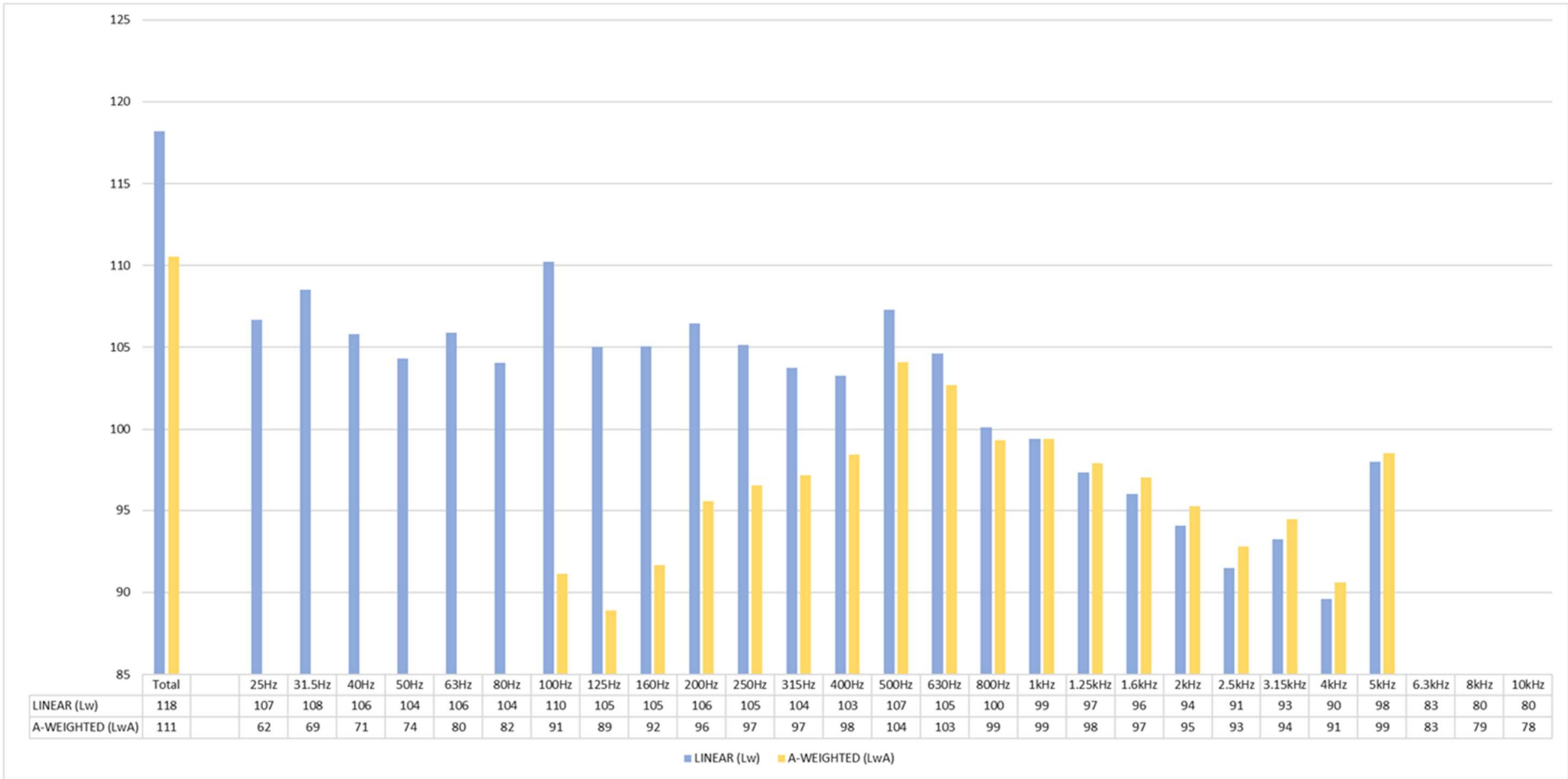


Figure 11: TD074 Forwards

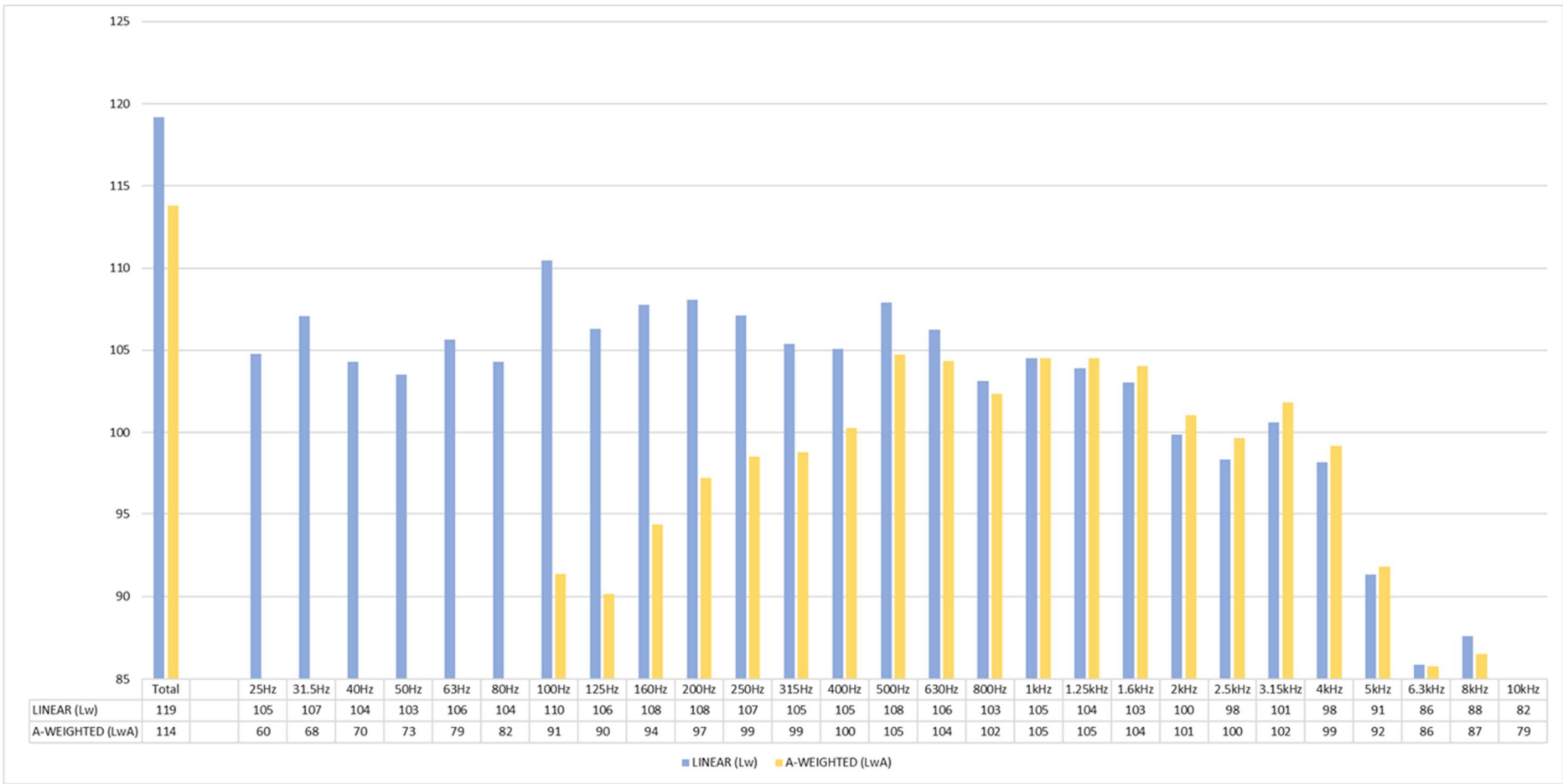


Figure I2: TD074 Reverse

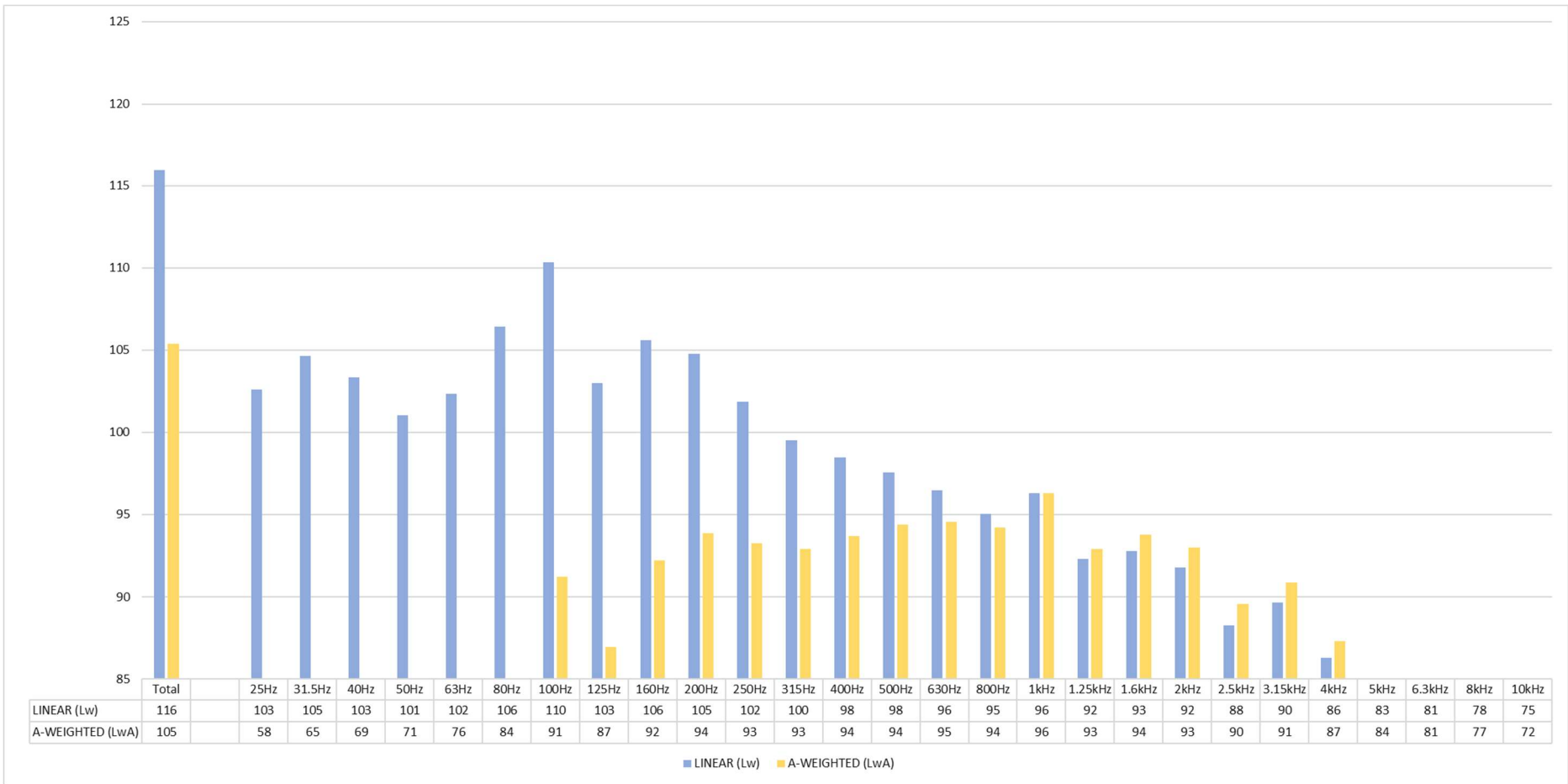


Figure I3: TD079 Stationary

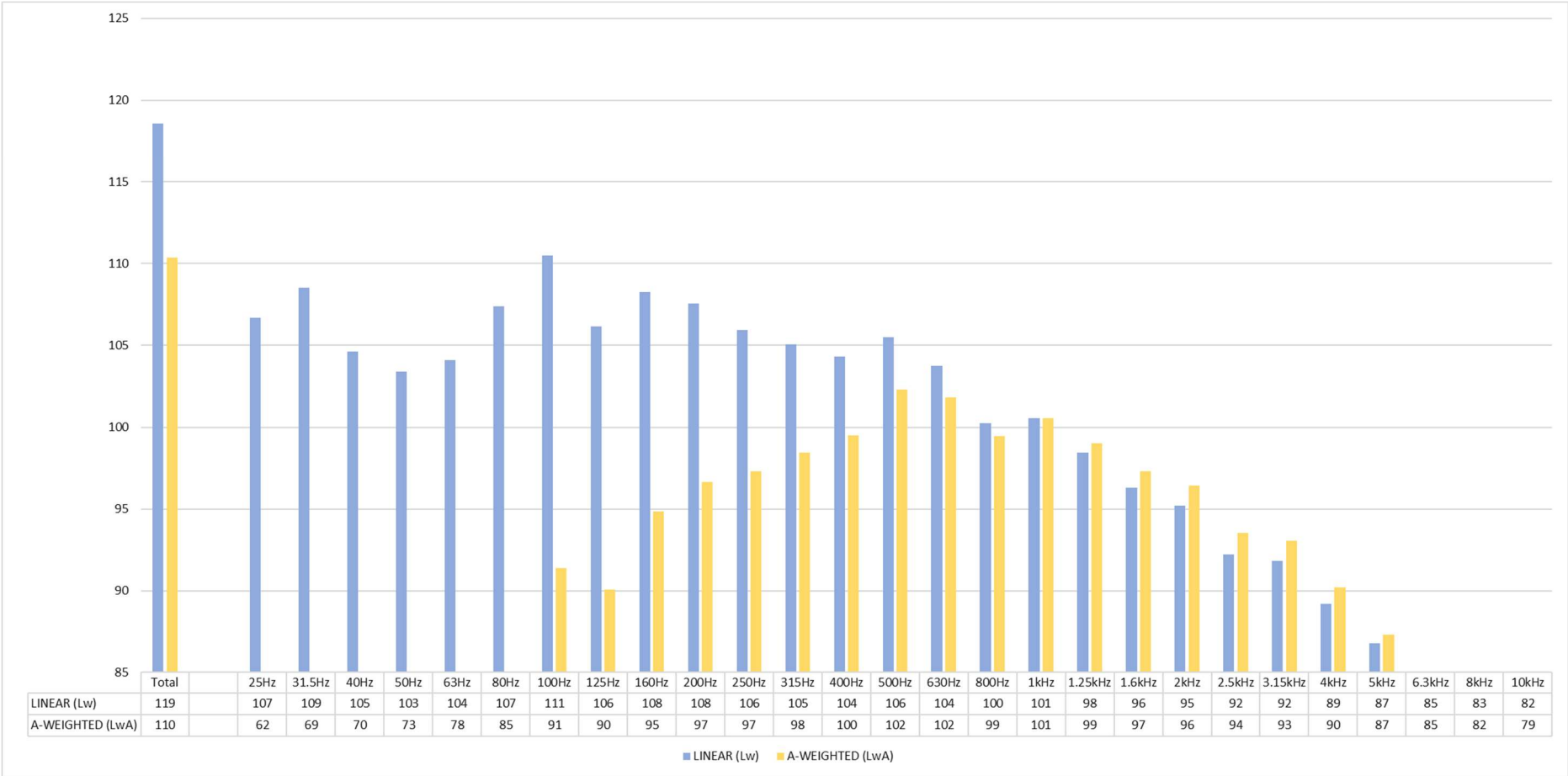


Figure 14: TD079 Forwards

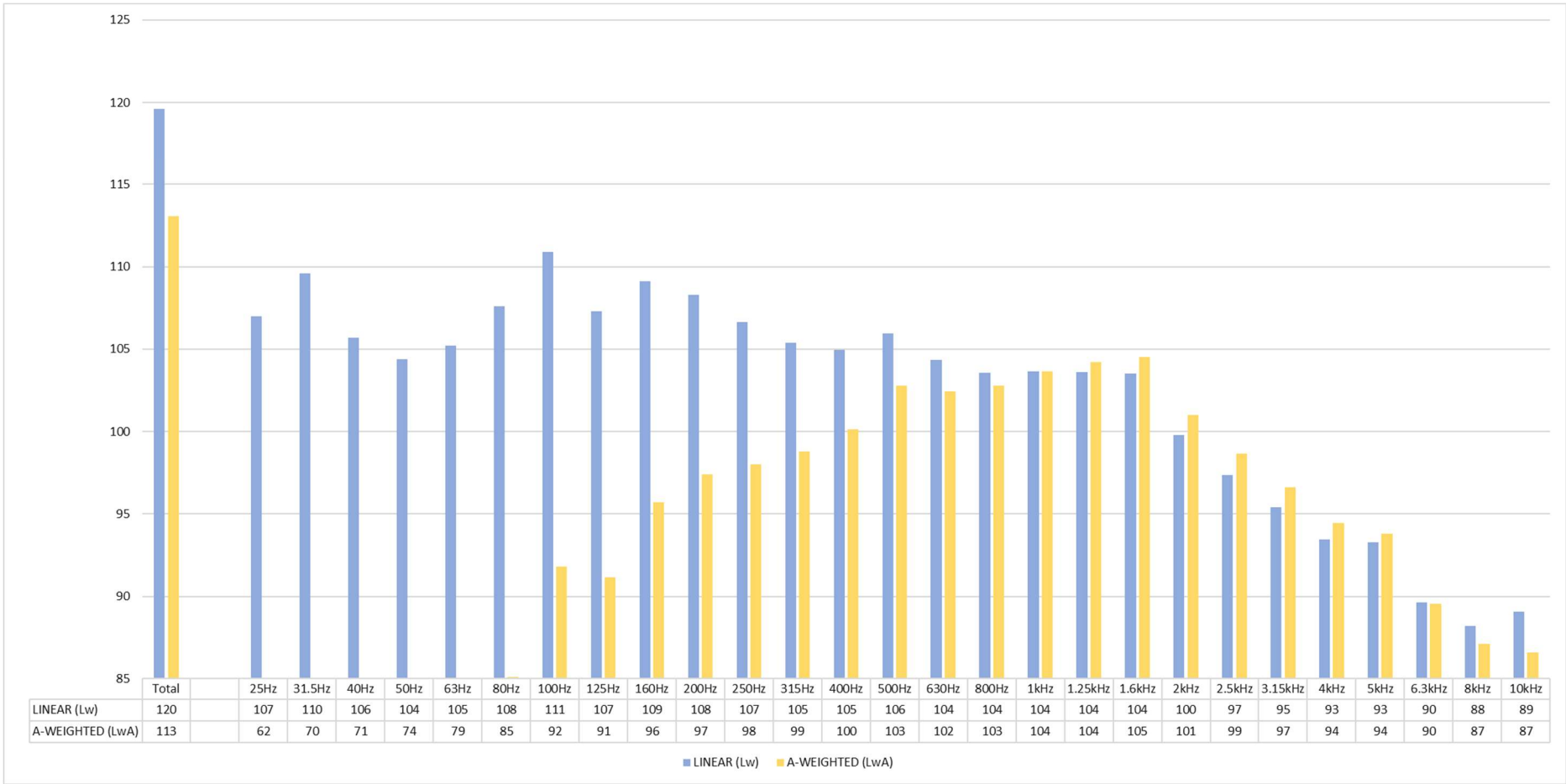


Figure I5: TD079 Reverse

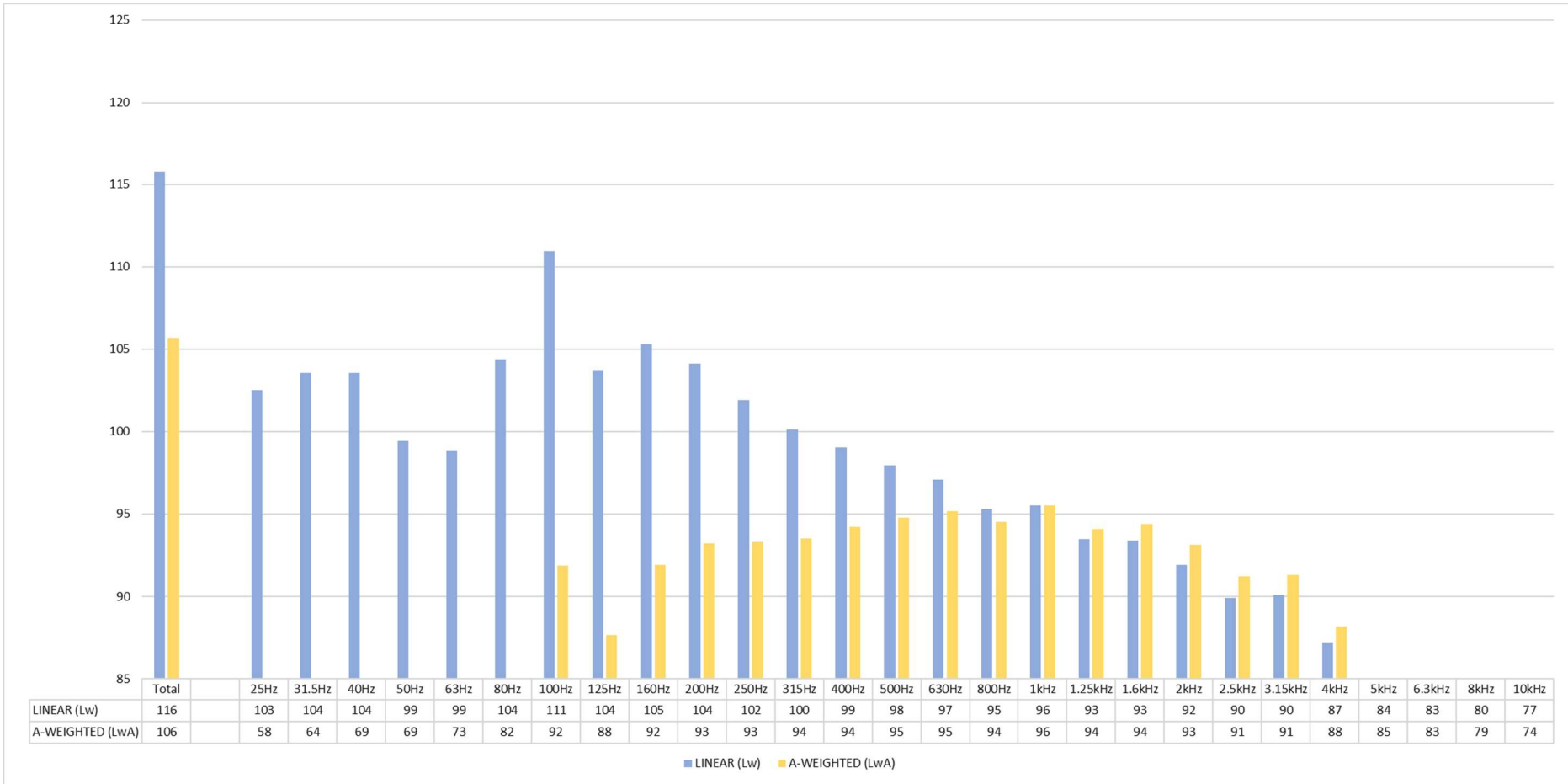


Figure I6: TD08I Stationary

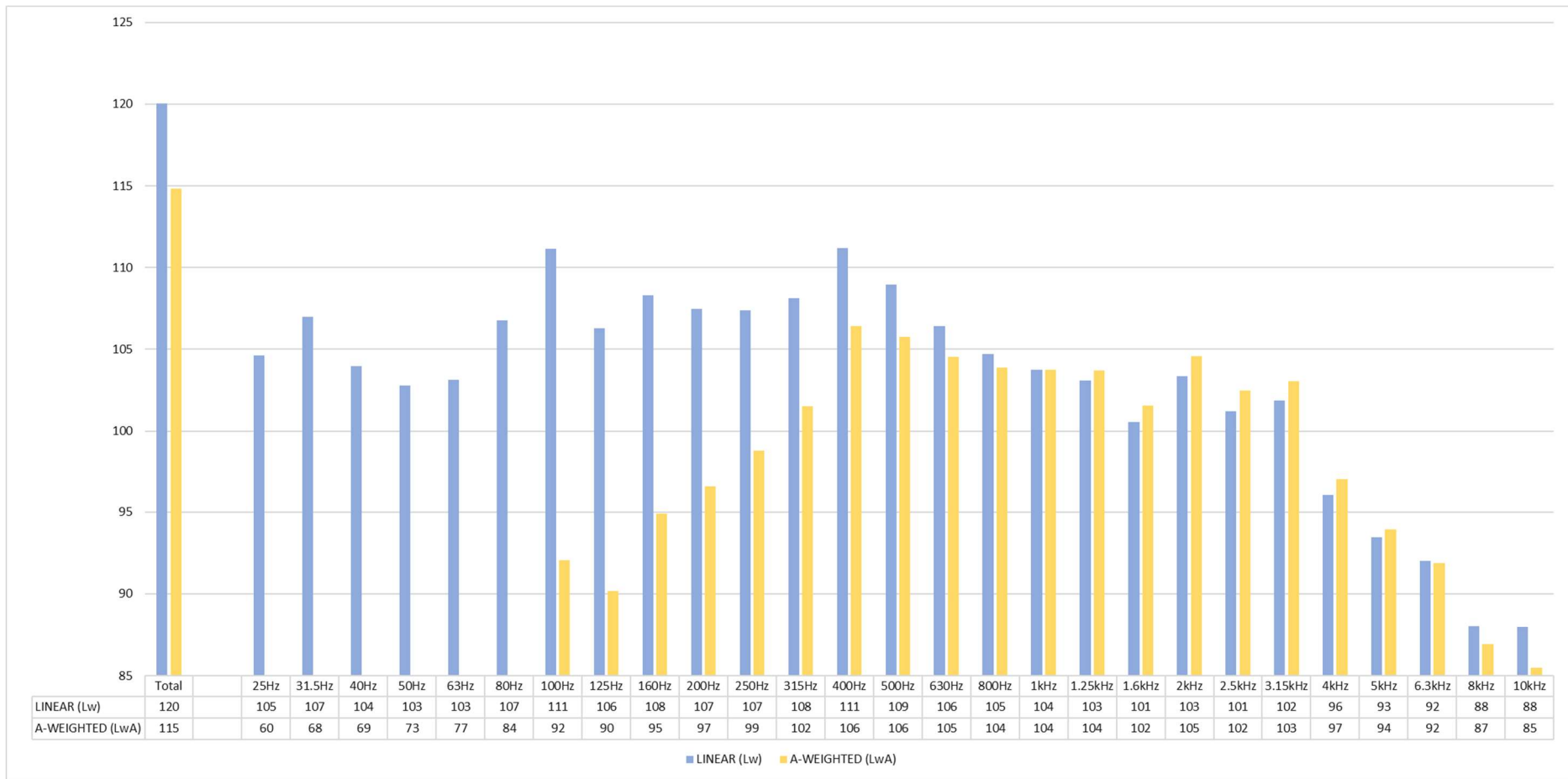


Figure 17: TD081 Forwards

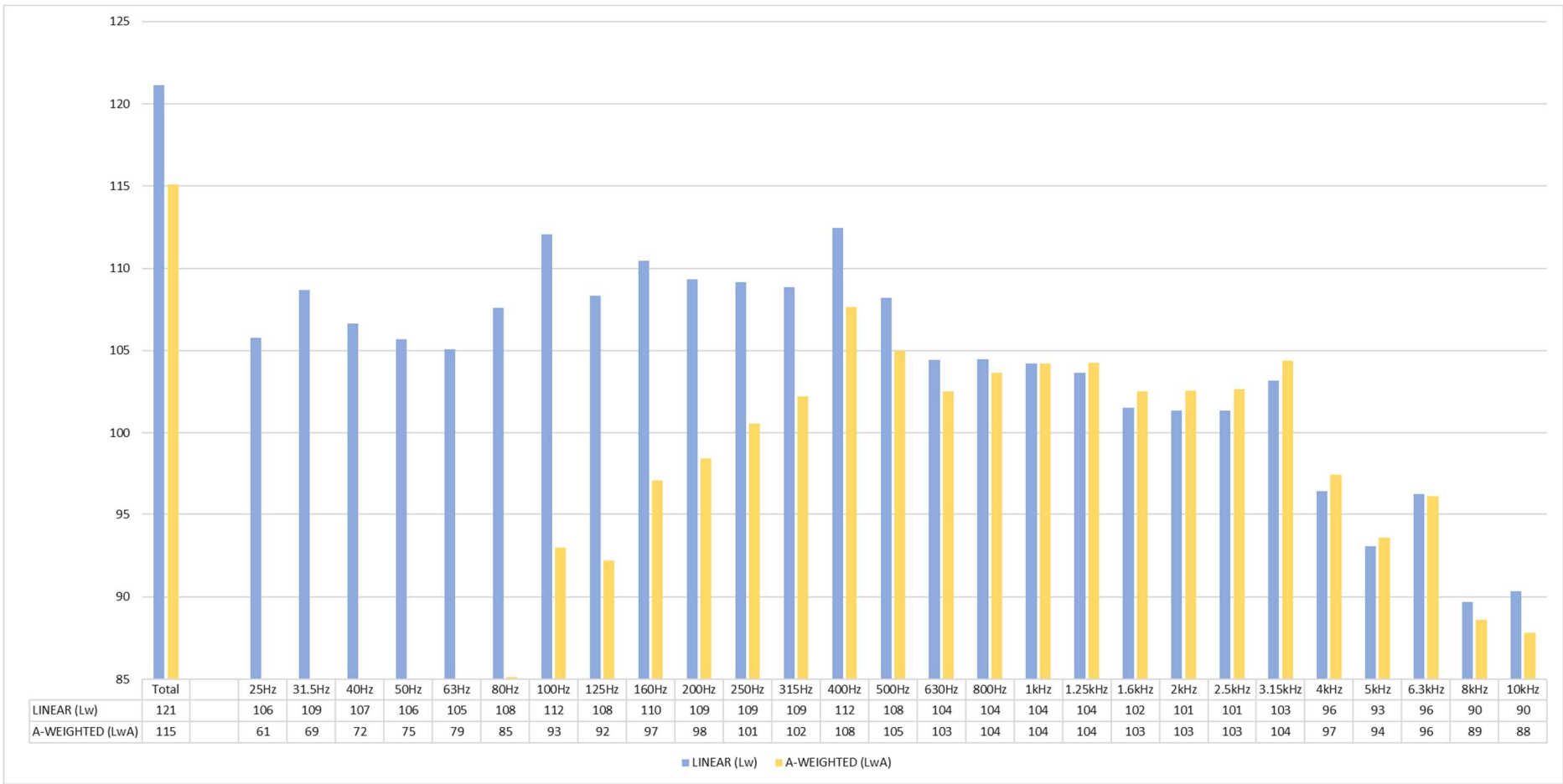


Figure I8: TD08I Reverse

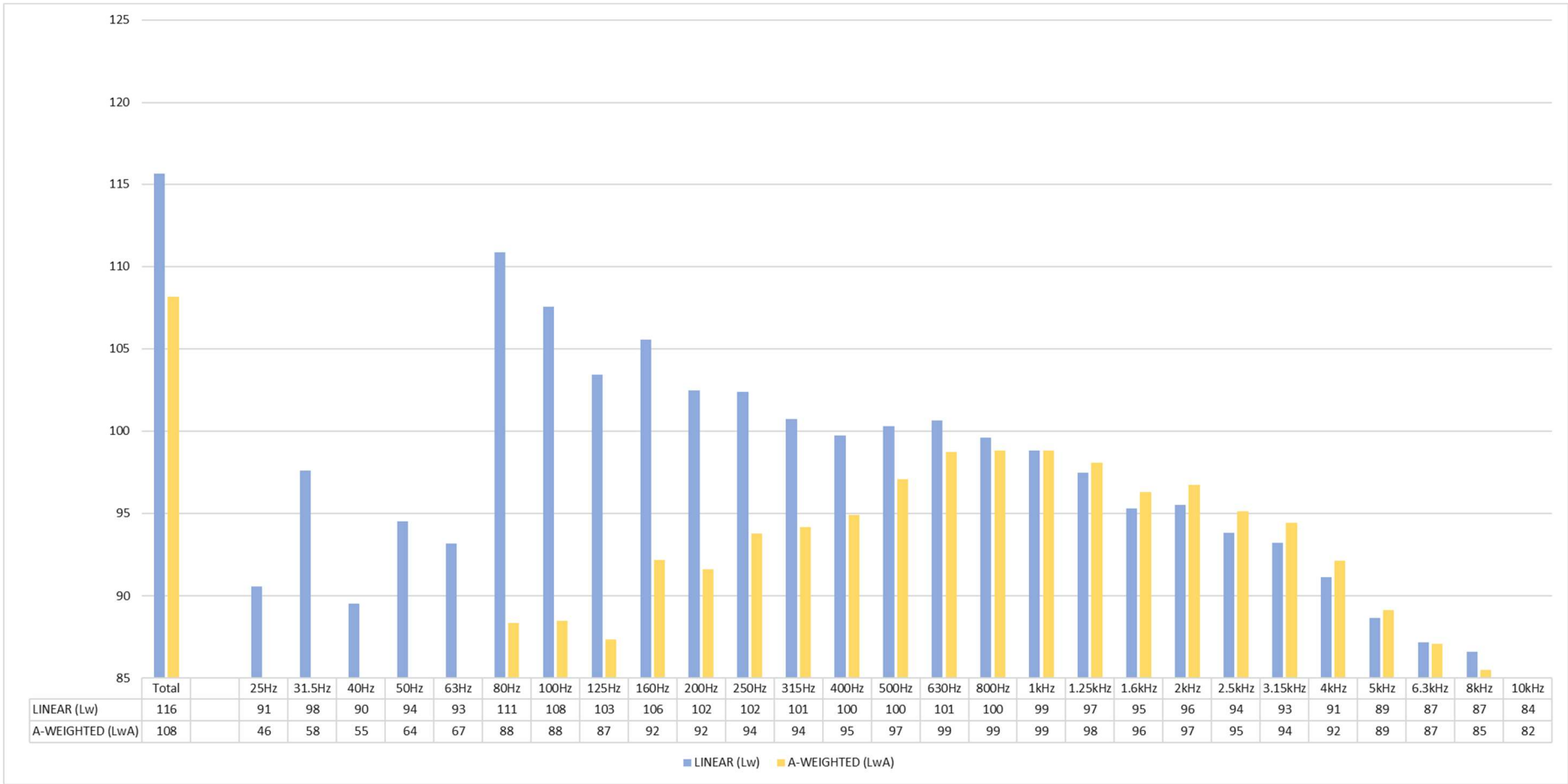


Figure I9: TD090 Stationary

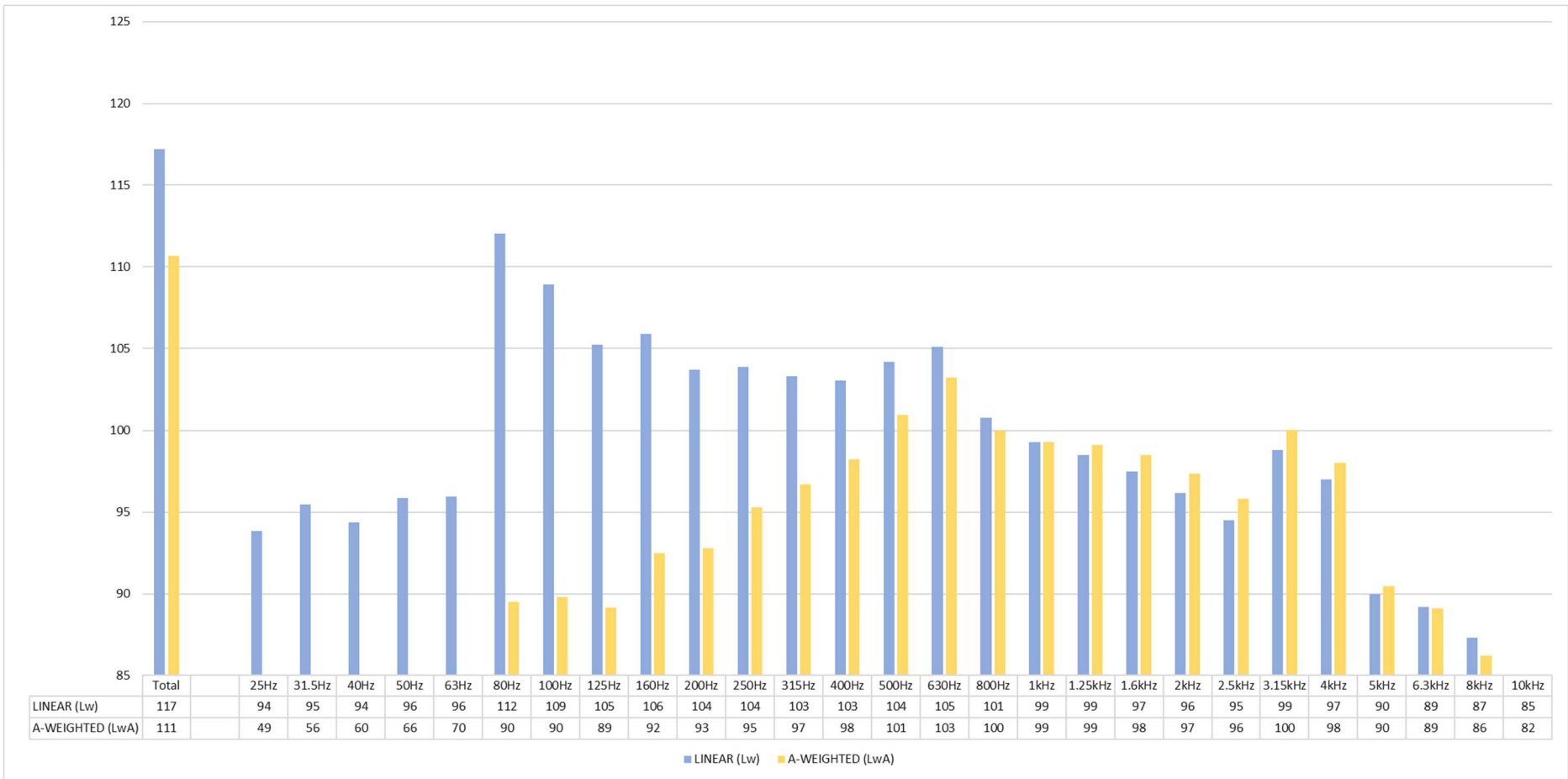


Figure 20: TD090 Forwards

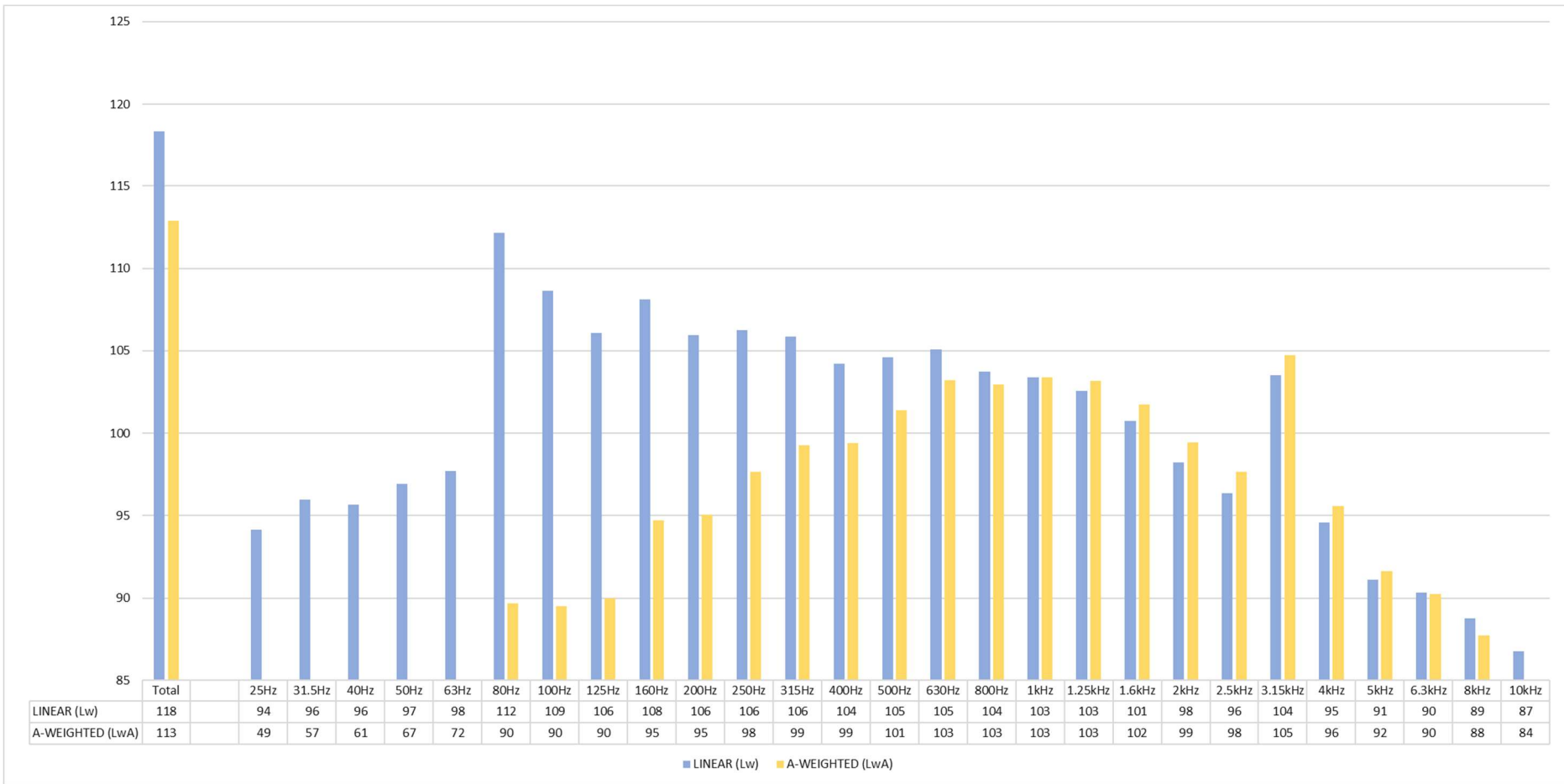


