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## Declaration of conformity (DOC)

### Producer's declaration

We

ООО "ECOcentr"

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(producer's name)

Rabochiy prospekt 101, Voronezh, Russia

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(address)

declare under our sole responsibility that the product

ECOcentr – SHUM, Release Date September 2019

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(company name, trade mark/software name, software or update package, version No. File description: Major version . Minor version. Release.  
Build, release date)

to which this declaration relates is in conformity with the calculation method

ISO 9613-2:1996

following the provisions of ISO 17534-1:2015 and ISO/TR 17534-3:2015.

The declared conformity applies to situations covered by the above calculation method except the situations specified in the enclosed Test Case Results Comparison Form (TRC-Form) and with limitations according to the enclosed "Grade of Implementation Form (GOI-Form).

Voronezh, September 2019

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(Place and date of issue)

V.U.Belotserkovskiy, signature

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(Name and signature or equivalent marking of authorized person)

### Test Case Results Comparison Form (TRC-Form)

<b>Test suite</b>	<b>Title</b>	ISO/TR 17534-3, Acoustics — Software for the calculation of sound outdoors: Recommendations for quality ensured implementation of ISO 9613-2 in software according to ISO 17534-1:—, Clause 6 “Test cases”				
	Place and date of publication:	International Organization for Standardization, 2015				
Calculation method	<b>Title</b>	ISO 9613-2:1996, Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation				
	Place and date of publication:	International Organization for Standardization, 1996				
<b>Test case</b>	centre frequency of octave band	<b>Limits of certified results (A-weighted) dB</b>		<b>Software calculation result (A-weighted) dB (exemplary)</b>	<b>Result inside tolerances</b>	<b>Comments</b>
		<b>upper</b>	<b>lower</b>		<b>yes/no</b>	
T01 – Reflecting ground (G = 0)	63 Hz	13,75	13,65	13,70	yes	—
	125 Hz	23,81	23,71	23,76	yes	—
	250 Hz	31,15	31,05	31,10	yes	—
	500 Hz	36,22	36,12	36,17	yes	—
	1 000 Hz	39,00	38,90	38,95	yes	—
	2 000 Hz	39,42	39,32	39,37	yes	—
	4 000 Hz	36,52	36,42	36,47	yes	—
	8 000 Hz	23,99	23,89	23,94	yes	—
	Total (63 Hz up to 8 000 Hz)	44,34	44,24	44,29	yes	—
T02 – Mixed ground (G = 0,5)	63 Hz	13,75	13,65	13,70	yes	—
	125 Hz	20,12	20,02	20,07	yes	—
	250 Hz	24,47	24,37	24,42	yes	—
	500 Hz	30,05	29,95	30,00	yes	—
	1 000 Hz	36,16	36,06	36,11	yes	—
	2 000 Hz	37,58	37,48	37,53	yes	—
	4 000 Hz	34,68	34,58	34,63	yes	—
	8 000 Hz	22,15	22,05	22,10	yes	—
	Total (63 Hz up to 8 000 Hz)	41,58	41,48	41,53	yes	—
T03 – Porous ground (G = 1)	63 Hz	13,75	13,65	13,70	yes	—
	125 Hz	16,43	16,33	16,38	yes	—
	250 Hz	17,78	17,68	17,73	yes	—
	500 Hz	23,88	23,78	23,83	yes	—
	1 000 Hz	33,32	33,22	33,27	yes	—
	2 000 Hz	35,74	35,64	35,69	yes	—
	4 000 Hz	32,84	32,74	32,79	yes	—
	8 000 Hz	20,31	20,21	20,26	yes	—
	Total (63 Hz up to 8 000 Hz)	39,19	39,09	39,14	yes	—

