
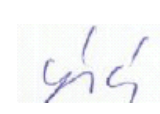


Produkte
Products

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<i>Test Report No.:</i>		<i>Page 1 of 11</i>			
Auftraggeber: <i>Client:</i>	GREEN CITY INTERNATIONAL DOO Zrenjanjinski put 84ž 11211 Beograd, Serbia				
Gegenstand der Prüfung: <i>Test item:</i>	Abfallsammelbehälter / Waste Container				
Bezeichnung: <i>Identification:</i>	Waste container – MSD 1100, MSE 1100, MSE 1100 with foot pedal opening	Serien-Nr.: <i>Serial No.:</i>	Pre-production sample without serial Nr.		
Wareneingangs-Nr.: <i>Receipt No.:</i>	2016/00280	Eingangsdatum: <i>Date of receipt:</i>	25.04.2016		
Prüfört: <i>Testing location:</i>	TÜV Rheinland Intercert Kft. H-1132 Budapest, Vaci u. 48.				
Prüfgrundlage: <i>Test specification:</i>	DIRECTIVE 2000/14/EC noise emission in the environment by equipment for use outdoors Annex VII. EN ISO 3744:1995 (Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane)				
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>				
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland Intercert Kft. H-1132 Budapest, Vaci u. 48.				
geprüft/ tested by:	kontrolliert/ reviewed by:				
25.04.2016	Norbert Szöke		25.04.2016		
			Péter Végh		
					
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges/ Other Aspects: --					
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

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Measuring equipment

Messung	Gerätenummer/ Ident.-Nummer Barcode-Nummer	nächste Kalibrierung
Brüel & Kjaer Type 2231 Modular Precision Sound Level Meter	1575188	04.17
Brüel & Kjaer Type 4230 Sound Level Calibrator	1577273	08.16

Identification

Mobile waste container – Container with 4 wheels with a capacity of 1100 l

- Type 1: MSD 1100 with hand opening mechanism
- Type 2: MSE 1100
- Type 3: MSE 1100 with foot opening mechanism

This test report based on results of test report 160415/U5-2, -3, -4

Installations and operating conditions

The measurements were carried out with 2 new MOBILE WASTE CONTAINERS as provided by the manufacturer.

Operating conditions:

- the presence of an operator in the normal working position (in accordance with the 2000/14/EC annex I/39.);
- on hard ground (asphalt);
- empty, four-wheel containers

The containers were tested according to the Directive 2000/14/EC on the noise emission in the environment by equipment for use outdoors.

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ACUSTIC ENVIRONMENT

During the measurements the motor hoe situated over a reflecting plane outdoors.

/ Smooth asphalt surface /

Flat outdoor area that meets the requirements of 4.2 and annex 4 of EN 3744 standard and the Directive 2000/14/EC.