Figure 21: TD090 Reverse

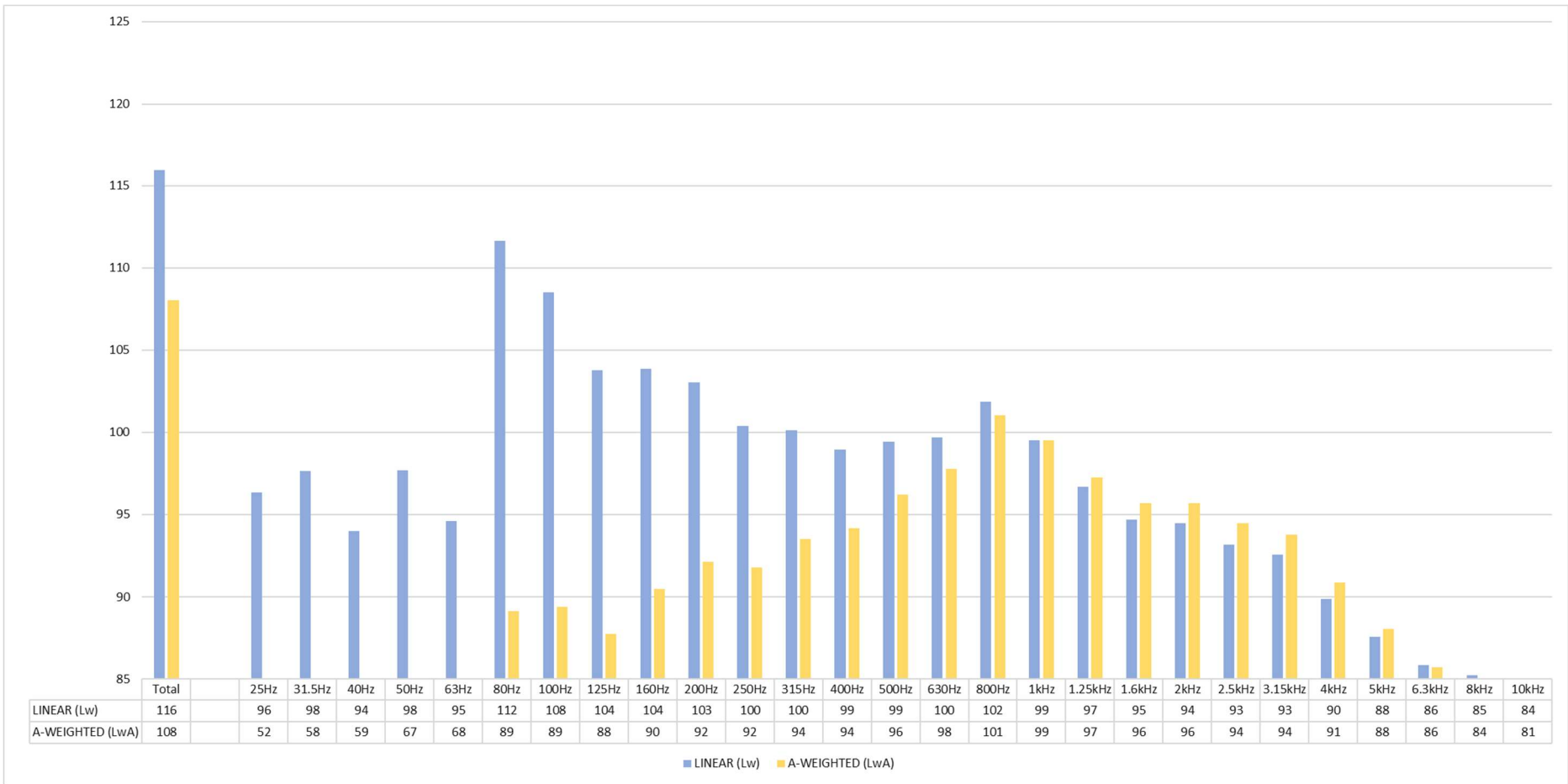


Figure 22: TD093 Stationary

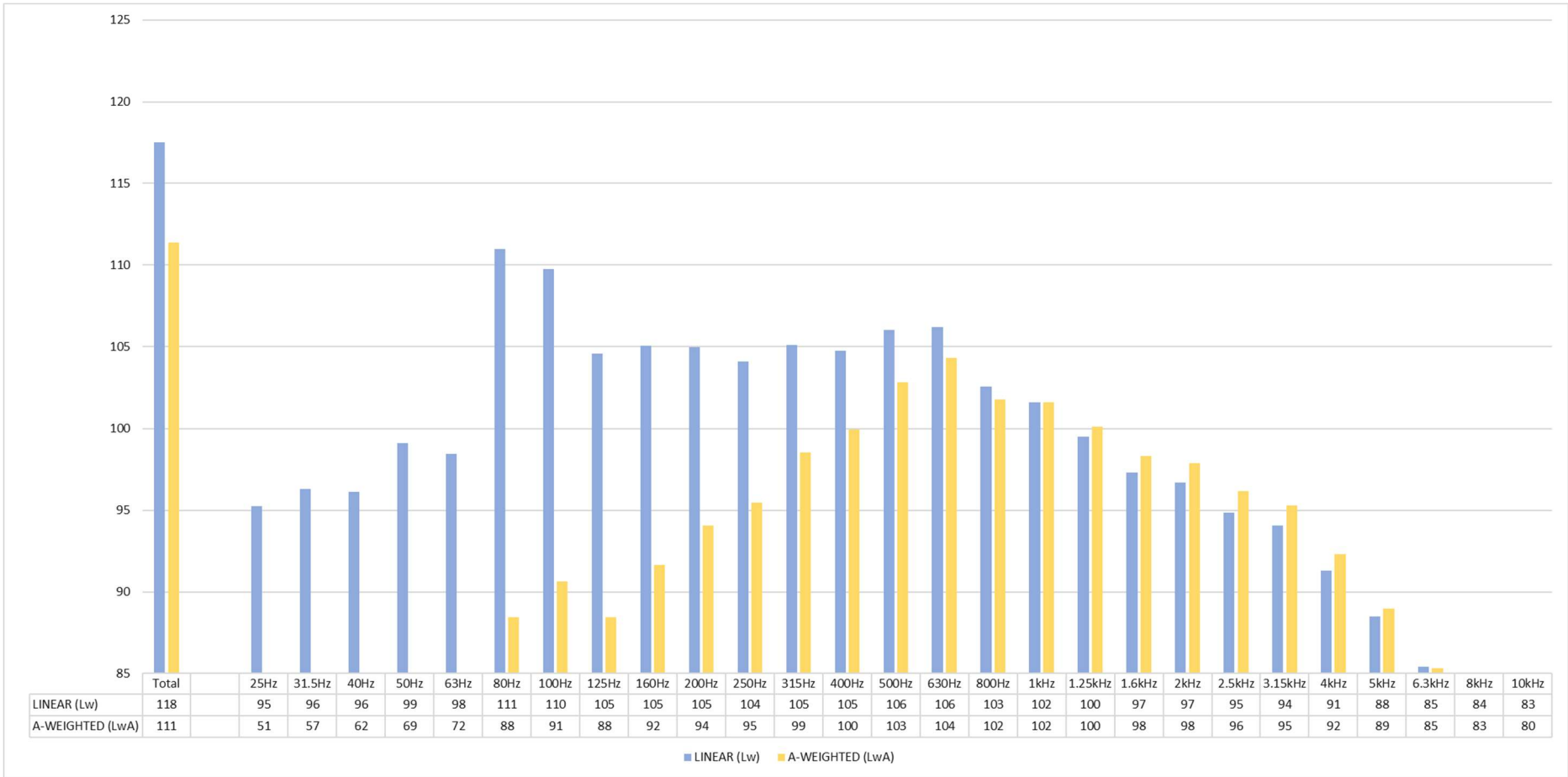


Figure 23: TD093 Forwards

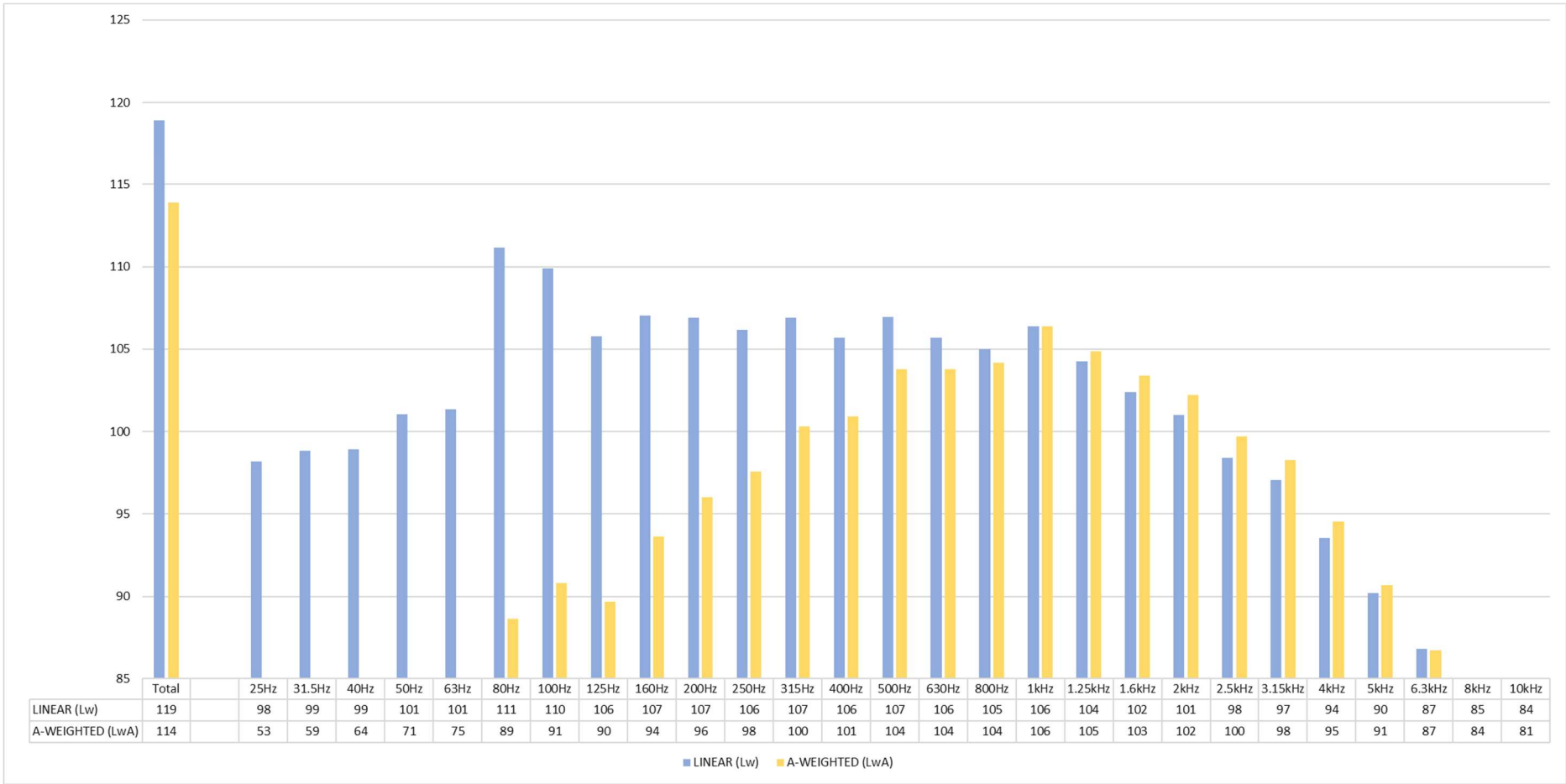


Figure 24: TD093 Reverse

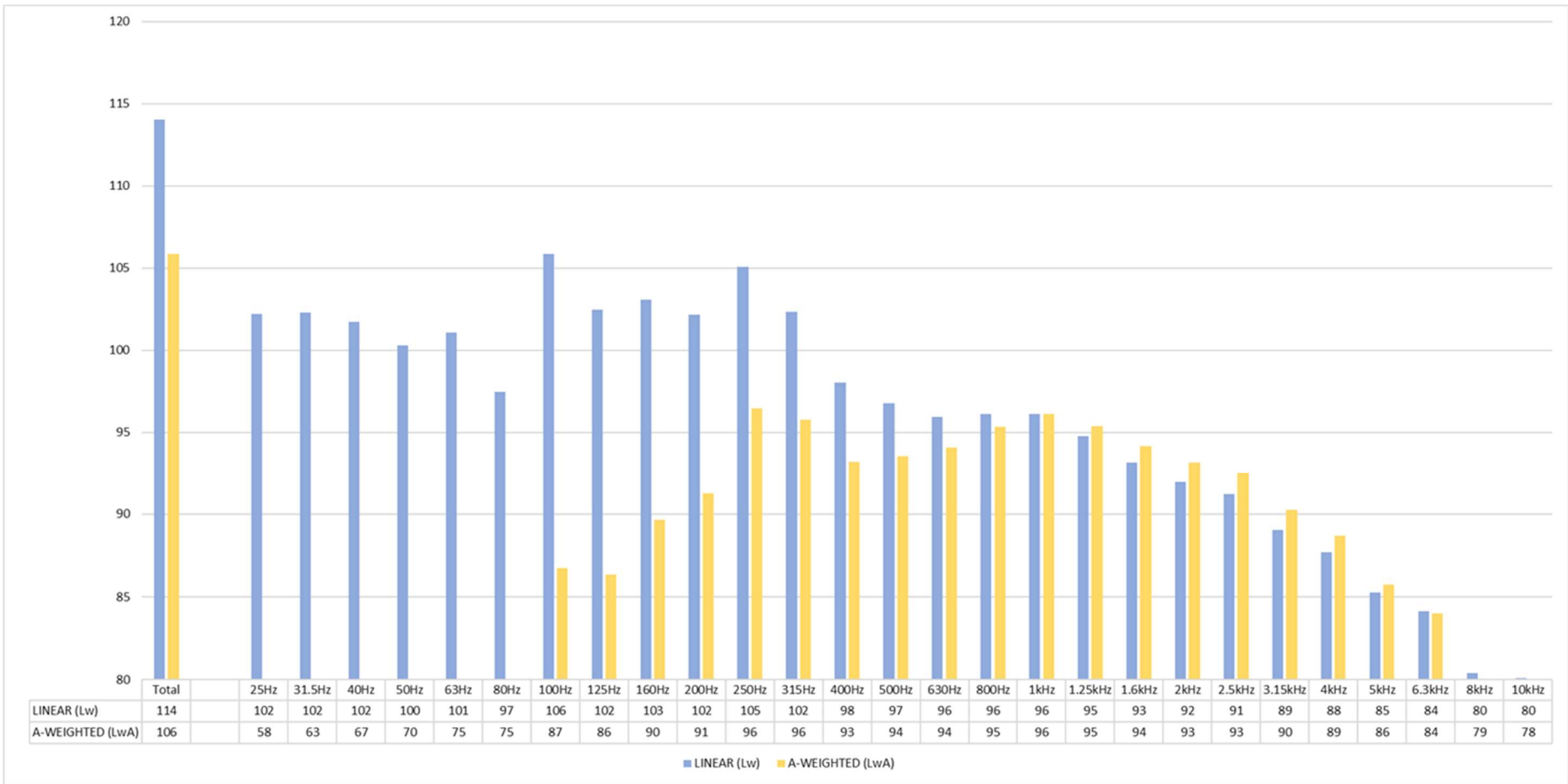


Figure 25: GR060 Stationary

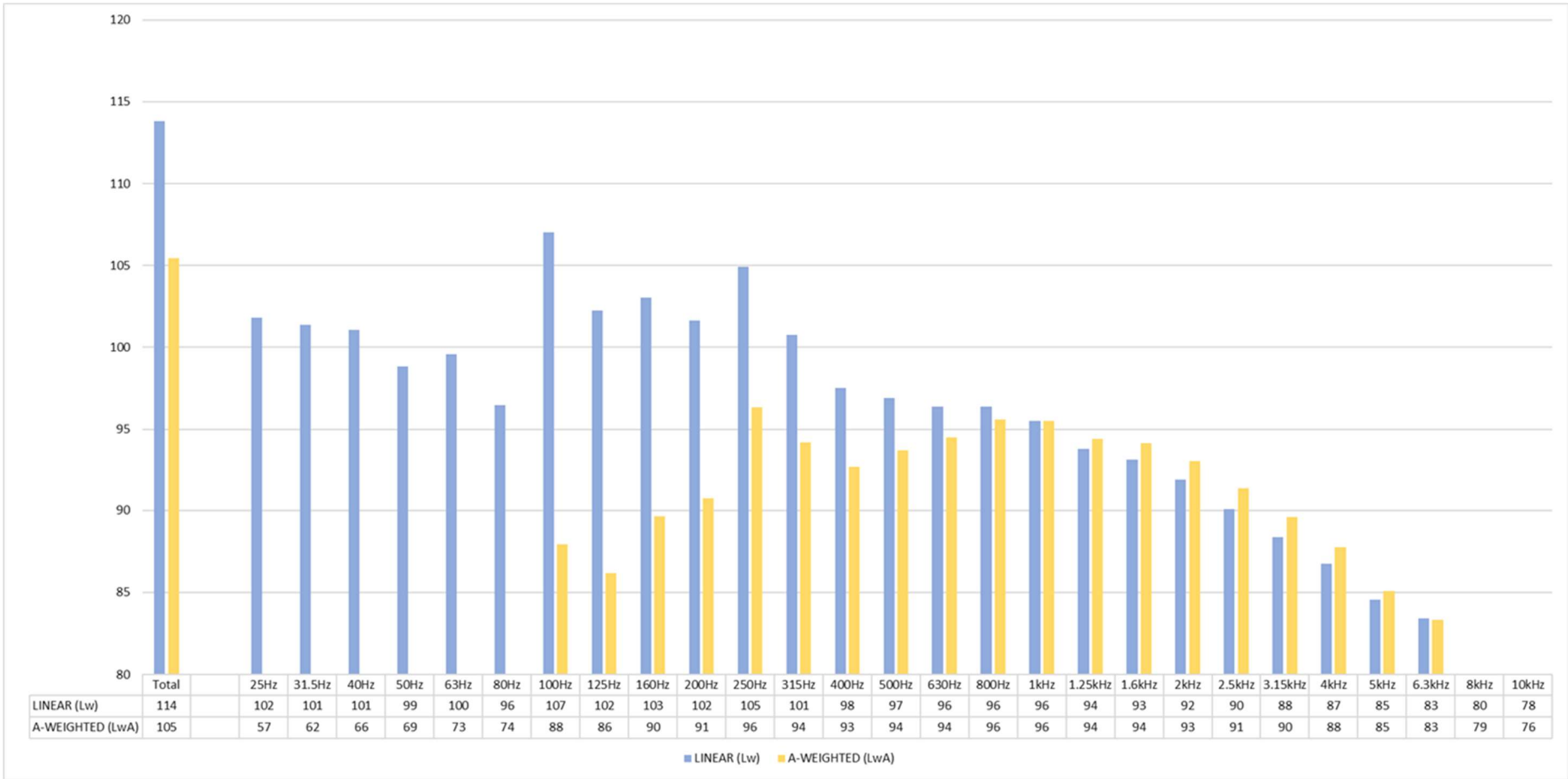


Figure 26: GR060 Forwards

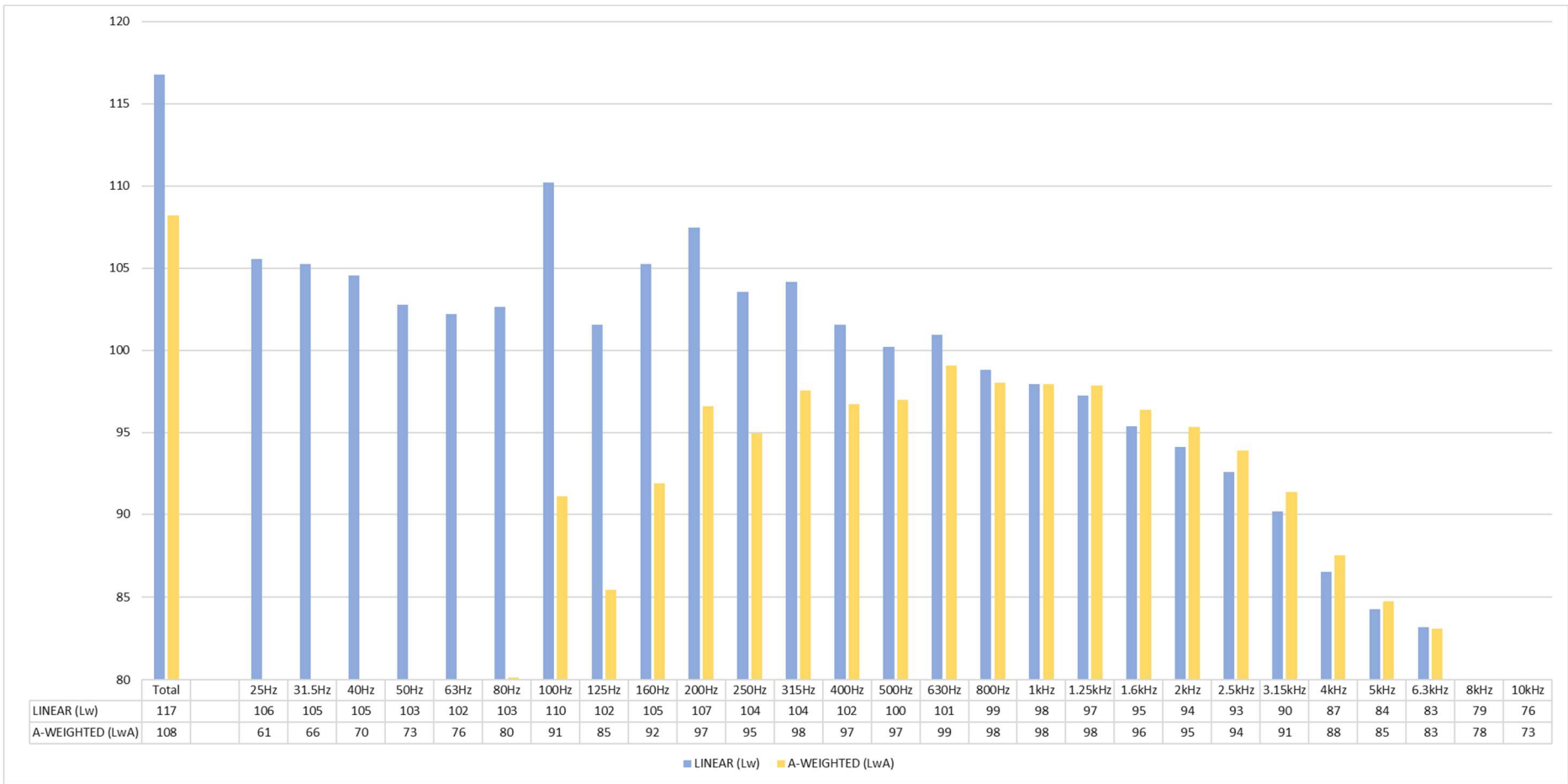


Figure 27: GR063 Stationary

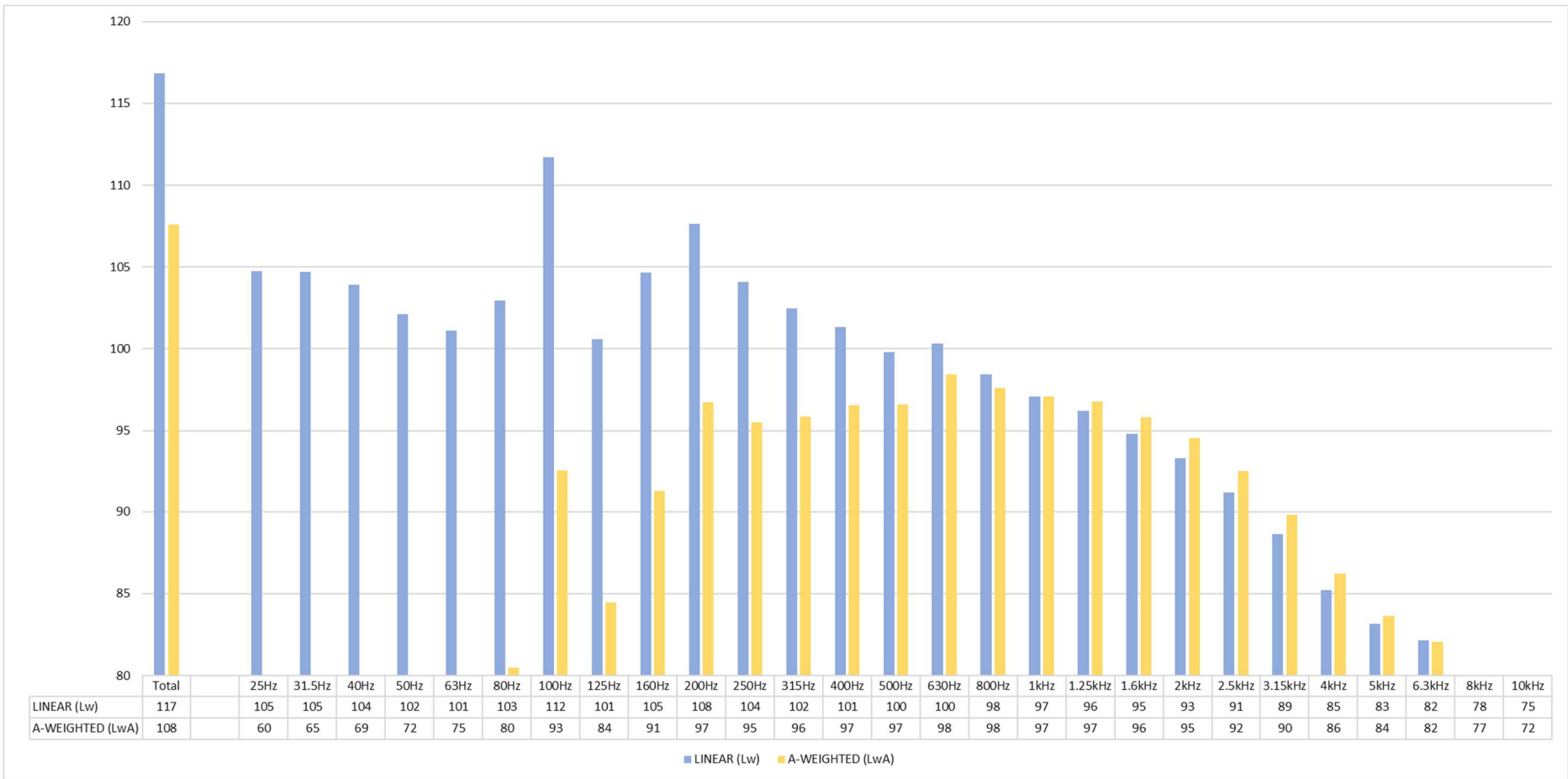


Figure 28: GR063 Forwards

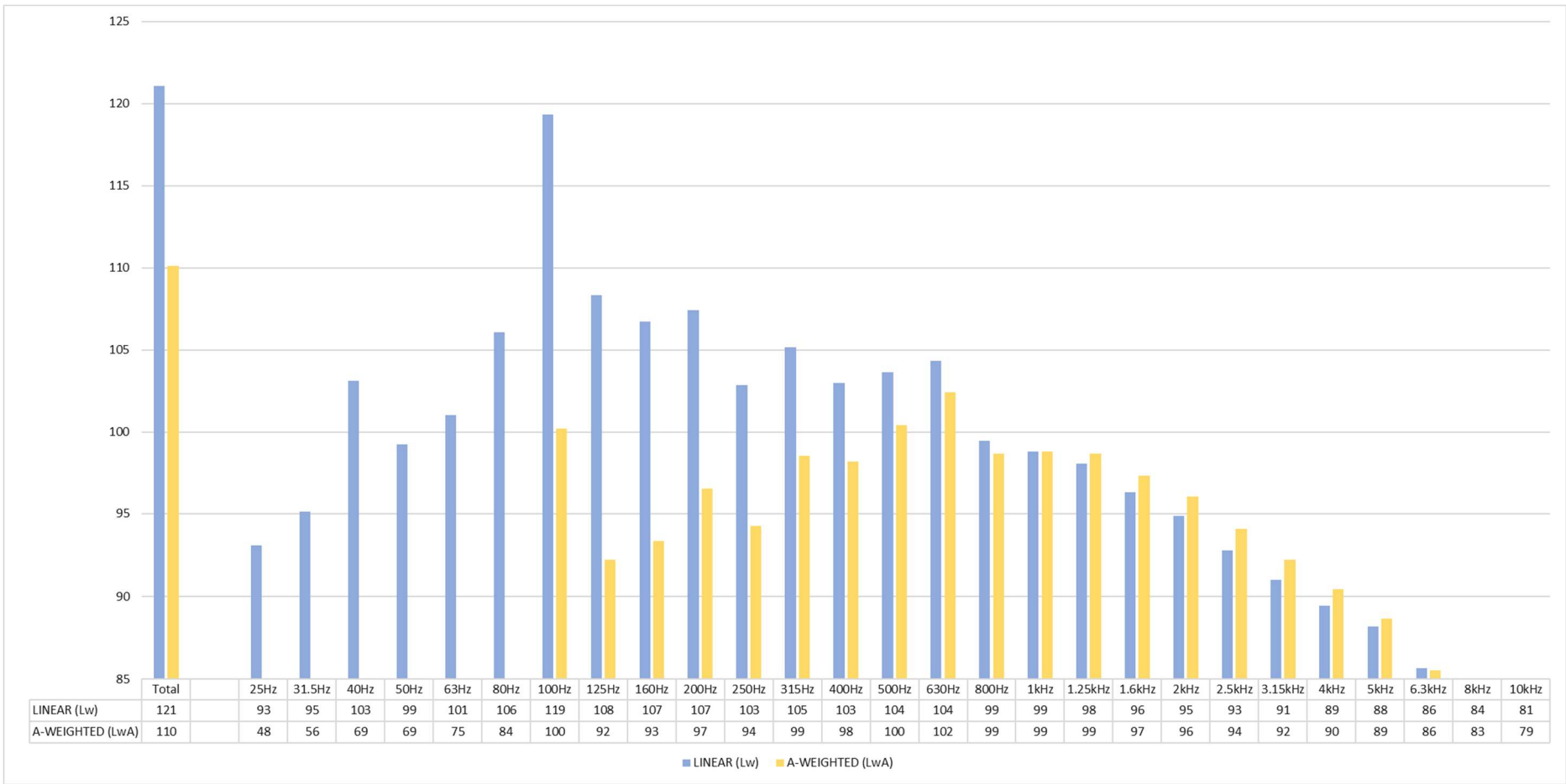


Figure 29: WL02 Stationary

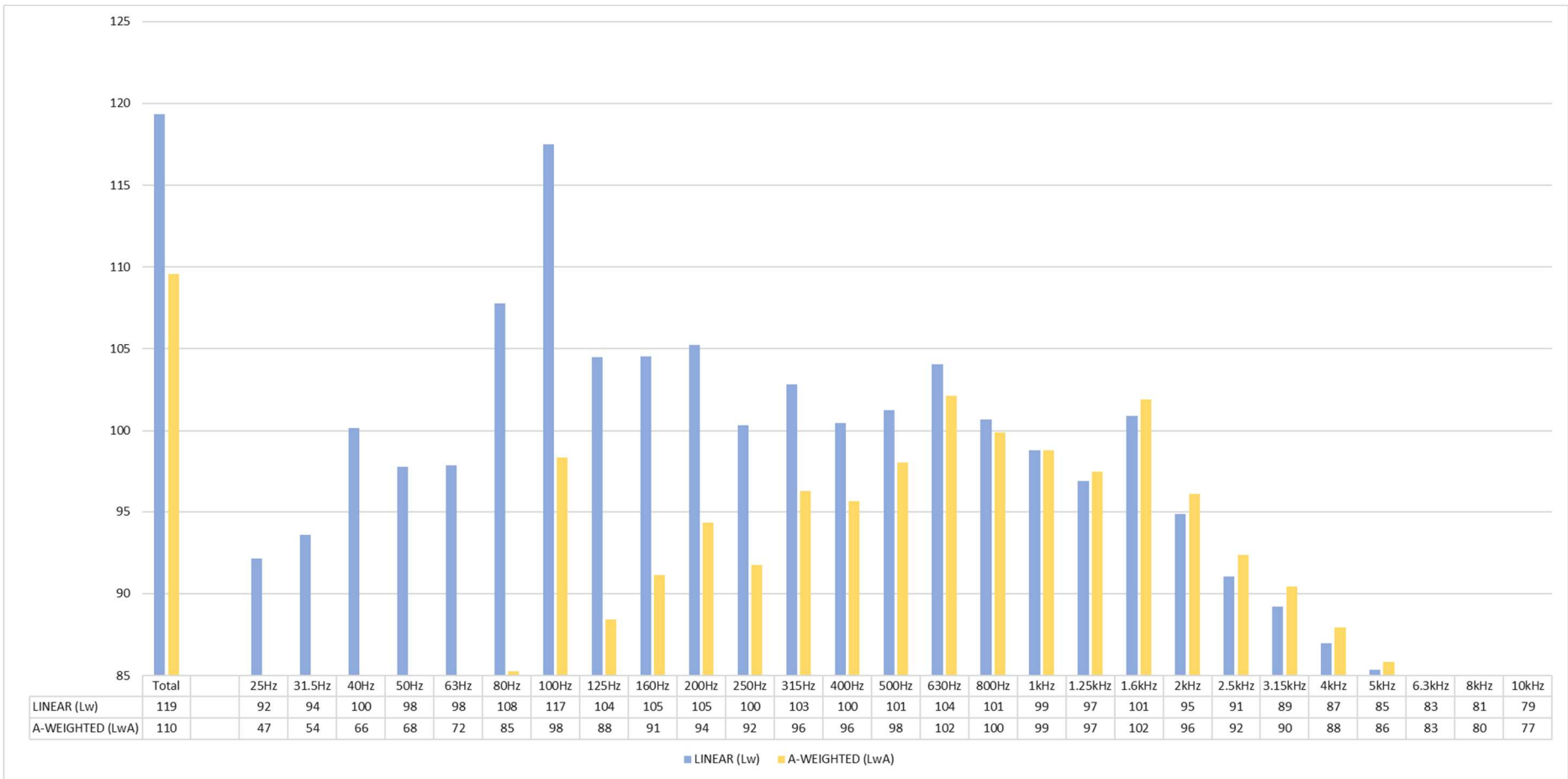


Figure 30: WL02 Forwards

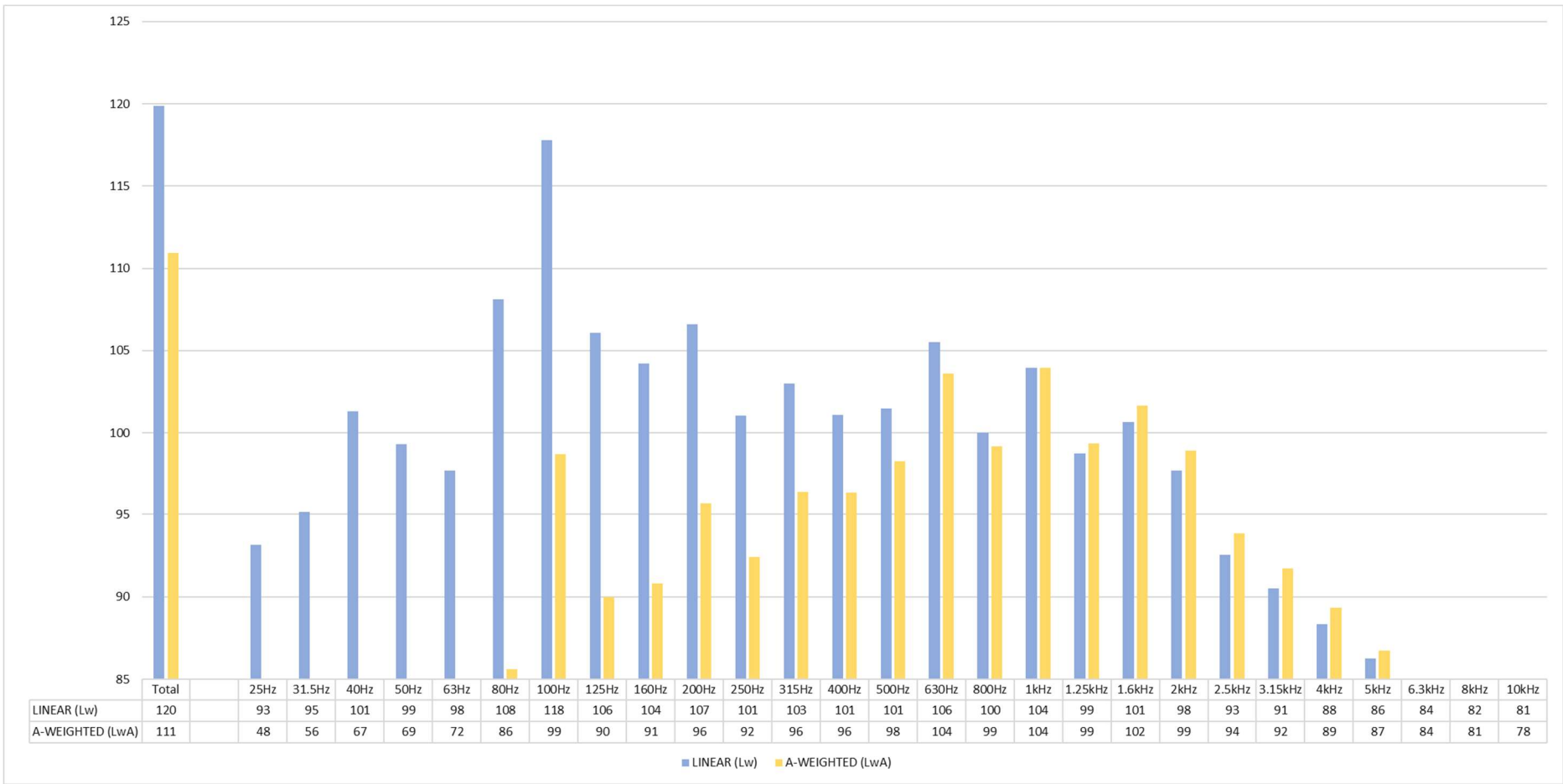


Figure 31: WL02 Reverse

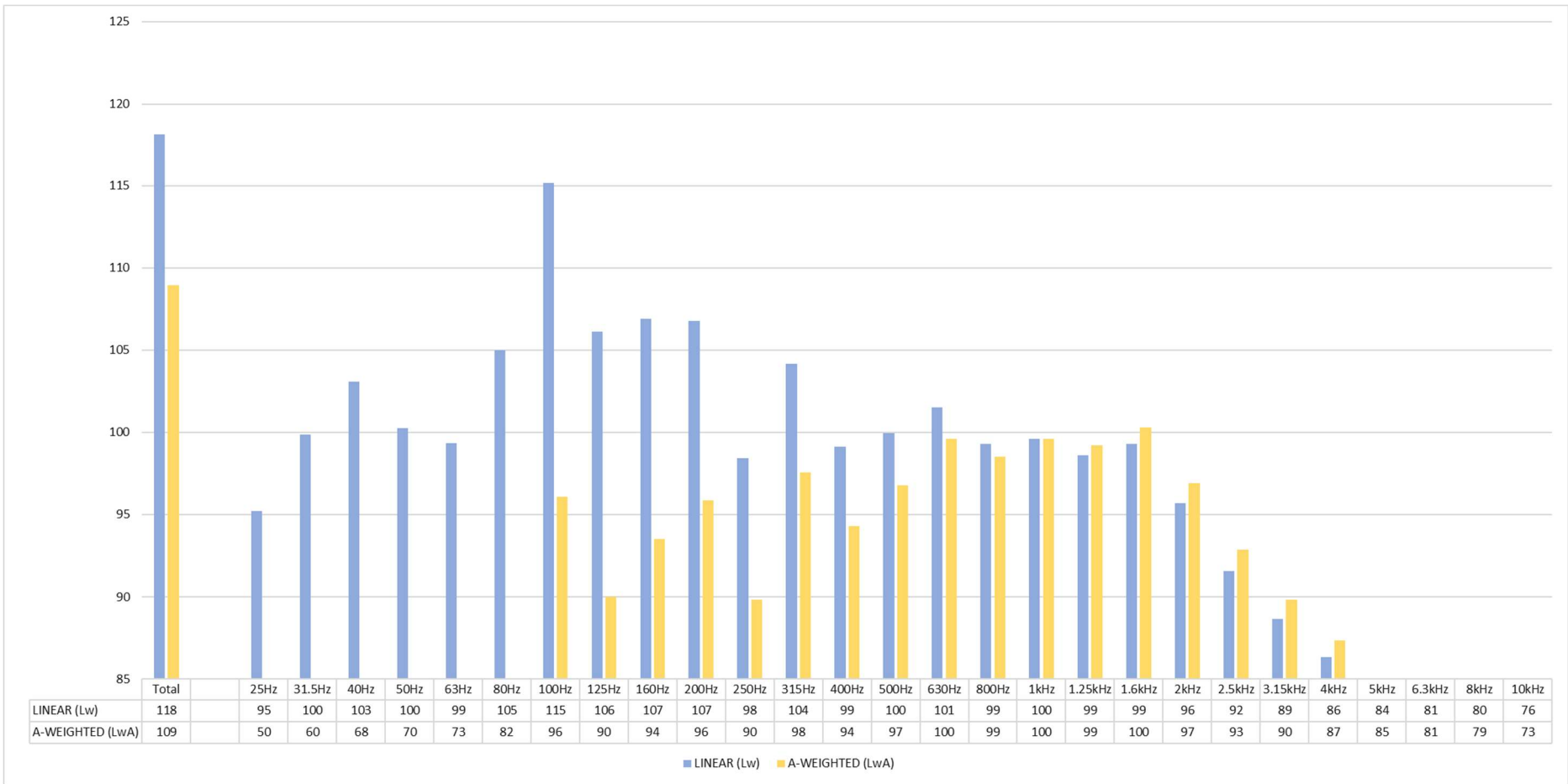