<b>Test suite</b>	<b>Title</b>	ISO/TR 17534-3, Acoustics — Software for the calculation of sound outdoors: Recommendations for quality ensured implementation of ISO 9613-2 in software according to ISO 17534-1:—, Clause 6 “Test cases”				
	Place and date of publication:	International Organization for Standardization, 2015				
Calculation method	<b>Title</b>	ISO 9613-2:1996, Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation				
	Place and date of publication:	International Organization for Standardization, 1996				
<b>Test case</b>	centre frequency of octave band	<b>Limits of certified results (A-weighted) dB</b>		<b>Software calculation result (A-weighted) dB (exemplary)</b>	<b>Result inside tolerances</b>	<b>Comments</b>
		<b>upper</b>	<b>lower</b>		<b>yes/no</b>	
T04 – Flat ground with spatially varying acoustic properties	63 Hz	13,75	13,65	13,70	yes	—
	125 Hz	20,19	20,09	20,14	yes	—
	250 Hz	26,68	26,58	26,63	yes	—
	500 Hz	32,89	32,79	32,84	yes	—
	1 000 Hz	37,00	36,90	36,95	yes	—
	2 000 Hz	37,82	37,72	37,77	yes	—
	4 000 Hz	34,92	34,82	34,87	yes	—
	8 000 Hz	22,40	22,30	22,35	yes	—
	Total (63 Hz up to 8 000 Hz)	42,28	42,18	42,23	yes	—
T05 – Identical to T04, but calculation with the alternative method according to ISO 9613-2:1996, 7.3.2	63 Hz	8,75	8,65	8,70	yes	—
	125 Hz	18,81	18,71	18,76	yes	—
	250 Hz	26,16	26,06	26,11	yes	—
	500 Hz	31,23	31,13	31,18	yes	—
	1 000 Hz	34,00	33,90	33,95	yes	—
	2 000 Hz	34,42	34,32	34,37	yes	—
	4 000 Hz	31,53	31,43	31,48	yes	—
	8 000 Hz	19,00	18,90	18,95	yes	—
	Total (63 Hz up to 8 000 Hz)	39,35	39,25	39,30	yes	—
T06 – Ground with spatially varying heights and acoustic properties	63 Hz	13,73	13,63	13,68	yes	—
	125 Hz	19,60	19,50	19,55	yes	—
	250 Hz	21,15	21,05	21,10	yes	—
	500 Hz	26,09	25,99	26,04	yes	—
	1 000 Hz	34,87	34,77	34,82	yes	—
	2 000 Hz	37,08	36,98	37,03	yes	—
	4 000 Hz	34,18	34,08	34,13	yes	—
	8 000 Hz	21,63	21,53	21,58	yes	—
	Total (63 Hz up to 8 000 Hz)	40,64	40,54	40,59	yes	—
T07 – Identical to T06, but calculation with the alternative method according to ISO 9613-2:1996, 7.3.2	63 Hz	9,21	9,11	9,16	yes	—
	125 Hz	19,27	19,17	19,22	yes	—
	250 Hz	26,61	26,51	26,57	yes	—
	500 Hz	31,68	31,58	31,63	yes	—
	1 000 Hz	34,45	34,35	34,41	yes	—
	2 000 Hz	34,87	34,77	34,83	yes	—
	4 000 Hz	31,97	31,87	31,92	yes	—
	8 000 Hz	19,42	19,32	19,37	yes	—
	Total (63 Hz up to 8 000 Hz)	39,80	39,70	39,75	yes	—
T08 – Flat ground with spatially varying acoustic properties	63 Hz	8,71	8,61	8,66	yes	—
	125 Hz	14,80	14,70	14,75	yes	—
	250 Hz	21,17	21,07	21,12	yes	—
	500 Hz	25,86	25,76	25,81	yes	—

<b>Test suite</b>	<b>Title</b>	ISO/TR 17534-3, Acoustics — Software for the calculation of sound outdoors: Recommendations for quality ensured implementation of ISO 9613-2 in software according to ISO 17534-1:—, Clause 6 "Test cases"				
	Place and date of publication:	International Organization for Standardization, 2015				
Calculation method	<b>Title</b>	ISO 9613-2:1996, Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation				
	Place and date of publication:	International Organization for Standardization, 1996				
<b>Test case</b>	centre frequency of octave band	<b>Limits of certified results (A-weighted) dB</b>		<b>Software calculation result (A-weighted) dB (exemplary)</b>	<b>Result inside tolerances</b>	<b>Comments</b>
		<b>upper</b>	<b>lower</b>		<b>yes/no</b>	
ties and long barrier	1 000 Hz	27,31	27,21	27,26	yes	—
	2 000 Hz	27,26	27,16	27,21	yes	—
	4 000 Hz	22,09	21,99	22,04	yes	—
	8 000 Hz	6,97	6,87	6,92	yes	—
	Total (63 Hz up to 8 000 Hz)	32,53	32,43	32,48	yes	—
T09 – Flat ground with spatially varying acoustic properties and short barrier	63 Hz	10,84	10,74	10,79	yes	—
	125 Hz	16,31	16,21	16,26	yes	—
	250 Hz	21,17	21,07	21,12	yes	—
	500 Hz	26,06	25,96	26,01	yes	—
	1 000 Hz	27,89	27,79	27,84	yes	—
	2 000 Hz	27,76	27,66	27,71	yes	—
	4 000 Hz	22,51	22,41	22,46	yes	—
	8 000 Hz	7,35	7,25	7,30	yes	—
Total (63 Hz up to 8 000 Hz)	32,98	32,88	32,93	yes	—	
T10 – Ground with spatially varying heights and acoustic properties and short barrier	63 Hz	10,19	10,09	10,14	yes	—
	125 Hz	15,17	15,07	15,12	yes	—
	250 Hz	19,63	19,53	19,58	yes	—
	500 Hz	22,69	22,59	22,64	yes	—
	1 000 Hz	24,17	24,07	24,12	yes	—
	2 000 Hz	23,39	23,29	23,34	yes	—
	4 000 Hz	17,64	17,54	17,59	yes	—
	8 000 Hz	2,91	2,81	2,86	yes	—
Total (63 Hz up to 8 000 Hz)	29,35	29,25	29,30	yes	—	
T11 – Flat ground with homogeneous acoustic properties and cubic building receiver at low height	63 Hz	23,94	23,84	23,89	yes	—
	125 Hz	28,57	28,47	28,52	yes	—
	250 Hz	30,65	30,55	30,60	yes	—
	500 Hz	32,60	32,50	32,55	yes	—
	1 000 Hz	34,82	34,72	34,77	yes	—
	2 000 Hz	35,04	34,94	34,99	yes	—
	4 000 Hz	33,83	33,73	33,78	yes	—
	8 000 Hz	30,23	30,13	30,18	yes	—
Total (63 Hz up to 8 000 Hz)	41,35	41,25	41,30	yes	—	
T12 – Flat ground with homogeneous acoustic properties and cubic building receiver at large height	63 Hz	24,89	24,79	24,84	yes	—
	125 Hz	30,66	30,56	30,61	yes	—
	250 Hz	33,64	33,54	33,59	yes	—
	500 Hz	35,55	35,45	35,50	yes	—
	1 000 Hz	36,75	36,65	36,70	yes	—
	2 000 Hz	37,51	37,41	37,46	yes	—
	4 000 Hz	36,62	36,52	36,57	yes	—
	8 000 Hz	33,02	32,92	32,97	yes	—