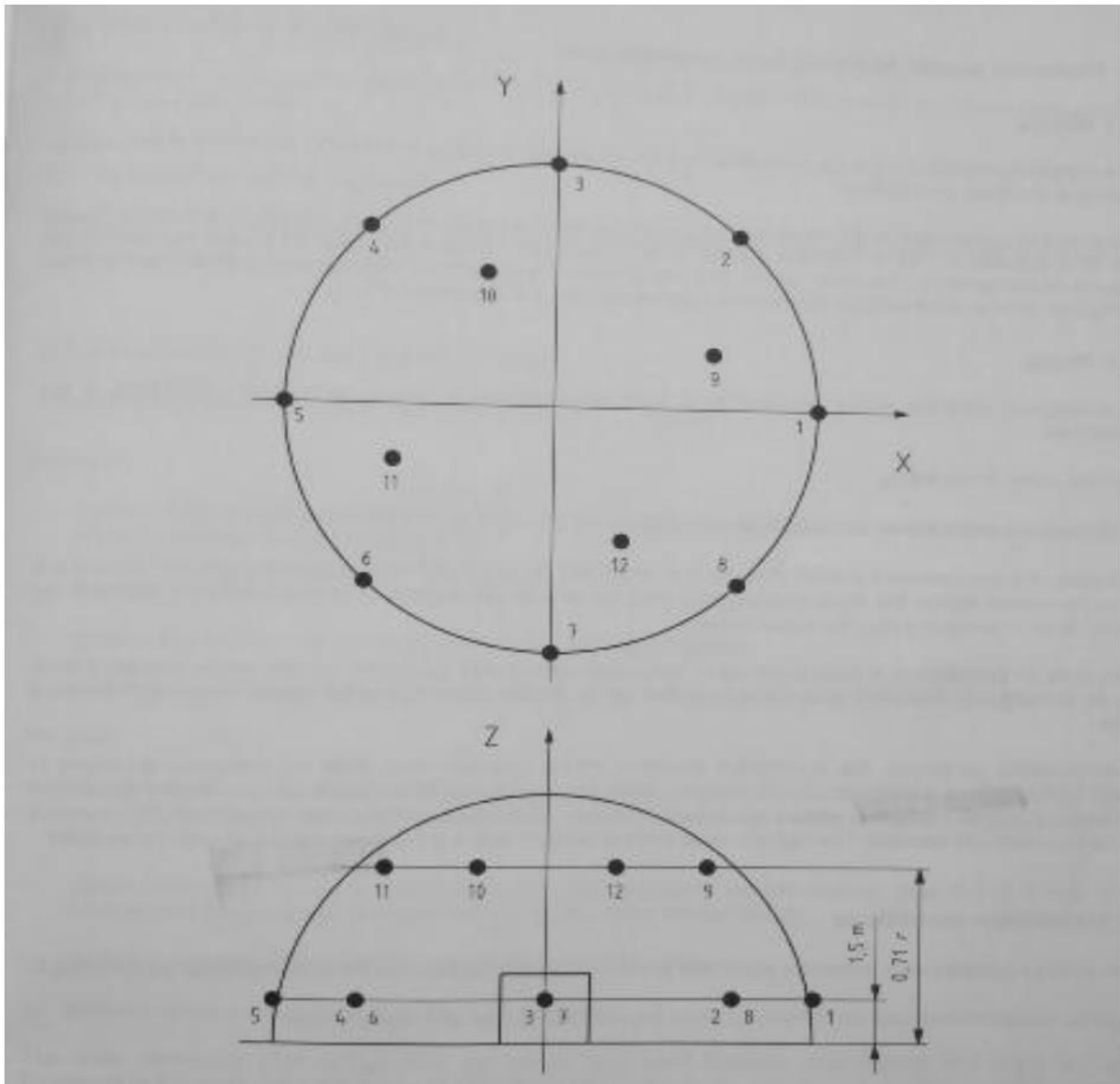
Background noise correction K1= 0 dB

Environmental correction: K2=0 dB / Outdoors measurements /

Measurement surface: hemisphere

Radius of the hemisphere: r= 3 m

The area of the measurement surface: S=56,52 m²



Sketch of the hemisphere measurement surface and the microphone position

<p>Abkürzungen:</p> <p>P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet</p>	<p>Abbreviations:</p> <p>P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested</p>
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Coordinates of the 6 microphone positions

Number of microphone	x/r	y/r	z
1	1	0	1,5m
2	0,7	0,7	1,5m
3	0	1	1,5m
4	-0,7	0,7	1,5m
5	-1	0	1,5m
6	-0,7	-0,7	1,5m
7	0	-1	1,5m
8	0,7	-0,7	1,5m
9	0,65	0,27	0,71r
10	-0,27	0,65	0,71r
11	-0,65	-0,27	0,71r
12	0,27	-0,65	0,71r

The measurements were carried out only six microphone position: 2; 4; 6; 8; 10; 12.

Environmental correction:

Determination of the environmental correction based on the EN ISO 3744:1995 and the Directive 2000/14/EC.

K_2 is the environmental correction

Environmental correction: $K_2=0$ dB / Outdoors measurements /

CONDITIONS

Barometric : 1020 hPa
 pressure
 Air : 27 °C
 temperature
 Relative : 53 %
 humidity
 Wind : 0 m/s
 velocity

BACKGROUND NOISE

The level of the background noise was at least 15 dB below the sound pressure level at each measuring point. (The measured background noise is less than 56 dB(A))

Background noise correction $K_1=0$ dB, according to the EN ISO 3744:1995 8.3

/ $\Delta L > 15$ dB; There is no correction /

	2	4	6	8	10	12
LEQ	43,1	41,7	41,4	42,0	41,6	42,4

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MEASUREMENT METHOD – DETERMINATION OF SOUND POWER LEVEL

The A-weighted sound power level was measured according to EN ISO 3744:1995 . Six microphone positions were located on the surface of the measuring hemisphere. The radius of the hemisphere is 3 m. /See the sketch of the measurement surface and microphone positions./

Digital integration was used to measure the equivalent continuous A-weighted sound pressure level, $L_{pAeq,T}$ in decibels for each measurement period T, and the response level was "S".