Figure 32: WL03 Stationary

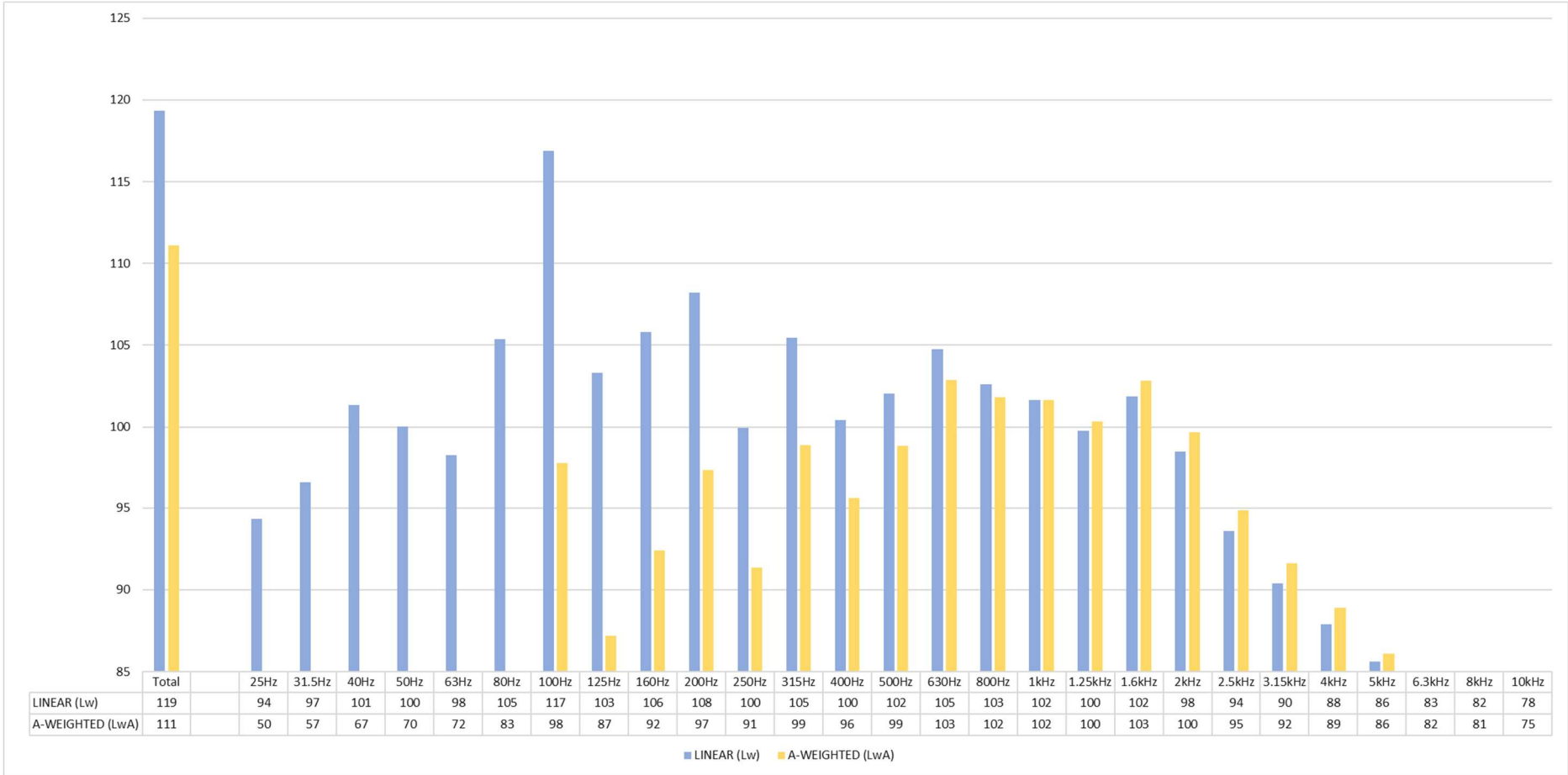


Figure 33: WL03 Forwards

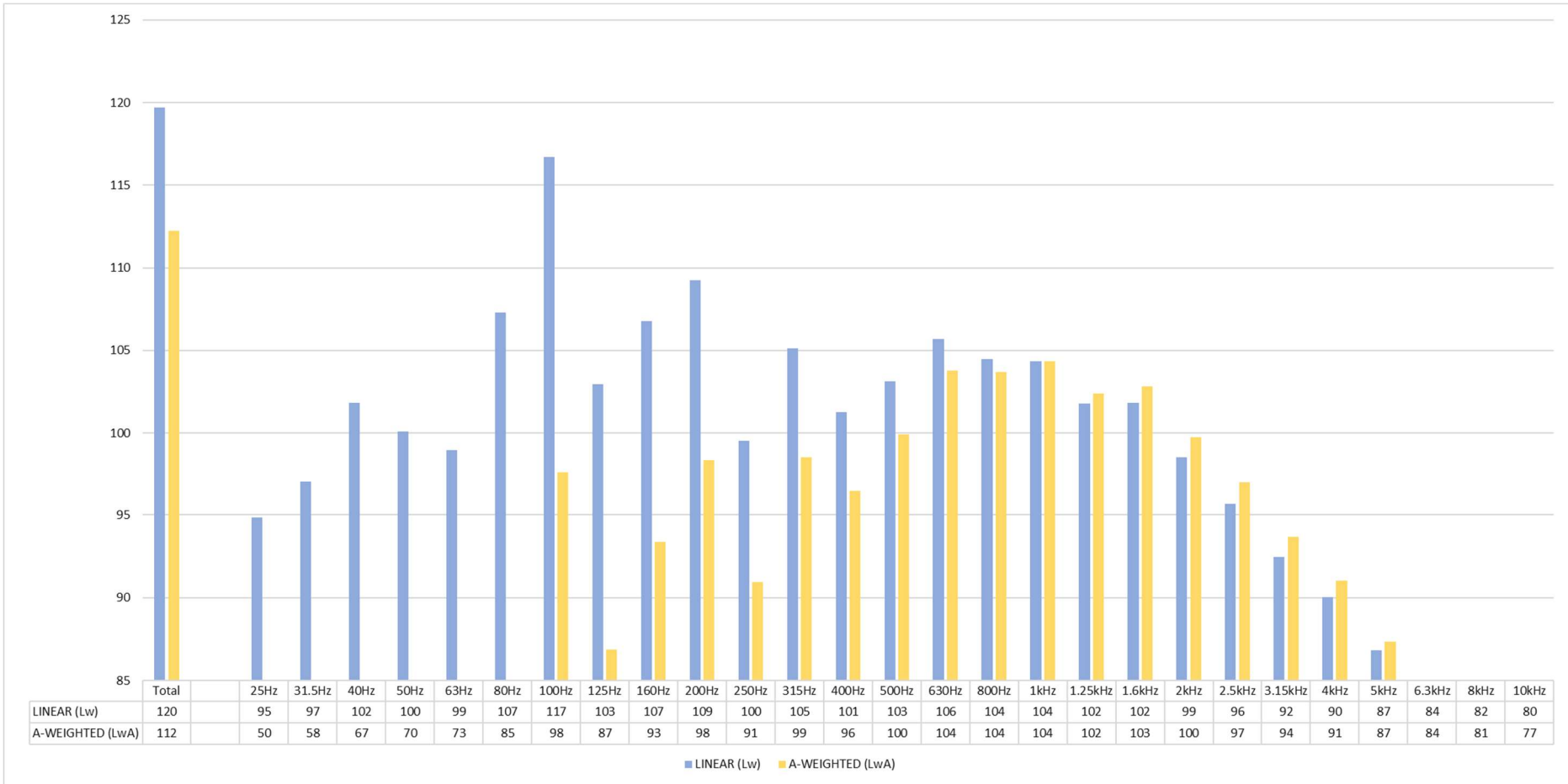


Figure 34: WL03 Reverse

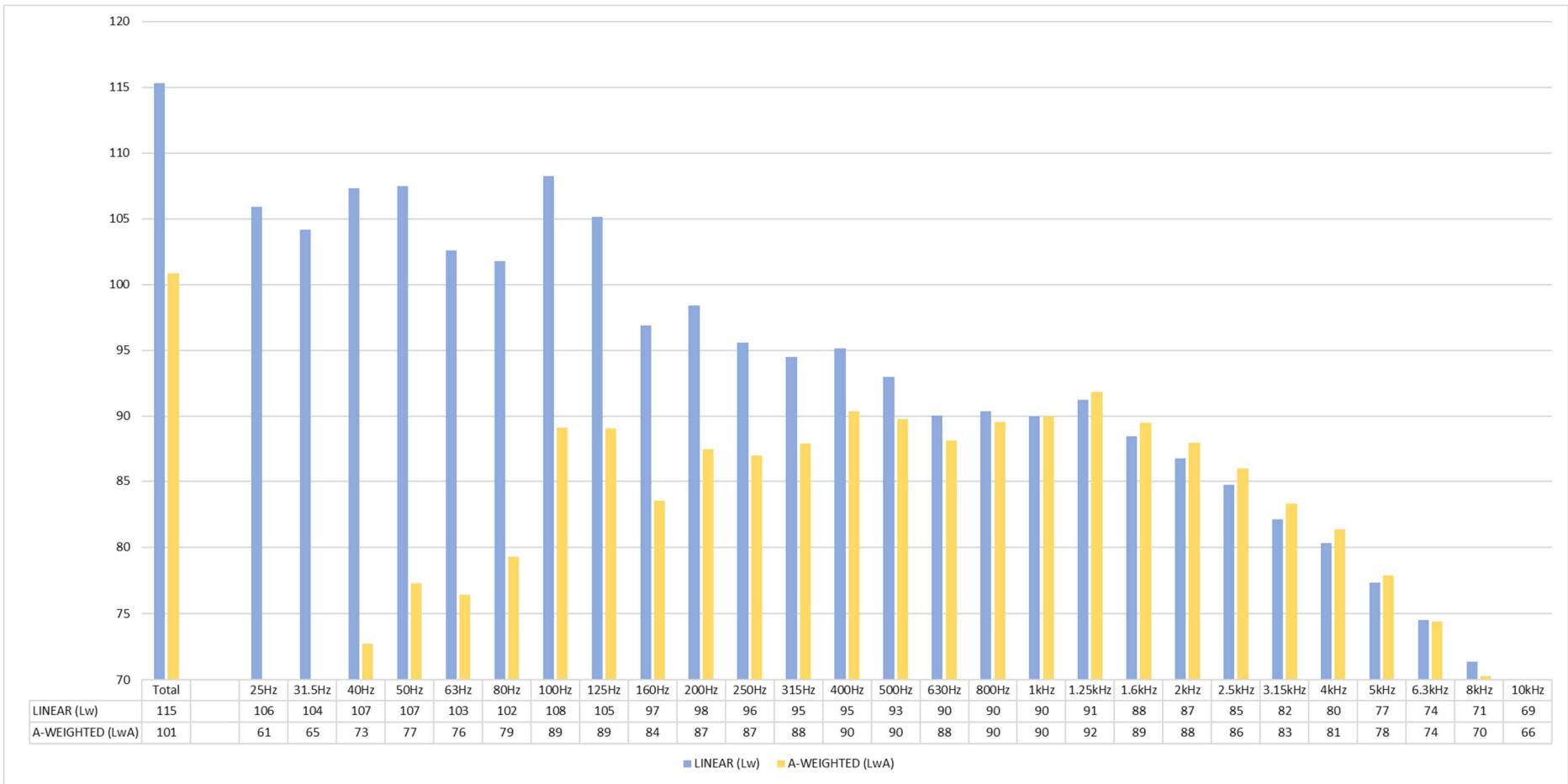


Figure 35: WLI89 Stationary

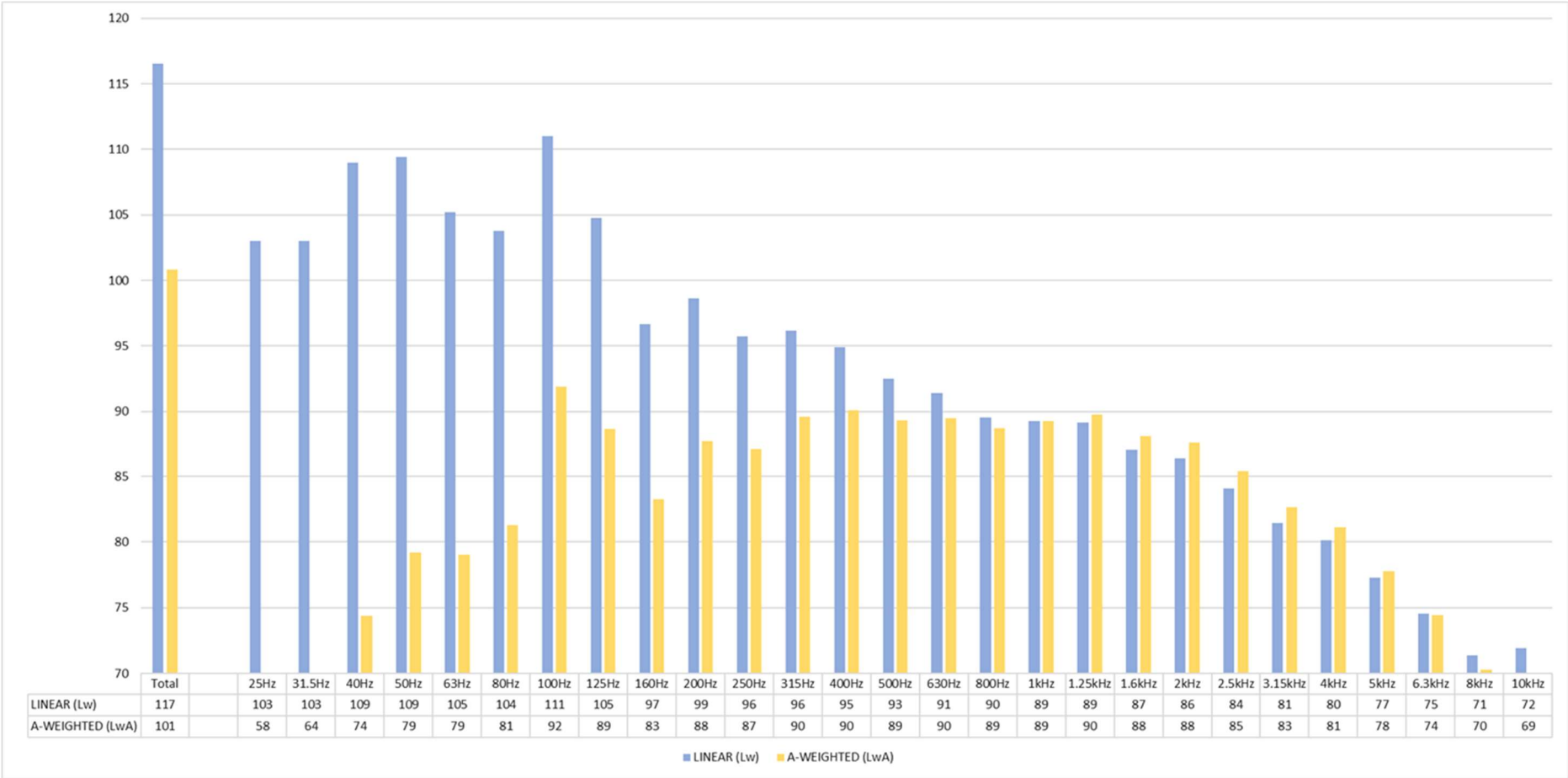


Figure 36: WLI89 Forwards

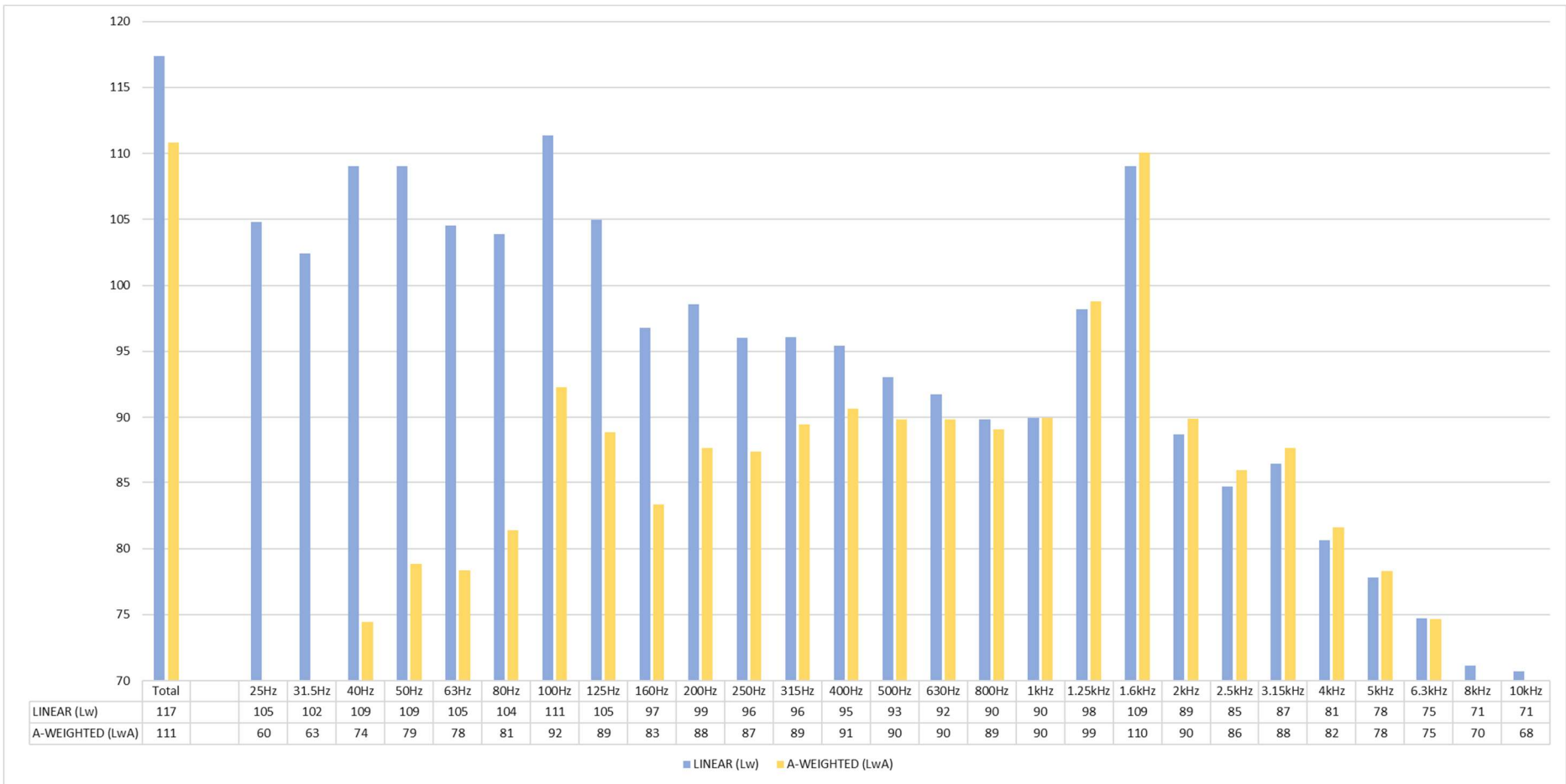


Figure 37: WLI89 Reverse

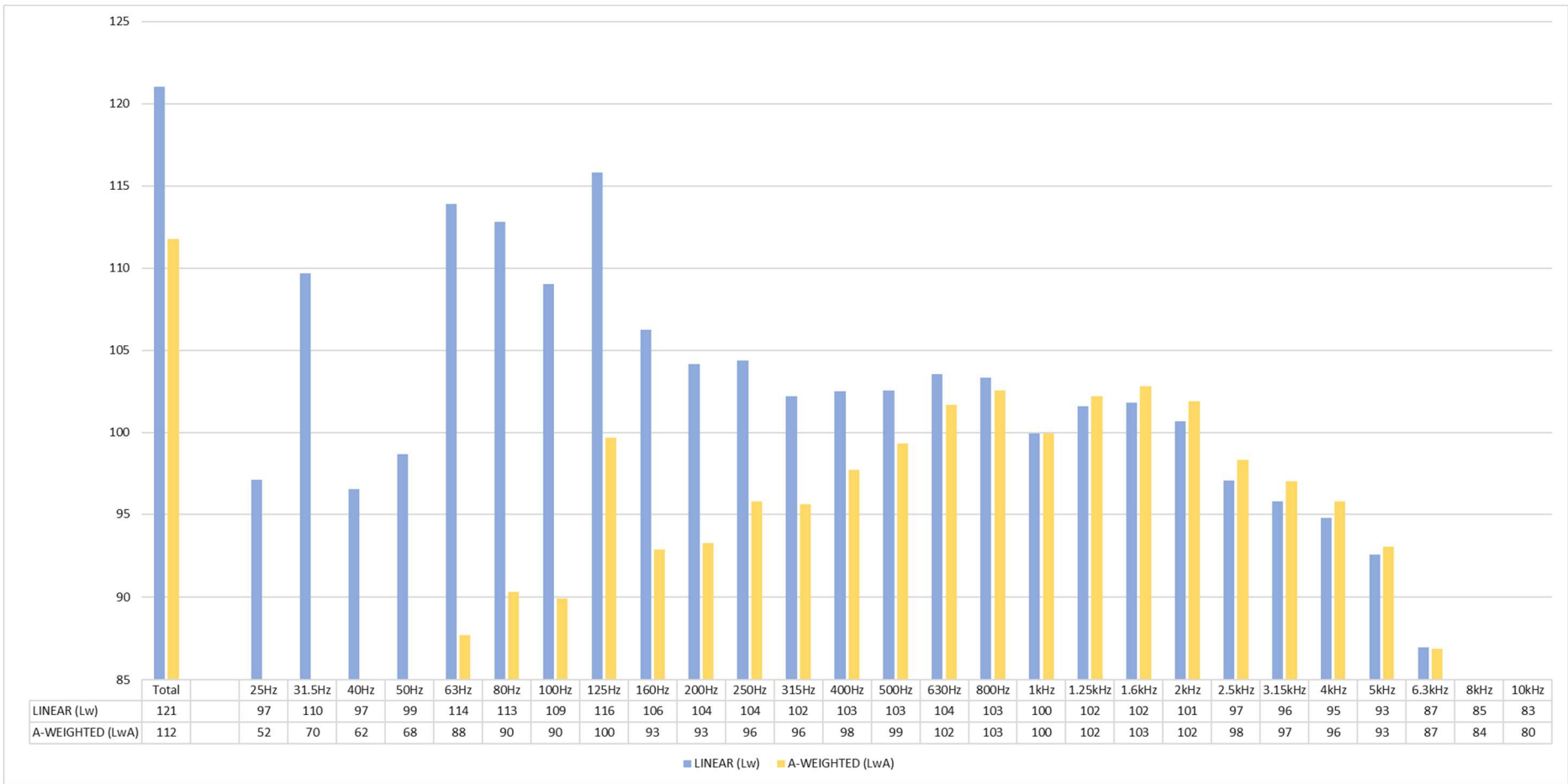


Figure 38: WC042 Stationary

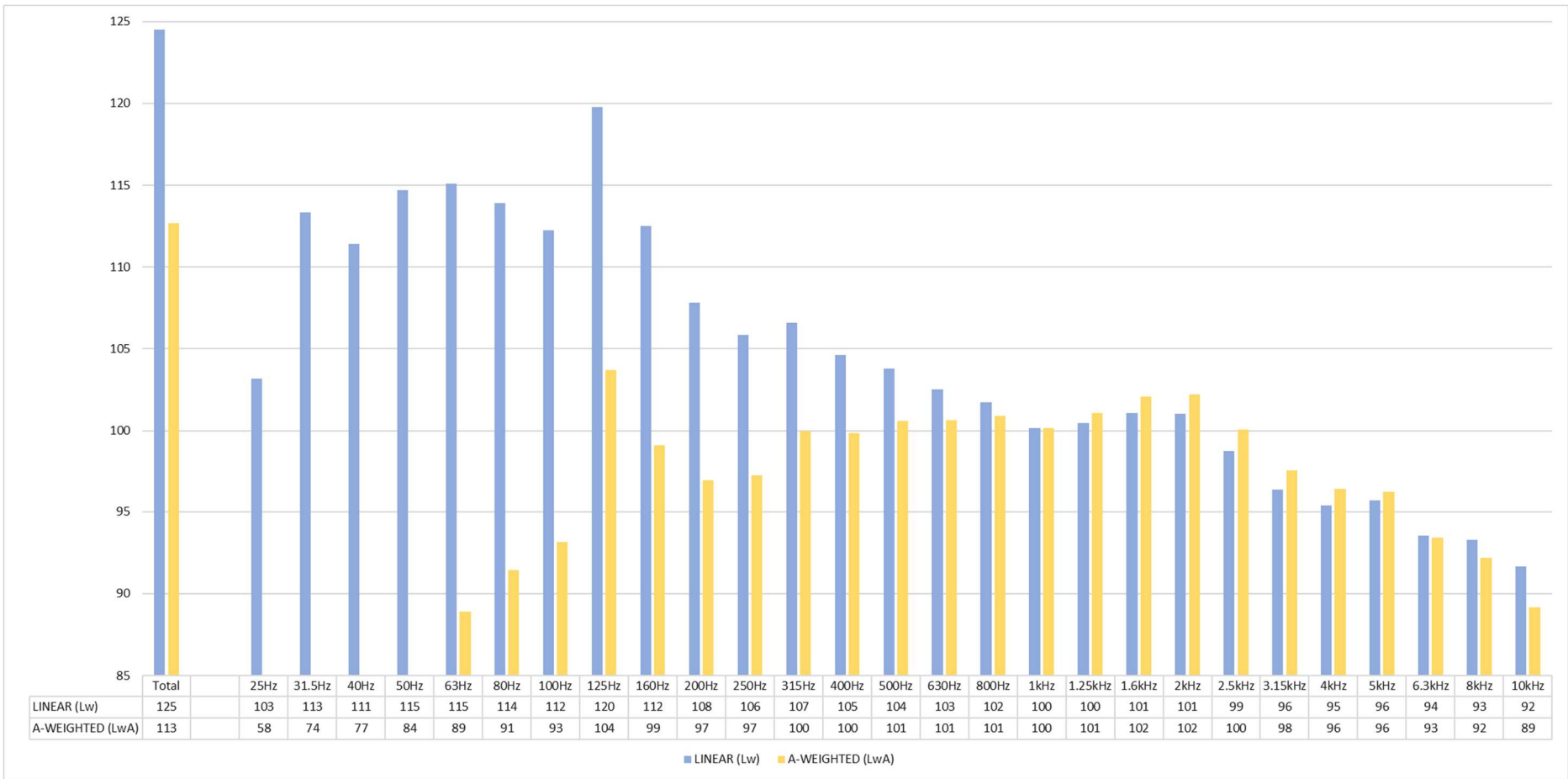


Figure 39: WC042 Uphill

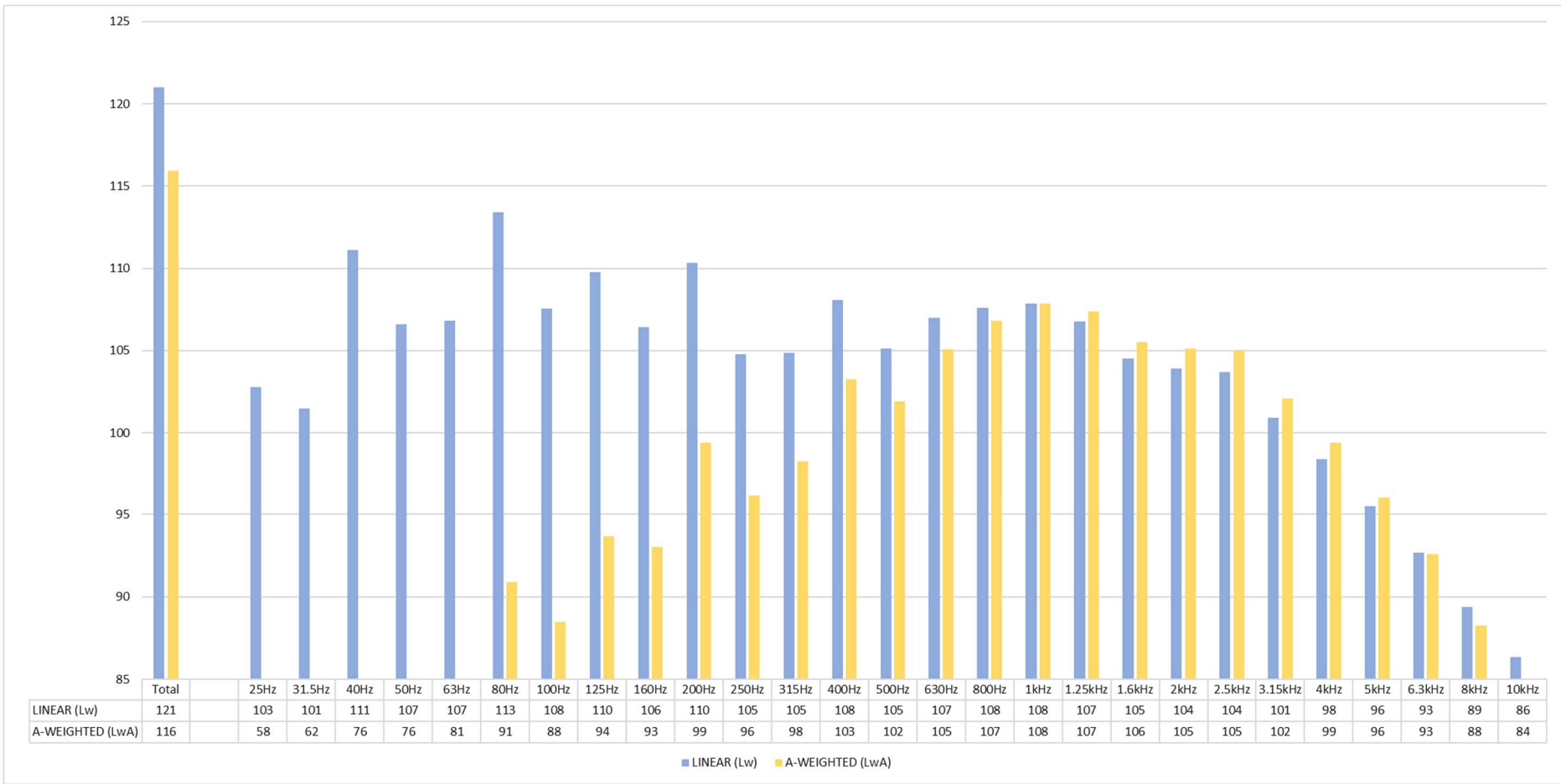


Figure 40: WC042 Downhill

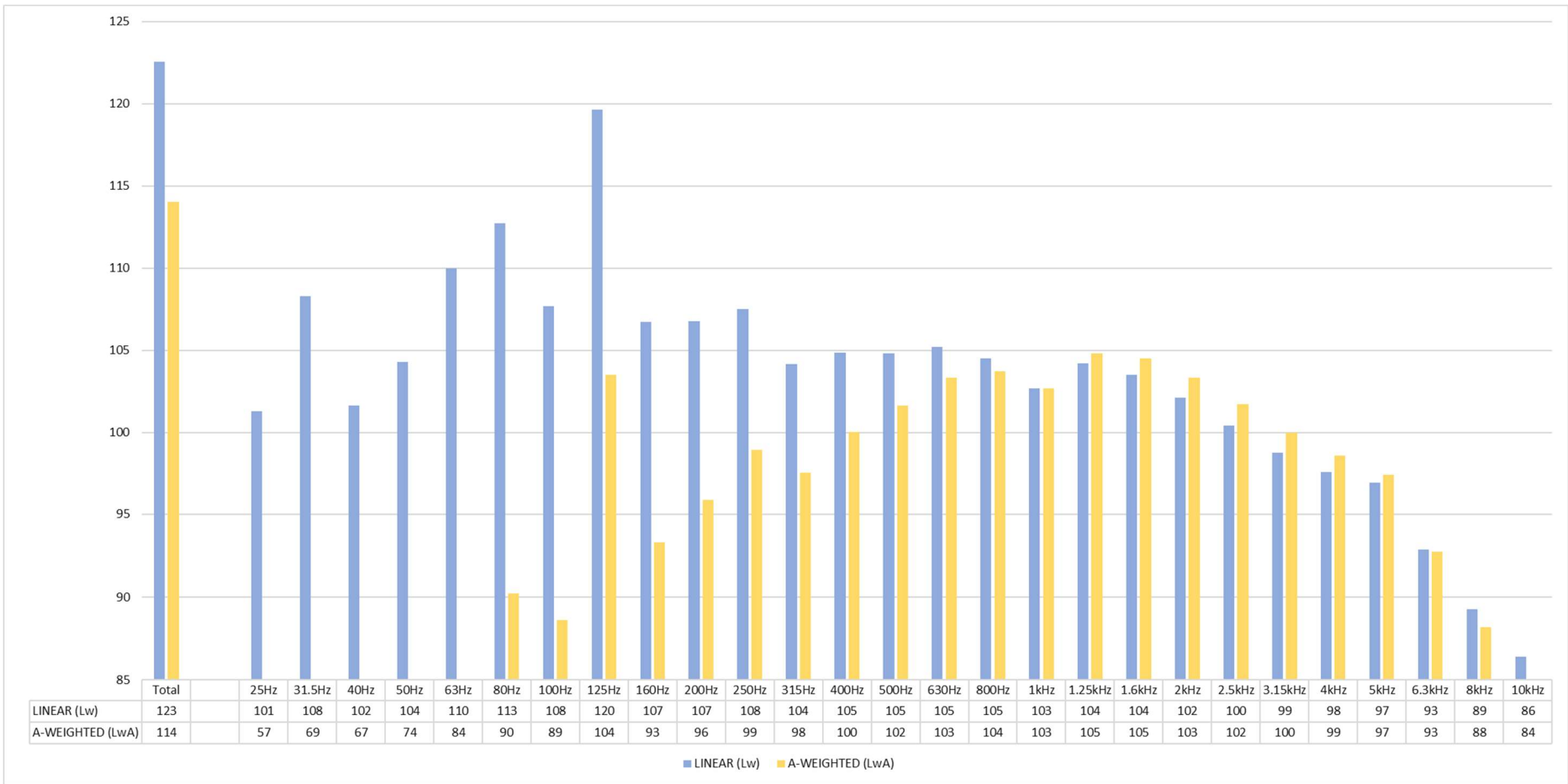


Figure 41: WC043 Stationary

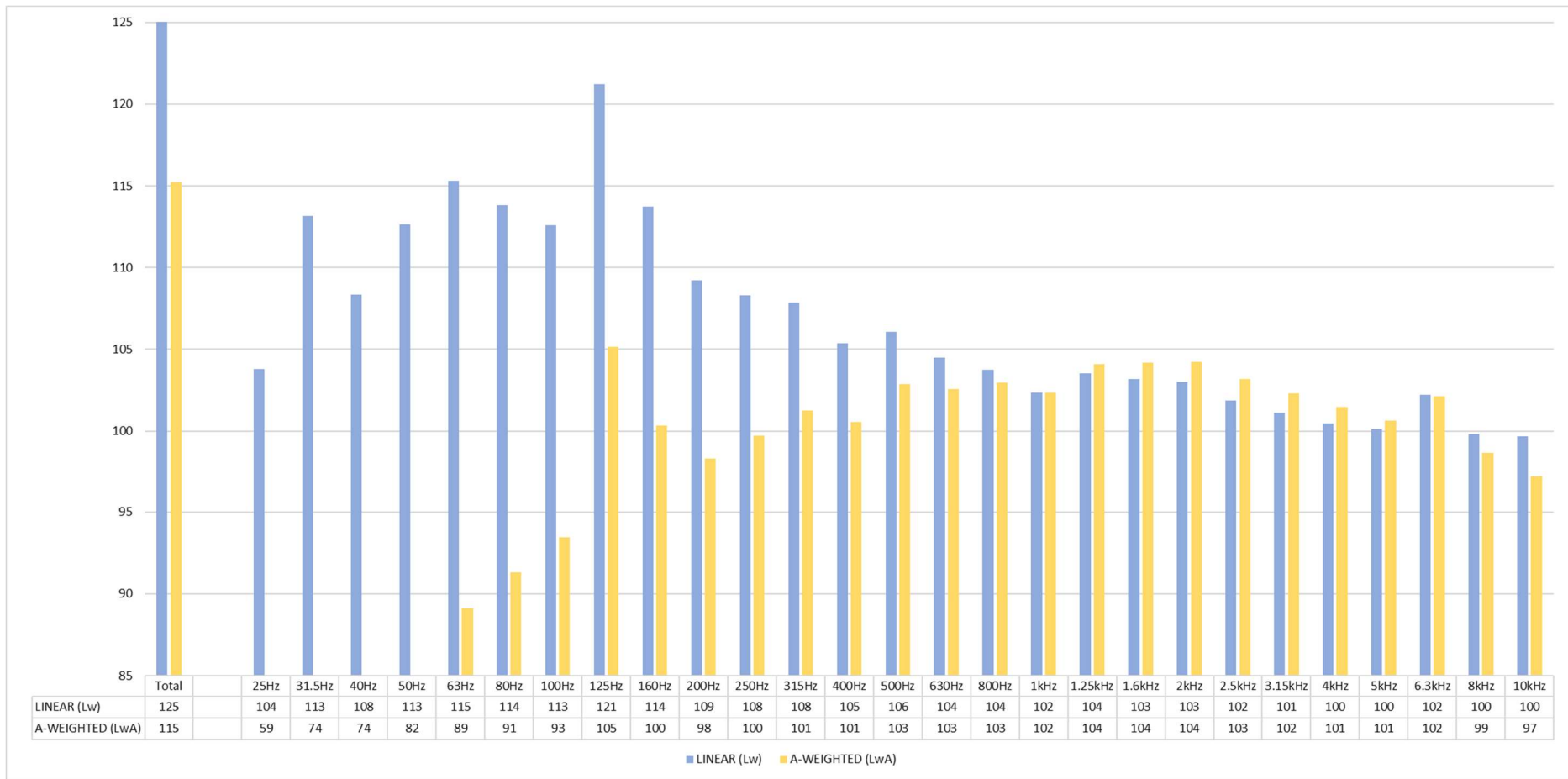


Figure 42: WC043 Uphill