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	Place and date of publication:	International Organization for Standardization, 2015				
Calculation method	<b>Title</b>	ISO 9613-2:1996, Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation				
	Place and date of publication:	International Organization for Standardization, 1996				
<b>Test case</b>	centre frequency of octave band	<b>Limits of certified results (A-weighted) dB</b>		<b>Software calculation result (A-weighted) dB (exemplary)</b>	<b>Result inside tolerances</b>	<b>Comments</b>
		<b>upper</b>	<b>lower</b>		<b>yes/no</b>	
	Total (63 Hz up to 8 000 Hz)	43,86	43,76	43,81	yes	—
T13 – Flat round with homogeneous acoustic properties and polygonal building receiver at low height	63 Hz	25,02	24,92	24,97	yes	—
	125 Hz	30,61	30,51	30,56	yes	—
	250 Hz	34,31	34,21	34,26	yes	—
	500 Hz	36,13	36,03	36,08	yes	—
	1 000 Hz	37,05	36,95	37,00	yes	—
	2 000 Hz	35,27	35,17	35,22	yes	—
	4 000 Hz	32,27	32,17	32,22	yes	—
	8 000 Hz	26,88	26,78	26,83	yes	—
	Total (63 Hz up to 8 000 Hz)	42,76	42,66	42,71	yes	—
T14 – Ground with spatially varying heights and acoustic properties and polygonal building	63 Hz	8,78	8,68	8,73	yes	—
	125 Hz	14,37	14,27	14,32	yes	—
	250 Hz	16,63	16,53	16,58	yes	—
	500 Hz	18,40	18,30	18,35	yes	—
	1 000 Hz	20,19	20,09	20,14	yes	—
	2 000 Hz	18,66	18,56	18,61	yes	—
	4 000 Hz	13,05	12,95	13,00	yes	—
	8 000 Hz	-1,13	-1,23	-1,18	yes	—
	Total (63 Hz up to 8 000 Hz)	25,43	25,33	25,38	yes	—
T15 – Flat ground with homogeneous acoustic properties and polygonal building receiver at large height	63 Hz	27,34	27,24	27,29	yes	—
	125 Hz	35,66	35,56	35,61	yes	—
	250 Hz	41,04	40,94	40,99	yes	—
	500 Hz	44,06	43,96	44,01	yes	—
	1 000 Hz	44,65	44,55	44,60	yes	—
	2 000 Hz	42,58	42,48	42,53	yes	—
	4 000 Hz	38,81	38,71	38,76	yes	—
	8 000 Hz	33,00	32,90	32,95	yes	—
	Total (63 Hz up to 8 000 Hz)	49,97	49,87	49,92	yes	—
T16 – Flat ground with homogeneous acoustic properties and three buildings	63 Hz	14,88	14,78	14,83	yes	—
	125 Hz	18,23	18,13	18,18	yes	—
	250 Hz	20,78	20,68	20,73	yes	—
	500 Hz	23,49	23,39	23,44	yes	—
	1 000 Hz	26,50	26,40	26,45	yes	—
	2 000 Hz	26,93	26,83	26,88	yes	—
	4 000 Hz	25,27	25,17	25,22	yes	—
	8 000 Hz	20,02	19,92	19,97	yes	—
	Total (63 Hz up to 8 000 Hz)	32,59	32,49	32,54	yes	—
T17 – Flat	63 Hz	15,39	15,29	15,34	yes	—