The frequency weight: A

The calculations of Free shutting down of the lid along the container body and complete opening of the lid

2 x 20 measurements were used for the Free shutting down and Complete opening of the lid to obtain a set of measurement data at all six microphone positions for each of 20 cycles (240 measurements).

The sound levels measured at each microphone position is classified in increasing order and the sound power

levels are calculated by associating the values at each microphone position according to their row

The measurement results were used to calculate L_p for cycles according to EN ISO 3744:1995 and the Directive 2000/14/EC. The results for each cycle were averaged over the measurement of 6 microphone positions.

The surface sound pressure level is corrected for reflected sound by K_2 . / $K_2 = 0$ /

The sound power levels L_{WA} shutting and L_{WA} opening are calculated from the quadratic mean of the five highest values among those obtained plus a surface area factor 17,52 dB, according to the EN ISO 3744:1995 and the Directive 2000/14/EC.

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RESULTS (Type 1)

Closing of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
77,9	74,5	73,3	75,8	77,7	77,1	75,2
80,1	75,9	73,6	74,3	81,5	74,9	76,4
76,2	74,3	76,5	75,5	81,3	80,8	77,8
77,5	73,8	74,4	76,1	80,6	80,2	77,2
77,5	72,6	72,9	76,3	80,3	79,7	76,7
Quadratic mean of 6 positions dB(A)						76,7
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						32,5
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of closing of the lid dB(A)						93,5
LWA of closing of the lid dB(A)						94
Measuring uncertainty dB(A)						+/- 4,8

Opening of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
77,2	77,3	77,8	78,7	84,3	82,3	80,2
77,9	76,9	78,4	79,8	83,3	81,5	79,8
80,1	76,2	78,2	79,0	83,2	80,4	79,3
77,9	76,1	79,1	79,2	81,3	82,6	79,4
78,0	77,4	79,6	79,3	83,1	80,6	79,7
Quadratic mean of 6 positions dB(A)						79,7
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						35,5
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of opening of the lid dB(A)						96,4
LWA of opening of the lid dB(A)						96
Measuring uncertainty dB(A)						+/- 4,8

Abkürzungen: P(ass) = entspricht Prüfgrundlage
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Rolling of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
80,4	77,9	82,4	80,5	79,6	82,3	80,1
81,0	76,8	82,8	81,6	80,4	82,3	80,4
81,2	80,2	81,5	80,5	80,0	84,3	80,8
78,6	81,4	81,0	82,4	79,3	82,8	80,8
80,4	82,0	82,1	82,6	79,8	81,9	81,0
80,6	78,9	79,8	81,8	80,6	81,4	80,5
Quadratic mean of 6 positions dB(A)						80,6
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						36,4
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of rolling of the lid dB(A)						97,4
LWA of rolling of the lid dB(A)						97
Measuring uncertainty dB(A)						+/- 4,8

$$L_{WA} = 10 \log \frac{1}{3} (10^{0,1 L_{WA \text{ Closing}}} + 10^{0,1 L_{WA \text{ Opening}}} + 10^{0,1 L_{WA \text{ Rolling}}})$$

$$L_{WA} = 95,2 \text{ dB(A)} = 95 \pm 4,8 \text{ dB(A)}$$

Abkürzungen: P(ass) = entspricht Prüfgrundlage
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RESULTS (Type 2)

Closing of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
48,6	46,7	47,4	47,4	50,5	51,3	48,3
48,7	47,8	46,8	46,9	49,8	50,9	48,0
46,4	49,6	46,8	48,4	50,9	50,8	48,8
46,4	47,6	47,3	47,6	52,3	50,9	48,9
48,3	47,2	46,6	46,8	53,1	51,9	49,3
Quadratic mean of 6 positions dB(A)						48,6
The background noise dB(A)						L_{pB}
43,6	42,4	43,6	43,2	44,3	43,7	43,5
$L'_{pE} - L_{pB}$						5,2
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						1,6
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of closing of the lid dB(A)						63,8
LWA of closing of the lid dB(A)						64
Measuring uncertainty dB(A)						+/- 4,8

Opening of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
54,3	52,5	54,5	55,3	54,2	55,5	53,7
57,3	55,1	54,7	56,7	56,3	56,8	55,2
55,5	54,8	55,7	55,4	56,8	56,9	55,2
55,4	56,2	55,5	53,8	57,4	57,2	55,4
55,8	53,9	55,3	54,2	58,2	57,6	55,8
Quadratic mean of 6 positions dB(A)						55,1
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						10,9
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,4
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of opening of the lid dB(A)						71,5
LWA of opening of the lid dB(A)						72
Measuring uncertainty dB(A)						+/- 4,8