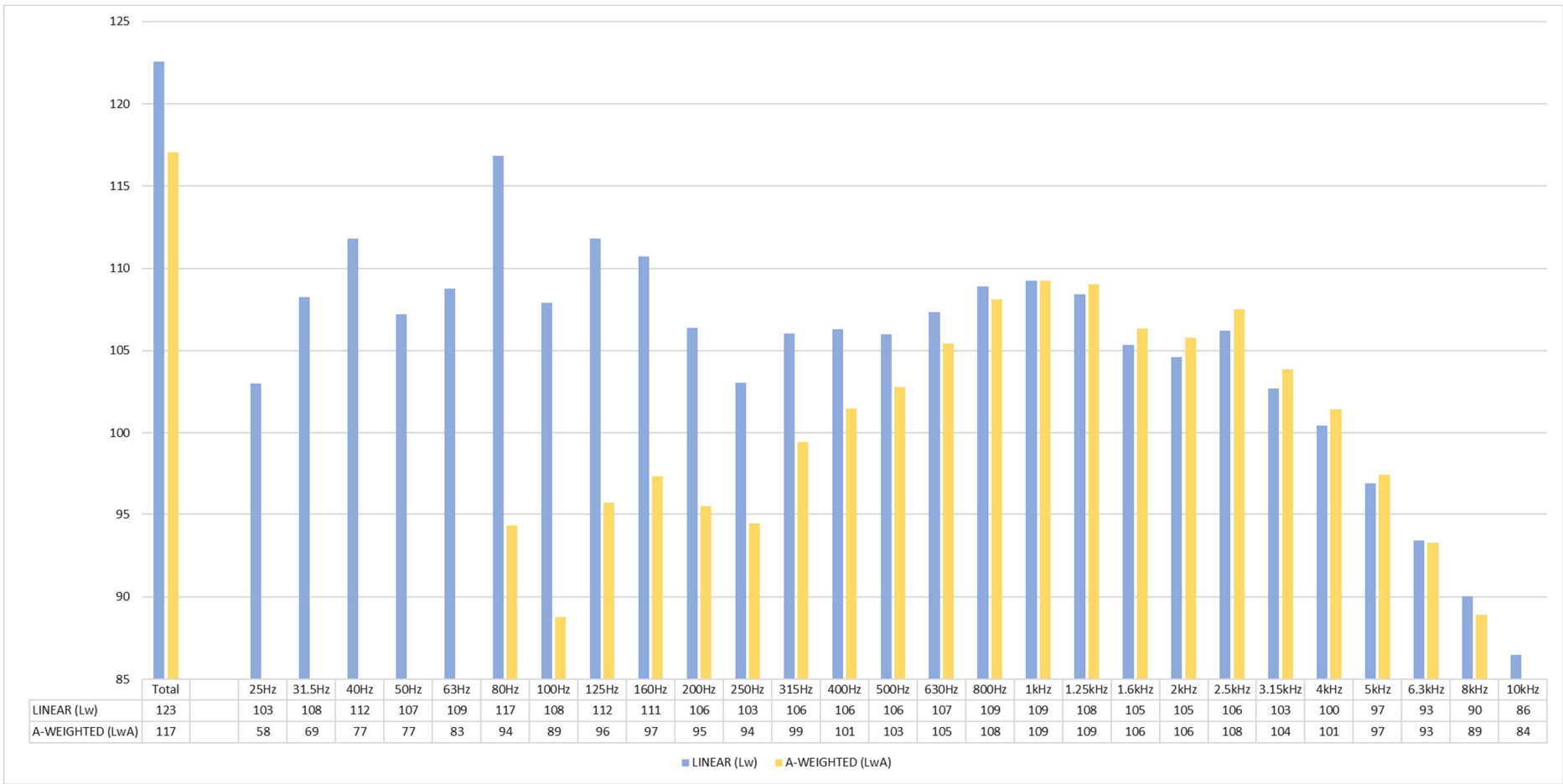


Figure 43: WC043 Downhill

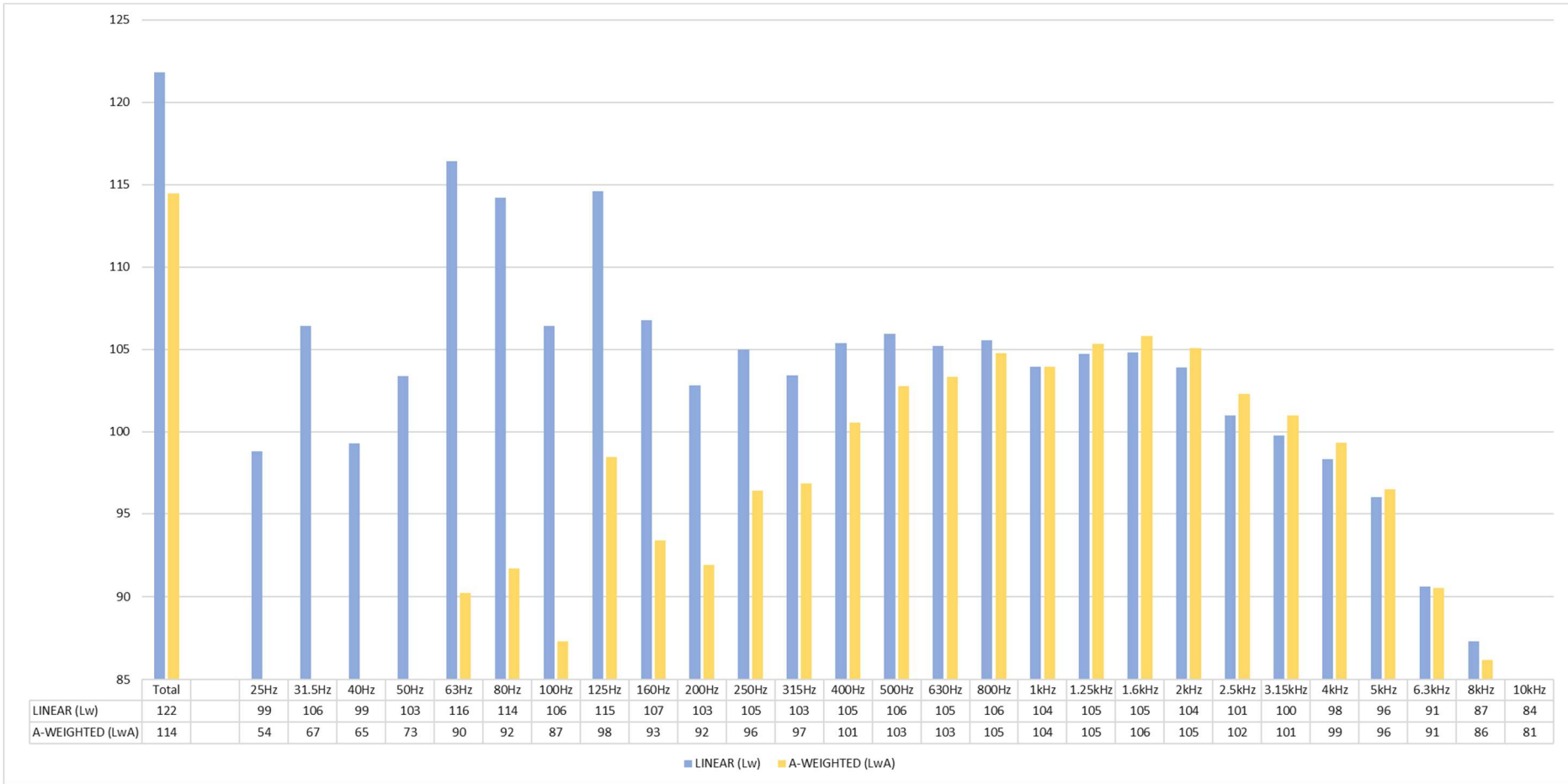


Figure 44: WC044 Stationary

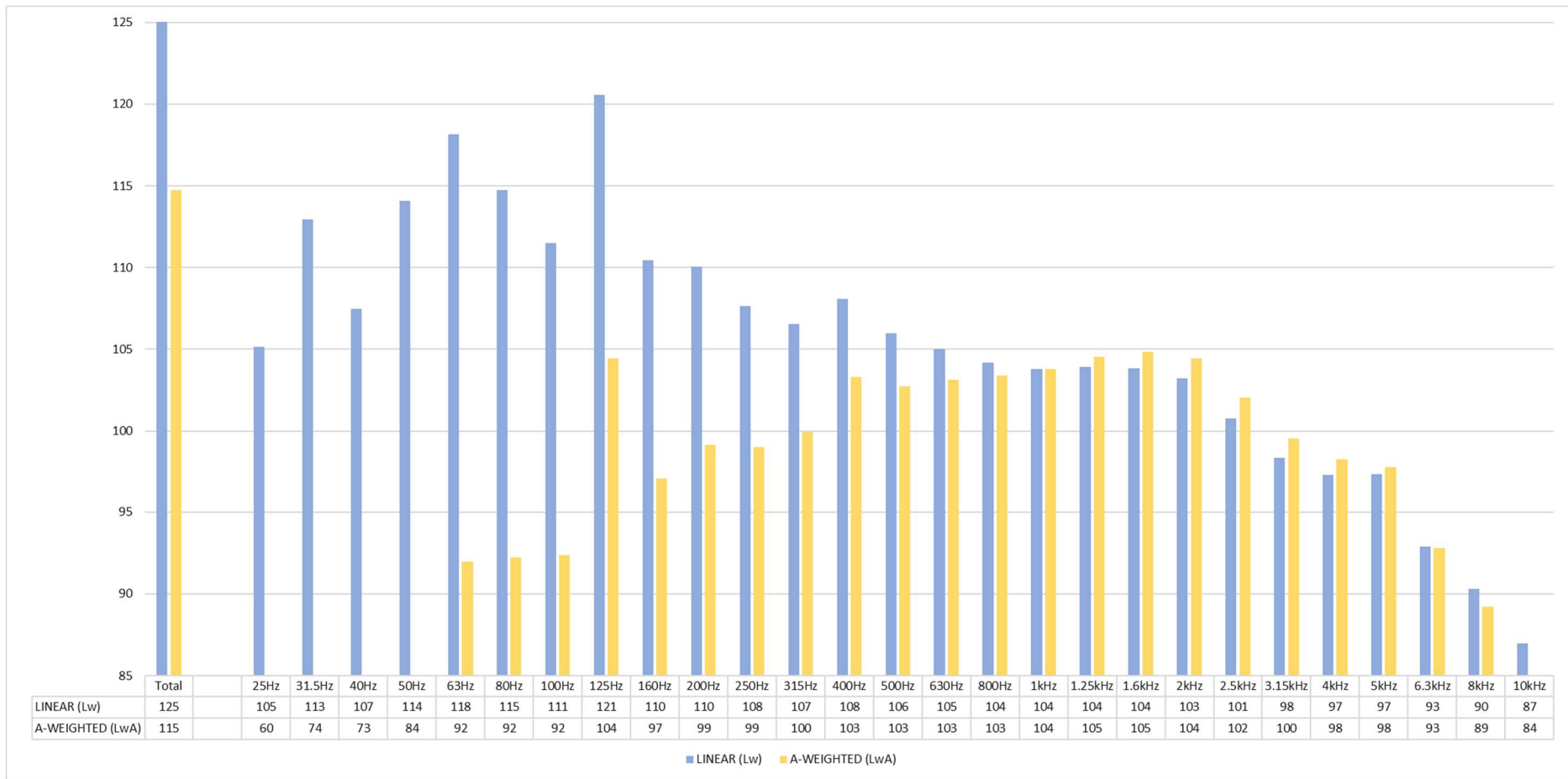


Figure 45: WC044 Uphill

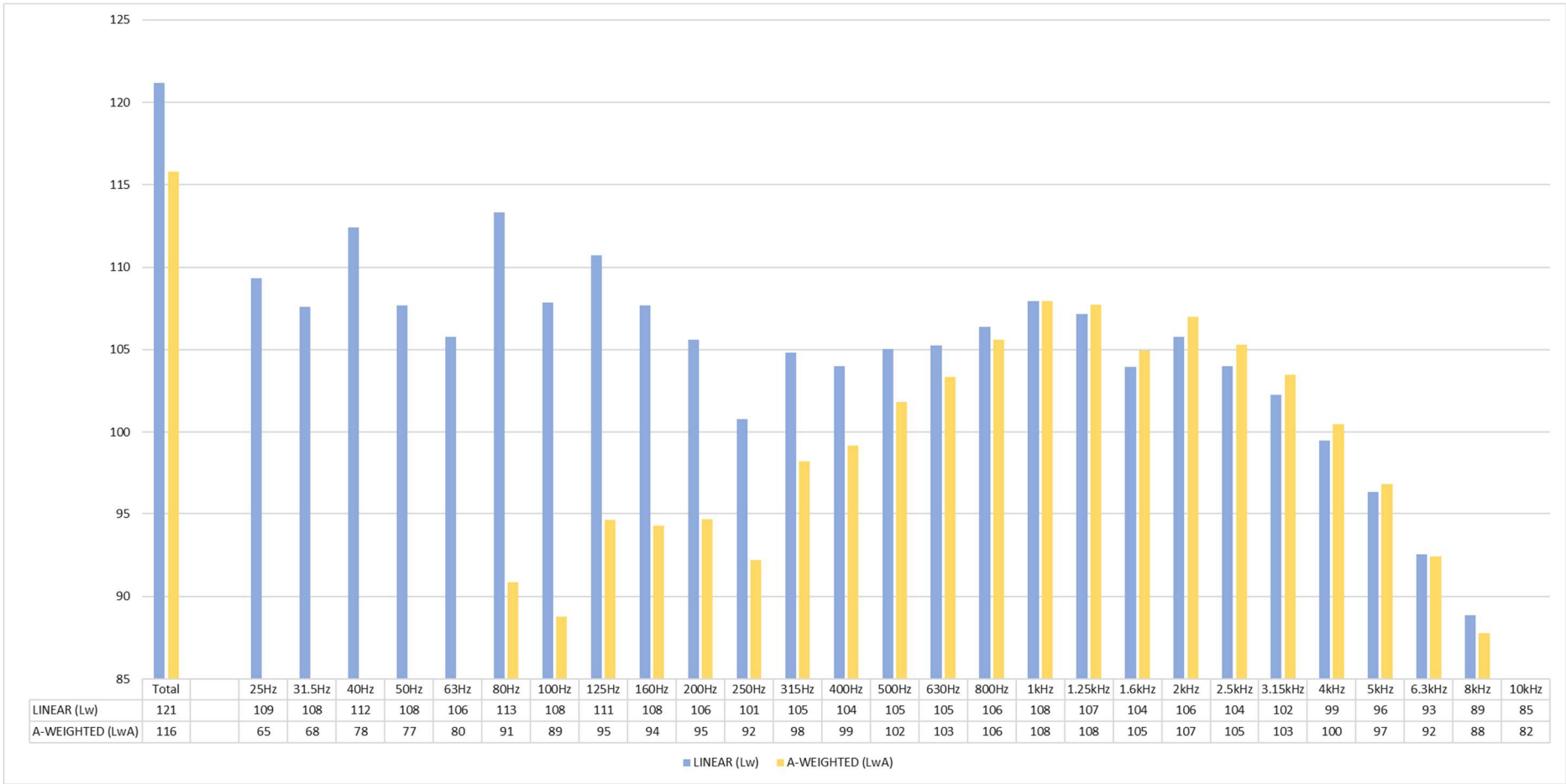


Figure 46: WC044 Downhill

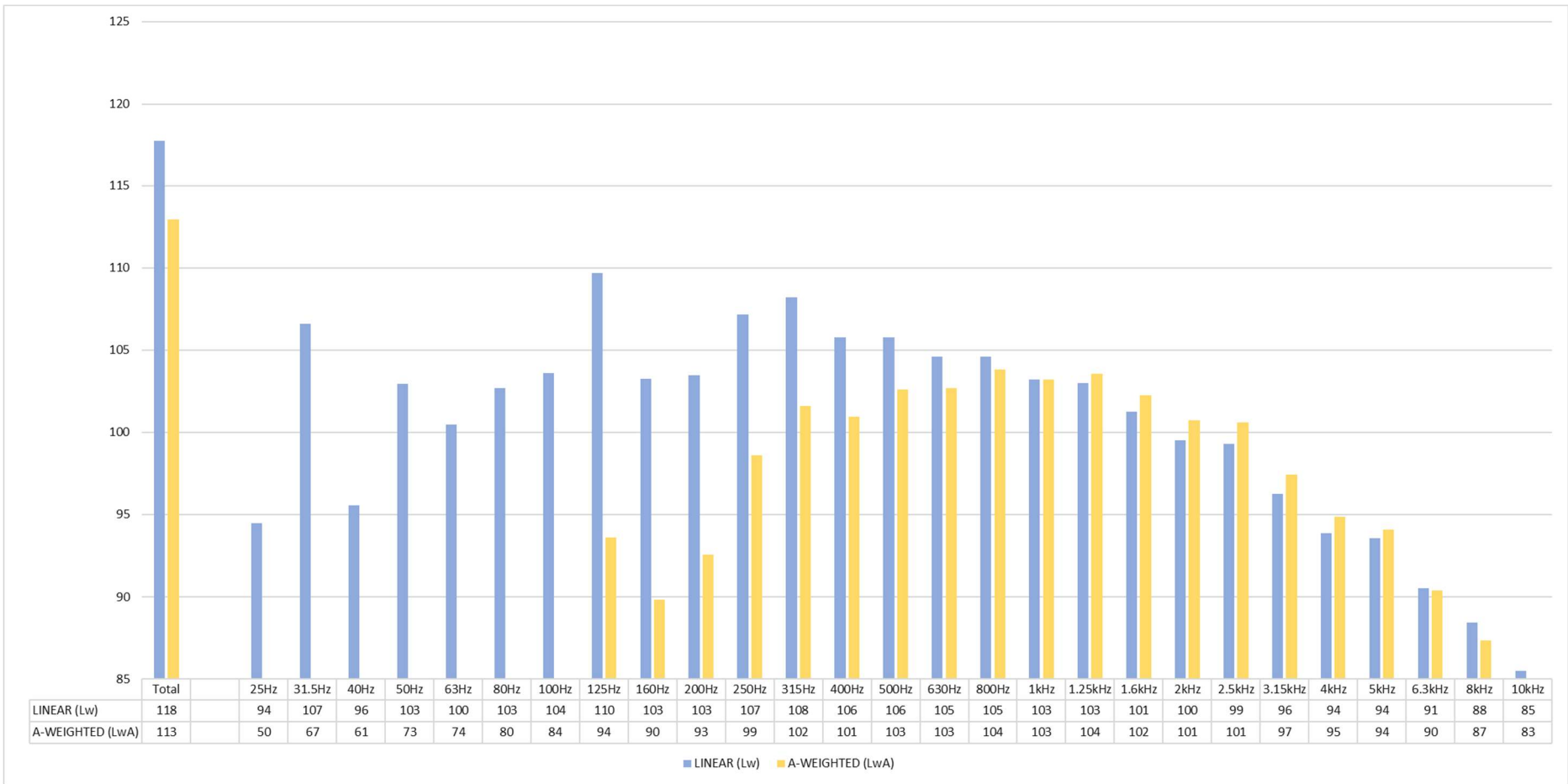


Figure 47: WC69I Stationary

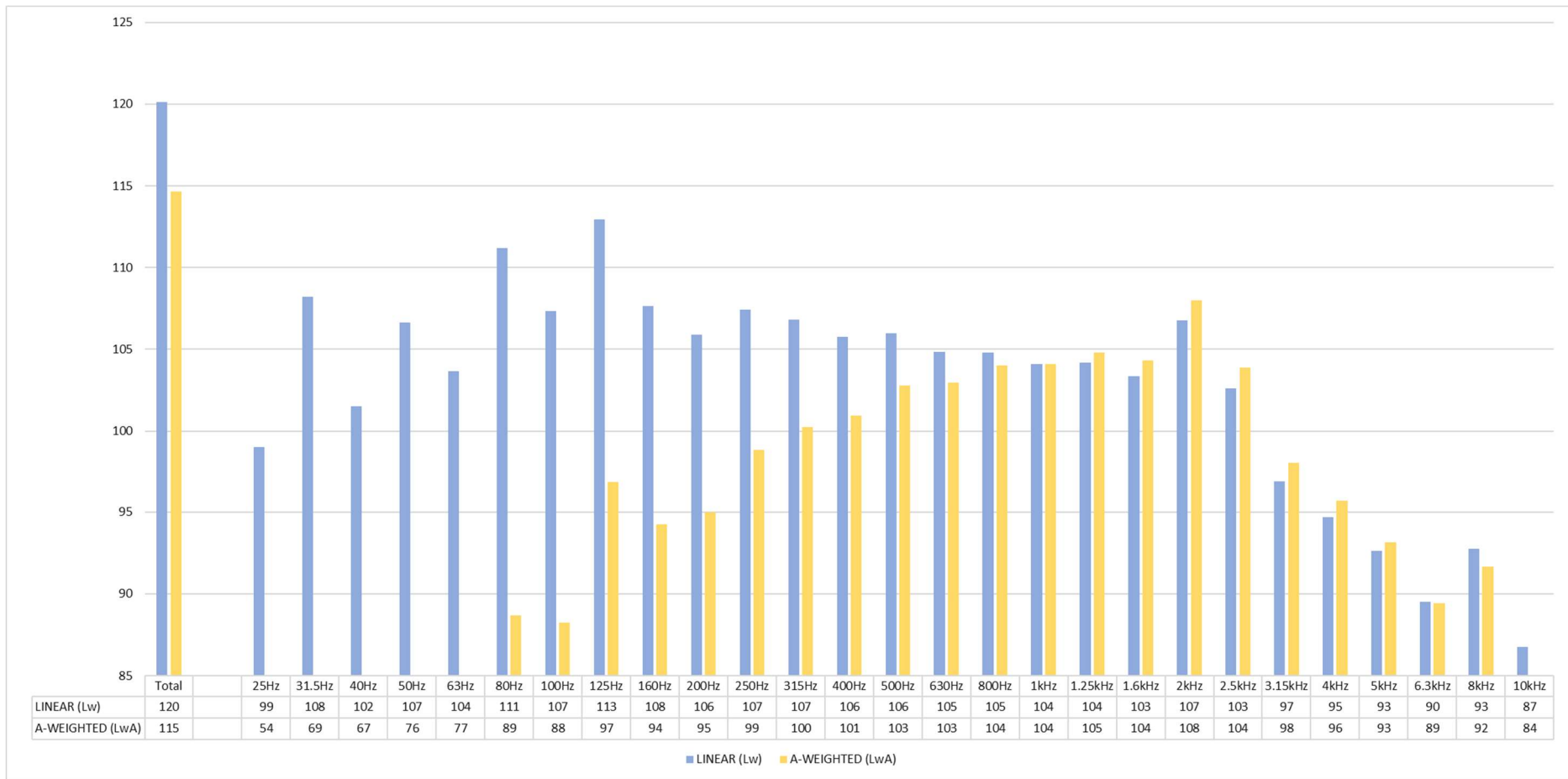


Figure 48: WC69I Uphill

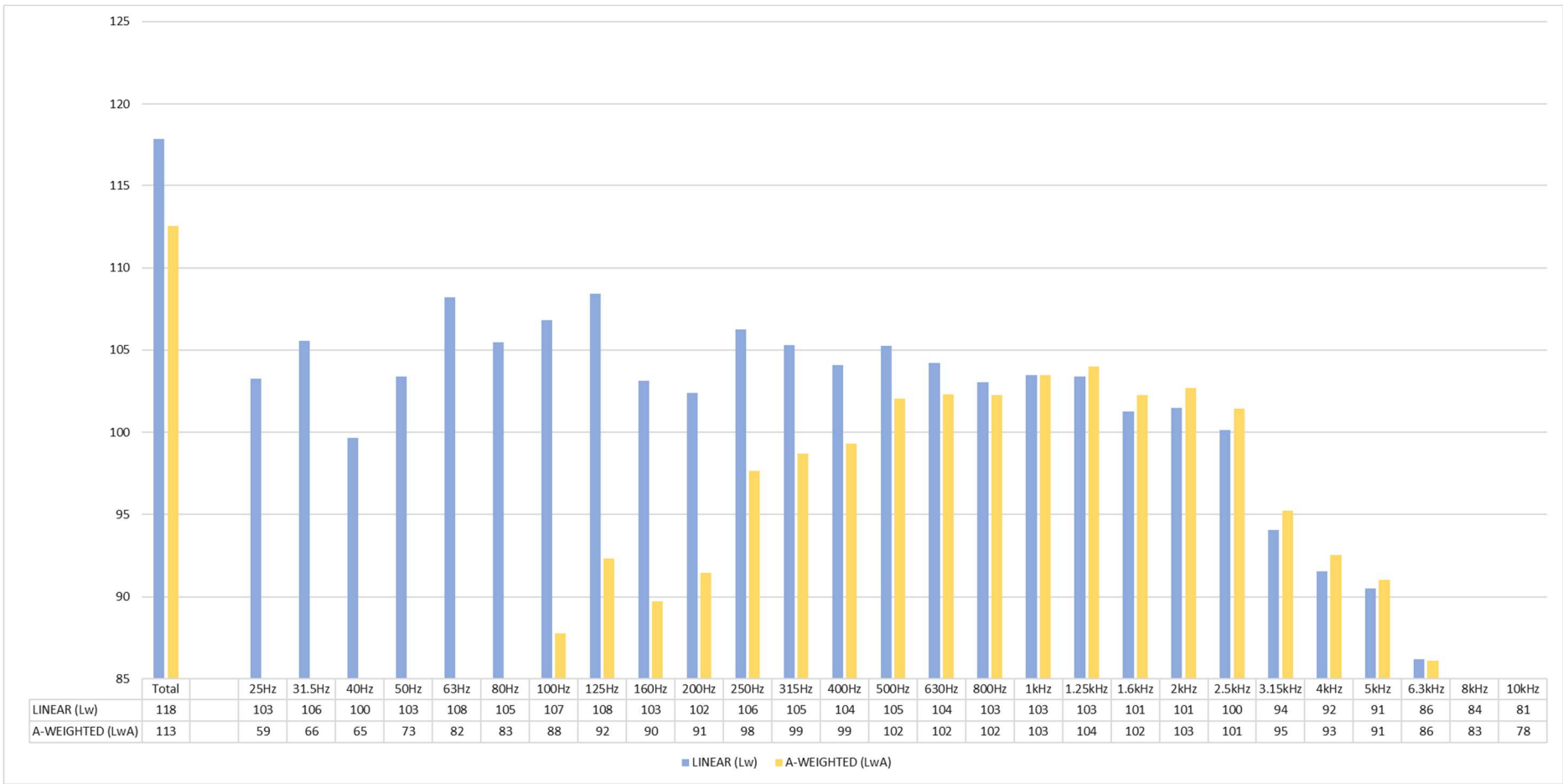


Figure 49: WC691 Downhill

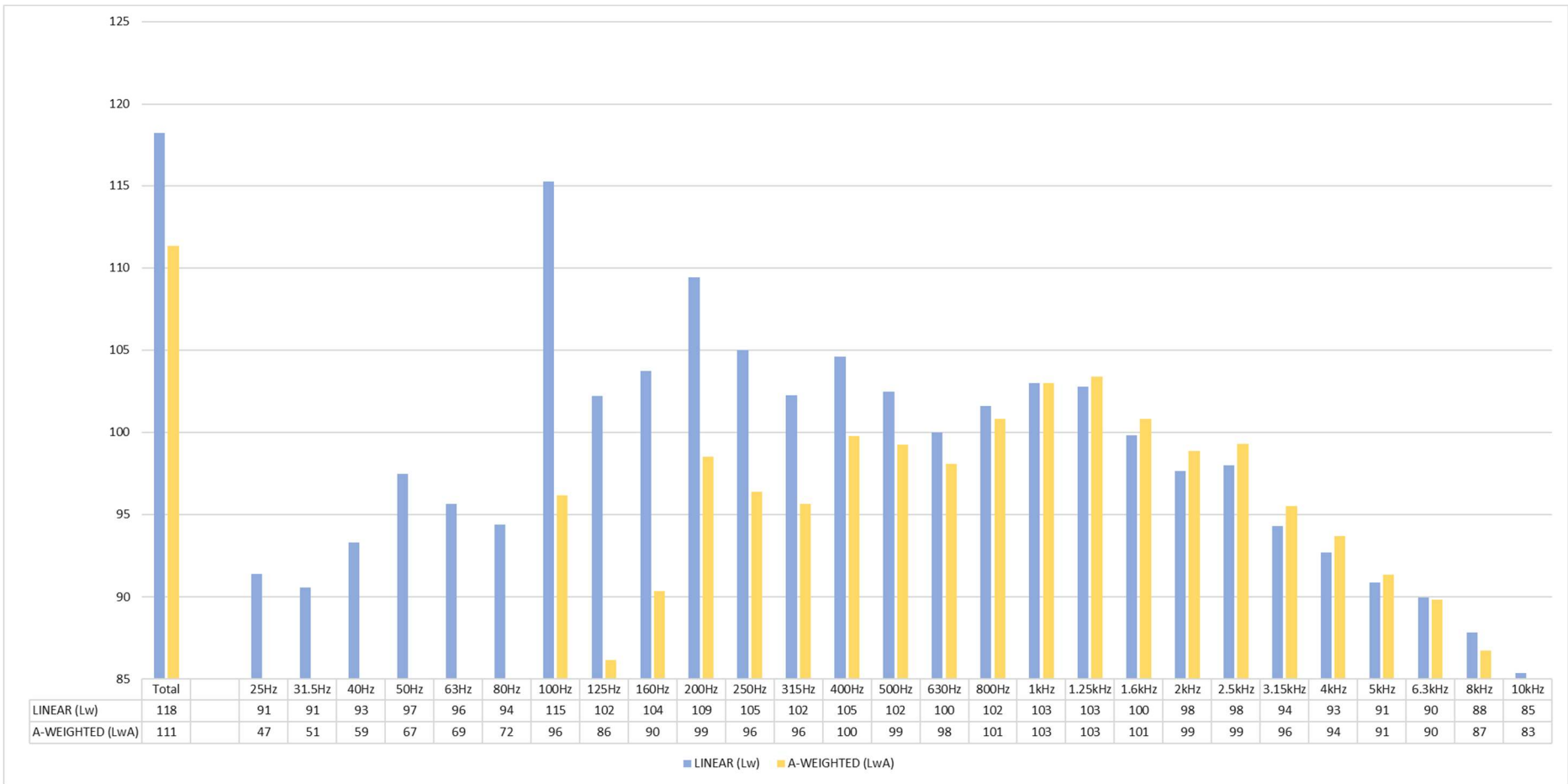


Figure 50: ST4090 Stationary

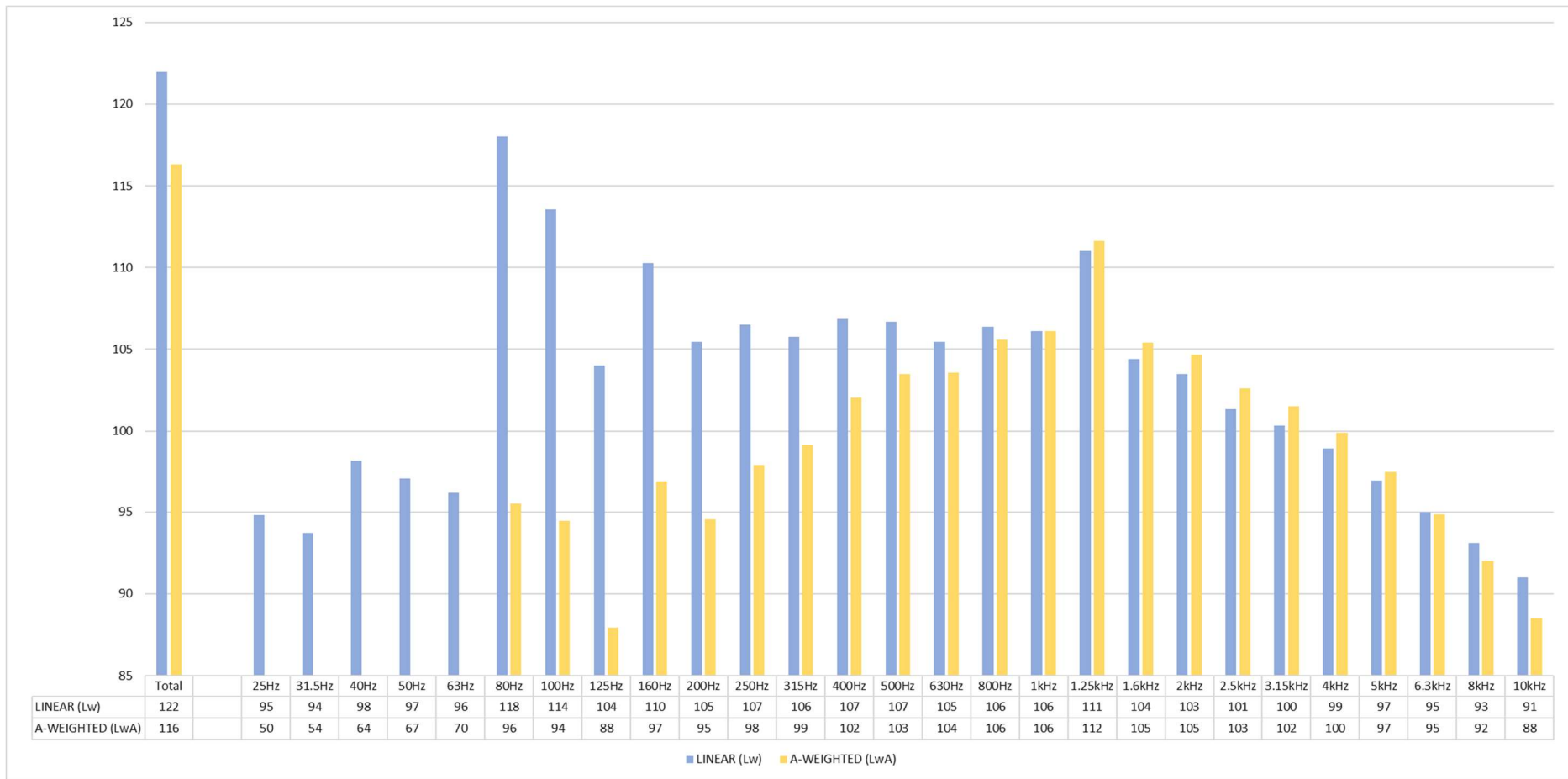


Figure 51: ST4090 Uphill

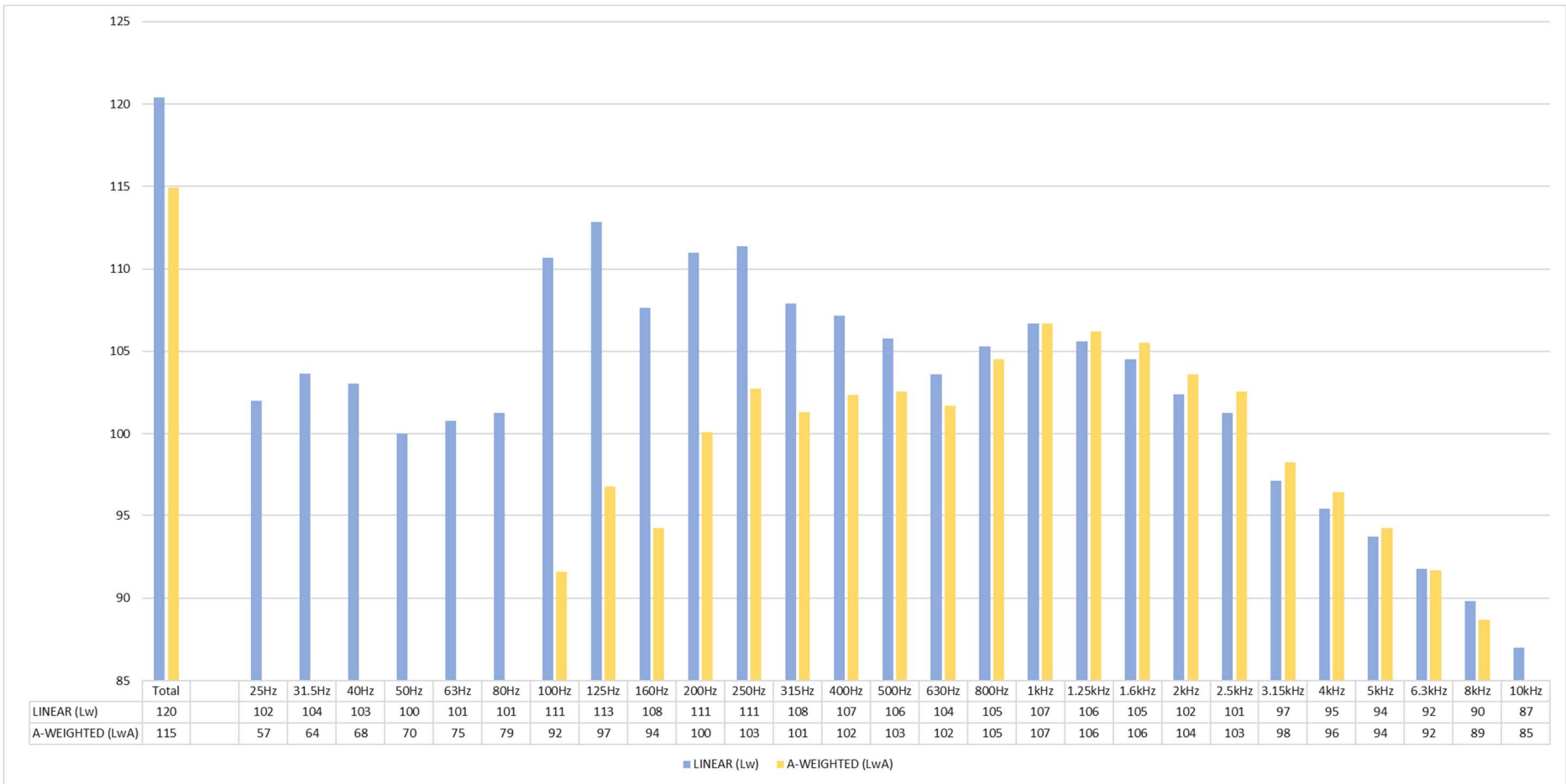


Figure 52: ST4090 Downhill

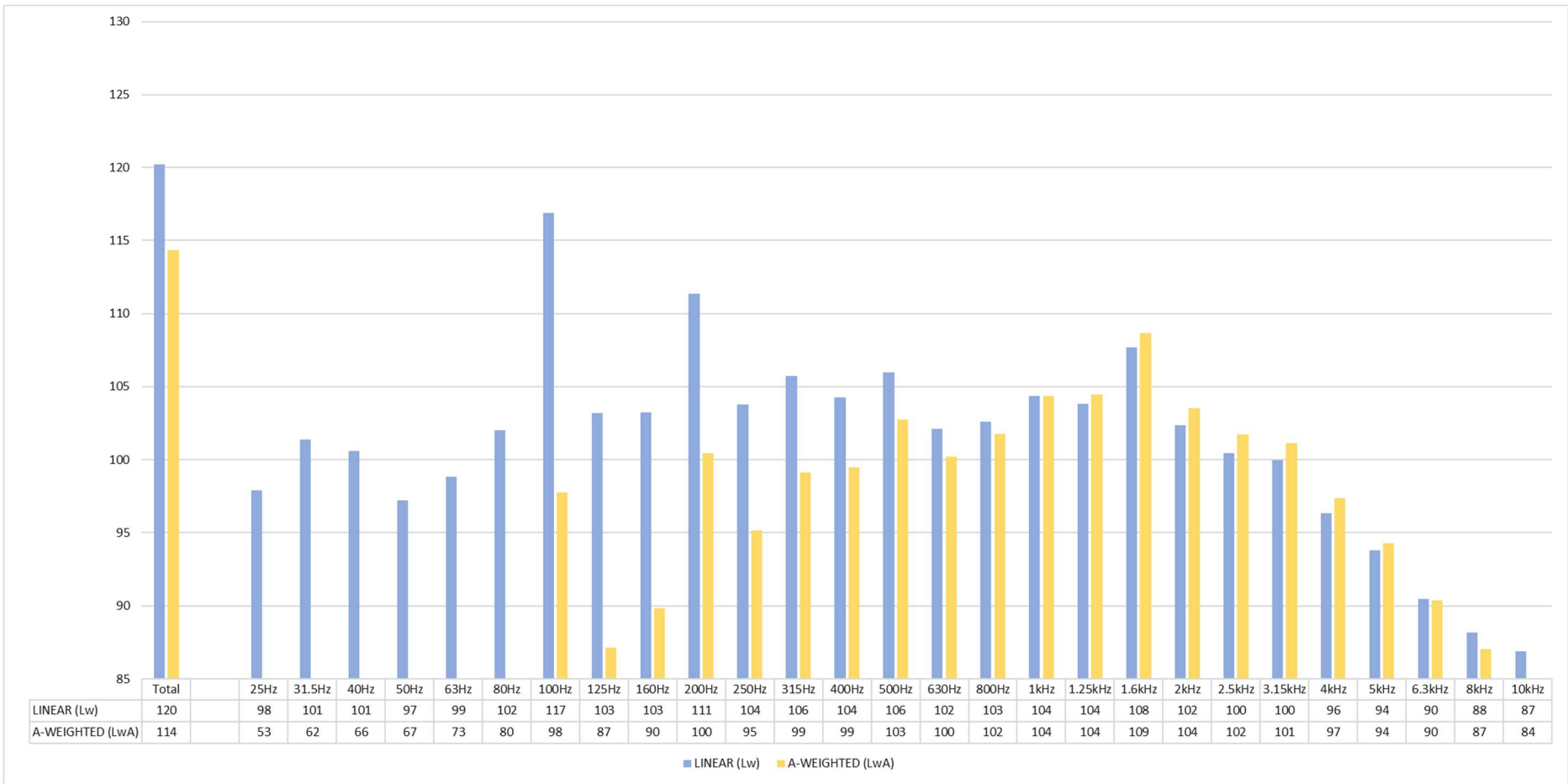


Figure 53: DT178 Stationary