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	Place and date of publication:	International Organization for Standardization, 2015				
Calculation method	<b>Title</b>	ISO 9613-2:1996, Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation				
	Place and date of publication:	International Organization for Standardization, 1996				
<b>Test case</b>	centre frequency of octave band	<b>Limits of certified results (A-weighted) dB</b>		<b>Software calculation result (A-weighted) dB (exemplary)</b>	<b>Result inside tolerances</b>	<b>Comments</b>
		<b>upper</b>	<b>lower</b>		<b>yes/no</b>	
ground with homogeneous acoustic properties and three buildings alternative position of source and receiver	125 Hz	19,23	19,13	19,18	yes	—
	250 Hz	22,00	21,90	21,95	yes	—
	500 Hz	24,03	23,93	23,98	yes	—
	1 000 Hz	26,44	26,34	26,39	yes	—
	2 000 Hz	26,88	26,78	26,83	yes	—
	4 000 Hz	25,22	25,12	25,17	yes	—
	8 000 Hz	19,97	19,87	19,92	yes	—
	Total (63 Hz up to 8 000 Hz)	32,77	32,67	32,72	yes	—
T18 – Flat ground with homogeneous acoustic properties and complex building with backyard	63 Hz	15,06	14,96	15,01	yes	—
	125 Hz	21,84	21,74	21,79	yes	—
	250 Hz	25,12	25,02	25,07	yes	—
	500 Hz	26,34	26,24	26,29	yes	—
	1 000 Hz	27,79	27,69	27,74	yes	—
	2 000 Hz	28,70	28,60	28,65	yes	—
	4 000 Hz	27,86	27,76	27,81	yes	—
	8 000 Hz	23,51	23,41	23,46	yes	—
Total (63 Hz up to 8 000 Hz)	34,94	34,84	34,89	yes	—	
T19 – Ground with spatially varying heights and acoustic properties and reflecting barrier	63 Hz	13,73	13,63	13,68	yes	—
	125 Hz	19,60	19,50	19,55	yes	—
	250 Hz	21,15	21,05	21,10	yes	—
	500 Hz	28,06	27,96	28,02	yes	—
	1 000 Hz	36,56	36,46	36,52	yes	—
	2 000 Hz	38,48	38,38	38,44	yes	—
	4 000 Hz	35,25	35,15	35,21	yes	—
	8 000 Hz	23,23	23,13	23,19	yes	—
Total (63 Hz up to 8 000 Hz)	42,05	41,95	42,00	yes	—	

### Grade of Implementation Form (GOI-Form)

In the reference setting for application of the program, it is possible to calculate	Yes	To a limited degree	No
with			
A-weighted sound pressure levels (reference 500 Hz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sound pressure levels in octave-bands of 63 Hz to 8 kHz;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
with			
point sources,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
line sources,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
area sources,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
with automatic subdivision of line and/or area sources under consideration of the distance to the receiver,	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
with image sources describing the reflection of sound at walls and other vertical surfaces that can be designed pursuant to Figure 8, and that occur at surfaces with dimensions and orientations pursuant to Formula (19), of first order,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acc. to 5.9 of ISO/TR 17534-3:2015 with higher order, complete until $n = 5$ ;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
with directivity factor for point sources depending on an angle,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
depending on two angles,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
with selectable reference direction for each source;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acc. to Formula (4) for moderate downwind conditions with attenuation due to geometrical divergence according to Formula (7),	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attenuation due to air absorption acc. to Formula (8) and Table 2,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attenuation due to air absorption for other conditions acc. to ISO 9613-1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attenuation due to ground effects in octave-bands according to Formula (9) and Table 3,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attenuation due to ground effects for A-weighted sound pressure levels acc. to Formula (10) under consideration of a directivity due to ground reflection according to Formula (11),	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attenuation caused by screening acc. to <a href="#">5.2</a> ISO/TR 17534-3:2015	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acc. to Formula (12) with diffraction over the upper edge of the screen,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acc. to <a href="#">5.5</a> ISO/TR 17534-3:2015	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acc. to Formula (13) with diffraction around the vertical edges,	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
with consideration of the special case for application of Formula (13) for large-area industrial premises for determination of the long-term average level in accordance with Note 15,	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>