Abkürzungen: P(ass) = entspricht Prüfgrundlage
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Rolling of the mobile waste containers						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
75,3	74,3	76,5	74,3	76,7	78,6	75,6
74,3	75,2	76,8	76,4	77,1	78,4	76,1
76,5	74,6	76,2	75,4	76,4	76,8	75,2
74,0	74,4	74,6	74,6	76,6	78,4	75,2
74,1	75,1	75,8	74,6	78,2	76,4	75,4
74,8	76,2	76,2	76,4	78,4	78,6	76,8
Quadratic mean of 6 positions dB(A)						75,8
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						31,6
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of rolling of the lid dB(A)						92,5
LWA of rolling of the lid dB(A)						93
Measuring uncertainty dB(A)						+/- 4,8

$$L_{WA} = 10 \log \frac{1}{3} (10^{0,1 L_{WA \text{ Closing}}} + 10^{0,1 L_{WA \text{ Opening}}} + 10^{0,1 L_{WA \text{ Rolling}}})$$

$$L_{WA} = 87,8 \text{ dB(A)} = 88 \text{ +/- } 4,8 \text{ dB(A)}$$

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RESULTS (Type 3)

Closing of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
60,5	62,7	61,9	62,0	61,4	61,0	61,0
63,4	59,3	59,8	59,3	60,8	62,4	59,7
62,9	59,5	59,6	58,8	61,9	60,9	59,5
61,8	60,5	59,4	59,9	62,4	60,3	59,8
60,4	61,0	59,4	59,8	60,9	60,6	59,6
Quadratic mean of 6 positions dB(A)						60,0
The background noise dB(A)						L_{pB}
43,6	42,4	43,6	43,2	44,3	43,7	43,5
$L'_{pE} - L_{pB}$						15,8
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,1
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of closing of the lid dB(A)						76,6
LWA of closing of the lid dB(A)						77
Measuring uncertainty dB(A)						+/- 4,8

Opening of the lid of the mobile waste container						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
65,6	65,2	64,2	62,0	66,2	66,6	64,3
65,6	64,6	62,8	61,8	65,3	65,6	63,5
66,4	64,6	63,6	62,3	65,8	65,4	63,7
66,4	66,6	64,5	63,6	66,4	66,7	64,9
66,7	67,2	65,6	64,5	64,5	66,8	65,9
Quadratic mean of 6 positions dB(A)						64,6
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						20,4
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of opening of the lid dB(A)						81,3
LWA of opening of the lid dB(A)						81
Measuring uncertainty dB(A)						+/- 4,8

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Rolling of the mobile waste containers						
Single event sound pressure level L'_{pEi} dB(A)						
Microphone position						
1	2	3	4	5	6	Quadratic mean L'_{pE} dB(A)
77,4	78,2	79,6	78,7	78,7	78,8	78,0
78,5	76,3	78,6	79,4	78,2	79,4	77,7
79,0	77,6	78,6	79,4	77,6	78,6	77,6
80,5	78,6	78,6	78,6	76,7	78,6	77,5
79,0	79,2	77,6	79,7	78,0	78,8	77,9
78,6	79,4	79,1	79,5	78,2	77,9	78,8
Quadratic mean of 6 positions dB(A)						78,0
The background noise dB(A)						L_{pB}
43,6	44,6	43,6	45,4	44,3	43,7	44,2
$L'_{pE} - L_{pB}$						33,8
Correction K1, $L'_{pE} - L_{pB} > 15$ dB						0,0
Room area m^2						2044,0
Room dimensions m						40 17 6
Absorption surface of the machinery room m^2						408,8
Correction K2						0,8
Measuring surface – semi sphere $r=3m$ (m^2)						56,5
Sound power of rolling of the lid dB(A)						94,7
LWA of rolling of the lid dB(A)						95
Measuring uncertainty dB(A)						+/- 4,8

$$L_{WA} = 10 \log \frac{1}{3} (10^{0,1 L_{WA \text{ Closing}}} + 10^{0,1 L_{WA \text{ Opening}}} + 10^{0,1 L_{WA \text{ Rolling}}})$$

$$L_{WA} = 90,2 \text{ dB(A)} = 90 \text{ +/- } 4,8 \text{ dB(A)}$$

CONCLUSIONS

The sound power level of the mobile waste container (Type 1) is: **LWA= 95 dB(A)**

The sound power level of the mobile waste container (Type 2) is: **LWA= 88 dB(A)**

The sound power level of the mobile waste container (Type 3) is: **LWA= 90 dB(A)**

End of test report

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