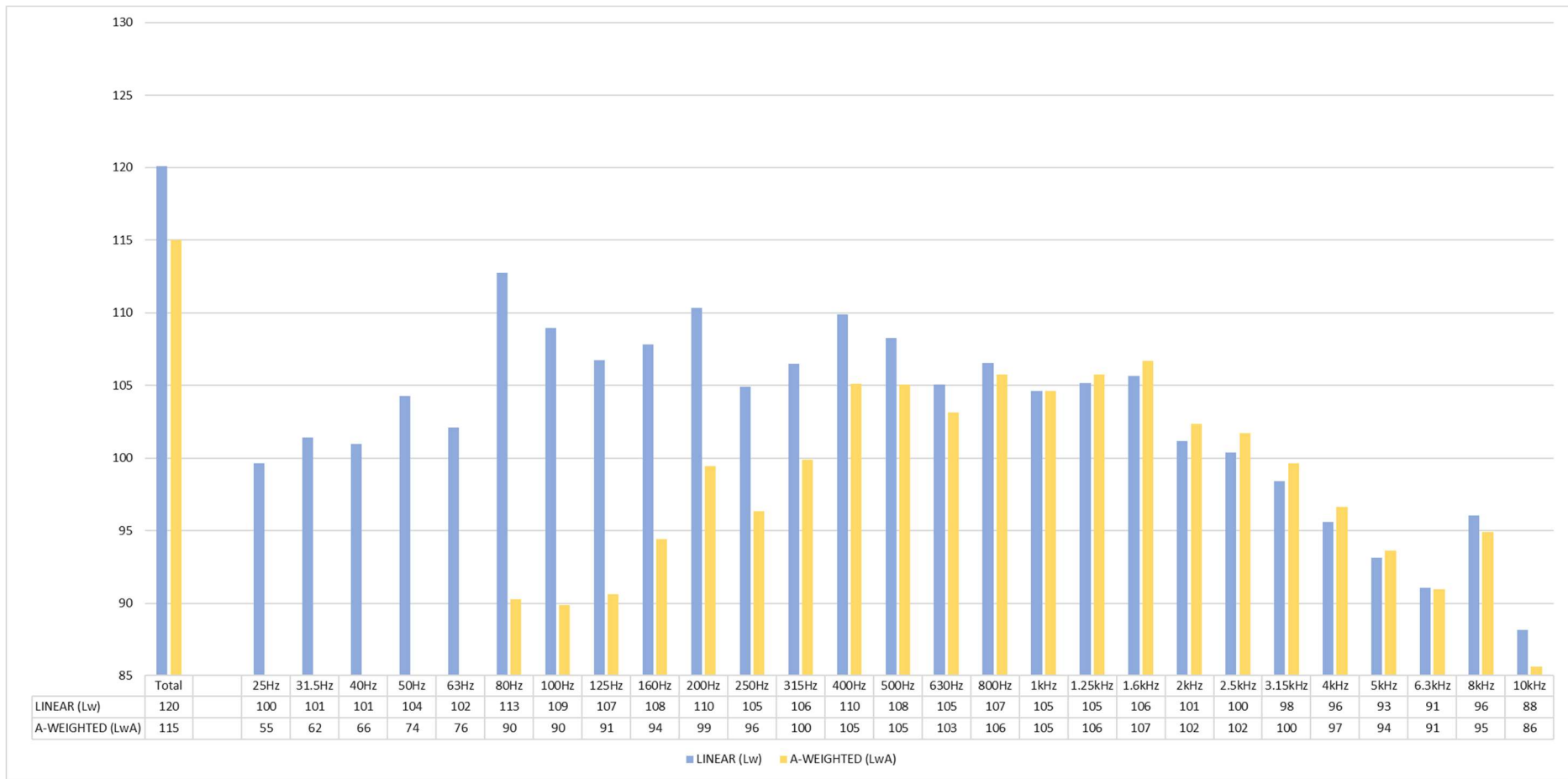


Figure 54: DT178 Uphill

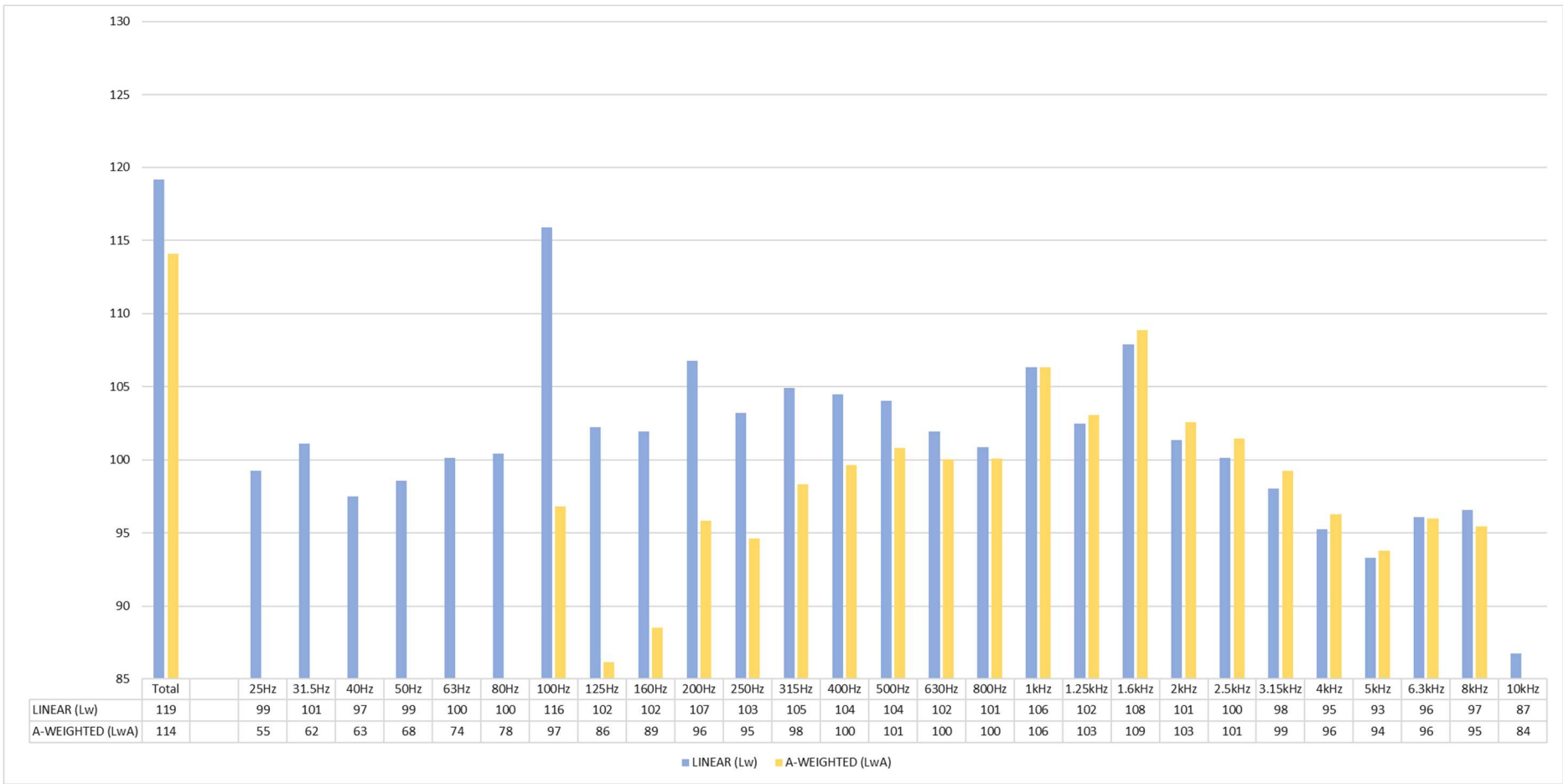


Figure 55: DTI78 Downhill

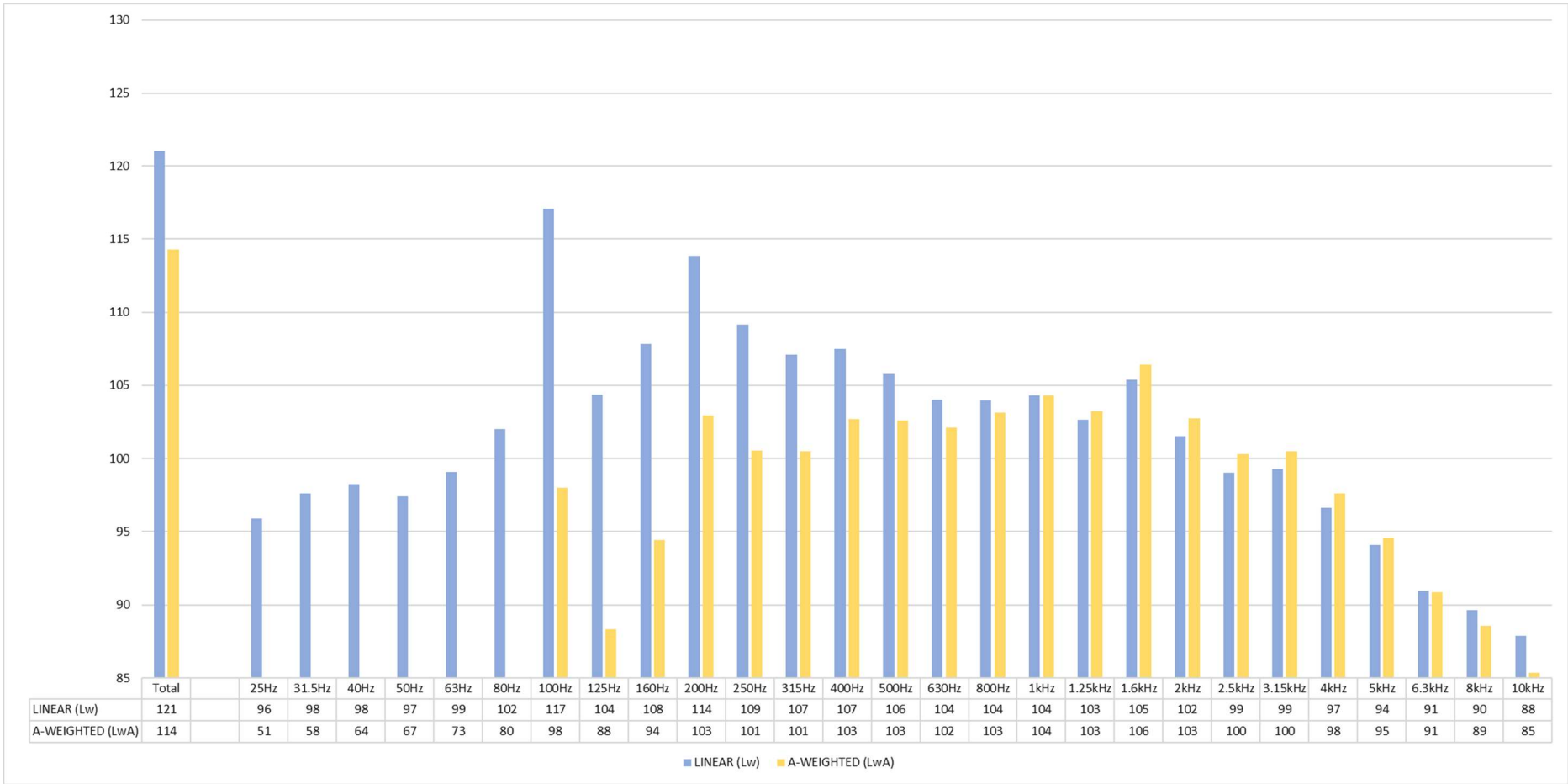


Figure 56: DT180 Stationary

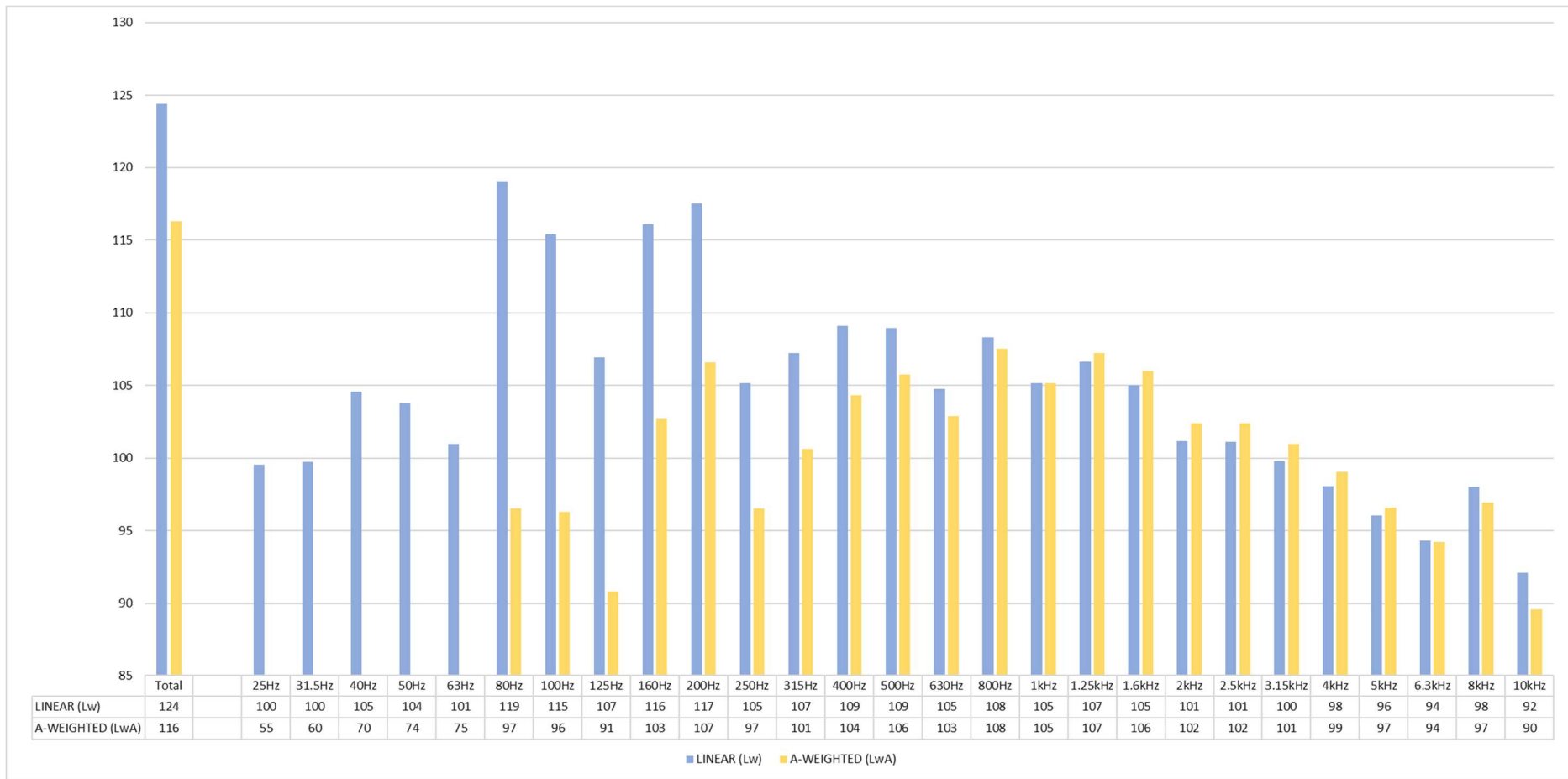


Figure 57: DT180 Uphill

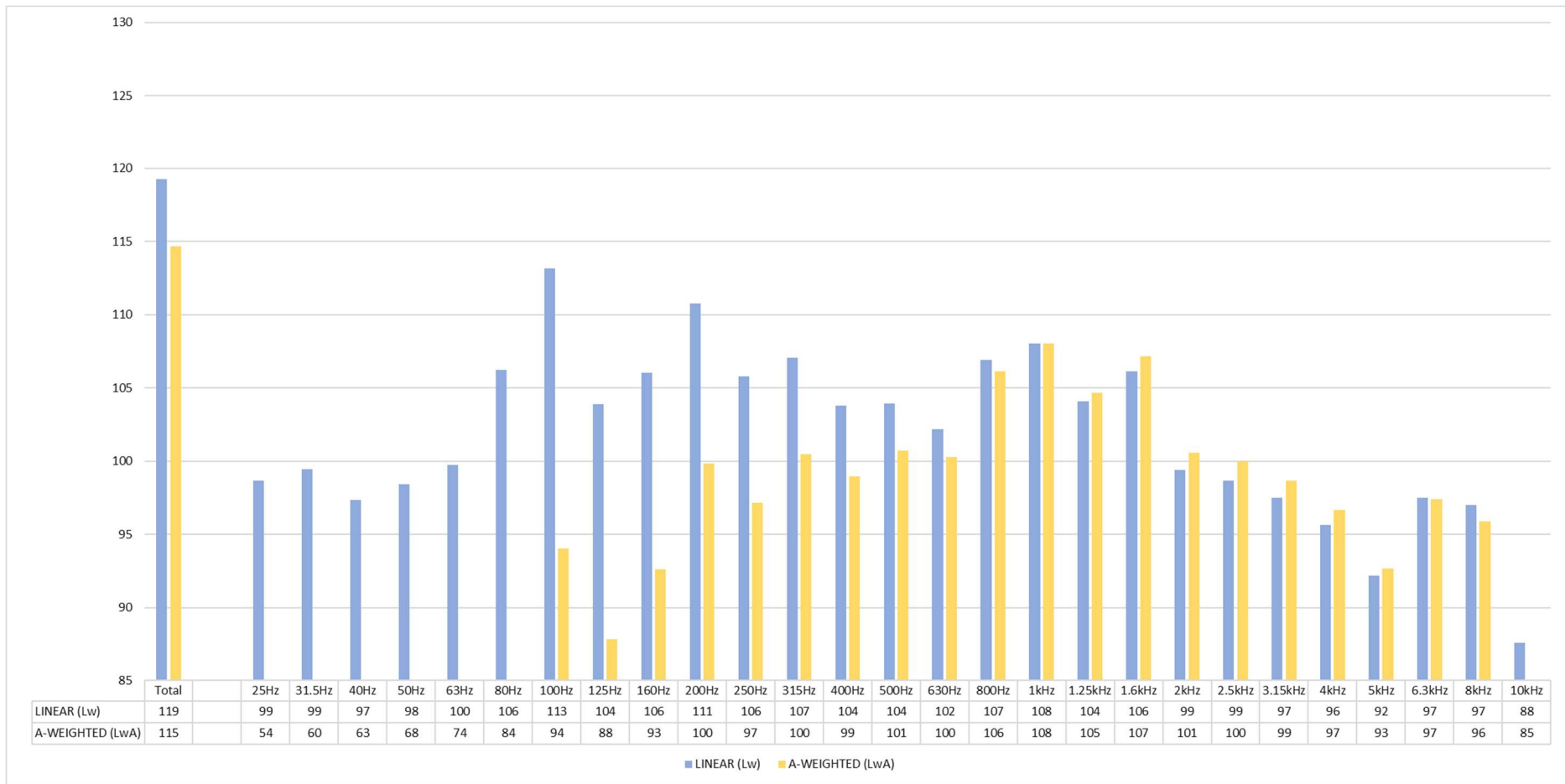


Figure 58: DT180 Downhill

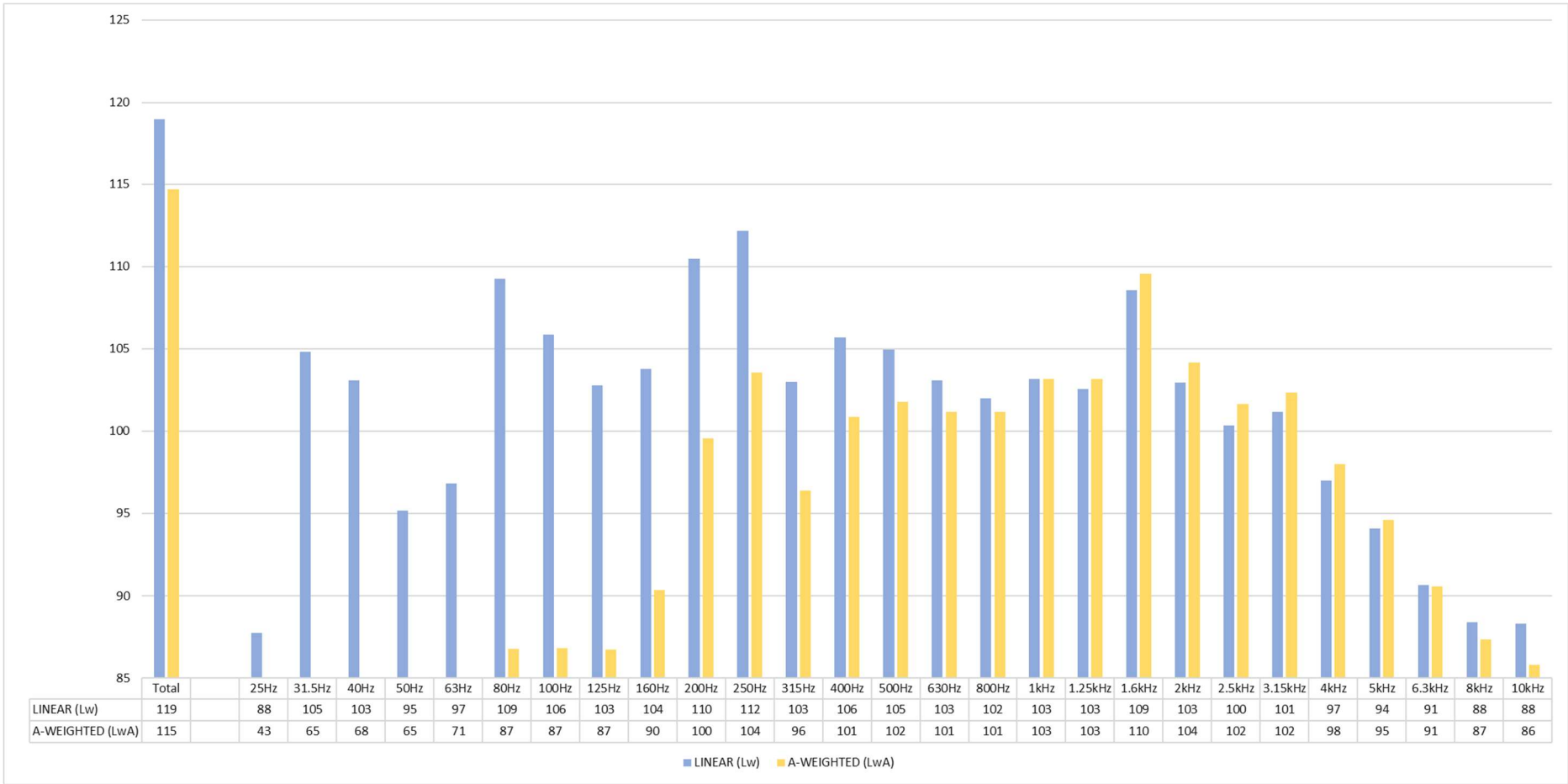


Figure 59: DT181 Stationary

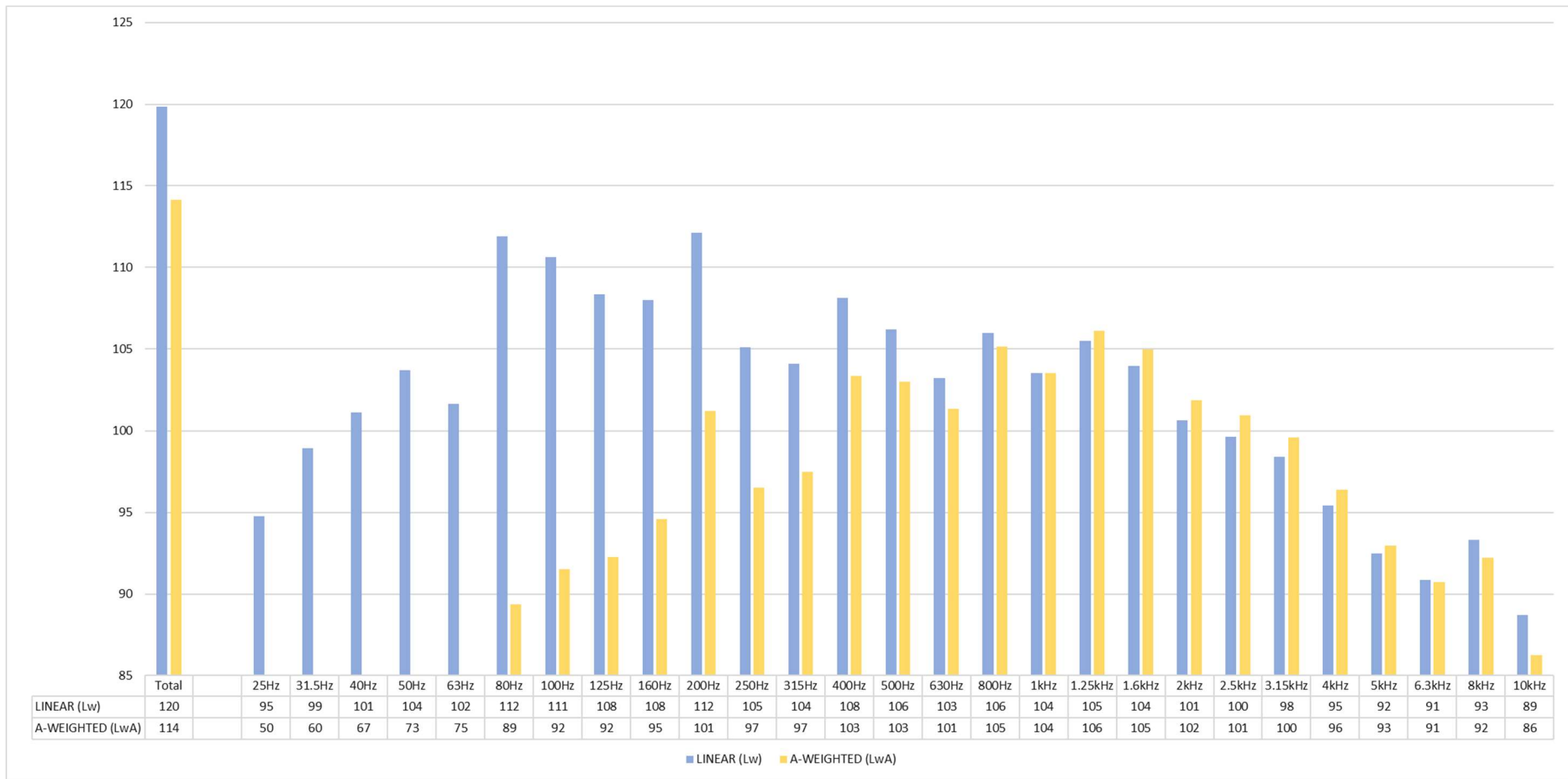


Figure 60: DT181 Uphill

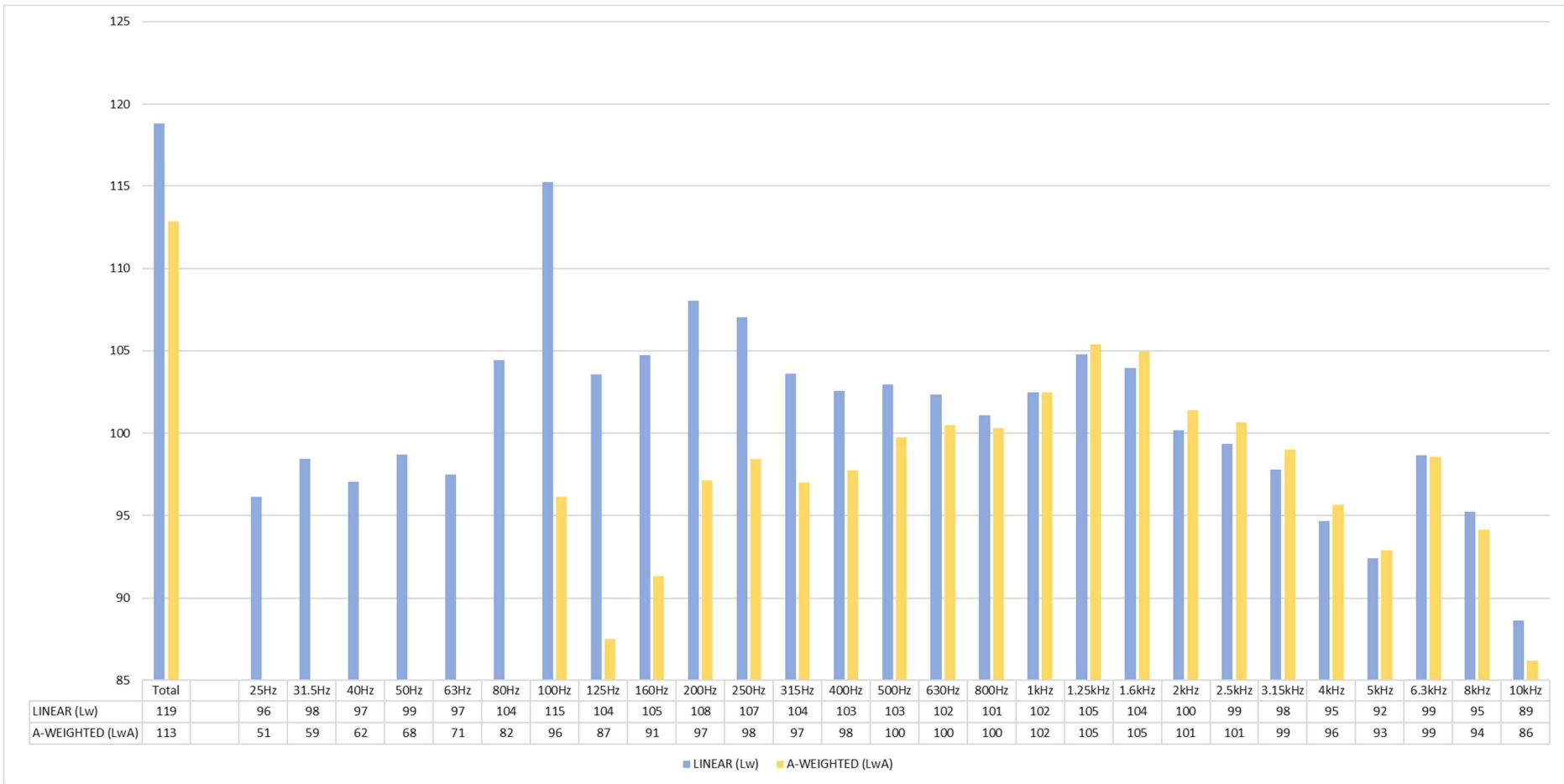


Figure 61: DT181 Downhill

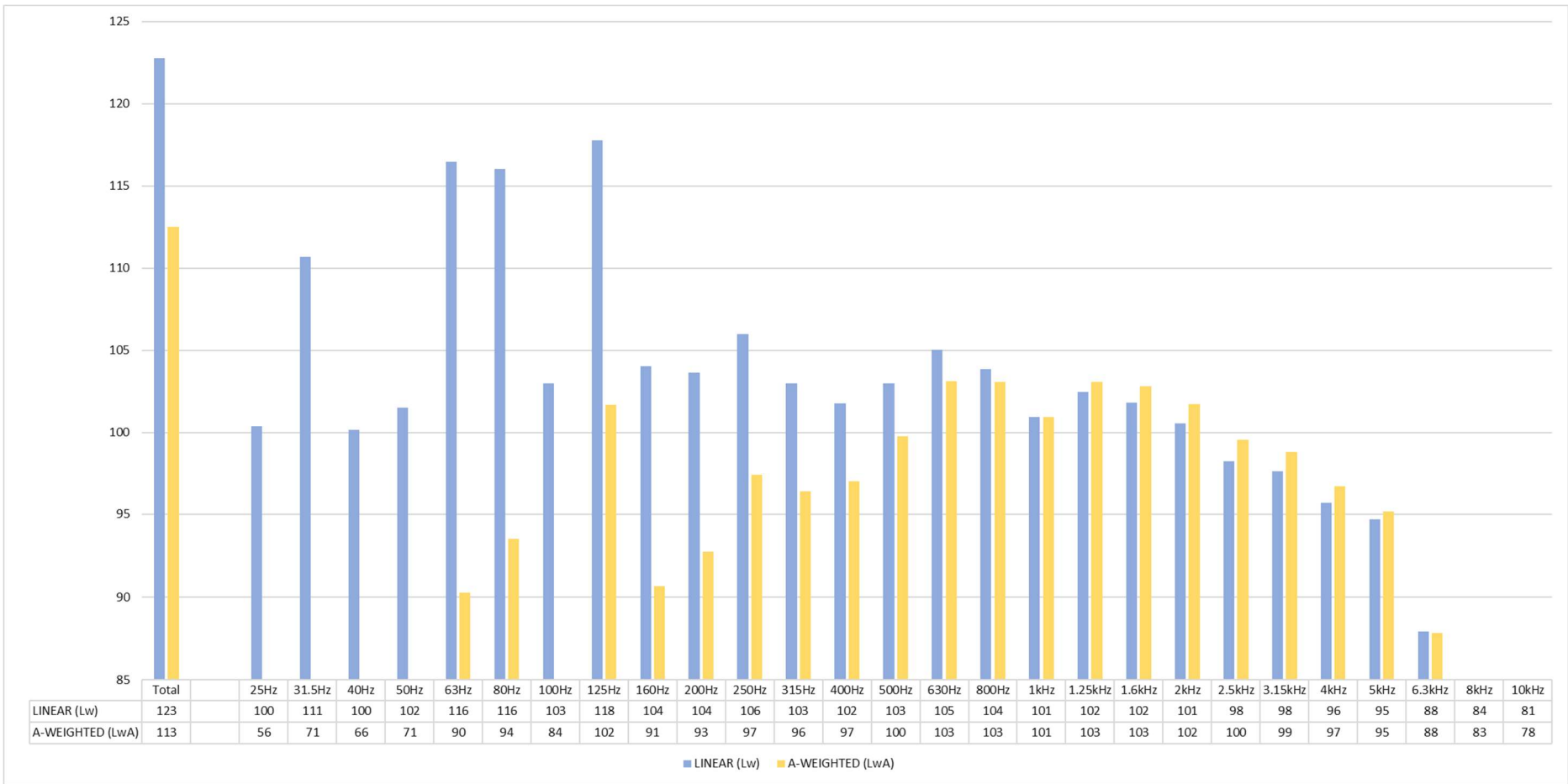


Figure 62: DT268 Stationary

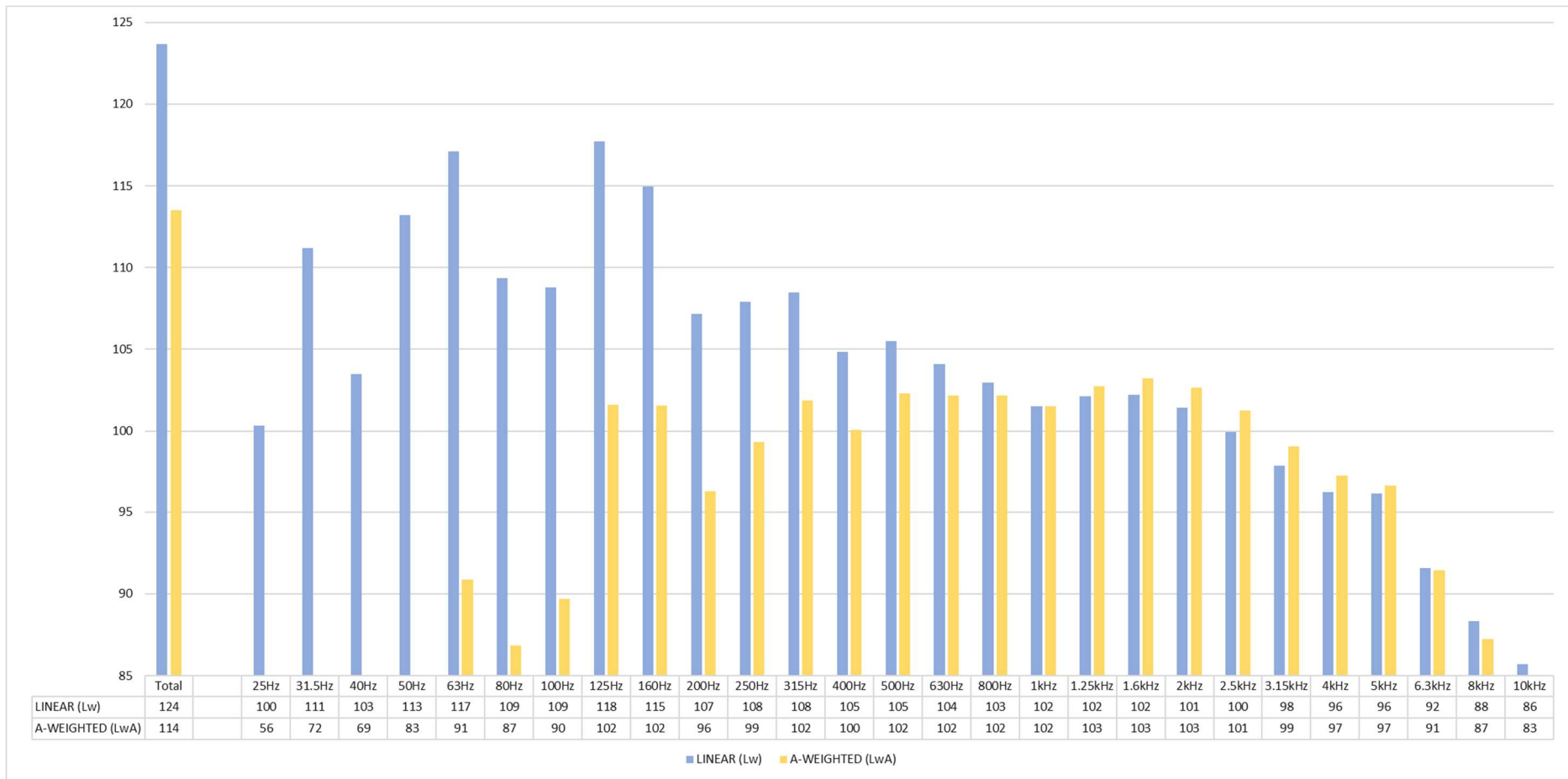


Figure 63: DT268 Uphill

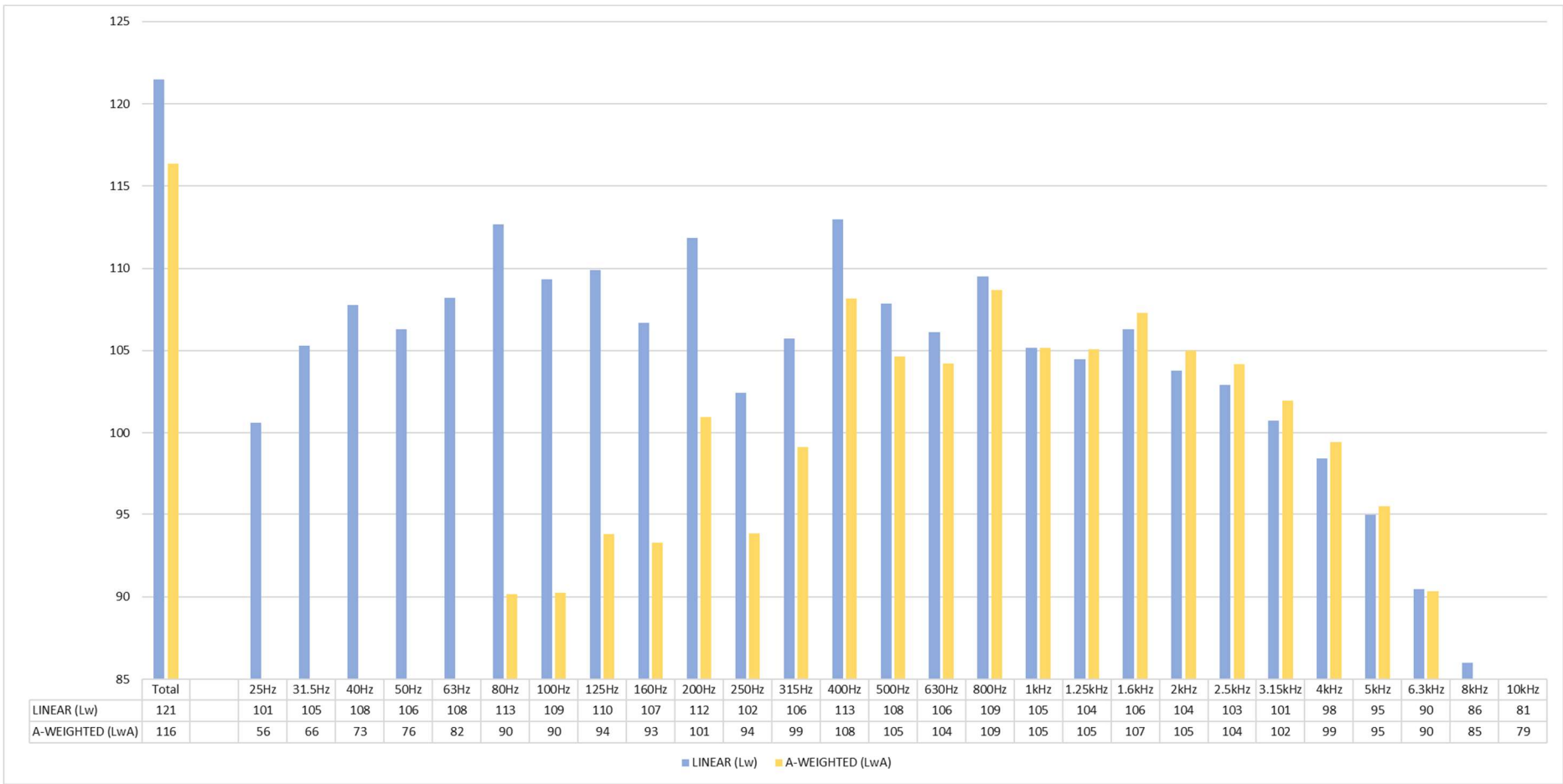


Figure 64: DT268 Downhill

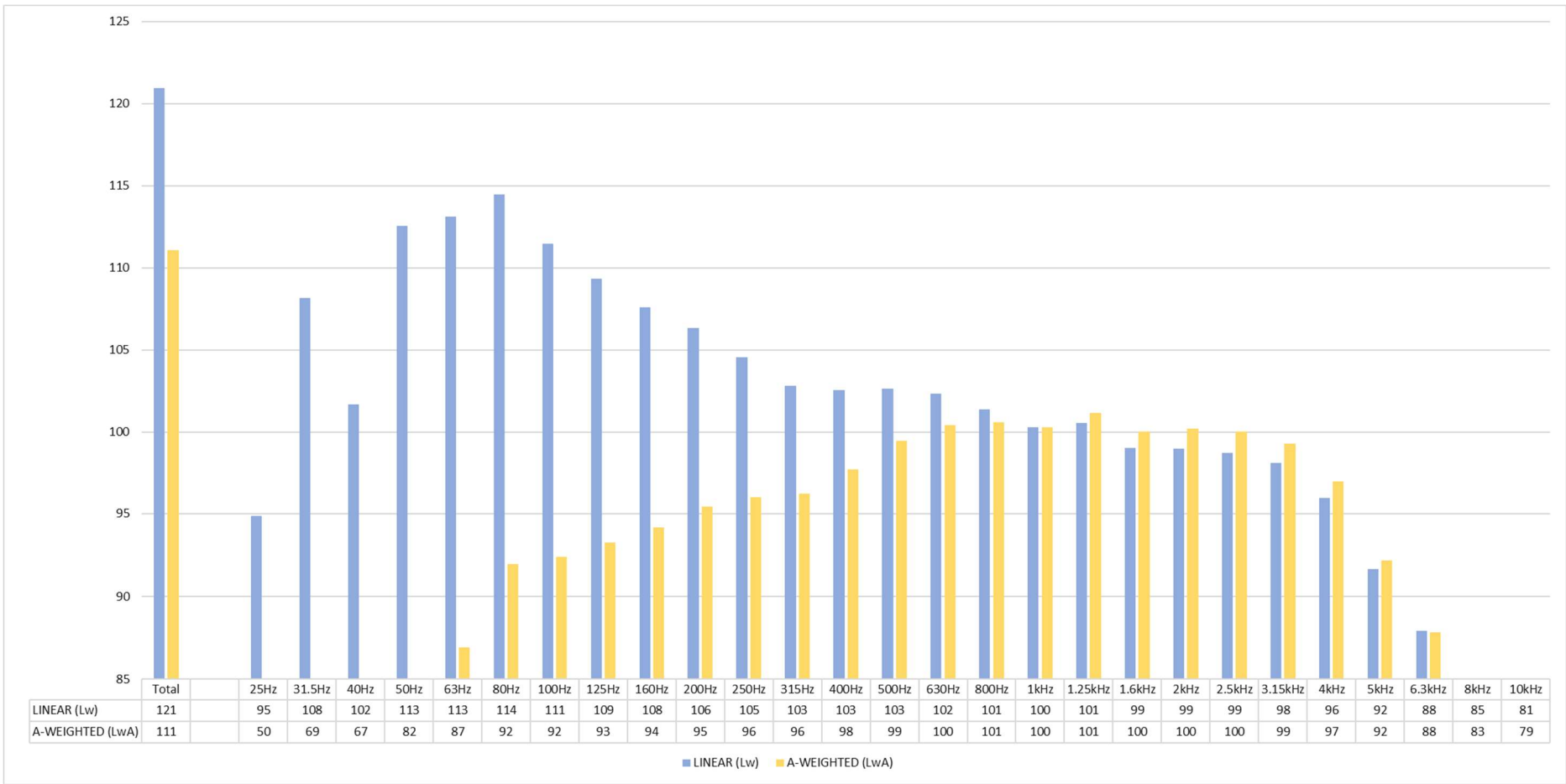


Figure 65: DT310 Stationary

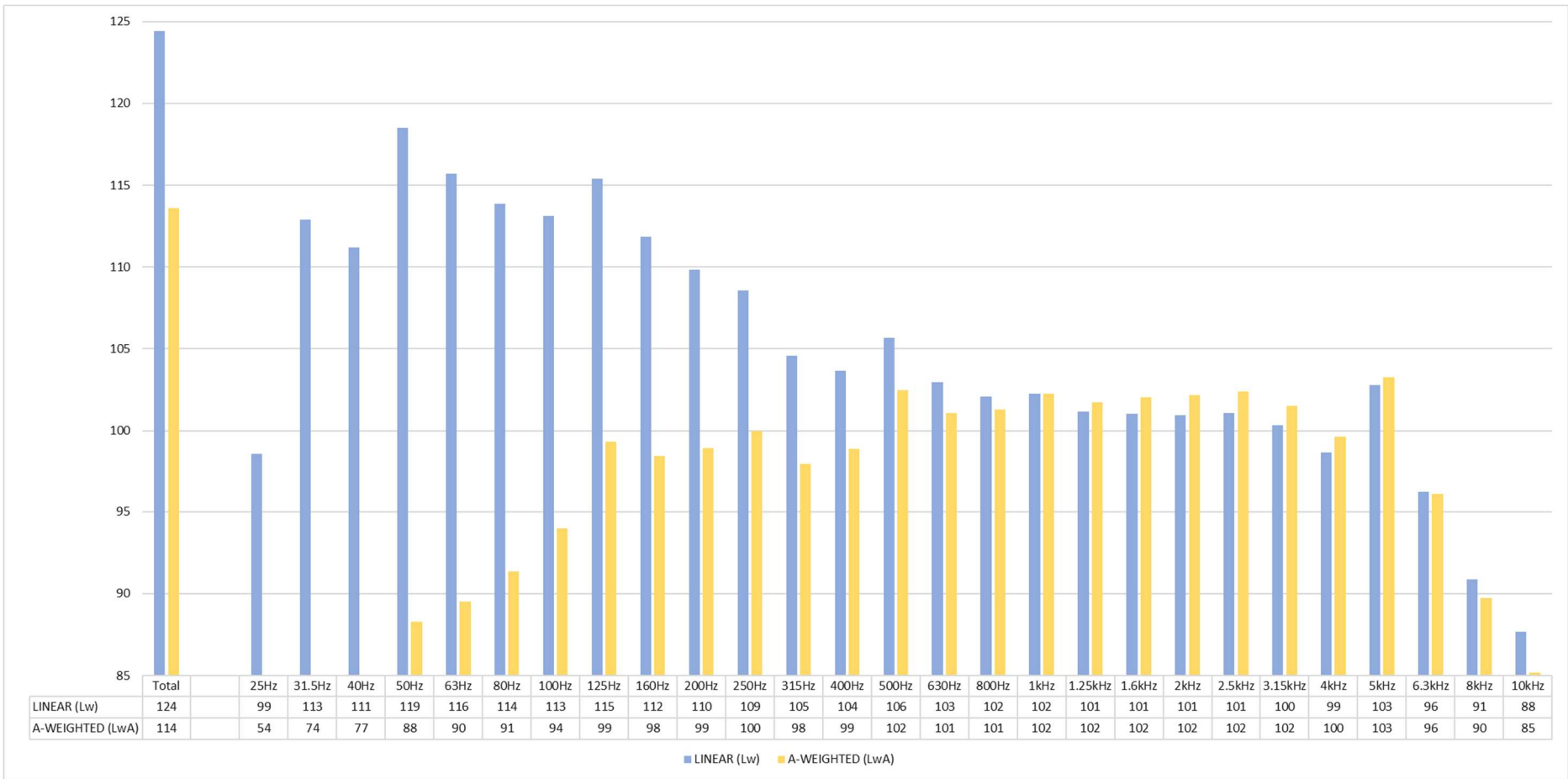


Figure 66: DT310 Uphill

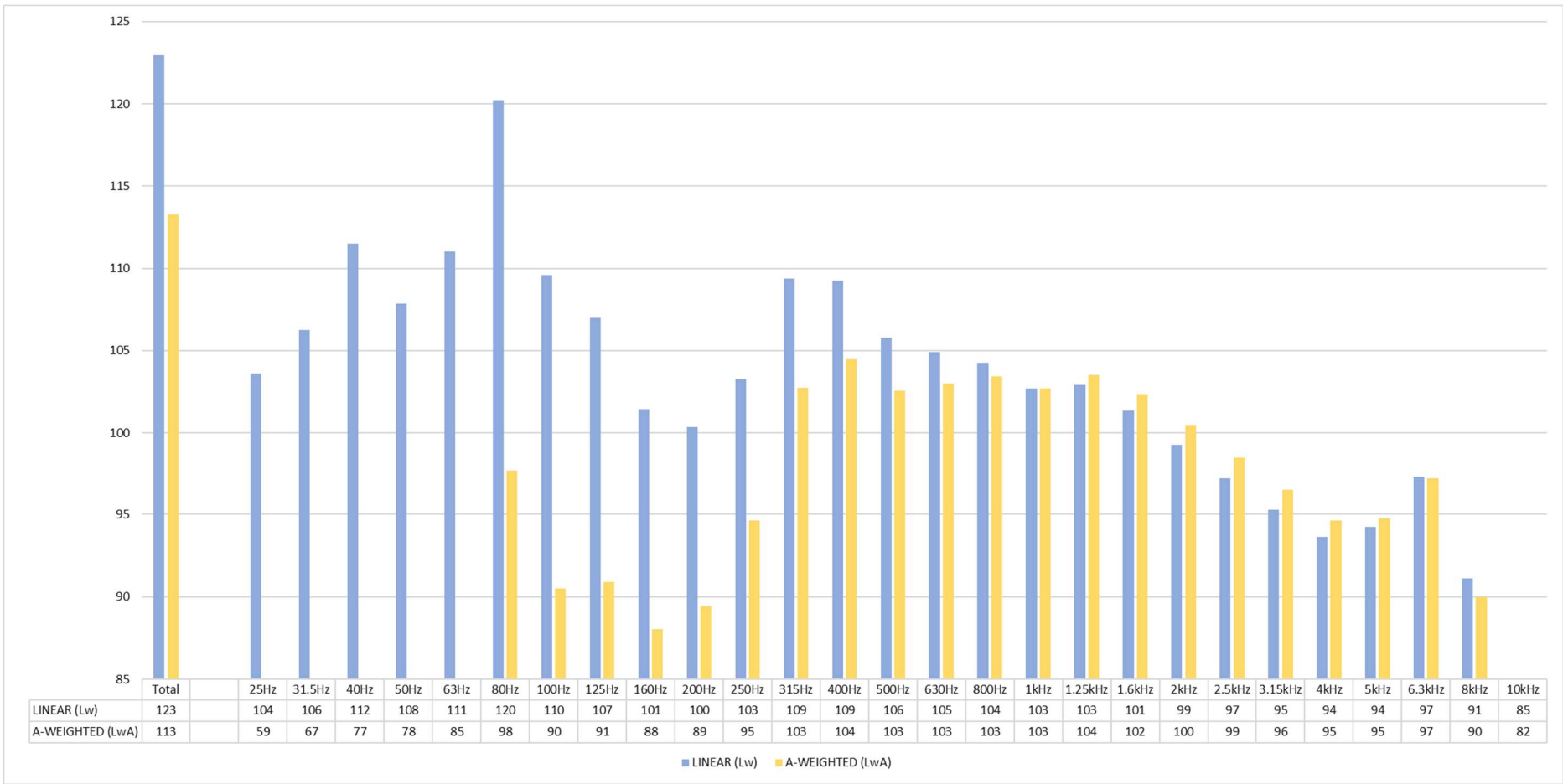


Figure 67: DT310 Downhill

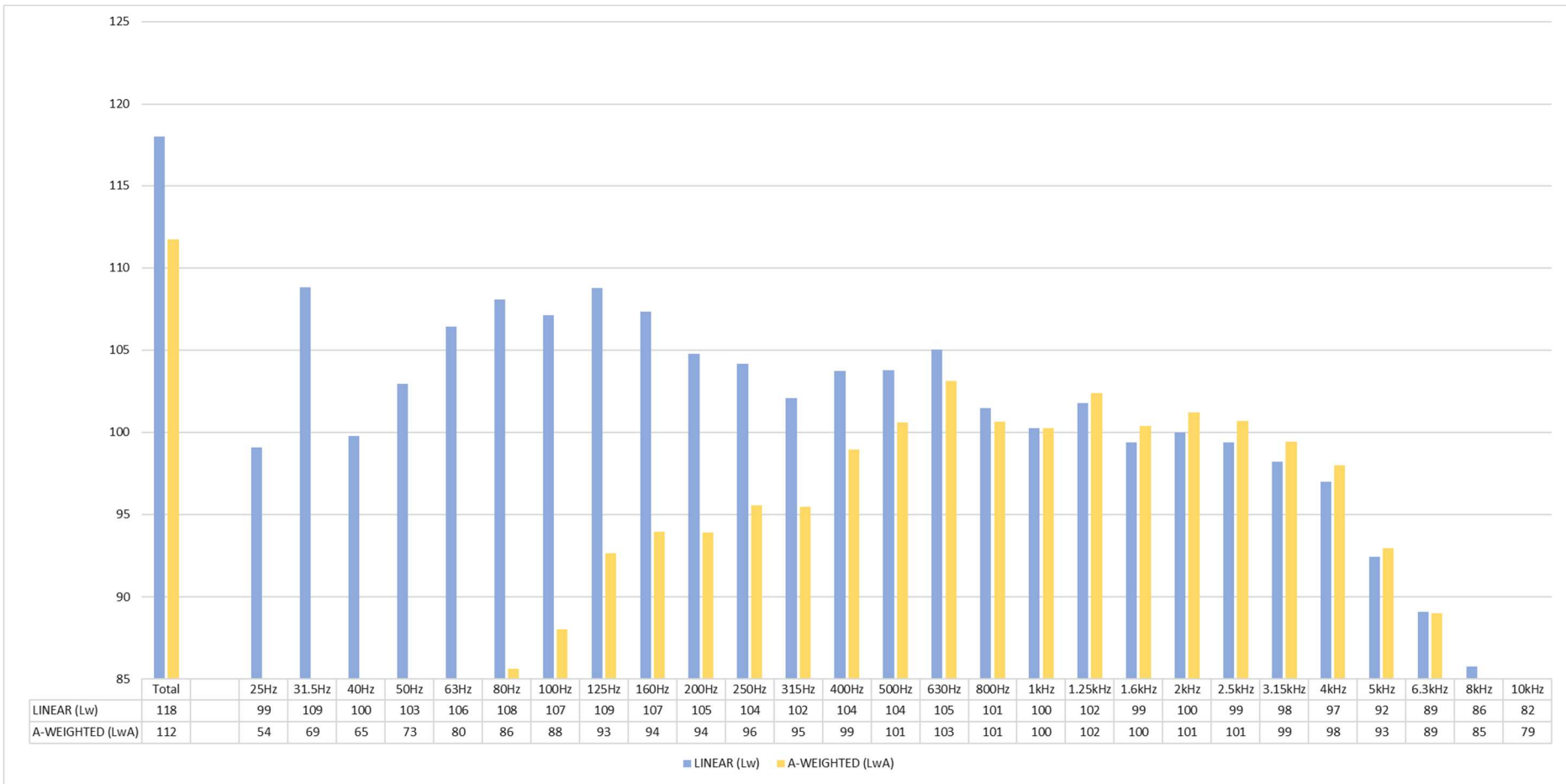


Figure 68: DT325 Stationary

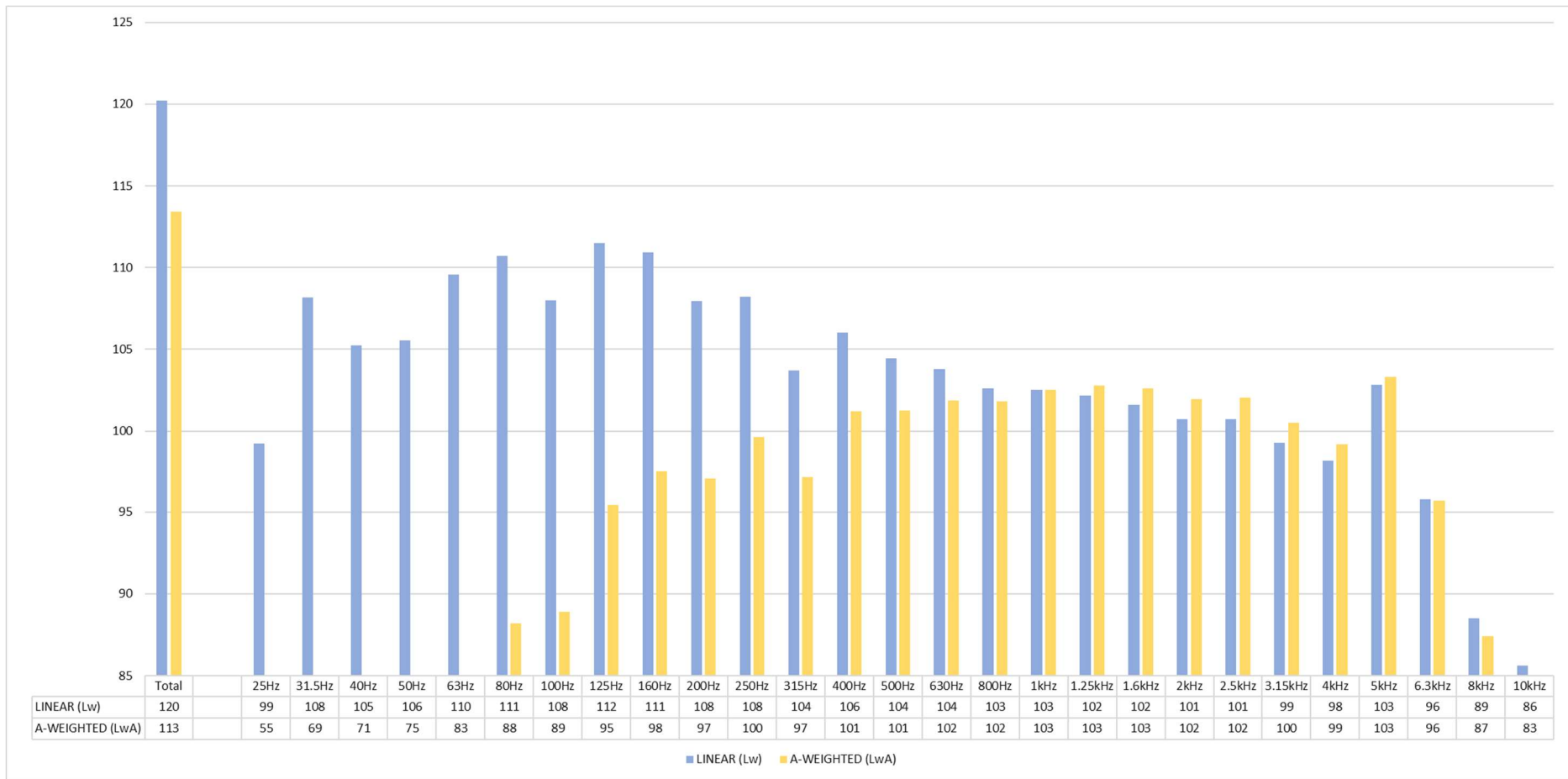


Figure 69: DT325 Uphill

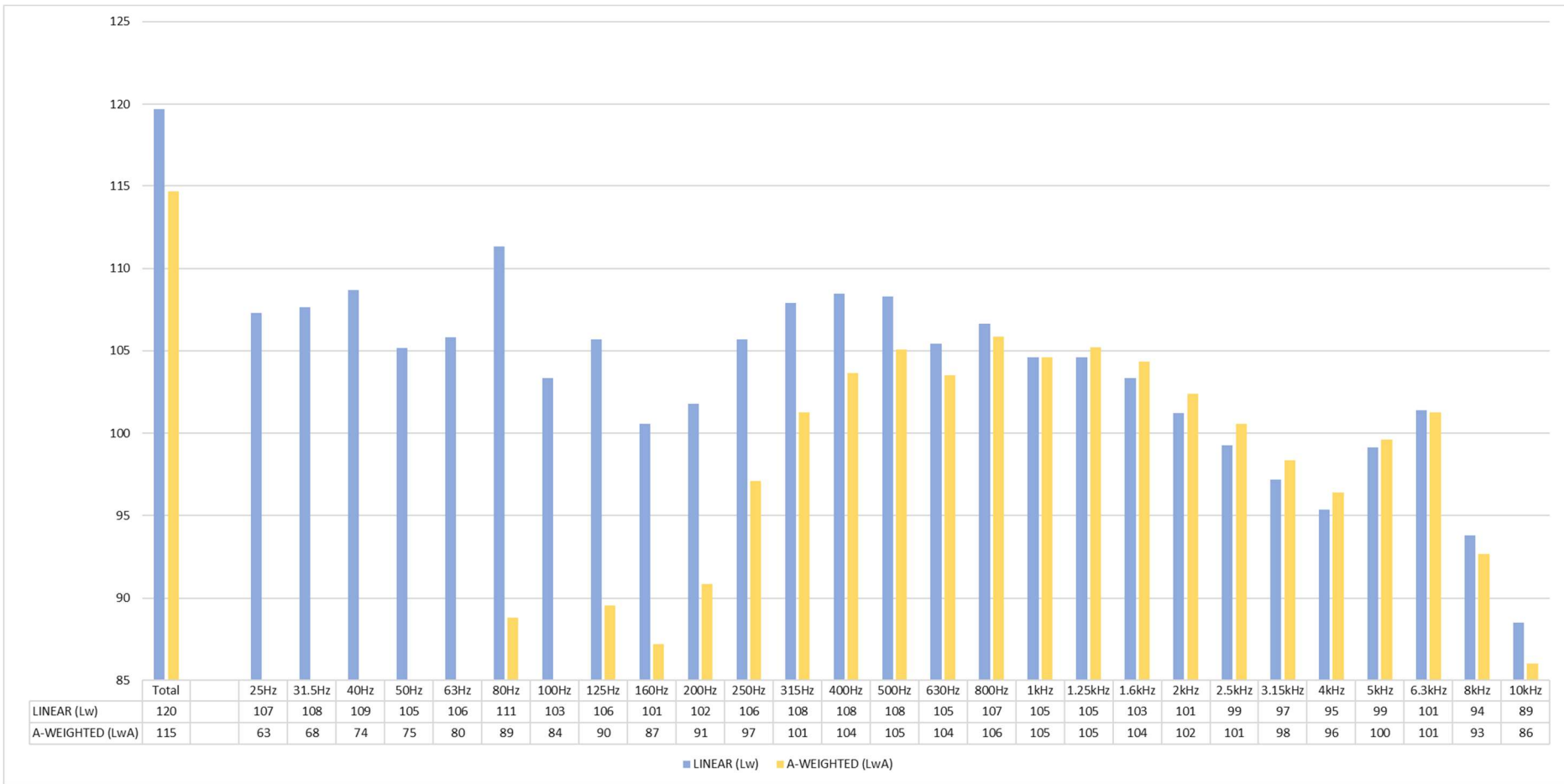


Figure 70: DT325 Downhill

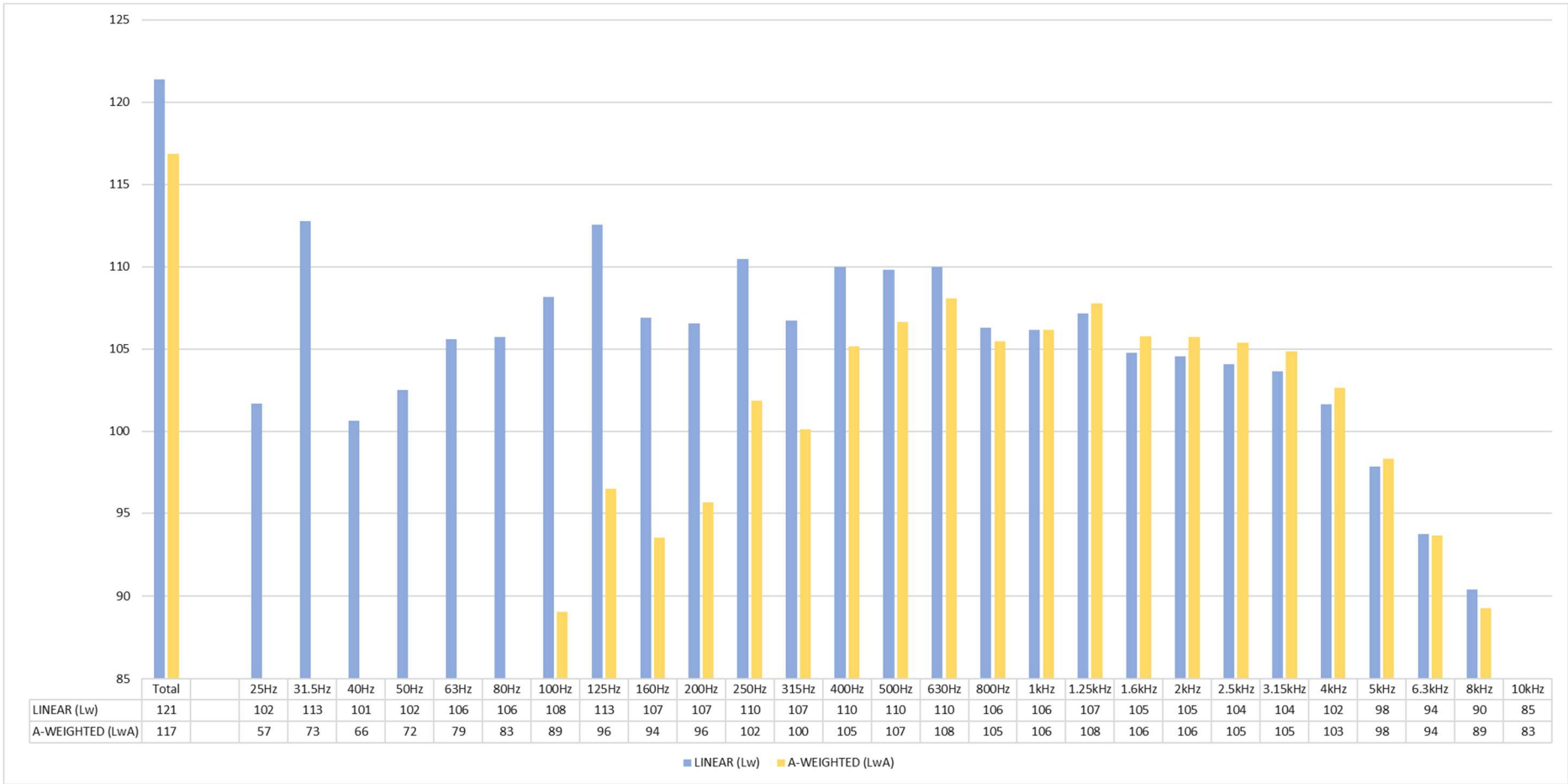


Figure 71: DT326 Stationary

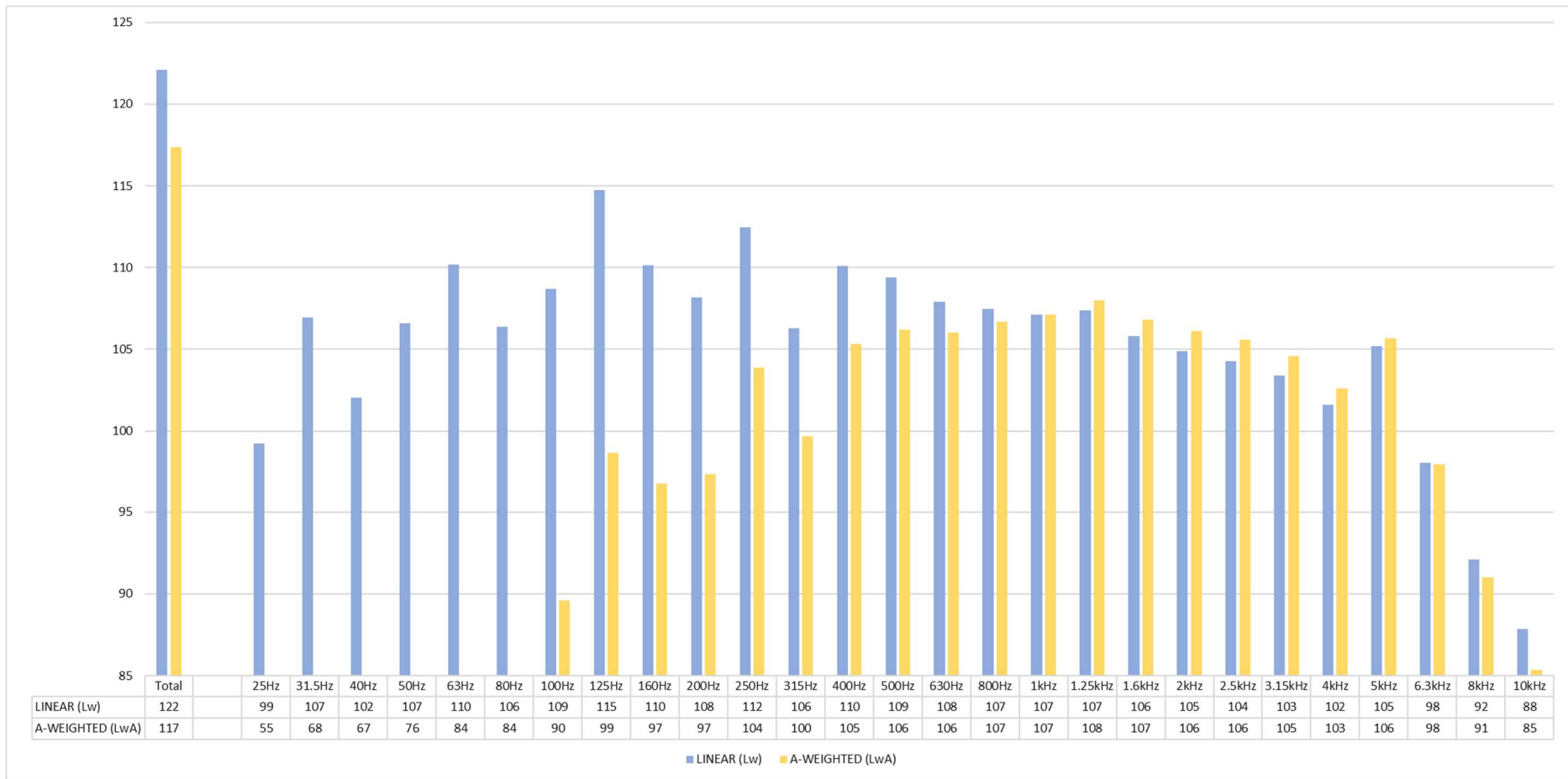


Figure 72: DT326 Uphill

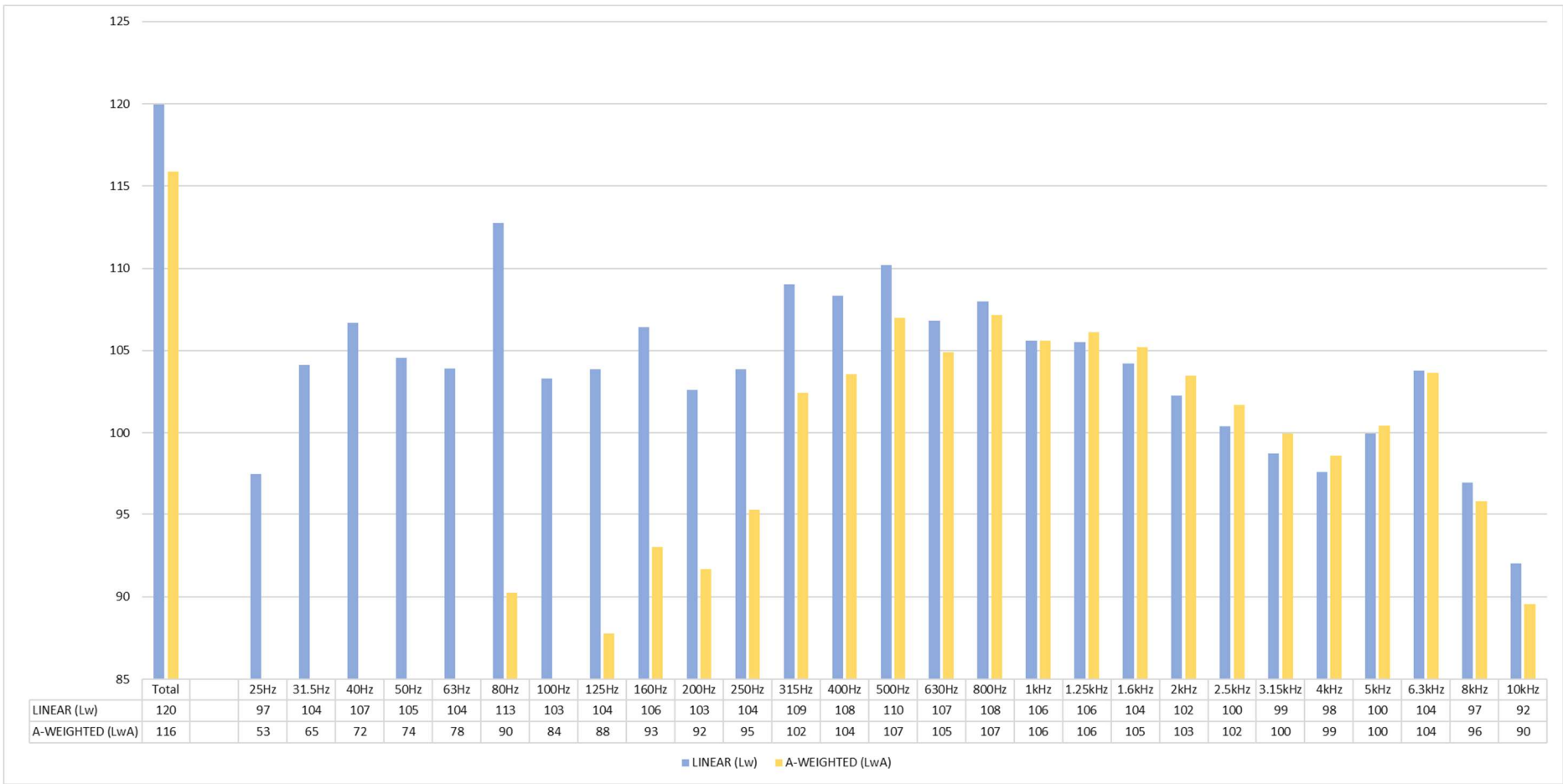


Figure 73: DT326 Downhill

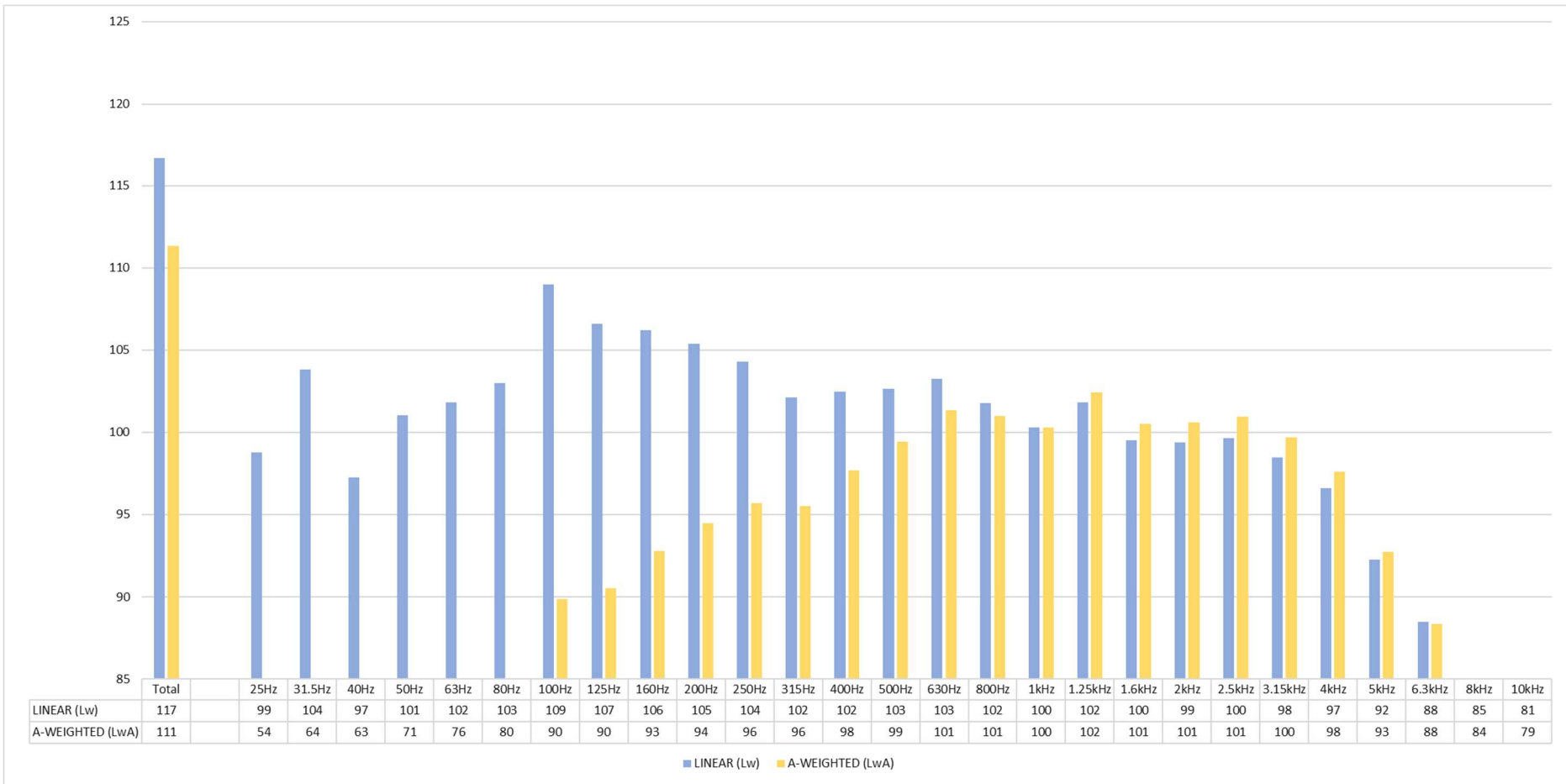


Figure 74: DT327 Stationary

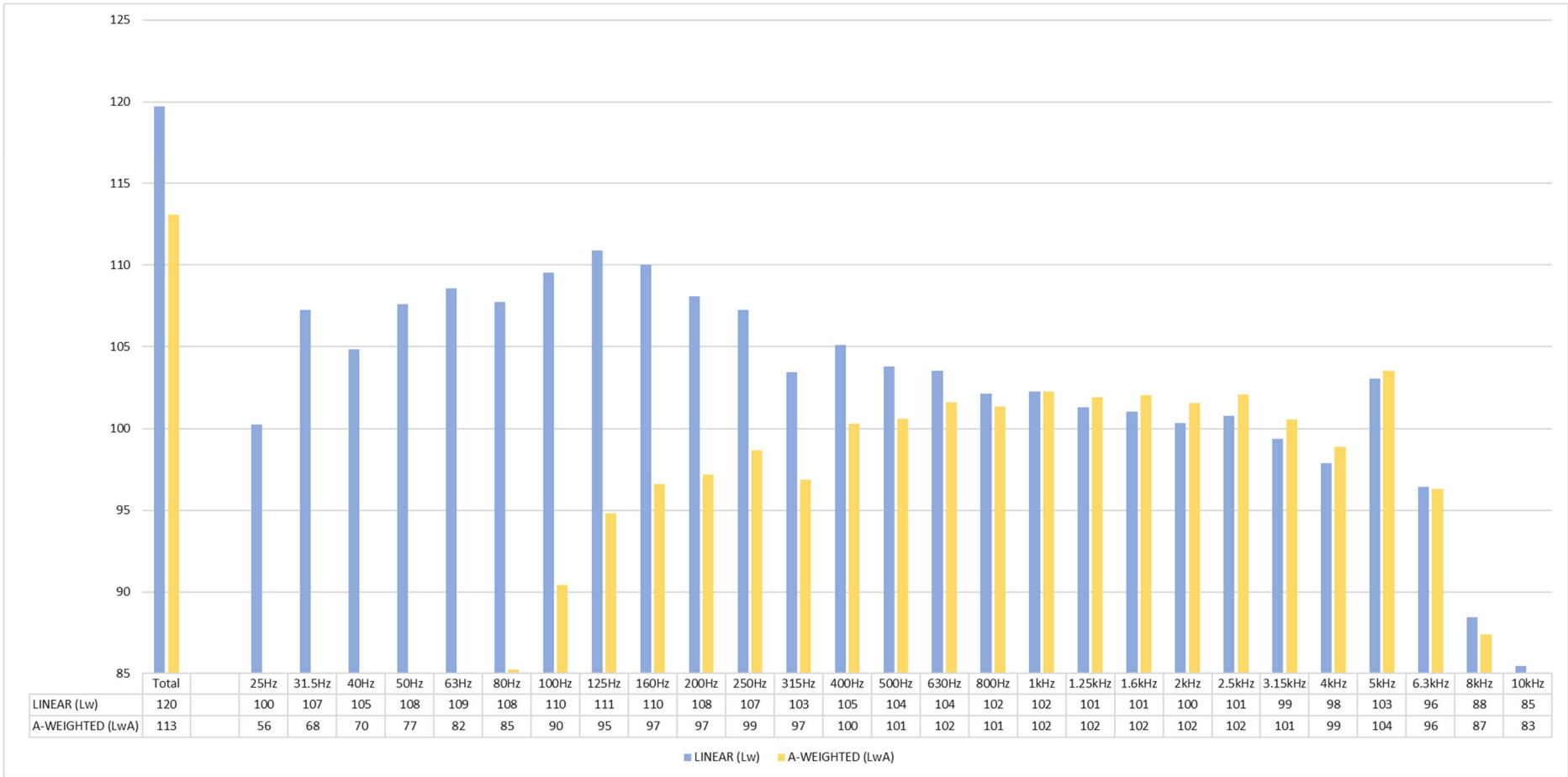


Figure 75: DT327 Uphill

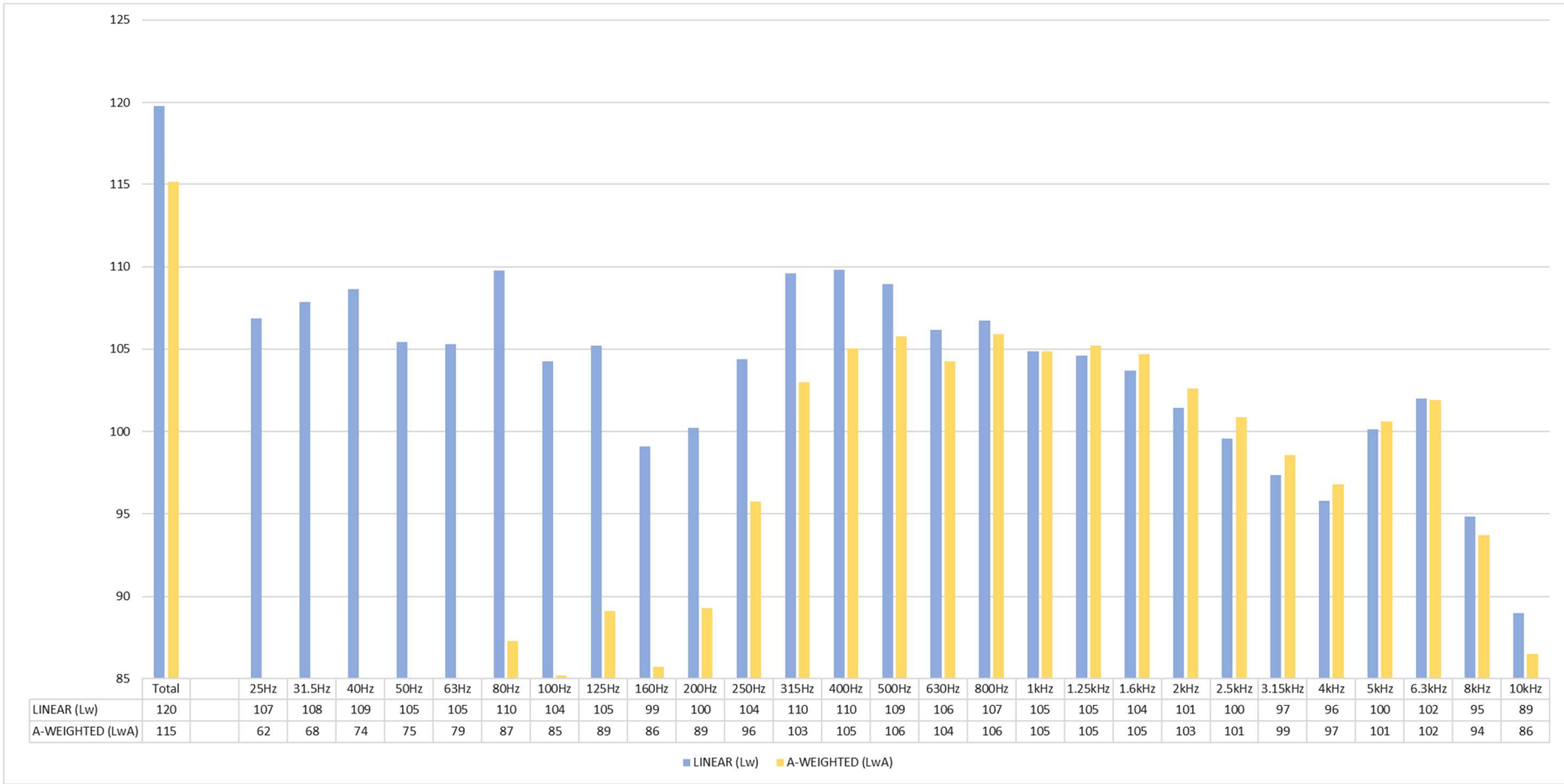


Figure 76: DT327 Downhill

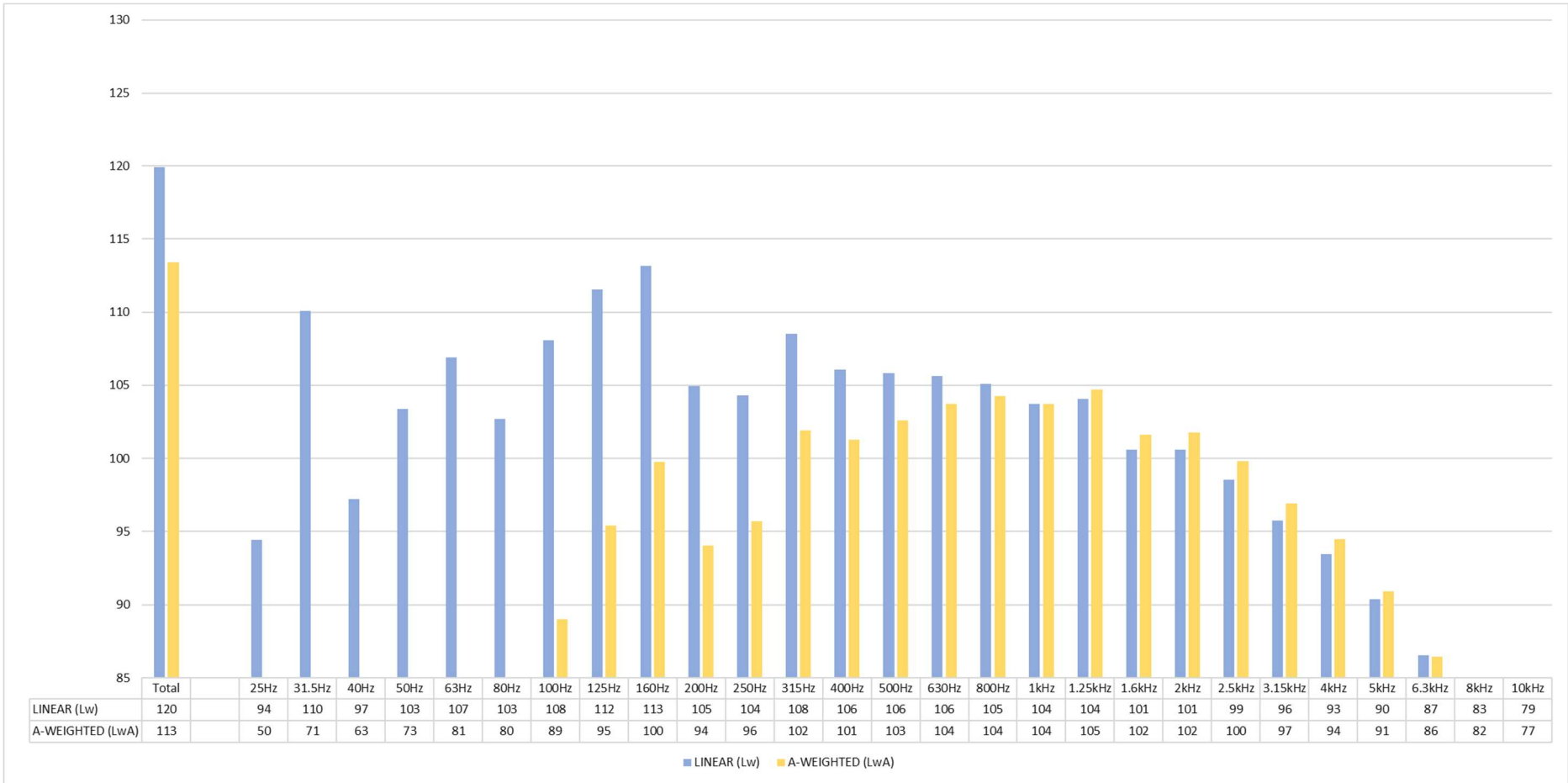


Figure 77: DT364 Stationary

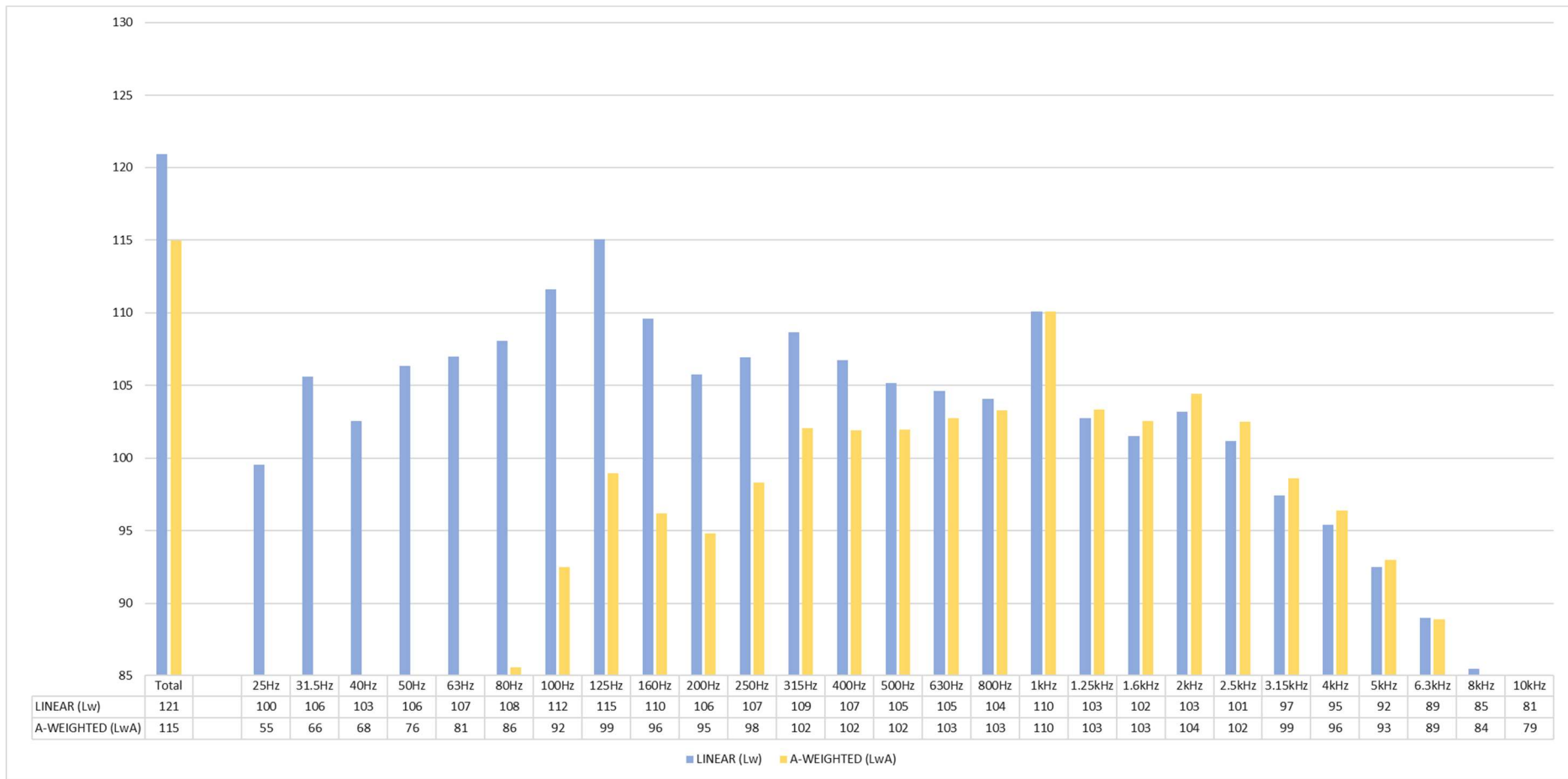


Figure 78: DT364 Uphill

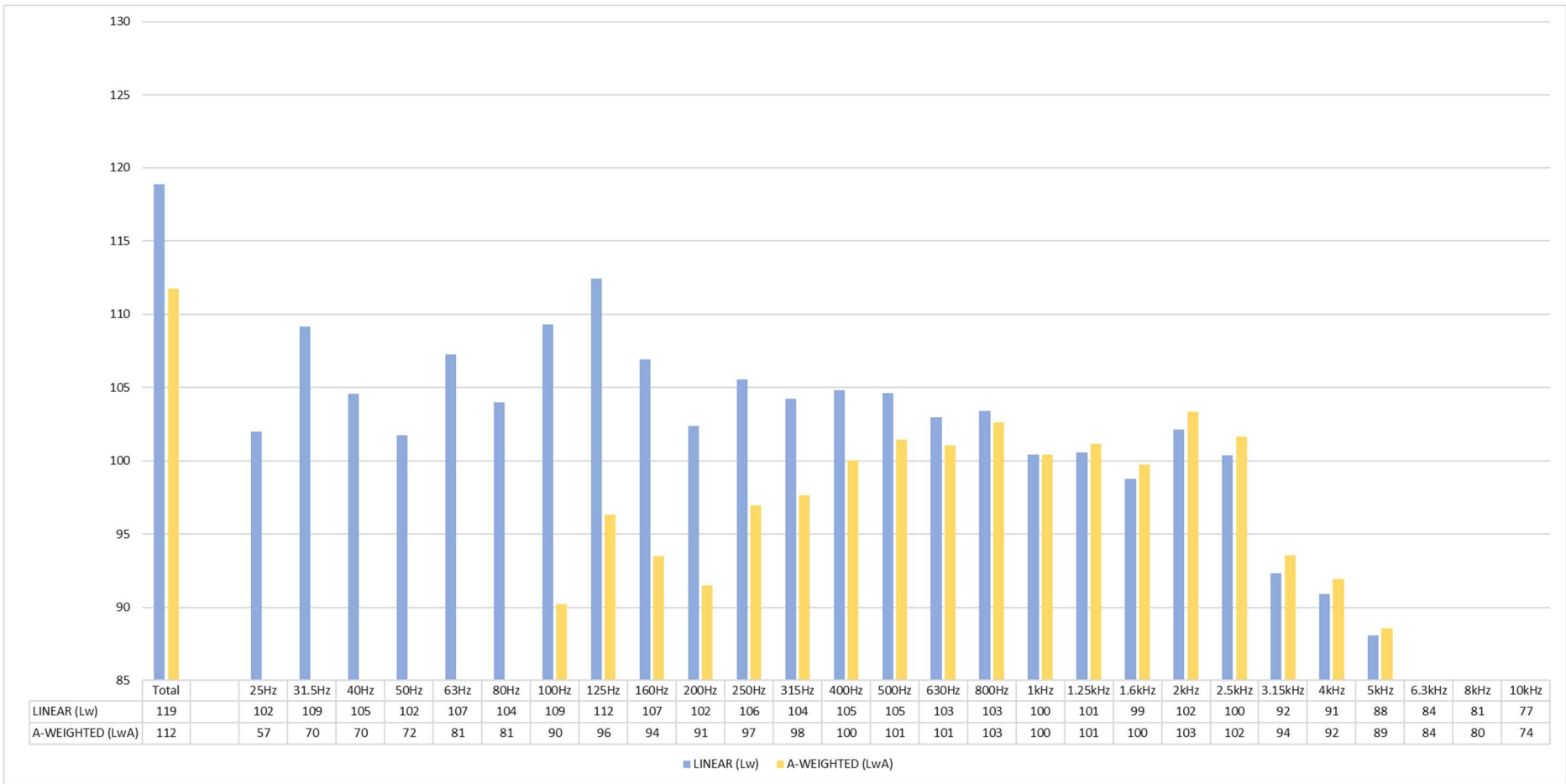


Figure 79: DT364 Downhill

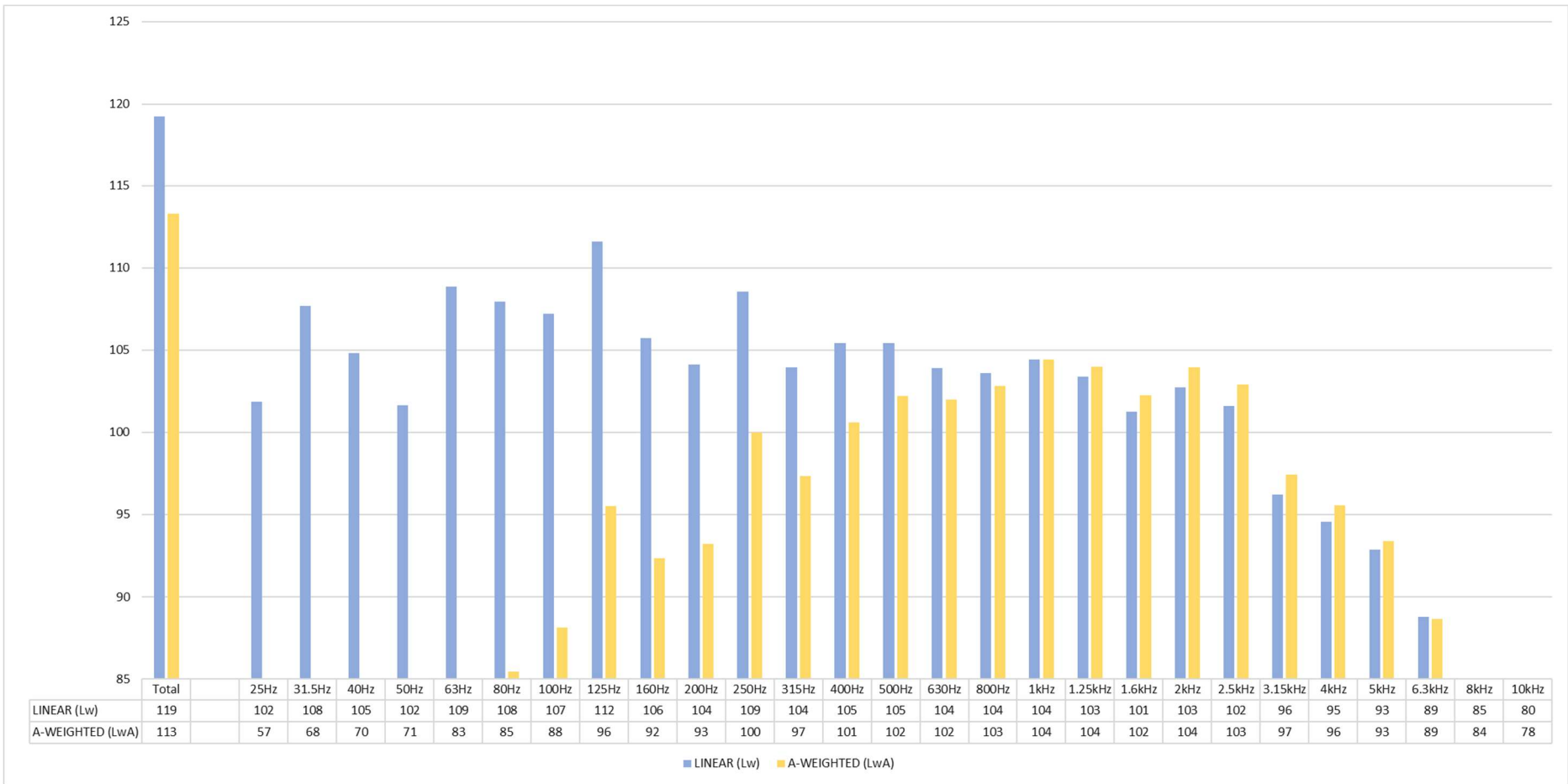


Figure 80: DT365 Stationary

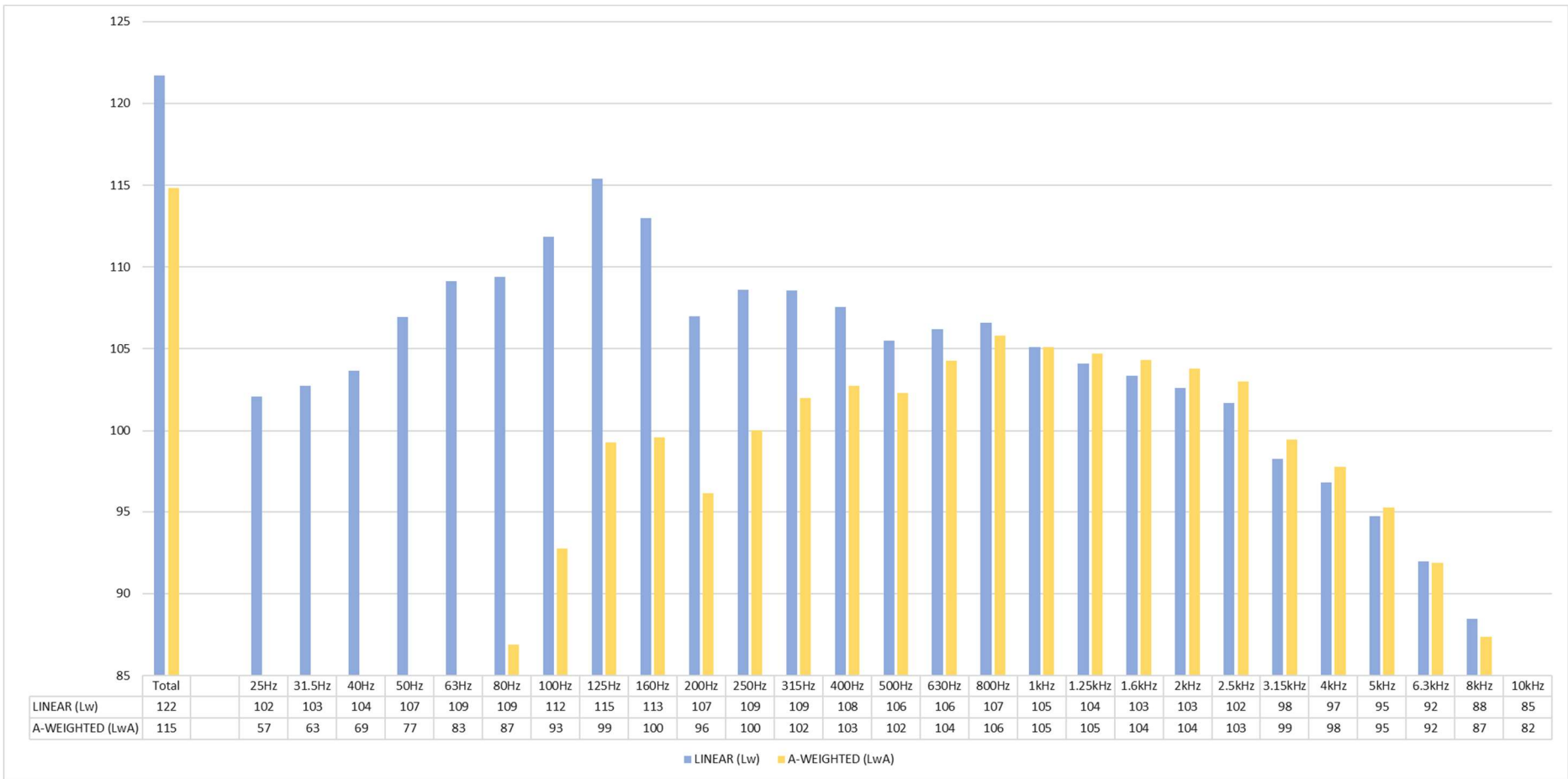


Figure 81: DT365 Uphill

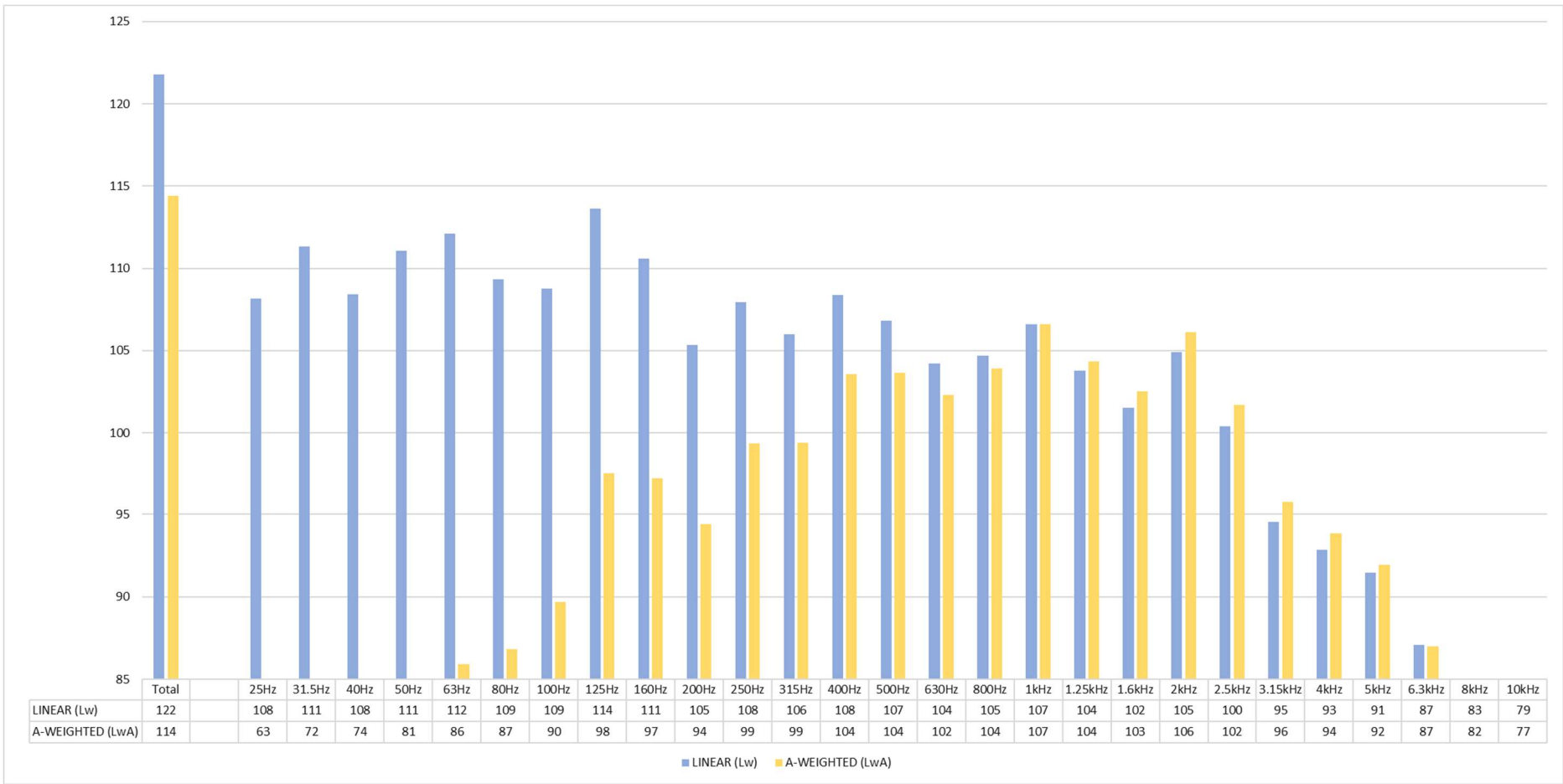


Figure 82: DT365 Downhill

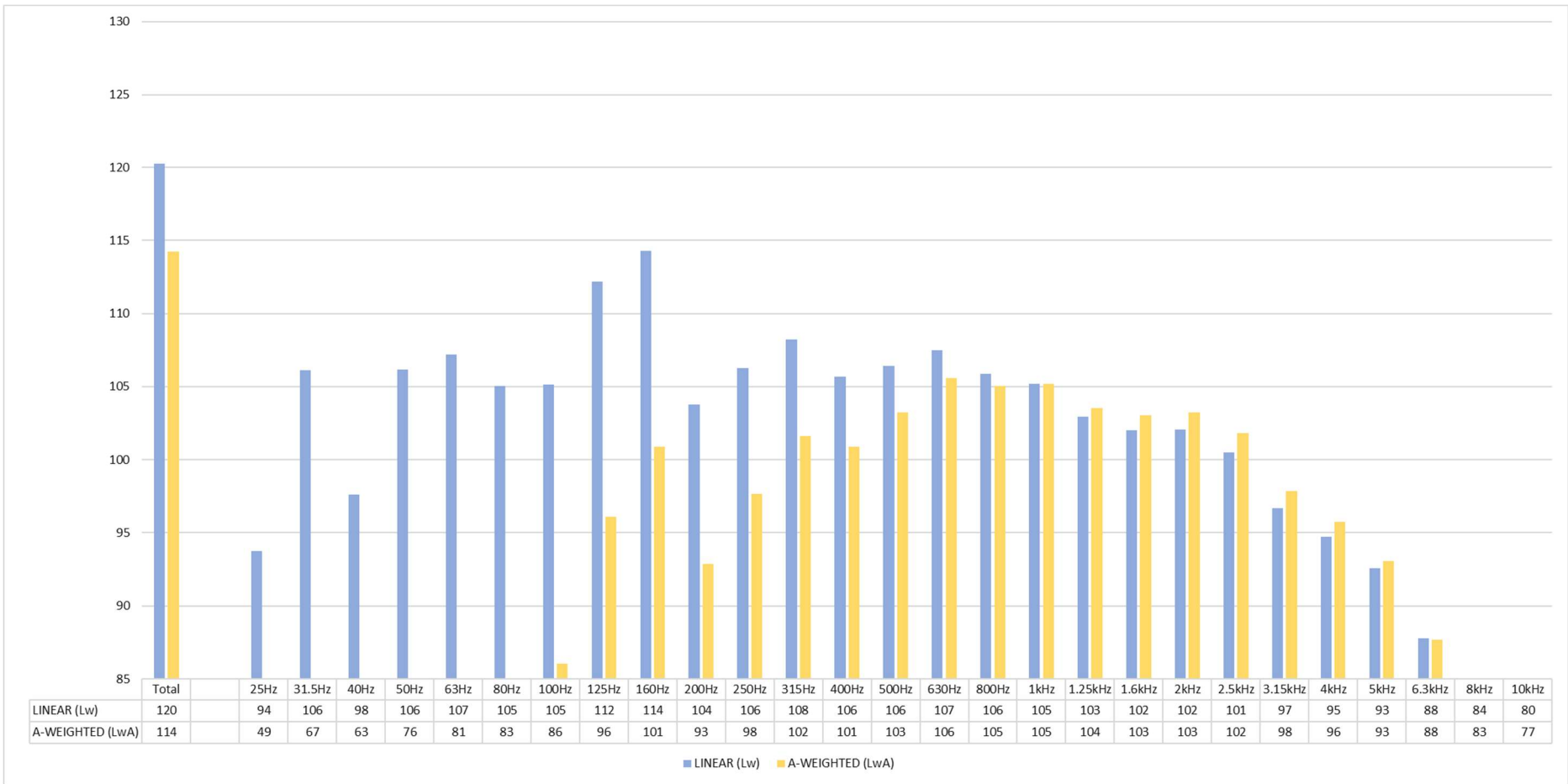


Figure 83: DT366 Stationary

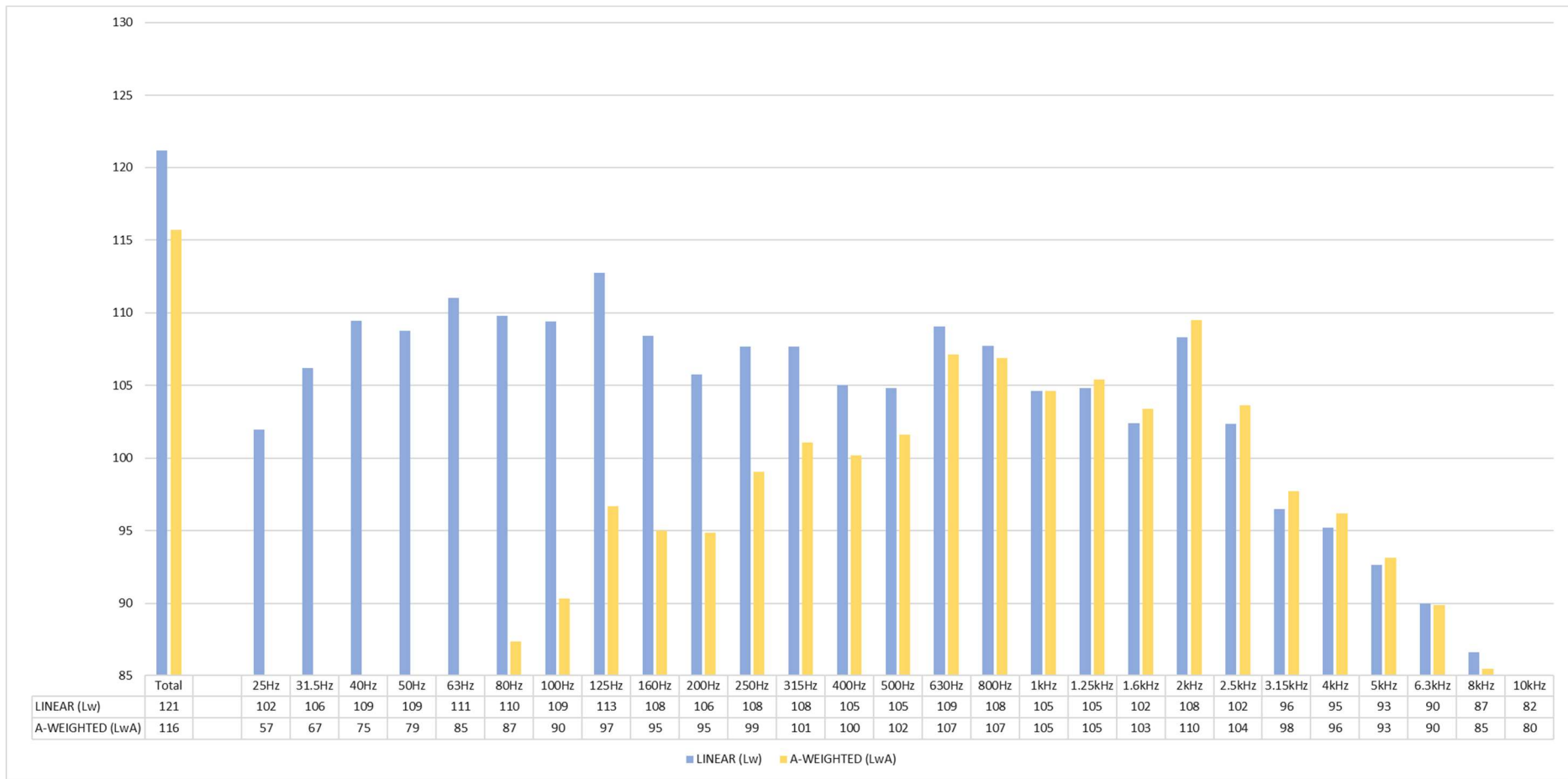


Figure 84: DT366 Uphill

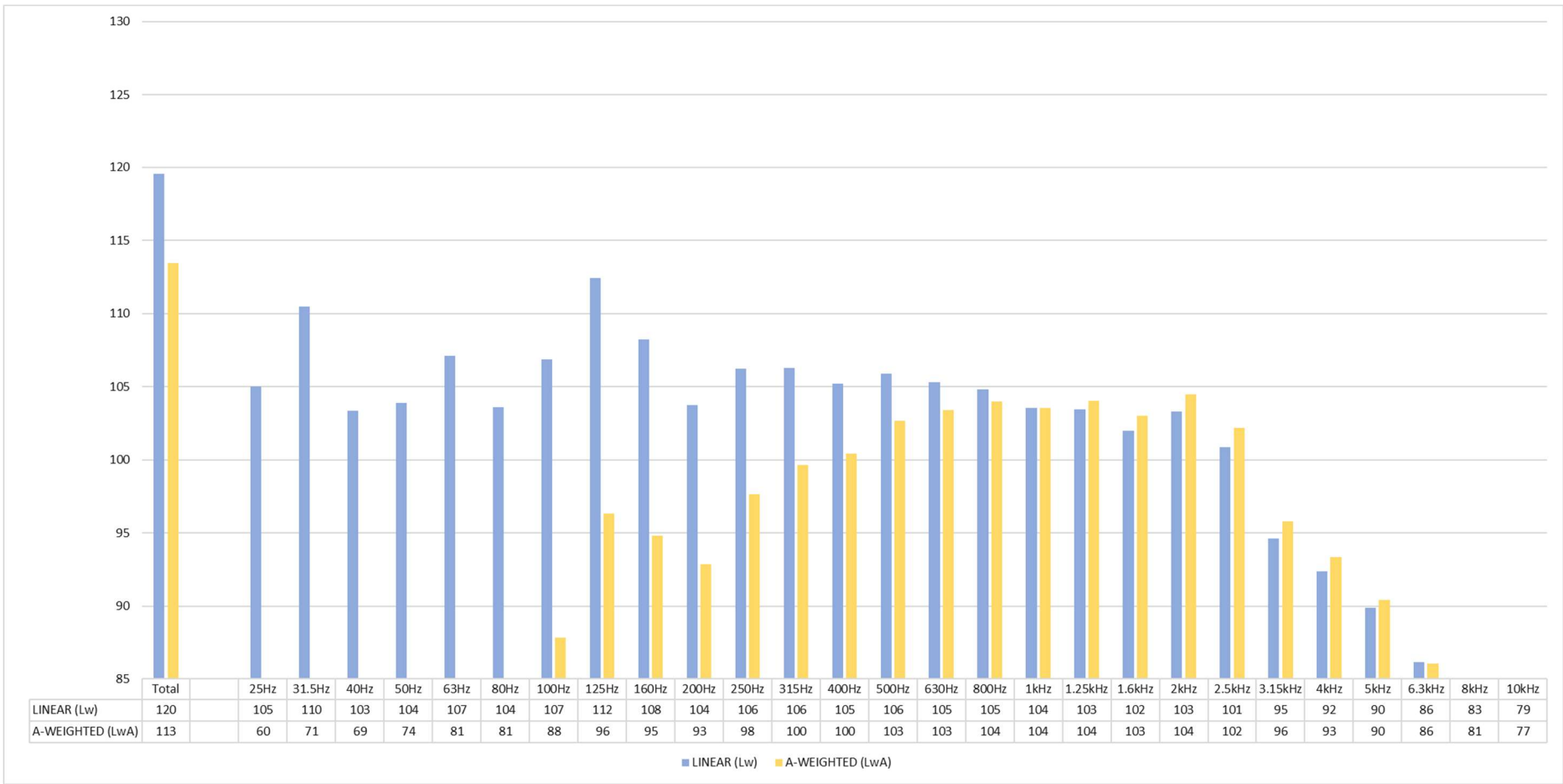


Figure 85: DT366 Downhill

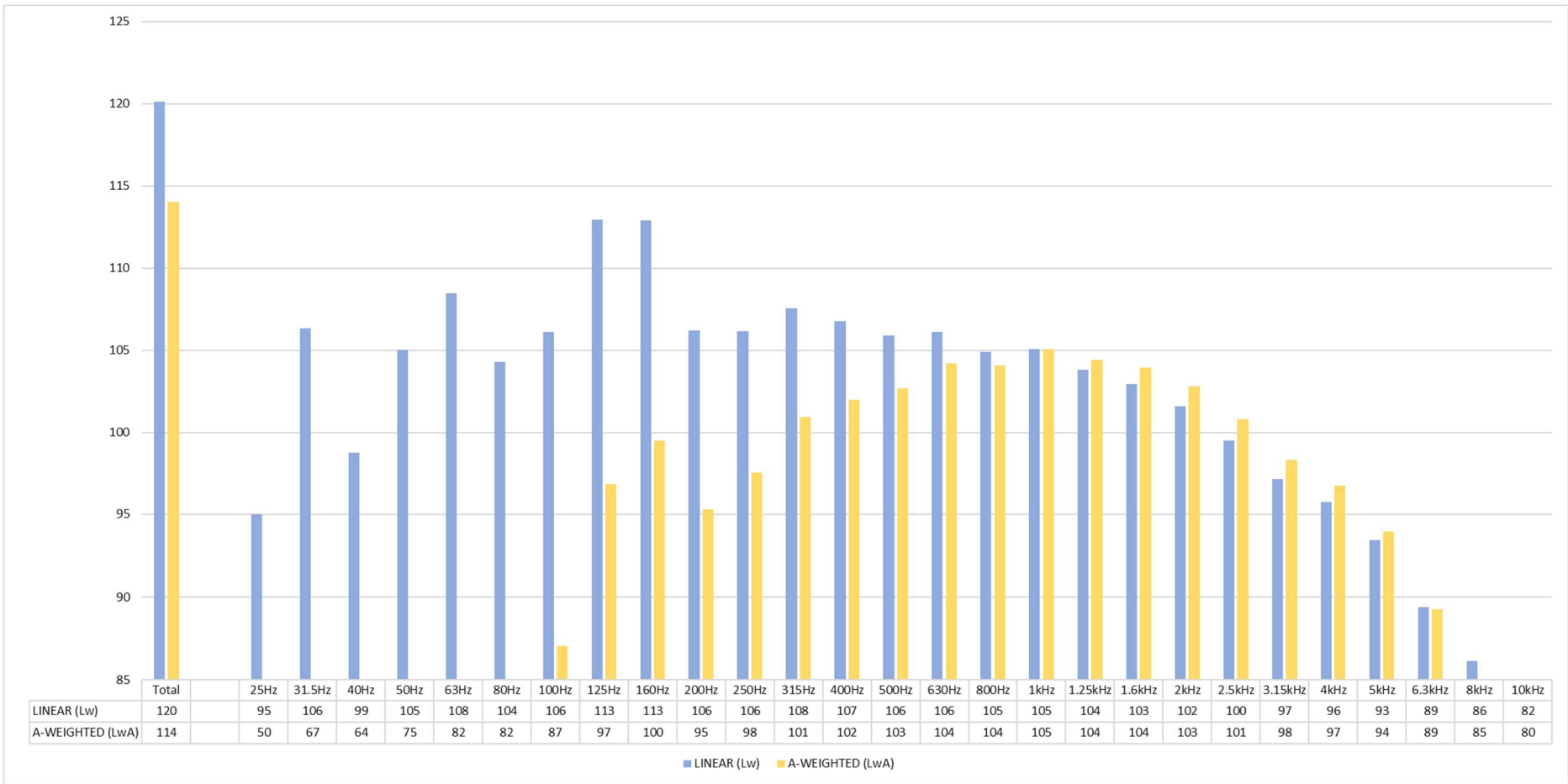


Figure 86: DT367 Stationary

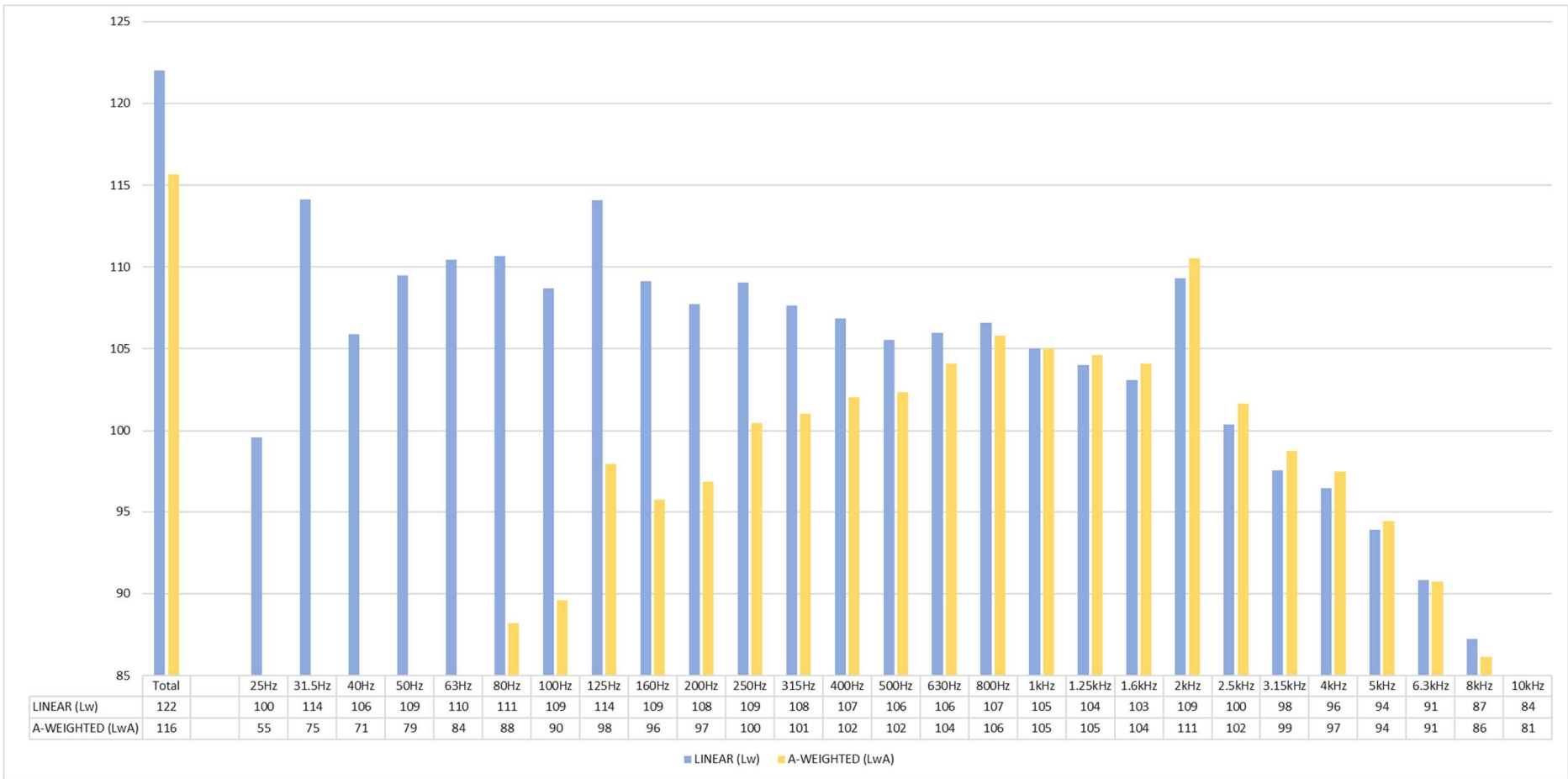


Figure 87: DT367 Uphill

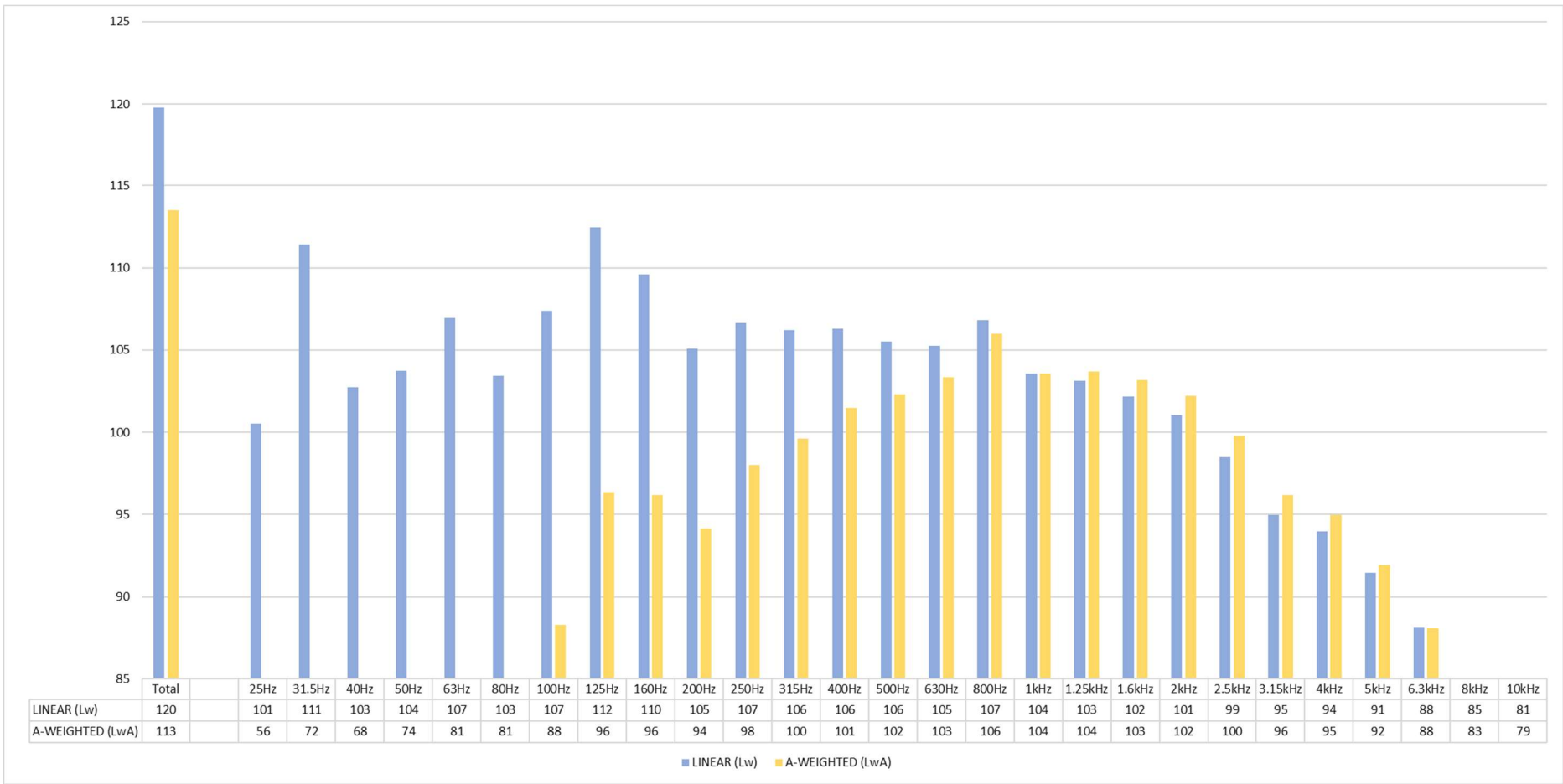


Figure 88: DT367 Downhill

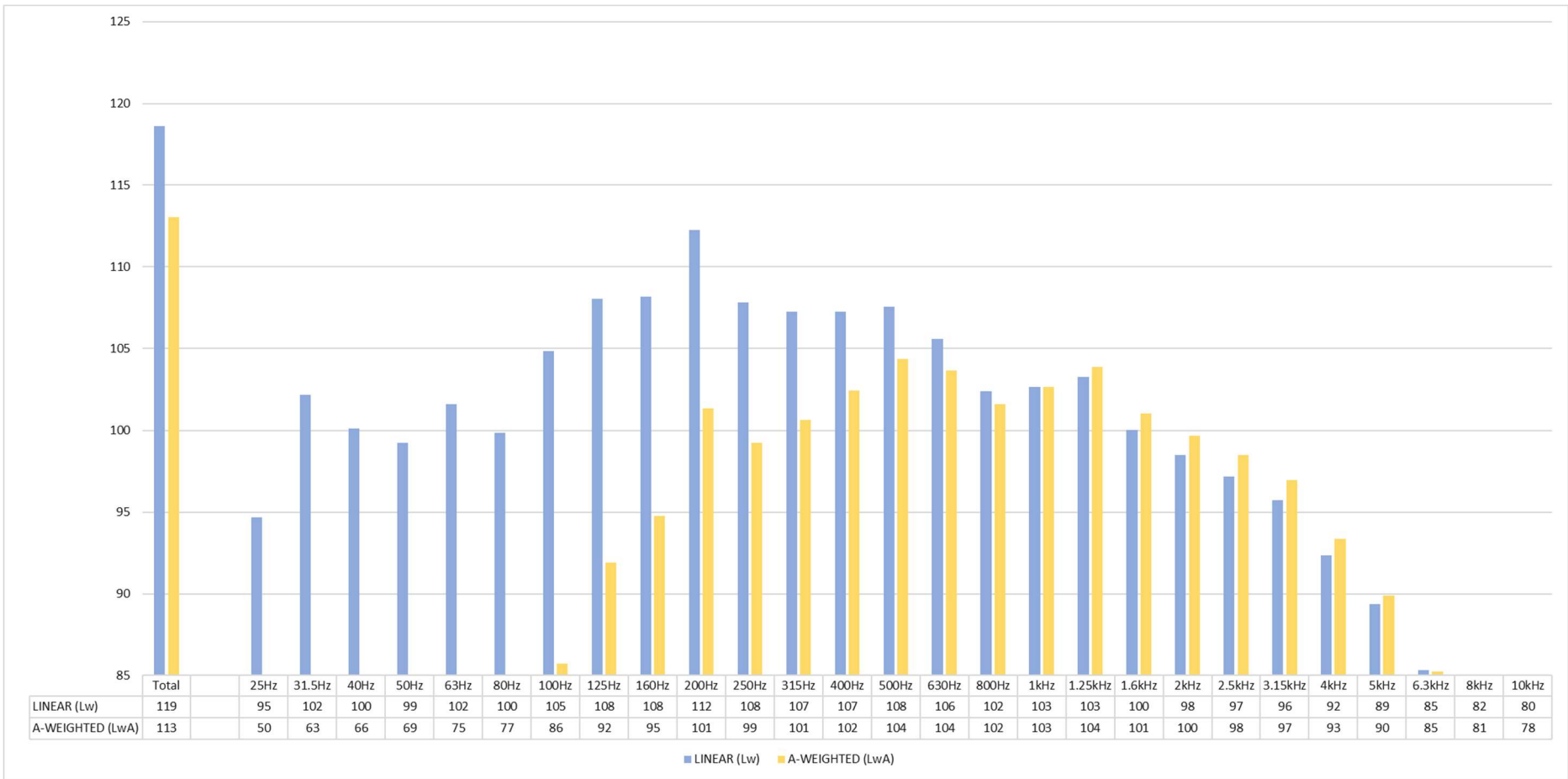


Figure 89: EX125 Stationary

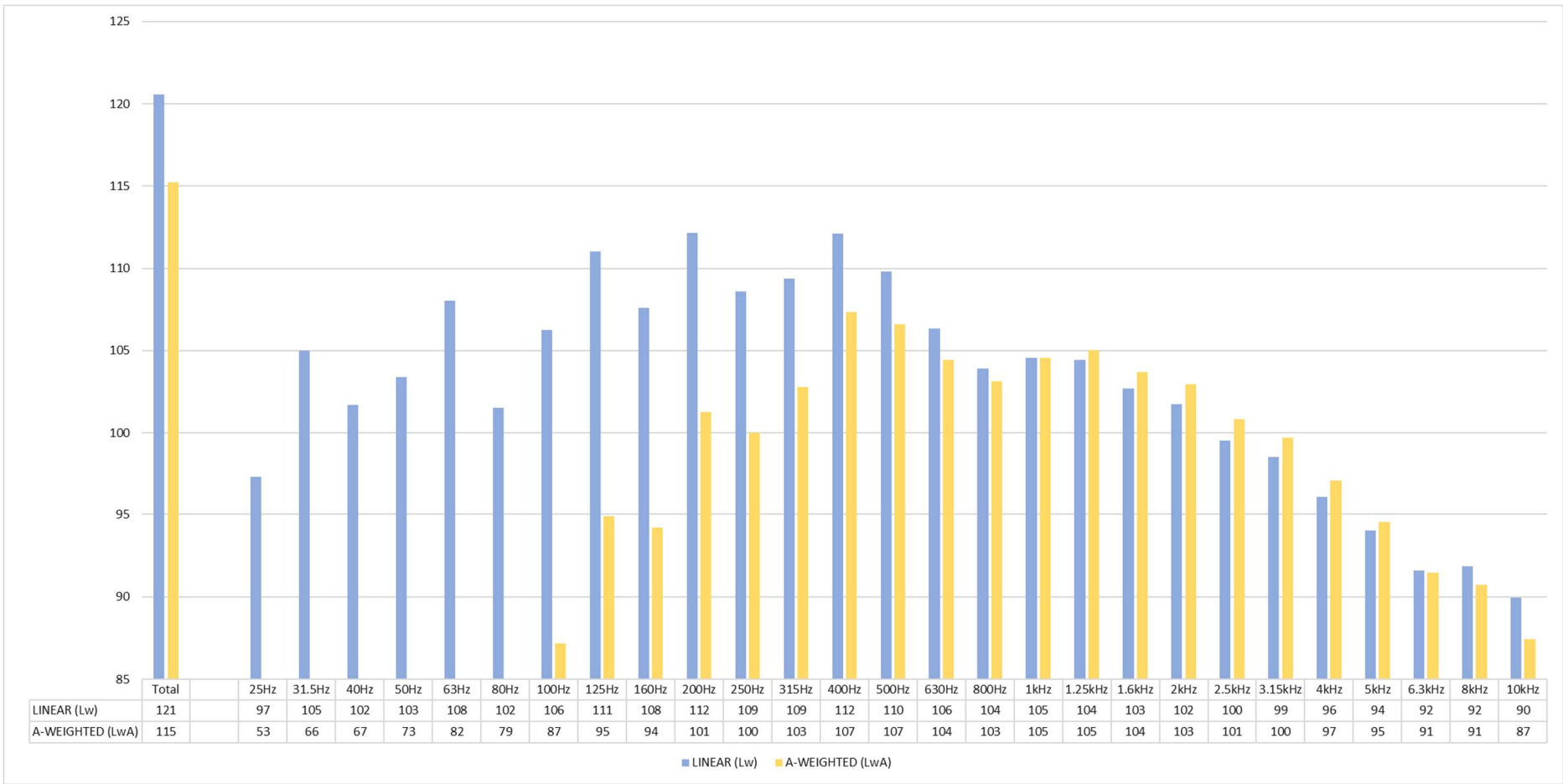


Figure 90: EX125 Dynamic

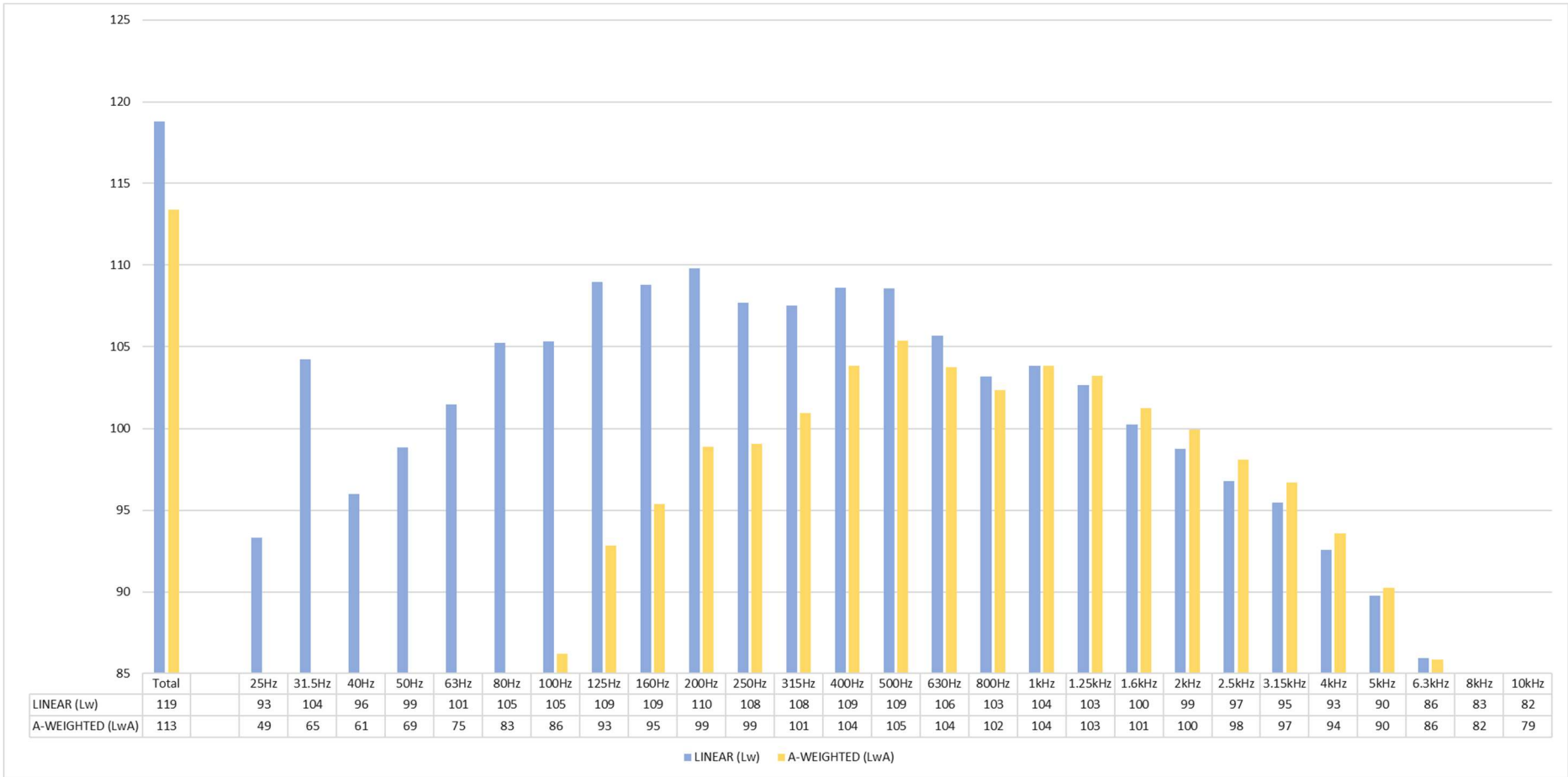


Figure 91: EX129 Stationary

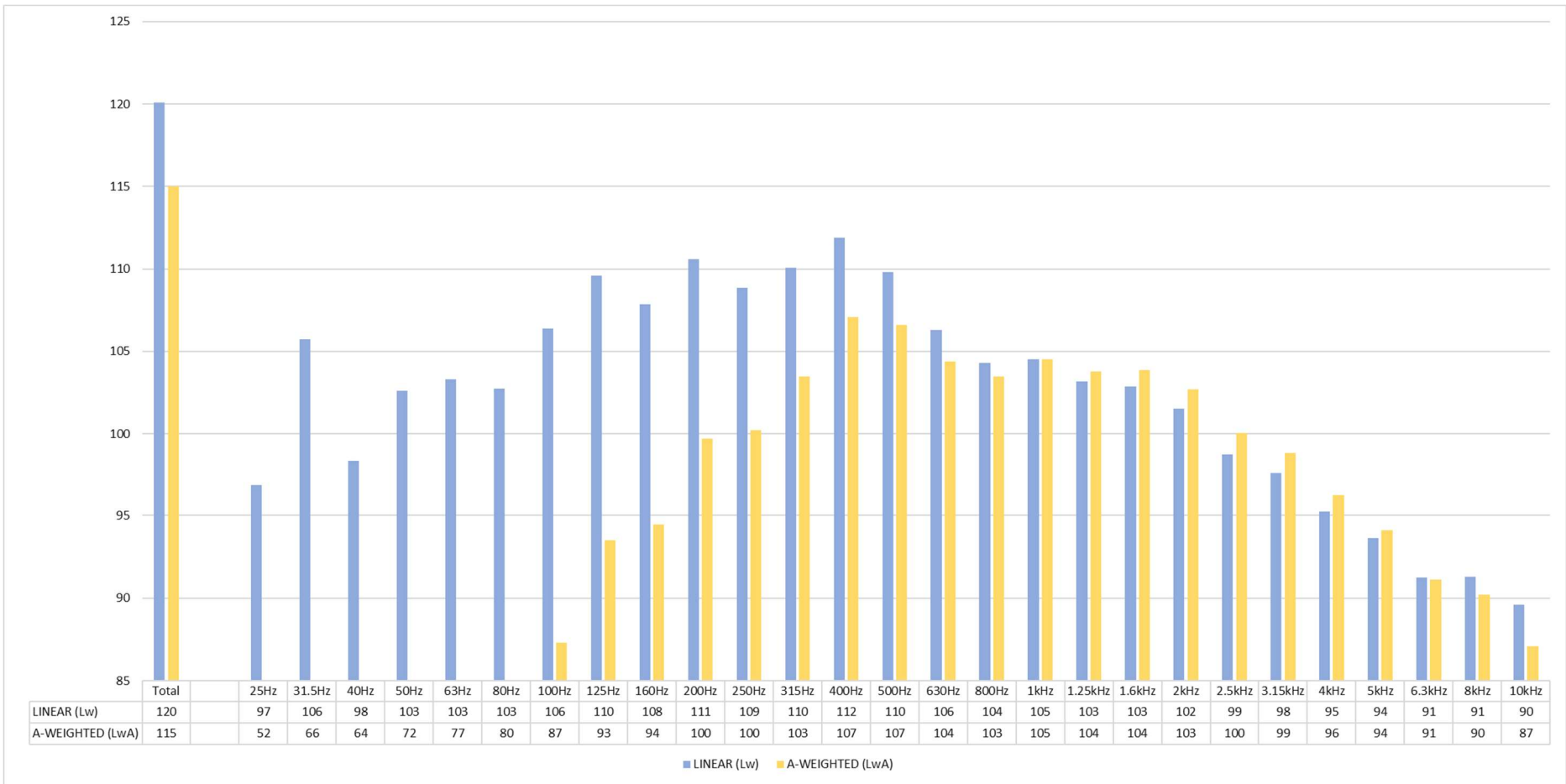


Figure 92: EX129 Dynamic

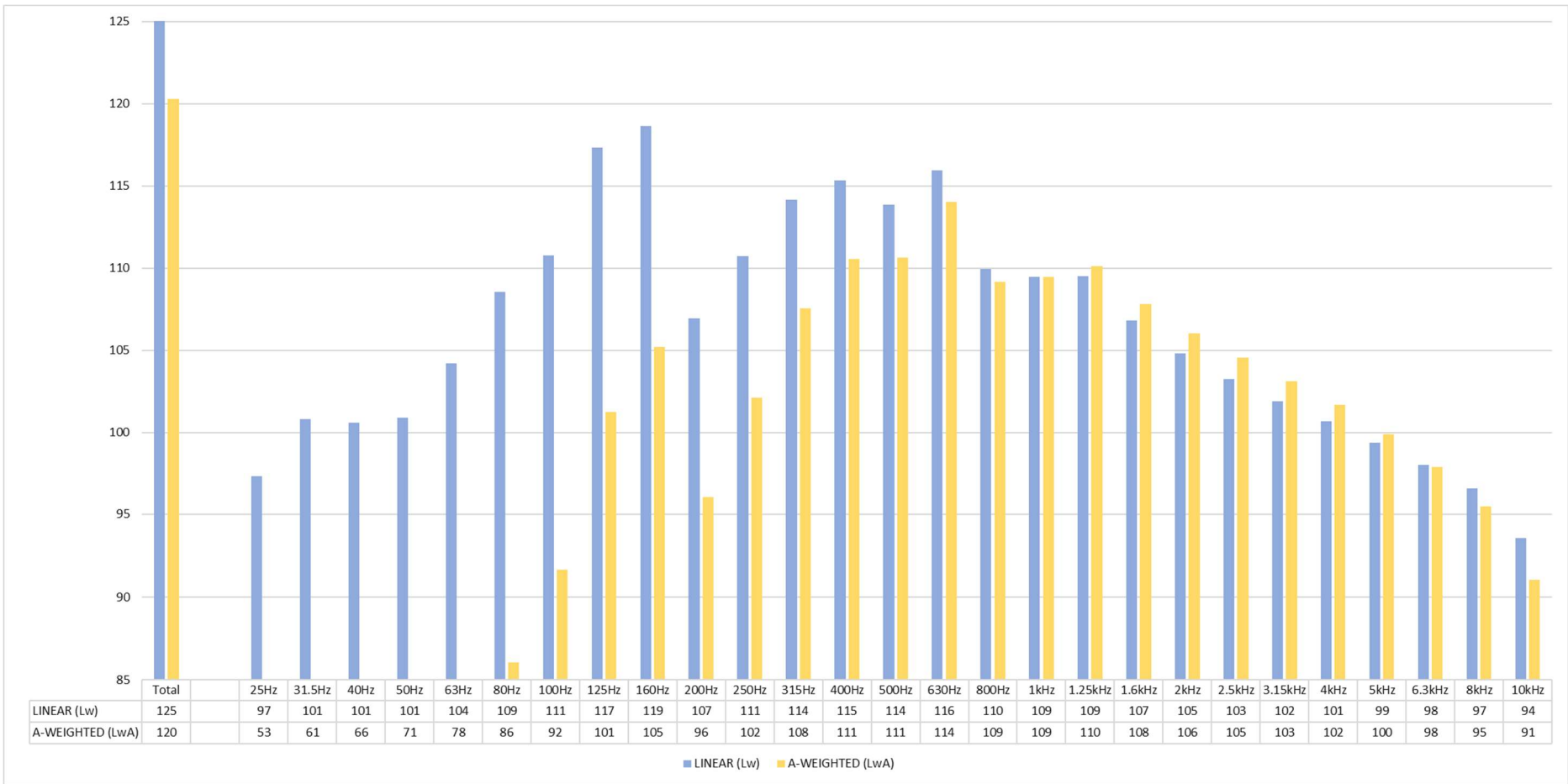


Figure 93: EX258 Stationary

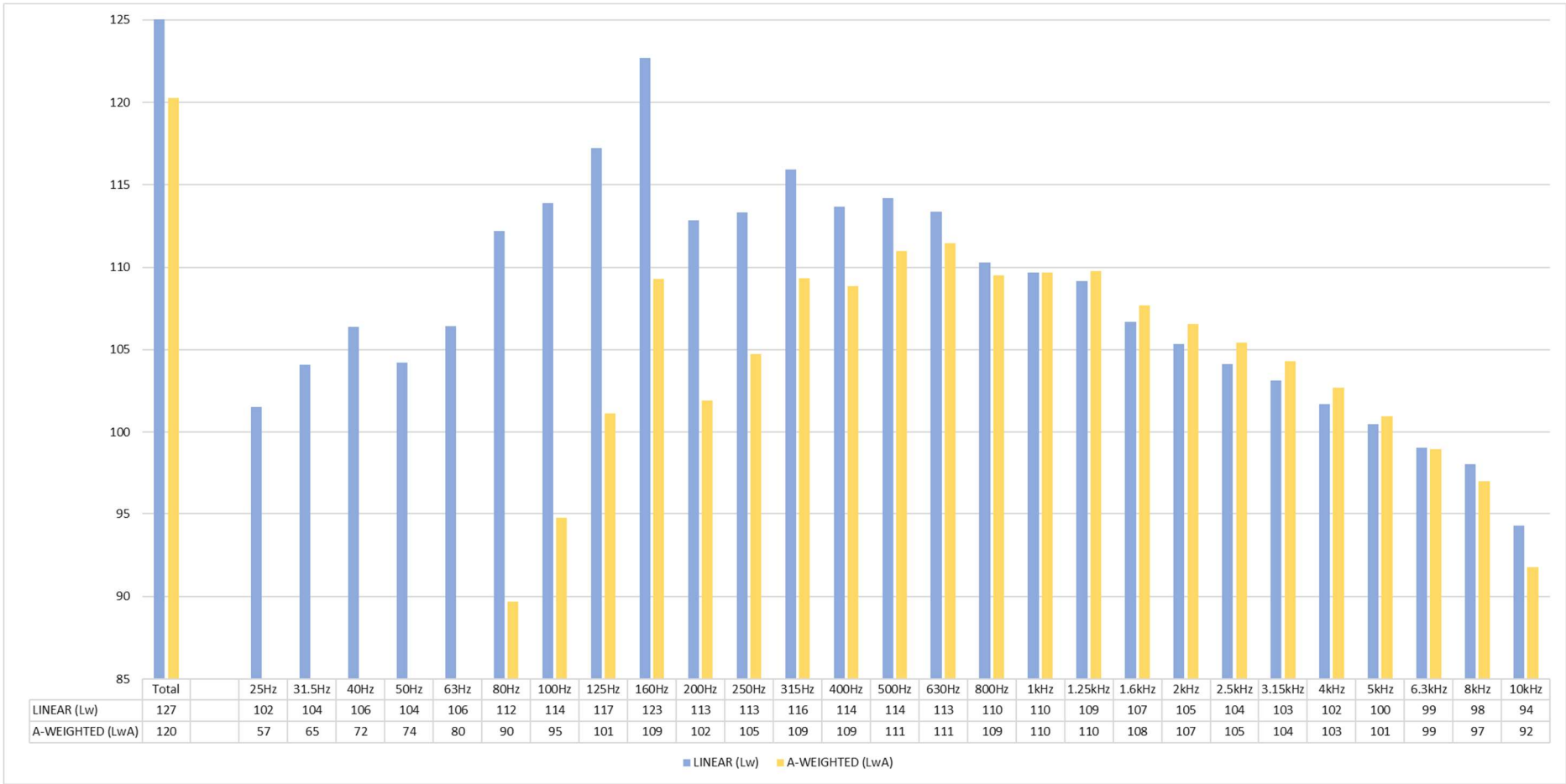


Figure 94: EX258 Dynamic

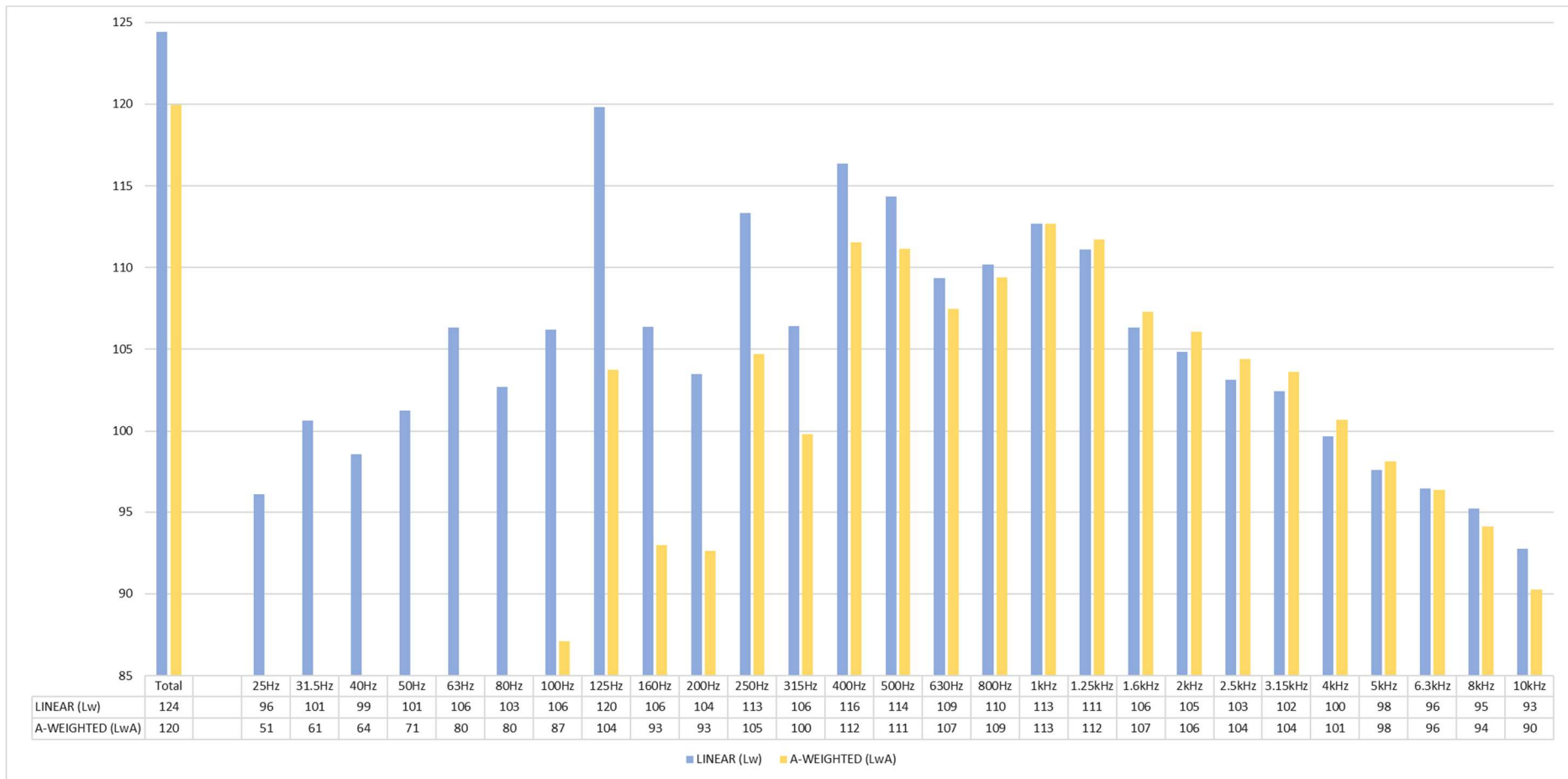


Figure 95: EX259 Stationary

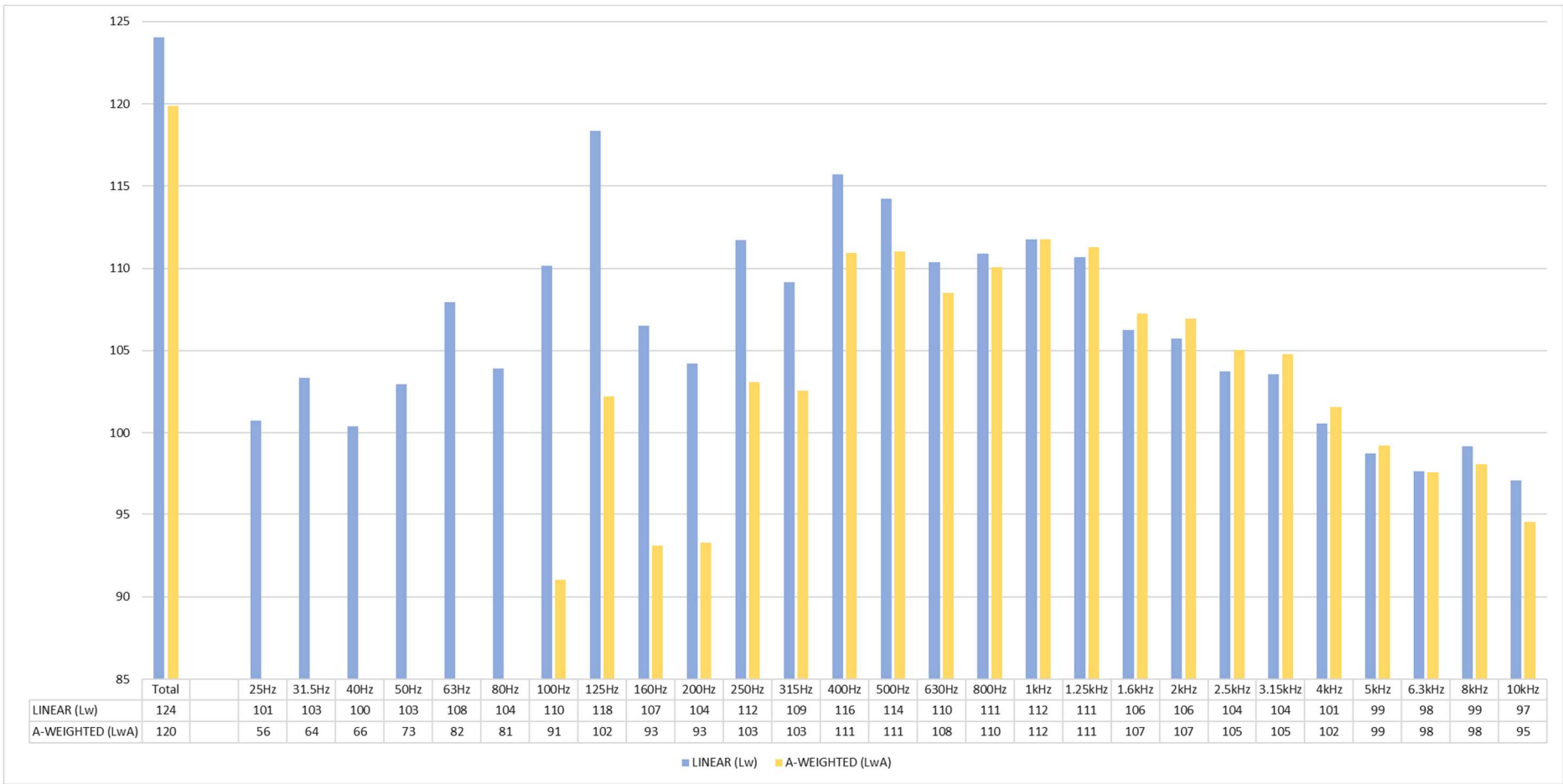


Figure 96: EX259 Dynamic